The Relationship Between Insurance Sector and Economic Growth In Morocco: An ARDL Approach.

العلاقة بين قطاع التأمين والنمو الاقتصادي في المغرب حسب مقاربة ARDL

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Résumé : Ce travail a pour objectif d'étudier l'effet et la causalité entre le secteur des assurances et la croissance économique au Maroc à l'aide des modèles ARDL et des séries temporelle pour la période 1980-2017. A long terme, ilexisteunecointégration entre les variables de chaque modèle avec un effet positif et significatif des primes d'assurance totales et des primes d'assurance-vie sur le PIB réel. A court terme, les primes d'assurance non-vie ont un effet positif et significatif sur la croissance économique contre un effet négatif des primes d'assurance-vie. Le test de causalité de Granger supporte le phénomène de "Supply Leading" en montrantune relation de causalité unidirectionnelle allant de l'assurance à la croissance économique.

Mots Clés:Les modèles ARDL, cointégration, primes d'assurance, test de causalité de granger, le phénomène de "Supply Leading".

Abstract : The aim of this paper is to investigate the effect and causality between insurance sector and economic growth in Morocco using ARDL models and time series data for the period 1980-2017. In the long run, there is cointegration between variables in each model and a significant positive effect of Total insurance premiums and life insurance premiums on real GDP. In the short run, there is a positive and significant effect of non-life insurance premiums on economic growth versus a negative effect of life insurance premiums. Granger causality test supports the supply-leading hypothesis by showing a unidirectional causal relationship running from insurance towards economic growth.

***Key Words*:**ARDL models, cointegration, insurance premiums, Granger causality test, supply-leading hypothesis.

JEL Codes : G22, O11, O16.

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Introduction :

The relationship between financial sector and economic growth has been a debatable issue. There exist two main directions regarding this relationship. The first one is demand-following hypothesis while the other one is supply-leading hypothesis.

As it was mentioned in the study of (Alhassan and Fiador,2014), supply-leading hypothesis means that a good financial system promotes economic growth. The demand-following hypothesis supports the idea that financial system is a result of economic growth as growth in the real economy stimulates the demand for financial services and that an expanding economy generates the demand for financial services.

In order to examine this two previous hypothesis, most of stdies focused on the contribution of banking sector and financial markets in economic growth whereas few of focused on insurance sector as an important part of financial systems. The weight of insurance services started to increase gradually in the 20th century especially after the first session of the United Nations Conference on Trade and Development (UNCTAD) in 1964 where it was acknowledged, in the first act and report of the Proceeding of the (UNCTAD), " a sound national insurance and reinsurance market is an essential characteristic of economic growth." Moreover, the prominence of the insurance-growth nexus is growing due to the remarkable increasing share of total written insurance premium to global GDP.

However, real growth economy in could also have an impact insurance consumption. A bigger income from an expanded economy may stimulate individuals to demand more insurance services. thus, total written insurance premiums elevates.

1. The EconomicBenefits of Insurance:

Insurance companies perform the same role as banks and capital markets in serving the needs of business units and private household in financial intermediation. Insurance is a very key financial sector part. In developed markets, the insurance sector have got a significant portion of the economy such as UK, EU and US.

In addition , (Akinlo and Apanisile,2014) declared that insurers can do Financial intermediation through collecting relative premiums from multitude of small individuals in the economy which forms a large pool of funds that could be used in both short and long term investments.

(Webb et all, 2002) also mentioned that life insurance decreases the demand for liquidity in the form of money and durable goods, and channels the composition of individuals' portfolios of savings to better productive assets. In addition, property/liability insurers lowers the possibility of distress liquidation of firms in the cse of catastrophic losses. For example, risk-neutral shareholders have a benefit in insuring against losses in order to avoid bankruptcy costs.

Another point provided by (Ward and Zurbruegg,2000) is risk transfer and indemnification. Risk transfer and indemnification services helps risk-averse individuals in purchasing large-expense items, such as automobiles and real estate as indemnification encourages their innovation.

