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*Pension literacy and consumers' decisions
in the context of pension system reforms*

Summary

The research problem of this article is the evaluation of the correlation between the level of knowledge about pensions and the perception of the changes introduced by the government in the pension system, as well as the correlation between the knowledge and decisions made by consumers in connection with these changes. The study uses a triangulation of research methods. The used primary data were obtained from our qualitative and representative quantitative studies. The research was a part of National Science Centre's research project (no. UMO-2012/05/B/HS4/04183).

The level of knowledge, both objective and subjective about the pension system is low. The research positively verifies the hypothesis of the relationship between knowledge on the evaluation of the changes in the pension system and the decisions concerning additional saving. It must be highlighted that evaluations and decisions are associated with the self-assessment of one's knowledge much more than by the actual level of one's knowledge. The considerable challenge for the government and the institutions linked to the pension system is to build financial pension awareness and encourage saving.

Key words: savings for old age, consumer behaviour, saving behaviour, pension literacy

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Introduction

The new pension system, introduced in Poland in 1999 is being constantly modified (the study takes into account two changes: a lowering of the portion of pension contributions transferred from ZUS to OFE as introduced in 2011 and also the possibility to stop saving at OFE as introduced in 2014). This may undermine peoples' confidence in the stability of the system and contribute to a change in attitudes and decision-making related to additional (voluntary) pension coverage.

Pension knowledge is an element of financial literacy and includes all the information, as well as the understanding of the issues connected with the pension system. This knowledge will be analyzed on the level of both subjective self-assessment and objective knowledge of the pension system issues.

It was assumed that the level of pension knowledge would influence the perception of the modifications introduced in the pension system and the decisions connected with additional saving for old age. In particular it was assumed that the higher level of their knowledge, both objective and subjective, the consumers are more likely to:

- make a decision to divide their pension assets into two separate accounts (ZUS and OFE) — the higher level of knowledge should lead to more diversified sources of future pension (Zaleśkiewicz 1996),
- negatively evaluate the changes made by the government, that higher knowledge leads to a higher awareness of the breaking of any promised rules in the pension system
- save additionally for old age.

The article uses the triangulation research method. Both quantitative and qualitative research results are presented. The research was part of the National Science Centre's research project "Saving Practices and Financial Pension Security in Households — Determinants, Attitudes, Models" (no. UMO-2012/05/B/HS4/04183).

The role of knowledge in making financial decisions

The process of shaping retirement competences, in particular of knowledge about the pension system should include planning household finances. Special attention should be given to the assessment of one's financial situation, the rules and conditions of building up savings for old age — both in state and private pension systems, specifying the number of work years or choosing a pension product.

Deciding to build up savings in order to make one's aging more secure (on the expected level and at the preferred pace of their growth), or deciding on introducing changes in this matter requires possessing proper knowledge of finances. This knowledge enables one to set realistic aims of saving for retirement and make sensible choices. This issue is of considerable significance, particularly in the context of aging of societies, changes in a family model, or the forecast levels of replacement rates².

² This issue is immensely important, not only in Poland. As A. Lusardi points out, also in the rich American society the improvement of education about finances and pensions seems to be

Information as a significant factor influencing making sensible decisions is a basis for the traditional models of consumer behavior. According to Schwartz (1986), customers who have access to complete information about the features of products are confident about what they personally prefer, they can process the data they have access to, and, as a consequence, they are able to specify their preferences among particular goods without incurring a loss.

At the turn of the 1970s and 1980s, some researchers started to indicate that not all consumers make a sufficient effort in order to take optimal purchase decisions (Olshavsky, Granbois, 1979, pp. 93–100), and they do not look for information in an active way (Beales et al., 1981, pp. 11–22). Among various reasons for this situation, the following were given: the lack of knowledge enabling an individual to acquire information, the unavailability of adequate information or too much information, seemingly sufficient amount of information or experiences acquired earlier, and also the lack of knowledge enabling one to process the acquired information. Many authors emphasize that information has a profound influence on financial behaviors.³

Financial knowledge (i.e. the whole information obtained through research, studying, etc.; also information resources in the area of finances, Słownik Języka Polskiego PWN [Polish Language Dictionary PWN], is an element of the so-called financial literacy. According to the definition of OECD (OECD, INFE 2011, p. 3), financial literacy is “A combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial wellbeing.”

In shaping individual elements of financial literacy, an important aspect is building **financial awareness** (Słownik Języka Polskiego PWN). Awareness can be understood on three levels: the existence of a particular need (e.g. the necessity to financially secure one's aging), a category of product (e.g. employee pension scheme) and particular products and decisions concerning acquiring these products (e.g. possibility to enter an employee pension fund offered as a part of an employee pension program. An inadequate level of financial awareness may lead to, among others, inability to make sound choices, inability to predict the results of one's decisions, or, finally being unable to assess one's decisions and being passive towards the changes occurring in the market (Świecka B., 2008, p. 237).

Awareness and knowledge determine **financial skills** — practical knowledge of particular aspects of household finance management, which means the ability to use

an absolute necessity, particularly when taking into account the fact that about 30% of households where the head is at the pre-retirement age have only small savings or have no additional pension coverage, see.: Lusardi A., 2003. Planning and Saving for Retirement. Department of Economics, Dartmouth College. Hanover, NH: Dartmouth College.

