



Nevşehir Hacı Bektaş Veli  
University Faculty of Economics  
and Administrative Sciences

I. İ. İ. F.

Kapadokya Akademik Bakış 2(2): 141–165

<http://dergipark.gov.tr/car>

**Başvuru:** 30/08/2018

**Kabul:** 15/01/2019

**Kapadokya Akademik Bakış**

CAR-CAPPADOCIA ACADEMIC REVIEW

## LIFE INSURANCE DEMAND IN BOSNIA AND HERZEGOVINA: STATISTICAL ANALYSIS

**Elma SATROVIC\***

### **Abstract**

*The focus of this research is to examine the impact of socio-demographic determinants and income on demand for life insurance in Bosnia and Herzegovina (B&H). Proxy variable of life insurance demand is the annual life insurance premium per capita in B&H. Socio-demographic determinants that are analyzed are: gender, marital status, educational level, age, employment status and number of family members. Questionnaire consists of 13 questions. Number of respondents after eliminating missing data is 120. Since the distribution of dependent variable deviates from normal, non-parametric tests are considered appropriate. Seven hypotheses are tested. Results indicate that annual life insurance premium per capita in B&H does not depend on gender and there are significant differences between married and single respondents in life insurance premium that they pay on annual basis. Results also show that the increase in income increases the life insurance demand and the significant impact of educational level. As a concluding remark actuaries and life insurance companies should pay much attention to: marital status, educational level and income while creating life insurance policies. Hence, this research can serve as a useful insight for actuaries to easily charge life insurance products and to support life insurance development strategy in B&H.*

**Keywords:** actuaries, life insurance demand, non-parametric tests, socio-demographic determinants

**JEL classification:** G22, C12, C21

---

\* Assist. Prof., Çağ University, Faculty of Economics and Administrative Sciences, e-mail: [elmasatrovic@cag.edu.tr](mailto:elmasatrovic@cag.edu.tr),  
ORCID: 0000-0002-8000-5543

## **Introduction and literature review**

A large number of research papers empirically investigate the impact of various determinants on the demand for life insurance. This is due to the fact that life insurance companies play a significant role in the financial systems (Satrovic, 2018; Satrovic and Muslija, 2018). Additionally, well developed financial system can play a significant role in the economic growth of the country (Satrovic, 2017).

The papers to date treating determinants of life insurance development are in general based on secondary data and have conducted macroeconomic analysis of determinant's impacts on life insurance demand (Beck and Webb 2003; Nesterova 2008; Sen 2008; Haiss and Sümegi 2006; Çelik and Kayali 2009; Munir et al. 2012). These papers do not analyze attitudes of customers towards life insurance, their perception of life insurance products and its benefits; do not take into account social differences among customers in observed geographic area. Therefore the need for collecting primary data, in order to analyze previously mentioned aspects, arose. This motivates author to conduct survey in Bosnia and Herzegovina (B&H). Total number of respondents is 120.

The research problem is insufficiently explored impact of determinants on demand for life insurance in B&H. Due to this issue, actuaries face problems in setting prices of life insurance products. In addition, insufficiently explored impact of various determinants on life insurance demand complicates the creation of life insurance development strategy in B&H. The aim of this research is to explore the impact of socio-demographic determinants and income on demand for life insurance in order to help actuaries to set prices of life insurance products and to support the creation of life insurance development strategy in B&H. Proxy variable of life insurance demand is the life insurance premium that B&H citizens pay on annual basis.

Determinants of life insurance demand have been explored quite intensively in research to date. Sarkodie and Yusif (2015) have analyzed this link in the case of Ghana. The most important determinants of life insurance are found to be income, the level of education, the employment status as well as the number of dependents. Income is also recognized as an important determinant of life insurance demand by Hammond (1969) and Berekson (1972). In addition, Celik and Kayali (2009) have recognized the income as a central determinant of life insurance demand in a sample of 31 countries as well as Zerriaa et al. (2017) in the case of Tunis. Andelinovic et al. (2016) have analyzed these determinants in the case of EU member states. Gross domestic product is found to be the most important determinant of life insurance demand. These authors have also advocated the importance of the development of financial sector. The importance of financial sector is also recognized by Outreville (1996), Ward and Zurbruegg (2002) and Zerriaa and Noubbigh (2016).

Ćurak et al. (2013); Mahdzan and Victorian (2013); Liebenberg et al. (2010); Jain and Talach (2012); Negi and Singh (2012); Dash and Sood (2013) and Chun et al. (2013) emphasize that most important socio-demographic determinants of life insurance demand are: gender, marital status, number of family members, age, educational level and employment status. The survey created for the purpose of this research is based on aforementioned papers and includes income as

additional determinant of life insurance demand. Questionnaire consists of 13 questions. The definition of variables is given in Appendix 1. Research is conducted in May, 2016.

### **Data and methodology**

Seven hypotheses are tested. This part of paper summarizes hypotheses together with methods used to test hypotheses.

**H<sub>1</sub>:** Life insurance premium that B&H citizens pay on annual basis depends on gender.

- Dependent variable is: Life insurance premium in BAM that B&H citizens pay on annual basis (CO3). Code in parenthesis indicates assigned question to this variable.
- Independent variable is: Gender (BI1). Code in parenthesis indicates assigned question to this variable.

Before selecting appropriate method, it is necessary to test the distribution of dependent variable. If CO3 is normally distributed two methods are recommended: Two-sample t test and linear regression, otherwise Mann-Whitney U test will be selected.

**H<sub>2</sub>:** Life insurance premium that B&H citizens pay on annual basis depends on marital status.

- Dependent variable is: Life insurance premium in BAM that B&H citizens pay on annual basis (CO3).
- Independent variable is: Marital status (CA1).

