

COMPARING OF DEPOSIT MODEL AND LIFE INSURANCE MODEL IN MACEDONIA

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***Abstract.** In conditions of the continuous decline of the interest rates for bank deposits, and at a time when uncertainty about the future is increasing, physical and legal persons have doubts how to secure their future or how and where to invest their funds and thus to “fertilize” and increase their savings. Individuals usually choose to put their savings in the bank for a certain period, and for that period to receive certain interest, or decide to invest their savings in different types of life insurance and thus to “take care” of their life, their future and the future of their families. In mathematics are developed many models that relate to the compounding and the insurance. This paper is a comparison of the deposit model and the model of life insurance.*

Key words: deposit, life insurance, interest rate, profit, mathematical models.

Clasificare JEL:C12,C83

1. Introduction

We live in a complex world where nobody believes that he/she can make a real and proper decision in the business conducting. Life insurance in our country is still insufficiently developed and the citizens are not familiar enough with it to be able to make a real decision where to invest the surplus of funds. Life insurance is the most common type of insurance in the world, mainly because of its benefits for the insured and the country as a whole. As special financial services that in a best way combine protection of interests of the insured and the members of their family with adequate basic savings, life insurance through accumulation and investment of significant financial resources, and up to the positive effects on the economy as a whole. Life insurance covers the insurance of the people that have accumulated funds or savings to cover the increased risks in the later years of insurance. The said is on voluntary basis, with the exception of the risks that threaten to third parties or their property, and hence the law stipulates compulsory insurance. The Law on Supervision of Insurance as the basic law by which is regulated the insurance industry in the Republic of Macedonia is in line with the directives and the other regulations of the European Union in the field of insurance, and this builds in the principles and standards to ensure the monitoring of the International association of insurance supervisions. The insurance sector in the Republic of Macedonia is characterized by moderately competitive market.

In 2011, in the group of life insurance on the market in the Republic of Macedonia, a significant participation is owned by two insurance companies: Grave (49,17%) and Croatia insurance (40,44%), and two other insurance companies have a low share on the market: Viner, Uniqa, which is due to the fact that they are two new companies that started with their business in 2011, and they are present for a relatively short period on the Macedonian insurance market.¹

In [7] a researching has been made in relation to when the insured persons are satisfied with the companies that offer life insurance. According to the researching made by the authors, it was established that the confidence, competences of the agents and the appropriateness of the product they are offered is crucial for the insurance beneficiary to be satisfied. On the other hand [6], the authors point to the risks that are present in life insurance. In [8] a comparison between the life insurance and the long term personal insurance has been made.

In our paper we have compared the deposit model and the model of life insurance.

2. Methodology of factor analysis

Subject of this researching is the attitude of the insured persons who voluntarily have additional insurances or more precisely, life insurance. The results of this research are only one part of a more precise and more complex researching. Surveyed were total of 118 respondents all over the country who have life insurance and the sample was designed by random selection. As a research technique was used survey and a structured questionnaire was used, composed of questions of open and closed type. For analysis of the data were used standard statistical mathematical procedures in the SPSSv16 program.

In this paper we will single out two hypotheses, as follows:

1 - H_0 : The sum of the annual amounts that are allocated for life insurance is in correlation with the total monthly income of the respondents

2 - H_0 : The time period to invest in life insurance is in correlation with the total monthly income of the respondents

The data are shown in tables (through frequencies and percentages), and for their testing we used the coefficient of correlation and the χ^2 - test.

The coefficient of correlation is calculated by the following formula:

$$r = r_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}} \quad (1)$$

Where:

- n, x_i, y_i are previously defined in the sample (total number of respondents, the independent variable and the dependent variable)

$$\bar{x} = \frac{1}{n} \sum_{i=1}^n x_i \quad (2)$$

And according to this, the coefficient of correlation r can be calculated according to the following formula:

$$r = r_{xy} = \frac{n \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{n \sum x_i^2 - (\sum x_i)^2} \sqrt{n \sum y_i^2 - (\sum y_i)^2}} \quad (3)$$

While the χ^2 - test is calculated with the following formula:

$$\chi^2 = \sum_{n=1}^{\infty} \left(\frac{\text{analyzed-expected}}{\text{expected}} \right)^2 \quad (4)$$

3. Results and discussion

For the needs of the first hypothesis we will analyze the cross tabulation between the two questions, to which the hypothesis refers:

1 - H_0 : The sum of the annual amounts that are allocated for life insurance is in correlation with the total monthly income of the respondents

All respondents didn't answer to this question, but only 77 out of 118 or 65,3% of the respondents:

Table N^o. 1: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Which is the annual amount that you allocate	77	65,3%	41	34,7%	118	100,0%

for the life insurance?							
Total monthly income?							

