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TRUST – THE INTANGIBLE ASSET OF POLICYHOLDER BEHAVIOR ON INSURANCE MARKET

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Abstract

Our analysis aims to identify the typology of consumers' behavior on insurance market. The initial sample consisted of 1579 individuals who were randomly selected by Metro Media Transilvania (MMT) with the Computer-Assisted Telephonic Interview (CATI) method. Using the Multiple Correspondence Analysis (MCA) and logistic regression, we are showing that higher levels of trust, pleasant experiences, income and education have a positive impact on insurance development.
This theoretical approach is relatively new as there are no specialized studies to investigate the intangible asset in insurance companies in Romania's case. This article should help the insurers to understand the role of trust and the importance of pleasant experiences in selling financial services such as life insurance and voluntary private pension.

Keywords: behavior, life insurance, logit, pension, trust

JEL classification: C25, G02, G22, J32

1. INTRODUCTION

Life insurance and *pension system* are some of the most complex and dynamic areas. In Romania's case, the instability in this area is generated by: legislative gaps, the level of education and income, the lack of confidence, the phenomenon of migration, the process of population ageing, the high level of corruption and the poverty of population - these are some relevant examples. A slower developer than other countries, Romania introduced a multi-pillar pension system after the EU accession. Additionally, life insurance industry has an interesting development during this decade.

Our effort contributes to the existent literature by analyzing certain factors that can influence the voluntary private pensions or life insurance market. On the other hand, we identify a typology of customer behavior manifest of insurance market.

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The paper is organized as follows: Section 2 reviews previous studies regarding the life insurance and voluntary private pensions, Section 3 describes the methodology and the database employed in this study, Section 4 offers information regarding our results and discussions, Section 5 presents the conclusions.

2. LITERATURE REVIEW

The importance of Romanian's pension system has been already examined in a number of studies until this moment: Gomulka (2000), Dupont (2004), Festic and Mencinger (2009), Dragotă and Miricescu (2010), Ciumaş and Văidean (2011).

Pension system remains a major issue in Romania which affects every citizen. Today, the pension system in Romania has three major components: Pillar I: public pensions - Law no. 19/2000 for public pensions and other social benefits (2000); Pillar II: mandatory private pensions – Law 411/2004 concerning the privately managed pension funds (2004); Pillar III: voluntary private pensions – Law 204/2006 regarding voluntary pensions in Romania (2006). In this paper we focus on the voluntary agreements which are "more permissive than mandatory private pensions, regarding the modifications that can be done, but also involve more fees and commissions" (Novac and Badea, 2007).

Previous works in the insurance literature have focused specifically on financial and socio-demographic aspects (Truett and Truett, 1990; Li *et al.*, 2007). *Income* is one of the most used factors which can influence positively life insurance demand (Truett and Truett, 1990; Beck and Webb, 2003; Li *et al.*, 2007; Chang and Lee, 2012; Dragos and Dragos, 2009; Feyen *et al.*, 2011; Kjosevski, 2012). Other factors with a positive influence are *urbanization* (e.g. Shi and Yan, 2015) and the *level of education* (e.g. Truett and Truett, 1990; Elango and Jones, 2011; Kjosevski, 2012).

The life insurance industry, particularly the life insurance and the pension system, is based on *trust* and *confidence*, both terms referring to expectations. "The distinction between confidence and trust depends on our ability to distinguish between dangers and risks, whether remote or a matter of immediate concern" (Luhmann, 2000). He also argues that this distinction doesn't refer to terms of probability. We consider the trust as one of the most important values of an insurance company and it is also a component of business ethics. According to Barrett (2005), "*without trust, insurance cannot perform its proper function as a risk management device for companies and individuals*", on the other hand "*for pension providers it is of particular interest and value to know about the levels of trust that consumers or customers have in them and how they benchmark and what drives it"* (Ennew, 2009, 2009, apud Vickerstaff *et al.*, 2012). The experimental study of Papon (2008) for investigating insurance behaviors suggest that *past-experience* influence insurance choices. On the other hand, Hakanen and Soudunsaari (2012), revile: "*trust is fragile and can be lost quickly through negative experiences"*.

From this perspective, it is expected a positive correlation between income, trust, past-experience, urbanization, level of education and pension system/life insurance.

3. DATA AND METHODOLOGY

The participants of this study were randomly selected by Metro Media Transilvania (MMT) with the Computer-Assisted Telephonic Interview (CATI) method. The initial sample consisted of 1579 individuals. Out of this total, 65 were excluded due to missing

values in the key variables analyzed, while the 16 individuals that displayed a very high level of trust in the insurance market were excluded due to their behavior as outliers, which affected initial procedures.