³ For a broad review of research on consumer knowledge — see: Alba J.W., Hutchinson W.J., (1987), Dimensions of Consumer Expertise, *Journal of Consumer Research*, 13 (4), pp. 411–454.

It must be emphasized here that in the last years researchers have been trying to identify the influence of various factors — not only of income, but also of demographic, social or psychographic variables on financial behaviors. The research on their influence on financial knowledge is done among others by OECD (Atkinson, A., Messy F, 2012).

knowledge in practice. These include, for example, the ability to look for information, or compare the safety and profitability of various financial instruments.

Attitudes and behavior, the two other elements of the financial literacy definition according to OECD, are closely connected. **Attitude** expresses a concrete “ready and permanent attitude towards particular people or objects” (Wojciszke, 2003, p. 178), and includes cognitive elements (convictions about the qualities of an evaluated object, its role and meaning in pursuing one’s aims), emotional or affective elements (i.e. positive and negative emotions related to a given object) and behavioral elements (connected with actions, decisions and habits in relation to the object of the attitude) (Mika, 1984).

Lack of financial knowledge

Research carried out in a number of countries indicates that a considerable number of consumers lack adequate knowledge about finances. This ignorance includes both general attitudes towards finances, particularly in making calculations (Bernheim, 1995, 1998; Moore, 2003, Jappelli et al., 2005), and the evaluation of financial products that would enable their rational assessment and choice (Benartzi, Thaler, 2001, pp. 78–98; Choi, Laibson, Madrian 2005, pp. 151–198; Choi, et al., 2002, pp. 67–113; Lusardi 2008; Lusardi, Mitchell, 2007, pp. 35–44). Consumers have little knowledge particularly about such financial instruments as stocks, bonds, mortgage loans, or pension funds (Miles, 2004; Białowąs 2013). Moreover, even when they use financial services (such as mortgage loans, credit cards, pension funds), they are not familiar with their basic features, which makes them unable, for example to evaluate, make a decision about changing or resigning from a service or service provider.

Research on irrational consumer choices within the scope of their financial behaviors also includes the lack of knowledge even when a consumer has been provided with full necessary information (McKenzie, Liersch 2011, pp. 1-13; Fernandes, Lynch, Netemeyer 2012). It is also confirmed by the results of research conducted by Benartzi and Thaler (2001, pp. 79–98), who discovered that even in the conditions of being provided with complete information, consumers tend to diversify allocating their money to pension saving schemes. Langer and Fox (2012) point out that this tendency may lead to choosing a portfolio which is possibly the easiest (allocating their money to basic financial instruments) or too heavily depending on the suggestions of the salesperson.

Subjective and objective knowledge

In consumer research, there is a notion of self-assessment made by consumers themselves, called subjective knowledge (Alba, Hutchinson, 2000, pp. 123–156; Bearden, Hardesty, Rose, 2001, pp. 121–134; Moorman et al., 2004, pp. 347–356; Carlson et al., 2009, pp. 864–876) and objective knowledge — concrete knowledge about a product/service being in a consumer’s memory⁴.

⁴ Evaluation of objective level of financial knowledge may be dependent on the level of difficulty of questions testing such knowledge. In the case of the research on education related to shaping financial literacy, the questionnaires were compiled by OECD (Atkinson, A., Messy F, 2012).

When analyzing the relationship between subjective and objective knowledge, one may theoretically expect that they will be strongly and positively correlated. However, such a coincidence does not always occur (see: Carlson et al., 2009, pp. 864–876, Radecki, Jaccard 1995, pp. 107–138). What is more, sometimes it turns out that **subjective knowledge** is more strongly connected with product-related experiences and consumers' confidence in their ability to make sound decisions — it is related to the notion of “trust in knowledge”, while **objective knowledge** is more connected with expert skills, the consequence of which is “trust in decision-making” (Alba, Hutchinson, 1987, pp. 411–454; Parker et al., 2011). Further discrepancies in the analyses of the use of subjective and objective knowledge by consumers are related to the different extent of consistency that they display in the process of searching for information, their will to make decisions, as well as the choices they make (Radecki, Jaccard 1995, pp. 107–138).

Literature on consumer behavior (e.g. Bearden, Hardesty, Rose, 2001, pp. 121–134), or decisions made in the conditions of uncertainty (Fox, Tversky, 1995, pp. 585–603; Fox, Weber, 2002, pp. 476–498) indicates that the subjective knowledge of a consumer has a considerable impact on decisions made by him/her. It should be added here that, assuming that the level of objective knowledge remains constant, subjective knowledge has a stronger impact on decision makers' motivations to act. According to Heath and Tversky (1991, p. 7) “People are willing to take a greater risk when they believe that they are well informed or competent, rather than when they think they are ignorant or not informed enough. We tend to assume that our feelings of being competent in a given context are determined by what we know in relation to what we can know”. What is more, the authors ascribe the preferences connected to the choices made in conditions of risk to two sources: 1. a cognitive tendency to generalize the rule that it/they will be better off in a situation where they understand a given issue better; 2. a motivation for defending oneself from recrimination (self-incrimination) — people with considerable actual knowledge tend to ascribe positive results of their choices to their expertise, however, they blame the coincidence (risk) for negative results. People who have a limited level of understanding of financial issues ascribe positive results to luck, and bad ones — to the lack of expertise.