2. Overview of Insurance in Morocco:

Generally, the insurance market in Africa is very weak in comparison with other areas of the world as it represents 1.36% of global's insurance market versus 30.24% in Europe and 30.6% in North America in 2017. Despite this situation, the insurance market in Morocco was in the 50th rank in the world level and in the second rank in Africa, after South Africa, with total insurance premiums of 3718 million USD in 2017.In addition, total expenditure on insurance services in Morocco has been constantly increasing over the period of the study as total written insurance premiums was almost tripled, within the period 1980-2013, from 46 million USD to 139 million USD in 2013 as it is reported in the 3rd Sigma review publication in 2018.

Considering this remarkable development of Moroccan insurance activity, it appears through statistics that it is worthy to be a subject of study and investigation in order to try to find out the reality of relationship and causality between economic growth and this type of activity .

3. LiteratureReview :

(Haiss and Sumegi, 2008) tested the impact of insurance on economic growth on a 29 European countries in the period 1992-2005. The study found a positive impact of life insurance on economic growth in Norway, Switzerland, Iceland and 15 countries and a positive effect of non-life insurance on economic growth in Central and Eastern Europe as well as Turkey and Croatia.

(Alhassan and Fiador,2014) took the case of Ghana as a case in order to study and determine the causal link between insurance penetration rate and economic growth between 1990 and 2010 following Autoregressive Distributed Lags models ARDL approach. Real GDP Per capita was used as a dependent variable representing economic growth, while the independent variables are as follows: , non-life insurance penetration rate, life insurance penetration rate, capital represented by Gross fixed capital formation, Foreign trade volume and consumer price index to express inflation. The study reported that there is a positive causal relationship between insurance penetration rate and economic growth in the long term, which indicates that funds mobilized by insurance institutions positively impact long-term growth. The study also found a unidirectional causal relationship from insurance activity towards economic growth.

(Muye and Shiekh Hassan,2016) studied a sample of 22 member countries of the ASEAN and GCC in order to examine the relationship between the development of the Islamic Takaful insurance sector and economic growth during the period 2004 - 2012. The study used per capita real GDP as a dependent

variable in addition to with the following independent variables: CPI as an indicator of Inflation, Total Takaful insurance premiums to show Islamic insurance market expressed, government spending provide by gross fixed capital formation GFCF and foreign trade. The study found out a positive and significant relationship between economic growth and Islamic Takaful insurance market.

(Olayungbo,2015) used VAR models and Toda-Yamamoto causality test (T-Y) and in order to examine the nature of the dynamic relationship between demand for insurance, financial development and economic growth in South Africa for the period 1970-2012. The VECM model showed that financial development stimulates demand for insurance in the short term. Results of Toda-Yamamoto (TY) test showed that financial development and insurance promote economic growth, as well as a unidirectional causal relationship from insurance activity And financial development towards economic growth which supports the Supply Leading hypothesis

Another of Olayungbo In 2016 where he used the Autoregressive Distributed Lags model (ARDL) to study the impact of both life i and non-life insurance on economic growth between 1976 and 2013 in Nigeria. He concluded that there exist a significant long and the short run positive dynamics contribution of life and non-life insurance in economic growth in Nigeria (Olayungbo, 2016).

4. The EmpiricalStudy:

4.1. Sources of Data and Variable Definitions:

This papere uses time-series data from 1980 to 2017 of real GDP, aggregate insurance premiums, life and non-life insurance premiums, foreign trade volume, gross fixed capital formation and inflation rate. Data of insurance premiums were taken from Sigma review publications issued by Swiss Re Institute´s research. The rest of macroeconomic variables where sourced from the world development indicators (WDI) data base.

LRGDP: is the logarithm of real GDP which is the monetary values of all final goods and services produced in Morocco and computed using 2010 base year in US dollars.

Insurance sector indicators are:

- **LTIPR**: logarithm of total insurance premiums.
- **LLIPR**: logarithm of life insurance premiums.
- **LNLIPR**: logarithm of non-life insurance premiums.

The logarithm of GDP and insurance sector indicators is used for the purpose of making for easy interpretation of regression coefficients in standardized form of percentage.

- **FTV**: Foreign Trade volume as a share of GDP represents the openness of an economy. It is supposed to have a positive effect on economic growth.
- **INF:** the annual percentage change in consumer price indicator CPI and is supposed to negatively affect economic growth.

