

MENDELU Working Papers
in Business and Economics
72/2017

New approaches to regulating insurance markets
in the European Union in the aftermath of the
financial crisis

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MENDELU Working Papers in Business and Economics

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Citation

Hrabalová, E., Vávrová, E., Hampel, D. (2017). New approaches to regulating insurance markets in the European Union in the aftermath of the financial crisis y. *MENDELU Working Papers in Business and Economics* 7/2017. Mendel University in Brno. Cited from: <http://ideas.repec.org/s/men/wpaper.html>

Abstract

Eliška Hrabalová, Eva Vávrová, David Hampel: **New approaches to regulating insurance markets in the European Union in the aftermath of the financial crisis**

The main objective of this paper is to analyze the impact of the financial crisis on insurance markets in the European Union and to evaluate changes in the approaches to insurance regulation depending on the effects of the financial crisis. The financial crisis has triggered an identified banking crisis and has shifted through the contagion channels from the US mortgage market to other financial sectors and regions of the world. With regard to the integration of financial institutions in the EU and the globalization of financial markets, a number of regulatory proposals has emerged in recent years to address the impact of the crisis, to eliminate the trigger of the crisis and to prevent recurrence of the causes of the crisis. The authors assess the development of financial health of insurers in the European insurance markets in the period of lingering financial crisis and draw conclusions based on the analysis of the insurance sector. The methods of panel regression and resulting models were used to achieve the aim of the paper.

Key words

financial crisis, insurance market, regulation, supervisory authority, Directive Solvency II

JEL codes: G01, G15, G22, G28

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Acknowledgements

This paper was initiated as a part of special research project of the Internal Grant Agency of the Faculty of Business and Management of Mendel University in Brno No. PEF_TP_2017001 with the title „Regulation of Financial Markets in the EU after the Financial Crisis“.

Introduction

The financial crisis hit the economies of states in a significant way. In 2009, real GDP fell by 4.4% in the EU Member States and by 4.5% in Euro area countries (Eurostat, 2015). In this sense, one can even speak about one of the worst crises since the Great Economic Crisis in the 1920's and 1930's. The cause of the financial crisis and the subsequent economic downturn was not one particular fact, but it was the effect of multiple factors, shocks and imbalances. Thus, short-term and long-term factors can be found that resulted in the outbreak of the financial crisis, which dates back to 2008-2009. Problems can be found in economic policy, over-expected earnings expectations, poor coordination of crisis management by international institutions, and underestimation of the risk of the outbreak of the crisis. Governments and regulators have begun to pursue a set of measures to address the financial crisis that can be summarized into specific areas (for more see Baldwin, Wyplosz, 2013). Central banks have had to provide liquidity to the financial system and to start substantial expansionary policies. Large financial institutions, called systemically important institutions, had to be rescued. Governments subsequently had to use fiscal policy to prevent a recession. Also, the response to the financial crisis was the introduction of more prudent, higher regulation of financial markets and the establishment of regulatory institutions and mechanisms to prevent financial instability and the recurrence of the financial crisis (Baldwin, Wyplosz, 2013).

The aim of this paper is to analyze the impact of the financial crisis on insurance markets in the European Union and to evaluate changes in approaches to insurance regulation depending on the effects of the financial crisis. The financial crisis has triggered an identified banking crisis and has shifted through the contagion channels from the US mortgage market to other financial sectors and regions of the world. With regard to the integration of financial institutions in the EU and the globalization of financial markets, a number of regulatory proposals has emerged in recent years to address the impact of the crisis, to eliminate the trigger of the crisis and to prevent recurrence of the causes of the crisis. The authors intended to assess the development of financial health of insurers in the European insurance market in the period of lingering financial crisis and to draw conclusions based on the analysis of the insurance sector.

For this purpose, we will build on financial analysis ratios. In order to prepare a financial analysis, it is important to use methods of ratio analysis based on financial data from the underlying financial statements. This paper will vary through the selection of data for financial evaluation, the work is based on the data of ISIS database. We have been given a short-term approach to the database published by Bureau van Dijk, so we are able to use this data to process the paper. The paper will examine financial health of insurance companies with the use of the mentioned database, which will

be further used for monitoring insurance markets within the European Union. Due to the fact that insurance markets represent a broad field of research, considering that each country has its own economic specifics, each insurance company has an individual approach, so the development of financial indicators in these markets can vary. This paper intends to examine the situation of the insurance markets for the period 2004-2014, thus even during the financial crisis, which started in the USA and spread further. Its introduction is represented by the collapse of Lehman Brothers, which hit the financial markets in the world. But what impact had the financial crisis on the insurance institutions? Has the crisis affected the development of insurance markets? Was the financial crisis really extensive and had consequences for insurance companies in the EU?

The partial objective of the paper is to assess the financial health of the insurance markets in the European Union considering the development of insurance markets during the financial crisis. The aim is to evaluate the financial performance of selected insurance companies for the analyzed period 2004-2014 and to solve the research question focusing on the effects of the financial crisis on the insurance markets. Therefore, the intention is to point out the possible consequences of the financial crisis for the development of profitability in selected commercial insurance companies. Data from the world's commercial ISIS database will be used. The database represents a comprehensive financial dataset of business companies and private companies within the global insurance market.

The research question was chosen to achieve the main objective of the paper. The data collection period is chosen intentionally with regard to the research question, which is formulated as follows: "Was the profitability of selected commercial insurance companies affected by the financial crisis?" The research question will be solved with the evaluation of the return on assets (ROA) indicator, and it will be answered in the discussion part of the paper. Life insurance companies will be analyzed in the EU. The methods and formulas used will be summarized in the following chapter of the paper, and at first described theoretically. At the end of the paper, the research question will be answered and the partial and final results achieved using econometric methods and financial analysis will be summarized.

Methodology and Data

The methodological approach used for the processing of this paper was as follows: used methodical procedures focused on descriptive method, causal analysis, synthesis and comparative analysis. Data sources mainly served as secondary sources, both published studies on the topic of the impact of the financial crisis on insurance regulation, studies of both foreign and Czech origin as well as publicly

accessible sources characterizing the most important regulatory and supervisory institutions operating on insurance markets. Other methods used were induction and deduction, where induction helped to draw general conclusions based on the analysis of underlying data and deduction led to the assessment of the impact of financial crisis on European insurance regulation.

The authors will review the impacts of the financial crisis on the insurance markets and the related regulatory requirements within the insurance markets of the group of EU countries. First, we selected active life insurance companies. The database does not contain the necessary data for the analysis of the insurance market of Cyprus, so the commercial insurance companies in Cyprus will not be analyzed and it will be assessed only the commercial insurance companies of 27 EU countries. Furthermore, we use the econometric method of panel regression to work out the data and outputs and then use the Gretl Programme. As input data will be used data and results of both basic and modified analysis as well as macroeconomic indicators. With the help of the Gretl Programme and the OLS method, the possible models will be estimated and the parameters will be further estimated using this method. Multiple models will be modeled and the most relevant model will be selected with the most informative value and reporting capabilities to look closer on the profitability of insurance companies.