Table no. 1 – Description of the variables used in the study

Variable	**Variable description**				
Endogenous variables (for binary Logit model)					
Y=1	If the person has Life or Voluntary Private Pension				
Y=0	If the person does not have Life or Voluntary Private Pension				
Exogenous variables					
Trust Level	1 Very low	2 Low level	3 High level	4 Very high level	
Experience	Respondent, its family, friends or acquaintance experienced: 1 very unpleasant situations with insurances 2 unpleasant situations with insurances 3 pleasant situations with insurances 4 very pleasant situations with insurances				
Types of Insurances	1 Compulsory insurances	2 Optional insurances	3 Compulsory and Optional insurances	4 Respondent does not own any type of insurances	
Residency	1 if the owner's main residence is in urban area 0 if owner's main residence is in rural area				
Education (*)	1 Gymnasium completed 2 Finished 10 classes, has a technical or vocational 3 Graduated high school 4 Post-secondary school 5 Academic degree / University				
Income (**)	1. Maximum 1300 RON	2. 1301 – 1700 RON	3. 1701 – 2500 RON	4. 2501 – 4000 RON	5. < 4000 RON

Note: * For the Binary logit models Education was regrouped into three categories after performing the MCA, as they some of them showcased strong similarities; The new categories are constructed as following: (1) – comprises the first two former groups, (2) – individuals from the initial third and fourth group and (3) – individuals holding a bachelor's degree.
**For the Binary logit models Income was included with its absolute values.

Source: own construction

The Multiple Correspondence Analysis is used in order to establish links between variables available in categories. The results are represented in a Euclidean space of low dimensions, and the graphical representation is constructed by using the first two dimensional axes. The analysis uses either an indicator matrix or a Burt table and based on the eigenvalues we are able to showcase the variance explained by the first two axes. Therefore, we are able to draw links between different categories of our variables (Le Roux and Rouanet, 2004).

In order to establish the influence of certain determinants on the life insurance and private pensions market, we focus our attention on two Logit Models. In our case, the target variables have a binomial specification; therefore we cannot develop predictions starting from the classical assumptions of the OLS methods (Greene, 2005). We estimate the model using a "link function", the logistic regression.

$$E(y_i|x_i) = \mu(x)$$

In this case, we are interested in modeling dichotomous variables. For instance, the life insurance is discriminated into categories as following:

$$y_i = \begin{cases} 1 - \ the\ individual\ has\ a\ life\ insurance \\ 0 - the\ individual\ does\ not\ have\ a\ life\ insurance \end{cases}$$

For y_i a dichotomous variable x_i the ensemble of exogenous variables we have:

$$E(y_i|x_i) = 1 * P(y = 1|x_i) + 0 * P(y = 1|x_i) \rightarrow E(y_i|x_i) = 1 * P(y = 1|x_i) = \pi_i = p_i$$

Therefore, the probability of meeting the event is given by the function:

$$F(z) = \Lambda(z) = \frac{1}{1 + e^{-x_i\beta}} = \frac{e^{x_i\beta}}{1 + e^{x_i\beta}}$$

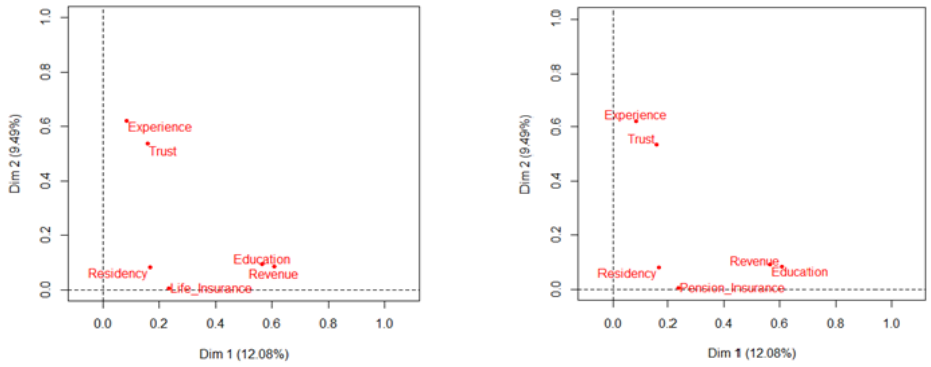
The advantage of using the Logit model is given by the existence of the Odds Ratio, which computes the exponential of the estimates in order to underline the effect of each variable on the event. Its formula is stated as following:

$$\frac{p_i}{1 - p_i} = e^{(x_i\beta)} \qquad \boldsymbol{c_i = e^{(x_i\beta)}}$$

All procedures were performed using the statistical software *R*. In developing the Multiple Correspondence Analysis, the authors made use of the packages "FactoMineR" and "ggplot2", available under free license, as the program itself. Also, in order to estimate the Logit Models, the package "aod" was used, in addition to the "glm" function.