Empirical research based on the principles adopted by Heath and Tversky was also conducted by Hadar L., Sood S., Fox C.R. (2013, pp. 303–316). They emphasize the considerable significance of subjective knowledge, pointing out that: “the willingness of consumers to pursue a risky investment increases when their subjective knowledge on possibilities of saving is higher, regardless of the level of their objective knowledge”. They indicate that financial decisions are made without complete knowledge of the probability of distribution of. Such uncertainty occurs not only in consumers' levels of objective knowledge, but also in their levels of subjective knowledge. That is why consumers typically make financial decisions under conditions of both imperfect objective knowledge and moderate to low subjective knowledge. The impact of objective financial knowledge on financial behaviors is greater when consumer confidence, propensity to make plans and willingness to take risk are added to the predictive model. To conclude, consumers are more likely to allocate money to the instruments about which they feel their subjective

knowledge is higher (regardless of the level of objective knowledge). They also tend to choose more risky options.

Taking into account the objective vs. subjective knowledge ratio, three situations can be highlighted. The first one is a situation of balance in which the level of subjective knowledge matches the level of objective knowledge. One could assume that decisions made by a consumer will then be more sensible, (informed decisions). Other two situations are the advantage of subjective knowledge over objective knowledge and the advantage of objective knowledge over subjective knowledge (see Graph 1).

Graph 1. Consumer decisions and the level of subjective and objective knowledge

		Subjective state of knowledge		
		low	medium	high
Objective state of knowledge	low	informed	accepting high risks	
	medium	informed		accepting high risks
	high	accepting only low risk	informed	

Source: own research.

If consumers have a high level of objective knowledge but feel that it is insufficient, they are likely to choose safer and better known solutions, even if other products would better satisfy their needs. On the other hand, if consumers feel that their subjective knowledge level is high, but they lack objective knowledge to make a right decision, they are more likely to take risk even if safer or better known products would better satisfy their needs. What is more, as indicated by research carried out so far, consumers who believe in their deep knowledge are less likely to look for information about a product and are less likely to learn about new products than the consumers whose level of knowledge is on a medium level (Bettman, Park, 1980, pp. 234–248; Alba, Hutchinson, 2000, pp. 123–156).

According to the authors' best knowledge the analysis presented below fills the cognitive gap in the areas of:

- the evaluation of the correlation between the level of knowledge about pensions and the perception of the changes introduced by the government in the pension system,
- the correlation between the knowledge and decisions made by consumers in connection with these changes.

Data and methods

The study uses a triangulation of research methods. The used primary data were obtained from quantitative and qualitative studies. The representative quantitative survey with a direct survey questionnaire was carried out in 2014 (n=1163)⁵. The data acquired from

⁵ Research done at Poznań University of Economics in cooperation with the Centre for Research and Statistical Education of the Main Statistical Office in Poland. For further information

the survey and presented in this article mainly concern two issues. The first issue is the level of knowledge about the Polish pension system — both its subjective evaluation and objective knowledge (measured by means of assessing the knowledge of ways of saving for retirement and the average monthly net pension received in Poland). The other issue concerns the planned decisions related to transferring a part of one's pension contributions either to ZUS (Inland Revenue) or both ZUS and OFE (Open Pension Funds) from August 2014. The article also uses data obtained from quantitative study carried out in 2012 concerning consumers' opinions about decreasing in 2011 the amount of contribution transferred to OFE by ZUS. Qualitative study, on the other hand, was carried out at the turn of 2013 and 2014 by means of focus groups interviews (10 interview groups). The data used concern the perception and evaluation of the pension system reforms introduced by the government. Also chosen consumer attitudes towards the examined issue were taken into consideration in the analyses.

The assessment of the level of literacy in the system of retirement security provision was made through the prism of:

- the awareness of the need to make one's aging secure,
- subjective assessment of knowledge,
- objective state of knowledge.

The analysis of subjective self-assessment of one's knowledge about the pension system was made based on the assessment made by the respondents using the scale ranging from 1 to 5, where 1 is "I know very little", to 5 — "I know a lot". When diagnosing the level of objective knowledge, two issues were used reflecting the actual knowledge about the pension system. These include:

- knowledge of the ways of saving for retirement (spontaneous awareness, open-ended question). Obtained responses were ordered into three groups: 1 — responses closely associated with pension coverage. It was assumed that they indicate a high level of knowledge about pensions (e.g. ZUS, KRUS (Agricultural Social Insurance Fund), pension funds, open pension funds, individual pension accounts, reversed mortgage); 2 — products offered in the finance market, the awareness of which indicates an average level of knowledge about pension coverage, e.g.: banking products, securities, investment funds, insurance products, or investment in real estate; 3 — ways of saving up not connected directly with saving for old age.
- knowledge of the amount of pension received from the state pension system. In this case it was assumed that the respondents who indicate the level of the average pension at the level of its actual average amount $\pm 10\%$ have "expert" level of knowledge about the pension system; those whose error is within $\pm 20\%$ of the amount of the average pension — have an average level of knowledge; those whose error is within $\pm 30\%$ have low knowledge, and those below 30% — no knowledge.

The next step consisted of examining the relationship between financial knowledge and the perception of the changes introduced in the pension system and also market decisions manifested by the use of finance products related to old age.

