

## **ROMANIAN INSURANCE MARKET OVERVIEW - THE DECAY OF ASTRA ASIGURARI - AN UNFORTUNATE EVENT OR IT COULD HAVE BEEN FORECASTED**

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### **Abstract**

*In an economy, insurance market is one sector of the natural economy of each country helping to protect goods and persons against various insurance risks taken over. More than that, it have an increasing role in increasing gross domestic product and investment placements.*

*We will try to "dissect" the insurance market through statistics methodologies in order to see what are the factors that mainly determine the financial stability of insurance companies and which are the differences between the trend given market and financial results of the company ASTRA Asigurari in order to point out that if the decay of this company could be foreseen or it was just an unfortunate event.*

*The paper aims a detailed statistical analysis of the insurance market in Romania between 2006-2015, by analysing key indicators of the market and their influences in bankruptcy call of the company ASTRA Asigurari SA.*

**Keywords:** Panel Data, Econometric Modeling, Macroeconomics, Microeconomics, Simultaneous Equation, Econometric Methods, Statistical Methods

**JEL Classification:** C5, C1

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## 1. Introduction

The insurance market in Romania, one of a rapidly expanding economic areas, a heterogeneous market and in this context for 2006 to 2014 we are identifying 10 companies that together hold over 90% of total gross written premiums.

Insurance market development in recent years is characterized by a decrease in the gap that separates our country market from the rest of European insurance markets.

The analysis will focus on three partial studies on this market in Romania for 2006-2014, namely the descriptive analysis that will give us an overview about this sector, the drawing up of the econometric models and the analysis of accounting records for the year before declaring bankruptcy for this insurance company.

## 2. Data and Methodology

### 2.1. Data

The data on which the statistical analyses are conducted are provided both by the Insurance Supervisory Commission in Romania through annual reports and also by the insurance firms included in the research by the annual reports published by them. The study data are from 2006 to 2015. The first part of the analysis is the descriptive analysis of the evolution of the insurance market, following indicators like income, technical reserves gross written premiums and capital share.

### 2.2. *The descriptive analysis of the main indicators and calculations of the market shares*

Descriptive analysis assumes explaining the main features of datasets, which provides analytically information in the interpretation of the main characteristics of the market.

For the descriptive analysis and calculation of market shares, we used the basic features of the MS Office Excel package, resulting tables and charts included and analysed further.

### 2.3. *Econometric model development, the explanation in mathematical form and validity testing*

Econometric models are statistical models that explain the relationships between different indicators included in the study, which at first sight have no connection. These are some of the tools used to predict the future evolution of various indicators.

Based on the above data it can be build a multifactorial econometric model as follows:

$$Y = f(X_1, X_2, X_3) + \varepsilon$$

where:

- $Y$  represents the real values of the dependent variable (Profit/Loss, Technical reserves),
- $X_1$  is the first real values of the explanatory variables (Net assets and market share of gross written premiums: CPPBs);
- $X_2$  represents the values of the second exogenous variables (market share capital: CPCS and compensation paid: IP);
- $X_3$  represents the values of the third explanatory variables (Profit/Loss: PP and allowances: IP);
- $\varepsilon$  is the residual variable, with significant influence on the variable  $Y$ .

In what follows we used EViews econometric software to work with data sets and to estimate empirical results of the econometric models.

To test the validity of the regression model, we used the F-Fischer test. This test measures how well the independent variables explain the evolution of the dependent variable. Also its determining if all the regression parameters are zero at the same time. The null hypothesis of this test is that all the coefficients are zero. If “p” probability is less than the significance level, the null hypothesis is rejected, which means that at least one of the regression coefficients is statistically significant. Also, if the critical value of  $F_{\alpha,k,n}$  is less than the calculated one, the model is considered as statistically invalid.

Checking if the model is valid is done by comparing the calculated value of the F test with its critical one. The critical value can be calculated by using the FINV Excel function, namely  $FINV(\alpha,k,n-k-1)$ ,  $\alpha = 0.05$  (significance level),  $n = 60$  (number of observations),  $k = 3$  (number of parameters), obtaining the result of  $F_{critical} = 1.5491$ .