The input data for the construction of panel regression will be the data of ISIS database, calculated ratios and macroeconomic data for the EU. As a dependent variable, return on assets (ROA) will be chosen, and other data as basic ratios, adjusted ratios, and macroeconomic data will be selected as independent variables. In particular, the relationship between the dependent variable of the return on assets and the independent variables will be examined. Independent variables included retention ratio, reserve ratio, expense ratio, asset leverage, solvency ratio, net profit after tax, technical provisions and share of investments in technical provisions. Independent variables also included macroeconomic indicators including inflation, unemployment and gross domestic product per person. The authors' choice of variables was based on the studies analyzed. Selecting the variables, we have taken into account studies in the Working Papers published by the International Monetary Fund (available in the SSRN database) such as Das, Davies, Podpiera (2003), Navajas, Thegeya (2013), Evans et al. (2000), as well as Geneva Papers, e.g., Diacon, Starkey, O'Brien (2002); and others: Clarke et al. (2013), Jurčević, Žaja (2013), Kokobe, Gemechu (2016).

According to Lukáčik, Lukáčiková, Szomolányi (2011), we will choose among 3 cases to estimate the model; at first, a pooled regression model, where the following estimate can be used:

$$y_{it} = \alpha + \beta_1 x_{it1} + \beta_2 x_{it2} + \dots + \beta_k x_{itk} + \mu_{it}$$

where:

α = Common constant

β = Data, ratios and macroeconomic variables

μ = Error component

Consequently, an estimate with fixed effects can be used:

$$y_{it} = \alpha + \beta_1 x_{it1} + \beta_2 x_{it2} + \dots + \beta_k x_{itk} + \mu_{it}$$

where:

α = Presence of fixed effects, the specific constant for each cross-sectional unit

β = Data, ratios and macroeconomic variables

μ = Error component

As the last, an estimate with random effects will be tested:

$$y_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + \dots + \beta_k x_{itk} + \varepsilon_i + \mu_{it}$$

where:

ε = Error associated with a particular unit

β = Data, ratios and macroeconomic variables

μ = Error component

Models will be constructed using the method of panel regression; selected models describe the best the relationship and match tests made when selecting the appropriate model variation.

For the econometric analysis, data of ISIS database will be used, the source of which is published by Bureau van Dijk. This company publishes a comprehensive database of financial data of business companies and private business data around the world. It made possible to use the database of commercial insurance companies in the world insurance market. We have gained a unique short-term access to this database and data acquired. The data are examined for the chosen period 2004-2014 in order to resolve the research issue in response to the effects of the financial crisis on the world insurance market. The research question is: "Was the profitability of selected commercial insurance companies affected by the financial crisis?" This research question will be addressed with the help of an assessment of financial health, specific through the indicator ROA, i.e., return on assets, and will be explicitly answered in the discussion. Among the basic ratios, the indicator of return on assets will be examined mainly in relation to the time course of the financial crisis, when the comparison will determine whether the financial crisis has affected this indicator in selected insurance companies.

Theoretical Background

Between 2002 and 2005, low interest rates have been established in the USA; this was a factor that has stimulated the interest of US borrowers and the demand for real estate increased. Also, the standards for mortgage lending have been relaxed. When receiving loans, the applicant's income, employment or other information was not controlled (Hull, 2015). Loans were provided to prospective buyers without the ability to repay. If a problem of gradual repayment arose, initially, repayments could be covered by a new loan, as rising prices accounted for increasing value of real estate that formed the basis for increased loans (Aiginger in Lacina, Rozmahel, Rusek, 2010). Thus, there was a huge increase in mortgage loans, which were much more risky: so-called subprime mortgages. The situation reached a critical point in 2007, when interest rates on loans rose radically. Initial problem was that interest rates have been downgraded for too long and consequently their growth caused problems. The US government's attempt to support the economy eventually turned to a reversal when the economic activity began to decline. The interest rate trend for the period 2001-2009 is shown in the graph, see Figure 1.

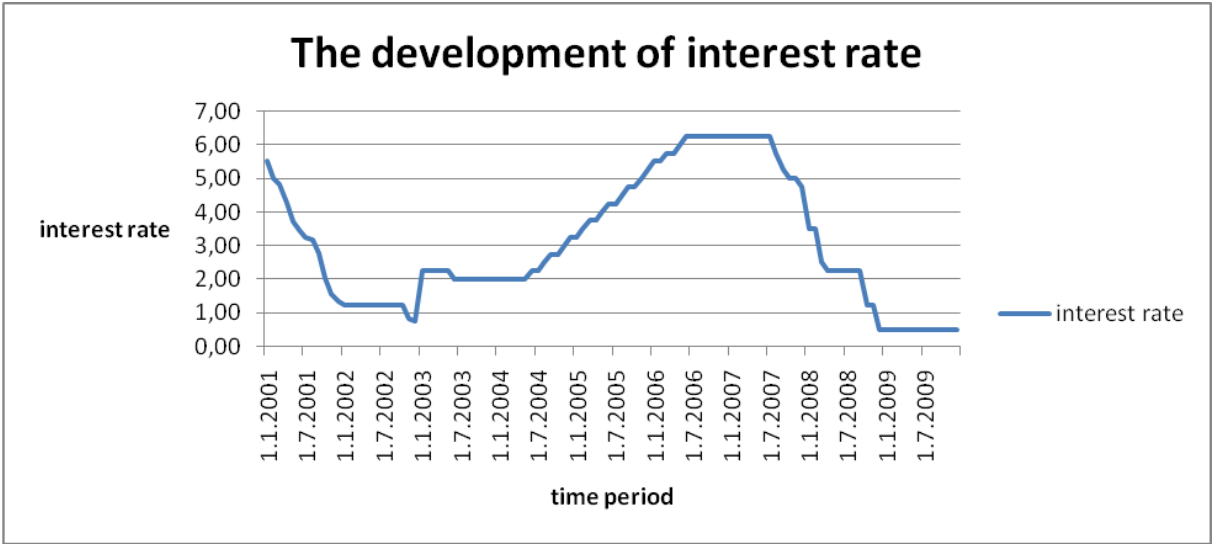


Figure 1: The development of interest rate of the FED (USA, 2001-2009)
Source: IMF (2017).

According to Aiginger in Lacina, Rozmahel, Rusek (2010), in the financial crisis problems could be divided into the following areas: microeconomic - related to financial innovations increasing investment opportunities and speculations; macroeconomic - related to the imbalance between 2 of the main world economies, i.e., China and the USA, and another macroeconomic problem, related to US efforts to prevent the recession, which the US economy moved into excessive expansionary policy for a period longer than it was considered optimal. Finally, regulatory failure, as financial regulation

did not prevent events such as distorted manager rewards, underestimation of risks, and securitization (Aiginger, 2010). According to Hull (2015), financial regulation relied too much on credit ratings, investors have insufficiently analyzed and at the same time underestimated the risks. They had inaccurate information on the quality of the securities. In September 2008, after the bubble broke in the US mortgage market with mortgages provided to clients with lower credit ratings, for several financial institutions as banks and insurers it was fatal, for example Lehman Brothers, whose fall meant a new phase of the crisis. This financial crisis, thanks to its spill-over effects, soon appeared in Europe's financial markets (Aiginger, 2010). The financial crisis has adversely affected many financial institutions. Some of them have failed. Many financial institutions have been rescued by their governments. Banks, for example, Citigroup, UBS have suffered great losses but were backed by the government. Lehman Brothers were not so lucky and gone bankrupt (Hull, 2015). The research question of this paper focuses on the problem whether the financial crisis affected the insurance industry also. According to Ducháčková and Daňhel (2010), the insurance industry is affected by various factors; the development of the insurance market can be influenced, for example, by macroeconomic development, capital markets development, changing client demand, globalization tendencies, etc., which implies a probability, that the event of financial crisis could have had a particular impact on insurance industry. However, the financial crisis (see Ducháčková, Daňhel, 2012) did not affect the insurance industry excessively. This crisis did not influence the banking sector only, it also affected the insurance sector to a lesser extent. Insurance companies appear to be more resilient against the effects of the crisis as they are better capital equipped.

