

DISCUSSION PAPER SERIES

IZA DP No. 11830

**Pension Strategies of Workers in a
Country Getting Old before Getting Rich**

Sonia Buchholtz
Jan Gąska
Marek Góra

SEPTEMBER 2018

DISCUSSION PAPER SERIES

IZA DP No. 11830

Pension Strategies of Workers in a Country Getting Old before Getting Rich

Sonia Buchholtz

Warsaw School of Economics

Jan Gąska

Warsaw School of Economics

Marek Góra

Warsaw School of Economics and IZA

SEPTEMBER 2018

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ABSTRACT

Pension Strategies of Workers in a Country Getting Old before Getting Rich

The downward trend in replacement rate is going to affect the material wellbeing of Polish future retirees. The aim of this paper is to identify the pension strategies working Poles undertake to counteract future deterioration in material conditions, with particular interest in saving practices and labour market activity. We make use of the Pension awareness of Poles survey data (N=1006) and apply quantitative methods: binary logistic regressions and principal component analysis (PCA). We distinguish between first-best and second-best strategies. The former relates to accumulating pension wealth, while the latter to the range of actions aimed at making ends meet, provided insufficient benefit. The results show that there is a poor relationship between knowledge, plans and behaviour. Moreover, knowledge itself is limited. Even though the awareness of the worsening conditions of retirees-to-be is increasing, little is being done to counteract it. Among various demographic and socio-economic descriptors income and education play an important role in distinguishing patterns, as well as status of self-employed. Three second-best strategies have been distinguished: own responsibility, external support, rebellion. We conclude that information policy on the pension system should be improved, and the incentives for older workers to continue their careers should be strengthened.

JEL Classification: J26, D14, D91

Keywords: pension system, population ageing, supplementary saving, labour force

Corresponding author:

Sonia Buchholtz
Department of Economics I
Warsaw School of Economics
Madalińskiego 6/8, Room 228
02-513 Warszawa
Poland

E-mail: sonia.buchholtz@sgh.waw.pl

INTRODUCTION

Even though population ageing is a common challenge for developed countries, none have been hit as hard as the Central and Eastern European (CEE) countries in recent decades. The demographic shift, which took place in the 1980s and 1990s, included a significant improvement in life expectancy, and a huge drop in fertility rates to levels around the lowest-low fertility. No circumstances herald a reversal in any of these trends. The representatives of the late 1940s/1950s post-war baby-boom are exiting labour markets on a massive scale, and the burden of prolonged economically inactive lives must be borne. Favourable age structure can no longer fuel pension systems. Their long-term sustainability is threatened, unless the system is ageing-proof (i.e. automatically adjusts to changes in demographic structures).

Such a universal ageing-proof pension system was introduced in Poland in 1999. Its implementation resulted from the 1993 ruling of the Constitutional Tribunal calling for a systemic reform aimed at creating a financially sustainable pension system. Similar calls were issued by international bodies worldwide [World Bank 1994, OECD 1996]. Despite several cases of misuse for current political goals and ad hoc tweaks, the main principles of the Polish pension system have remained unchanged for 20 years. These include: strong emphasis on income allocation over the life course, transparency, and direct link between contributions and benefits, fulfilled within joint non-financial and financial defined contribution (NDC and FDC, respectively) scheme (cf. [Góra & Palmer 2004]). Contributions are collected on individual accounts, and the amount of benefit (in the form of an annuity) is calculated by dividing account value by unisex life expectancy at the age of retirement for the individual's cohort.

From the perspective of a retiree-to-be, this design has clear consequences. One has three options to increase their old-age pension: by raising the sum of contributions, by increasing the contributing period, by shortening the period of receiving benefits (i.e. delaying retirement). Extraordinarily high rates of return are least likely. The amount of benefit may be increased by supplementary pensions. Apart from the obligatory part, individuals have additional tools for supplementary pension saving [Buchholtz, Chłoń-Domińczak, Góra 2018]. Individual account statements including estimated future benefits are sent regularly to the system participants to make them aware of the future benefit levels. All in all, the key message for an individual is that the responsibility for own pension is passed on oneself. Individuals who do not contribute much or do it infrequently should expect low benefit levels. This in particular refers to the cases of low labour participation, interruptions in working careers, fixed-term contracts (only recently and partly covered by contributions) and work in the shadow economy – all of which occur in Poland [Buchholtz, Chłoń-Domińczak, Góra 2018].