There are considered the following assumptions:  $H_0$ : the model is not valid versus  $H_1$ : the model is valid.

### **3. Analysis of the volume of gross written premiums**

It can be seen in Figure 1 that in the last 10 years the insurance market in Romania is controlled by ten insurance companies in terms of total gross written premiums, though they follow a downward path reaching a minimum of 73.51% of the total gross written premiums in the market in 2015, which means an increase of competitiveness upon this sector.

We can also observe that in all ten years the market leader, in terms of total gross written premiums is Allianz Tiriac Asigurari S.A being surpassed in the period 2010-2013 by ASTRA Asigurari SA. At the same time, in the next year, although ASTRA Asigurari S.A came under the control of “Autoritatea de Supraveghere Financiara” (FSA) fact that lowers the consumer confidence in this company, it has managed to remain on third top performing insurance companies in Romania.

Even in 2015, the year when it was decided to start bankruptcy proceedings for ASTRA Asigurari, when it has not been operating a full year, the company managed to remain in the top ten best performing insurance companies on the Romanian market.

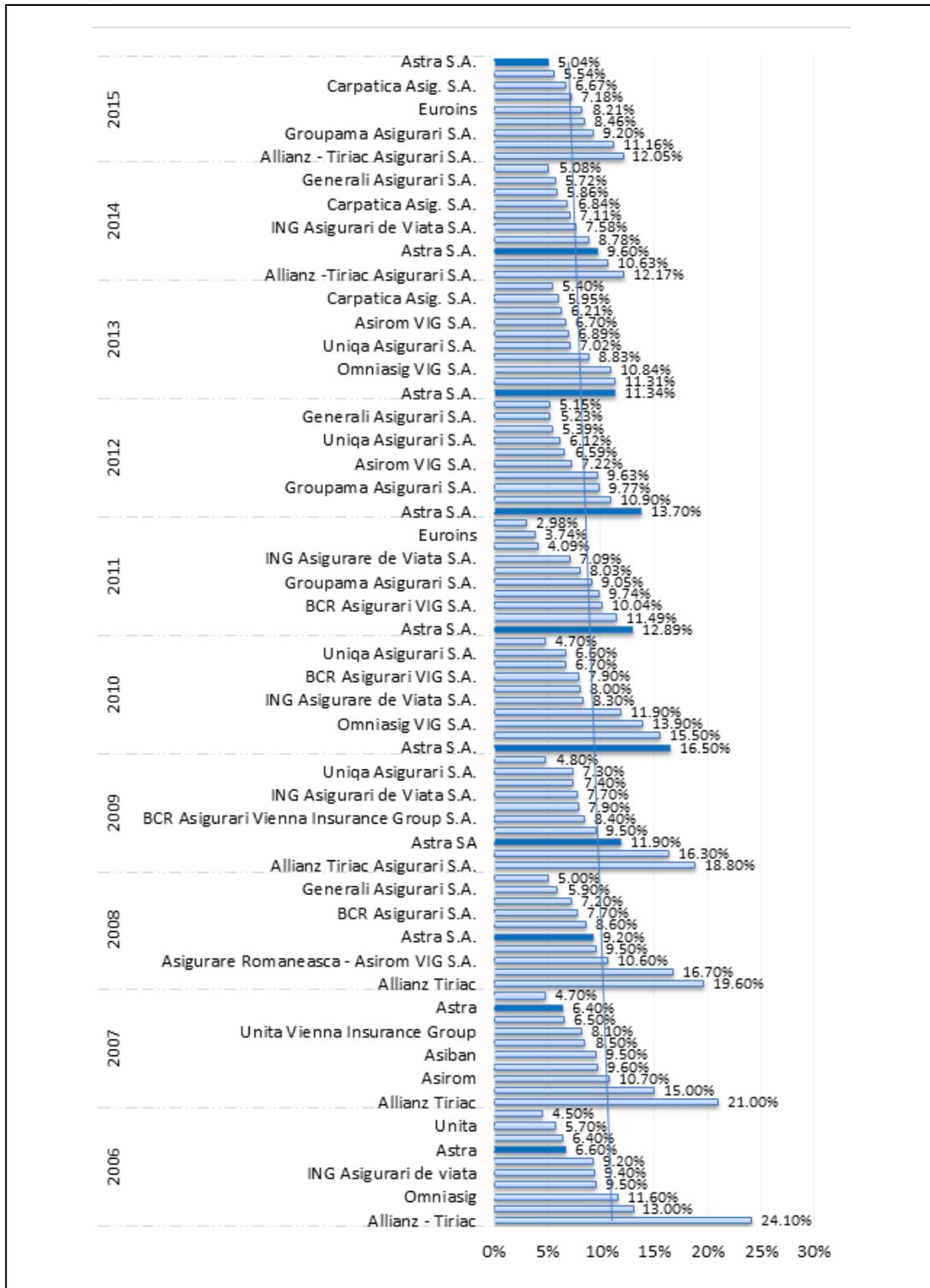


Fig. 1. The market share of gross written premiums between 2006 and 2015.

#### 4. Analysis of income indicators

As regarding the developments in the financial results, we can see from Figure 2 a high volatility in the market, which combined with the small number of companies that controls the most of GWP (gross written premiums) supports the status of the Romanian insurance market as an “emerging market”.

Thus we can see that the only insurance company that has managed to obtain a financial benefit in all studied years is ING Asigurari S.A. closely followed by Allianz Tiriac which recorded losses only in 2010. Regarding ASTRA Asigurari S.A. we can see a sharp drop in earnings beginning in 2012, when the company recorded a loss of 48.6% of the total insurance market, and in 2013, the losses recorded by ASTRA represents over 62% of total losses in the insurance market. Thus it is understandable why, in 2014, ASTRA Asigurari S.A. will pass under the control of the FSA.

