CLUSTER ANALYZES OF HOUSEHOLDS' SAVING HABITS

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ABSTRACT

The issue of self-care is becoming more and more important since the last years because of the economic environment. Our research used a household questionnaire to measure self-care behavior , and the degree to which households may to be influenced by the state through a variety of incentives. The questionnaire was completed in 578 households. Cluster analysis was performed based on 16 variables in order to test the different segments we divided households into. We decided to create four clusters. Their properties were the following names: 1 Self-caring with financial knowledge; 2 Self-caring without financial knowledge; 3 Carpe Diem; 4 Hope-based self-care.
Keywords: cluster, households, savings, state influence, financialculture

INTRODUCTION

"The state required as an important forum for the rules of the game, and as a judge, who will explain the rules and to require compliance therewith" (*Friedman*, 1996). The taxsystem is relatively stable, but constantly changing. The taxes, and their effect, and changes in other factors required to implement various tax policies. The goal of the tax is to fund the policy functions of government. The return on savings taxation or sensitive of tax exemption is a political tool. The important fiscal policy tool is the use of taxcredits and tax exemptions, but the effects of taxation are complex and difficult to measure. An immediate effect of taxation is income deprivation. The tax-system effects on the behavior of economy. In many cases,the individual taxpayers make a decision by tax consequences. The long-term savings and other investment opportunities in the taxation system is built on such effects (*Vigvári*, 2008). The appropriate financial knowledge, financial responsibility and foresight in the household saving decisions than seek to minimize their taxes are paid. Many individuals, households have problems with the lack of financial literacy, even though you want to take care of herself and her family. Many people over estimate their knowledge of financial, its cause cannot produce proper financial decisions. People having financial literacy save and achieve greater return on their investments more (*Bodie et al.*, 2011).

AIMS

The tax imposed direct, gratuitous, repetitive and recurring payment, which is paid by members of the business market to the state. The extent and manner of payment of tax are determined by state. Taxes have regulatory functions.These features in the enforcement of the direction and strength of the effect depend on the combined effect of several factors (*Vigvári*, 2008), these long-term saving functions are examined during the research.

MATERIALS AND METHODS

In our research, the population of long-term self-care habits, the influential role of the state and their impact is analyzed. Currently, primary research was performed with the survey, in which there are questions about household saving habits and asset structure. In order to be a targeted suvey, the questionnaire was made through an on-line interface and filled out personally by each subject. The questionnaire has been filled out by 578 households that we devote to research. In the future, an additional 4,000 households are expected to be asked in Hungary by a representative sampling. We analyzed the data using the Microsoft Excel spreadsheet program and SPSS 14.0 for Windows software package. During the study we examined the responses in order to know more about households' saving habits which can be divided into groups, segments.

RESULTS AND CONCLUSIONS

We performed cluster analysis ensuring segments based on 16 variables. The created segments are really different in saving habits and the members of each cluster are similar. We can typify the saving habits.

According to Kendall's indicator only 28.1% agrees of the examined households regarding the factors that influence saving decisions. We have decided to create four clusters (*Jánosa*, 2011).

In the cluster analysis we decided to make segments by 16 questions which can define the saving habits of households (*Table 1*).

The F tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and thus cannot be interpreted as tests of the hypothesis that the cluster means are equal.

The number of elements is different in each cluster (*Table 2*). These values are shown in the third table. The first cluster consisted of 171 households , the second cluster 151, the third cluster 46, and the fourth cluster 199 households.

The tables of ANOVA (*Table 1, Table 3*) examine the significance of the variables. Beside the F- value, the Wilks' lambda statistics is also used in the comparison in the fourth table (*Sajtos and Mitev*, 2007).

It can be based on the F and Wilks' lambda values that examined households are most familiar with voluntary health insurance funds and pension fund products. In addition, they have knowledge of the retirement savings account and long-term

investment account, and the advantages of the Home Savings and Loan Association's contract. They are aware that the house and retirement savings are important, and they need „emergency reserves" for the financial security of their family (*Székelyi and Barna*, 2002).

