Retirement Security – the Role of Self-Care

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Abstract: One of the most significant social changes threatening the EU member states is the ageing of the population and its effects on the economy. Hungary is no exception and as a result, it faces various challenges including the reform of the health care system, the social insurance system, the pension system and the tax system. These economic and social challenges necessitate long-term government strategies, which need to be modelled, tested and verified. In the developed members of the EU the method of microsimulation has been used for a long time and it is becoming more and more popular in checking the effects of measures. This study consists of three parts. The first part shows the present and expected future populations of the EU member states. The second part presents the pillars of the Hungarian pension system and the achievements of pension modelling. The third part summarizes the theoretical basics and results in the research project "The role of self-care in our lives".

Keywords: ageing society, retirement security, modelling the pension system, self-care

The present and expected future population of the EU and Hungary

At present the social insurance system of most countries is the PAYG (Pay As You Go) system, that is, every year pensions are mostly covered by the contributions of the working population (Augusztinovics, 2014). The theoretical foundation of this pension system was first mentioned in Paul Samuelson's publication in 1958, in which the author assumes that the active population always pays for the pensions of the elderly. Based on this assumption it follows that the system can be maintained if a sufficient number of children are born, who will become active workers later and support the generation before them. The system also assumes that as the population grows, the economy will also grow (Samuelson, 1958). The distribution of the population according to age can be examined with a so-called population pyramid. Fig. 1 shows the precalculation of the website https://populationpyramid.net. According to it, the population of Europe will probably decrease and get older, which threatens the sustainability of the pension systems of European countries in the long run similarly to developed countries outside Europe (EPC, ONYF, OECD, 2015).
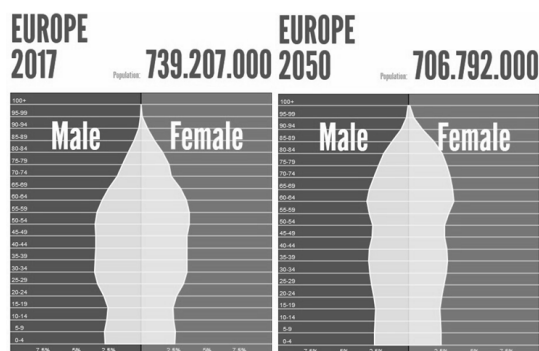
Figure 1 The population pyramid of Europe in 2017 and in 2050

Source: https://populationpyramid.net*, 2017*

Hungary's population pyramid can be found on the website of the Central Statistical Office (KSH), at http://www.ksh.hu/interaktiv_korfa in a virtual and editable (interactive) format. Fig 2 shows that in the population pyramid of Hungary in 2050 the population will probably be stagnating: the proportion of middle-aged people is slightly higher than that of children, but the proportion of elderly people is even higher. Only the proportion of very old people is lower.
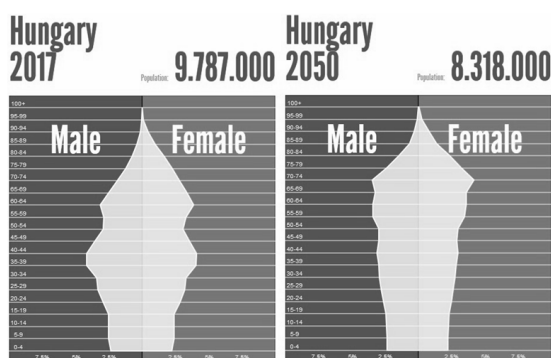

Figure 2 The population pyramid of Hungary in 2017 and in 2050

Source: https://populationpyramid.net*, 2017*

Table 1 shows the precalculations of the study of the European Commission (EPC, 2015), which predicts a considerable ageing of the population of the EU, as the life expectancy of both men and women will probably increase. The number of births is not expected to change considerably. Table 1 shows that stagnation is expected.

