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Insurance and Economic Growth in Tunisia : A Theoretical and Empirical Analysis

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Abstract
The purpose of this paper is to investigate the impact of insurance in economic growth, with empirical analysis for Tunisia. The analysis used data for the period between 1998- 2013 .The methodology of our research employs statistical methods concerning the analysis between the GDP and insurance indicators. Insurance indicators are measured by insurance penetration (the share of gross premium written to GDP) and insurance density (the average value of the insurance premium paid by an inhabitant for one year). We used three different insurance variables life, non-life insurance and the total insurance penetration and density.According to our results, insurance sector positively and significantly influences economic growth. The results are confirmed in terms of non-life insurance, life insurance and total insurance.
Keywords: Tunisian insurance market, Economic growth, Insurance.

1. Introduction

Theoretical and empirical analysis have revealed that countries with developed financial systems maintain faster and more stable long-run growth. Developed financial markets have a significant positive impact on total factor productivity, which translates into higher long-run growth (Haiss and Sumegi, 2008).

The insurance sector , as financial service, has developed as part of the global development of financial system, it also has become more crucial due to the intensification of risks and uncertainties in almost of economic activities.

Recently, the economic importance of the insurance sector has been increasing as result of the liberalization of financial systems and globalization of financial markets (Outreville, 2014).

The insurance plays a crucial role in the economy activities. It offer a safe and stable environment for economic development.

The principal function of the insurance is risk transfer which support the creation of a more stable environment for firms and the reduction in the level of capital required to protect against risk. This allows firms to intensify their efforts and resources on their principal field.

By protecting firms and citizens against adverse events, the insurance sector provides a safety and stable environment . Insurance plays, at this level, an important role in economic stability . Moreover, as institutional investors, the insurance sector provides a long-term source of finance for investment in the economy, thus contributing to sustainable growth .

Insurance not only contribute to a stable environment, but it also enhance companies of the importance of risk management, and influences their investment decisions.

The object of our paper is to determine the correlation between insurance and economic growth in Tunisia, by taking into consideration insurance penetration and insurance density .

The rest of the paper is organised as follow. Section 2 starts with a literature review of the relationship between insurance and economic growth , followed by a presentation of the insurance markets in Tunisia (Section 3). Section 4 describe data, methodology and the model. Section 5 presents results and the interpretations of the empirical estimation and the section 6 concludes .

2. Literature Review

Since 1964, in the context of the United Nations Conference on Trade and Development (UNCTAD), the important role of insurance sector in the economic growth of a country has been fully recognized, being regarded as a very important national sector, which is an essential feature of a suitable economic system, at the same time contributing to the economic growth and the promotion of employment.

Francois Outrevillle (UNCTAD, 1990) has carried out a pioneering examination of the relation between insurance development and economic growth in developing countries. His study evaluate the relationship between property-liability insurance premium written and economic and financial development with cross-section data of 55 developing countries (1990) with OLS method. A positive relationship between logarithm of property-liability premium per capita and GDP per capita was founded.

Potential relationship between growth in insurance and economic growth was examined by Ward and Zurbruegg (2000) for nine OECD countries. Real Gross National Product and total written premium were considered as measures for economic and insurance activity, respectively.

This study tried to answer issues which had not been considered in Outreville's study, such as causal relationships. It did not accommodate the potential for causal relationships to differ in size and direction across countries. Ward and Zurbruegg (2000) use Johansen co-integration trace test and error correction models and it was concluded that the causal relationships between economic growth and insurance market development may vary across countries.

Catalan, Impavido and Musalem (2000) worked on Granger Causality of insurance asset to economic growth for four teen OECD and five developing countries for the period 1975 - 1997. Their results performed that contractual savings seems to have some relation to Market Capitalization and Value Trade in the majority of countries.

Their analyse involve that the correlation between life insurance and pension funds is not so strong in OECD countries, whereas, the majority of non OECD countries show this relationship. The impact of non-life insurance is almost equivalent to the impact of the life insurance for Market Capitalization and less for pension funds. The connection between contractual savings and Market Capitalization seem to hold for OECD countries, especially for countries in small and tight market but enabling regulatory environment.

