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Retirement Risk and the Usage of Financial Products by Current Retirees in a Transition Country: Evidence from Poland

Kamila Bielawska¹ and Krzysztof Łyskawa²

ABSTRACT

In many countries which undergone an economic transition from centrally planned to market economy in Europe, the state old-age pension is the main source of income in retirement. However, replacement rates from public pension schemes have been decreasing. Therefore, supplementary savings for seniors are needed to provide an acceptable standard of living during retirement. We examine the usage of financial products supplementing retirement income of seniors aged 65+ depending on the period of retirement, the financial situation before retirement and socioeconomic status. We use data from the survey carried out in 2018 on the representative sample of Polish seniors aged 65+ for whose households the state old-age pension is the main source of income (1,336 retirees). Logistic regression was performed to study how socioeconomic status, the period of retirement and subjective level of satisfaction with expenses in the preretirement period influenced the likelihood of using financial products (general model) and specific financial products (separate models) for retirement purposes. The general logistic model showed that factors such as a higher level of education, non-dependent work increased chances for using financial products. There are differences between seniors who used particular financial products, derived from separate regression models. A higher likelihood of possessing life insurance products characterized those who performed employment contracts, who used early retirement and retired between 2009-2018. The highest chances for utilizing capital market instruments were those with a higher level of education and performing non-dependent work. The outcomes of the research show that usage of financial products among seniors in Poland is growing and becoming more diversified but still is moderate.

KEY WORDS: retirement risk, retirement planning, financial products, retirees.

JEL Classification: G2, I3.

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1. Introduction

In the countries of Central and Eastern Europe (CEE), which experienced the transition from the centrally-planned to the market-orientated economy, the mono-pillar public old-age pension had been and still is the main source of income during retirement. OECD (2021) reports for CEE countries the noticeable share of the income from work in the structure of retirement sources,

whereas the capital flows still are almost non-existent. It might suggest that public old-age pensions are not sufficient to cover all expenses of retiree household. Most countries of the CEE region have introduced systemic pensions reforms, which will lead to a decrease in replacement rates in the coming decades (European Commission, 2021). Poland is the country that has switched its public pension system from mono pay-as-you-go (PAYG) defined benefit (DB) pillar into the multi-pillar system based on public notional defined contribution

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(NDC) part and funded defined contribution (FDC) pillars both individual and occupational pension plans. In effect, the replacement rates in Polish public pension system calculated on the NDC formula, successively decline. Despite numerous attempts to make retirement savings more attractive, the supplementary pension market in Poland is very small (Szczepański et al., 2022) and is too young to pay pensions (Dybał, 2017). One of the possible reasons for the scarce development of the private savings for retirement is lack of social awareness of the results of the pension reform (Koczur & Szumlicz, 2018). It may be also connected with the perception of retirement risk and the response to this risk by the individuals (Kawiński & Szumlicz, 2021).

Without working longer (Góra, 2013) and additional retirement saving, retirement risk of following generations of retirees will increase. This paper aims to examine factors which determined possession of retirement savings in form of different financial products by seniors, who retired between 1980 and 2018. We use microdata from the survey carried out in 2018 on the representative sample of seniors aged 65+ for whose households' the old-age pension from the social insurance system managed by Zakład Ubezpieczeń Społecznych (ZUS) (1,336 pensioners who retired between the 1980's up to 2018) is the main source of income. Using logistic regression models, we examine how gender, educational level, source of income before retirement, level of consumption satisfaction and the period of retirement influenced the likelihood of using financial products to secure additional financial resources for retirement in general and specific financial products such as cash or bank deposits, capital market instruments and life insurance. The paper is divided into five sections. We start with a review of the literature on the importance of retirement planning and its determinants. Then we briefly discuss the research corresponding to the financial behaviour and its outcomes for Polish households, including seniors aged 65+. Next, we present the data, methodology and hypothesis, which are followed by the description of the results and discussion. The last section concludes.