Before selecting appropriate method, it is necessary to test the distribution of dependent variable. If CO3 is normally distributed two methods are recommended taking into account the type of independent variable: One-way ANOVA and linear regression, otherwise Kruskal-Wallis test will be selected.

**H<sub>3</sub>:** There is significant positive relationship between life insurance premium in BAM that B&H citizens pay on annual basis and the level of their annual income.

- Dependent variable is: Life insurance premium in BAM that B&H citizens pay on annual basis (CO).
- Independent variable is: The level of B&H citizen's annual income in BAM (CO2).

Regardless of the distribution of dependent variable, this combination of variables enables the use of linear regression. This is why linear regression will be used in this case.

**H<sub>4</sub>:** There is significant relationship between respondent's attitudes towards life insurance development and educational level.

- Dependent variable is: Life insurance is developed in B&H (PER1).
- Independent variable is: Educational level (OR1).

Linear regression will be used in this case.

**H<sub>5</sub>:** Attitudes towards life insurance products in B&H depend on age.

- Dependent variables are: Life insurance products in B&H appropriately satisfy customer's needs (PER2), Life insurance products in B&H are attractive (PER3), Life insurance products in B&H offer various benefits (PER4).
- Independent variable is: Age (CA3).

Before selecting appropriate method, it is necessary to test the distribution of dependent variables. If they are normally distributed two methods are recommended: One-way ANOVA and linear regression, otherwise Kruskal-Wallis test will be selected. In addition, here will be tested is there possibility to create aggregate life insurance products attitude variable. In the case it is possible, H<sub>5</sub> will be tested again by adding new dependent variable.

**H<sub>6</sub>:** Life insurance premium that B&H citizens pay on annual basis depends on employment status.

- Dependent variable is: Life insurance premium in BAM that B&H citizens pay on annual basis (CO3).
- Independent variable is: Employment status (BI2).

Before selecting appropriate method, it is necessary to test the distribution of dependent variable. If CO3 is normally distributed two methods are recommended: Two-sample t test and linear regression, otherwise Mann-Whitney U test will be selected.

**H<sub>7</sub>:** Life insurance premium that B&H citizens pay on annual basis depends on the number of family members.

- Dependent variable is: Life insurance premium in BAM that B&H citizens pay on annual basis (CO3).
- Independent variable is: Number of family members (CA2).

Before selecting appropriate method, it is necessary to test the distribution of dependent variable. If CO3 is normally distributed two methods are recommended: One-way ANOVA and linear regression, otherwise Kruskal-Wallis test will be selected.

### Results of the research

**H<sub>1</sub>:** Life insurance premium that B&H citizens pay on annual basis depends on gender.

Initially, this hypothesis is tested by calculating descriptive statistics. Obtained results in software SPSS are as follows (table 1):

Table 11: Descriptive statistics for H<sub>1</sub>

	Gender		Mean	Std. Deviation
<b>Life insurance premium that B&amp;H citizens pay on annual basis</b>	Male	1	6.98	36.06
	Female	9	3.63	46.21

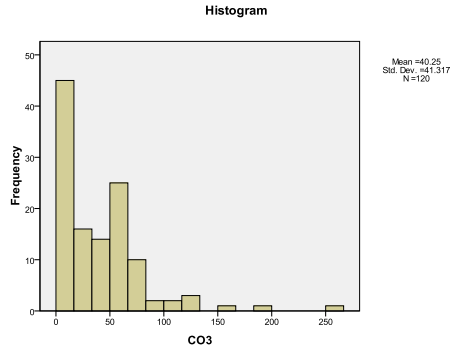
The results in table 1 indicate that average amount of life insurance premium that B&H citizens pay on annual basis differs between male (36.98 BAM) and female respondents (43.63 BAM). In order to analyze is this difference significant, recommended tests are: Two-sample t test and linear regression in the case when dependent variable is normally distributed, otherwise Mann-Whitney U test will be selected.

Next step in this analysis is to test is dependent variable normally distributed. Formal and informal tests are conducted. Informally, the assumption of normality is tested using histogram. Based on histogram (graph 1), the assumption on normal distribution would be rejected. This distribution appears to be right-skewed:

Graph 1: The distribution of dependent variable in H<sub>1</sub>

---

1 Source: Author's calculations (applicable to all tables and graphs).



Formally, the assumption of normality is tested using: Kolmogorov-Smirnov and Shapiro-Wilk tests. Obtained results are as follows:

Table 2: Tests of normality, dependent variable in H<sub>1</sub>

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<b>Life insurance premium that B&amp;H citizens pay on annual basis</b>	0.165	120	0.000	0.813	120	0.000

Test statistics in both cases are significant ( $p$  values below 0.05). Based on this result (table 2) the null hypothesis that dependent variable in H<sub>1</sub> is normally distributed is rejected. This is why H<sub>1</sub> will be tested using Mann-Whitney U test.

Table 3: Mann-Whitney U test - H<sub>1</sub>

	<b>Life insurance premium that B&amp;H citizens pay on annual basis</b>
<b>Mann-Whitney U</b>	1669.00
<b>Wilcoxon W</b>	3560.00
<b>Z</b>	-0.689
<b>Asymp. Sig. (2-tailed)</b>	0.491

Grouping Variable: Gender

Mann-Whitney U test (table 3) shows there is no significant difference between male and female respondents in the amount of life insurance premium that they pay on annual basis ( $p$  value = 0.491) which gives answer to the question mentioned with table 1. The hypothesis: *Life insurance premium that B&H citizens pay on annual basis depends on gender* is rejected. The obtained result is in accordance with: Ćurak et al. (2013); Jain and Talach (2012); Dash and Sood (2013) and Chun et al. (2013).

