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CAR-CAPPADOCIA ACADEMIC REVIEW

LIFE INSURANCE DEMAND IN BOSNIA AND HERZEGOVINA: STATISTICAL ANALYSIS

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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

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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 addttion, 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_1: 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_2: 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_3: 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_4: 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_5: 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_5 will be tested again by adding new dependent variable.

H_6: 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_7: 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_1: 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_1

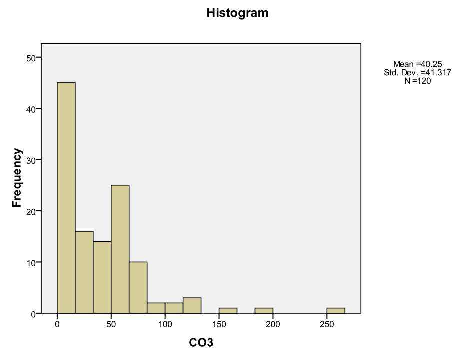
	Gender		Mean	Std. Deviation
Life insurance premium that B&H citizens pay on annual basis	Male	1	6.98	36.06
	Female	9	3.63	46.21

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_1

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_1

	Kolmogorov-Smirnov			**Shapiro-Wilk**		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
Life insurance premium that B&H citizens pay on annual basis	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_1 is normally distributed is rejected. This is why H_1 will be tested using Mann-Whitney U test.

Table 3: Mann-Whitney U test - H_1

	Life insurance premium that B&H citizens pay on annual basis
Mann-Whitney U	1669.00
Wilcoxon W	3560.00
Z	-0.689
Asymp. Sig. (2-tailed)	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_2: Life insurance premium that B&H citizens pay on annual basis depends on marital status.

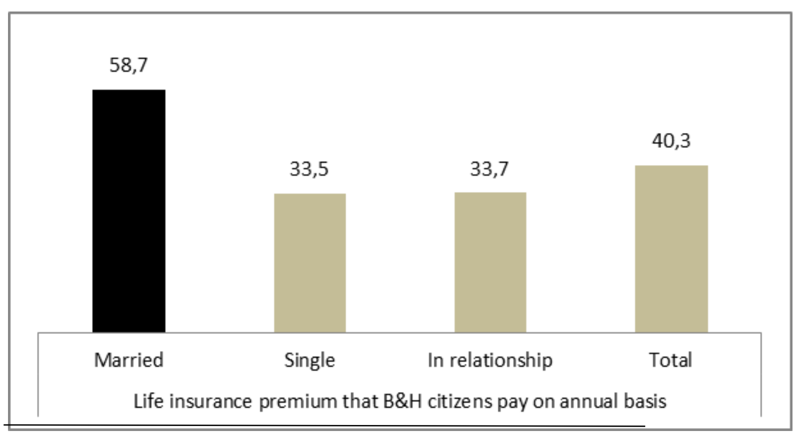
Descriptive statistics (table 4) represents the amount of life insurance premium that B&H citizens pay on annual basis depending on marital status. It can be seen that married respondents pay on average higher life insurance premium comparing to single or in relationship respondents (graph 2 – black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

Table 4: Descriptive statistics for H_2 – CO3 dependent variable

		N	Mean	Std. Deviation
Life insurance premium that B&H citizens pay on annual basis	**Married**	32	58.66	56.77
	Single	58	33.47	34.30
	In relationship	30	33.73	27.15
	Total	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_2



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_2 – Grouping variable (marital status)

	CO3
Chi-Square	5.666
df	2
***p* value**	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_2 – CO3 dependent variable

		Mann-Whitney U	**Sig.**
Married	Single	651.00	0.019^{**}
	In relationship	365.00	0.104
Single	Married	651.00	0.019^{**}
	In relationship	820.50	0.660
In relationship	Married	365.00	0.104
	Single	820.50	0.660

Note: ** significant at 5% level

H_3: 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_3 – CO3 dependent variable

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

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

Table 8: Ordinary least square estimator (OLSE) - H_3

CO3	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
CO2	0.003	0.001	3.91	0.000	0.002	0.005
_cons	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_3

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$_4$: There is significant relationship between respondent's attitudes towards life insurance development and educational level.