Calculations were made with the use of the IBM SPSS Statistics computer program.

Results

Pension awareness

Financial awareness in the area of pension coverage has an impact not only on the future financial situation of households, but it can also have consequences for the system of social services, in particular pension and healthcare systems. Its inadequate level in the case of pension coverage means a low propensity to save for old age or making poor decisions when choosing saving instruments.

Being aware of the necessity to have financial pension coverage, including the existence of products enabling additional saving is an important factor influencing attitudes and behaviors. Individuals whose awareness of the necessity to save for old age is inadequate will not search for information in order to increase their knowledge in this area, and as a result they will not use products enhancing pension security, although they will need it. The lack of awareness results from the lack of basic knowledge, which in turn limits not only the range of options to choose from, but also making any changes of services or service providers.

Additionally, the inability to manage one's finances, especially with a long-term view — like in the case of pension savings — may be a result of the lack of a habit to save regularly even the smallest amounts of money. It is confirmed by the results of our qualitative studies, where consumers often pointed out that saving for retirement should be done on a regular basis and should not entail any risk: "One should save up regularly, even the smallest amounts, because during a few decades of work quite a lot of money can be amassed." (female, 34 years old). It should also lead to developing a habit of saving: "It is better to save up little, but do save up. If we save up some money once every two months, it is better to divide this amount in half and save up every month. It is better fixed in your head. It is easier to get used to such rules." (male, 37 years old).

The awareness of the fact that saving for old age is a necessity was verified by the analysis of attitudes towards two exemplary statements (rated by the respondents on a Likert scale ranging from 1 — strongly disagree, to 5 — strongly agree):

- planning one's financial future when retired,
- approval of the statement that saving up for retirement makes sense.

Positive attitudes towards **long-term financial planning**, which includes saving to **makes one's aging more secure**, are the basis for shaping pension awareness and knowledge. The above is confirmed by the results of research conducted in different countries, which indicate that individuals with a more positive attitude towards financial planning are better prepared for retirement in terms of finances than those with a negative attitude (Glamser,

1976, pp. 104–107; Helman, Paladino, 2004; Mutran et al., 1997, pp. 251–273). However, although pension financial planning should be an important part of a person's life plan, young people in particular believe that it will become important to them in a decade or in a few decades. (Pettigrew et al., 2007). In fact, people frequently start planning (and making concrete decisions) only when they reach middle age or briefly before retirement, which is too short time to amass enough assets. It is a result of the unwillingness to think about the far future or the necessity to anticipate one's lifespan (Rowlingson, 2002, pp. 623–642) as well the existence of other, more urgent needs (Clery et al., 2007, p. 119).

The results of the survey conducted among Poles indicate that only every third person declares planning their financial retirement future. Such planning in a statistically significant way relates to such features as: sex, age, education and self-assessment of the health state of household's head, as well as the household's status, region of the country, and the size of locality (statistically significant dependence for $p = 0.05$). The lack of significant correlation was observed in the case of the level of education, the number of people in a household, occupation or income.

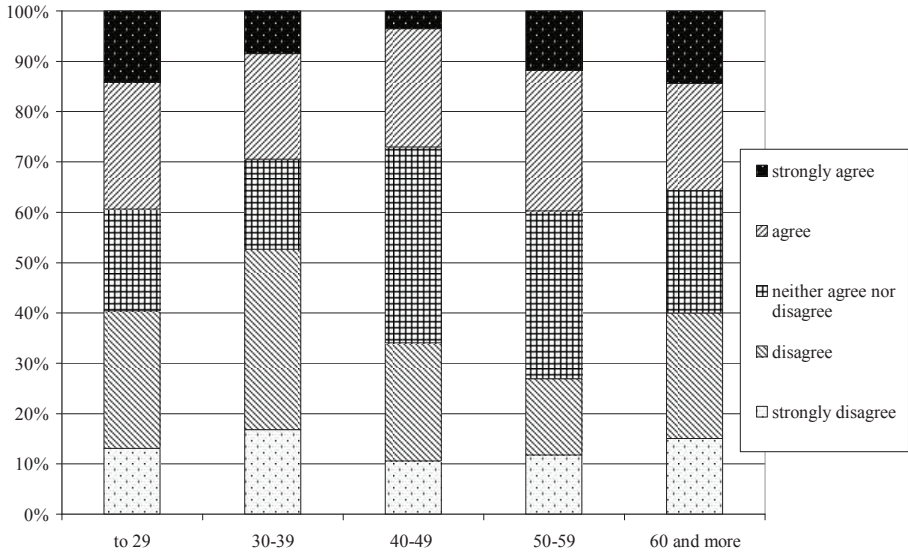
The identified dependencies largely confirm the relationships between planning and the features of the representatives of the households. As seen in the obtained research results, individuals who declare planning their finances for old age are mostly males (41% vs. 29% of females) and older people (aged 50–59). As already mentioned, pension planning also depends on the education of the head of the household: individuals with education in economics declare planning definitely more often — 50%, than those with other education — 32%. In this group prevail individuals co-habiting with a spouse/partner and childless (52%), households from the eastern and north-western regions of Poland (43% in both cases), particularly from towns up to 50 thousands inhabitants.