Between the banking sector and insurance sectors, there is a contradiction in their business models to be seen in assets and liabilities management. In the insurance sector, there is a specific model to find; insurers have a long tradition of matching maturity, they have better capital facilities (Zweifel, Eisen, 2012). *"Because of the specificity of insurers' business model traditional insurers are much less prone to "a panic due to lack of liquidity" nor do they cause it."* (PEIF, 2009). Already mentioned, not only banks but also insurance companies suffered huge losses during the financial crisis. For example the American International Group (AIG), an international insurance company, departed from the exclusive insurance business in former times and started to carry out investment banking. AIG provided bankruptcy insurance; when problems affected firms that were estimated to be less likely to risk, AIG was affected with the same problems. Even big world's insurers needed emergency rescue by the government. Government interventions have helped to some institutions, but some insurers have gone bankrupt, eg. Yamato Life, the Japanese life insurance company. The US administration begun to take actions to stabilize the market and to prevent collapse of major

financial institutions, for this would endanger the stability of the entire financial system. For this purpose, the US government provided rescue packages, but state interventions did not revive the financial sector. According to Koba (2012), AIG represents an example of the rescue package which was granted a loan of \$ 85 bil. The managers of AIG insurance company used risky strategies; according to Ducháčková, Daňhel (2012), the AIG was offering insurance for innovative financial products in former times, which proved to be too risky and so the company had to be supported by the US government. A similar scenario also involved MBIA Insurance Company and Ambac Financial Group.

The fact that the financial crisis affected both the banking sector and insurance sector also is due to the strong interconnection of these two sectors. The convergence of sectors can be seen for example in bancassurance and in the convergence associated with the increasing importance of capital markets used as an alternative instrument in the risk transfer referred to as alternative risk transfer (see Zweifel, Eisen, 2012). The interconnectedness of both sectors can be seen in the fact that many insurers suffered losses due to investments with Lehman Brothers which has been bankrupt. According to Šídlo (2008), for example: Allianz - an European insurance company whose loss of EUR 400 million was linked with company Lehman Brothers; another example was the Aegon insurance company.

Banks and insurance companies pay the price of stricter regulatory requirements and tighter supervision for impacts related to the financial crisis. Regulatory system and supervision of financial institutions has to be addressed not only in the context of ongoing changes, such as the liberalization of financial markets and the formation of national and multinational financial groups, but also in the context of development of the financial markets, the resolution of financial crises and the international harmonization of trade rules. The financial crisis led to changing the viewing angle of requirements for adjusting the regulatory system of financial institutions. According to Hull (2015), problems arose during the crisis and those problems resulted in more prudent regulation requirements. Updated Basel III, the regulatory framework for banking institutions, adjusted amount of equity, where the required capital adequacy increased significantly and introduced new liquidity requirements and new rules because the lack of liquidity was a serious problem during the financial crisis. According to PEIF (2009), the crisis revealed weaknesses, whose effects grown stronger by the lack of financial regulation. Financial regulation requires large and long-term derogation, not just immediate intervention. *"Although all countries are subject to the same Basel III rules, local regulators have some freedom in applying the rules, and legislation is not exactly the same in all countries"* (Hull, 2015). Since the rules are not identical, for example, a situation could come that

institutions move particular operations to another country to avoid the greater capital requirements imposed in the country of residence (Hull, 2015).

Regarding insurance companies, they have been also affected by the financial crisis, and therefore requirements for stricter regulation have been raised. The importance of regulation in insurance industry is mainly justified by the priority of consumer protection, because clients are the centre of interest and it is important that insurers meet their commitments to clients. Factors increasing risk in insurance industry are, e.g., calculation of premiums, lack of transparency or uncertain return on capital investment (Zweifel, Eisen, 2012). There are other factors that increase the risk in insurance industry, such as deductibles, the level of reinsurance as well as the estimation of variables such as expected claims and expected losses. For these reasons, it is important to assess risks and to force a correct regulation (Dowd, Blake in Niehaus, 2008). Increased capital requirements have been set up for commercial insurance companies as a result of the financial crisis and stricter rules for investing technical provisions into particular financial instruments. Specific investment rules are given by the laws and directives, as it is essential that insurers have sufficient resources to subsequently cover their obligation to pay the clients. When investing technical provisions, it is important to meet the principles of safe investments, i.e., to invest following conditions of profitability, security, diversification, and liquidity, that is, to have as many resources available as needed to pay off commitments. Nevertheless, the financial crisis could negatively affect clients who may have increased the number of attempted insurance frauds or on purpose induced impaired claims ratio. For these reasons, the issue of regulation is addressed in insurance sector and banking sector. According to Ducháčková, Daňhel (2012), it is desirable these sectors to be more, better and stricter regulated. Regarding regulation, it is important for the insurance company to maintain its solvency. It is therefore important to include regulatory requirements that will help insurers to avoid insolvency. Regulation is crucial because otherwise the probability of insolvency of insurance companies could be bigger (Zweifel, Eisen, 2012).

In the insurance industry in the European Union, criticism of the solvency system arose at the end of the 1990s. The existing regulatory system Solvency I did not include all risks, and the system was outdated. In 2001, the European Commission initiated a gradual update of the existing system of legal regulation of commercial insurers in the form of Solvency I Directive. The planned implementation of the updated regulatory concept was to be introduced from 2008 onwards, but gradually it became clear that the implementation deadline would be delayed (Mesršmíd, 2015). According to Pavlát, Kubiček (2010), several methods have been developed for the maintenance of financial stability of insurers since the mid-1990s, but the financial crisis has become the trigger for

the application of methods into practice. Solvency II is an updated regulatory concept that assigns capital to a broader set of risks than the previous concept Solvency I that was not sufficiently sensitive to risks (Hull, 2015). In order to minimize the probability of recurrence of the financial crisis, according to Böhm, Mužáková (2010), it was necessary to make certain political and economic changes and to adjust the activities of rating agencies. It is necessary for credit rating agencies to carry out independent and objective assessments with the highest degree of quality, to carry out the analyses carefully, to obtain as much information as possible and to review and update the information.

Demanding preparation of the Solvency II regulatory framework started in the period 2001 to 2002, involved strengthening of supervision, strengthening of supervisory competences, taking into account insurance industry development and risk management. The reasons of the financial crisis were addressed by the European Commission and the Commission authorized Jacques de Larosière as a head of the working group to prepare a report about causes of the crisis and its resolution. According to the Report, causes have been identified in several areas: namely the failure of rating agencies, insufficient risk management, insufficient information on new financial instruments, inadequate risk pricing, low interest rates and excessive liquidity (Böhm, Mužáková, 2010). Furthermore, the report stated that the competencies of various regulatory and supervisory authorities are confusing, supervisors do not cooperate to the required extent and European rules are too fragmented to operate the financial markets properly. Therefore, rules have to be published that will be harmonized. The de Larosière Report summarized 31 recommendations. For example, it recommended that credit rating agencies in the European Union should be registered in order to investigate how they operate and to be subject of supervision. For example in the United States, according to Koba (2012), the Office for Credit Rating Agencies and the Securities Commission were established. Furthermore, the Report recommended that the application of accounting principles should be further explored, to simplify OTC (i.e., over-the-counter) derivatives, and that deviations from regulation would be sanctioned (Pavlát, Kubiček, 2010). A number of organizations and forums have dealt with the Report of the expert group headed by Jacques de Larosière. Insurance Europe, formerly the Comité Européen des Assurances (CEA), welcomed the Report positively in its complex, but expressed opposition to recommending a possible fusion of insurance and banking supervision. The proposal for strengthening the financial system was also adopted by the G20 countries. On the basis of this Report, which further recommended the strengthening of supervision, it was proposed to create a European System of Financial Supervision. In order to avoid repeating the situation during the financial crisis, the introduction of elements of stricter regulation was discussed, and the

establishing of new supervising bodies was addressed. A European Systemic Risk Board was set up to monitor macroeconomic developments and a European System of Financial Supervision was established for monitoring microeconomic development (Ducháčková, Daňhel, 2012).