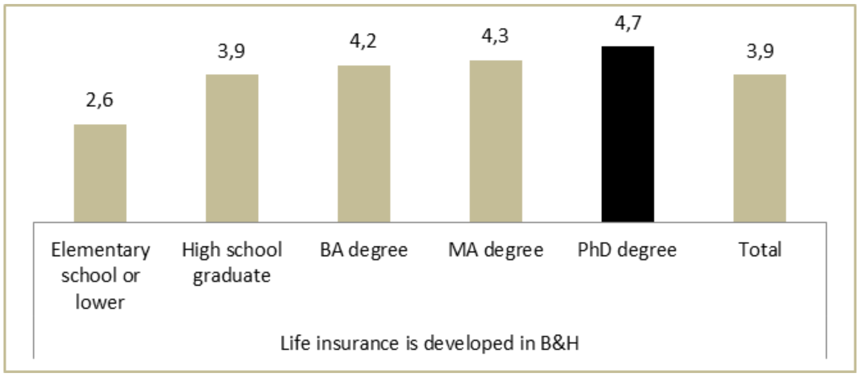
Before conducting linear regression, variables are analyzed using descriptive statistics that indicates attitude towards the life insurance development depending on educational level. Results are presented in table 10. It can be seen that the strength of positive attitude towards life insurance development 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$_4$ – PER1 dependent variable

		N	Mean	Std. Deviation
Life insurance is developed in B&H	**Elementary school or lower**	21	2.62	0.921
	High school graduate	29	3.93	1.334
	BA degree	32	4.19	0.998
	MA degree	28	4.32	0.819
	PhD degree	10	4.70	0.483
	Total	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$_4$



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]	
OR1	0.460	0.079	5.85	0.000	0.304	0.616
_cons	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_4

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_5: Attitudes towards life insurance products in B&H depend on age.

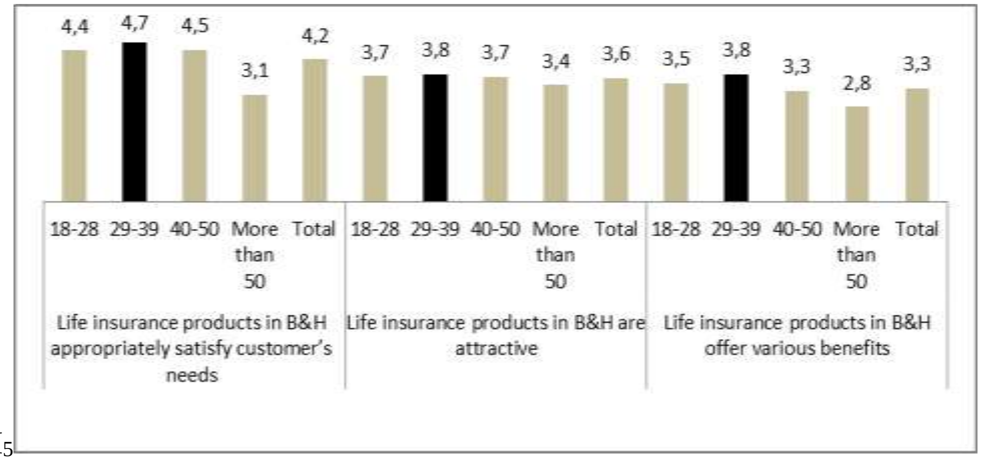
Before conducting appropriate test, variables are analyzed using descriptive statistics that indicates attitude towards the life insurance products depending on age. Results are presented in table 13. It can be seen that the highest positive attitude for question *Life insurance products in B&H appropriately 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_5