	2010	2050
Life expectancy of women	82,1 év	89 év
Life expectancy of men	76 év	84,5 év
Number of births	1,5	1,6
Working age population (15-64)	325 million	283 million
Pension expenses in the EU (as a percentage of the GDP)	10,2 %	12,5 %
Pension expenses in Hungary (as a percentage of the GDP)	10,4 %	13,8 %

Table 1 EPC precalculations for the EU

Source: EPC, 2015

Table 1 shows that the active working population in the EU will decrease drastically and pension expenses are also expected to increase in the EU member states. Forecasts show that financing pensions will probably be a greater and greater burden for the governments of the EU member states including Hungary.

	2007	2010	2020	2030	2040	2050	2060
Population (15-64)	6.9	6.9	6.5	6.2	5.8	5.2	4,8
Population growth (15-64)	0.0	-0.4	-1.0	-0.3	-1.2	-0.8	-0.7
Employment growth (15-64)	-0.1	0.7	-0,4	-0.6	-1.2	-0.9	-0,6

Table 2 EPC macroeconomical forecasts for Hungary

Source: EPC, 2015

Tables 2 and 3 show that expenses of pension payments are likely to grow at the same time.

	2007	2010	2020	2030	2040	2050	2060
Real GDP growth rate	2,9	3,3	2,4	2,1	1,1	0,8	1,0
Labour input growth rate	-0,3	0,8	-0,2	-0,6	-1,0	-0,9	-0,7
Labour productivity growth rate	3,2	2,5	2,6	2,7	2,1	1,7	1,7

Table 3 EPC demographic forecasts for Hungary

Source: EPC, 2015

The basis of the sustainability of the PAYG pension system is that the number of active workers is far higher than the number of retired people, otherwise the system collapses [6]. The precalculations of KSH show that the proportion of young and old people will change in the wrong direction because the number of old people will rise and the number of young people will fall. Table 4 shows that the proportion of pensioners and working age people hardly grew from 22.4% in 1970 to 27.2% in 1990. By 2050, however, it may grow to 47.7% (Simonovits, 2002), which means that in 1970 5 workers contributed to the pension of one pensioner, whereas in 2050 only 2 workers will do the same.

	1970	1990	2020	2030	2040	2050
Pensioners and working age ratio (%)	22,4	27,2	30,2	33,7	38,6	47,7

Table 4 The ratio of pensioners and working age people in Hungary

Source: KSH, 2015

The pillars of the Hungarian pension system

State pension systems are targeting long-term goals and have long-term impacts (Holtzer, 2010.). Fig. 3 shows that the Hungarian pension system is founded on two pillars. The first pillar is the PAYG principle, the second is the capital provision principle (Novoszáth, 2014). In the case of a pension system based on the PAYG principle, the incoming contributions are not capitalized or invested but pensions are paid directly from them (Mészáros, 2014). The PAYG system is comfortable and seems attractive while the population and the economy are growing (Samuelson, 1958). The current obligatory social insurance system faces the following three problems that

endanger the financial balance of the Hungarian pension system: an ageing population, low level of employment and the partial payment of contributions. According to demographical data the population stopped growing a long time ago, the economy is not growing, and pension payments are continuously growing (EPC, ONYF, OECD, 2015).
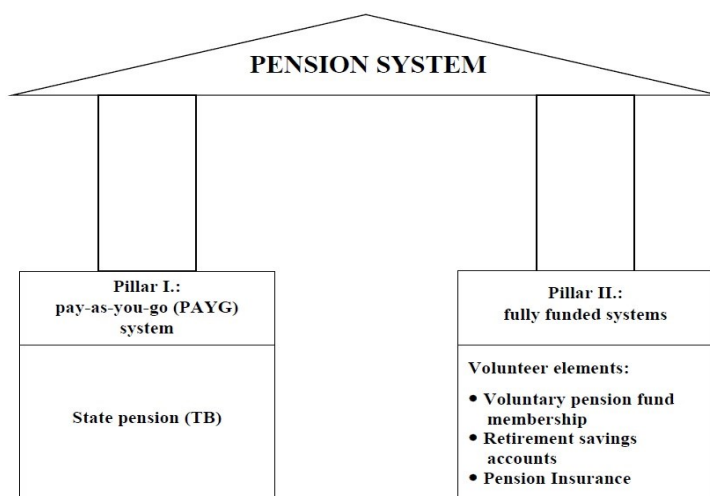