The financial crisis was the main trigger for both the revision of the regulation of financial markets and the creation of new supervisory bodies. As a result of the financial crisis and the de Larosière recommendations, the structure of European supervision has changed. In 2011, the European System of Financial Supervision (ESFS) was set up, consisting of three independent institutions, which should focus primarily on the microeconomic level of supervision. The European Banking Authority (EBA), the European Securities and Markets Authority (ESMA) and the European Insurance and Occupational Pensions Authority (EIOPA) have been created as new supervisory authorities. These institutions were set up to submit drafts of technical recommendations for national regulators to monitor compliance with and non-infringement of European directives (de Grauwe, 2014).

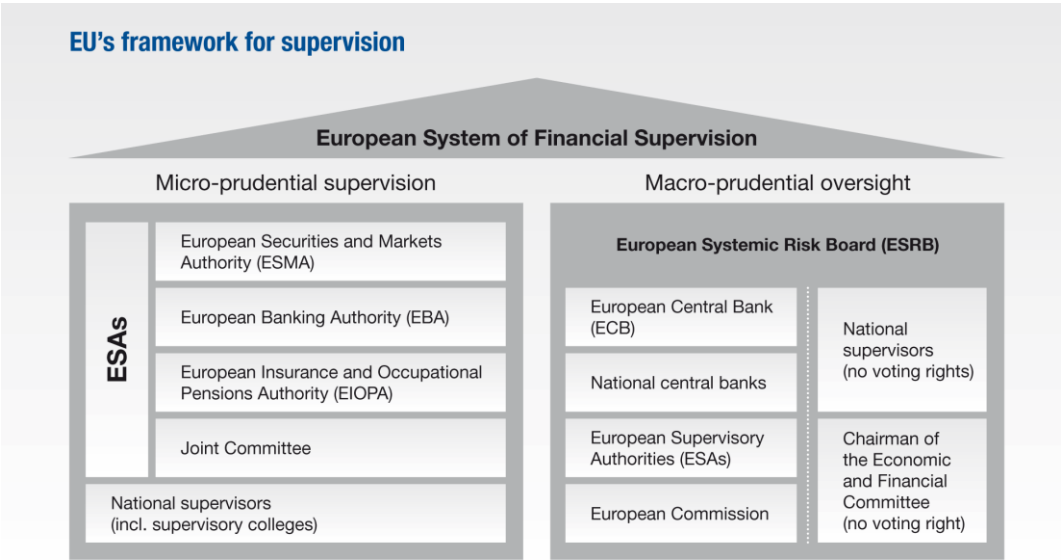


Figure 2: European System of Financial Supervision
 Source: Financial Supervisory Authority (2014).

EIOPA is one of the European Union's supervisory bodies, with the task of being responsible for oversight over the insurance sector. This institution is an independent organization to track and identify potential risks and vulnerabilities at the microeconomic level. On the basis of monitoring and identification of conditions, EIOPA acts as an advisory body for the European Commission, the Council of the European Union and the European Parliament (EIOPA, 2016). It analyzes insurance markets and financial institutions to gather all necessary information, and develops regulatory proposals, uniform methodologies and recommendations to stabilize the environment, to support

and preserve the credibility and resilience of insurance markets, to protect policyholders and insured, and to improve the conditions for a fully integrated European Union's insurance market. According to Regulation (EU) No 1094/2010 of the European Parliament and of the Council, in accordance with Article 1(6), objectives of supervision in insurance sector are defined as: *"protecting public interests by contributing to the short, medium and long-term stability and effectiveness of the financial system in the interest of the Union's economy, their residents and businesses. The Authority of insurance sector shall contribute to:*

- *improving the functioning of the internal market, including in particular a thorough, effective and uniform level of regulation and supervision,*
- *ensuring the integrity, transparency, efficiency and orderly functioning of the financial markets,*
- *strengthening supervisory coordination at international level,*
- *the prevention of regulatory arbitrage and the promotion of equal conditions in competition policy,*
- *ensuring that the risks associated with insurance, reinsurance and occupational retirement provision were appropriately regulated and subjected to proper supervision; and*
- *strengthening consumer protection."* (EU, 2010)

The EU's response to the financial crisis has demonstrated the ability of how quickly European institutions can react to particular crisis situations and how they are resilient. The crisis registered risks that need to be managed, and efforts have been made to restore the stability of the financial sector through extensive reform. However, only regulation is not sufficient, it is important to pay attention to regulatory supervision as it would not make sense to strengthen regulation without functional supervision. After the adjustment of regulation and the harmonization of supervision in the EU countries, the solvency ratio has become the key for commercial insurers in connection with the assessment of financial health. According to Cipra (2015), indicator of solvency represents a situation when a commercial insurance company has a surplus of assets over liabilities and thus, it can repay current and future liabilities arising from the insurance policies. In order to assess the ability of an insurer to meet its obligations at the present and in the future, it is necessary to determine correctly the size of premiums written, the volume of technical provisions and the level of reinsurance, the investment funds to be invested, and also to distinguish the capital adequacy of the insurer.

According to Mesršmíd (2015), we can divide the insurance regulation into two phases. An important breakthrough was the event of the financial crisis. The phase before financial crisis falls under the Solvency I regulatory framework, and the new phase after the financial crisis, reinforced with the model of maximum harmonization, belongs to the regulatory framework of Solvency II. Vávrová

(2012) states: *"The stabilizing role of the insurance sector in the market economy will be enhanced by higher requirements for high quality functional risk management systems and robust internal control systems in commercial insurance companies."* The Solvency II concept aimed to overcome some of the previous regulatory weaknesses. It was not the only regulatory initiative, more initiatives appeared. In the preparatory phase of regulatory requirements, the Committee of European Insurance and Occupational Pensions Supervisors (CEIOPS) conducted surveys among member states. As regards the solvency of insurance companies, the Committee has dealt with a guarantee of low probability of insolvency. However, the analysis of this issue showed different views of the EU member countries. From the view of CEIOPS, the reinsurance system should be regulated in the first step, but the European Commission has proposed the creation of new supervisory institutions. The proposed standards differed at the territorial level – they were different in the European Union and different at a global level (Zweifel, Eisen, 2012). The Solvency II project is linked to a change in the approaches to monitoring of commercial insurers based on solvency, to a more comprehensive solvency assessment based on the overall risk situation of commercial insurers. The Solvency II Directive includes the regulation of both life and non-life insurance, the calculation of capital requirements based on the valuation of risks and includes supervisory rules. Due to the specificity of the business model of insurance companies, it has been shown that it is not possible to take on the approaches and parameters that are included in the Basel II or Basel III for banking regulation, and that the regulatory framework for insurance sector must be specific. The Solvency II regulatory concept was published in the Official Journal of the EU in 2009, with the aim that the entry into force will be in 2012. However, the financial crisis caused reforming the organization of the European System of Financial Supervision and the Solvency II Directive had to be adapted to that.

