Study Regarding the Profitability of Top 10 Romanian Insurance Companies

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ABSTRACT  This paper had the objective of investigating the profitability of the Top 10 biggest Romanian Insurers based on the official audited data available at 01.06.2012 at the Insurance Supervisory Commission - the years 2001-2010. The financial indicator used for our inquiry was the commercial profitability rate. The method used was the mathematical regression, linear and polynomial, fitted with the least squares method. For each insurer a linear and a polynomial model were calculated, resulting 20 models. A linear and a polynomial model were calculated as well, for the average commercial profitability rate for top 10 Romanian Insurers. The predictions obtained were compared with the average Top 10 commercial rentability rate evolution and the closest model was Generali Asigurari polynomial which is in concordance with the increasing trend in the market. The main causes of negative pressure on the profitability in the context of the financial crisis and insurer’s response to them were discussed. In conclusion, Generali business model which was focused on a watchful qualitative selection of the risks and an adequate calibration of the underwriting process can be a good alternative to follow for the Romanian insurance companies, considering that Solvency II will come in force starting with 01.01.2013.

KEY WORDS  Insurance, insurance market, commercial profitability rate, regression, efficiency

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1. Introduction  
The adhesion to the European Union determined a process of harmonization of the legislation in the insurance field which connected Romania to the E.U. law principles and their main objectives, the protection of the insured’s interest and maintaining a high degree of confidence in the insurance market.

An adequate degree of protection of the insured’s relay on the financial soundness, solvency and stability of the insurers. A well balanced company from the financial point of view, with a high solvency degree, has the premises to have a good response to the competition, to become competitive.

The main element which is influencing competitiveness is efficiency. Competition is rewarding efficiency and generally, efficient companies will have bigger market share and higher profits, having the necessary funds for maintaining a high solvency degree and a long term financial stability.

The central objective of the new solvency regime “Solvency II” which will be in force in EU starting with 1st January 2013 is the protection of the insured’s by improving the quality of the insurer’s risk management. Solvency II is stimulating the insurance companies to use modern strategies and practices of risk management which will lead to a proper identification and an
efficient administration of risks and a reduction of the capital burdens. Solvency II will induce a reduction of the expenses for the companies with a good quality risk management, increasing their profitability.

In Romania, the insurance market registered since 2006 an overall net loss, with direct negative consequences for the shareholders of the companies which closed the financial year with loss, who had to participate often to capital increases. In 2010, the last year with official audited financial results, the overall loss of the Romanian Insurance market was 276.6 mil RON (64.6 mil EURO) and the overall profit was 235.3 mil RON (54.9 mil EURO), the net overall result being negative -41.3 mil RON (9.7 mil EURO) (4). The 2010 overall net loss of the insurance industry was with 61% lower than 2009 result and with 93% lower than 2008 result when the market registered a negative record result since 2006: 582.46 RON (-146.16 mil EURO) (5).

2. Objectives of the study
The study based on temporal mathematical regression aims to forecast the evolution of profitability in time, as a fundament of solvency and competitiveness for the first ten biggest insurance companies in Romania according to the financial results registered in the period 2001-2010 and for the average of the entire group of 10 companies. The Top 10 insurance companies are representing together 79.17% of the market in terms of gross written premium according to 2010 audited financial results published by the Insurance Supervisory Commission - ISC.

3. Research methodology
a) Data collection: All calculations were made using the audited data from the Insurance Supervisory Commission, starting with the first report from 2001 until 2010. The reports disclose the gross written premiums and the net financial result. BCR Asigurari was founded in 2001; first data available were in 2002.

b) Data processing: The index which will be the object of the temporal mathematical regression will be the commercial profitability rate.

The commercial profitability rate is one of the most synthetic indexes of company’s efficiency. The efficiency of the company is the fundament of the competitiveness. The commercial profitability rate is a division between a result indicator (profit or loss) and an indicator which reflects a flux of activity (the turnover).