**H<sub>2</sub>**: Life insurance premium that B&H citizens pay on annual basis depends on marital status.

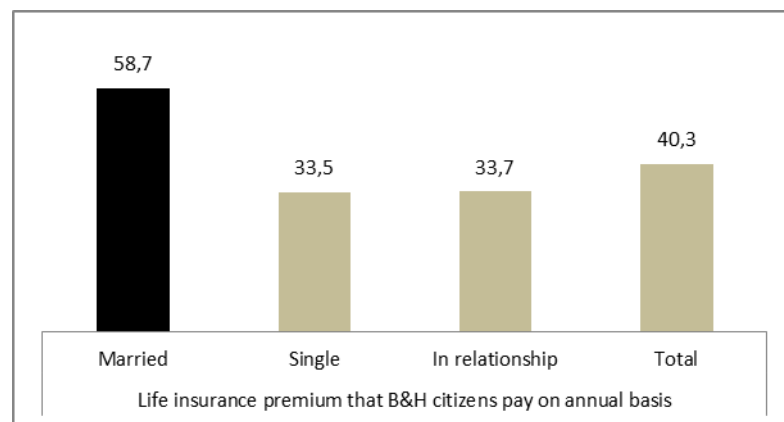
Descriptive statistics (table 4) represents the amount of life insurance premium that B&H citizens pay on annual basis depending on marital status. It can be seen that married respondents pay on average higher life insurance premium comparing to single or in relationship respondents (graph 2 – black bar). In relationship respondents pay annually, on average, higher life insurance premium comparing to single ones.

Table 4: Descriptive statistics for H<sub>2</sub> – CO3 dependent variable

		N	Mean	Std. Deviation
<b>Life insurance premium that B&amp;H citizens pay on annual basis</b>	<b>Married</b>	32	58.66	56.77
	<b>Single</b>	58	33.47	34.30
	<b>In relationship</b>	30	33.73	27.15
	<b>Total</b>	120	40.25	41.32

Graph 2 represents average values of life insurance premium that B&H citizens pay annually depending on marital status:

Graph 2: Average values of dependent variable (in BAM) depending on marital status – H<sub>2</sub>



Since the dependent variable is continuous which is not normally distributed, there is a need to test are these differences between marital status groups significant by applying Kruskal-Wallis and Mann-Whitney U tests. Kruskal-Wallis test results are as follows:

Table 5: Kruskal-Wallis test of H<sub>2</sub> – Grouping variable (marital status)

	CO3
<b>Chi-Square</b>	5.666
<b>df</b>	2
<b>p value</b>	0.059***

Note: \*\*\* significant at 10%

Table 5 indicates there is significant difference between marital status groups in life insurance premium that they pay on annual basis. The hypothesis: *Life insurance premium that B&H citizens pay on annual basis depends on marital status* can't be rejected at 10% significance level ( $p$  value = 0.059). Mann-Whitney U test (table 6) indicates there are significant differences in life insurance premium that B&H citizens pay on annual basis only between married and single respondents at 5% significance level ( $p$  value = 0.019).

Table 6: Mann-Whitney U test of H<sub>2</sub> – CO3 dependent variable

		Mann-Whitney U	Sig.
<b>Married</b>	Single	651.00	0.019**
	In relationship	365.00	0.104
<b>Single</b>	Married	651.00	0.019**
	In relationship	820.50	0.660
<b>In relationship</b>	Married	365.00	0.104
	Single	820.50	0.660

Note: \*\* significant at 5% level



**H<sub>3</sub>:** There is significant positive relationship between life insurance premium in BAM that B&H citizens pay on annual basis and the level of their annual income.

Regardless of the distribution of dependent variable, linear regression can be used when dependent and independent variables are continuous. This is why this hypothesis is initially tested using ordinary least squared estimator (OLSE) in software STATA 12. Descriptive statistics indicates that average annual income per capita of respondents equals 8833.53 BAM with standard deviation 4248.62. At the other side average annual life insurance premium per capita in B&H equals 40.25 BAM with standard deviation 41.32. Minimum values show there are respondents who indicate the 0 level of income and those that don't buy life insurance at all. Skewness and Kurtosis measures indicate that distributions of both variables deviate from normal (table 7).

Table 7: Descriptive statistics for H<sub>3</sub> – CO3 dependent variable

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
<b>CO2</b>	120	0	18317	8833.53	4248.62	0.312	-0.240
<b>CO3</b>	120	0	266	40.25	41.32	2.100	7.714
<b>Valid N</b>	120						

Table 8 summarizes results of linear regression model estimated using OLSE.

Table 8: Ordinary least square estimator (OLSE) - H<sub>3</sub>

CO3	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
<b>CO2</b>	0.003	0.001	3.91	0.000	0.002	0.005
<b>_cons</b>	11.135	8.250	1.35	0.180	-5.201	27.471
Number of obs = 120						
F( 1, 118) = 15.31						
Prob > F = 0.0002						
R-squared = 0.1149						
Adj R-squared = 0.1074						
Root MSE = 39.036						

*F* test indicates that model is significant at 1% level ( $p$  value = 0.0002). Variable CO2 has significant positive impact on CO3 ( $p$  value = 0.000). *F* test also indicates that variance explained by the model differs from 0. However, the coefficient of determination of 11.5% indicates low explanatory power of the model. 11.5% of variability of CO3 is explained by the model. Before giving interpretation of coefficients, assumptions of linear regression are tested. Jarque-Bera normality test with  $p$  value (0.000) below 0.05 indicates that distribution of residuals differs from normal. VIF value of 1.05 indicates no multicollinearity. White's test of homoscedasticity ( $p$  value = 0.269) indicates that this assumption is not violated. Since, these data are cross-section, assumptions of no autocorrelation and stationarity can't be rejected. The only assumption that is violated is normal distribution of residuals. It is controlled using Huber/White robust estimator. Obtained results are as follows:

Table 9: Huber/White robust estimator - H<sub>3</sub>

CO3	Coef.	Robust Std. Err.	t	P>t	[95% Conf. Interval]	
CO2	0.003	0.001	4.71	0.000	0.002	0.005
_cons	11.135	5.668	1.96	0.052	-0.090	22.360
Number of obs = 120						
F( 1, 118) = 22.20						
Prob > F = 0.0000						
R-squared = 0.1149						
Root MSE = 39.036						

Huber/White robust estimator does not change the values of regression coefficients, rather values of standard errors. CO2 has significant impact on CO3 in both cases. The interpretation of regression coefficient is as follows: the increase in annual income per capita by 1 BAM will increase the life insurance premium that B&H citizens pay on annual basis by 0.003 BAM on average, *ceteris paribus*. Huber/White robust estimator indicates that constant term is significant at 10% level, contrary to OLSE. Significant constant does not have economic meaning. The hypothesis: *There is significant positive relationship between life insurance premium in BAM that B&H citizens pay on annual basis and the level of their annual income* can't be rejected. Obtained results are in accordance with Mahdzan and Victorian (2013), Jain and Talach (2012) and Dash and Sood (2013).

**H<sub>4</sub>:** There is significant relationship between respondent’s attitudes towards life insurance development and educational level.

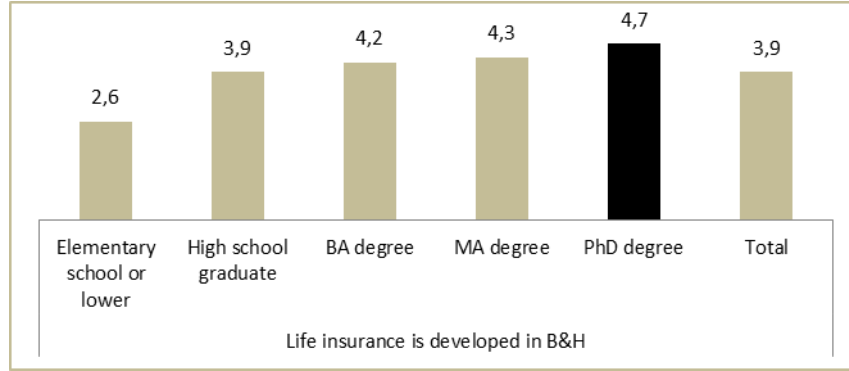
Before conducting linear regression, variables are analyzed using descriptive statistics that indicates attitude towards the life insurance development depending on educational level. Results are presented in table 10. It can be seen that the strength of positive attitude towards life insurance development in B&H increases with educational level. PhD degree respondents on average have stronger positive attitude regarding development of life insurance in B&H comparing to other educational level groups (graph 3 – black bar). The group with second highest positive attitude regarding development of life insurance is MA degree respondents. Respondents with elementary school or lower on average disagree that life insurance is developed in B&H.

Table 10: Descriptive statistics for H<sub>4</sub> – PER1 dependent variable

		N	Mean	Std. Deviation
<b>Life insurance is developed in B&amp;H</b>	<b>Elementary school or lower</b>	21	2.62	0.921
	<b>High school graduate</b>	29	3.93	1.334
	<b>BA degree</b>	32	4.19	0.998
	<b>MA degree</b>	28	4.32	0.819
	<b>PhD degree</b>	10	4.70	0.483
	<b>Total</b>	120	3.93	1.182

Graph 3 represents average values of attitudes towards life insurance development in B&H depending on educational level:

Graph 3: Average values of dependent variable depending on educational level – H<sub>4</sub>



In order to test is there significant relationship between variables in  $H_4$ , OLSE is used in initial stage (table 11):

Table 11: Ordinary least square estimator (OLSE) –  $H_4$

PER1	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
<b>OR1</b>	0.460	0.079	5.85	0.000	0.304	0.616
<b>_cons</b>	2.632	0.241	10.94	0.000	2.156	3.109
Number of obs = 120						
F( 1, 118) = 34.24						
Prob > F = 0.0000						
R-squared = 0.2249						
Adj R-squared = 0.2183						
Root MSE = 1.0452						

$F$  test indicates that model is significant at 1% level ( $p$  value = 0.000). Variable OR1 has significant impact on PER1 ( $p$  value = 0.000).  $F$  test also indicates that variance explained by model differs from 0. The coefficient of determination of 22.49% indicates that OR1 explains 22.49% variability of PER1. Before giving interpretation of coefficients, assumptions of linear regression are tested. Jarque-Bera normality test with  $p$  value 0.045 indicates that distribution of residuals differs from normal. VIF value of 1.00 indicates no multicollinearity. White's test of homoscedasticity ( $p$  value = 0.0066) indicates that this assumption is violated. Since, these data are cross-section, assumptions of no autocorrelation and stationarity can't be rejected. The violated assumptions are controlled using Huber/White robust estimator. Obtained results are as follows:

Table 12: Huber/White robust estimator – H<sub>4</sub>

PER1	Coef.	Robust Std. Err.	t	P>t	[95% Conf. Interval]	
OR1	0.460	0.069	6.66	0.000	0.323	0.597
_cons	2.632	0.245	10.75	0.000	2.148	3.117
Number of obs = 120						
F( 1, 118) = 44.29						
Prob > F = 0.0000						
R-squared = 0.2249						
Root MSE = 1.0452						

Regression coefficient with OR1 indicates that unit increase in variable educational level, increases attitude towards life insurance development by 0.46 on average, ceteris paribus. Significant constant does not have economic meaning. The hypothesis: *There is significant relationship between respondent's attitudes towards life insurance development and educational level* can't be rejected.