Another problem in the formulation of the Solvency II concept was the emergence of an opposition block of the UK, Ireland and the Netherlands, because according to these countries the capital requirements seemed excessive. The reason for the creation of the opposition by the UK, however, was not only excessive capital requirements, but also a concern that their competitiveness will be impaired as a result of the Solvency II system implementation (Gray, Pickard, 2012). In 2014, the Omnibus II Directive which updated the Solvency II Directive was adopted primarily in the field of technical and legislative protection, thus contributing to the requirement of increased transparency and market stability. The final version of the Solvency II Directive came into effect in January 2016.

The new regulatory system of Solvency II consists of three pillars. The first pillar includes quantitative requirements, assets and liabilities valuation, technical provisions requirements, allocation of own resources and capital requirements. The Minimum Capital Requirement (MCR) was determined

based on analyzes of quantitative impact assessments that assessed sufficiency of the requirements. The Solvency Capital Requirement (SCR) is risk-based and can be used as standard formula or internal models. The standard formula is unified model formulated by EIOPA and the European Commission according to the average portfolio for all EU insurers. On the other hand, the internal model is a model that the insurance company adapts for itself in accordance with own conditions. It's using must be defended in the supervisory institution. The second pillar addresses the qualitative requirements, internal control system, risk management of the company, supervisory guidelines, monitoring, own risk and solvency assessment (ORSA). Also, the second pillar includes stress testing that is appropriate to better prediction of the impacts of unfavorable situations. The third pillar addresses the issues of reports, market discipline and disclosure, thereby enhancing the transparency in the insurance industry.

Stress testing is becoming a popular and widespread tool for risk management in the financial markets, as it can assess potential vulnerability in the financial sector. Although the stress testing is used by insurers, it is used to a lesser extent compared to banks (for comparison see Komárková, Frait, Komárek, 2013). During the preparation of Solvency II, 5 quantitative impact studies (QIS) were carried out, which meant for commercial insurers the test phase of their readiness and revealed the practical implications of this approach (Baranoff, 2012). On the EIOPA website, you can see how individual insurers have passed during these studies. The fifth quantitative impact study was conducted in 2010 in connection with the financial crisis to verify the proposed calibration. The new regulatory approach SII for insurance companies has been introduced as obligatory only in EU countries, unlike the regulatory method for banking has been applied globally (Cipra, 2015). The regulatory project Solvency II has been introduced in the member states of the European Union. The question remains whether the Solvency II concept is capable for dealing with extraordinary and improbable events, as a weakness remains that it is dependent on actuarial models based on historical data, so may be some problems in the future cannot be solved (for more see Ducháčková, Daňhel, 2012).

Another attempt to escape consequences of the financial crisis was to appoint an Expert Group headed by Prof. Stiglitz whose task was thoroughly to analyze causes of the financial crisis and then draw recommendations for the UN. This Expert Group submitted a proposal for a new regulatory system. This proposal included, for example, disclosure requirements in a comprehensible form, in particular for complex investment products, non-acceptance of excessive risks, a prohibition of variable interest rates, especially for clients with lower income, introduction of mandatory hedge fund registration by the federal financial regulator, and determination of capital adequacy

requirements. According to the Expert Group, the methodology of regulation should be comprehensive and should deal with systemic risk (Pavlát, Kubiček, 2010).

In countries such as the United States, UK, Germany, France and others, principles have been set to curb future emergence of financial crises, especially those of a systemic nature. Such long-term measures include, in particular, the creation of new supervisory bodies and financial regulation and the adjustment of their competences, the introduction of special taxation for large financial institutions or the possibilities of division of financial institutions. The division of financial institutions concerns large institutions, because of the fact that if a large financial institution has problems, it is unlikely that such a large institution could be rescued and this would have a significant impact on the financial stability of the financial system as a whole (Pavlát, Kubiček, 2010).

Table 1: Supervisory institutions in the insurance industry in the EU countries (2017)

Country	Supervisory institution
Belgium	Banking, Finance and Insurance Commission
Bulgaria	Financial Supervision Commission
Czech Republic	Česká národní banka (Czech National Bank)
Denmark	Finanstilsynet
Estonia	Finantsinpektsioon
Finland	Vakuutusvalvonta
France	Autorité de Controle des Assurances et des Mutuelles
Croatia	Croatian Financial Services Supervisory Agency Insurance Supervision Agency
Netherlands	De Nederlandsche Bank
Ireland	Irish Financial Services Regulatory Authority
Italy	Istituto per la Vigilanza sulle Assicurazioni Private e di Interesse Collettivo
Cyprus	Insurance Companies Control Service
Latvia	Financial and Capital Market Commission
Lithuania	Insurance Supervisory Commission of the Republic of Lithuania
Luxembourg	Commissariat aux Assurances
Hungary	Pénzügyi Szervezetek Állami Felügyelete
Malta	Malta Financial Services Authority
Germany	Bundesanstalt für Finanzdienstleistungsaufsicht
Poland	Komisja nadzoru finansowego
Portugal	Instituto de Seguros de Portugal
Austria	Finanzmarktaufsicht
Romania	Insurance Supervisory Commission
Greece	Private Insurance Supervisory Committee
Slovakia	Národná banka Slovenska
Slovenia	Agencija za zavarovalni nadzor
Spain	Dirección General de Seguros y Fondos de Pensiones Ministerio de Economía
Sweden	Finansinspektionen
United Kingdom	Financial Conduct Authority/Bank of England

Source: Own processing according to Vávrová (2014).

Despite the fact that new authorities have been set up to harmonize supervisory and regulatory practice, due to many differences, such as a different tax system, various historical developments, inhomogeneous supply of insurance products, etc., a complete harmonization of insurance supervision in the member states of the European Union does not occur (Burling, Lazarus, 2011). Insurance supervision falls within the competence of the member states in the EU. The Table 1 shows individual institutions performing the supervisory task in insurance industry in the EU countries. For example, in the UK, since 2001, the Financial Services Authority (FSA) has been the only regulator of the entire financial market. This FSA Authority was focused on protecting consumers of financial

services, and on maintaining trust in a financial system that strengthens the stability of the system. Currently, this role is held by the Financial Conduct Authority, which supervises the capital market and its focus is the fair treatment of customers. The Bank of England focuses on the financial soundness of insurers and is responsible for the financial system. In Germany until 2002, the Insurance Supervisory Authority was one of the three supervisory authorities of the German financial system focusing on the insurance sector. However, in 2002, the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin) was created by the merger of the three supervisory authorities. Germany's commercial insurers are regularly reviewed by this authority, which controls, in particular, the level of minimum capital adequacy. The issue of insurance regulation in the countries of the European Union is currently influenced notably by the process of implementation of Solvency II, the way of regulation differs in various countries and the development of insurance regulation goes in various directions (Burling, Lazarus, 2011). The regulatory methodology is largely dependent on the historical development of the country's financial systems.