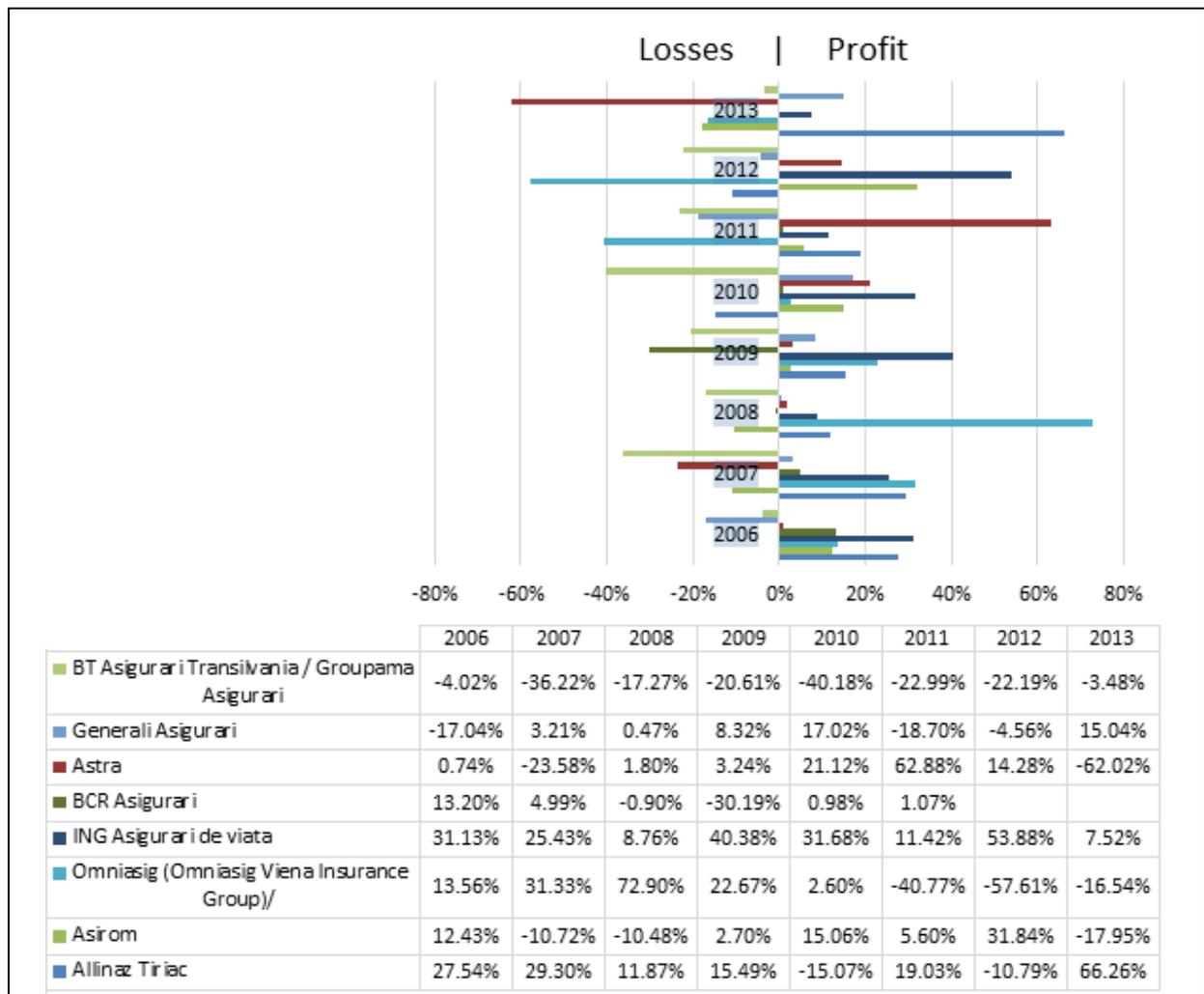


Fig. 2. Income indicators.

Moreover we can notice that in 2012 Omniasig Asigurari was in a similar situation, but they succeeded in correcting the loss of over 55% reached in the first half of 2015.

In Table 1 we can see both records regarding profits and losses in this market services sector. Also we may observe that the maximum historical peak was in 2009 followed by significant decreases in profit recording in the following year, as a result of the economic crisis that manifests a little bit late in this service sector. It also outlines a slight recovery since the last half of 2012, suggesting a timid exit from economic crisis of this sector.

Although market developments in 2012 is one daunting, we see a strong recovery in 2013, when the outcome increases by 187%, but at the same time we can also observe an increase in losses recorded by the insurance companies, which increased by nearly 231% and as I presented above, 62% of these losses are recorded by ASTRA Asigurari SA.

## 5. Changings in Share Capital

We can see that nearly all insurers increased their share capital in a positive sense, except ASTRA that has remained with the same capital from 2006 to 2013. Thus the first corrective measure imposed by the Financial Supervisory Authority was the substantial increase in capital.