Figure 3 The pillars of the Hungarian pension system

Source: Uniqa, 2017

The possibilities of modelling the state pension system

The PAYG system is in a serious crisis all over the world and the reforms of pension systems are inevitable. . On a macro level an automatic system should be designed for contributions and pension payments that would ensure the long-term balance of the system. The results of measures need to be examined and a suitable method for this is microsimulation. The microsimulation models used in the impact assessments of pension systems can be classified according to several criteria from absolutely static to fully dynamic. Fig 4 shows this classification (ONYF, 2015).
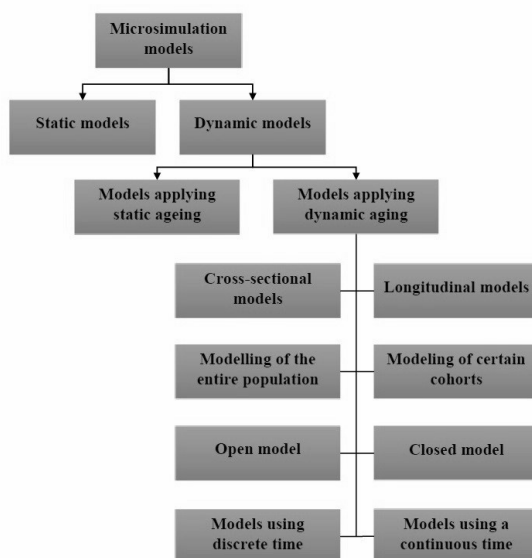

Figure 4 Microsimulation models

Source: ONYF, 2015

Microsimulation performs modelling at the level of individuals and households, where the direct impact of a change in the pension system is felt. This way the changes in the distribution of various incomes (wages, pensions) in time can be modelled. The task of pension calculation requires the long-term forecast of data, which means they have to be modelled at least 30-50 years ahead (in the U.S. calculations are performed for 75 years (Simonovits, 2002), in the EU and in Hungary for 50 to 60 years ahead (EPC, ONYF, OECD, 2015)). In general, the following two micro-simulation models are used in the impact analysis of the pension systems:

- ♦ Static models: pension modelling based on statistical data collection, where the known statistical data are further extrapolated as a function of time. Statistical and probability calculation tools can be used to perform this. The impact of the hypotheses in the model can be examined with the statistical analysis of the simulation results, and strategic decisions can be based on this (Gilbert, Troitzsch, 1999, Spadaro, 2007).
- ♦ Dynamic models: Microsimulation calculations based on model points where the model points are focused on, which means sets in the same category are extrapolated. This way it requires considerable fewer calculations but if a pension system is examined, say for 50 years ahead, problems may arise with new people entering the system (Li, 2011, Dekkers, 2013).

