Journal of Applied Finance & Banking, vol. 3, no. 3, 2013, 157-168
ISSN: 1792-6580 (print version), 1792-6599 (online)
Scienpress Ltd, 2013

The Role of the Overall Economic Development on the Insurance Market Growth–Evidence of the European Union

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Abstract

In this paper the authors wanted to reveal the relationship between overall economic development measured by gross domestic product per capita (GDPPC) influences the insurance market development measured by indicators such as gross written premium per capita (GWPPC) and the share of gross written premium in GDP. Therefore, the authors have calculated correlation coefficients for EU27, and separately for old EU members (EU15) and new EU member states (EU12) for the 2000-2009 period. Moreover, this analysis is conducted for total insurance markets as well as for the both life and nonlife insurance segments. The results of the analysis of the correlation coefficient indicate strong and positive correlation between overall economic development and insurance development in EU27 and particularly in EU12. Moreover, the authors conducted panel analysis to find out how the overall economic development affects insurance sector growth. The results of this analysis reveal that overall economic development has an influence on the demand for insurance that is especially evident in new EU member states.

JEL classification numbers: E44
Keywords: insurance markets, old and new EU members, level of development, correlation analysis, dynamic panel analysis

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Article Info: *Received :* January 7, 2013. *Revised :* February 12, 2013.
Published online : May 1, 2013

1 Introduction

Insurance plays a vital role as one of the three key pillars of financial services, alongside banking and capital markets. Still, the financial structures of different EU members remain diverse. Similarly, research on insurance markets is limited, compared to what is available on banks, partly because insurance market analysis involves considerable difficulties in data collection and comparability. Nevertheless, research on insurance and economic growth is increasing as more reliable data becomes available.

Economists have demonstrated that the insurance industry contribute to economic growth. According to the [1] insurance promotes economic development through various channels emphasizing that insurance reduces the capital firms need to operate; insurance fosters investment and innovation by creating an environment of greater certainty; insurers are solid partners for the development of a workable supplementary system of social protection, in particular in the field of retirement and health provision; as institutional investors, insurers contribute to the modernisation of financial markets and facilitate firms' access to capital. Moreover, insurance promotes sensible risk-management measures through the price mechanism and other methods and contributes to responsible and sustainable economic development and insurance fosters stable consumption throughout the consumer's life.

The growth in premiums paid by the insured in a particular economy is closely related to gross domestic (GDP) growth. Therefore, this research aims to analyze the relationship of the purchasing power of the population measured by gross domestic product per capita and development of the insurance market. An often mentioned assumption in current literature is a positive correlation between gross domestic product per capita and the degree of development of the insurance market ([2]; [3]) emphasizing an important role of insurance industry development in economic growth.

However, we examine the relationship of the purchasing power of the population measured by gross domestic product per capita and development of the insurance market in EU and separately in both old EU countries, i.e. EU15 and on a sample of new EU member states, i.e. EU12. The distinction between former and new members allows us to understand better the differences between the two groups of countries. Moreover, we wanted to test this relationship with respect to total, and both life and non-life insurance segment.

Somewhat similar analysis was done by [4] where the relationship between degree of development of insurance markets and GDP per capita was conducted on the sample of six Central and Eastern European countries on the data set for the 1998 – 2005 period. In comparison with initial research this paper presents a substantial upgrade because it focuses on all EU member states, distinguishing them to old and new members and examines the relationship between the GDP per capita and level of development of insurance markets separately for total, life and non-life insurance markets. Time range of this research also spans the previous one as it now refers to 2000-2009 period.

Particularly, in this paper the authors wanted to investigate the role of the economic development on insurance sector growth. Therefore, we have employed dynamic panel analysis method for testing how the overall economic development contributes to the insurance sector growth and how this effect differs between new and old member states.

To ensure comparability the main part of the analysis in this paper is derived from organization *Insurance Europe* (formerly known as Comité européen des assurances or

CEA) including insurance density rates as well as the insurance penetration rates which are disseminated regularly. These indicators were calculated using gross written premiums (direct business) on home territory underwritten by companies with their head office in the corresponding country. Indicators of the purchasing power of the population measured by gross domestic product per capita have been taken from *Eurostat*, the statistical office of the European Union.

This paper comprises six sections. The first section refers to the introductory remarks, after which follows an overview of the literature. Level of development of insurance markets in the EU is given in the third section, while the fourth section deals with the empirical analysis. In the final section conclusions are drawn. The references follow after the concluding remarks. Appendices regarding empirical analysis are added in the end.