The biggest capital increase had BT Asigurari (Groupama) as compared to the capital from 2006, in 2013 was with 847.27% more and these capital increases sustained year by year ranks BT Insurance / Groupama first in the capital share in 2013.

**Tabel 1. Changing in share capital between 2006 and 2013.**

	Frequency	Percentage
Allianz - Tiriac	<b>59,303,289</b>	<b>169.00%</b>
Asirom	<b>152,090,647</b>	<b>238.43%</b>
Omniasig (Omniasig Viena Insurance Group)	283,307,323	274.42%
ING Asigurari de viata	59,948,832	133.09%
BCR Asigurari	-30,000,000	-100%
ASTRA (ASTRA Uniqa)	0	0%
Generali Asigurari	129,100,909	258.20%
Carpatica ASIG	8,800,000	73.33%
BT Asigurari Transilvania / Groupama Asigurari	309,257,050	847.27%
Asigurare Reasigurare Ardaf S.A.	-162,588,888	-100%

The share capital of the main insurers had a positive trend from 2006 to 2013, but within this interval was recorded also negative values, but when you draw the line at the end of 2013, it can be seen that all values are positive. The exception is Groupama Insurances that, compared to the year 2011 its capital values fell sharply. Best breakthrough in terms of capital had BT Insurance / Groupama rising from a capital of 36.5 million in 2006 to a share capital of 1,170,774,450 in 2011, an increase of 1,134,274,450 meaning of 3107.60% more

followed a sharp decrease in 2012 and a slight increase in 2013. These fluctuations have changed the company's position in the market in terms of capital, detached from the first to second place in the market.