Dynamic simulation is usually used where demographic models also have to be created (Fig. 5). The probabilities of births, deaths, marriages and divorces in Hungary can be obtained from the Central Statistical Office (KSH). For the most important demographic events, such as births and deaths, the Hungarian Demographic Research Institute (NKI) has forecasts.
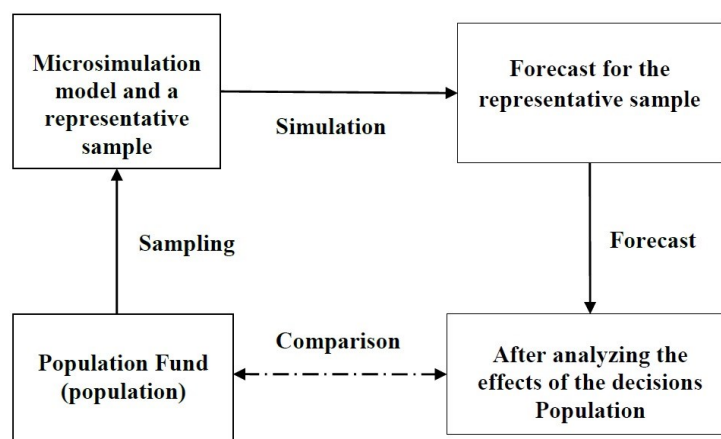
Figure 5 The process of microsimulation modelling

Source: Gilbert-Troitzsch, 1999, Molnár, 2004

Nowadays microsimulation is an accepted method in Hungary to examine the composition of the population and its impact on the present and future pension system with the help of demographic data. It is based on statistical data collection and makes the time series analysis of demographic data possible (ONYF, 2015).

The possibilities of modelling voluntary pension schemes

Present economic thinking goes beyond scientific areas related to markets only, and reaches areas focusing on human nature such as behavioural science or sociology. In

a way it returns to classical traditions, since early thinkers focused on self-control, too (Hámori, 1998). The components of human nature become part of the economic thinking and their interactions change it.

1. reserved – outgoing	2. trusting – distrustful
3. concrete thinking – abstract thinking	4. practical – imaginative
5. reactive emotionally – emotionally stable	6. open – nondisclosing
7. submissive – dominant	8. self-assured – apprehensive
9. serious – lively	10. traditional – experimental
11. disregarding rules – rule-conscious	12. group-oriented – self-reliant
13. shy – uninhibited	14. flexible – perfectionistic
15. utilitarian – sensitive	16. relaxed – tense

Table 5 Cattell's 16 personality factor model

Source: Mirnics, 2006

People are reasonable; it is a basic assumption of economy meaning that people make decisions based on their system of preferences. In other words, the rational behaviour of people means that of all available possibilities they choose the best (Fodor, 2013). On the other hand, we are emotional beings. Table 5 shows how Raymond Cattel describes personality using 16 personality factors.

Economy examines social cooperation, phenomena resulting from decisions individual make based on personal interest (Heyne, Boettke, Prychitko, 2003). Such social cooperation is for example a government, a business venture, or the stock exchange, which is created by individuals who follow their own interest and have little information about each other, yet it still works, it constitutes a production unit and not disorder. Socioeconomic systems like pension systems are governed by rules. In order to operate systems the participants have to know the rules and agree to apply them. A widespread computer method nowadays to map personality is a statistical method called factor analysis (Ottó, 2003). The data can be processed and the statistical calculations can be performed with the SPSS software (Sajtos, 2007).

Motivations of decisions

A basic assumption is that people view retirement with apprehension and uncertainty. The previous parts show that the PAYG system is in a crisis, therefore the second pillar of the pension system, self-care, receives more and more attention nowadays (see Fig. 3). Self-care helps retain material and personal independence, and also expresses responsibility towards one's family. In developed European countries self-care has been playing an important role for a long time (EPC, 2015). In order to understand the motivations behind our decisions (Hámori, 1998) more deeply, I used certain parts of factor analysis, which is a popular computer method nowadays (Czirfusz, 2010, Ottó, 2003). I used the SPSS software and help from the department to process the questionnaires and perform the statisctical calculations (Csiszárik, 2015, Sajtos, 2007). The questionnaires were filled by students of the Keleti Faculty of Business and Management in 2015 and 2016, respectively. The respondents could fill in the questionnaire on paper or online at kerdoivem.hu. The number of respondents was 222 (N=222). My questions were related to pension systems, pension savings systems, self-care and planning retirement security as these elements define the financial backgrounds of one's future existence, that is, the extent of self-care (see Table 6). The questions were grouped into three categories:

♦ The role of self-care (savings);
♦ Pension systems (compulsory, voluntary);
♦ Financial planning (seeking expert financial advice).