Each household segment can be characterized as follows (*Table 4*).

Table 1

ANOVA data table

	Cluster		Error			
	Mean Square	**df**	**Mean Square**	**df**	**F**	**Sig.**
My family's financial safety is important.	8.761	3	0.177	563	49.413	0.000
It's risky to live without savings	36.039	3	0.642	563	56.179	0.000
It's risky to live without insurance	17.739	3	10.283	563	13.824	0.000
I have to save money every month	39.090	3	10.124	563	34.763	0.000
I need "emergency savings" for the safety of my family	27.196	3	0.482	563	56.383	0.000
I need to save money for the future of my children	32.089	3	0.577	563	55.597	0.000
I need to save money for buying a flat	45.617	3	0.629	563	72.512	0.000
I need to save money for the safety of my retirement	45.984	3	0.797	563	57.678	0.000
I know the retirement saving accounts	178.764	3	10.087	563	164.491	0.000
I know the Start account	191.603	3	10.166	563	164.291	0.000
I know the long-term investment account	203.597	3	10.153	563	176.532	0.000
I know the voluntary fund account.	221.339	3	0.891	563	**248.373**	0.000
I know the voluntary pension fund accounts	230.608	3	0.753	563	**306.437**	0.000
I know the advantages of LTP	190.070	3	10.185	563	160.360	0.000
A financial culture needs to be developed.	28.187	3	0.610	563	46.245	0.000
How much does government tax benefit influence your saving decisions?	5.991	3	10.762	563	3.401	0.018

Table 2

Number of Cases in each Cluster

Cluster	1	171.000
	2	151.000
	3	46.000
	4	199.000
Valid		567.000
Missing		11.000

Table 3

ANOVA 2 data table: Tests of Equality of Group Means, Classification of the major indicators of the cluster

	Wilks' Lambda	F	df1	df2	Sig.
My family's financial safety is important.	0.792	49.413	3	563	0.000
It's risky to live without savings	0.770	56.179	3	563	0.000
It's risky to live without insurance	0.931	13.824	3	563	0.000
I have to save money every month	0.844	34.763	3	563	0.000
I need "emergency savings" for the safety of my family	0.769	56.383	3	563	0.000
I need to save money for the future of my children	0.771	55.597	3	563	0.000
I need to save money for buying a flat	0.721	72.512	3	563	0.000
I need to save money for the safety of my retirement	0.765	57.678	3	563	0.000
I know the retirement saving accounts	0.533	164.491	3	563	0.000
I know the Start account	0.533	164.291	3	563	0.000
I know the long-term investment account	0.515	176.532	3	563	0.000
I know the voluntary fund account	**0.430**	**248.373**	3	563	0.000
I know the voluntary pension fund accounts	**0.380**	**306.437**	3	563	0.000
I know the advantages of LTP	0.539	160.360	3	563	0.000
A financial culture needs to be developed	0.802	46.245	3	563	0.000
How much does government tax benefit influence your saving decisions?	0.982	3.401	3	563	0.018

Table 4

Cluster analysis summary table

	Cluster 1	Cluster 2	Cluster 3	Cluster 4
My family's financial safety is important.	4.94	4.96	4.15	4.92
It's risky to live without savings	4.68	4.43	3.02	4.13
It's risky to live without insurance	3.58	3.04	2.59	3.00
I have to save money every month	4.28	3.93	2.50	3.78
I need "emergency savings" for the safety of my family	4.70	4.64	3.26	4.41
I need to save money for the future of my children	4.66	4.47	3.09	4.20
I need to save money for buying a flat	4.59	4.36	2.76	3.95
I need to save money for the safety of my retirement	4.50	4.19	2.61	3.88
I know the retirement saving accounts	4.47	2.06	2.13	3.47
I know the Start account	3.95	1.55	1.74	1.97
I know the long-term investment account	4.36	1.75	2.04	2.64
I know the voluntary fund account	4.52	1.88	2.65	4.04
I know the voluntary pension fund accounts	4.63	1.94	2.80	4.17
I know the advantages of LTP	4.72	2.29	2.09	3.64
A financial culture needs to be developed	4.76	4.39	3.24	4.36
How much does government tax benefit influence your saving decisions?	3.53	3.09	3.20	3.19
What level do you think the state pension will cover your needs, when you will retire?	1.89	1.99	2.17	1.97

