THE ANALYSIS OF THE FINANCIAL POSSIBILITIES ON THE LIFE INSURANCE MARKET AFTER ECONOMIC CRISIS – CASE OF REPUBLIC OF CROATIA

Ticijan PERUŠKO Ph.D.,

Assistant Professor Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković" Pula

tperusko@unipu.hr

Iva HASIĆ, student Juraj Dobrila University of Pula, Faculty of Economics and Tourism "Dr. Mijo Mirković" Pula

ihasic@unipu.hr

Abstract

The global economic crisis has caused a series of changes in the markets around the world. Following such an occurrence, the planning of future trends has become essential in order to appropriately use more modest financial possibilities available. The period after the global economic crisis has set different trends in motion characterised by low growth rates. Such trends have also affected the life insurance market.

New economic circumstances which swept through the life insurance market require different analysis and forecasts. In planning the movements and financial possibilities in the life insurance market, it is necessary to identify specific qualities which have been created in the market following the economic crisis. Scientific statistical and mathematical methods were used in order to develop a model which meets the said prerequisites.

The aim of this paper is to show the method of creation and implementation of the model for the life insurance market for the period following the global economic crisis. The implementation of the model is illustrated for the Republic of Croatia life insurance market. The information obtained has multiple application. It provides prognostic information about the future annual financial values of the life insurance market. The course of future market trends is determined by using the financial trend analysis in the forecast periods, as well as by comparison with the values realised in previous years. The information obtained by the model is useful for stakeholders in the life insurance market as additional information for business strategy and income planning. **Keywords:** life insurance, planning information, economic crisis, insurance

market, prognostic model.

JEL Classification: P33, G22, I13.

1. INTRODUCTION

The specific quality of life insurances lies in the possibility of negotiating an unlimited number of life insurance policies by both legal and physical entities. This enables each entity to be able to have an unlimited number of policies by which they cover the occurrence of the insured event and provide compensation for the damage from each policy and, if so agreed, return of the premium of each negotiated life insurance policy, with addition of bonuses in the event that the insured occurrence does not happen.

The life insurance market is not limited by the number of existing cases which are the subject of the possibility to negotiate insurance and existence of already agreed insurances, as is the case with property insurance. Insurance companies, therefore, organise resources in attracting policyholders and in earning their trust in order to realise benefits in their business. (Felicioa & Rodrigues; 2015, 7).

Global processes have led to the liberalisation and deregulation of the market, which is evidenced in modern economies, including the insurance industry. (Njegomira & Marković; 2012, 135). Insurance business has its special place as a factor of every country's economic development and life insurance is an important factor in economic stability (Milosevic; 2012, 148).World economic movements affect market movements and the world economic crisisdisturbedall the markets, including the life insurance market. The goal of the conducted research is to evaluate annual life insurance market trends in the Republic of Croatia, thus determining the potential market capacity. The evaluation of the planned annual capacity plays a considerable role in the planning of business goals of all stakeholders in that market. The period after the economic crises is characterised by market instability, which requires a high flexibility of life insurance market stakeholders. The models which are developed for evaluation in the post-crisis periods are important as they facilitate procurement of information which is of the utmost significance for good business decision-making.

2. RESEARCH METHODS

Business planning and management require information for evaluation of future movements. Evaluation of future movements and trends in the life insurance market enables development of market presentation, depending on information users. The economic crisis has led to disturbances in the life insurance market in the way that, following the world economic crisis, the growth rates considerably differ from the period before the crisis.

The evaluation of future movements in the life insurance market was made by application of the statistical analysis of trend modelling. A trend can be defined as a statistical regularity of movement of the analysed occurrence (Žužul, J. atalt.; 2008, 139). Using a trend which indicates a dynamic mean value expressed by a mathematical function for illustration of the tendency of a timedependent change, the movement of a gross premium value in the Republic of Croatia insurance market is forecast.