It may be noted that most respondents (17) have incomes above 811 Euros, and 31 of them allocate annual amount for insurance up to 250,00 Euros. It is also interesting to note that 6 respondents that have income above 811 Euros allocate up to 250,00 Euros per year for insurance.

Table N^o. 2: Crosstabulation - Which is the annual amount that you allocate for life insurance? * Total monthly income

			Total monthly income								
			Up to 325 Euros	Up to 410 Euros	Up to 490 Euros	Up to 570 Euros	Up to 650 Euros	Up to 730 Euros	Up to 810 Euros	811 + Euros	Total
Which is the annual amount that you allocate for life insurance?	Up to 250 Euros	Count	4	4	5	5	3	0	4	6	31
		Expected Count	2,0	3,6	4,4	4,4	2,8	2,4	4,4	6,8	31
		Std. Residual	1,4	,2	,3	,3	,1	-1,6)	-,2)	-,3)	
	251 - 500 Euros	Count	1	1	5	1	2	4	2	2	18
		Expected Count	1,2	2,1	2,6	2,6	1,6	1,4	2,6	4,0	18
		Std. Residual	-,2)	-,8)	1,5	-1,0)	,3	2,2	-,4)	-1,0)	
	501 - 750 Euros	Count	0	1	0	1	0	1	2	1	6
		Expected Count	,4	,7	,9	,9	,5	,5	,9	1,3	6
		Std. Residual	-,6)	,4	-,9)	,2	-,7)	,8	1,2	-,3)	
	751 - 1000 Euros	Count	0	2	1	2	0	1	1	4	11
		Expected Count	,7	1,3	1,6	1,6	1,0	,9	1,6	2,4	11
		Std. Residual	-,8)	,6	-,5)	,3	-1,0)	,2	-,5)	1,0	
	1000 Euros and more	Count	0	1	0	2	2	0	2	4	11
		Expected Count	,7	1,3	1,6	1,6	1,0	,9	1,6	2,4	11
		Std. Residual	-,8)	-,3)	-1,3)	,3	1,0	-,9)	,3	1,0	
	Total	Count	5	9	11	11	7	6	11	17	77
		Expected Count	5	9	11	11	7	6	11	17	77

Source: Analysis and comparison of profit in various long-term investments (master thesis - 2016)

In order for us to be able to prove the H_0 – hypothesis, first we will calculate the mean, standard deviation and the coefficient of correlation.

Table N^o. 3: Descriptive Statistics - Which is the annual amount that you allocate for life insurance? * Total monthly income

	Mean	Std. Deviation	N
Which is the annual amount that you allocate for life insurance?	2,39	1,488	77
Total monthly income	5,82	2,618	115

Table N^o. 4: Correlations - Which is the annual amount that you allocate for life insurance? * Total monthly income

		Which is the annual amount that you allocate for life insurance?*	Total monthly income
Which is the annual amount that you allocate for life insurance?*	Pearson Correlation	1,000	,242*
	Sig. (2-tailed)		,034
	N	77,000	77
Total monthly income	Pearson Correlation	,242*	1,000
	Sig. (2-tailed)	,034	
	N	77	115,000

*. Correlation is significant at the 0.05 level (2-tailed).

According to the coefficient of correlation, which shows us the level of association, we can conclude that these two variables have a positive correlation, i.e., that the increasing of the total monthly incomes has a positive impact on

increasing of the annual amount that the insured allocate for life insurance. Since the coefficient of correlation is 0,243 or 24,3%, we can safely conclude that between these two variables there is a poor correlation connection.

The analysis of the χ^2 test can be seen on the following table. The said has the value of 27,871.

Table N^o. 5: Chi-Square Tests - Which is the annual amount that you allocate for life insurance? * Total monthly income

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	27,871 ^a	28	,471
Likelihood Ratio	33,870	28	,205
Linear-by-Linear Association	4,468	1	,035
N of Valid Cases	77		
a. 39 cells (97,5%) have expected count less than 5. The minimum expected count is ,39.			