The qualitative research analyses the three groups separately. Different statistical analyses were performed on the three groups such as averages, frequency, cross tabulation analysis.

Questions	Answers	Percentage
1. Gender		
Male	138	62,2%
Female	84	37,8%
2. Age		
below 28	118	53,2%
between 29-48	86	38,7%
above 48	18	8,1%
3. The role of self-care		
Yes	126	56,8%
No	96	43,2%
4. Knowledge about the pension system		
State pension		
Yes	82	36,9%
No	144	63,1%
Private pension		
Yes	60	27%
No	162	73%
Other possibilities		
Yes	62	16,16%
No	160	83,84%
5. Financial planning		
Yes	64	28,8%
No	158	71,2%
Total number of respondents	222	100%

Table 6 "The role of self-care in our lives" questionnaire

Source: author's own research, 2015 (N=222)

The questionnaire can be found in Table 6. The gender and age distribution of the respondents can be found in Tables 7 and 8.

Gender	Frequency	Percentage
Male	138	62,2%
Female	84	37,8%
Total	222	100,0%

Table 7 Proportion of gender among the respondents

Source: my own research, 2015 (N=222)

Age	Frequency	Percentage
below 28	118	53,2%
between 29-48	86	38,7%
above 48	18	8,1%
Total	222	100,0%

Table 8 Distribution of respondents by age

Source: author's own research, 2015 (N=222)

The role of self-care

Based on the replies given to questions 3 and 4 of the questionnaire young people are basically well-informed about pension and retirement but still do not consider financial planning important, which is shown by the low percentage (28.8%) of "yes" replies to question 5 (see Table 6).

Saving for retirement	Frequency	Percentage
Yes	126	56,8%
No	96	43,2%
Total	222	100,0%

Table 9 Saving for retirement

Source: author's y own research, 2015 (N=222)

The "yes" replies in Tables 10 and 11 indicate that young people are thinking about saving for retirement. Table 10 shows further connections with cross tabulation analysis, for example retirement savings are more important for men than women in our survey.

				Gender		Total
				Male	Female	
Role of self-care	Yes		number	86	40	126
			% Retirement savings	68,3%	31,7%	100,0%
			% Gender	62,3%	47,6%	56,8%
			% Total	38,7%	18,0%	56,8%
	No		Number	52	44	96
			% Retirement savings	54,2%	45,8%	100,0%
			% Gender	37,7%	52,4%	43,2%
			% Total	23,4%	19,8%	43,2%
Total			Number	138	84	222
			% Retirement savings	62,2%	37,8%	100,0%
			% Gender	100,0%	100,0%	100,0%
			% Total	62,2%	37,8%	100,0%

Table 10 Cross tabulation of the questions about gender and "Role of self-care"

Source: author's own research, 2015 (N=222)

Table 11 show further relationships by cross tabulation, for example that people between 29 and 48 years of age consider retirement savings important.

				Age			Total
				below 28	between 29-48	above 48	
Role of self-care	Yes		Number	86	66	12	126
			% Retirement savings	38,1%	52,4%	9,5%	100,0%
			% Age	40,7%	76,7%	66,7%	56,8%
			% Total	21,6%	29,7%	5,4%	56,8%
	No		Number	70	20	6	96
			% Retirement savings	72,9%	20,8%	6,3%	100,0%
			% Age	59,3%	23,3%	33,3%	43,2%
			% Total	31,5%	9,0%	2,7%	43,2%
Total			Number	118	86	18	222
			% Retirement savings	53,2%	38,7%	8,1%	100,0%
			% Age	100,0%	100,0%	100,0%	100,0%
			% Total	53,2%	38,7%	8,1%	100,0%

Table 11 Cross tabulation of the questions "age" and "Role of self-care"

Source: author's own research, 2015 (N=222)

Knowledge about the pension system

The replies in the "Other possibilities" section of question 4 show that 16,16% of young people are thinking about some alternative forms of financial planning (see Table 6). The other answers included voluntary pension scheme, additional voluntary contributions, Pension Savings Account, pension insurance, life insurance combined with investment, investment funds, life insurance with investment and buying gold or real estate as investment. Table 12 apparently shows that young people do not know very much about state pension but the cross tabulation in Table 13-14 shows a different result.