2 An Overview of the Literature

A review of some studies shows us that the growth of insurance consumption (measured as insurance penetration or total premiums as a percentage of GDP) generally follows what is referred to as an "S-Curve": it is slower at lower levels of development, accelerates as the insurance market and the economy expand, and then slows down again as the market matures. This general relationship is reviewed in [5] and [6].

The paper [3] analyzed the S-curve relationship between the level of per capita income and insurance penetration on the sample of 90 countries in life and 88 countries in non-life insurance for the 1970-1998 period. The analysis showed that life insurance penetration differed widely from the international average suggesting that other factors, in addition to income, must account for the demand for life insurance. As it is only a one-factor model, it neglects all factors influencing the demand for insurance other than GDP per capita. Non-life insurance segment revealed a much greater coherence among countries.

The publication [7] tried to assess the link between strengthening the insurance industry and economic growth and development in developing countries. It examines key relationships between insurance and economic growth indicators using an international insurance dataset. The three key findings that arise from this analysis are that countries are much more likely to experience sustained growth if their insurance markets develop well; insurance market development is closely related to improved financial sector performance; and insurance markets do not develop adequately without both public and private sector investment in their infrastructure.

The findings from above mentioned studies suggest that when insurance markets have the necessary capacity and infrastructure to deliver their variety of services, synergies arise between insurance and other financial services that improve financial sector effectiveness and economic productivity.

While from a theoretical point of view the insurance sector should contribute to economic stability and growth, and vice versa, empirical evidence is mixed at best.

The paper [8] provides an overview of the development of the insurance sector in the countries of Central and Eastern Europe (CEE) and the former Soviet Union (FSU) during 1990–2001. Hierarchical cluster analysis is employed to assess the development of individual country markets with regard to both insurance density and penetration rates. Based on the analysis, it is evident that the insurance sector in CEE, and to an even greater extent in most of the FSU, remains greatly underdeveloped. This study has also

questioned the viability of the S-curve relationship, whereby a positive correlation is claimed to exist between per capita income and insurance penetration in a given country. In the context of CEE and the FSU the evidence suggests that this is not necessarily the case. As for the life insurance branch, the general lack of activity provides little evidence to support any positive correlation between penetration rates and per capita income.
For example, objective of the [9] is to investigate the link between insurance sector development and economic growth. The empirical analysis of a panel data set of 29 European countries for the period from 1992 to 2004 is used to estimate the coefficients and the significance of each input factor. The following variables were used for the regressions: Real GDP per employee, physical capital stock, human capital stock, interest rate, inflation rate, gross premium income. Results showed no evidence for a correlation between aggregate insurance premium income and GDP growth.
It is also important to mention papers [10] and [11] which do not bring any empirical evidence but contribute to the literature in this area.
In reference [10] the author examined the determinants of the relationship between insurance growth and economic development. This paper contributes to this body of research by providing an extensive literature review of empirical studies that have looked at both sides of the relationship, i.e. the demand side (economic growth is an explanatory variable among other factors that affect the demand) and the development side (insurance is a determinant of growth).
In reference [11] the authors provide a broad overview of the financial structure of the EU25 as well as of the old and new member states. Although they do not present any empirical evidence on the relationship between GDP growth and the development of the financial system, this paper gives a description of the financial system of the new EU, and provides as many financial indicators as possible for drawing a picture of the EU financial structure development.

3 Level of Development of Insurance Markets in EU

Level of development of insurance market of a particular country is generally measured by relative indicators such as premium per capita, i.e. *insurance density rate* and total premiums to GDP ratio, i.e. *insurance penetration rate*.
Insurance density rates (premium income/population) measure the volume of premium income in relation to a country's own population, i.e. how much money per capita is spent annually on insurance-related products. As such, they are a useful indicator, as populations generally remain constant over short periods.
Insurance penetration (premium income/GDP) is the level of insurance used in an economy as measured by total insurance premiums collected by the insurance market divided by gross domestic product. This is a useful measure since it is not affected by currency fluctuations, as both premium income and GDP are measured in the national currency.
GDP is an indicator for a nation´s economic situation. It reflects the total value of all goods and services produced less the value of goods and services used for intermediate consumption in their production. Expressing GDP in PPS (purchasing power standards) eliminates differences in price levels between countries, and calculations on a per head basis allows for the comparison of economies significantly different in absolute size.