When the amount received is the result of actions undertaken during over forty years, the range of possible decisions is wide, the environment - dynamic, and responsibility is borne individually, the role of rational management increases. Rational management is a complex issue, though. This is a combination of actions over the whole period of participation in the pension system, preceded by plans, formulated on the basis of best knowledge and logical preferences. In consequence, informational deficiencies, as well as short-term perspective and avoidance of necessary actions (procrastination) exacerbate the individual's financial standing.

There is also an additional historical background to be mentioned. The twentieth century hit the CEE countries hard economically, and Poland was not an exception here. First, world wars destroyed fixed capital and decimated working-age populations. Second, the subsequent period of socialist economy successfully undermined incentives for long-term saving due to property nationalisation programmes, currency denominations, periods of high inflation and inefficient governance. Three decades after the fall of the Iron Curtain have not changed saving habits dramatically. Even though the economy has grown at a decent rate annually, and the financial crisis did not affect it much, doubtlessly Poland is the case of a country which will get old before getting rich. There is no prospect of an extensive support for impoverished elder individuals given the negative demographic dividend. The more so, if one keeps in mind the challenge to intergenerational solidarity from increasing contribution rates and higher burden resulting from the need to finance benefits for the last generation of pensioners from the previous, traditional system. In consequence, several actions may be undertaken to maintain decent living standards in the last stage of life: investment in long employability, increased savings and raising children that would care for elder parents. Each of them is a form of income allocation over the lifecycle.

The objective of this paper is to examine the strategies of maintaining consumption in the last stage of life by Polish retirees-to-be. Keeping in mind the historical context, we consider strategies regarding more and less favourable material conditions. In addition, we identify the determinants of actions taken, and perform strategy segmentation with regard to their demographic and socio-economic characteristics. To our knowledge, such analysis has not yet been performed for any CEE country, mainly because of the lack of adequate datasets. In particular, such study has not been conducted for countries with NDC+FDC pension schemes. We assume that in such an environment strong link between contributions and resultant pension wealth should affect individual saving strategies.

The remainder of the paper is organized as follows: Section 2 reviews the literature on individual retirement decision-making process. Section 3 is devoted to the description of the

methodological issues and the analytical strategy. Section 4 presents the results of the empirical analysis, distinguishing first-best and second-best solutions. Section 5 discusses the results in the context of population ageing, social purposes of the pension system and future social policy. Section 6 concludes with several recommendations.

LITERATURE REVIEW

RATIONAL RETIREMENT STRATEGY AND CAUSES OF IRRATIONALITY

The journey leading individuals to optimal retirement savings decisions is quite long. First of all, one needs to be informed about possible options on retirement savings, needs to know future replacement rates and how pension savings work. In that context, financial literacy is important in shaping retirement decisions. The second step is to decide on a particular behaviour and create a savings plan regarding future retirement. Thirdly, individuals need to stick to this plan and save the planned amount regularly. Only after this step, retirement behaviour is complete and affects the welfare of a given individual [Hershey et al. 2010]. As we show further, actual behaviour of individuals found empirically is far from perfect, which leads to inefficiencies.

The catalogue of behavioural reasons for the difficulty of retirement planning is quite wide and involves the following problems [Knoll 2011]:

- the existence of statutory retirement age and contributions in most countries provide a behavioural *anchor* for retirees i.e. some specific strategies that serve as default. Diverting from these strategies requires effort and therefore suboptimal behaviour may be chosen instead [Tversky & Kahneman 1974];
- *loss aversion* linked to the reference point may also shape people's decision-making – individuals are very reluctant to sacrifice what they have already earned, regardless of its long-term impact [Tversky & Kahneman 1991];
- *affective forecasting* which can be broadly described as a tendency to inaccurately predict future mental states after a certain event. In case of retirement, people tend to overestimate happiness resulting from additional leisure time [Gilbert & Wilson 2007]. Moreover, *impact bias* leads them to perceive the change as more influential than it actually is. On the other hand, they do not take into account the need to accommodate negative events (such as prolonging work) [Gilbert & Wilson 2003];

- *hyperbolic discounting*, which implies time-inconsistent preferences and higher discount rate while approaching the statutory retirement age, may in particular lead to preference towards early benefit reception [Bidewell et al. 2006];
- *planning fallacy* – as people tend to underestimate the time needed to complete a given task, they start saving for retirement too late and too little to accrue sufficient retirement capital. Moreover, future retirees tend to overestimate return rates on their savings [Armor & Taylor 2002];