State pension	Frequency	Percentage
Yes	82	36,9%
No	140	63,1%
Total	222	100,0%

Table 12 State pension

Source: author's own research, 2015 (N=222)

Cross tabulation based on the replies by gender shows that the respondents are knowledgeable about state pension (see Table 13).

			Gender		Total
			Male	Female	
State pension	Yes	Number	48	34	82
		% State pension	58,5%	41,5%	100,0%
		% Gender	34,8%	40,5%	36,9%
		% Total	21,6%	15,3%	36,9%
	No	Number	90	50	140
		% State pension	64,3%	35,7%	100,0%
		% Gender	65,2%	59,5%	63,1%
		% Total	40,5%	22,5/	63,1%
Total		Number	138	84	222
		% Stet pension	62,2%	37,8%	100,0%
		% Gender	100,0%	100,0%	100,0%
		% Total	62,2%	37,8%	100,0%

Table 13 Cross tabulation of questions "Gender" and "State pension"

Source: author's own research, 2015 (N=222)

Cross tabulation shows that young people are knowledgeable about state pension (see Table 14).

			Age			Total
			below 28	between 29-48	above 48	
State pension	Yes	Number	58	20	4	82
		% State pension	70,7%	24,4%	4,9%	100,0%
		% Age	49,2%	23,3%	22,2%	36,9%
		% Total	26,1%	9,0%	1,8%	36,9%
	No	Number	60	66	14	140
		% State pension	42,9%	47,1%	10,0%	100,0%
		% Age	50,8%	76,7%	77,8%	63,1%
		% Total	27,0%	29,7%	6,3%	63,1%
Total		Number	118	86	18	222
		% State pension	53,2%	38,7%	8,1%	100,0%
		% Age	100,0%	100,0%	100,0%	100,0%
		% Total	53,2%	38,7%	8,1%	100,0%

Table 14 Cross tabulation of the questions "Age" and "State pension"

Source: author's own research, 2015 (N=222)

Table 15, similarly to the above apparently indicates that young people are not well-informed about private pension but the cross tabulation in Tables 16 and 17 shows a different result.

Private pension	Frequency	Percentage
Yes	60	27,0%
No	162	73,0%
Total	222	100,0%

Table 15 Private pension

Source: author's own research, 2015 (N=222)

The cross tabulation according to gender and age shows that respondents are knowledgeable about private pension (Tables 16 and 17).

			Gender		Total
			Male	Female	
Private pension	Yes	Number	40	20	60
		% Private pension	66,7%	33,3%	100,0%
		% Gender	29,0%	23,8%	27,0%
		% Total	18,0%	9,0%	27,0%
	No	Number	98	64	162
		% Private pension	60,5%	39,5%	100,0%
		% Gender	71,0%	76,2%	73,0%
		% Total	44,1%	28,8%	73,0%
Total		Number	138	84	222
		% Private pension	62,2%	37,8%	100,0%
		% Gender	100,0%	100,0%	100,0%
		% Total	62,2%	37,8%	100,0%

Table 16 Cross tabulation of gender and the question about private pension

Source: author's own research, 2015 (N=222)

Even though the number of respondents was not too high, the replies were quite varied. The respondents had varied opinions concerning the foundations of their future financial security.