**H<sub>5</sub>:** Attitudes towards life insurance products in B&H depend on age.

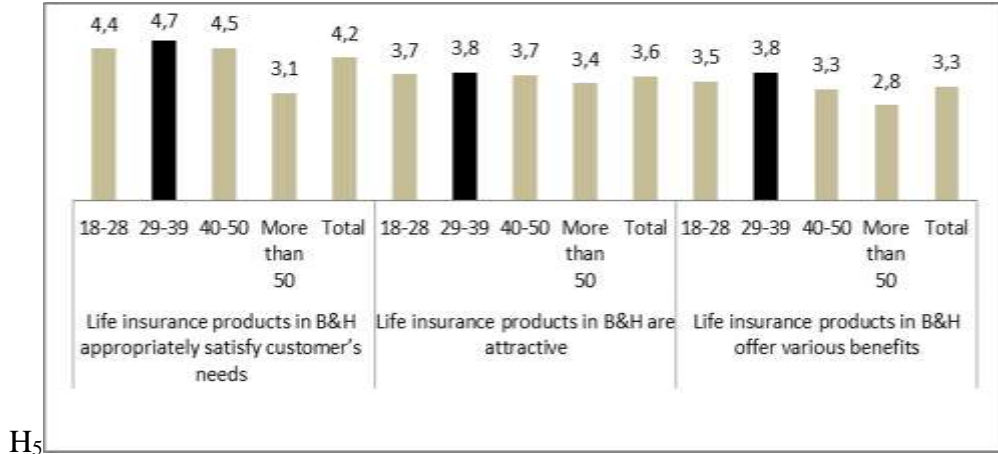
Before conducting appropriate test, variables are analyzed using descriptive statistics that indicates attitude towards the life insurance products depending on age. Results are presented in table 13. It can be seen that the highest positive attitude for question *Life insurance products in B&H appropriately satisfy customer's needs* has 29-39 years old group of respondents (graph 4 – black bar). However, more than 50 years old respondents have the lowest value on average for PER2. The value of 3.14 indicates that mostly they don't have attitude towards PER2. If we are looking at overall average value (4.18) respondents on average agree that *Life insurance products in B&H appropriately satisfy customer's needs*.

For variable *Life insurance products in B&H are attractive* highest average value of attitude has 29-39 years old group of respondents (graph 4 – black bar), while the lowest value have more than 50 years old respondents. Overall average value (3.63) indicates that respondents do not have attitude regarding the variable PER3 depending on age. However, substantial number of respondents agrees that life insurance products in B&H are attractive. The interpretation of variable *Life insurance products in B&H offer various benefits* is similar as in previous cases. However, overall average value of 3.32 indicates that mostly respondents do not have attitude towards variable PER4. In all three cases differences between groups of respondents depending on age exist. In addition, it is tested are these differences significant.

Table 13: Descriptive statistics for H<sub>5</sub>

			Mean	Std. Deviation
<b>Life insurance products in B&amp;H appropriately satisfy customer's needs – PER2</b>	<b>18-28</b>	8	4.44	0.769
	<b>29-39</b>	0	4.70	0.571
	<b>40-50</b>	4	4.46	0.588
	<b>More than 50</b>	8	3.14	1.297
	<b>Total</b>	20	4.18	1.037
<b>Life insurance products in B&amp;H are attractive – PER3</b>	<b>18-28</b>	8	3.69	1.151
	<b>29-39</b>	0	3.75	1.209
	<b>40-50</b>	4	3.67	1.341
	<b>More than 50</b>	8	3.43	1.372
	<b>Total</b>	20	3.63	1.243
<b>Life insurance products in B&amp;H offer various benefits – PER3</b>	<b>18-28</b>	8	3.48	1.091
	<b>29-39</b>	0	3.75	1.020
	<b>40-50</b>	4	3.25	1.511
	<b>More than 50</b>	8	2.79	1.449
	<b>Total</b>	20	3.32	1.290

Graph 4: Average values of dependent variables depending on age –



Kolmogorov-Smirnov and Shapiro-Wilk tests indicate that in all 3 cases the assumption of normality is rejected (table 14).

Table 14: Tests of normality, dependent variables in H<sub>5</sub>

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
<b>PER2</b>	0.276	120	0.000	0.757	120	0.000
<b>PER3</b>	0.241	120	0.000	0.860	120	0.000
<b>PER4</b>	0.210	120	0.000	0.892	120	0.000

This is why, Kruskal-Wallis test is used in this case. Contrary to the conclusion based on descriptive statistics, Kruskal-Wallis test (table 15) indicates there are significant differences only for variable *Life insurance products in B&H appropriately satisfy customer's needs* depending on age at 1% level ( $p$  value = 0.000). Based on these results, there is uncertain conclusion regarding the rejection of hypothesis: *Attitudes towards life insurance products in B&H depend on age*. Further analysis is required only for variable PER2.