The lowest percentage of those who admit long-term financial planning are people aged 30–49, who usually have a stable professional standing and a regular income and who should already start planning their finances for old age. This segment consists of people living alone, the inhabitants of rural regions and regions located in the centre of Poland. What is interesting, people who perceive their health condition as low more seldom make plans for their financial retirement future.

Another issue identifying the level of awareness is the belief that saving up for retirement is sensible. Consumers' attitudes towards the need to save for old age was verified by research three times — in 2009 ($n=513$), 2012 ($n=493$) and 2014 (K77, $n=1163$).

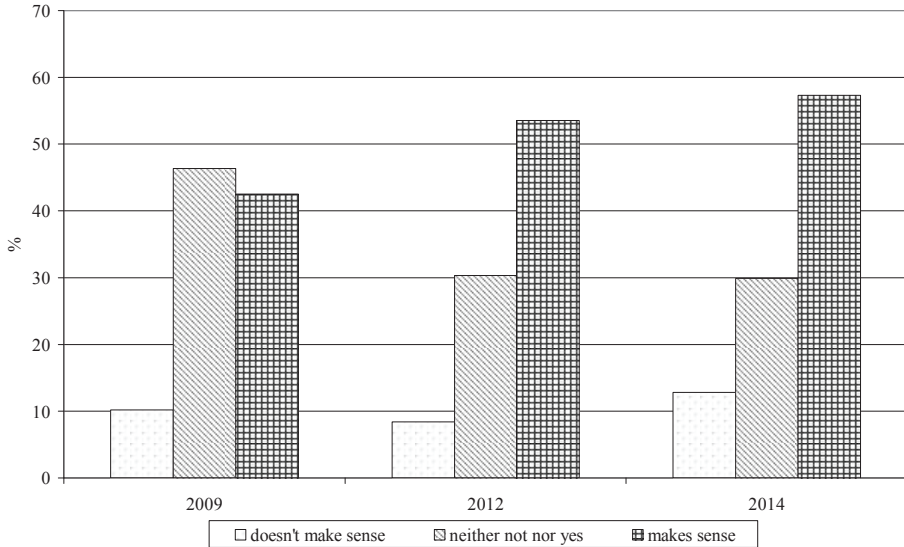
When analyzing the survey results, it is clear that the percentage of people who agree with this statement has risen — from 42% to 57%, however, the percentage of individuals with the opposite view is rather constant (Graph 3).

**Graph 2. “I am making plans for my financial retirement future”
– the level of acceptance of the statement according to the age criterion**



Source: own study on the basis of conducted quantitative study (n=1163).

Graph 3. The level of acceptance of the statement that “saving up for retirement makes sense”

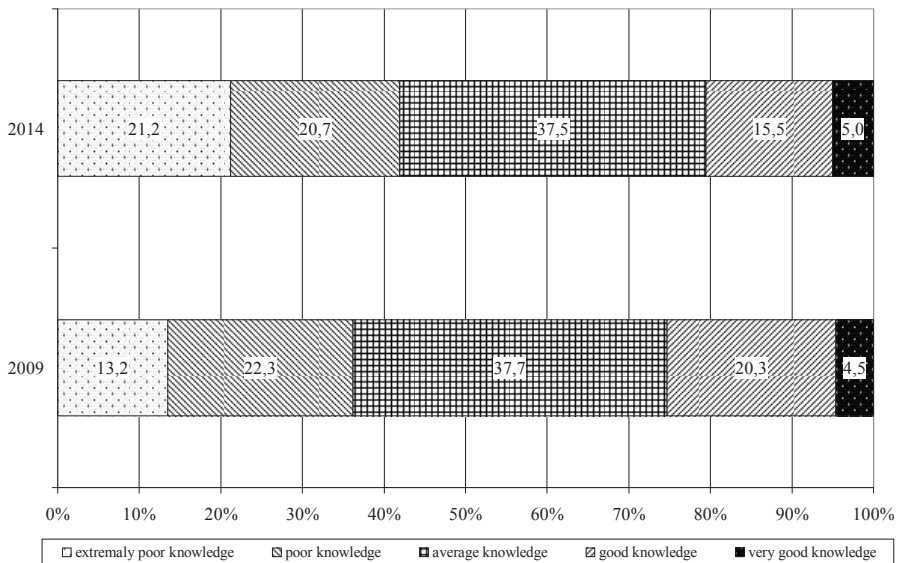


Source: research conducted in 2009 (n=513), 2012 (n=493), and 2014 (n=1163).

Subjective self-assessment of the level of knowledge about the pension system

Research on the self-assessment of the level of knowledge⁶ about the pension system was carried out in 2009 and 2014. The results show that only every twentieth Pole declares a very high level of knowledge about the pension system and, in comparison with the research from 2009, this number has risen only by 0.5 percentage point. Unfortunately, at the same time it can be observed in the analyzed years that there has been a substantial rise in the number of people who assess their pension-related knowledge as very poor — from 13% in 2009 to as many as 21% in 2014. The biggest percentage of respondents assesses their knowledge about the pension system in Poland as medium — the percentage is constant in both studies — 38%. Generally, the average assessment of the level of knowledge has decreased from 2.72 points (max. 5 points) in 2009 to 2.62 points in 2014.

Graph 4. Self-assessment of the level of knowledge about the pension system in Poland



Source: own study on the basis of conducted quantitative study.