The general formula of the commercial profitability rate is:

\[
\text{Rcp} = \frac{\text{Net financial result}}{\text{Turnover}} \times 100
\]  
(1)

For an insurance company the formula becomes:

\[
\text{Rcp} = \frac{\text{Net financial result}}{\text{Total gross written premium}} \times 100
\]  
(2)

The quality of the insurance company management is validated by the clients’ appreciation and it’s reflected in total gross written premium. The ratio between the net result and total gross written premium represents the net commercial profitability rate for an insurance company.
Table 1. Table of net commercial profitability rate for the top 10 insurers in Romania (6)

<table>
<thead>
<tr>
<th>Rcp/Year</th>
<th>Allianz</th>
<th>Groupama (Asibain)</th>
<th>Astra</th>
<th>Ardf</th>
<th>Astra</th>
<th>RCR Asigurari</th>
<th>Generali</th>
<th>ING ASIGURARI</th>
<th>Omnisig</th>
<th>UNIQA</th>
<th>Average top 10 Rcp</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>0.62%</td>
<td>9.43%</td>
<td>0.18%</td>
<td>0.01%</td>
<td>-13.86%</td>
<td>-9.91%</td>
<td>-6.11%</td>
<td>-2.42%</td>
<td>-4.25%</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>2002</td>
<td>6.47%</td>
<td>8.06%</td>
<td>12.77%</td>
<td>4.60%</td>
<td>0.15%</td>
<td>2.23%</td>
<td>2.13%</td>
<td>3.44%</td>
<td>1.56%</td>
<td>-9.80%</td>
<td>3.16%</td>
</tr>
<tr>
<td>2003</td>
<td>6.32%</td>
<td>10.09%</td>
<td>1.09%</td>
<td>3.55%</td>
<td>0.44%</td>
<td>1.14%</td>
<td>2.21%</td>
<td>2.94%</td>
<td>2.86%</td>
<td>-1.48%</td>
<td>2.83%</td>
</tr>
<tr>
<td>2004</td>
<td>5.62%</td>
<td>5.79%</td>
<td>0.23%</td>
<td>-4.58%</td>
<td>0.24%</td>
<td>13.42%</td>
<td>-4.76%</td>
<td>5.10%</td>
<td>1.82%</td>
<td>-3.26%</td>
<td>1.96%</td>
</tr>
<tr>
<td>2005</td>
<td>4.15%</td>
<td>2.82%</td>
<td>0.14%</td>
<td>-6.29%</td>
<td>-13.19%</td>
<td>4.81%</td>
<td>-11.54%</td>
<td>7.35%</td>
<td>1.29%</td>
<td>0.11%</td>
<td>-1.03%</td>
</tr>
<tr>
<td>2006</td>
<td>2.79%</td>
<td>0.37%</td>
<td>-62.20%</td>
<td>2.34%</td>
<td>0.27%</td>
<td>3.54%</td>
<td>-10.38%</td>
<td>8.07%</td>
<td>2.86%</td>
<td>-8.25%</td>
<td>-6.06%</td>
</tr>
<tr>
<td>2007</td>
<td>2.58%</td>
<td>-1.12%</td>
<td>-16.79%</td>
<td>-5.06%</td>
<td>-18.69%</td>
<td>0.87%</td>
<td>0.91%</td>
<td>5.52%</td>
<td>1.56%</td>
<td>-5.24%</td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td>1.66%</td>
<td>-21.78%</td>
<td>-51.93%</td>
<td>-9.02%</td>
<td>-5.45%</td>
<td>0.15%</td>
<td>0.22%</td>
<td>2.54%</td>
<td>11.94%</td>
<td>28.28%</td>
<td>-9.52%</td>
</tr>
<tr>
<td>2009</td>
<td>2.31%</td>
<td>-7.06%</td>
<td>-27.67%</td>
<td>0.80%</td>
<td>0.77%</td>
<td>-9.64%</td>
<td>3.15%</td>
<td>14.67%</td>
<td>3.90%</td>
<td>0.50%</td>
<td>-1.83%</td>
</tr>
<tr>
<td>2010</td>
<td>-1.85%</td>
<td>-6.47%</td>
<td>0.12%</td>
<td>3.48%</td>
<td>2.54%</td>
<td>0.23%</td>
<td>4.75%</td>
<td>7.16%</td>
<td>0.35%</td>
<td>12.98%</td>
<td>-0.29%</td>
</tr>
</tbody>
</table>

c) Chosen mathematical model: In order to obtain previsions for the profitability rates that will be registered by the Romanian insurers, we chose the temporal mathematical regression analysis.