2. Literature Review

The engagement and aims of the state in old-age pension provision have evolved through decades, starting from poverty relief in an advanced age to

consumption smoothing over the life cycle (Barr & Diamond, 2006; Chybalski & Marcinkiewicz, 2016; Krause et al., 1997). However, the process of dynamic ageing of the population and maturity of public pension systems in developed countries, make the states rethink the scope of public intervention and level of old-pensions paid to current and future generations of retirees (Guardiancich, 2013; Rein, 2004). In the countries of Central and Eastern Europe which experienced the transition from the centrally-planned to the market-orientated economy, the mono-pillar public old-age pension had been and still is the main source of income during retirement (Żukowski, 2013). According to the OECD data in 2005 it counted for 70-80% of retirement income in Poland, Hungary, Slovakia and Czech Republic (OECD, 2011). More recent OECD (2021) data show the growing importance of income from work (up to 30-40%) in the income structure of current retirees (Figure 1). Therefore, it might suggest that public old-age pensions are not sufficient to cover all retirees' household expenses. In Poland, beneficiaries of the old-age pensions in the social insurance scheme tend to apply for the benefit as soon as possible (when they reach the minimum statutory retirement age) and continue to be economically active for at least few years (Bielawska, 2019).

Concurrently, retirees have no other significant sources of retirement income, namely, capital flows from pension plans or general savings. In CEE countries, the level of private savings is rather low and highly dependent on income (Kolasa & Liberda, 2015; Marcinkiewicz, 2017).

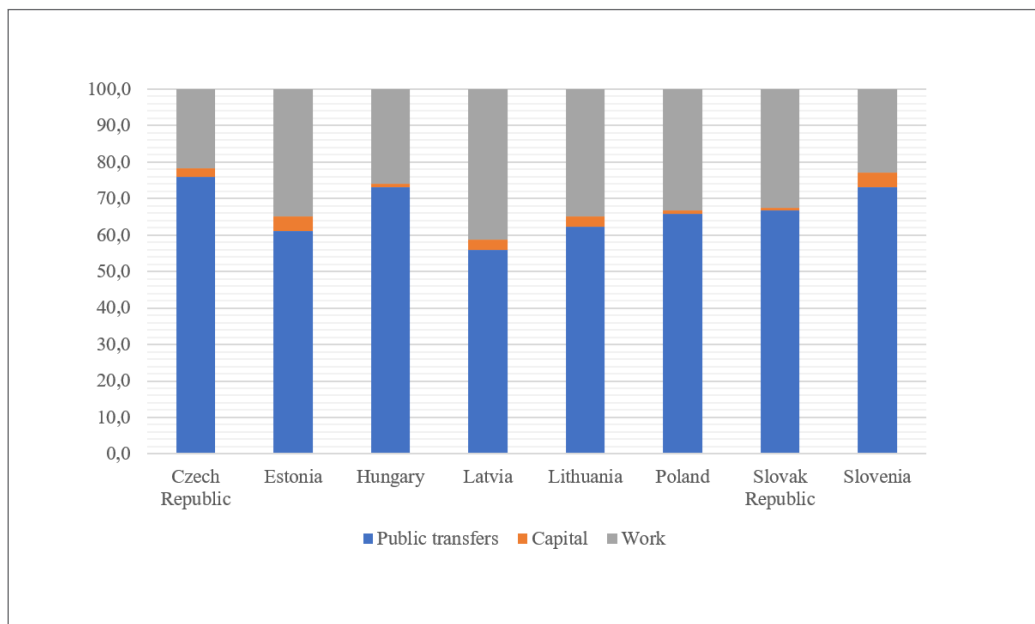
Most countries of the CEE region have introduced systemic pensions reforms, which will lead to a decrease in replacement rates (European Commission, 2021). The impact of these reforms is differentiated among the CEE countries and will gradually materialize in the lowering of replacement rates. Some of these structural reforms comprised building the private funded pillar(s) both mandatory and voluntary, to boost financial markets and retirement saving. There is evidence of the positive influence of reforms in CEE countries on the development of capital markets (Cosmin et al., 2015; Hryckiewicz, 2009). However, the usage of financial products require financial literacy (Lusardi & Mitchell, 2014) and trust to financial institutions, which in countries like Poland is

low (Bielawska & Turner, 2023). Since the economic transition in Poland, the financial system in Poland, like in other countries of the region, is bank-oriented and bank deposits and cash constitute about 80% of the households' assets (Narodowy Bank Polski [NBP], 2022).