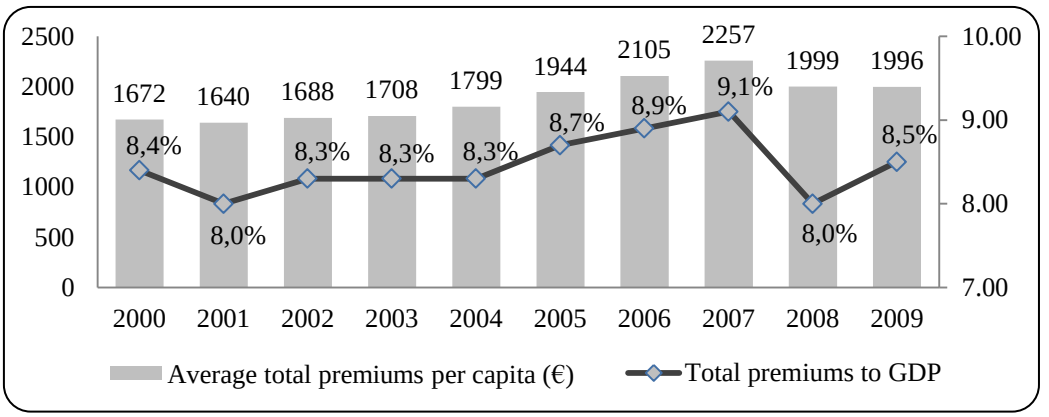

Figure 1: Average total premiums per capita (€) and total premiums to GDP ratio (%) in 2000-2009 in EU27
Source: http://www.insuranceeurope.eu/facts-figures/statistical-series/total-business [12]

Figure 1 shows the level of development of the insurance industry in EU based on average values of total (life and non-life) premiums per capita and the share of total premiums in GDP in the 2000-2009 period. After steady growth of these indicators in the beginning of the observed period, a sharp decline in the year 2008 suggests that insurance industry was hit by global financial crisis which still has the impact on this sector since, according to study [13] on world insurance, there was an overall decline in premiums in 2011.

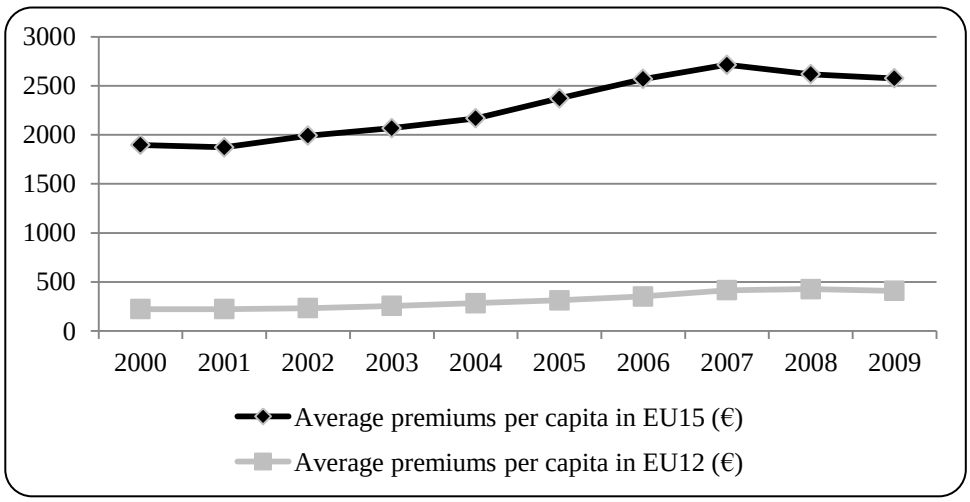

Figure 2: Average total premiums per capita (€) in 2000-2009 in EU15 and in EU12
Source: authors' calculation based on data from
http://www.insuranceeurope.eu/facts-figures/statistical-series/total-business [12]

However, Figures 2 and 3 show how these indicators differ between old EU member states belonging to Western Europe and new EU member states. Specifically, in the whole observed period EU15 countries reported higher level of development measured by both

mentioned indicators.