The abovementioned behavioural problems are further supplemented by multidimensionality of factors affecting the retirement decision, making it one of the most complex and difficult financial undertaking over the entire course of life. Moreover, decision on retirement timing is taken only once in a lifetime and, therefore, individuals cannot learn how to behave through *learning-by-doing* process or use every day heuristics to improve the decision-making process. In other words, pension savings as well as the decision on the timing of retirement are the so called *credence goods*, whose quality can be assessed only after the product is purchased and decision is made. In case of retirement plan or pension savings, quality cannot be evaluated, because the consumer has no previous experience with that kind of product and benefits are known only after a long period of time [Gottschalk 2018]. There are many studies on the impact credence goods characteristics on sellers' behaviour (see e.g. Kerschbamer and Sutter [2017] for a review). Conversely, buyers' decisions regarding this kind of goods are more often driven by emotions, such as fear or trust, which also affects retirement behaviour [Johnson & Grayson 2005]. Consumers are also reluctant to devote much time on the decision process and they are confused by the wide range of choices [Harrison et al. 2006].

EMPIRICS OF FINANCIAL LITERACY

Financial literacy is considered to be a necessary, yet not sufficient, precondition of various rational financial decisions, including those related to pensions. Financial savvy is perceived as necessary in long-term decisions, as it helps in assessing relative profitability and portfolio risks. Sound pension wealth requires some insight in survival probabilities, investment rates, expected values, opportunity cost, as well as compound interest, risk diversification, real rate of return, etc. By contrast, financial illiteracy is characterized by diminished probability of planning for retirement, increased propensity to excessive consumption, lower saving rate, suboptimal portfolio, overpaying for financial services, making more errors, and higher probability of abuse. Not surprisingly, financial illiteracy often leads to premature retirement [Klapper et al. 2012]. As Fornero & Lo Prete [2017] show on a sample of 21 European countries

in previous 20 years, insufficient financial knowledge also increases the electoral costs, which are borne by whole societies.

There is a consensus when it comes to individual-level characteristics correlated with high and low financial literacy levels. In general, most knowledgeable are prime-agers (however, age and cohort effects are significant), men (especially married ones), individuals with better educational background, and urban dwellers (for an overview see [Lusardi & Mitchell 2014]). Making numerous financial transactions does not automatically lead to increased literacy. As shown by Lusardi and Mitchell [2011], frequent users may do it blindfold, using erroneous heuristics and with excessive self-confidence. Additionally, there are country effects resulting from historical experiences of inflation (deflation), crises, or habits formed in planned economies [Atkinson & Messy 2012; Lusardi & Mitchell 2011]. Moreover, the knowledge about the future pension income can be based on current experience of retirees, which may be misleading, when retirees fail to accurately take changing conditions into account. Even in developed economies financial literacy is a skill far from obvious. Furthermore, it can be expected that increasing complexity of financial instruments will lead to further discrepancies within societies, not to mention welfare losses [Fornero & Monticone 2011].

EMPIRICS OF THE POLITICAL ECONOMICS OF PENSION SYSTEMS

Individual views on pension system and preferences regarding the social security system may depend on many factors and may change in time. Although financial incentives are a strong determinant of individual retirement decisions [Gruber & Wise 2005], there is quite a wide spectrum of other factors affecting retirement behaviour, starting from individual characteristics (such as health, type of job etc.), through psychological factors such as bounded rationality towards institutions and social norms [van Erp et al. 2014].

Preferences regarding the pension system are, to some extent, shaped by social norms. As Fehr and Gächter [2000] pointed out, individual decisions depend on the belief on how one ought to behave and, thus, may change over time. For instance, Ljunge [2011] shows that older generations were hesitant to claim early benefits to avoid social stigma, while youths got used to the welfare state and do not have such considerations. As social norms are not uniform across the society, they may differ between groups and be related to their political preferences [Krauth 2006]. Nevertheless, the results in that area are inconclusive – for instance, field experiment by Bauer and colleagues [2017] shows that social norms can be easily overridden by financial incentives.

Apart from the pension system itself, institutions may also affect the retirement behaviour. For example, constraints on hours worked or high employment protection increase exit rates from the labour market, because the rigidity of regulations forces employees to reduce employment in case of adverse shocks [Hek & Vuuren 2011; Klaauw & Wolpin 2008]. Kopczuk and Song [2008] show that workers retire significantly more often in January and around their birthdays, which can be linked to earnings tests in US Social Security system. Lack of flexible retirement age can also be a significant obstacle in optimal retirement behaviour [van Vuuren 2013]. Moreover, there is a strand of literature arguing that imperfect financial markets and lack of possibility to lend against pension benefit may shape the retirement decision [de Hek & van Erp 2009; French 2005].