Poland is the country that has switched its public pension system from mono PAYG DB pillar into the

multi-pillar system based on public NDC part and FDC pillars both individual and occupational pension plans. Since 1999, when the systemic reform was introduced, a lot of parametric changes, as well as reversal from the mandatory funded pillar, occurred. In effect, for more and more retirees the NDC old-age pension becomes the main and often sole source of income in retirement. Although the NDC formula grad-

Figure 1
Sources of Retirement Income of Older People in CEE Countries, 2018



Note: Income from work includes both earnings (employment income) and income from self-employment. Capital income includes private pensions as well as income from the returns on non-pension savings.

Source: own elaborations based on: OECD (2021), *Pensions at a Glance 2021: OECD and G20 Indicators*, OECD Publishing, Paris, <https://doi.org/10.1787/ca401ebd-en>

Table 1
Gross Replacement Rate of Old-age Pension from Social Insurance in Poland (%)

Year	2000	2005	2010	2015	2020	2021	2022
Gross replacement rates (%)	63.7	66.6	62.2	61.5	54.8	53.5	52.1

Source: own computation based on ZUS data.

ually affects the pension levels from the public system, the replacement rates in the Polish public pension system decline (Table 1). Without additional retirement saving, the retirement risk of following generations of retirees will increase. We define the retirement risk as the inability to cover individual needs the old age (Łyskawa, 2004). Operationalization of such a subjective approach to retirement risk by Bielawska and Kozłowski (2024) allowed for the identification of the share of current retirees' households with materialized retirement risk, which is especially high in one-person households (over 50%). The retirement risk may be (at least partially) mitigated by retirement planning, including possession of retirement savings. Retirement savings may be boost by systemic factors (introduction or development of occupational and/or individual pension plans which may be mandatory or voluntary with tax incentives) as well as individual decisions.

The literature review provides a lot of research on factors influencing the measures taken to secure resources for old age. The factors studied most often include socioeconomic status (age, gender, education, income) as well as financial literacy and financial behavior.

In terms of gender, it was proved that being a male predisposes one to have more savings than women (Clare, 2004; Fisher, 2010; Quick & Moen, 1998;). The most commonly cited explanations for this are factors such as lower earnings of women for the same type of work than men, less dynamic and shorter careers (Chłóń-Domińczak, 2010). Therefore the gender effect may depend on the income level, what was confirmed by Vivel-Bua et al. (2019). However, as noted by Noone et al. (2010), as the traditional gender roles are becoming more egalitarian over time, this trend may change and will need further research. Another possible explanation for the lower probabilities for women to save for retirement is lower level of financial literacy (Kumar et al., 2019). Women are also perceived as more conservative investors and more risk-averse than men (Faff et al., 2008; Grable, 2008), what may affect the selection of the form of retirement savings.

Educational attainment is a documented determinant of retirement planning. Better educated and high earners (Grable & Lytton, 1997; Joo & Grable, 2005;

Tinofirei et al., 2023) are better prepared for retirement than others. Vivel-Bua et al. (2019) specify three potential channels through which education might positively affect the retirement planning process, including the amount of savings, that is: "the greater earning potential of individuals with higher educational levels; their better abilities to engage in financial planning; and their lower costs of entry – information, search, etc. – to the financial market."

Feng (2018) proves that not only age, economic and financial status or job characteristics, but also lack of awareness about necessity of retirement savings and past saving habits affect the voluntary savings. Financial behavior, which is defined as individual's actions to shape the financial situation and financial well-being (i.e. active saving, budgeting), is positively correlated with retirement planning (Chua & Chin, 2022).

In this research, we concentrate on retirement planning expressed as possessing financial products to mitigate retirement risk by seniors who retired over the last thirty years in Poland (between 1980 and 2018). We also analyze if changes in material status combined with the introduction of structural pension reform in Poland in 1999 affected the financial preparedness for retirement, especially among the "youngest" retirees, who are already affected by the change in the calculation of old-age pension from the public system (since the year 2009). Those who retired at the beginning of the transformation of the Polish economy did experience unemployment and hyperinflation, which had not fostered savings. Despite the favorable economic conditions in Poland through the last thirty years, the level of savings of Polish households is still low from the perspective of the economy and individual household. According to the last edition of Social Diagnosis (Batorski et al., 2015), 45% of households declared possessing savings, comparing to 23%-24% in the first waves of this study carried out in 2000, 2003 and 2005 (Batorski et al., 2015). It mainly results from the improvement in the income of households and is in line with other mentioned before research. Published so far results based on Social Diagnosis 2015 (Batorski et al., 2015) indicate, the 65+ years olds tend to have the highest odds for having savings in comparison to the reference group (45-54 years old), what is, as authors state, "an opposition to the hypothesis of life-cycle". The structure of savings

of Polish households slowly changes over the decades, however, the main form constitutes bank deposits and cash with the insurance and investment products below 10% of total household savings.