4. RESULTS AND DISCUSSIONS

In the below Figure no. 1 we can draw a link between the variables "Experience" and "Trust", as they are closely placed on the graphic, similar "Education" and "Income". We also expect to find a connection between the residency (urban or rural) and the possession of a life insurance or a voluntary private pension.

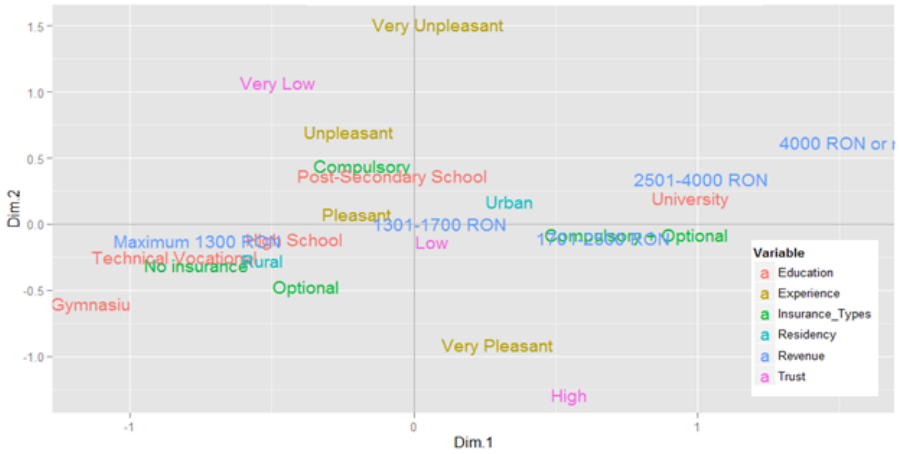


Note: This figure reports the results of the MCA on the variables considered.
Source: own computations in R

Figure no. 1 – Proximity of the variables through the Multiple Correspondence Analysis

4.1 Types of insurance policies

The Multiple Correspondence Analysis, including the different types of insurance policies, underlines the fact that, generally, people that earn less than 1300 RON, live in a rural area and have lower levels of education are more likely not to hold any type of insurance.

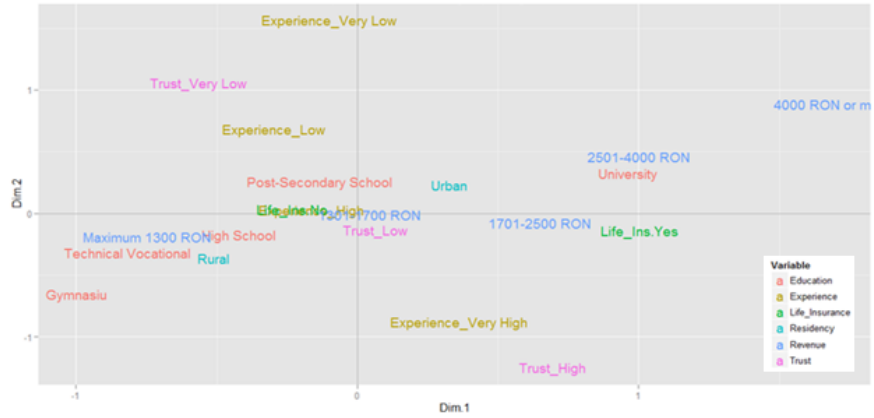


Note: This figure reports the results of MCA for the type of insurance policies in Romania.
Source: own computations in R
Figure no. 2 – The MCA on the types of insurance available in Romania

The horizontal axis, that explains up to 11.21% of the variance, also states the fact that the respondents that tend to contract both types of insurances (i.e. compulsory and optional) are more likely to hold an academic degree and earn at least 1701 RON. However, individuals that earn an income that exceeds 2501 RON / month develop a stronger possibility of having both types. Based on the aforementioned representation, we can consider the fact that the compulsory insurances tend to be linked to low-trusting behaviors and unpleasant experiences. Meanwhile, the placement of the optional insurances on the graphic makes them hard to be framed in a certain set of features.