- **GFCF:** is Gross fixed capital formation as a share of GDP and It contains investments on plants, machinery, equipment and infrastructure. It is supposed to positively affect economic growth.

4.2.Models Specification and Methodology:

In estimating the empirical relationship between insurance premiums and economic growth in Morocco, Models and the linear time series used in the above previous studies will be adopted, especially those of (Alhassan and Fiador,2014), (Muye and Shiekh Hassan, 2016). The main regression equation to be evaluated can be specified as follows:

$$Y_t = \beta IPt + \gamma X_t + \varepsilon_t \text{ ……..(1)}$$

Where Y_t is economic growth in year t, IPt is the insurance premium indicator (further decomposed into life and non-life insurance) in year t, X is a vector of controls (grossfixed capital formation, inflation and trade) and $\varepsilon_t$is a disturbance term.

4.3.Unit Root and ARDL Cointegration Test:

This paper adopts the ARDL model proposed by (Pesaran et all 2001). According to (Nkoro and Uko, 2016), this model is advantageous because of the following reasons:

- Since each of the underlying variables stands as a single equation, endogeneity is less of a problem in the ARDL technique because it is free of residual correlation. Also, it enables us to analyze the reference model.
- When there is a single long run relationship, the ARDL procedure can distinguish between dependent and explanatory variables. That is, the ARDL approach assumes that only a single reduced form equation relationship exists between the dependent variable and the exogenous variables (Pesaran, et all, 2001).

In addition to the above advantages, the test is relatively more efficient in small sample data (Olayungbo, 2016).

The ARDL cointegration approach can be achieved by determining the existence of the long run relationship of variables then choosing the appropriate lag length for the ARDL model and estimating the long run estimates of the selected ARDL model. Finally, reparameterizing of the ARDL model into error correction model.

Table01: ADF Unit Root Test Results at Level.

		LRGDP	LTIPR1	LLIPR1	LNLIPR	FTV	GFCF	INF
With Constant	**t-Sta**	-1.01	-2.145	-0.937	-2.303	-0.97	-2.53	-1.48
	Prob.	0.73	0.2291	0.7657	0.1761	0.752	0.123	0.5294
		n0	n0	n0	n0	n0	n0	n0
With Constant & Trend	**t-Sta**	-2.941	-0.844	-1.439	-0.875	-2.292	-3.903	-3.978
	Prob.	0.163	0.9518	0.8321	0.9483	0.427	0.0254	0.018
		n0	n0	n0	n0	n0	**	**
Without Constant & Trend	**t-Sta**	2.0708	-0.094	0.2907	-0.087	0.8796	0.3458	-1.824
	Prob.	0.9892	0.6439	0.7646	0.6463	0.8947	0.7783	0.065
		n0	n0	n0	n0	n0	n0	*

Source: Eviews 10

a. Unit Root Test Results:

Notes:

- (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant.
- The significance means the degree to which the null hypothesis of non stationarity is rejected.

Table02: ADF Unit Root Test Results at the First Difference.

		LRGDP	LTIPR1	LLIPR1	LNLIPR	FTV	GFCF	INF
With Constant	**t-Sta**	-2.282	-1.754	-6.552	-1.687	-7.464	-1.342	-9.55
	Prob.	0.1838	0.3954	0	0.4302	0	0.5937	0
		n0	n0	***	n0	***	n0	***
With Constant & Trend	**t-Sta**	-2.363	-4.379	-6.862	-4.224	-7.494	-4.898	-4.819
	Prob.	0.3911	0.0071	0	0.0104	0	0.0019	0.0025
		n0	***	***	**	***	***	***
Without Constant & Trend	**t-Sta**	-0.7623	-1.8488	-6.6297	-1.7743	-7.3888	-0.4424	-9.4087
	Prob.	0.3786	0.0621	0	0.0724	0	0.5141	0
		n0	*	***	*	***	n0	***

Source: Eviews 10.

Using ADF unit root test and based on the SIC criteria, the results ,in Table01, show that all time series have a unit root at level except inflation (INF) where the test showed that it is stationary at the level when the test is done with constant and trend and without constant and trend. Thus, it couldn't be definitely accepted as stationary at level.