Results

The aim of this paper is to evaluate the financial performance of selected insurance companies in the European Union, taking into account the event of financial crisis. Within the set objective, the timeframe for examining the issue was set for the period from 2004 to 2014. In order to fulfill the aim of the paper, the research is based on data from the ISIS database; indicators for life insurance will be calculated from available data of this database. Output of indicators of ratio analysis will be used to fulfill the objective, thus for the financial health assessment on insurance markets in the European Union. In the European Union, 28 member states were selected. Despite the fact, that necessary data were not available for the insurance market of Cyprus, only life insurance companies of 27 countries of the European Union will be assessed. The largest European insurance companies include Allianz, AXA, Aegon, ERGO, Metlife and Prudential, etc. United Kingdom's insurance market is one of the most advanced financial markets, it also has extensive experience with supervision and regulation of financial markets. For this reason, the Financial Services/Conduct Authority in the UK has become a model for many other countries. First, the financial performance of selected life insurance companies in the European Union will be assessed. As mentioned above, a problem of missing ISIS data has been identified during the research, therefore, it has been necessary to work with available data of life insurance companies. On the basis of available data, the return on assets in relation to the financial crisis was assessed.

The input data for panel regression for insurance markets of the European Union were selected data and indicators from the financial analysis of life insurance companies and the macroeconomic indicators for the time period 2004-2014. As a dependent variable, indicator ROA, i.e., return on assets was chosen. It is often used to measure company performance in various studies, such as Clarke et al. (2013), Kokobe and Gemechu (2016) and also in Jurčević and Žaja (2013). Both the input data of the financial analysis and its indicators were chosen as independent variables. Specifically, they are variables: reserve ratio, retention ratio, asset leverage, solvency ratio, net technical provisions, net profit after tax, share of investments in technical provisions and the indicator expense ratio. Variables as unemployment, inflation and gross domestic product per person were selected to serve as complementary macroeconomic indicators. Independent variables were selected based on available studies from the SSRN database published by the International Monetary Fund, and in particular on the studies, e.g., Insurance and Issues in Financial Soundness (Das, Podpiera, Davies, 2003), Financial Soundness Indicators and Banking Crises (Navajas, Thegeya, 2013), Macroprudential indicators of financial system soundness (Evans et al., 2000). In the choice of variables, the study from the authors Navajas and Thegeya (2013) was the most fundamental; the authors used a similar combination of variables.

Before constructing models for insurance markets of the European Union, we set the expected signs of the functional relationship for selected variables, which can be seen in the Table 2.

Table 2: Expected signs of selected variables

Independent variables	Expected signs
Reserve ratio	+
Asset leverage	+
Retention ratio	+/-
Expense ratio	-
Solvency ratio	+/-
Share of investments in technical provisions	+
Net profit after tax	+
Technical provisions	+
Unemployment	-
Inflation	-
Gross domestic product per person	+

Source: Own processing (2017).

For insurance markets of the European Union, a preliminary analysis was carried out, where 3 life insurance companies were drawn for each country; except of Cyprus which had no data available. The functionality of the model has been confirmed and the method of panel regression with selected

variables has been used for all active life insurers operating in the European Union's insurance markets.

After determining the expected signs, we decided to add a dummy variable to the input data. The dummy variable will serve to distinguish the time period before and during and after the financial crisis. The dummy variable will contain values of 0 in time period 2004-2007, and for the rest of the time period from 2008 to 2014, the dummy variable will be 1. After inserting variables and constructing models, the dummy variable appeared to be inconclusive and therefore, time indicators were added to the model to detect any deviation in the development of the financial crisis. These indicators replaced dummy variables for analyzed periods. The time indicators appeared to be more appropriate indicators of deviation and therefore, they were left in the model. Inconsistent variables were removed by gradual elimination during constructing the model.

While deciding on a suitable model of the panel regression, it was distinguished among a pooled regression model, a fixed effects model and a random effects model. Firstly, it was decided about the suitability of the model between the pooled regression model and the fixed effects model based on the conformity test of average values of all units. Based on this test, it was decided that according to the p-value, which is lower than the level of importance, the zero hypothesis of the common constant is rejected. Based on this result, we chose the fixed effects model. Also, we compared the model with fixed effects with the model with random effects. A model with random effects was constructed. Subsequently, the Hausman test was evaluated, where according to its p-value, which was lower than the level of importance, the random effects model was rejected in favor of an alternative hypothesis about the adequacy of the fixed effects. The resulting panel regression model for EU insurance markets corresponds to the fixed effects model in Table 3.

Table 3: Fixed effects model, ROA = dependent variable

Independent variables	Coefficient	p-value
Const.	1,34069	7,22e-012
Profit after tax	5,47817e-07	6,55e-122
Net technical reserves	-1,08061e-08	0,0074
HICP	-0,197577	6,16e-05
Time indicator_1	-0,734300	0,0012
Time indicator_2	-0,364045	0,1004
Time indicator_3	-0,00929784	0,9656
Time indicator_5	-1,52348	1,31e-014
Time indicator_6	-0,133782	0,5363
Time indicator_7	-0,222380	0,2497
Time indicator_8	-0,651341	0,0005
Time indicator_9	0,293399	0,1164
Time indicator_10	0,0130451	0,9473
Time indicator_11	-0,232645	0,2896

Source: Own processing in software Gretl (2017).

Based on evaluated tests, we chose the fixed effects model as the final model of panel regression which is specific with changing constant for each crossover unit. The model's constant represents the level of the year 2007. Furthermore, the explanatory variables can be interpreted in relation to the explained variable, e.g., if the net profit increases by EUR 1 million, the return on assets will increase by $5.47817 \cdot 10^{-7}$ pp. And likewise, if the technical provisions increase by EUR 1 million, the return on assets will decrease by $1.08061 \cdot 10^{-8}$ pp. This outcome considers the fact that life insurance companies are creating technical provisions but not sufficiently investing them, thus decreasing their profitability. From the macroeconomic indicators with the selected variables, inflation is conclusive as variable; if inflation increases by 1per cent, the return on assets will show a decline of -0.197577pp. Thus, the increase in inflation could lead to situations that would indicate an increase in the insurer's own costs or an increase of loss compensations of insurance claims, thereby reducing profits of insurers. From the point of view of the consumer, inflation would influence the possession and disposal of smaller amount of financial means when consumer would rather use money at his own consumption expenses and thus reduce his interest in insurance. This situation would have a negative effect on insurers and their return on assets. With regard to time indicators, they were inserted into the model and due to their prominence in 2008 and 2011, they were left in the model. The time indicators act as a set, so we decided to keep them in the model. See the evolution of time indicators related to the level of year 2007 in the chart in the Figure 3.