4.2 Life insurance

The horizontal axis of the MCA regarding the life insurance explains a total of 12.08% of the variance. Observing the results showcased by the Figure no. 3, we can conclude that, generally, people who do have a life insurance have higher levels of income. But the categories of income 1701 – 2500 RON and 2501 – 4000 RON are more likely to purchase this type of service. Moreover, the consumer profile of these individuals is completed by their education. Our findings underline the direct correlation between the owners of a life insurance and those consumers that own at least a bachelor's degree.



Note: This figure reports the results of MCA to present the characteristics of the Romanian life insurance market.
Source: own computations in R

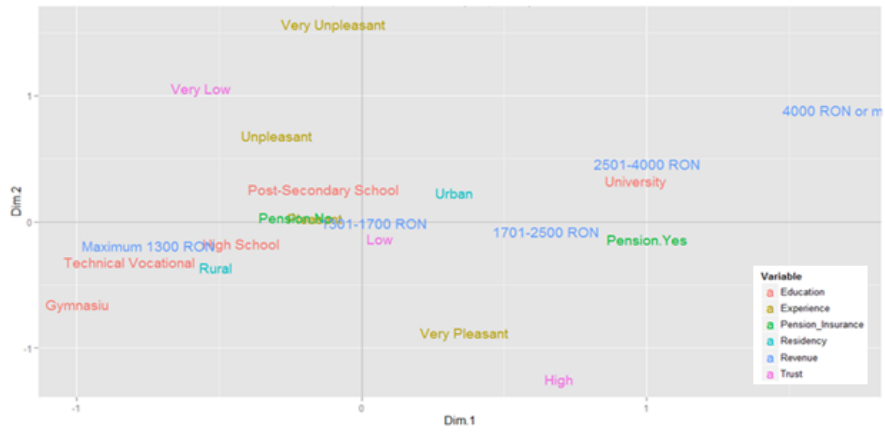
Figure no. 3 – The MCA on the possession of life insurances in Romania

On the other hand, the left side of the same axis correlates the lower educational categories to the lowest level of income included in our study. These two important characteristics of some respondents are strongly related to their residency, which in most cases is settled to a rural area. The limitations of this method forbid the establishment of a direct link between the consumers fitting this profile and the absence of a life insurance. However, we can observe the fact that this group is more likely to be possessionless of such service, as its features are closer to the point of the graphic where we observe the placement of the "No Life Insurance" benefiting individuals. Our results are in line with Truett and Truett (1990), Dragos and Dragos (2009) and Elango and Jones (2011).

The second axis, which explains 9.49% of the variance, underlines the subjects of trust and experience with the insurance market. Results show a direct link between high levels of trust and pleasant experiences, while the people that had unpleasant events display a lack of trust, consequently, they don't buy this types of financial products. Other studies using the MCA analysis found similar proportions of variance for the first two axes, an eloquent example being showcased by Ayele *et al.* (2014).

4.3 Voluntary private pensions

The second MCA, performed using the voluntary private pensions, mirrors the results obtained previously. The first axis underlines that people who possess at least a bachelor's degree and earn in excess of 1701 RON are more likely to benefit from such contracts. These results reveal also that the other categories are less likely to follow this pattern. The vertical axis opposes the individuals that experienced unpleasant events with the insurances and hold a low level of trust to those who display a high level of trust and came across pleasant experiences. These results are also in line to Papon (2008), Ennew (2009, apud Vickerstaff *et al.*, 2012).



Note: This figure reports the results of MCA to present the Romanian voluntary private pensions.
Source: own computations in R
Figure no. 4 – The MCA on the possession of voluntary private pensions in Romania

We continue the analysis by developing a logistic regression in the established order of which the variables used above will provide noteworthy predictors in order to establish what increases the probability of an individual to buy a life insurance or a private pension. In order to understand such behaviors in depth, we estimated two Binary Logistic models, one for each type of insurance.