Walczak and Pieńkowska-Kamieniecka (2018) referring to the Social Diagnosis database 2015 proved that differences in financial behavior between men and women also exist in Poland and they support the outcomes briefly reported earlier for western countries. Olejnik and Białowąs (2015) positively verified the hypothesis linking the knowledge about pension reform with additional savings for retirement. Studies by Pieńkowska-Kamieniecka et al. (2019) and Solarz (2020) confirm the significant role of the level of income for making additional retirement savings as well as the role of financial literacy and retirement awareness as a predictor of voluntary savings in Poland.

3. Data Sources and Methodology

In this paper we use data collected during own quantitative research in the form of individual (face-to-face) interviews performed on the random, representative sample of seniors aged 65+ for whom the public old-age pension is the main source of income ($n=1,500$). As paradigmatic changes in the pension provision faced mainly those who were covered by social insurance system, we extracted the sample of 1,336 respondents receiving the old-age pension from the main social insurance scheme (managed by Social Insurance Institution – ZUS). Interviews were carried out in 2018.

The questionnaire contained a wide range of questions concerning the pre-retirement and post-retirement financial situation, sources of income, satisfaction with the consumption levels, individual replacement rates, timing and drivers of retirement decision, retirement planning as well as socio-demographic features of the respondents such as level of education, profession, household composition and area of residence.

Data analysis was aiming to examine factors related to retirement planning by securing financial resources for retirement by current retirees prior to retirement. Firstly, the structure of the data was analyzed to identify variables that may be significantly different in sub-populations when compared to the whole population. To check if the differences in proportions are statistically significant an N-1 chi-squared test was used.

The selection of independent variables was based on the results of research in this field presented in the literature review, namely, gender, level of education, source of preretirement income. We also used the variables representing the level of subjective satisfaction with consumption level prior to retirement what may explain the retirement savings priority. It was also interesting to see if pensioners retiring since 2009, for whom the old-age pension was calculated (as a general rule) on NDC basis, were more eager to save for retirement. The structure of the sample presented in Table 2 allows comparing the response variable (trying to secure funds prior to retirement) with subsamples determined by gender, education level, source of income prior to retirement, year of retirement and self-evaluation of individual income prior to retirement.

Among respondents, 45% declared that they have tried to secure financial resources for retirement (39% of women and 50% of men). The most common financial instrument used is cash or bank deposits. Only 11% of respondents declared investments in capital market instruments (direct: shares, bonds or indirect via investment funds) and 9% had had life insurance. These proportions differ in terms of gender – significantly more men had tried to secure the funds in general, in cash and capital market instruments. The difference in possession of life insurance is not statistically significant.

Differences also arise when the sample is divided by the level of education, with a tendency for more educated people to try to secure funds more often. Among people reporting the post-secondary education level, over 63% reported retirement savings. In this group, the percentage of respondents reporting investments in capital market instruments was also the highest in the sample (19%).

In terms of the source of income prior to retirement, significantly fewer people had tried to secure any funds when being paid with social benefits. On the other hand, being employed on a contract for a specific job or running own company or sole proprietorship seems to determine more retirement awareness and financial planning. The old-age pension for entrepreneurs who had paid the minimum contributions for social insurance was close to the minimum guaranteed pension. Therefore the motivation for own actions should be higher. Entrepreneurs were also more eager

to undertake investment risk when securing financial resources for retirement. The share of respondents in this subsample declaring investments in capital market instruments (20%) was higher than in the general sample.