The self-assessment of the level of knowledge about the pension system in Poland in a statistically significant way is related to the sex and age of the head of the household, the level of education and its character (economics, or other), occupation and the status of the household (relationships significant for $p=0.05$, on the basis of the independence test χ^2

⁶ Respondents assessed the level of their knowledge about the Polish pension system on a scale ranging from 1 — poor knowledge, to 5 — very good knowledge.

was verified for 10 segmentation variables)⁷. The important features influencing this rating are also spatial variables: the size of locality and the region of Poland. Moreover, the anticipated lifespan is an important determinant of a subjective assessment of knowledge. These relationships are presented in Table 1.

Table 1. Assessment of subjective knowledge according to respondents' features

Variable	χ^2 (p)	Highest grades	Lowest grades
Sex	23.445 (0.000)	male (2.76)	female (2.49)
Age	43.81 (0.002)	60–69 (2.84)	≤ 29 (2.43)
Education	45.37 (0.000)	higher (2.91)	primary and vocational (2.52)
Type of education	24.42 (0.007)	economics (2.88)	other than economics (2.60)
Occupation	71.35 (0.025)	uniformed services (2.86) private entrepreneurs (2.78)	unemployed (2.24) labourers (2.50)
Household status	47.09 (0.005)	all children independent (2.82)	living on their own (2.45)
Size of locality	45.34 (0.001)	≤ 20 thousand inhabitants (2.87)	the country (2.54)
Region	47.82 (0.004)	south (2.70)	north (2.40)

Note: the average assessment was given in brackets (scale range 1 to 5 points).

The table presents the features related to the level of knowledge in a statistically significant way.

Source: own study on the basis of conducted quantitative study (n=1163).

Objective knowledge

The assessment of objective knowledge was made by measuring the spontaneous awareness of pension products for retirement saving and the awareness of the average monthly old-age pension in Poland⁸.

Spontaneous awareness of the options for retirement saving is low. Only 16% of individuals were able to name at least one of the ways of accumulating pension capital within the functioning system of pension coverage. It was assumed that these individuals can be classified as consumers whose level of retirement literacy is high. A substantial

⁷ To prove the statistical significance of the existing relations between the variables in cross tabs the chi square test was chosen. Among all nonparametric tests this one seems to be best known and interpreted among the wide public.

⁸ At the time when the research was conducted, the average pension received from ZUS was at gross PLN 1954.2, which is net PLN 1624.34.

majority of individuals (2/3) when naming familiar ways of saving for old age pointed at products offered in the finance market, which are not directly related to developing pension funds, but enable one to save for other purposes, too. It was assumed that the consumers who named these ways of saving with a view to making one's aging more secure have an average level of knowledge. The last, third group consists of 17% of consumers with a low level of knowledge, who when spontaneously specifying the ways of financial securing one's aging, pointed at ways which are not directly linked to saving or investing.

It is noteworthy that the level of objective knowledge about the ways of saving for old age is in a statistically significant way related to the lower amount of variables than the level of subjective knowledge. The observed dependence was only on the level and type of education, occupation, region and the size of locality.

Another issue used when constructing the indicator of subjective knowledge is the awareness of the average monthly old-age pension. The results of research show that every third person can estimate with high accuracy the current level of pensions, 27.4% of respondents have average, 18.7% — low, and 18.4% — no knowledge about the subject. In this case the level of knowledge in a statistically significant way depends on age, education, occupation, size and status of the household and the region.

Connecting the two issues described above (the knowledge of the ways of saving for old age and the levels of pensions), a synthetic indicator of objective knowledge was constructed (for the description of the contributing variables see above).⁹

When analyzing the obtained results it can be stated that every third person has a high level of objective knowledge in the scope of both analyzed issues, 42.4% have average knowledge and the rest of respondents — have little knowledge. It is worth emphasizing that the factors influencing the level of objective knowledge about the pension system are: the level and character of education ($\chi^2=20.09$ and 15.67 respectively for $p=0.000$), occupation ($\chi^2=41.16$, $p=0.004$), household status ($\chi^2=30.12$, $p=0.001$), income ($\chi^2=39.93$, $p=0.011$) and the region ($\chi^2=30.62$, for $p=0.001$). Such a correlation was not observed for the following factors: sex, age, household size, the size of locality.

As mentioned before, the relation between objective and subjective knowledge may be presented as a matrix displaying three situations:

- objective knowledge is higher than subjective knowledge (underestimating one's knowledge, expected prudent behaviors),
- objective knowledge is equal to subjective knowledge (balance, expected sensible behaviors),

⁹ According to both areas of objective knowledge we have calculated the points for every respondent (0 to 3 for the knowledge of ways of saving and 0 to 2 for the estimated level of pensions). We counted the indicator as a sum of points: 4 to 5 points — high, 2 to 3 — medium, and 0 to 1 — low.

Criterion validity of the indicator was confirmed in the qualitative research — people with more knowledge about retirement savings knew more ways to save for retirement and were able to approximate the average pension more accurately. The nature of the research did not allow for a full examination of the validity and hence the index presented should be considered with caution.

- objective knowledge is lower than subjective knowledge (overconfidence, expected highly risky behaviors).

The situation of Polish households is presented in table 2 and graph 5.