Table no. 2 – Parameters estimates of the Binary Logit on the "Life insurance"

Variable	Estimate	Std. Error	Z-test value	Probability
Intercept	-2.845	0.2262	-12.578	$2*10^{-16}$ ***
Trust (2)	0.403	0.1829	2.204	0.0275 **
Trust (3)	1.068	0.2184	4.891	$1.01*10^{-6}$ ***
Education (2)	0.187	0.1996	0.937	0.3487
Education (3)	0.384	0.2075	1.851	0.0642 *
Income	0.000367	0.0000544	6.740	$1.59* 10^{-11}$ ***
AIC Criterion			**1350.5**	

Note: This table reports the results of the Logit procedure on the determinants of a Life Insurance.
Source: own computations in R

In the first, regarding the life insurances market in Romania, we came to the conclusion that the best fitting model for our data can be found in the Table no. 2. Due to the high level of correlation between the issues of trust and experience (see Hakanen and Soudunsaari, 2012) in addition to possible endogeneity biases, the latter was excluded from the analysis as it resulted to be recurrently non-significant. Moreover, the variable "Residency" was also excluded under the same circumstances. We can observe the fact that all the coefficients of our regression are positive, with the exception of the constant term. Therefore, we can state that is more likely for an individual to purchase a life insurance contract if he develops a higher level of trust in this system. Besides this, we see that holders of a bachelor's degree tend to be more interested in this type of product, than those who have a lower level of education.

These findings are sustained also by the odds ratios, which we can observe in the Table no. 3. In this case, at a statistically significant level of 10%, a person that holds an academic degree is 1.468 times more likely to have a life insurance than an individual that has stopped his educational route after the gymnasium, first ten grades or technical/ vocational preparation. Similarly, at a statistically significant level of 1%, a person that considers the insurance market trustworthy is 2.909 times more likely to possess a life insurance than an individual that sustains has low-trusting in the system.

Table no. 3 – Odds Ratio for the model explaining the Life Insurance

Variable	Odds Ratio	Lower Limit	Upper Limit
Intercept	0.05813446	0.03677883	0.08935927
Trust (2)	1.49633113	1.05306768	2.15986018
Trust (3)	2.90944407	1.90199436	4.48344092
Education (2)	1.20562146	0.81958926	1.79488603
Education (3)	1.46818200	0.98189478	2.21807569
Income	1.00036693	1.00026154	1.00047534

Note: This table reports the Odds Ratio for each variable that can increase or decrease the probability of purchasing a Life Insurance.

Source: own computations in R

The results from the previous Logit model are closely mirrored by the second regression, performed on the private pension owning probability. Using the same regressors we can underline the fact that every variable or sub-category included in the analysis are statistically significant at a level of at least 10%. In this case, we are able to sustain again the fact that higher levels of education and a development in the trust area regarding the insurance market are bound to determinate an increase in the probability of purchasing this type of financial product.

Table no. 4 – Parameters estimates of the Binary Logit on the "Voluntary Private Pension"

Variable	Estimate	Std. Error	Z-test value	Probability
Intercept	-2.283	0.2027	-11.262	$2*10^{-16}$ ***
Trust (2)	0.2765	0.1640	1.685	0.09194 *
Trust (3)	0.8113	0.0202	4.010	$6.08*10^{-5}$ ***
Education (2)	0.4063	0.1831	2.237	0.0253 **
Education (3)	0.5185	0.1955	2.652	0.00799 ***
Income	0.000156	0.0000512	3.054	0.00226 ***
AIC Criterion			**1508.4**	

Note: This table reports the results of the Logit procedure on the determinants of a Voluntary Private Pension.

Source: own computations in R

Examining the Odds Ratio we reach similar conclusions as in the previous case. For instance, at a statistically significant level of 10%, people that declared that they have a low level of trust in the insurance market are 1.318 times more likely to purchase a private pension contract from an insurance company than those who display a very low level of trust. At the same time, at a statistically significant level of 1%, individuals that affirmed having a high trust level are 2.25 times more likely to be interested in such contract than those whose trust is very low.

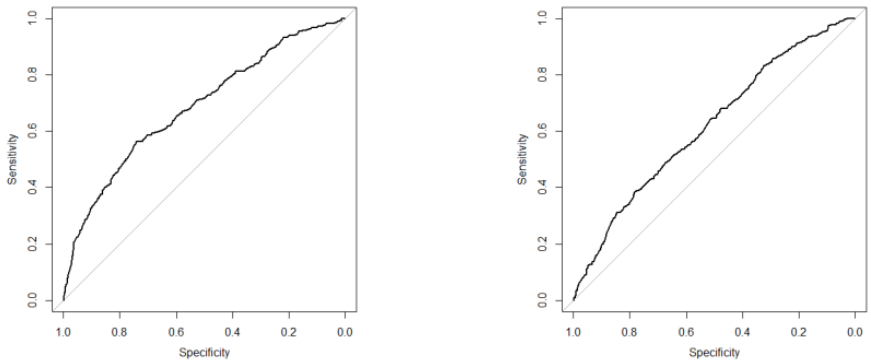
Table no. 5 – Odds Ratio for the model explaining the Voluntary Private Pensions