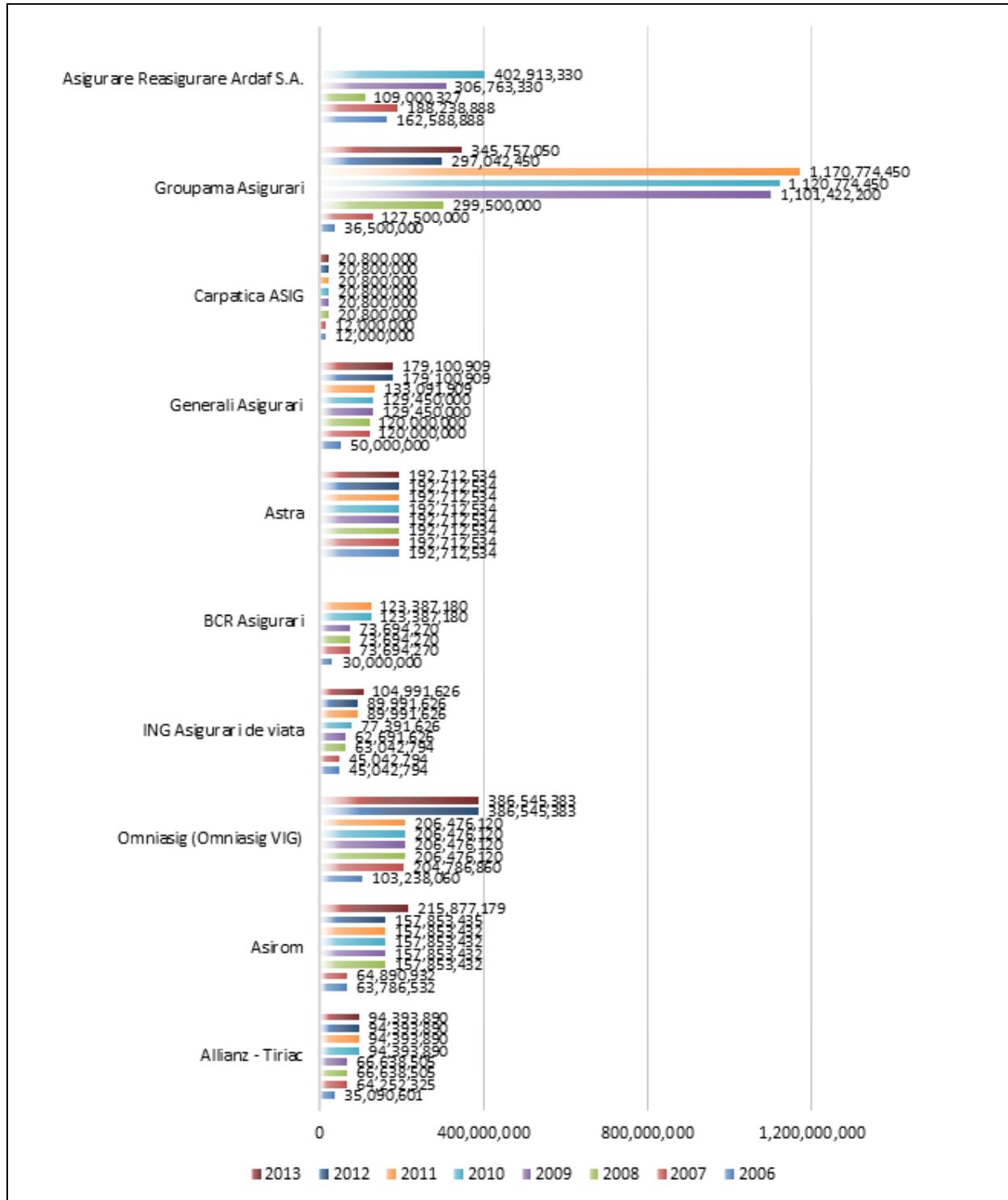


Fig. 3. Change in share capital during the studied period.