Starting from the fact that, after the year 2008, the growth rates of all markets, thus the life insurance market too, have been considerably different, the movements of the life insurance market in the periodbetween the years 2009 and 2014 have been included in the formation of the model. Applying those periods for prognosis offuture market values the previous growth rates, which marked the period before the beginning of the economic crisis, are excluded. In trend model testing, the polynomial trend proved to be most representative. The kth degree polynomial trend is expressed as follows (Šošić; 2008, 604):

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Whereytare time series frequencies, xis variable time, which acquires the values of the first n natural numbers, i.e.x_t=t=1,2...,n;a,bj, j=1,2,..., k are unknown parameters; k is the degree of the polynom, $k^{<}n$; e_{t} are unknown values of the variable u (Šošić; 2008, 604). The regression representativeness indicator is obtained using the coefficient of determination. The coefficient of determination is the proportion of the part of the sum of squares in the total number of squares, interpreted by the model, and is expressed as (Šošić; 2008, 391):

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In testing of the polynomial trend model, the third degree polynomial expression showed the highest representativeness (Šošić; 2008, 607):

 $y_t = a + b_1 x_t + b_2 x_t^2 + b_3 x_t^3 + e_t$ (4)

Evaluations of the value of gross life insurance premiums in the Republic of Croatia for the period of three years, i.e. the period between the years 2015 and 2017, were carried out by means of implementation of the obtained model. The application of the obtained information facilitated the analysis of the life insurance market movement, as well as the financial possibilities being offered to the stakeholders in the market.

3. MOVEMENT OF LIFE INSURANCE MARKET IN REPUBLIC OF CROATIA IN PERIODS BEFORE AND AFTER THE ECONOMIC CRISIS

Movements in the life insurance market in the period between the years 2003 and 2014 can be divided into two parts. The first part is characterised by a

powerful growth in the total life insurance gross premiums throughout each of those years. The disturbances which took place in 2008 affected the life insurance market, followed by stagnation of market growth and then growth at very low rates. A more detailed overview is provided by the table below, which shows the movement of the life insurance gross premiums in the period between the years 2003 and 2014.

Year	Calculated gross premium (in 000 kunas)	Index
2003	1,349,981	
2004	1,569,421	1.16
2005	1,895,769	1.21
2006	2,165,061	1.14
2007	2,482,743	1.15
2008	2,545,775	1.03
2009	2,488,675	0.98
2010	2,457,683	0.99
2011	2,431,268	0.99
2012	2,461,154	1.01
2013	2,538,414	1.03
2014	2,637,726	1.04

Table 1. Calculated gross premiums in the life insurance market in the Repub-lic of Croatia in the period between the years 2003 and 2014

Source: Croatian Insurance Bureau, Retrieved from http://www.huo.hr/hrv/statistickaizvjesca/18/ (06.03.2015)

The annual growth rates were ranging from the lowest rate of14% in 2006, to the highest market growth rate of 21% in 2005. After the year 2008, stagnation, caused by economic movements, set in. Thus, in 2008 the life insurance market records a low annual premium growth of 3% only to, in the following three-year period, record a fall between the years 2009 and 2011. The annual growth of the calculated gross premium was realised in the year 2011 to the value of 1% and the trend of market growth continues until the year 2014.

The life insurance market in the Republic of Croatia encompasses standard life insurances, annuity insurances, additional covers with life insurance, event insurances, such as weddings or childbirth and life or annuity insurances where the policyholder bears the investment risk (http://www.huo.hr/hrv/statistic-ka-izvjesca/18/(06.03.2015)). The value structure in the total gross premium of the overall life insurance market is such that a standard life insurance represents a significant share in the total calculated gross premium.

Table 2. Illustration of the standard life insurance gross premiums in the totalof life insurance premiums in the Republic of Croatia in the periodbetween the years 2003 and 2014

Year	Calculated life insurance market gross premiums (in 000kunas)	Calculated standard life insurance gross premiums (in 000 kunas)	% share of the standard life insurance premiums in total life insurance market premium
2003	1,349,981	1,349,981	100%
2004	1,569,421	1,569,421	100%
2005	1,895,769	1,895,769	100%
2006	2,165,061	2,165,061	100%
2007	2,482,743	2,073,627	84%
2008	2,545,775	2,140,992	84%
2009	2,488,675	2,143,134	86%
2010	2,457,683	2,095,817	85%
2011	2,431,268	2,092,895	86%
2012	2,461,154	2,134,691	87%
2013	2,538,414	2,231,682	88%
2014	2,637,726	2,322,926	88%

Source: Croatian Insurance Bureau, Retrieved from http://www.huo.hr/hrv/statistickaizvjesca/18/ (06.03.2015)

The movement of the standard life insurance gross premiumsfollowed the movement of the total of the insurance market. A high share of the gross standard life insurance premiums of 88% in the total premiums of the life insurance group illustrates that the main market movement trends will be determined by standard life insurances.