We note a significant relationship between the annual amount that the respondents allocate for life insurance and the total monthly incomes, at $\chi^2(28)=27,871$, $p=0.05$. This means that we can prove the hypothesis H_0 that the Sum of annual amounts allocated for life insurance is in correlation with the total monthly incomes of the respondents.

The second hypothesis is:

H_0 : The time period of investing in life insurance is in correlation with the total monthly incomes of the respondents

The following variables have been taken into consideration for the second hypothesis: How many years you already have life insurance and total monthly income. For this cross tabulation have been surveyed 79 respondents from a total of 118 or 66,9%.

Table N^o. 6: Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
How many years you already have life insurance? * Total monthly income	79	66,9%	39	33,1%	118	100,0%

By cross tabulation of these two variables we have concluded that persons most often make allocation up to 5 years for life insurance. As the years of allocation for life insurance increase, thus the number of respondents decreases. The persons with total incomes above 810 Euros have most of insurances up to 5 years.

Table N^o. 7: Crosstabulation - How many years you already have life insurance? * Total monthly income

		Total monthly income									Total
		Up to 250 Euros	Up to 325 Euros	Up to 410 Euros	Up to 490 Euros	Up to 570 Euros	Up to 650 Euros	Up to 45000	Up to 730 Euros	Above 810 Euros	
How many years you already have life insurance?	Up to 5 years	1	3	8	8	6	5	3	4	12	50
	Up to 10 years	0	1	2	1	2	1	3	3	5	18
	Up to 15 years	0	0	0	2	3	1	0	0	0	6
	Up to 20 years	0	0	0	1	0	0	0	0	0	1
	More than 20 years	0	0	0	0	0	0	0	2	2	4
	Total	1	4	10	12	11	7	6	9	19	79

Source: Analysis and comparison of profit in various long-term investments (master thesis - 2016)

In order for us to be able to prove the H_0 – hypothesis, first we will calculate the mean, standard deviation and the coefficient of correlation

Table N^o. 8: Descriptive Statistics - How many years you already have life insurance? * Total monthly income

	Mean	Std. Deviation	N
Total monthly income	5,82	2,618	115
How many years you will make allocation for life insurance?	2,68	1,235	73

We will test the level of association of these two variables through the Pearson's coefficient of correlation. According to the table given below, we can note that the said has a negative correlation, indicating that between the two analyzed variables there is a negative correlation, i.e., that by increasing of total incomes of the respondents, the years of allocation for life insurance decline. The coefficient of correlation of - 0,001 points out to the poor correlation between these two variables.

Table N^o. 9: Correlations - How many years you already have life insurance? * Total monthly income

		Total monthly income	How many years you will make allocation for life insurance?
Total monthly income	Pearson Correlation	1,000	-,001)
	Sig. (2-tailed)		,991
	N	115,000	73
How many years you will make allocation for life insurance?	Pearson Correlation	-,001)	1,000
	Sig. (2-tailed)	,991	
	N	73	73,000

With level of significance of $p=0,05$, it can be concluded that there is no statistically significant correlation between these two variables.

The analysis for χ^2 test can be seen in the table No 10. The obtained value of χ^2 test is 31.391.

Table N^o. 10: Chi-Square Tests - How many years you already have life insurance? * Total monthly income

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	31,391 ^a	32	,497
Likelihood Ratio	30,591	32	,538
Linear-by-Linear Association	2,241	1	,134
N of Valid Cases	79		
a. 40 cells (88,9%) have expected count less than 5. The minimum expected count is ,01.			

There is a statistically significant relationship between the annual amount that the respondents allocate for life insurance and the total monthly incomes, at $\chi^2(32)=31,391$, $p=0,05$. This means that we can accept H_0 , i.e., that the Time period of investment in life insurance is in correlation with the total monthly incomes of the respondents

4. Conclusion

Considering the fact that the Republic of Macedonia is substantially lagging behind in the development of life insurance in relation to the neighboring countries and Europe, one of the priorities in the future is to make influence in order to change the approach of the citizens regarding the savings and to raise the awareness for the need of this type of insurance. The premium on life insurance per capita in the Republic of Macedonia is 5 Euros and 4% of the population in Macedonia has a life insurance policy. Potential for development of the domestic market for life insurance is provided by the pension system, which shows the basic deficiencies of the system of integration solidarity. According to the research it can be concluded that the persons that have life insurance with high monthly incomes also have a higher insurance rate, which is not the case with the period of investment in life insurance. Therefore the insurance companies should make efforts to motivate and convince the insured persons to increase the amount of insurance, but also the period of insurance.

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