There are significant differences between groups divided by the financial situation before retirement – with more cases of securing the funds for people with a better situation. What is interesting, the highest percentage of respondents reporting measures to secure funds for old age were those who declared that they had had sufficient income to satisfy consumer needs when properly managed (54%). This share is slightly higher than in the households who declared that they had enough money to cover their needs without any effort. This result underlines the role of financial planning in generating private savings.

When looking at the year of retirement, fewer people tended to secure funds when they retired in earlier years (1980-1998) with the highest prevalence in the most recent period (2009-2018). More than half of them used financial instruments for the retirement purpose. Also among this subsample the share of those using capital market instruments as well as life insurance is significantly higher than in the general sample. Most the declared life insurance products are group insurance which was offered by employers to employees. Although the usage of long-term saving instruments was increasing among the following retirees, it still may be perceived as very low. One of the reasons for this situation may be the low level of trust in financial institutions (Batorski et al., 2015).

Preliminary analysis of the structure of the sample and the dependent variables combined with the review of previous research as well as a deficit of knowledge of changes in saving patterns of young retirees has led to formulating the following hypotheses:

(H1): Being a well-educated men performing non-dependent work prior to retirement in Poland predestinates to have retirement savings

(H2): Seniors retiring in 2009 and onwards are more likely to have retirement savings

(H3): Retirees who were satisfied with fulfilling their consumption needs prior to retirement are more likely to secure financial resources for retirement

Basing on the chosen set of variables, the binominal logistic regression model was estimated. The goal

of the logistic regression analysis was to identify significant features related to securing funds in (a) any form, (b) in a form of cash or bank deposits, (c) in a form of capital market instruments (bonds, shares, investment funds) or (d) in a form of life insurance. Taking into consideration the size of the sample and the structure of obtained answers a binominal logistic regression was chosen as the most suitable decision model. The sample was too small and some answers too scarce to build a comprehensive multinomial logistic regression model, so four separate models were built. In order to estimate the conditional probability (P_i), that a participant has any additional security of funds for retirement described by a given vector of values of independent variables (x_i), a logit model for the binary variable was constructed. The choice of such a model was based on the fact that it is easily interpreted in terms of changes in the odds ratio. Since respondents were described by a number of qualitative characteristics, individual variants of such characteristics were entered into the model through the corresponding binary variables, with one variant of a characteristic being taken as the baseline variant (the "-" descriptors in Table 3). In order to assess which of the distinguished groups of factors (objective: e.g., education attainment level, source of preretirement income - or subjective: income sufficient to meet consumption needs before retirement) allows more accurate classifications. The different groups of variables were entered into the model separately (three different models), and finally the model was estimated with all variables. It should be noted that backward step elimination of statistically insignificant variables was applied in each case. Evaluations of the model parameters and their most important characteristics are included in Table 4. In determining the classification matrix, the optimal Cramer's cut-off point was used. Significance of variables was assessed based on the p-value calculated for the Wald significance test. A variable was considered significant if the p-value was below the significance level of 0.05. Accuracy Ratio indicates a value above 0.6. To infer whether the insignificance of a variable may be due to high estimation errors, related to collinearity of variables, VIF was also determined (Table 5). The problem of collinearity was not found, as the VIF values are close to unity.

Table 2
Structure of the Analyzed Sample

	n	Tried to secure any funds		a. in cash & bank deposits		b. capital market in- struments		c. life in- surance	
		[%]		[%]		[%]		[%]	
Total	1336	45.0		38.6		11.2		8.8	
Gender	1336								
Female	626	38.8	**	32.4	**	7.8	*	7.5	
Male	710	50.4	*	44.1	*	14.1	†	10.0	
Education	1336								
Primary	49	16.3	***	14.3	***	2.0	*	0.0	*
Basic professional	177	26.6	***	23.7	***	3.4	**	3.4	*
Secondary	486	42.4		37.7		7.2	*	6.4	†
Post-secondary	145	63.4	***	57.9	***	18.6	**	10.3	
Higher	479	51.8	*	41.8		16.7	**	13.8	**
Source of income prior to retirement	--								
Contract of employment	946	47.3		39.7		11.4		9.9	
Contract of mandate	70	60.0	*	52.9	*	10.0		11.4	
Own company/sole proprietorship	133	63.2	***	59.4	***	20.3	**	9.8	
Social benefits	240	29.2	***	25.4	***	7.5	†	7.9	
Year of retirement	1263								
1980-1993	112	30.4	**	25.9	**	2.7	**	2.7	*
1994-1998	127	32.3	**	29.9	†	7.1		1.6	**
1999-2008	548	44.3		36.7		10.4		8.0	
2009-2018	476	53.2	**	47.1	**	15.1	*	13.2	**
Self-evaluation of income prior to retirement	1276								
Suff. for everything	258	53.1	*	41.9		18.6	**	15.9	***
Suff. for everything, if managed	584	54.3	***	47.6	***	13.4		8.2	
Requiring a very cost-eff. management	311	33.8	***	30.5	**	5.1	**	7.1	
Suff. only for basic expenses	123	25.2	***	21.1	***	3.3	**	4.1	†