Using the same unit root test on the first difference, all time series are found to be stationary i.e. they are I(1) as it is clear from the result of Table02

In fact, one of the most important things in unit root test result before moving to the ARDL cointegration is to make sure that there is no I(2) time series because critical values in bounds test are calculated only for I(0) and I(1).Hence, having i(2) series makes the ARDL cointegration test invalid.

b.The ARDL Cointegration Approach: From the results of stationarity, it seems that all the time series are I(1). Thus the ARDL cointegration approach can be applied in the study to test the existence of a long run relationship using boundary test. The ARDL models proposed by (Pesaran et al .2001) include boundary testing is applied in case the time series are integrated from the same 0 or 1 level and when there are different levels of stationarity .

When the computed F-statistic is greater than the upper bound critical value, then the H_0 on The null hypothesis of non-existence of the long-run relationship is rejected (variables are cointegrated). If the F-statistic is below the lower bound critical value, the H_0 cannot be rejected (there is no cointegration among the variables).If the computed F statistic falls within(between the lower and upper bound) the critical value band, the result of the inference is inconclusive.(Nkoro and Uko, 2016).

According to (Narayan,2005), the existing critical values in (Pesaran et al .2001) cannot be applied for small sample sizes because they are based on large sample sizes. Hence, he provides another set of critical values that can be applied on small sample sizes, ranging from 30 to 80 observations. The critical values are 2.496 - 3.346, 2.962 – 3.910, and 4.068 – 5.250 at 90%, 95%, and 99%, respectively.

Table 03: Bounds Test Result

Critical Values Narayan			
Significancelevel	%1	%5	---
Upperbounds	5.25	3.91	---
Lowerbounds	4.068	2.962	----
	F-stat model01	F-stat model02	F-stat model03
	5.33***	5.15**	***5.37

Source: Eviews 10.

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant. The significance means the degree to which the null hypothesis is rejected.

The results in Table 03 show that there is cointegration between variables of the three models. The F statistics of models 01 and 03 are 5.33 and 5.37 respectively which are greater than the upper boundary 5.25 at a significant level as the Fstatistic of model 02 is 5.15 and it is greater than, the critical value, 2.96 at a significant level of 5%. Therefore, the H_0 hypothesis, which says that there is no cointegration, is rejected and rather the H_1 hypothesis that says there is cointegration is accepted. After providing evidence a long run equilibriumrelationship (cointegration), The long and the short run models are estimated based on the specifications below:

b.1The Long Run Specifications:

$$LRGDP_t = \alpha_0 + \alpha_{1i} LRGDP_{t-i} + \alpha_{2i} LTIPR_{t-i} + \alpha_{3i} FTV_{t-i} + \alpha_{4i} INF_{t-i} + \alpha_{5i} GFCF_{t-i} + \varepsilon_{1i} \quad \ldots\ldots(02)$$

$$LRGDP_t = \beta_0 + \beta_{1i} LRGDP_{t-i} + \beta_{2i} LLIPR_{t-i} + \beta_{3i} FTV_{t-i} + \beta_{4i} INF_{t-i} + \beta_{5i} GFCF_{t-i} + \varepsilon_{2i} \quad \ldots\ldots(03)$$

$$LRGDP_t = \theta_0 + \theta_{1i} LRGDP_{t-i} + \theta_{2i} LNLIPR_{t-i} + \theta_{3i} FTV_{t-i} + \theta_{4i} INF_{t-i} + \theta_{5i} GFCF_{t-i} + \varepsilon_{3i} \quad \ldots\ldots(04)$$

Where equations (02),(03)and(04) are the long run model specifications of model01,model02 and model03 respectively and(α,β,θ) are long run coefficients. ε is an error term.

Table04 : LagLengths

	Model01		**Model02**		**Model03**	
Lag	**AIC**	**SC**	**AIC**	**SC**	**AIC**	**SC**
0	-3.492062	-3.26986	-3.766847	-3.544655	-3.471648	-3.249456
1	-3.706298	-3.43966	-3.830913	-3.564282	-3.700009	-3.433378
2	-4.1004*	-3.7894*	-4.1848*	-3.8737*	-4.1024*	-3.7914*
3	-4.044241	-3.68873	-4.127924	-3.772416	-4.046829	-3.691321

Source: Eviews 10.