## 6. Analysis and interpretation of empirical results of econometric models

An econometric model is one of the most important tools used by economists to forecast future developments in economic indicators. In simple terms, econometric models measure past relationships between variables and then tries to predict how changes of some variables will affect the future course of others. These models are based on a theory of how various factors interact with others in the economy.

Therefore we will present the influence of gross written premiums, expenses and net assets on profit/loss indicator, respective influence of gross written premiums, claims paid and the income on technical reserves between 2006 and 2013. Therefore we can make comparison between the values that could be expected for 2014 and actual recordings of ASTRA Asigurari S.A. in order to conclude whether this decline could been expected, or others were the reasons for the bankruptcy of one from the top 10 of the insurance companies in Romania.

Both endogenous indicators were chosen because they best summarizes a company financial performance (profit / loss) and stability (technical reserves). Technical reserves, in this service sector, are considered one of the most important indicators of stability of a company because if they are not sufficiently formed may cause the company's failure to honor his obligations in the case of major damages. On the other hand, if those are oversized can produce artificial discrepancy between the actual situation of the company and that shown in the records.

After stationary checking of series (Fisher – ADF test) and choice of regression type for panel data (with fixed effects or random effects – Hausman test) were explained regression models and their empirical results as presented in Annexes 1 and 2, with the specification that in the first phase were tested influences of all exogenous variables in the study, but those were not significantly different from 0 – associated probabilities were greater than the critical threshold of 0.05 – were eliminated, and estimating of the regression models was repeated only with significant indicators.

The unit root test or Fisher – ADF test is used in order to test the validity of the null hypothesis and accordingly to it a unit root is present in the time series.

Beside the evaluation of the consistency of an estimator when compared to an alternate, the Hausman test (Annex3 and 4) can also be used to choose between random and fixed effects model in panel data. “In this case, Random effects (RE) is preferred under the null hypothesis due to higher efficiency, while under the alternative Fixed effects (FE) is at least consistent and thus preferred.”

Thus the first econometric model shows that the change of profit or loss is explained by changes in net assets, the gross written premiums and claims paid in a percentage of 95.67%. Thus we estimate profit or loss based on the values of the three exogenous variables based on the relationship:

$$\text{Profit / Loss} = 218132096 + 1.57 * \text{Net Assets} \\ - 23,241,206 * \text{The market share of gross written premiums} \\ + 1.06 * \text{Allowances paid}$$

**Table2. Empirical results for the first econometric model**

Dependent Variable: PP		
Variable	Coefficient	Probability
C	218132096	0.00
AN	1.57	0.00
CPPBS	-23,241,206	0.0053
IP	1.06	0.00
<b>R-squared</b>	0.9566	
<b>Prob(F-Statistic)</b>	0.0000	

Thereby for 2014 the estimated value of the indicator of profit and loss for ASTRA Asigurari will be equal to 1,350,748,253, and in fact profit was 10 times lower. So we can clearly say that the FSA suspicion that ASTRA Asigurari miscalculated the value of admissible assets and a technical reserves was right and that led to the opening of the financial recovery of the company by special administration.

The second econometric model (Annex 2) explains in a percentage of 90.35% Technical Reserves change based on changes in gross written premiums, claims paid and the indicator of profit / loss.

**Table3. Empirical results for the second econometric model**

Dependent Variable: TR		
Variable	Coefficient	Probability
C	-4157072	0.00
CPPBS	28689716	0.00
IP	- 0.71	0.0053
PP	0.43	0.00
<b>R-squared</b>	0.9035	
<b>Prob(F-Statistic)</b>	0.0000	

So technical reserves may be estimated for the years beyond by the following formula:

$$\begin{aligned} \text{Technical reserves} = & - 4157072 + 28689716 * \text{Market share of gross written premiums} \\ & - 0.71 * \text{Allowances paid} \\ & + 0.43 * \text{Profit / loss.} \end{aligned}$$

Applying this formula to the data recorded in 2014, we obtain an estimated value of technical reserves of -22.752.254 compared to the value recorded in registers by ASTRA Asigurari of 1.054.323.677. This major difference mainly shows an understatement of the premium reserve and claims reserve, incorrect calculation of coverage of technical reserves with admitted assets, overstatement of payable accounts, major discrepancies between bookkeeping and actual results and violating the legal provisions in their establishment of claims paying reserves.