Webb, Grace and Skipper (2002) explored the contribution of banks and insurance to economic growth by promoting the efficient allocation of capital. They use cross-country data for fifty five developed and developing countries for the period 1980-1996.

They employed average penetration of life and non-life insurance to explain GDP per capita growth and they used, in addition, average growth rate of capital stock per capita, average penetration of banking activity, average level of exports as a share of GDP, average government expenditure share of GDP, natural log of initial real GDP per capita and data on proportion of the population over twenty five years who have completed primary school.

They found that the exogenous components of banking and life insurance penetration are robustly predictive of increased productivity. They found that there is no correlation between economic growth and non-life insurance. Economic growth influences life insurance penetration while it does not conclude banking development.

Kugler and Ofoghi (2005) explored the components of insurance premium to find a long run relationship between insurance market development and economic growth . They used, also, Granger causality tests with integrated measures of specific classes of long-term and general business insurance for the United Kingdom.

Disaggregated data for long-term insurance includes yearly and single premium (including life insurance, annuities, individual pensions and other pensions) for the period 1966-2003 and for general business insurance, includes motor, accident and health, liability, property, pecuniary loss and reinsurance (Marine, Aviation and Transport) for the period 1971-2003.

For most of variables , co-integration tests confirmed long run relationship between development in insurance market size and economic growth. In the short run, growth in life , liability and pecuniary loss insurance causes economic growth. Additionally, they funded that causality from GDP growth to insurance market size development is more powerful than the causality from the other side.

Peter and Kjell (2006) treated a theoretical and empirical study of the correlation of insurance and economic growth . They worked on a cross country panel data analysis using insurance premium annual data from twenty nine European states for the period 1992 - 2004 . They conducted a weak evidence for the role of life insurance in economic growth.

Arena (2008) applied the generalized method of moments for dynamic models of panel data for fifty five countries between 1976 and 2004 to test whether there is a causal relationship between insurance development (life and non-life insurance) and economic growth. Robust evidence was found that both life and non-life insurance have a positive and significant effect on economic growth. Precisely, for life insurance, high-income countries drive the results, and for non-life insurance, both high-income and developing countries drive the results.

The insurance is most often regarded as an item of expenditure which is not required by potential buyers, particularly if they are not informed. Economists regard it as a top need that becomes fully available only after various other needs are satisfied, which is totally wrong (Liedtcke, 2007).

Haiss and Sumegi (2008) tested a cross country panel data analysis from twenty nine European countries between 1992 and 2005 to study the causality between insurance activity and economic growth in Europe. They applied Ordinary Least Squares (OLS) estimate and time-fixed effects in data analysis.

They obtained that there is a positive relationship of life insurance on GDP growth in the five teen European countries. The non-life insurance has a larger impact in Central and Eastern Europe.

Wadlamannati (2008) worked on the repercussion of insurance growth and reforms on economic growth in India for the period 1980 - 2006. The insurance growth was measured by penetration growth for life, non-life and total insurance . The study finds that reforms in Indian insurance sector do not affect economic activities , but their growth has positive consequences on economic development.

Marijuana, Sandra and Lime (2009) considered the correlations between insurance sector and economic development in ten transition European Union member states between 1992 and 2007. The results show that, insurance sector development positively and significantly involves economic growth. Their findings are proved in terms of life and non-life insurance, as well as total insurance.

Adams, Andersson, Andersson and Lindmark (2009) figure out long run relationship between banking, insurance and economic growth in Sweden using time-series data for the period 1830 - 1998. They exploit econometric tests for co-integration and Granger causality to identify conjoint effects of banking and insurance and economic growth.

They establish that the development of bank lending activity anticipated economic growth in Sweden during the nineteenth century and increased the demand for insurance, while Granger causality was reversed in the twentieth century.

Their study indicate that banking has the predominant impact on both economic growth and the demand for insurance while insurance market appears to be supported more by economic growth rather than reinforcing economic development.

Verma and Bala (2013) applied Ordinary Least Square regression model to investigate the relationship between the life insurance and economic growth in India. The total life insurance premium , and total life insurance investment , are employed as indicators for life insurance and Gross Domestic Product (GDP) is used for the economic growth. The data explored the period 1990-91 to 2010-11.