For that reason, the annual standard life insurance premium movements affect the entire movement of the life insurance market in the Republic of Croatia. By means of evaluation and prognosis of the movement of the annual gross standard life insurance premiums will enable the consideration of market possibilities of all stakeholders in this insurance market segment.

4. EVALUATION OF THE MOVEMENTS OF THE LIFE INSURANCE MARKET AND ANTICIPATED FINANCIAL POSSIBILITIES

The evaluation of future insurance market movements is significant for several reasons. The insurance market affects the economic results and economic development of a country (Hou & Cheng; 2012, 126). Insurance has become the main component in the economies of developed countries (Cristea et.al.; 2014, 227). The insurance market stakeholders create their business strategies on the basis of evaluation of future market movements. Market expansion requires a different strategy from the strategy of a stagnant market. Economic subjects evaluate movements in order to determine the advantages which they can achieve in the life insurance market. Evaluation of future market movements, therefore, must be as realistic as possible, as wrong evaluation and prognosis affect the decisions of all the subjects who base their undertakingson information about movements in the life insurance market.

The evaluation of the movement of the life insurance premiums in the Republic of Croatia was carried out using the trend prognostic model. Using the trend prognostic model, the values of future annual gross premiums for the period between the years 2015 and 2017 have been evaluated. Two important moments in the movement of annual premiums in the Republic of Croatia life insurance market have been noticed. The trend of a constant life insurance premium growth was recorded in the market before the economic crisis began. A constant life insurance premium growth before the economic crisis was also recorded in other European countries, especially in the fast growing East European economies (Fritescu; 2014, 354). After the year 2008 the market growth was halted and the growth rates record a fall in the annual gross premium in the period between the years 2009 and 2011.

In order to, as realistically as possible, predict the movement of the annual gross premiums in the Republic of Croatia life insurance market, the year 2009 was taken as a starting point. By this approach, market movements during the previous years, when markets were not affected by the world economic crisis, were not taken into account.

Using the trend prognostic model, covariation of the change in the annual gross premiums in the standard life insurance market over time was described. In testing of the prognostic models, the polynomial trend model of the third

degree proved to be the most representative for the Republic of Croatia life insurance market. The data used for the formation of the prognostic trend model is shown in the table below.

Table 3. Illustration of the data for formation of thepolynomial trend modelof the third degree for predicting the standard life insurance marketmovements in the Republic of Croatia

Year	xt	Standard life insurance calculated gross premiums (in 000 kunas)	Gross premiums annual growth/fall (in 000 kunas)	Index %
2009	0	2,143,134	-	
2010	1	2,095,817	-47,318	97.80
2011	2	2,092,895	-2,922	99.90
2012	3	2,134,691	41,796	102.00
2013	4	2,231,682	96,991	104.50
2014	5	2,322,926	91,244	104.10

Source: Author's calculations

Using the data from the table, the scatter diagram and the polynomial trend model were produced. The representativeness, shown using the coefficient of determination R², must be very high due to a relatively low number of years, i.e. the coefficient of determination must have values which include the comprehensiveness of the observed set. The coefficient of determination is expressed as a percentage of the relationship between the observed variables, interpreted by the model (Šošić; 2008, 391). The reason for this is the representativeness of the model for calculation of the estimated values which reflect the evaluation of the position, including the observed past periods.