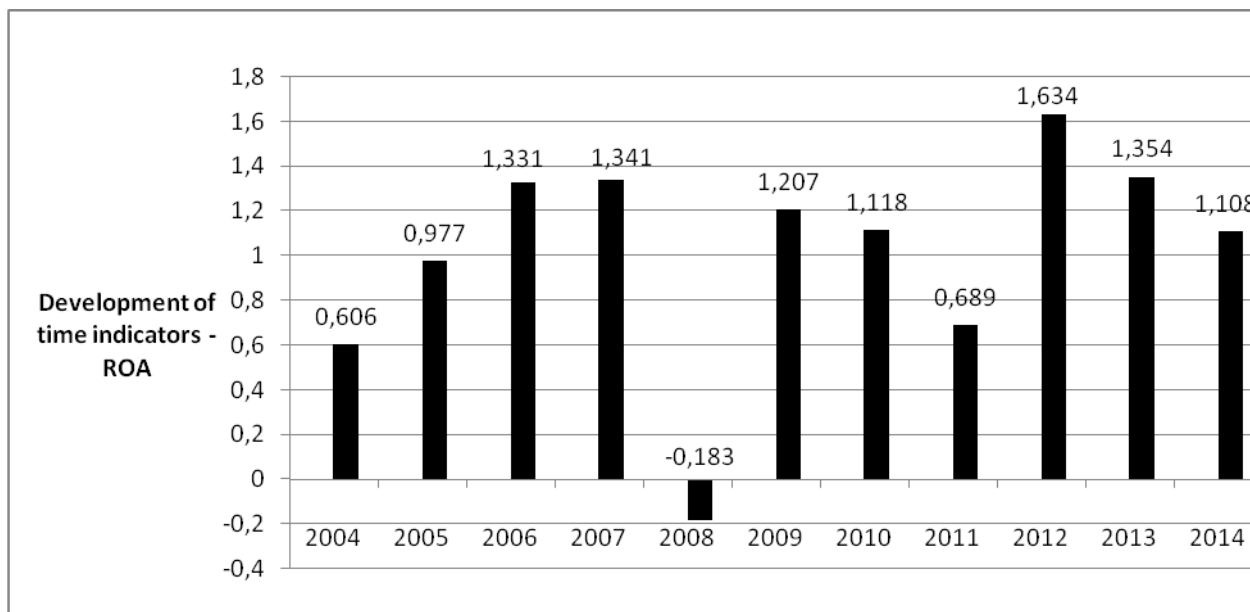


Figure 3: Development of time indicators for insurance companies in EU
Source: Own processing in software Gretl (2017).

From the chart, based on time indicators and their development calculated to the level of year 2007, it is possible to see the increasing trend of the indicator ROA since 2004, when indicator in the year 2004 is conclusive. The year 2008 is a breakthrough year indicating a decline in the return on assets development compared to 2007. On the basis of the fixed effect model, however, the year 2011 was also conclusive which declined compared to 2007, also, but the decrease was not so obvious. The decrease in 2011 was noticeable from the performed financial health assessment addressing the research issue in relation to the development of return on assets.

Conclusions

Ideas expressed in this paper seek ways how to restore the growth and global competitiveness on the EU insurance markets. The financial crisis was triggered by insufficient regulation of insurance markets, which could have been caused by excessive lending, new risky financial products and poor risk assessment. This crisis has revealed serious financial regulation shortcomings, the removal of which requires stronger and longer-term interventions than just focus on immediate action. According to Brokešová, Pastoráková, Ondruška (2014), it is important to pay attention to the insurance industry as it fulfills the function of stabilizing the economy. Regulators' interest in regulating and supervising insurance industry is increasing as the sector contributes to the economic development and stabilization of economies as a whole over the long-term. The resilience of the

insurance industry proved particularly during the financial crisis, when the effects of the financial crisis were overcome in a short time due to the shock resistance of the insurance industry.

The research question was formulated as follows: "Was the profitability of selected commercial insurance companies affected by the financial crisis?" To respond to this research question, the indicator ROA (return on assets) was used to examine insurance markets observed in the European Union with regard to the financial crisis. According to Valckx, Chan-Lau, Feng, Huston (2016), the insurance market and its insurers featured a systemic financial risk in the context of the financial crisis. Such an opinion, however, has never been published before the outbreak of the financial crisis. However, after the collapse of insurance company AIG the systemic risk had to be re-evaluated. "*The financial crisis affected all sectors of financial services, including commercial insurance*" (Ducháčková, Daňhel, 2012). The financial crisis did not appear in the banking sector only, it affected insurance markets also. However, insurance markets were affected on a smaller scale compared to the banking sector. This resulted of a different business model of banks and insurance companies, and hence, from better capital adequacy of insurance companies. Further, insurance industry could be less affected in comparison with banks taking into account both the different business model and a degree of deregulation, also. The deregulation rate was higher in the banking sector than in the insurance industry. In banking regulation, conditions for lending were released to a large extent before the outbreak of the financial crisis.

The impact of the financial crisis into the development of insurance markets of the EU has been assessed in this paper using the return on assets indicator. According to Ducháčková, Daňhel (2012), the worldwide premiums written declined in 2008 as it has fallen by 2% actually. This decline was influenced by development in the financial markets, especially in the second half of the year 2008. In the life insurance industry, the premiums written declined by 3.5% globally. Life insurance companies operating in the UK were also affected by the financial crisis, despite the large size and maturity of the insurance market as well as extensive experience of financial supervision and regulation. According to Ducháčková, Daňhel (2012), the economy of the Czech Republic overcame the financial crisis relatively in a good shape. The financial sector did well in this crisis, Czech insurance companies didn't suffer any dramatic losses.

On the basis of the assessment of the ROA indicator, it can be stated that the decrease of the ROA indicator was recorded definitely. Downswing were recorded in particular in the year 2008; following years were referred to as years of compensation of the decline, but the financial crisis did not have a significant impact on the analyzed insurance markets. This is in line with the opinion of PEIF experts

(2009) that insurers operating with traditional business model have entered the financial crisis in a relatively strong position, nevertheless, they have not been completely immune to the financial crisis. In the second half of the year 2008, the growing trend of insurance markets development turned into a decline in Europe, according to Valckx, Chan-Lau, Feng, Huston (2016).

The downswing of the return on assets could have occurred as life insurance companies invested in companies that were hit by the financial crisis. Allianz could serve as an example having EUR 400 million of investment-related losses in Lehman Brothers. Aegon insurance company reported credit exposure to Lehman Brothers. Allianz and Aegon reported excessive exposure to Icelandic banks also (Ducháčková, Daňhel, 2012). The decline in the value of assets in life insurance companies' portfolio represents another reason for the decline in the return on assets where the investment was not profitable. This may be associated with the situation where securities have lost value and insurance companies have not earned the expected return from their financial investments. Further, the capital life insurance may be the reason for the downswing in this indicator. This capitalizing type of insurance belongs to provisioning products offered by insurance companies, which offer a choice of strategies for the realization of securities. After clients select guaranteed bonus, insurers are committed to reevaluate provisions and to pay guaranteed bonus to clients. However, if the valuation does not reach the minimum limit, it could mean a loss for insurers, as this obligation must be paid to clients.

According to Valckx, Chan-Lau, Feng, Huston (2016), low interest rates are the major source of risk especially for life insurers. Changes in investment behavior at low interest rates environment may have contributed to higher systemic risk. In contrary to this fact, a number of respondents in the Insurance Banana Skins survey (2015) stated they did not find the low interest rates as a source of risk, on the contrary, they find it beneficial for insurers to protect themselves in a low interest rate environment and to focus on underwriting of risks as their core business. The most respondents in the survey, however, see the opposite effect of low interest rates. According to the respondents' majority, low interest rates mean an immediate impact on life insurance companies, as a large part of their products is based on the form of appreciation of technical provisions. According to the EIOPA (2016), stress tests showed that a number of European commercial insurers are vulnerable due to low interest rates, which raised concerns about the solvency of insurers.