The results stipulate empirical evidence that life insurance has both positive and significant effect on the Indian economic growth .

Eze and Okoye (2013), analysed the impact of insurance practice on the growth of Nigerian economy, and to determine the short and long run effect insurance in economic development. The study attended that the insurance premium has significantly affected the economic growth in Nigeria. The total insurance investment has significantly impacted on economic growth in Nigeria, and insurance sector development in significantly related to Nigerian economic growth .

Under these circumstances, our research methodology is based on the indicators that show the size of the insurance market in Tunisia. The most used indicators in the literature and international statistics are: the annual amount of the insurance premiums, the share of Gross written premiums within the GDP - also known as the insurance penetration degree, and the average of the insurance premium paid per capita during a year - known as the degree of density in the field of insurance.

In order to uncover the correlation between insurance and economic growth in Tunisia, we have tested several statistical methods in the analysis of the GDP indicators and those of the insurance market. The conclusion will show to what extent economic growth and insurance growth mutually intensify in Tunisia, within both the field of life insurance and that of non-life insurance.

3. Tunisian Insurance Market

The insurances market in Tunisia counts 19 resident companies and 4 offshore companies ; 15 of the resident companies operate under the statute of limited company and 4 are made up in company with mutual form.

The majority of the companies operate in multi - branches and some of them are specialized in a particular activity of insurance : Two in life insurance (Hayett and Amina), one in exportations and credits insurance (Cotunace); one in reinsurance (Tunis-Re) and one in local credits insurance (assurcredit).

The market is also enamelled by a dense insurance intermediaries network (672 in 2013), most of them operating as mandatory agents of companies, and this beside 56 broking offices. This network which covers the majority of the republic areas, offers proximity services to the policyholders.

Another link, not less significant of this insurance services chain : experts. Nearly 822 experts and average commissaries of various qualifications from mechanics energy – car to electronics and aviation, are registered to practise the evaluation of damage after disaster.

In 2013, the Tunisian Insurance Market recorded an increase of 8,3 % of the insurance written premiums amount that rose to 1 395 MDT in 2013 against 1 288 MDT in 2012.

The claims paid registered an increase of 7,6 % passing from 724 MDT in 2012 to 779 MDT in 2013.

The development of the Tunisian insurance industry is considered slow due to the relatively low level of income and the restrictive regulation of the market.

The sector appears to have suffered from the political changes in 2011 and the different economic effects of the Tunisian revolution. The growth rate of insurance premiums has decelerated considerably in recent years : The level of premiums in relation to GDP has fallen from 1.9% in 2007 to 1.76% in 2010, but recovered

to 1.82% of GDP by 2011 and 1.80% in 2012 to 1,81 % in 2013.

Insurance penetration in Tunisia is situated behind several countries at a similar level of income and economic development (Table 1).

The growth of insurance has been held back by several structural and political problems occurred in Tunisia in last years.

Table 1: International comparison of Insurance Markets

Country	Insurance Penetration	Insurance Density USD$
South Africa	14.28	1047
Namibia	7.5	433.7
Kenya	3.7	29.9
Botswana	3.17	229.5
Morocco	2.97	87.9
Tunisia	1.81	75
Zimbabwe	1.70	12.1
Egypt	0.68	22.5
Nigeria	0.68	10.8
Algeria	0.60	32.5

Source: Swiss Re

The Tunisian insurance industry has long been subject to restrictive regulations that have limited its ability to engage in technical risk and financial management.

Several of the companies report cumulative deficits that exceed their authorized capital and thus operate with negative equity. In fact, the capital shortfalls of these companies exceed the capital of all the other companies so that the industry as a whole suffers from negative equity.

The compulsory personal lines are in chronic deficit, while the returns on financial investments have been suppressed by the low yields on government securities as well as on the equities in which insurance companies have invested their technical reserves (Vittas, 1995). Insurance also suffers from a large tax burden, especially on the premiums paid in some lines of business.