We will shortly describe bellow the main steps of the mathematical regression method using the programs Analyze-It and Data Analysis from Excel 2007. The mathematical regression has two important steps. First is to determine the equation of the regression which best represents the temporal evolution of commercial profitability rate and the second is to use the equation for predictions. For each insurer, we tried to find the best regression model which represents the evolution in time of the commercial profitability rate. The simple regression method implies explaining the resulted variable Y on the basis of the factorial variable time, using a regression function Y = F(x), where Y is the value of the commercial profitability rate represented on the OY axis and X is the time variable, represented on the OX axis. The linear regression analysis model \( \hat{y} = ax + b \) and the second degree polynomial regression analysis model \( \hat{y} = a x^2 + bx + c \) were used.

4. Results

We obtained 20 regression equations synthetically presented in the table bellow, together with the indicators: the correlation coefficient (R squared), Standard Error (Std. Error), Significance of F test for the model (Significance F) and the significance of T test (P-value) for the model’s parameters.

Figure 1. Commercial profitability rate regression results for the top 10 Romanian insurers
The coefficient of determination $R^2$ (RSQUARED) shows the intensity of the connection between the outcomes $y$ and the regressor $t$, how well future outcomes are likely to be predicted by the statistical model.

Out of the 20 regression models calculated, it came that stronger connections between the outcomes and the regressor were at Groupama Asigurari (the company who bought Asiban S.A) which had a coefficient of determination $R^2$ (RSQUARED) of 0.66 both for the linear model and for the polynomial model, Generali 0.74 for the polynomial model and Allianz Tiriac Asigurari 0.62 for the polynomial model.

**Standard Error** – standard error of the estimation- it is calculated like a standard deviation of the errors in accordance with the number of the degrees of freedom and considering that the errors “$e$” follow a normal distribution. Standard Error is an average measure of how far are the estimated dependent values of the empirical values. The majority of models registered a Standard Error below 0.1, and for Allianz Tiriac linear and polynomial models, Asirom polynomial model, Generali polynomial model, ING Asigurari linear and polynomial model and Omnia asig linear and polynomial model the Standard Error was below 0.05.

First stage for sorting the regression models was the F test to evaluate the global significance of the model.

The F test is the first statistical test used in regression analysis and it’s testing the significance of the regression parameters on the whole (except the intercept). Applying F test we are verifying the simultaneously significance of all estimations obtained for the regression’s parameter’s, we are appreciating the model considering that it is not representing a random relational mechanism.

The test hypothesis is:

$$H_0: \alpha_1 = \alpha_2 = \ldots = \alpha_p = 0 \text{ in our case a=b=0}$$

$$H_1: (\exists) i, \text{ so that } \alpha_i \neq 0.$$  

The F distribution critical values with a confidence level of 95% were $F_{(0.05;8)} = 4.46$ for the linear model and $F_{(0.05;3,7)} = 4.35$ for the polynomial model.

Applying the F test to our 20 regression models, we aimed to reject the null hypothesis, which allowed us to assert that the regression equation is globally significant from the statistic point of view, with the mention that some parameters may be not statistically significant, but this was the object of the T test afterwards.

The F test significance (Significance F) was the indicator we had to follow in first instance. The value of this indicator had to be under the error probability of 0.05% that we agreed at the beginning, to conclude that the regression model is statistically significant.

As it can be observed in the Figure no. 1 table, only seven regression models from the total of twenty passed the test (the models highlighted in purple): Allianz Tiriac Asigurari polynomial model, Groupama (former Asiban) both models, Generali both models, ING Asigurari both models.

The second stage was the testing of the parameters significance by applying the T Test.