Table 15: Kruskal-Wallis test of H<sub>5</sub> – Grouping variable (age)

	PER2	PER3	PER4
<b>Chi-Square</b>	29.425	0.803	6.057
<b>df</b>	3	3	3
<b>p value</b>	0.000*	0.849	0.109

Note: \* significant at 1%

Table 16: Mann-Whitney U test of H<sub>5</sub> – PER2 dependent variable

		Mann-Whitney U	Sig.
<b>18-28</b>	<b>29-39</b>	389.50	0.155
	<b>40-50</b>	554.50	0.772
	<b>More than 50</b>	285.00	0.000*
<b>29-39</b>	<b>18-28</b>	389.50	0.155
	<b>40-50</b>	183.50	0.119
	<b>More than 50</b>	86.50	0.000*
<b>40-50</b>	<b>18-28</b>	554.50	0.772
	<b>29-39</b>	183.50	0.119
	<b>More than 50</b>	138.50	0.000*
<b>More than 50</b>	<b>18-28</b>	285.00	0.000*
	<b>29-39</b>	86.50	0.000*
	<b>40-50</b>	138.50	0.000*

Note: \* significant at 1% level



Table 16 indicates there is significant difference for variable PER2 depending on age between following groups of respondents:

- 18-28 years old and more than 50 years old at 1% level ( $p$  value = 0.000)
- 29-39 years old and more than 50 years old at 1% level ( $p$  value = 0.000)
- 40-50 years old and more than 50 years old at 1% level ( $p$  value = 0.000).

Contrary to other groups, more than 50 years old respondents on average do not have attitude towards the variable *Life insurance products in B&H appropriately satisfy customer's needs*. In addition it will be tested is there possibility to create aggregate life insurance products attitude variable. In case it is possible,  $H_5$  will be tested again by adding new aggregate dependent variable. Cronbach's Alpha reliability statistics (table 17) indicates the marginal acceptance of aggregate life insurance products attitude variable (0.663).

Table 17: Cronbach's Alpha reliability statistics for life insurance products attitude variables

Cronbach's Alpha	N of Items
0.663	3

Kruskal-Wallis test (table 18) indicates there are significant differences between age groups for the aggregate variable at 1% level ( $p$  value = 0.004). This is why further analysis is required.

Table 18: Kruskal-Wallis test of  $H_5$  – Grouping variable (age)

	PER2	PER3	PER4	AVG_PERC
<b>Chi-Square</b>	29.425	0.803	6.057	13.163
<b>df</b>	3	3	3	3
<b><math>p</math> value</b>	0.000*	0.849	0.109	0.004*

Note: \* significant at 1%

The differences among groups are tested using Mann-Whitney U test. Results are as follows:

Table 19: Mann-Whitney U test of H<sub>5</sub> – AVG\_PERC dependent variable

		Mann-Whitney U	Sig.
18-28	29-39	410.50	0.344
	40-50	563.00	0.875
	More than 50	386.00	0.002*
29-39	18-28	410.50	0.344
	40-50	202.50	0.373
	More than 50	129.50	0.002*
40-50	18-28	563.00	0.875
	29-39	202.50	0.373
	More than 50	215.50	0.026**
More than 50	18-28	386.00	0.002*
	29-39	129.50	0.002*
	40-50	215.50	0.026**

Note: \* significant at 1% level; \*\* 5%

The obtained conclusions are the same as in the case of variable PER2. The only significant difference is between groups 40-50 and more than 50.

**H<sub>6</sub>:** Life insurance premium that B&H citizens pay on annual basis depends on employment status.

Initially, this hypothesis is tested calculating descriptive statistics. The obtained results in software SPSS are as follows (table 20):

Table 20: Descriptive statistics for H<sub>6</sub>

	Employment status		Mean	Std. Deviation
<b>Life insurance premium that B&amp;H citizens pay on annual basis</b>	Employed	9	5.61	50.542
	Unemployed	1	6.55	33.413

The results in table 20 indicate that life insurance premium that B&H citizens pay on annual basis, on average, differs between employed (45.61 BAM) and unemployed respondents (36.55 BAM). So, on average employed respondents pay higher annual premium of life insurance comparing to unemployed.

It is proved previously that dependent variable violates assumption of normal distribution. This is why Mann-Whitney U test is used in this case to test are differences in life insurance premium that B&H citizens pay on annual basis between employed and unemployed respondents significant (table 21).

Table 21: Mann-Whitney U test – H<sub>6</sub>

	Life insurance premium that B&H citizens pay on annual basis
<b>Mann-Whitney U</b>	1623.50
<b>Wilcoxon W</b>	4179.50
<b>Z</b>	-0.623
<b>Asymp. Sig. (2-tailed)</b>	0.533

Grouping Variable: Employment status

Mann-Whitney U test shows there is no significant difference between employed and unemployed respondents in B&H in the level of life insurance premium that they pay on annual basis ( $p$  value = 0.533). The hypothesis: *Life insurance premium that B&H citizens pay on annual basis depends on employment status* is rejected. These results are contrary to results obtained in: Ćurak et al. (2013); Liebenberg et al. (2010); Jain and Talach (2012) and Dash and Sood (2013).

**H<sub>7</sub>:** Life insurance premium that B&H citizens pay on annual basis depends on the number of family members.

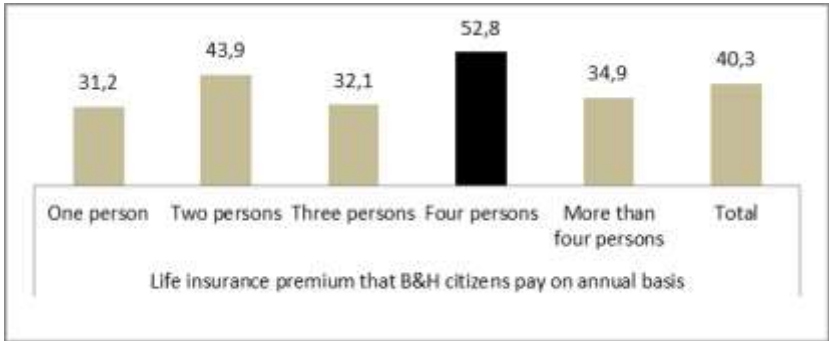
Descriptive statistics (table 22) represents average life insurance premium that B&H citizens pay on annual basis depending on number of family members. It can be seen that families with four members pay on average higher life insurance premium (in BAM) comparing to other groups (graph 5 – black bar). Families with two members pay on average higher annual life insurance premium comparing to one, three and more than four members families. The lowest annual life insurance premiums pay families with one member.