The business of the nine teen Tunisian insurance companies are structured as shown in table 2 :

Table 2: Tunisian insurance market structure 2011-2012

	2011		2012	
Titles	**Premiums**	**In %**	**Premiums**	**In %**
1. STAR	205 735	17,47	233 590	18,17
2. COMAR	138 458	11,75	144 779	11,26
3. GAT	106 997	9,08	120 428	9,37
4. AMI	91 263	7,75	108 015	8,40
5. ASTREE	101 226	8,59	104 937	8,16
6. MAGHREBIA	94 358	8,01	100 085	7,79
7. CARTE	74 835	6,35	76 784	5,95
8. MAE	69 013	5,86	72 781	5,66
9. ASS. BIAT	63 494	5,39	65 485	5,09
10. LLOYD	52 403	4,45	56 760	4,42
11. CTAMA	52 132	4,43	55 382	4,31
12. SALIM	40 532	3,44	41 731	3,25

Source: FTUSA report 2013

STAR, COMAR GAT and AMI are the most important companies in the Tunisian insurance market that uphold almost 50 % of the total written premiums of the Tunisian insurance market (Table 3).

Table 3: Written premiums concentration of the three first companies

	2011		2012	
Company	**Share**	**Total**	**Share**	**Total**
STAR	17.47	**45.95%**	18.17	**47.2%**
COMAR	11.75		11.26	
GAT	9.08		9.37	
AMI	7,75		8,40	

Source: FTUSA report 2013

The market remains influenced by the automobile branch which generates in average 45,72 % of premiums and whose turnover progresses with a high rate 9.18% With a turnover of 587.730 MD realized in 2012.

The Fire and credit insurance preserves its first position in the global activity of the sector with the higher progression than motor and life insurance respectively 13.38% and 14.97%. As for the life insurance, although it records a significant progression of about 13.25% during the year 2012 compared to 2011, its market share remains weak (about 15.25%).

Concerning claims, the sector records spent in 2012 nearly 726.1 MD against 712,042 MD in 2011 (a progression of about 1,97% due to an important various risk claim), related to several activities of which in particular the automobile damage with 375.538 MD (52,72%), the group health insurance with 165.003 MD (16.58%) and the Fire and life insurance with 123.040 MD (17%).

Table 4: Tunisian insurance market structure by categories 2011-2012

	2011		2012	
Branch	**Premiums**	**In %**	**Premiums**	**In %**
Automobile	538.300	45,70	587 730	45,72
Group Health	167.588	14,23	185 130	14,40
Work Accidents	118	-	-164	-0,01
Transport	73.486	6,24	73 653	5,73
Fire	70.873	6,02	80 674	6,28
Agriculture	7.293	0,62	6 822	0,53
Various Risks	121 757	10,34	126 929	9,87
Life	176.953	15,02	200 396	15,59
Credits	9.460	0,80	10 877	0,85

Source: FTUSA report 2013

The compulsory personal lines of insurance, which include third party automobile and work accident, account for over 45.5% of total business. Group health insurance represents about 14.4%, while transportation, fire and various risks, which tend to be large industrial and commercial risks, account for about 22% of total premiums. Life insurance is poorly developed and represents only 15.6% of the total. Most life insurance is linked to bank loans and, though not imposed by the state, is effectively compulsory for borrowers. The existence of social security probably crowds out the purchase of life insurance.

The structure and the rapid evolution of insurance sector in Tunisia give us a global vision of the insurance role in the development of different economic sector. Our study is based on two insurance indicators that explain in large the importance of insurance in economic development and growth.

The degree of insurance penetration - expressed as the ratio of written gross premiums and Gross Domestic Product - has reached the level of 1,80% at the end of the year 2012, in slight decrease compared with the previous year, when it recorded the level of 1.81%.

The insurance density, expressed by the ratio of written gross premiums and total population at the end of the year 2012, was 119,768 Tunisian Dinars per capita (101,097 dinars for non-life insurance and 18,671 dinars for life insurance), down by approximately 10 dinars per capita compared with the previous year.

4. Data And Methodology

In this study we empirically explore the relationship between insurance and economic growth in Tunisia . We consider three main dependent variables that capture insurance sector:

1. The ratio of gross life insurance premiums to GDP (Life insurance penetration);
2. The ratio of gross non-life insurance premiums to GDP (Non-Life Insurance penetration);
3. The ratio of gross insurance to population (Insurance Density)

We statistically test the following sets of correlations:

- GDP per capita and the degree of insurance penetration, for the total insurance market, life insurance and non-life insurance ;
- GDP per capita and insurance density .