Notes: (*) indicates the lowest value.

Before estimating both long and short run dynamics, the optimal lag lengths must be chosen. In Table 04 and based on AIC and SC criterion, the optimal lag length of the three models is 2.

Table05 : Long Run Estimations.

Method: Least Squares			Included observations: 36 afteradjustments			
	Model01		Model02		Model03	
Variable	Coefficient	Prob.	Coefficient	Prob.	Coefficient	Prob.
C1	-0.590012	0.7697	---	---	---	---
LTIPR1(-1)	0.06957*	0.0792	---	---	---	---
LTIPR1(-2)	-0.054008	0.1016	---	---	---	---
C2	---	---	-0.416258	0.854	---	---
LLIPR1(-1)	---	---	0.027457**	0.0443	---	---
LLIPR1(-2)	---	---	-0.017248	0.1552	---	---
C3	---	---	---	---	-0.309197	0.876
LNLIPR1(-1)	---	---	---	---	0.062319	0.1186
LNLIPR1(-2)	---	---	---	---	-0.04863	0.1469
LRGDP(-1)	0.368092	0.0124	0.340316*	0.0141	0.351825*	0.0166
FTV(-1)	0.002753*	0.0781	0.003599**	0.0142	0.002803*	0.0803
GFCF(-1)	-7.38E-12	0.2444	-9.49E-12	0.1327	-6.92E-12	0.282
INF(-1)	-0.003665	0.1628	-0.00533**	0.0336	-0.003835	0.1505
LRGDP(-2)	0.643381*	0.0001	0.667558**	0.0001	0.649459**	0.0001
FTV(-2)	0.000328	0.823	0.001401	0.2959	0.000339	0.8216
GFCF(-2)	8.07E-13	0.8696	-1.83E-14	0.9971	7.93E-13	0.8728
INF(-2)	-0.001572	0.5587	-0.003262	0.2226	-0.001553	0.5699
R-squared	0.99771		0.99781		0.997649	
D-Watson	2.825501		2.398552		2.82656	

Source: Eviews 10.

Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%.

From Tble05and in Model 01, there is a significant positive long run effect of total insurance premiums ($LTIPR_{-1}$) on Morocco's economic growth at a significant level of 10%. A 1% increase in $LTIPR_{-1}$ leads to an increase of 0.069% LRGDP). A1% increase in $LRGDP_{-1}$ and $LRGDP_{-2}$resulted an increase of 0.36% and 0.64% respectively in LRGDP respectively and at a significant level of 5% and 1% respectively. In addition, foreign trade volume has also a positive effect on economic growth in Morocco, where the 1% increase in FTV_{-1} leads to an increase of 0.002% in LRGDP. The rest of variables remain insignificant. This result implies that through its function of savings mobilization and risk transfer, insurance markets stimulates growth in the real economy in the long-run.

In Model 2 and in long term, life insurance has a significant positive effect on economic growth in Morocco at a significant level of 5% where an increase of 0.027 in LRGDP is resulted for every 1% increase in LLIPR-1.This is in line with the opinion of (Webb et all, 2002) who argue that "Life insurers mobilize funds

through attractive medium and long-term savings products." $LRGDP_{-1}$ and $LRGDP_{-2}$ have a similar effect to the results in model 01 but with different rates on LRGDP where the increase of 1% leads to an increase of 0.34% and 0.66% in LRGDP at a significant level of 5% and 1% respectively .The increase of 1% in FTV_{-1} gives an increase of 0.003% in LRGDP. In addition, there exists a significant negative effect of inflation rate as the 1% increase in inflation rate INF_{-1} leads to a decrease of 0.005% in LRGDP while the other coefficients were insignificant. In model 3, The results showed an insignificant positive effect of non-life insurance $LNLIPR_{-1}$ on LRGDP in Morocco in the long term while there was a significant effect of LRGDP-1 and LRGDP-2 at a significant level of 5% and 1% with an increase of 0.35% and 0.64% in LRGDP for each increase of 1%. A 1% FTV-1 leads to an increase of 0.002% in LRGDP at a significant level of 10%.