In terms of analyzing the relationship among the data, the macroeconomic data and the ratio analysis indicators in the time of the financial crisis, where the return on assets was selected as the dependent variable, we have come to the conclusion with the help of panel regression that from the

selection of variables, it has proven conclusive both net profit after tax, technical provisions, inflation, and time indicators; especially in the years 2008 and 2011, which have detected a deviation from developments in the financial crisis. Thus, the opinion was proven by the panel regression in this paper showing that insurance markets were affected by the financial crisis to a small extent. The result regarding the relevance of time indicators coincides with the outcome of the assessment of the financial health of insurers, which proved a decrease in ROA performance in 2008 and in 2011 also in some cases. However, according to the development of time indicators, it was noticeable that the maturity of insurance market could have a considerable impact on the extent of its impact.

The lack of regulation contributed to the impact of financial crisis on insurance markets, which could have been caused by excessive lending, new risky financial products, and insufficient risk assessment. According to Valckx, Chan-Lau, Feng, Huston (2016), investment rules were released in 2009 also. These authors also state that in the last years after the outbreak of the financial crisis, there has been an increase in the systemic risk in North America and Europe; it has increased up to 3 times compared to the year 2006, especially in the life insurance sector and banking sector. It is important to pay attention to the insurance industry as it fulfills the function contributing to stabilization of the economy. There is a growing interest in regulating and supervising insurance industry as the industry contributes to the economic development in the long-term and thus, it belongs to more stable sectors. According to de Grauwe (2014), new supervisory institutions were created at the European level of supervision in the insurance sector but the question is how willingly the national supervisors will share information with the authorities at the European level. According to the Insurance Banana Skins survey (2015), benefits of more prudent regulation are recognized, but a number of regulatory initiatives could greatly flood the regulated sector with high costs. Attention is being paid to other threats, which are becoming more and more manifest at present. Significant risks that insurance companies start to fear include cyber-related risks, in particular data security, and the possibility of software failure. Insurance companies are institutions holding sensitive information about their clients and a threat of such information would mean a loss of credibility for clients and a reputational risk for insurers.

A number of authors tend to think of the benefits of more prudent regulation, stronger regulation of the insurance industry, but there are also opposing views that do not consider a large amount of regulation as optimal. *"Excessive regulation can put European Union countries ahead of more serious problems than can be solved by this way of regulating."* (Ducháčková, Daňhel, 2012). According to Kotaška (2012), the Solvency II regulatory system at the European level could evoke opposition against implementation already in the preparatory phase by some insurers mainly due to additional

costs both in the form of administrative burden, and in the form of actuarial, IT and risk management recruitment. According to the Insurance Banana Skins survey (2015), regulation enforces high costs with respect to solvency capital requirements and compliance. As a result, profits and overall growth in insurance industry may be reduced as well as manifestation of less interest in the benefits of innovations. The Solvency II project has negative impacts in form of increased costs, according to Vávrová (2012), which stated that additional costs depend on the length of the preparation for the changes. As the implementation of the Solvency II regulatory concept has been achieved only in the year 2016 (approved in 2009), it can be inferred that the costs of insurers in this context were significant indeed. According the survey of Nečas (2012), the majority of respondents takes the view that insurance industry is over-regulated. This over-regulation could lead to an unfavorable situation due to the declining interest in financial business in the future. On the contrary, a KPMG survey (Kotaška, 2012) dealing with readiness of insurance companies on Solvency II implementation revealed that 67 insurance companies out of 84 respondents tend to benefit from this regulatory project, despite considerable costs, as they accept the more complex risk management in Solvency II as an added value.

The Solvency II concept should contribute to better risk management and consequently to better strategic decision making. However, the new Solvency II regulatory framework is characterized by a rather comprehensive, complex and costly regulation. Its expensiveness refers to costs related to the time aspect when much time has been devoted to the development and testing of proposed requirements arising from Solvency II. Commercial insurers had to adopt this project both in terms of administrative costs, costs associated with additional employees, and a lengthy period of uncertainty. Considering this project, insurance companies would not be able to fully engage in business activities which made them profitable. The introduction of the Solvency II regulatory framework has created costs for insurers, increased costs could be compensated by an increase of premiums written, hence, the costly process of implementing the regulation may burden clients of insurance companies even more. Increased premiums could also cause a reduced interest in the insurance as financial service. Another negative can be found in the issue of market transparency. Transparency of the market is a prerequisite for well-functioning financial markets and for effective regulation but the Solvency II framework with a detailed description of principles on almost 3 000 pages is not intended to simplify the rules. The costs of this regulatory project can burden the small insurers sector and jeopardize their ability to meet regulatory requirements, the ability to achieve profitability, and consequently their ability to exist. The insurance market does not need any excessive regulation; a regulation resulting from a comprehensive, complex and rigid concept could even damage insurance markets.

The situation on the financial markets is complicated and shows a low efficiency of the regulatory strategy for both commercial insurance companies and banking companies as it is not flexible enough. According to Ducháčková, Daňhel (2015), this situation raises the question of whether it would be more appropriate to return to the original roots of both sectors, to reduce regulatory interventions and to increase market spontaneity. Instead of complicated state interventions it is necessary to use useful theoretical tools, to have a long-term vision and to restructure current issues. The whole system needs to be simplified. In terms of regulation, quality terms should not be changed for quantity. *"Regulation should simplify and consolidate supervisory institutions at national level and only then build transnational supervisory authorities, not vice versa."* (Daňhel, Ducháčková, 2015). Regulation should be simple, transparent and consistently required. On the other hand, the Solvency II regulatory concept applied to the European Union's commercial insurers was supposed to contribute to better risk management and consequently lead to better strategic decisions. As part of EU regulation, the European Commission (see Mesršmíd, 2015) introduced a "smart regulation" concept that would reduce regulatory burdens and simplify existing legislation, while maintaining a high level of market protection. For the time being, however, it is only a goal of regulation in the outlook, not a current reality in regulating of insurance markets.

In this paper, the insurance markets of the European Union were assessed. For this assessment, we used the return on assets indicator to assess the development of commercial insurance companies in the context of the financial crisis. In addition, models were constructed with the help of panel regression and one was chosen. It was the model the best describing the relationship between selected variables in the analyzed time period, and responding to the tests. When assessing the return on assets in the context of the financial crisis, life insurance companies in the EU countries with similar characteristics were analyzed. In a comprehensive assessment, it can be concluded that EU insurance markets were affected by the financial crisis in particular in the year 2008 and that declines were offset in the following years. In comparison to the banking sector, the most life insurers did not register a deep decrease in the ROA development. This result was also achieved with the help of panel regression. According to the development of time indicators, there was a noticeable decline in the development of EU insurance markets in the years 2008 and 2011. In the analyzed group of EU countries, the member states are considered to be predominantly developed countries and therefore it is not surprising that the financial crisis did not affect the development of insurance markets too much. The financial crisis has affected these countries' insurance markets in the year 2008, but for next years the indicator of return on assets has started to grow again. For

some countries, the growth has started to grow gradually in 2009 and 2010, with faster growth in other countries where the compensation of decline has already been achieved in 2009.

On insurance markets of the most countries, the financial crisis did not radically affect the outcome of the insurers' management. A relative development level of insurance markets of individual countries can add an impact on the economy of insurance companies also, as the insurance markets of developed countries have not been affected so much by the negative situation during the financial crisis and the insurers have kept their businesses with good results. This fact also emerged from the development of time indicators achieved by panel regression. Regarding the development of profitability after the financial crisis, insurance markets in countries slowly equalizing the slump returned to profits at the end of 2010 and the decline in previous years was offset. Thus, the financial crisis affected globally the insurance markets in analyzed EU countries and the impact of the financial crisis on the insurance markets development was proven.

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