For the purposes of analysis, we have a set of 16 observations, between 1998 and 2013. The analysis of the correlation between the variables identified can be achieved either through the Pearson correlation coefficient ($\mathbf{R^2}$), that shows the intensity and direction of correlation, or it can be done globally, by means of the linear regression equation.

5. Results and Interpretation

Testing for the relation between GDP per capita, as dependant variable, and the degree of insurance penetration for all Tunisian insurance market, life insurance penetration and non-life insurance penetration, lead to obtain significant results that involve a robust correlation between variables.

Model 1: OLS, using observations 1-16
Dependent variable: GDPcapita

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.842675	0.0669704	12.5828	<0.00001	***
nolifeinsurance	0.00425437	0.000381589	11.1491	<0.00001	***
lifepenetration	387.594	160.958	2.4080	0.03161	**

R-squared	0.997023	Adjusted R-squared	0.996564
F(2, 13)	2176.561	P-value(F)	3.80e-17
Log-likelihood	19.10847	Akaike criterion	−32.21694
Schwarz criterion	−29.89918	Hannan-Quinn	−32.09825

The value of the square of the multi-correlation coefficients R^2 = 0.997 certify that there is a significant regression between indicators. In other words, the life and non-life insurance explain significantly the evolution of the Gross Domestic Product per capita.
We test the regression on whole the insurance market by the relation between GDP per capita and the insurance penetration (gross premiums written with the share in the GDP).

Model 2: OLS, using observations 1-16
Dependent variable: GDPcapita

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	−11.9416	1.87408	−6.3720	0.00002	***
penetration	983.046	111.368	8.8270	<0.00001	***

R-squared	0.847686	Adjusted R-squared	0.836807
F(1, 14)	77.91561	P-value(F)	4.28e-07
Log-likelihood	−12.37047	Akaike criterion	28.74094
Schwarz criterion	30.28612	Hannan-Quinn	28.82007

The interpretation of the obtained relationship divulge that, on the basis of the data analyzed for 1998-2013, on a shot time horizon if the share of life insurance in GDP increases by 1 percent the GDP per capita increases by 1933.88 DT, while if the share of non-life insurance in GDP increases by 1 percentage point , GDP per capita increases 266.2 DT.

The second step is to test the correlation between the degree of insurance density and the GDP per capita as dependent variables.

Model 3: OLS, using observations 1-16
Dependent variable: GDPcapita

	Coefficient	*Std. Error*	*t-ratio*	*p-value*	
const	0.917852	0.119868	7.6572	<0.00001	***
lifedensity	62.4624	13.7739	4.5348	0.00056	***
nolifedensity	44.5223	3.44451	12.9256	<0.00001	***

R-squared	0.997472	Adjusted R-squared	0.997083
F(2, 13)	2564.619	P-value(F)	1.31e-17
Log-likelihood	20.41738	Akaike criterion	−34.83475
Schwarz criterion	−32.51698	Hannan-Quinn	−34.71606

Our estimation show that there is a very high and direct correlation (the Pearson coefficient is 0.99) with a high level of confidence (the significance coefficient is 0.001).

6. Conclusion

The results of our analysis are consistent with reality and with previous studies who evaluate the influence of insurance sector on economic growth in developing countries.

We have confirmed that there is a correlation, based on the causal impact, between the insurance market, measured by the level of insurance penetration, and the degree of density and the economic growth, measured by GDP per capita.

The correlation obtained between the GDP per capita and the insurance share in GDP shows a greater effect of the non-life insurance than that of the life insurance, a result that explain predomination of non-life

insurance in Tunisian insurance market. Moreover, the profile of the potential insured in Tunisia is defined and forged by the Tunisian society, by the factors which are in close connection with the income of the population, their way of life, the degree of knowledge, the degree of civilization and culture.

The obtained results indicate the need to implement incentives for insurance development and its structure both on life and on non-life insurance . With its development would enable faster economic growth in Tunisia, because insurance sector has a positive impact and has a significant role in the economic growth. It is imperative for the relevant institutions to implement institutional improvements contribute to the strengthening of competition, to advance techniques for risk management, to develop new products and new distribution channels.

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