b.2The Short Run Specifications: The short run models are estimated based on the following specifications:

$$\Delta LRGDP_t = \delta_{0.} + \sum_{I=1}^{P} \delta_{1i} \Delta LRGDP_{t-i} + \sum_{I=1}^{P} \delta_{2i} \Delta LTIPR_{t-i} + \sum_{I=1}^{P} \delta_{3i} \Delta FTV_{t-i} + \sum_{I=1}^{P} \delta_{4i} \Delta INF_{t-i} + \sum_{I=1}^{P} \delta_{5i} \Delta GFCF_{t-i} + ECT1_{t-1} + \varepsilon_{1t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

$$\Delta LRGDP_t = \pi_{0.} + \sum_{I=1}^{P} \pi_{1i} \Delta LRGDP_{t-i} + \sum_{I=1}^{P} \pi_{2i} \Delta LLIPR_{t-i} + \sum_{I=1}^{P} \pi_{3i} \Delta FTV_{t-i} + \sum_{I=1}^{P} \pi_{4i} \Delta INF_{t-i} + \sum_{I=1}^{P} \pi_{5i} \Delta GFCF_{t-i} + ECT2_{t-1} + \varepsilon_{2t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

$$\Delta LRGDP_t = \phi_{0.} + \sum_{I=1}^{P} \phi_{1i} \Delta LRGDP_{t-i} + \sum_{I=1}^{P} \phi_{2i} \Delta LNLIPR_{t-i} + \sum_{I=1}^{P} \phi_{3i} \Delta FTV_{t-i} + \sum_{I=1}^{P} \phi_{4i} \Delta INF_{t-i} + \sum_{I=1}^{P} \phi_{5i} \Delta GFCF_{t-i} + ECT3_{t-1} + \varepsilon_{3t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Where equations (05), (06) and (07) are the short run model specifications of Model 01,Model 02 and Model03 respectively and(δ,π,ϕ) are long run coefficients. ε is an error term. In addition, there exist error correction terms ECT which are time series of each model generated from their long run estimations by using Eviews software.

From Table06 of the short run and in model 01, there is a positive but insignificant effect of total insurance premiums on economic growth. In model 02, there is a positive but insignificant effect of the lag 1 of insurance premiums $LLIPR_{-1}$ economic growth. There is a negative and significant effect life insurance premiums $LLIPR_{-2}$ on economic growth in Morocco at a 5% level of significance

where an increase of 1% in life insurance premiums $LLIPR_{-2}$ reduces LRGDP by 0.031%. In model 3 there is a positive and significant effect of the lag 2 of non-life insurance premiums $LNLIPR_{-2}$ on economic growth in Morocco at a 5% level of significance where an increase of 1% in non-life insurance premiums $LNLIPR_{-2}$ increases LRGDP by 0.031%.this is consistent with the argue of (Webb et all, 2002) that say "Property/liability insurers do not mobilize medium and long-term savings to the extent that life insurers do. Their products are characterized by a short to medium-term intermediation of funds." Error correction terms ECT are all negative and significant at 5% in models 01, 02 and 03. This means that the long run disequilibrium is corrected, in the short run, by 77.24% for total insurance, 67.07% and 79.46% for life and non-life premiums respectively. In addition, there is a significant positive effect at 5% of the of trade FTV_{-1} in the short term on LRGDP in model 02 at a rate of 0.002% per 1% increase while inflation INF_{-1} showed a significant negative impact in the short term at the level of 10% where a decrease rate of 0.0048% in LRGDP per 1% increase in INF_{-1}.

Table06: Short Run Estimations.