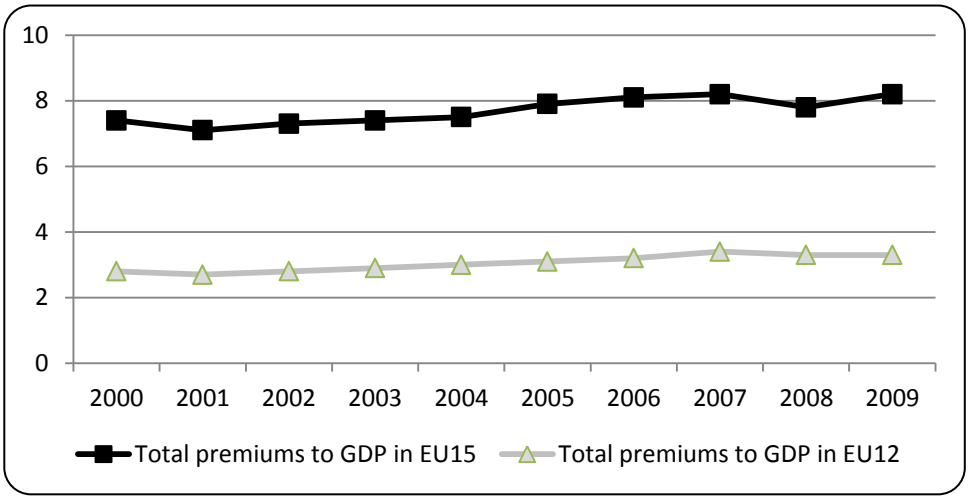

Figure 3: Total premiums to GDP ratio (%) in 2000-2009 in EU15 and in EU12
Source: authors' calculation based on data from
http://www.insuranceeurope.eu/facts-figures/statistical-series/total-business [12]

4 Empirical Analysis of the Correlation between the Level of Development of the Insurance Market and Gross Domestic Product per Capita

With the aim of determining the relationship between the degree of development of the insurance market, measured by both insurance density and insurance penetration rate, and gross domestic product per capita, correlation analysis was conducted. The goal of the analysis is to find out whether there is a correlation between those variables, and if there is, how strong the correlation is and the direction in which it operates.

The correlation coefficient ranges between -1 and 1, where -1 presents perfect negative correlation and 1 perfect positive correlation. The value of 0 indicates a situation in which the observed variables are not related.

Table 1: Results of correlation analysis between GDP per capita and level of insurance development in EU27 (2000-2009)

EU27	Life		Non-life		Total	
Correlation	Premium per capita	Share of insurance premium in GDP	Premium per capita	Share of insurance premium in GDP	Premium per capita	Share of insurance premium in GDP
GDP per capita	0,718198508	0,530048735	0,769220036	0,359574609	0,803040679	0,54839468

Source: authors' calculation based on data from [14] to [17]

Table 1 shows that there was a very firm positive relationship between gross domestic product per capita and both measures of development of the insurance market: (1) insurance density rate and (2) insurance penetration rate in EU. This is the case for total insurance market and for life insurance segment. Table 1 shows correlation coefficients between analysed values, where all of them were above 0.5. The stronger level of correlation is observed between GDP per capita and insurance premium per capita with values of correlation coefficients near 1.

Table 2: Results of correlation analysis between GDP per capita and level of insurance development in EU12 (2000-2009)

EU12	Life		Non-life		Total	
Correlation	Premium per capita	Share of insurance premium in GDP	Premium per capita	Share of insurance premium in GDP	Premium per capita	Share of insurance premium in GDP
GDP per capita	0,854008062	0,672010911	0,890029612	0,601417659	0,941672911	0,778239987

Source: authors' calculation based on data from [14] to [17]

Table 2 showed that there was especially firm positive relationship between gross domestic product per capita and both measures of development of the insurance market on the sample of EU12. This is true for total market and for both life and non-life insurance segments as well.

Table 3: Results of correlation analysis between GDP per capita and level of insurance development in EU15 (2000-2009)

EU15	Life		Non-life		Total	
Correlation	Premium per capita	Share of insurance premium in GDP	Premium per capita	Share of insurance premium in GDP	Premium per capita	Share of insurance premium in GDP
GDP per capita	0,36754429	-0,029092784	0,513072212	-0,008268221	0,509535293	-0,02744667

Source: authors' calculation based on data from [14] to [17]

However, the analysis on the sample of EU15 showed diverse results. Contrary to our expectations, as shown in Table 3, the values of correlation coefficients in life insurance segment do not support any positive correlation between share of insurance premium in GDP and per capita income. On the sample of EU15 correlation coefficients between premium per capita and GDP per capita higher than .5 where obtained in non-life insurance segment and in total insurance industry. At the same time, the correlation between share of insurance premium in GDP and GDP per capita proved to be negative but weak.