The goal of the T Test is the evaluation from the statistic point of view of the $a,b,c$ parameters estimations obtained after applying the least squares method, in order to state as objective as possible that the estimations are statistically significant and are not occurred by chance. If the T test is confirmed, we can state that the parameter is determinative for the analyzed process.
For each parameter we have to use a T test with the hypothesis:
H0: $\alpha_i = 0$
H1: $\alpha_i \neq 0$.

For first hypothesis H0, we have to demonstrate that the statistics $t_{\text{stat}} = \frac{\hat{\alpha}_i}{SE}$ follows a Student distribution with $n - p$ degrees of freedom, which allow T test use, where SE is the Standard Error from the Figure nr. 1 table (standard deviation of the parameter’s distribution).

The result of the T test was compared with the Student Distribution Table value for an accepted risk of 0.05 (95% confidence level) and a number of 7 degrees of freedom for the polynomial model respectively 8 degrees of freedom for the linear model.

In ANOVA table $t_{\text{stat}}$ is the statistic t which verifies the hypothesis H0: $\alpha_i=0$ against alternative hypothesis H1: $\alpha_i \neq 0$.

$t_{0.05, 7}$ tabled value is 2.365 and $t_{0.05, 8}$ tabled value is 2.306. These are the reference values to be compared with $t_{\text{stat}}$ from the ANOVA tables.

The statistical power is the probability to obtain statistically significant results. A result is statistically significant if it is unlikely to have occurred by chance. The significance level or critical $P$-value gives us the amount of evidence required to accept that an event is unlikely to have occurred by chance. (Pecican, 2006). In statistical hypothesis testing, the p-value is the probability of obtaining a result at least as extreme as that obtained, assuming the truth of the null hypothesis that the finding was the result of chance alone. A P-value of 0.05 or less rejects the null hypothesis "at the 5% level" that is, the statistical assumptions used imply that only 5% of the time would the supposed statistical process produce a finding this extreme if the null hypothesis were true. In statistical researches 5% and 10% are common significance levels to which P-values are compared.

In our table $P$-value is the critical bilateral probability of the T test with the hypothesis specified at T-Stat. P-value is the probability that the estimated parameter is equal to zero; if $P$-value is bellow the significance level we reject this hypothesis. For the chosen significance level of $\alpha = 0.05$, we are testing if the null hypothesis of the parameters can be rejected.

We mention below only the t test result for the regression models parameters which previously passed the global model significance F test:
- Groupama linear passed the T test for all parameters;
- Groupama polynomial didn’t passed the test for any parameter of the model, registering high P-values for “a” and “b” parameters, 0.92 respective 0.38, much over the significance level of 0.05 chosen at the beginning of the test;
- Allianz Tiriac Asigurari polynomial passed the test for “a” and “b” parameters of the function $\hat{y} = \hat{\alpha} + \hat{\beta}x + \hat{\xi}$, but registered a high value of the critical probability for the intercept 0.61>0.05;
- Generali linear failed the test for all parameters, registering high values for the intercept -0.93 and for a parameter -0.84;
- Generali polynomial passed the T test for all parameters, registering values under the significance level of 0.05;
- ING Asigurari linear passed the T test for “a” parameter but registered a high value of the critical probability for the intercept “c” 0.59>0.05.
- ING Asigurari polynomial failed the test for all parameters, registering high values for the intercept 0.21, a value of 0.10 for the parameter “b” and 0.24 for the parameter “a”.
From the intensity of the connection between the outcomes \( y \) and the regressor \( t \) point of view, the models which passed the T test for all parameters, Groupama linear and Generali polynomial registered the highest values of the coefficient of determination \( R^2 \) (RSQUARED), 0.66 respective 0.74.

Linear Generali registered a very low RSQUARED of only 0.005, which shows that it is not a strong connection between outcomes \( y \) and the regressor \( t \).

Regarding ING Asigurari models, we registered a RSQUARED of only 0.48 for the linear model and a RSQUARED of 0.57 for the polynomial model which indicate, in the first case, not very high intensity of connection between model’s variables.

In conclusion, out of the 20 regression models the most adequate are Groupama linear and Generali polynomial. These two models passed successfully the model statistical significance test and parameter statistical significance test, had a good coefficient of determination \( R^2 \) (RSQUARED), 0.66 for Groupama and 0.74 Generali and low standard errors, 0.06 Groupama and 0.04 Generali.