Cluster 1: Conscious self-caring with financial knowledge
Financial security is important for the families in this segment. They save for this security. They know that it is important to save for housing purposes, their retirement, their children's future and a safety „emergency reserve". They know each investment product and the government can influence their saving decisions with the variety of tax breaks and with the options of government grants.

Cluster 2: Self-caring without financial knowledge
For the members of this segment, financial security is important to their families and these members try to contribute to it. They know that it is important to save for housing purposes, their retirement, their children's future and a safety „emergency reserve", although consider these less important than the first cluster members. In the 1st cluster the members have financial knowledge, but in this segment they were not aware of certain investment products, so very difficult financial decisions are taken with due efficiency. Their saving decisions are the least affected by the government.

Cluster 3: Carpe Diem
The 'Carpe diem' segment thinks that the importance of financial security for the family is important, but they do not know the specific investment opportunities and they do not want to pre-save for any purpose, neither residential purposes nor senior years, or even for children in the future. In their opinion an "emergency reserve" is not important at all. This group is typically made up of those who live from paycheck to paycheck and their habits are not in close connection with the amount of their paycheck. Fortunately, this segment contains the lowest numberrespondants. Only 8 percent of the examined households falls into this cluster.

Cluster 4: Hope-based self-care
The members of this segment think that it is important to keep savings for different purposes less than the first and secondclusters. But they do not know the details of investment opportunities.Voluntary health insurance fund and retirement accounts are well known, but the long-term investment account is not. They have medium knowledge of retirement savings accounts and the Home Savings and Loan Association's contract, but they barely know any other investment opportunities. The developing of financial culture is significant for them, as for the segments of the first and second clusters. They are located between the first and second clusters.They try to learn about investment opportunities aligned with their goals. The government tax benefits are also less significant than for the second and the third cluster members. This is probably due to the lack of financial literacy and financial awareness.

A characteristic each of the four clusters considered important was the financial security of their families. Insurance is not considered essential by all. The savings conscious members of the first, second and fourth clusters think that insurance is moderately important. The examined households believe that the state pension will

not cover the needs of that time and tax breaks only have moderate little or no ability to influence the groups.

According to the *Table 5* 95.1% of households could correctly classify to invidiual segments, which means that the subdivision, the cluster analysis was successful.

Table 5

Cluster control board

		Cluster Number of Case	Predicted Group Membership				Total
			1	2	3	4	
Original	Count	1	**164**	0	0	7	171
		2	0	**146**	1	4	151
		3	0	2	**41**	3	46
		4	4	4	3	**188**	199
	%	1	**95.9**	0.0	0.0	4.1	100.0
		2	0.0	**96.7**	0.7	2.6	100.0
		3	0.0	4.3	**89.1**	6.5	100.0
		4	2.0	2.0	1.5	**94.5**	100.0

a: 95.1% of original grouped cases correctly classified.

We also performed the classification of functions (*Table 6*). The first function explains the 77.2% of the variance, the second function 17.4%. The third function explained only 5.4%, so it is not worth it to deal with it.

On the *Table 7* the first function is very similar to the second factor elements, while the second function is very similar to the first factor elements.

On the first diagram (*Figure 1*) we can see the segments of the households, so we plotted the four clusters against the first and second functions, factors.

The chart clearly shows that the third cluster("Carpe Diem") is separated from the other 3 groups and it is also very perceptible that the fourth cluster is between the first and second clusters. All the clusters can be separated, obviously.