These results suggest that other factors, in addition to income, must account for the demand for insurance in EU15. For example, building standards, exposure to natural catastrophes [3], pension schemes, social security systems or higher insurance culture in

comparison to EU12.
In order to investigate in more detail how GDP per capita influences the gross written premium per capita panel analysis was conducted. Panel analysis is a completely new approach in analyzing financial markets. It combines two dimensions – time and space – simultaneously. The result of panel analysis is the average change of a variable through time between different countries.
Therefore, we created six different models, i. e. three models including total, life and non-life insurance segment in EU15 and three models including total, life and non-life insurance segment in EU12.
The results of the panel analysis including total, life and non-life insurance segment in EU15 are shown in detail in the Appendix A. However, the summarized findings are as follows:

- one currency unit (euro) increase in GDP per capita increases the total gross written premium per capita in EU15 for 0.0461 euro;
- one currency unit (euro) increase in GDP per capita increases the life gross written premium per capita in EU15 for 0.0254 euro; and
- one currency unit (euro) increase in GDP per capita increases the nonlife gross written premium per capita in EU15 for 0.0208 euro.

Similarly to our findings obtained when calculating correlation coefficients, the GDP per capita influences the level of insurance development measured by gross written premium per capital in new EU members more evidently. The results of the panel analysis including total, life and non-life insurance segment in EU12 are shown in detail in the Appendix B. However, the summarised findings are as follows:

- one currency unit (euro) increase in GDP per capita increases the total gross written premium per capita in EU12 for 0.0548 euro;
- one currency unit (euro) increase in GDP per capita increases life gross written premium per capita in EU12 for 0.0254 euro; and
- one currency unit (euro) increase in GDP per capita increases the non-life gross written premium per capita in EU12 for 0.0295 euro.

As it can be seen from the Appendices A and B all estimated parameters in these models are significant. The results of the panel analysis suggest that overall economic development measured by GDP per capita influences insurance development in total and separately in life and in nonlife insurance segment. This is particularly true for the sample consisting of new EU member states (EU12).

5 Conclusion

Empirical analysis of the correlation between the level of development of the insurance market and gross domestic product per capita showed firm positive relationship in EU27 for total insurance market and for life insurance segment. Particularly strong positive relationship between gross domestic product per capita and both measures of development of the insurance market was found on the sample of EU12. The analysis of the correlation coefficient on the sample of EU15 did not found strong and positive relationship between these indicators.
Furthermore, panel analysis was conducted in order to investigate in more detail how GDP per capita influences the gross written premium per capita in EU, old EU members

as well as in new EU member states separately for total, life and non-life gross written premium. The results of the analysis suggest that the level of economic development measured by GDP per capita influences the level of insurance demand which is particularly evident in new EU member states.

The explanation for this can be found in recent history of these former socialist countries where prior to the shift to market economy only one (or a few) state owned insurance companies operated in the market, insurance industries in these countries were poorly developed in terms of number of insurance companies, lines of business and the number of the insured. Some insurance lines of business have not been developed or have been underdeveloped such as life insurance, while non-life insurance dominated the market, especially mainly mandatory motor insurance. Population has not been focused on voluntary insurance due to low living standards, lack of information about them and the bad experiences related to the payments of claims. The process of reporting the claims occurred and claims payout lasted a long time and would result in a much lesser values due to high rates of inflation. Also, some types of risk coverage were provided by the government. As a consequence these countries are characterised by the lack of insurance culture in comparison to EU15.

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Appendices

Appendix 1

Dependent Variable: TOTAL GROSS WRITTEN PREMIUM PER CAPITA IN EU15
Method: Panel Least Squares
Sample: 2000 2009
Periods included: 10
Cross-sections included: 15
Total panel (balanced) observations: 150
TGWPPC = C(1) +C(2)*GDPPC

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	902.5676	206.1005	4.379259	0.0000
C(2)	0.046115	0.006401	7.203720	0.0000
R-squared	0.259606	Mean dependent var		2284.620
Adjusted R-squared	0.254603	S.D. dependent var		1068.179
S.E. of regression	922.2264	Akaike info criterion		16.50470
Sum squared resid	1.26E+08	Schwarz criterion		16.54484
Log likelihood	-1235.853	Hannan-Quinn criter.		16.52101
F-statistic	51.89358	Durbin-Watson stat		0.105559
Prob(F-statistic)	0.000000			