The predicted values for the commercial profitability ratio for Groupama Asigurări S.A. are:
- 2011: -14.56%
- 2012: -17.20%
- 2013: -19.83%

The predicted values for the commercial profitability ratio for Generali Asigurări S.A. are:
- 2011: 15.04%
- 2012: 23.80%
- 2013: 34.06%

We used for reference the linear and the polynomial regression models fitted for the average commercial profitability rate for the top 10 Romanian Insurers. The results are synthetically presented below:

<table>
<thead>
<tr>
<th>Statistical Indicators</th>
<th>Average Top 10 Romanian Insurers commercial profitability rate models</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>linear</td>
</tr>
<tr>
<td>Regression Equation</td>
<td>( y = -0.009x + 0.028 )</td>
</tr>
<tr>
<td>R squared</td>
<td>0.32931</td>
</tr>
<tr>
<td>Standard Error</td>
<td>0.038215</td>
</tr>
<tr>
<td>Significance F</td>
<td>0.106155</td>
</tr>
<tr>
<td>P-value intercept</td>
<td>0.347934</td>
</tr>
<tr>
<td>P-value X</td>
<td>0.106155</td>
</tr>
<tr>
<td>P-value x²</td>
<td>-</td>
</tr>
</tbody>
</table>

Figure 2. Average commercial profitability rate regression results for the top 10 Romanian insurers.

The linear model has a low coefficient of determination R Squared. The model’s significance test and the parameters significance tests for a confidence level established at 95% failed.

To the opposite, the polynomial model is well fitted; it has a good coefficient of determination R Squared of 0.66 and a low Standard Error of 0.029. The model’s significance F Test, confirmed with a good result of Significance F indicator of 0.03, that globally the model is well representing the data series evolution in time with a confidence level of 95%. The probability that the estimated parameters of the model are zero was rejected with a confidence level of 95%,
the P-Values obtained after applying the T Test being 0.033 for the intercept “c”, 0.026 for the parameter “b” and 0.050 for the parameter “a”.

The predicted values for the average commercial profitability ratio for top 10 Romanian Insurers were:

- 2011: 1.10%
- 2012: 4.65%
- 2013: 9.02%

5. Discussions

Groupama Asigurari linear is a representative model for a part of the insurers from Romanian Insurance Market. It’s a decreasing model and it is in concordance with the market gross written premium trend. According to the non audited figures the overall gross underwritten premium will shrink again in 2011 (7), generating negative consequences for the insurers’ profitability.

In the chart below we have the gross written premium (GWP) evolution in 2001-2010 period.

![GWP In bil. EURO at average annualy exchange rates](image)

Figure 3. Gross written premium evolution for the Romanian Insurance Market in the period 2001-2010

The figures predicted with Generali polynomial model for 2012, 2013 are high, looking back and comparing with the figures registered by large Romanian Insurance companies until now, but the model it’s closer to the average commercial profitability model calculated for the top ten insurers, which predicts an increase in terms of profitability. Like the average commercial profitability top 10 model, it’s a polynomial model and its graph it’s concave up.

From the profitability point of view, the Romanian Insurance Market registered from 2006 to 2010 five consecutive years of cumulative loss. It was a minimum point of -6.52% overall market commercial profitability in 2008, than the loss smoothed to -1.16% in 2009 and -0.50% in 2010.
Figure 4. Commercial profitability evolution for the Romanian Insurance Market (overall) in the period 2001-2010

In terms of profitability, the financial crisis overlapped on the negative trend started in 2006, but the effects were not, as it could be expected, a deterioration of the overall market commercial profitability. Starting with 2009 the overall market commercial profitability improved substantially showing the insurers’ efforts to diminish the expenses, but still remained negative.

The Romanian Insurance Market had an accelerated developing rate from 2001 to 2008, between 20% and 30% per year in terms of gross written premium. This evolution draw the attention of the main players of the European Insurance Market, which entered on the market especially through acquisitions, starting a acrimonious battle for market share, hopping that the increasing trend of the market will continue for quiet long time.