Table 22: Descriptive statistics for H<sub>7</sub> – CO3 dependent variable

	N	Mean	Std. Deviation
<b>One person</b>	21	31.24	29.797
<b>Two persons</b>	38	43.87	49.016
<b>Three persons</b>	12	32.08	27.315
<b>Four persons</b>	23	52.78	50.889
<b>More than four</b>	26	34.92	30.958
<b>Total</b>	120	40.25	41.317

Graph 5 represents average values of life insurance premium that B&H citizens pay on annual basis depending on number of family members:

Graph 5: Average values of dependent variable depending on number of family members – H<sub>7</sub>



Since the dependent variable is continuous which is not normally distributed, there is a need to test are these differences significant by applying Kruskal-Wallis and Mann-Whitney U tests. Kruskal-Wallis test results are as follows:

Table 23: Kruskal-Wallis test of H<sub>7</sub> – Grouping variable (number of family members)

	CO3
<b>Chi-Square</b>	2.936
<b>df</b>	4
<b>p value</b>	0.569

Table 23 indicates there is no significant difference in life insurance premium that B&H citizens pay on annual basis depending on number of family members ( $p$  value = 0.569). The hypothesis: *Life insurance premium that B&H citizens pay on annual basis depends on the number of family members* is rejected. There is no need to conduct Mann-Whitney U test. The obtained result is in accordance with Dash and Sood (2013).

### Conclusion

This research provides the empirical evidence on the determinants of life insurance demand in Bosnia and Herzegovina. Socio-demographic determinants that are analyzed are: gender, marital status, educational level, age, employment status and number of family members. In addition, the impact of income is also analyzed. Proxy variable of life insurance demand is the life insurance premium that B&H citizens pay on annual basis. Total number of respondents is 120. There were no missing data, so each questionnaire is used in hypotheses testing. Before selecting appropriate method for testing hypotheses, the distribution of dependent variable is tested. Central limit theorem indicates that even when a population is not normally distributed, the distribution of the “sample means” will be normally distributed when the sample size is 50 or more, and enables application of parametric tests. However, the combination of variables used in this analysis indicates that in case when distribution of dependent variable deviates from normal, better solution is to use non-parametric tests.

Obtained results indicate that life insurance premium that B&H citizens pay on annual basis does not depend on gender. The test of second hypothesis indicates there are significant differences between married and single respondents in life insurance premium that they pay on annual basis. There are no significant differences among other groups. Results also show that the increase in income increases the life insurance premium that B&H citizens pay on annual basis. The test of fourth hypothesis indicates there is a significant relationship between respondent’s attitudes towards life insurance development and educational level.

Further, analysis shows the uncertain conclusion regarding the rejection of hypothesis: *Attitudes towards life insurance products in B&H depend on age*. Other two hypotheses indicate that employment status and number of family members do not have significant impact on life insurance demand. Hence, actuaries and life insurance companies should pay much attention to: marital status, educational level and income when creating life insurance policies. Taking into account the fact that life insurance sector is not well researched in the case of Bosnia and

Herzegovina this paper can serve as a useful insight for life insurance companies. Besides that, these results can serve as a benchmark for policy makers while creating the development strategies of financial sector. However, to the best of our knowledge, this is the first paper treating the determinants of life insurance in Bosnia and Herzegovina by employing the suggested methodology. Thus, the recommendation for future research is to conduct one more survey by increasing the sample size and to test for the validity of the results of the present paper. In addition, this research can be extended by employing structural equation modeling and thus providing more informative results.

## References

- 1- Andelinovic, M., Misevid, P. and Pavkovic, A. (2016). Determinants of Life Insurance Demand in New EU Member States: Panel Data Analysis. *Notitia*, Vol. 2 (2), pp. 1-12.
- 2- Beck, T. and Webb, I. (2002). Economic, Demographic, and Institutional Determinants of Life Insurance Consumption across Countries. *The World Bank Economic Review*, Vol. 17(1), pp. 51-87.
- 3- Berekson, L.L. (1972). Birth Order, Anxiety, Affiliation and the Purchase of Life Insurance. *The Journal of Risk and Insurance*, Vol. 39, pp. 93-108.
- 4- Çelik, S. and Kayali, M. (2009). Determinants of Demand for Life Insurance in European Countries. *Problems and Perspectives in Management*, Vol. 7(3), pp. 32-37.
- 5- Chun, C., Chuo, L., Mei, T. i Teng, W. (2013). Determinant of Life Insurance Consumption among University Tunku Abdul Rahman Staffs in Perak Campus. *Universiti Tunku Abdul Rahman*.
- 6- Ćurak, M., Džaja, I. and Pepur, S. (2013). The Effect of Social and Demographic Factors on Life Insurance Demand in Croatia. *International Journal of Business and Social Science*, Vol. 4(9), pp. 65-72.
- 7- Dash, G. and Sood, T. (2013). Why Should One Invest in a Life Insurance Product? An Empirical Study. *International Journal of Arts, Science & Commerce*, Vol. 4(1), pp. 36-45.
- 8- Haiss, P. and Sumegi, K. (2006). The Relationship of Insurance and Economic Growth - A Theoretical and Empirical Analysis. *Empirica, Journal of Applied Economics and Economic Policy*, Vol. 35(4), pp. 405-431.
- 9- Jain, D. and Talach, K. (2012). A Study of Factors Influencing Consumer Choice of Life Insurance Products. *International Journals of Multidisciplinary Research Studies*, Vol. 1(2), pp. 11-21.
- 10- Liebenberg, A., Carson, M. and Dumm, R. (2010). A Dynamic Analysis of the Demand for Life Insurance. *American Risk and Insurance Association*, Vol. 79(3), pp. 619-644.
- 11- Mahdzan, N.S. and Victorian, S.M. (2013). The Determinants of Life Insurance Demand: A Focus on Saving Motives and Financial Literacy. *Canadian Center of Science and Education*, Vol. 9(5), pp. 274-284.
- 12- Munir, S., Khan, A. and Jamal, A. (2012). Impacts of Macroeconomic & Demographic Variables on the Demand of Life Insurance: A case study of State Life Insurance Corporation of Pakistan (1973-2010). *University of Management and Technology, Lahore, Pakistan*.
- 13- Negi, D. and Singh, P. (2012). Demographic Analysis of Factors Influencing Purchase of Life Insurance Products in India. *European Journal of Business and Management*, Vol. 4(7), pp. 169-180.
- 14- Nesterova, D. (2008). Determinants of the Demand for Life Insurance: Evidence from Selected CIS and CEE Countries. *National University "Kyiv-Mohyla Academy"*.
- 15- Neumann, S. (1969). Inflation and Saving through Life Insurance. *The Journal of Risk and Insurance*, Vol. 36, pp. 567-582.