Notes: Table presents number of respondents responding positively to each question and corresponding percentages of these subsamples who also retired earlier. Statistical significance of difference between total average and each subsample's average: † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

^a – multiple choice question

4. Results

Logistic regression results are presented in Table 3. Modelling allowed for positive verification of hypothesis (H1). Men had had higher chances to secure financial resources for the retirement period than women. They also had significantly higher chances for using in that purpose capital market instruments and cash or bank deposits than women. The level of education appeared to be a significant factor for retirement savings for Polish seniors. People with a lower than the secondary level of education had lower chances to secure any funds for retirement. It is understandable, as these workers usually have had lower salaries and if were in the production age during economic transformation, might be suffered from structural unemployment. People with post-secondary education had a higher chance of having retirement savings and also significantly the highest probability of using capital market instruments for retirement purposes (odds ratio 2.74). Retirees with higher education level had significantly higher chances to utilize life insurance as a retirement product. The form of economic activity had a statistically significant role in securing financial resources for retirement and its form. The most prudent persons appeared the self-employed, who had almost twice higher chances to have savings for retirement. Insurance products were the most popular among employed persons.

Persons retiring between 2009 and 2018, had a higher likelihood of collecting retirement savings. This group of respondents also had a significantly highest odds ratio for utilizing the life insurance as a retirement product. This outcome leads to positive verification of hypothesis (H2).

One of the most interesting results which derives from the analysis of the satisfaction of consumption levels (extend to which respondent income prior to retirement covered his consumption needs). Among those who reported sufficient income to cover consumption needs prior to retirement, respondents who managed their expenses, had higher chances to have retirement savings than those who may allow to satisfy consumption needs without any restrictions. Therefore, the hypothesis (H3) was positively verified. The last result underlines the role of usage of the household budget and management of expenses in order to create long-term savings and therefore the role of financial literacy understood as knowledge, awareness and skills combined.

5. Discussion

The outcomes of this research, in general, support the results on socio-economic status (SES) in retirement planning. In terms of gender, man had had the higher chances to save for retirement. They also tended to use more sophisticated financial instruments. Higher level of education corresponded with having retirement savings. Preretirement sources of income also played a role as significant driver of households retirement savings and its structure.

Our research adds to existent data on the savings and their structure among people 65+ in several ways. First of all, it is based on the actions undertaken prior to retirement by different cohorts of retirees in the long run (1980-2018). We also prove, that not only having sufficient income is connected to the creation of retirement savings, but reasonable management of financial resources is also important. It corresponds with the outcome of other research (Chua & Chin, 2022) on the role of financial behavior on retirement planning. Looking into the future, where the next generations of retirees can expect lower pensions from the public pension system, the importance of increasing financial literacy and retirement planning should gain more attention and action. It should be also accompanied by the efforts to make the financial products more transparent and easier to understand by non-specialist. Recent research shows (Hadryan & Rutecka-Góra, 2023) that 'the language of agreements on individual pension products is very difficult and their understanding requires higher education or expertise in the field of finance.