In Romania the financial crisis started in 3rd quarter of 2008, 2009 being the first year when the recession effects were felt on the Romanian Insurance Market. After five years of increase in gross written premium, the insurance market decreased in 2009 for the first time with 5.24% in real terms (8). In 2010 the decreasing trend accelerated because of the serious decline of the automotive market and leasing market, the decrease in real terms taking in account the inflation being 13.26% (1). According the non-audited results for 2011, the insurance market shrinked in nominal terms with 4.30% compared with 2010. (7).

The Romanian insurers have to face a big challenge regarding the profitability. Even in the boom period, a large number of insurers registered losses because of the particularities of the Romanian Insurance Market. Motor hull and motor compulsory third party liability insurance lines are dominating the Romanian Insurance Market, and their loss ratio is high. A large part of the big insurance companies had an aggressive policy of market share expansion hoping that is enough time to make portfolio profitable in the following years. The time of cleaning and making the portfolio profitable didn’t come, the financial crisis reduced the purchasing power of the clients, the internal consume and the results were that the insurers were forced to reduce the non life contracts’ premiums, to keep the their clients on one hand and on the other hand life contracts lapses increased. The consequence was that the largest part of insurers registered a decrease of the turnover.

The insurers compensate the decrease in incomes by personnel reduction, salary freezing, renegotiating of rents, improved controlling of loss expenses, and reduction in personnel training expenses due to a better stability of the employees. To reduce the loss expenses, the insurers
renegotiated the contracts with the repair shops reducing the handwork tariff and limited the spare parts margin for the multibrand repair shops.

An important tool with impact on portfolio profitability was the introduction of the online quoting software solutions. Since January 2010 it was mandatory for compulsory auto third party liability policies to be issued online in electronic format. Insurers started to introduce online quoting platforms at the end of 2009, especially for compulsory TPL, motor hull, homeowners and travel policies. These online quoting software solutions improved the underwriting process for individual’s policies, taking into account more risk factors, with positive impact on portfolio profitability. The profitability of commercial clients, were rates are the results of negotiations, remains an issue to be solved by the Romanian Insurers.

The compulsory homeowner’s insurance that came in force in 2010, didn’t have an important influence on written premiums in the VIII class “Fire Insurance and natural catastrophes”, the increase was in nominal terms of only 3,49% in 2010 (7). In the future this can impel the sales of the facultative fire insurance policies which are rentable for the insurers because they have a good loss ratio.

A high ratio of 79.94% (1) of the Romanian Insurance Market is nonlife insurance, a market with a high degree of competition. This is a supplementary pressure for the insurers. Because of the decrease in clients’ purchasing power, in order to keep the existing clients and to attract new business, Romanian insurers have to fall into line with the premium decreasing trend existing in the market. As a consequence, the underwriting activity becomes more commercial instead of relying on statistical and actuarial calculations, influencing in the negative the profitability in the context that the loss expenses don’t change meaningfully. In plus, in 2013 Solvency II must be implemented and this will generate at least at the beginning supplementary costs.

Being well known that the insurance industry has a 6-12 months lagging behind the economy, if the financial crisis will be prolonged in 2012 the profitability of the Romanian Insurers will be subject of a negative pressure at least in the next two years.

6. Conclusions

The best adjusted profitability models Groupama Asigurari and Generali Asigurari are representing until the end of 2010 two different management approaches. Groupama Asigurari had an expansive policy aiming as high as possible market share, offering low insurance rates for motor and homeowner’s insurance. Generali Asigurari focused on an adequate calibration of the underwriting process and a qualitative selection of the risks, creating a well balanced portfolio by increasing the sales in non motor policies which are more profitable. The Romanian Insurance Market has a good potential, the insurance density and insurance penetration are still very low comparing with the other E.U. countries, except Bulgaria. Nevertheless, in the future, considering that Solvency II will come in force at 01.01.2013, the Romanian Insurers have to change their vision from gaining market share by practicing commercial rates to a growth based on a better quality of risk evaluation and selection, following Generali business model.
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