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

Graph 4: Average values of dependent variables depending on age – H_5



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_5

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	**df**	**Sig.**	**Statistic**	**df**	**Sig.**
PER2	0.276	120	0.000	0.757	120	0.000
PER3	0.241	120	0.000	0.860	120	0.000
PER4	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_5 – Grouping variable (age)

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

Note: * significant at 1%

Table 16: Mann-Whitney U test of H_5 – PER2 dependent variable

		Mann-Whitney U	**Sig.**
18-28	**29-39**	389.50	0.155
	40-50	554.50	0.772
	More than 50	285.00	0.000*
29-39	**18-28**	389.50	0.155
	40-50	183.50	0.119
	More than 50	86.50	0.000*
40-50	**18-28**	554.50	0.772
	29-39	183.50	0.119
	More than 50	138.50	0.000*
More than 50	**18-28**	285.00	0.000*
	29-39	86.50	0.000*
	40-50	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**
Chi-Square	29.425	0.803	6.057	13.163
df	3	3	3	3
***p* value**	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_5 – 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_6: 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_6

	Employment status		Mean	Std. Deviation
Life insurance premium that B&H citizens pay on annual basis	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_6

	Life insurance premium that B&H citizens pay on annual basis
Mann-Whitney U	1623.50
Wilcoxon W	4179.50
Z	-0.623
Asymp. Sig. (2-tailed)	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_7: Life insurance premium that B&H citizens pay on annual basis depends on the number of family members.

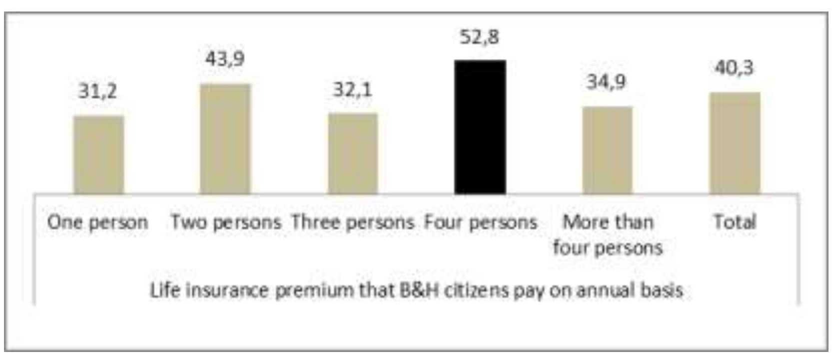
Descriptive statistics (table 22) represents average life insurance premium that B&H citizens pay on annual basis depending on number of family members. It can be seen that families with four members pay on average higher life insurance premium (in BAM) comparing to other groups (graph 5 – black bar). 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_7 – CO3 dependent variable

	N	Mean	Std. Deviation
One person	21	31.24	29.797
Two persons	38	43.87	49.016
Three persons	12	32.08	27.315
Four persons	23	52.78	50.889
More than four	26	34.92	30.958
Total	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_7



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_7 – Grouping variable (number of family members)

	CO3
Chi-Square	2.936
df	4
***p* value**	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.

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Appendix 1 –

Definition of variables

a) CATEGORICAL VARIABLES

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

b) BINARY VARIABLES

Code	Question		Type of question
BI1	**4.**	**Gender:**	Dichotomous
	1-	Male	
	2-	Female	
BI2	**5.**	**Employment status:**	Dichotomous
	1-	Employed	
	2-	Unemployed	
BI3	**Do you currently own a life insurance policy?**		Dichotomous
	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
	6.	**Educational level:**	
	1-	Elementary school education or lower	
OR1	2-	High school graduate	Multiple choice question, choose one of the answers
	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.

$$[1 - \text{strongly disagree}, 2 - \text{disagree}, 3 - \text{no attitude}, 4 - \text{agree}, 5 - \text{strongly agree}]$$

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