Table 2. The levels of subjective and objective knowledge (size of segments — in %)

		Subjective state of knowledge		
		low	medium	high
Objective state of knowledge	low	10.2	8.4	5.0
	medium	17.9	15.9	8.6
	high	13.9	13.1	7.0

Source: own study on the basis of conducted quantitative study.

When analyzing the relations between subjective and objective knowledge, theoretically it could be expected that they are strongly and positively correlated. However, such a coincidence does not always occur (see.: Carlson et al., 2009, pp. 864–876, Radecki, Jaccard 1995, pp. 107–138). It is also confirmed by the results of research conducted on the inhabitants of Poland. In the case of pension literacy, the relation between objective and subjective knowledge turns out to be statistically insignificant.

When analyzing the featured segments, it must be noted that the most numerous is the one in which the representatives of households underestimate their objective knowledge about the pension system (45%), and the least numerous — the number of people who overestimate this knowledge (22%).

The differences in socioeconomic profiles of the presented group should be noted. Relatively more often individuals who overestimate their knowledge are males (27%), with high per capita income (every third respondent) and with grown-up children (30%). Individuals who assess their knowledge rationally are relatively most often representatives of the biggest households (every second respondent), in particular the inhabitants of the eastern part of Poland (39%). In the segment of individuals underestimating their objective knowledge, relatively prevalent are females (every second respondent), from the households, with the lowest income (55%), and those living alone (59%).

Knowledge vs. Evaluation of the modifications of the pension system and saving for old age

Since its introduction in 1999, the Polish pension system has been constantly modified. These modifications influence the perception of the system and the confidence in the state institutions. It can even be presumed that they also determine the decisions about saving additionally for old age. There is a question whether and how one's knowledge — objective and subjective — influences the perception of these modifications of the pension system and also whether it determines the interest of consumers in acquiring additional pension coverage.

Two fundamental changes in the basis of the pension system were used to verify the hypotheses made in this article:

- in 2011, a part of the pension contribution transferred to OFE by ZUS was lowered from 7.3% to 2.3%,
- in 2014, 51% of assets were transferred from OFE to ZUS, and a possibility was introduced to resign from transferring a part of the contribution to OFE and leave it in ZUS.

Research carried out in 2012 shows that the 2011 decision of the Polish Sejm at the request of the Government of the Republic of Poland to lower the part of pension contribution transferred to OFE by ZUS was negatively evaluated by almost 50% of respondents. (25.4% rated it as very bad, 23.3% — as bad), and only every tenth respondent was positive about it. However, quite a high number of individuals — as many as 39.1%, were unable to form their opinion about this change. It may mean that the modifications of the pension system met with a low level of interest.

When comparing the perception of this modification to the attitudes and behaviors related to saving up for old age, it can be seen that there is a statistically significant relationship between the opinions about the change in legislation and the perception of the necessity to save up for old age ($\chi^2=18.95$, for $p=0.041$). Individuals who are critical of the lowering of the part of the transferred contribution, are usually more likely to believe that one should start saving up for retirement at the moment of starting work. Individuals who are positive about the decision — are more likely to satisfy other needs first, and the individuals who have no opinion in this matter usually believe that additional saving up for retirement makes no sense.

Additionally, when analyzing the relation between this change and using the services offered within the third pillar, a statistically significant relation can be seen (chi-square = 10.004, for $p=0.040$). Among the individuals who were critical of the decision of the government to lower the part of the contribution transferred to OFE by ZUS, prevail those who additionally save up for retirement (61.7%, vs. 45.5% of non-savers), and among individuals positive about the decision, 6.6% save for retirement (12.5% do not save).

Assessing the influence of another modification — the possibility to resign from transferring a part of pension contribution to OFE and leaving its full amount in the ZUS account, it can be also observed that almost half of the respondents had not made a decision about allocating their pension contribution.¹⁰ 23.4% of individuals were strongly convinced about continuing to divide their contribution into both ZUS and OFE accounts (further 16.3% were also willing to make such a decision), and only 5.2% were strongly

¹⁰ The research concerned declarations and was conducted in the first six months of 2014, and the insured individuals were to make a decision about dividing their pension contributions between ZUS and OFE until the end of July of the same year. Enforcing the solution, the government made it difficult for consumers to keep the status quo ante, as keeping the division the contributions between OFE and ZUS required submitting a suitable statement.

convinced that they should gather further contributions only in their ZUS account (further 6.6% also considered this option).

However, it cannot be unequivocally stated that decisions about leaving one's contributions in OFE are connected with deeper knowledge. A lot of individuals with extensive knowledge about pensions are convinced that transferring their contributions to ZUS is a better solution. Therefore, a variable connected with the strength of one's convictions was adapted to the analysis. It was assumed that the strength of one's conviction (both about leaving the funds and transferring them) rises with the level of knowledge (the variable adopts three values: no opinion, moderately convinced, strongly convinced).

When analyzing the strength of one's conviction that the government's decision was right, it must be stated that among the highlighted types of knowledge, statistically significant is only subjective knowledge (extreme opinions are presented only by every fourth person with poor subjective knowledge and as many as 40% of people with high subjective knowledge) The differences resulting from different levels of objective knowledge are statistically insignificant.