## 7. Conclusions

Analyzing all the data presented above we can conclude that the entry of ASTRA Asigurari S.A. in the bankruptcy proceedings could be avoided and the main reasons for its exclusion from the insurance market was the mismanagement and the board stubbornness to not let the company to be taken over. The head of FSA, Misu Negritoiu, claims that the main reasons why the recovery plan failed are:

“Conditioning the application of the recovery plan by raising the special administration, improvised proposal that ASTRA Asigurari was to take AXA Asigurari but the agreement has not been completed, the insufficient recovery solutions from shareholders for covering the debts of 200 million RON and the uncertainty of investments from shareholders.”

At the same time, special administrator KPMG Advisory established that ASTRA Asigurari was in “incapacity to pay his debts, the solvency margin have fallen below half the legal limit and it was in the impossibility of restoring the financial recovery”.

Due to the wrong registration of the accounting records, mainly as regard its premium reserves, claims reserves and technical reserves and the overstatement of claims that could not have been rectified within a year after the start of the special administration, FSA decided the bankruptcy of this major insurance company in the Romanian market.

## References

- Baltagi, B.D. (2013). *Econometric analysis of Panel Data*. 5<sup>th</sup> Edition, Wiley.  
Baltagi, B.D. (2009). *A Companion to Econometric Analysis of Panel Data*, Wiley.

Voineagu, V., Țițan, E., Șerban, R., Ghiță, S., Todose, D., Boboc, C. and Pele, D. (2007). *Teorie și practică econometrică*. Ed. Meteor Press.

Ruxanda, G. (2001). *Analiza Datelor*, Ed. ASE.

Alexandru, A.A., Strat, V.A. and Gogonea, R.M. (2013) Statistical analysis of Romanian insurance market. A gross written premiums perspective. *Journal of Social and Economic Statistics*.

Grecu, A.M. and Munteanu, A.M. *Analiza statistică a pieței asigurărilor din România 2008-2009*.

Tinca, A. *Economie teoretică și aplicată*, Volumul XX (2013), No. 11(588), pp. 79-89.

Ensign Management Consulting, (2014) *Analiza pieței bancare și a asigurărilor*.

Hatanaka, M. (2001). *Time-Series-Based Econometrics, Unit Roots and Cointegration*. Oxford University Press.

Pele, D.T. and Șerbănescu, C.I. (2004). Tendințe ale pieței asigurărilor. Metode statistice. *Analiza pieței asigurărilor în România în anul 2002*. In: *Finanțele și dezvoltarea durabilă*, ASE, București.

Pele, D.T., Dragotă, M. and Șerbănescu, C. (2008). Portfolio Diversification and Market Share Analysis for Romanian Insurance Companies. In: *Risk Management and Value. Valuation and Asset Pricing*, Mondher Bellalah, Jean Luc Prigent, Annie Delienne (Université de Cergy-Pontoise, France), Georges Pariente (Institut Supérieur de Commerce, ISC Paris, France), Olivier Levyne, Michel Azria (ISC Paris, France) & Jean Michel Sahut (ESC Amiens, France), World Scientific Studies in International Economics.

Insurance profile 2011 Magazine (2013) Ed. Xprimm

Premise pentru modelarea seriilor de prețuri și de randamente la Bursa de Valori București

Clark, T.S. and Linzer, D.A. (2012). Should I Use Fixed or Random Effects?, Department of Science

\*\*\* <http://www.asfromania.ro>

\*\*\* <http://asfromania.ro/publicatii/rapoarte-anuale/rapoarte-anuale>

\*\*\* <http://asfromania.ro/publicatii/rapoarte-anuale/rapoarte-asf>

\*\*\* <http://www.lasig.ro>

\*\*\* [www.portaldeasigurari.ro/legislatie/](http://www.portaldeasigurari.ro/legislatie/)

Annex 1.