6. Conclusion

The systematic decrease in replacement rates of Poles from the public pension system will lead to an increase in retirement risk defined as the possibility of not gaining resources sufficient for financing individual needs after retiring. Our research confirms that there are significant factors that affected pension awareness and led to securing at least some resources to supplement the public old-age pension of the current retirees. They comprised: gender (being a man), higher than the secondary level of education, non-dependent work which usually means lower old-age pension levels than for employees. In our research, the youngest retirees (those who retired between 2009

Table 3

Logistic Regression With: Gender, Education, Source of Income Prior to Retirement, Year of Retirement and Self-Evaluation of Own Income Prior to Retirement as Predictors of Trying to Secure Funds Before Retirement in any Form, in Form of Cash, in Shares or Bond or in a Form of an Insurance Policy (4 Separate Models)

	Tried to secure any funds		a. in cash & bank deposits		b. capital market in- struments		c. life insur- ance	
	[OR]		[OR]		[OR]		[OR]	
Gender								
Female	--		--		--		--	
Male	1.44	**	1.43	**	1.54	*	1.06	
Education								
Primary	0.37	*	0.36	*	0.48		0.00	
Basic professional	0.59	*	0.63	*	0.40		0.48	
Secondary	--		--		--		--	
Post-secondary	2.05	***	1.94	**	2.74	***	1.50	
Higher	1.18		0.97		2.28	***	1.93	**
Source of income prior to retirement								
Contract of employment	1.16		1.15		0.87		2.52	*
Contract of mandate	1.74	†	1.61	†	0.57		1.14	
Own company/sole proprietorship	2.16	**	2.43	***	1.61		1.70	
Social benefits	0.66	†	0.67	†	0.84		1.97	†
Year of retirement								
1980-1993	0.55	*	0.62	*	0.23	*	0.33	†
1994-1998	0.63	*	0.75		0.81		0.25	†
1999-2008	--		--		--		--	
2009-2018	1.28	†	1.37	*	1.31		1.85	**
Self-evaluation of income prior to retirement								
Suff. for everything	1.56	*	1.23		2.65	**	1.56	
Suff. for everything, if managed	1.74	***	1.65	**	1.89	*	0.84	
Requiring a very cost-eff. management	--		--		--		--	
Suff. only for basic expenses	0.73		0.67		0.51		0.68	
Intercept	0.41	***	0.34	***	0.04	***	0.03	***

Notes: a = multiple choice questions (thus no reference variables). The table reports odds ratios (OR). All variables were entered into the model simultaneously. p -values: † $p < 0.1$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4
Evaluation of the Logistic Regression Model

Model	Classi- fication cutoff	Cox & Snell's pseudo- R2	Nagelker- ke's pseudo-R2	True Negative Ratio	True Positive Ratio	Accuracy Ratio	Cohen's kappa
Tried to secure any funds	.4499	.1251	.1673	.5925	.7128	.6469	.3530
a. in cash & bank deposits	.3862	.1082	.1468	.6200	.6545	.6334	.3170
b. capital market instru- ments	.1115	.0791	.1572	.6168	.7801	.6350	.2376
c. life insurance	.0883	.0583	.1293	.5847	.7679	.6010	.1826

Table 5
Variance Inflation Factor of Used Variables

Dummy Variable		VIF
Gender	Male	1,1621
	Primary	1,0970
Education	Basic professional	1,2948
	Post-secondary	1,1972
	Higher	1,3954
Source of income prior to retirement	Contract of employment	2,6148
	Contract of mandate	1,0599
	Own company/sole proprietorship	1,6552
	Social benefits (excl. survivors pension)	2,1089
Year of retirement	1980-1993	1,1358
	1994-1998	1,1375
	2009-2018	1,2730
Self-evaluation of individual income prior to retirement	Sufficient for everything without saving	1,5802
	Sufficient for everything, if managed	1,6601
	Sufficient only for basic expenses	1,2403

and 2018) seem to be more aware of retirement risk and have had higher chances to provide individual retirement savings in more differentiated forms (not only bank deposits or cash). They also seemed to use more sophisticated products like life insurance.

The carried research also underlines the importance of financial behavior (i.e. usage of the household budget and expense management) as a factor allowing for the creation of long-term savings. Therefore, the role of financial literacy and how it translates into financial behavior is crucial for making retire-

ment planning available for future retirees. One of the most efficient channels of strengthening financial literacy and behavior in terms of retirement planning might be employer-provided education (Joo & Grable, 2005). Such a solution could be effective in Poland, because as of 2019, employers in Poland are involved in the process of ensuring retirement savings by having to set up auto enrollment-based pension plans, in which participation is slowly but steadily increasing.

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