A strengthening of these relationships may be expected when taking into account the correlation between objective knowledge (OK) and subjective knowledge (SK). It turns out that in the case of the evaluation of the government's actions, an extreme approach is slightly more often adopted by people whose subjective knowledge is higher than their objective knowledge (overestimating one's knowledge). The confirmation of this correlation can be also seen on the other side: those who underestimate their knowledge relatively more often are unable to unequivocally evaluate the changes taking place in the market.

Table 3. The degree of conviction about the government's decision and the objective to subjective knowledge ratio (in %)

The degree of conviction about the government's decision	Objective knowledge to subjective knowledge ratio		
	OK>SK	OK=SK	OK<SK
no opinion	51.9	46.1	46.2
moderately convinced	23.6	23.0	20.5
strongly convinced	24.5	30.9	33.3

Source: own study on the basis of conducted quantitative study.

When studying the impact of knowledge and the opinions about the modifications of the pension system introduced by the government on actual market decisions (using the third pillar), it was observed that

Use of the third pillar is statistically significant related to the subjective knowledge. Among those who rate their knowledge as poor, only every tenth person uses the third pillar. This percentage rises to almost every fourth person among those who believe that the level of their knowledge about pensions is high (chi-square = 21.208, for $p=0.000$)

There is also a positive and statistically significant correlation between the level of objective knowledge and saving up for retirement (Spearman's $\rho = 0,68$, $p=0,02$), although this correlation is much weaker than in the case of subjective knowledge (Spearman's $\rho = 0,11$, $p=0,000$).

Very weak, but a statistically significant relationship exists also between the perception of analyzed pension system change and saving for old age ($\chi^2=5,92$, $p=0,05$). Among individuals saving at PPE (Employee Pension Plan, IKE (individual retirement account) or IKZE (Individual Pension Security Account) dominate those who have a clearly stated approach to the changes introduced by the government (21.3%, against 13.9% of those who have no clear opinion on the matter).

Conclusion and discussion

As follows from the conducted research, the level of knowledge, both objective and subjective about the pension system is low. Consumers make decisions without doing concrete calculations on their results: "We are totally at sea and try to rationalize our decisions" (quote from the qualitative study). The bases for the decisions made are mainly such factors as the level of expected gains/losses and the confidence in the state.

The research positively verifies both the hypothesis of the relationship between knowledge and the evaluation of the changes in the pension system, and the hypothesis of the relationship between the knowledge and the decisions concerning additional saving. It must be highlighted that evaluations and decisions are associated with the self-assessment of one's knowledge (subjective knowledge) much more than by the actual level of one's knowledge (objective knowledge).

The first of the analyzed changes — decreasing the part of the pension contribution transferred to OFE by ZUS, was negatively evaluated by almost half of respondents. Disapproval of these changes was expressed more frequently by individuals with a higher level of awareness of the necessity to save for old age.

The analyses of the impact of knowledge on the perception of the government's decision to allow resigning from saving at OFE indicate that objective knowledge has no impact on consumers' opinions. What is noteworthy, with the growing level of subjective knowledge, grows not only the number of individuals convinced of the need to divide the contributions between ZUS and OFE, but also of those who believe that the contributions should remain in the ZUS account in full (i.e. the higher the level of subjective knowledge the more often consumers hold extreme opinions — they firmly oppose or firmly support changes). That is why it is impossible to establish an unequivocal relationship between knowledge and the perception of the change introduced by the government. It is also worth emphasizing that a positive correlation occurs between the level of knowledge and saving to secure one's aging. However, also in this case there are stronger correlations within the levels of subjective knowledge.

People who save in order to secure their aging are mainly those who are negative about the government's decision to lower the part of contribution transferred to OFE by ZUS

Moreover, the higher the level of objective and subjective knowledge of individuals, the more frequently they save for retirement.

In the light of the obtained results, the considerable challenge for the government and the institutions linked to the pension system (and for the broadly understood education) is to build financial pension awareness and encourage saving, even with the use of the simplest methods. Because taking into account the forecast low replacement rate, it is necessary to make citizens develop the need to make voluntary pension savings.

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Streszczenie

Problemem badawczym w artykule jest ocena zależności pomiędzy poziomem wiedzy emerytalnej a postrzeganiem zmian przeprowadzanych przez rząd w zakresie systemu emerytalnego oraz związanymi z tym decyzjami konsumentów. W opracowaniu zastosowano procedurę triangulacji metod badawczych. Wykorzystane dane pierwotne pochodzą z jakościowych oraz reprezentatywnych badań ilościowych, będących częścią projektu badawczego realizowanego ze środków NCN (nr UMO-2012/05/B/HS4/04183).

Poziom wiedzy o systemie emerytalnym — zarówno obiektywnej, jak i subiektywnej — jest niewielki. Przeprowadzone badania pozytywnie weryfikują hipotezę o zależności między wiedzą a oceną zmian w zakresie systemu emerytalnego oraz podejmowanymi decyzjami dotyczącymi dodatkowego oszczędzania. W zdecydowanie większym stopniu oceny i decyzje związane są z samooceną własnej wiedzy niż rzeczywistym jej poziomem.

Istotnym wyzwaniem dla rządu i instytucji związanych z systemem emerytalnym jest budowanie finansowej świadomości emerytalnej i zachęcanie do oszczędzania.

Słowa kluczowe: oszczędzanie na starość, zachowania konsumentów, zachowania oszczędnościowe, kompetencje finansowe

Cytowanie

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