			Age			Total
			below 28	between 29-48	above 48	
Private pension	Yes	Number	40	18	2	60
		% Private pension	66,7%	30,0%	3,3%	100,0%
		% Age	33,9%	20,9%	11,1%	27,0%
		% Total	18,0%	8,1%	0,9%	27,0%
	No	Number	78	68	16	162
		% Private pension	48,1%	42,0%	9,9%	100,0%
		% Age	66,1%	79,1%	88,9%	73,0%
		% Total	35,1%	30,6%	7,2%	73,0%
Total		Number	118	86	18	222
		% Private pension	53,2%	38,7%	8,1%	100,0%
		% Age	100,0%	100,0%	100,0%	100,0%
		% Total	53,2%	38,7%	8,1%	100,0%

Table 17 Cross tabulation of age and the question "Private pension"

Source: author's own research, 2015 (N=222)

Financial planning

Based on the replies to the previous questions it can be concluded that young people are basically informed about pension systems but they still do not consider

financial planning important, which is shown by the low number (28.8%) of "yes" answers (see Table 18).

Financial advice	Frequency	Percentage
Yes	64	28,8%
No	158	71,2%
Total	222	100,0%

Table 18 Financial advice

Source: author's own research, 2015 (N=222)

The cross tabulation in Table 19 shows that men are more likely to ask for financial advice than women. It is interesting to note that in an older age the respondents are more likely to use financial advice.

			Gender		Total
			Male	Female	
Financial advice	Yes	Number	48	16	64
		% Financial advice	75,0%	25,0%	100,0%
		% Gender	34,8%	19,0%	28,8%
		% Total	21,6%%	7,2%	28,8%
	No	Number	90	68	158
		% Financial advice	57,0%	43,0%	100,0%
		% Gender	65,2%	81,0%	71,2%
		% Total	40,5%	30,6%	71,2%
Total		Number	138	84	222
		% Financial advice	62,2%	37,8%	100,0%
		% Gender	100,0%	100,0%	100,0%
		% Total	62,2%	37,8%	100,0%

Table 19 Cross tabulation of gender and the question "Financial advice"

Source: author's own research, 2015 (N=222)

Examining Table 20 we can see that with increasing age retirement security is becoming more and more important.

			Age			Total
			below 28	between 29-48	above 48	
Financial advice	Yes	Number	18	36	10	64
		% Financial advice	28,1%	56,3%	15,6%	100,0%
		% Age	15,3%	41,9%	55,6%	28,8%
		% Total	8,1%	16,2%	4,5%	28,8%
	No	Number	100	50	8	158
		% Financial advice	63,3%	31,6%	5,1%	100,0%
		% Age	84,7%	58,1%	44,4%	71,2%
		% Total	45,0%	22,5%	3,6%	71,2%
Total		Number	118	86	18	222
		% Financial advice	53,2%	38,7%	8,1%	100,0%
		% Age	100,0%	100,0%	100,0%	100,0%
		% Total	53,2%	38,7%	8,1%	100,0%

Table 20 Cross tabulation of age and the question about financial advice.

Source: author's own research, 2015 (N=222)

Conclusions

The current pension system will be likely to cause social, economic problems in Hungary and globally in the future due to the ageing of societies, the drastic change in the proportion of retired and working age people according to forecasts. The question of sustainability greatly influences the choice of possible models. This sustainability is determined by the proportion of jobholders, or more precisely, those paying contributions and pensioners, as they get their pension from the contributions paid. Therefore the two sides must be balanced macroeconomically. As shown before microsimulation can model pension concepts effectively in advance. Microsimulation is gaining importance in both Hungary and the EU. Both experts and this study recommends a mixed system; i.e. state pension is supplemented by voluntary elements. Information about the available possibilities is very important. Obviously, a single study cannot solve the problems of the pension system that many experts and governments have not been able to solve so far but in addition to presenting the problem, it can be stated that there are possibilities and concepts to forecast the impacts of the pension systems.

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