Dependent Variable: PP				
Method: Panel Least Squares				
Date: 06/02/16 Time: 01:43				
Sample: 2006 2013				
Periods included: 8				
Cross-sections included: 10				
Total panel (unbalanced) observations: 79				
White cross-section standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.18E+08	35130087	6.209267	0.0000
AN	1.573434	0.097078	16.20794	0.0000
CPPBS	-23241206	8057566.	-2.884395	0.0053
IP	1.057026	0.185112	5.710213	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.956670	Mean dependent var	1.08E+09	
Adjusted R-squared	0.948792	S.D. dependent var	7.61E+08	
S.E. of regression	1.72E+08	Akaike info criterion	40.91475	
Sum squared resid	1.96E+18	Schwarz criterion	41.30466	
Log likelihood	-1603.133	Hannan-Quinn criter.	41.07096	
F-statistic	121.4337	Durbin-Watson stat	0.940516	
Prob(F-statistic)	0.000000			

Explaining the empirical results:

In the lower panel we can find the information about the summary statistics for the entire regression as follows:

1. R-squared: Measures the success rate of the regression model in predicting the values of endogenous variable
2. Adj. R-squared: Adjust the number of the independent regressors by penalizing R-squared for additional regressors
3. S.E. of regression: Estimate the variance of the residuals
4. Sum Squared resid: Reports the sum of squared residuals
5. Log-likelihood: reports the log likelihood function evaluated at coefficient estimates assuming normally distributed errors.
6. F-statistic: Tests if all slope coefficients are zero
7. Prob(F-static: Reports the probability of drawing an F-statistic as the one estimated
8. Mean dependent var and S.D. dependent var: represents the mean and the standard deviation of the dependent variable.
9. Akaike info, Scwarz and Hannan-Quin criterions: are used in model selection
10. Durbin-Watson stat: measures the correlation in the residuals.

Annex 2 – Hausman test.

Dependent Variable: RT				
Method: Panel Least Squares				
Date: 06/02/16 Time: 01:42				
Sample: 2006 2013				
Periods included: 8				
Cross-sections included: 10				
Total panel (unbalanced) observations: 79				
White cross-section standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4157072.	50113423	-0.082953	0.9341
CPPBS	28689716	5292046.	5.421290	0.0000
IP	-0.714534	0.126198	-5.661998	0.0000
PP	0.431616	0.050764	8.502376	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.903596	Mean dependent var	6.84E+08	
Adjusted R-squared	0.886068	S.D. dependent var	5.32E+08	
S.E. of regression	1.80E+08	Akaike info criterion	41.00104	
Sum squared resid	2.13E+18	Schwarz criterion	41.39095	
Log likelihood	-1606.541	Hannan-Quinn criter.	41.15725	
F-statistic	51.55165	Durbin-Watson stat	1.426126	
Prob(F-statistic)	0.000000			

Correlated Random Effects - Hausman Test				
Equation: Untitled				
Test cross-section random effects				
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.	
Cross-section random	45.110905	3	0.0000	
Cross-section random effects test comparisons:				
Variable	Fixed	Random	Var(Diff.)	Prob.
AN	1.573434	1.322810	0.003464	0.0000
CPPBS	-2324120...	7463215.3...	230716197...	0.0000
IP	1.057026	0.810901	0.003933	0.0001
Cross-section random effects test equation:				
Dependent Variable: PP				
Method: Panel Least Squares				
Date: 10/21/16 Time: 23:27				
Sample: 2006 2013				
Periods included: 8				
Cross-sections included: 10				
Total panel (unbalanced) observations: 79				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.18E+08	67511966	3.231014	0.0019
AN	1.573434	0.093239	16.87519	0.0000
CPPBS	-23241206	9317069.	-2.494476	0.0151
IP	1.057026	0.201831	5.237187	0.0000
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.956670	Mean dependent var	1.08E+09	
Adjusted R-squared	0.948792	S.D. dependent var	7.61E+08	
S.E. of regression	1.72E+08	Akaike info criterion	40.91475	
Sum squared resid	1.96E+18	Schwarz criterion	41.30466	
Log likelihood	-1603.133	Hannan-Quinn criter.	41.07096	
F-statistic	121.4337	Durbin-Watson stat	0.940516	
Prob(F-statistic)	0.000000			