Graph 1. Illustration of the scatter diagram for the Republic of Croatia life insurance market in the period between the years 2009 and 2014

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Source: Prepared by the author

The polynomial trend model of the third degree for the prognosis of the movement of the gross standard life insurance premiums in the Republic of Croatiais expressed as follows:

$$y = 2.000.000 - 2030, 4x^3 + 34736x^2 - 86833x$$

The coefficient of determination R²equals 0.966, which means that the prognostic trend model has the representativeness of 0.996, i.e. that it encompasses 99.60% of all observed occurrences. Supposing that the movement of the gross standard life insurance premiums in the Republic of Croatia market will continue to progress in accordance with the obtained polynomial trend, the values for the period between the years 2015 and 2017 have been predicted. The calculated values are shown in the table below.

Table 4. Predicted values of the calculated gross premiums in the Republicof Croatia standard life insurance market for the period between theyears 2015 and 2017

Year	Standard life insurance planned calculated gross premiums (in 000 kunas)	Gross premiums planned annual growth/fall (in 000 kunas)	Index %
2015	2,290,931	-31,944	98.60
2016	2,397,805	106,974	104.70
2017	2,488,875	91,069	103.80

Source: Author's calculations

The standard life insurance market realised a fall in the calculated gross insurance premiums following the economic crisis. The fall in premiums was recorded in the period between the years 2009 and2011. After that, a slight growth in the year 2012 was achieved, of 2%. The following two years saw gross premium growth of 4.5% in 2013 and 4.1% in 2014. According to the values obtained by application of the trend model, the fall in premiums by 31,944 million kunas, i.e. by 1.4%, follows in 2015. The insurance companies, therefore, face preparation of business goals in accordance with the anticipated trend in the market. Given that standard life insurances have a share of 88% in the total life insurance group, it is to be expected that, in 2015, a fall will follow in the calculated gross premiums of the total life insurance market in the Republic of Croatia.

After the fall in the gross premium value in 2015, a predicted market growth will follow in 2016 of 4.7%, i.e. 106,974 million kunas. Considering the entire period after the crisis started, value-wise and percentage-wise, this planned market growth represents the highest market plunge in the Republic of Croatia in the period after the economic crisis. The trend of the standard life insurance market value growth is also expected in the year 2017. Although the anticipated growth is lower than the previous year, namely 3.80%, i.e. 91,069million kunas, it represents an additional indication of possible market recovery.

Provided the trend which is marked by the post-crisis period in the observed and planned periods continues, the highest annual growth of the calculated gross premiums of 5% in the life insurance market of the Republic of Croatia is to be expected. Accordingly, powerful competition in attracting policyholders is also expected. This still unstable market will not record large growths in annual gross premiums, with possible market value falls. It is, therefore, to be expected that all existing channels for attracting policyholders will be intensified in order to achieve the planned financial goals in such market conditions.

5. CONCLUSION

The period after world economic crises requires different approaches and changes in company business strategy. Evaluations are therefore very important for the periods following market disturbances caused by the economic crisis. The market characteristics after such events are annual falls in the market value, followed by a multiannual period of market recovery. The stakeholders in the market must be prepared to apply innovative strategies in order to realise their planned business goals, as new conditions also require new approaches. Companies which are not flexible, prepared for changes, or able to adapt their business to the new conditions are susceptible to the risk of jeopardisingtheir own businessexistence.

Predicting market movement in such conditions is extremely important, as information is obtained about market potentials which require a specific approach in business. The models which predict annual market movements are significant, as they indicate possible threats in business due to the market fall, as well as the opportunities which arise due to market growth. Using the illustrated prognostic model, additional information is provided, which complements the data base for business planning and decision-making in the life insurance segment.

In income planning, a series of scenarios is used and, based on the analysis of strengths and weaknesses, opportunities and threats, the most realistic are chosen in the life insurance market. Adaptation to various business scenarios in the planning of market representation is the property of the illustrated prognostic model. Due to the planned values of market movements, the planning of income from life insurance facilitates the realisation of the planned gross premiums from life insurance and the number of insurances in insurance companies in line with the changeable market possibilities. At the annual level as well asduring monthly, quarterly and half-yearly checks of realised and planned income, new scenarios can be created for prediction of the financial impacts on stakeholders' business in the life insurance market.

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