	Model01		**Model02**		**Model03**	
Variable	**Coef**	**Prob.**	**Coef**	**Prob.**	**Coef**	**Prob.**
C1	0.0394**	0.0263	----	----	----	----
D(LTIPR1(-1))	0.03864	0.2235	----	----	----	----
D(LTIPR1(-2))	0.04414	0.193	----	----	----	----
C2	----	----	0.03177**	0.0672	----	----
D(LLIPR1(-1))	----	----	0.01495	0.2581	----	----
D(LLIPR1(-2))	----	----	-0.03151**	0.0211	----	----
C3	----	----	----	----	0.04159	0.016
D(LNLIPR1(-1))	----	----	----	----	0.02867	0.335
D(LNLIPR1(-2))	----	----	----	----	0.05939*	0.071
C4	----	----	----	----	0.07911	0
D(LRGDP(-1))	-0.0029	0.992	0.12397	0.664	-0.04942	0.863
D(LRGDP(-2))	0.13236	0.391	0.14238	0.437	0.10419	0.484
D(FTV(-1))	0.00184	0.133	0.00291**	0.0429	0.00178	0.129
D(FTV(-2))	-0.0001	0.909	0.00057	0.6721	-0.00023	0.836
D(INF(-1))	-0.0017	0.413	-0.0048*	0.0652	-0.00184	0.374
D(INF(-2))	0.00171	0.441	-0.00023	0.9296	0.00151	0.472
D(GFCF(-1))	-4.5E-12	0.408	-7.6E-12	0.255	-3.7E-12	0.479
D(GFCF(-2))	-5.1E-12	0.321	9.58E-13	0.8697	-5.2E-12	0.287
D(ECT (-1))	-0.695**	0.004	-0.6301**	0.019	-0.6922**	0.003
R-squared	0.772459		0.67078		0.794693	
D-W stat	2.120522		1.89041		2.007494	

Source : Eviews 10.

c. Serial Correlation Problem and Stability: The result of Breusch-Godfrey Serial Correlation LM Test and the Cumulative Sum of Recursive Residuals CUSUM) are as follows:

c.1Serial Correlation LM Test:

Table07: Serial Correlation LM Test.

	Model 01	Model 02	Model 03
F-statistic	0.382	0.0913	0.3094
P-statistic	0.687	0.9130	0.7373