Table 6

Canonical correlation

Function	Eigenvalue	% of Variance	Cumulative %	Canonical Correlation
1	4.264(a)	77.2	77.2	0.900
2	0.959(a)	17.4	94.6	0.700
3	0.298(a)	5.4	100.0	0.479

*a: First 3 canonical discriminant functions were used in the analysis.*

Table 7

Function value matrix

	1	2	3
My family's financial safety is important	**0.571(*)**	-0.460	0.373
It's risky to live without savings	**0.518(*)**	-0.391	0.336
It's risky to live without insurance	**0.455(*)**	0.037	-0.436
I have to save money every month	**0.452(*)**	-0.073	0.068
I need "emergency savings" for the safety of my family	**0.447(*)**	-0.006	0.099
I need to save money for the future of my children	0.148	**0.547(*)**	0.139
I need to save money for buying a flat	0.112	**0.468(*)**	0.351
I need to save money for the safety of my retirement	0.141	**0.465(*)**	0.152
I know the retirement saving accounts	0.134	**0.464(*)**	0.210
I know the Start account	0.150	**0.460(*)**	0.171
I know the long-term investment account	0.163	**0.346(*)**	0.249
I know the voluntary fund account	0.128	**0.330(*)**	0.195
I know the voluntary pension fund accounts	0.110	**0.143(*)**	-0.090
I know the advantages of LTP	0.414	0.139	**-0.648(*)**
A financial culture needs to be developed	0.087	0.380	**0.557(*)**
How much does government tax benefit influence your saving decisions?	0.059	0.006	**-0.102(*)**

*Pooled within-groups correlations between discriminating variables and standardized canonical discriminant functions; Variables ordered by the absolute size of correlation within the function.; *Largest absolute correlation between each variable and any discriminant function*

Figure 1

The clusters of the households
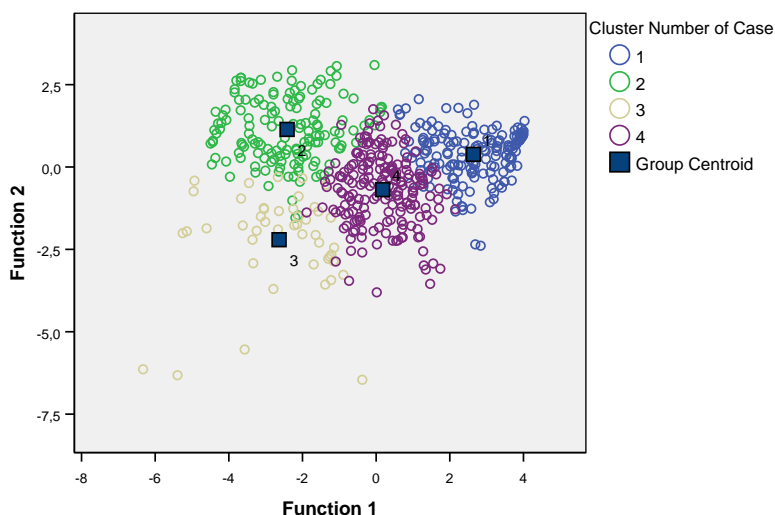
After processing the results of the questionnaire survey it can be determined that most of the households think savings are important. Only 8% of them think that savings are not worth it. This segment lives for today and does not assume any responsibility for their future financial security. In the opinion of the rest of the examined households the development of financial culture is important, but only the first cluster possesses the tools for financial decisionmaking thanks to their special knowledge.

CONCLUSIONS

The self-care habits of our households are important not only in the short term, but also in the longterm. In fact, the next generation of financial positions is affected. The role of the public roles is important to effect on capable of households with long-termsaving, self-reliance encouraged through the tax system, tax exemptions, tax credits or government subsidies and through the education system, in order to become part of general education. Our survey presented these effects as well.

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