Dependent Variable: LIFE GROSS WRITTEN PREMIUM PER CAPITA IN EU15
Method: Panel Least Squares
Sample: 2000 2009
Periods included: 10
Cross-sections included: 15
Total panel (balanced) observations: 150
LGWPPC = C(1) +C(2)*GDPPC

C(1)	670.0245	170.0964	3.939087	0.0001
C(2)	0.025401	0.005283	4.807804	0.0000
R-squared	0.135084	Mean dependent var		1431.280
Adjusted R-squared	0.129240	S.D. dependent var		815.6511
S.E. of regression	761.1207	Akaike info criterion		16.12070
Sum squared resid	85737093	Schwarz criterion		16.16085
Log likelihood	-1207.053	Hannan-Quinn criter.		16.13701
F-statistic	23.11498	Durbin-Watson stat		0.127505
Prob(F-statistic)	0.000004			

Dependent Variable: NONLIFE GROSS WRITTEN PREMIUM PER CAPITA IN EU15
Method: Panel Least Squares
Sample: 2000 2009
Periods included: 10
Cross-sections included: 15
Total panel (balanced) observations: 150
NLGRPPC = C(1) +C(2)*GDPPC

C(1)	230.4384	91.87299	2.508228	0.0132
C(2)	0.020751	0.002854	7.272012	0.0000
R-squared	0.263250	Mean dependent var		852.3533
Adjusted R-squared	0.258272	S.D. dependent var		477.3356
S.E. of regression	411.0989	Akaike info criterion		14.88879
Sum squared resid	25012335	Schwarz criterion		14.92893
Log likelihood	-1114.659	Hannan-Quinn criter.		14.90510
F-statistic	52.88216	Durbin-Watson stat		0.107461

Prob(F-statistic)	0.000000

Appendix 2

Dependent Variable: TOTAL GROSS WRITTEN PREMIUM PER CAPITA IN EU12
Method: Panel Least Squares
Sample: 2000 2009
Periods included: 10
Cross-sections included: 12
Total panel (unbalanced) observations: 118
TGWPPC = C(1) + C(2)*GDPPC

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-164.7111	18.01548	-9.142753	0.0000
C(2)	0.054830	0.001820	30.13008	0.0000
R-squared	0.886699	Mean dependent var		315.4661
Adjusted R-squared	0.885722	S.D. dependent var		269.9530
S.E. of regression	91.25760	Akaike info criterion		11.88205
Sum squared resid	966042.1	Schwarz criterion		11.92901
Log likelihood	-699.0412	Hannan-Quinn criter.		11.90112
F-statistic	907.8215	Durbin-Watson stat		0.271580
Prob(F-statistic)	0.000000			

Dependent Variable: LIFE GROSS WRITTEN PREMIUM PER CAPITA IN EU12
Method: Panel Least Squares
Sample: 2000 2009
Periods included: 10
Cross-sections included: 12
Total panel (unbalanced) observations: 118
LGWPPC = C(1) + C(2)*GDPPC

C(1)	-91.54176	14.20279	-6.445336	0.0000
C(2)	0.025366	0.001435	17.68090	0.0000
R-squared	0.729360	Mean dependent var		130.6017
Adjusted R-squared	0.727027	S.D. dependent var		137.7010
S.E. of regression	71.94437	Akaike info criterion		11.40647
Sum squared resid	600415.1	Schwarz criterion		11.45343
Log likelihood	-670.9816	Hannan-Quinn criter.		11.42553
F-statistic	312.6143	Durbin-Watson stat		0.252162
Prob(F-statistic)	0.000000			

Dependent Variable: NONLIFE GROSS WRITTEN PREMIUM PER CAPITA IN EU12
Method: Panel Least Squares
Sample: 2000 2009
Periods included: 10
Cross-sections included: 12
Total panel (unbalanced) observations: 118
NLGWPPC = C(1) + C(2)*GDPPC

C(1)	-73.11843	13.87714	-5.268985	0.0000
C(2)	0.029455	0.001402	21.01323	0.0000
R-squared	0.791949	Mean dependent var		184.8390
Adjusted R-squared	0.790155	S.D. dependent var		153.4526
S.E. of regression	70.29477	Akaike info criterion		11.36008
Sum squared resid	573197.1	Schwarz criterion		11.40704
Log likelihood	-668.2445	Hannan-Quinn criter.		11.37914
F-statistic	441.5557	Durbin-Watson stat		0.082138
Prob(F-statistic)	0.000000			