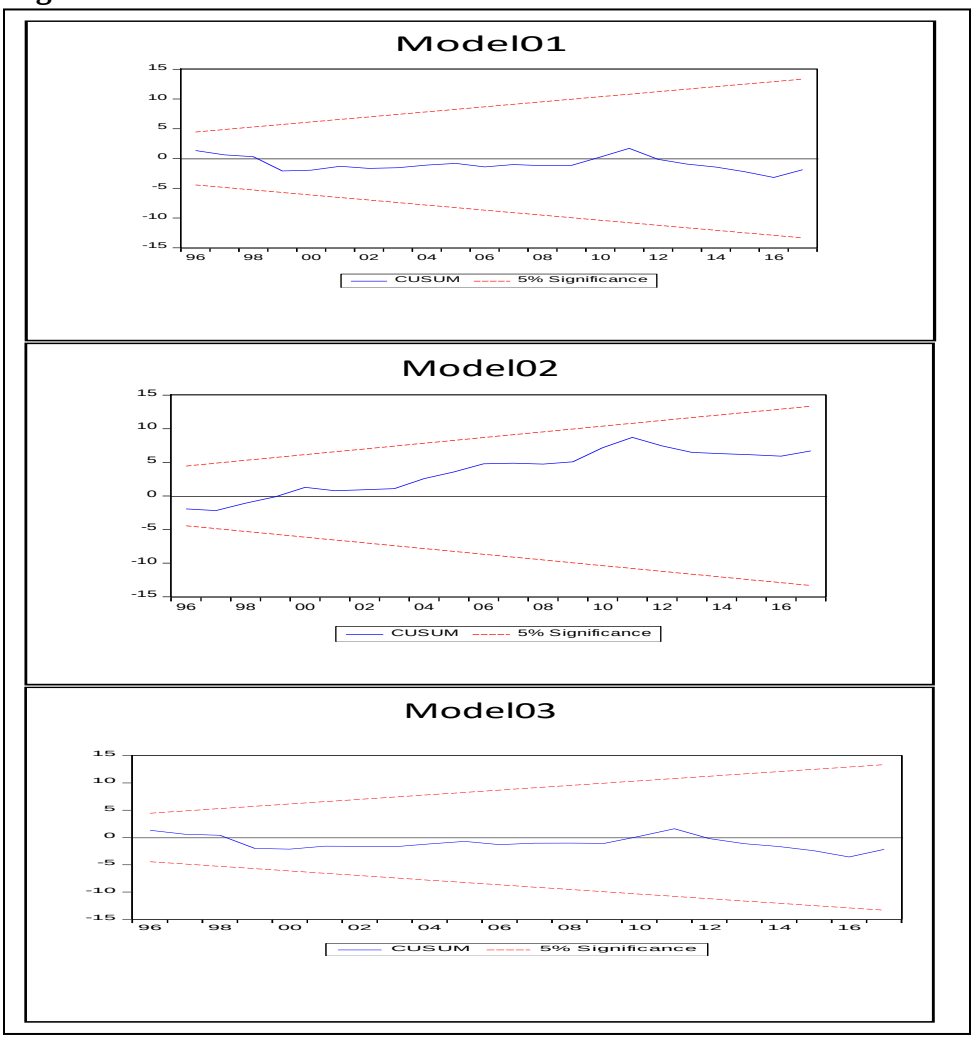
Source: Eviews 10

H_0: There is no autocorrelation between errors.

H_1: the variance of the errorsis not heterogenous.

c.2Cumulative Sum of Recursive Residuals CUSUM test:

Figure01: Cumulative Sum of Recursive Residuals CUSUM test results.



From Table 07, the P-statistic is greater than 10% for the three models. Thus, the null hypothesis not be rejected. Hence the three models are free of serial autocorrelation problem.From Figure01, since CUSUM lies within the 5% critical lines, the model coefficients are stable. In addition, R-squared values of all models in this paper are between 0.67 and 0.99 which means that higher variations in growth are significantly explained by the models estimated.

5.Causality Test :

Table:07 Granger Causality Tests

Pairwise Granger Causality Tests Time: 14:43		**Date: 08/25/18**	
Sample: 1980 -2017		**Lags: 2**	
NullHypothesis:	***Obs***	***F-Statistic***	***Prob.***
LTIPR1 does not Granger Cause LRGDP	36	7.09843	0.0029
LRGDP does not Granger Cause LTIPR1		1.26408	0.2967
LLIPR1 does not Granger Cause LRGDP	36	2.3837	0.1089
LRGDP does not Granger Cause LLIPR1		1.92505	0.1629
LNLIPR1 does not Granger Cause LRGDP	36	6.89178	0.0033
LRGDP does not Granger Cause LNLIPR1		1.06132	0.3582

Source: Eviews 10.

From Table 07, the null hypothesis that there is no causal relationship running from insurance premiums to the gross domestic product (LRGDP) is rejected at a significant level of 5% for LTIPR and LNLIPR, while the same hypothesis cannot be rejected from LRGDP towards insurance premiums. Thus, that there is a unidirectional causal relationship from insurance premiums towards GDP, which supports the supply-leading hypothesis. This means that the development of the insurance market in Morocco stimulates and promotes economic growth through encouraging the accumulation of capital, Transfer of risk and indemnification.

Conclusion:

This study tries test the causality and effect between total insurance services expenditure and economic growth in Morocco using time series data for the period 1980-2017. Due to the relatively small sample size (37 observations) and the absence of I(2) time series, the Autoregressive Distributed Lags models (ARDL) are used on three models. The ARDL model is based on bounds testing as a method of detecting cointegration where the study found a long run relationship between variables of each model.

The long run estimations of the three models showed a significant positive effect of total insurance premiums and life insurance premiums on the economic growth with a positive but insignificant effect of non-life insurance premiums. This is consistent with the findings of (Alhassan and Fiador,2014) and (Azman-Saini and Smith,2011), where they argued that insurance market stimulates real growth by increasing the accumulation of capital. In addition, there exist a significant positive effect of the two lags of LRGDP and foreign trade volume FTV on LRGDP and a significant negative impact of inflation rate. The estimation of the short run relationship was done using VECM models. The results showed a significant positive effect of non-life insurance premiums on GDP versus a negative effect of the lag 2 of life insurance premiums. This is in line with the result of, (Haiss and Sumegi,2008) and (Alhassan and Fiador ,2014,90) while the Other variables showed the same results as in the long term.

The causality test proved that there is a unidirectional causal relationship from insurance premiums towards GDP which means the validity of supply-leading hypothesis .This is also in line with the result of ,(Olayungbo, 2015) and (Alhassan and Fiador,2014).These results imply that insurance sector in Morocco is a good and crucial economic component that should be encouraged and developed.

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