Variable	Odds Ratio	Lower Limit	Upper Limit
Intercept	0.1019424	0.06776456	0.1501538
Trust (2)	1.3184424	0.96068350	1.8291977
Trust (3)	2.2508793	1.51534822	3.3532997
Education (2)	1.5062382	1.05737095	2.1703086
Education (3)	1.6795106	1.14973809	2.4768657
Income	1.0001565	1.00005531	1.0002569

Note: This table reports the Odds Ratio for each variable that can increase or decrease the probability of purchasing a Voluntary Private Pension.

Source: own computation in R

Regarding the subject of education, we observe the fact that people holding at least a bachelor's degree are 1.679 times more likely to be attracted into buying this financial product than individuals that stopped their institutionalized educational progress at the gymnasium, first ten classes or at a technical / vocational related major, at a statistically significant level of 1%.



Note: This figure displays the ROC curves for the two Logit models estimated. The curve on the left represents the first model (on the Life Insurance) and the second, on the right, cements the features of the Voluntary Private Pensions.

Source: own computations in R

Figure no. 5 – ROC curves for the Logistic models

Using the AUC (Area Under Roc Curve) we can determinate if the model is well-specified, using the Sensitivity and Specificity. At a 0.6849 level out of 1, we can state that our first model, on the Life Insurance contracts, reflects an accurate representation of the true data. In a similar manner, with a level established at 0.6189 out of 1 of the Voluntary Private Pension contracts, we can conclude that our model is well-specified.

Using the confusion matrix, listed in the Table no. 6, we can observe the fact that over 70% of the individuals were correctly predicted by the procedure as owning or not a life insurance contract, enough to qualify the model as credible for predictions (Foody, 2002). 900 people, representing 60.08 % of our sample, were correctly identified as not having such product in their portfolio, while 159 (representing 10.61%), were correctly predicted possessing a life insurance.

Table no. 6 – Confusion Matrix based on the first Binary Logit

	Real Value		Total
Prediction	**0**	**1**	
0	900 (60.08%)	123 (8.22%)	1023 (68.30%)
1	316 (21.09%)	159 (10.61%)	475 (31.70%)
Total	1216 (81.17%)	282 (18.83%)	1498 (100%)

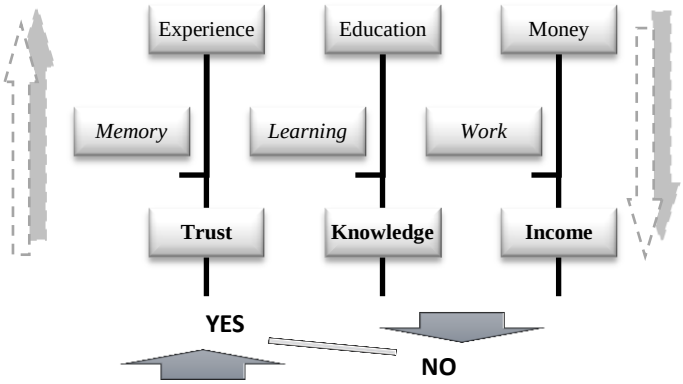
Note: This table reports the results associated to the Confusion Matrix, whose role is to showcase the number of individuals that were correctly classified as owning or not a Life Insurance.

Source: own computations in R

Our results suggest that the most important factors which have an influence on the endogenous variable are trust, education and income.

5. CONCLUSIONS

In order to establish what increases the probability of an individual to buy a life insurance or a voluntary private pension we used the Multiple Correspondence Analysis (MCA) and logistic regression. Our results are illustrated in the figure below (Figure no. 6).



Note: This figure reports the results of typology of consumers' behavior on insurance market.

Source: own processing

Figure no. 6 – Policyholder Behavior

Over the time, to buy or not to buy an insurance product was analyzed in terms of financial resources. Behavioral finance provides information that can lead to development of this financial sector. An example of an intangible asset is trust. Memory is the mental process in which all experience is stored, and more, the insurer must know that, for example, a delay of paying the policy can affect the level of trust.

Our model suggests that education also plays an important role. Knowledge about insurance products is limited by learning like money to work. To be lucky is not a belief in the insurance market.

Acknowledgements

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