- 16- Outreville, J. F. (1996). Life Insurance Markets in Developing Countries. *Journal of Risk and Insurance*, Vol. 63(2), pp. 263-278.
- 17- Satrovic, E. (2018). Merits of Life Insurance, Munich: GRIN Verlag.
- 18- Satrovic, E. (2017). Financial Development and Human Capital in Turkey: ARDL Approach, *Cappadocia Academic Review*, Vol. 1(2), pp. 1-15.
- 19- Satrovic, E. and Muslija, A. (2018). Economic and Demographic Determinants of the Demand for Life Insurance: Multivariate Analysis, *Journal of Management and Economics Research*, Vol. 16, pp. 102-115.
- 20- Sarkodiem E.E. and Yusif, H.M. (2015). Determinants of Life Insurance Demand, Consumer Perspective - A Case Study of Ayeduase-Kumasi Community, Ghana. *Business and Economics Journal*, Vol. 6(3).
- 21- Sen, S. (2008). Insurance in India: Determinants of Growth and the Case of Climate Change. *TERI University*.
- 22- Ward, D., Zurbruegg, R. (2000). Does Insurance Promote Economic Growth? Evidence from OECD Countries. *Journal of Risk and Insurance*, 67 (4), pp. 489-506.
- 23- Zerriaa, M. and Noubbigh, H. (2016.) Determinants of Life Insurance Demand in the MENA Region. *The Geneva Papers on Risk and Insurance - Issues and Practice*, Vol. 41(3), pp. 491-511.
- 24- Zerriaa, M., Amiri, M. M., Noubbigh, H., and Naoui, K. (2017). Determinants of Life Insurance Demand in Tunisia. *African Development Review*, Vol. 29(1), pp. 69-80.

Appendix 1 –  
**Definition of variables**

a) **CATEGORICAL VARIABLES**

Code	Question	Type of question
CA1	<b>1. Marital status:</b>	Multiple choice question, choose one of the answers
	1- Married	
	2- Single	
CA2	3- In relationship	Multiple choice question, choose one of the answers
	<b>2. Number of family members:</b>	
	1- One person	
	2- Two persons	
	3- Three persons	
CA3	4- Four persons	Multiple choice question, choose one of the answers
	5- More than four persons	
	<b>3. Age:</b>	
	1- 18-28	
	2- 29-39	
	3- 40-50	
	4- More than 50	

b) **BINARY VARIABLES**

Code	Question	Type of question
BI1	<b>4. Gender:</b>	Dichotomous
	1- Male	
BI2	2- Female	Dichotomous
	<b>5. Employment status:</b>	
BI3	1- Employed	Dichotomous
	2- Unemployed	
	<b>Do you currently own a life insurance policy?</b>	
	1- Yes	
	2- No	

c) **CONTINUOUS VARIABLES**

Code	Question	Type of question
CO2	Please indicate the level of your annual income in BAM.	Open
CO3	Please indicate the life insurance premium in BAM that you pay on annual basis.	Open



d) **ORDINAL VARIABLES**

Code	Question	Type of question
OR1	<b>6. Educational level:</b>	Multiple choice question, choose one of the answers
	1- Elementary school education or lower	
	2- High school graduate	
	3- BA degree	
	4- MA degree	
5- PhD degree.		

Please choose one of the numbers from 1 to 5 which indicates to what extent you agree with the following statements.

[1 – strongly disagree, 2 – disagree, 3 – no attitude, 4 – agree, 5 – strongly agree]

**Life insurance development in B&H**

Code	Question	Strongly disagree	Disagree	No attitude	Agree	Strongly agree
PER1	Life insurance is developed in B&H.	1	2	3	4	5

**Life insurance products in B&H**

Code	Question	Strongly disagree	Disagree	No attitude	Agree	Strongly agree
PER2	Life insurance products in B&H appropriately satisfy customer's needs.	1	2	3	4	5
PER3	Life insurance products in B&H are attractive.	1	2	3	4	5
PER4	Life insurance products in B&H offer various benefits.	1	2	3	4	5