EMPIRICS OF RETIREMENT PLANNING

Controlling for endogeneity, retirement planning is a strong predictor of wealth, especially for younger workers [Lusardi & Mitchell 2011; 2007a]. Almenberg and Säve-Söderbergh [2011] report similar results for Sweden, Fornero and Monticone [2011] for Italy and Bucher-Koenen and Lusardi [2011] for Germany. In another study Lusardi & Mitchell [2007b] show that wealthier households plan more and therefore are better prepared for retirement.

The reasons for difficulties in converting knowledge into retirement planning are various and complex. For instance, van Rooij and others [2007] argue that even though risk aversion in pension domain is very high, most participants consider themselves as financially illiterate and do not fully understand the details of the pension programme. They also show that individuals in general lack financial knowledge to manage their own pension portfolio and prefer to delegate the management of their assets to pension funds. Chan and Stevens [2008] prove that individuals respond to the information they have and, while some with correct pension information behave rationally, those misinformed respond to their perceived, not actual, pension information. Therefore, information about the pension system is almost as important as incentives. Moreover, a study by van Solinge and Henkens [2009] shows that self-perceived life expectancy has an important impact on retirement plans, but little influence on actual behaviour.

Moreover, even if financial knowledge is present, there are other obstacles in creating the retirement savings plan. Benartzi and Thaler [2007] challenge the assumptions of standard economic models that individuals are able to optimize their behaviour to achieve maximum welfare. Instead, they typically use heuristics and rules-of-thumb in planning their retirement behaviour. Moreover, retirement planning is affected by the inevitable inertia and laziness –

therefore, the pension plan should be designed in a way that participants need to opt-out instead of opt-in. Simplifying enrolment process should also be useful to achieve this goal (cf. [Choi et al. 2005]).

Nevertheless, the problem with automatic or default enrolment plans is that they provide very low savings rates as well as relatively safe (and therefore not profitable) forms of investment. Even though many participants are aware that their savings rates are too low, they spend little time elaborating on it. For instance, Hewitt Associates [2002] shows that when employees are allowed to decide how much to save, they often choose multiples of 5% or minimal (maximal) rates allowed by the plan. Furthermore, asset diversification strategies are either absent or very naïve. The experiment by Read and Loewenstein [1995] proves that when facing simultaneous choice between several kinds of assets, individuals tend to divide their assets into equal parts and diversify between full portfolio (i.e. allocate each portion to different asset from this portfolio). This leads to bias in investment portfolios towards options which are better represented in the pool from which the choice is made. However, such strategies are applied when the investment choice is limited. When they face a full spectrum of investment products, simple strategies prevail. An example of such strategy is when individuals choose one item from each category and then direct the equal part of assets to each investment vehicle or divide the pool according to arithmetically simple division [Huberman & Jiang 2006]. The third important observation is that future retirees tend to ask their spouses or friends for financial advice instead of seeking professional help. Duflo and Saez [2002] show the importance of peer effect in the study of American university staff, where the colleagues' choice from the same department was a strong determinant of the savings level. The potential solution to overcome the problem of designing retirement strategy is to force workers to investment in professionally managed assets (as was the case of Open Pension Funds in Poland). Moreover, there are also studies (cf. [Cronqvist & Thaler 2004], [Benartzi & Thaler 2002]), proving that portfolios of professionally managed funds outperform portfolios of individual investors, even if those who chose individual investing were financially savvy. Finally, thinking about retirement is unpleasant and requires difficult decision making. It involves thinking about the future self (e.g. an experiment by Hershfield et al. [2011] shows that those who imaged themselves in the future tend to accept later monetary rewards) and requires imaging themselves as ill and inefficient. Furthermore, they require difficult decisions which tend to be postponed [Steel 2011]. As Brown et al. [2016] show, procrastination in financial decisions can even predict financial default and therefore it is important to help employees to overcome this problem while planning for retirement.

EMPIRICS OF ACTUAL RETIREMENT BEHAVIOUR

Even if a sound retirement plan is present, the link between retirement intentions and actual behaviour is often not sufficiently strong. An early study by Hurd et al. [2004] claims that although most workers retire as early as possible, there is a small impact of pro-retirement savings patterns and the apparent conflict between actual and optimal behaviour of pensioners is also subject of interest for behavioural economics. In general, the reasons for too low retirement savings are believed to be: lack of self-control and bounded rationality. Thaler and Sherfrin [1981] proposed a model in which the lack of self-control is framed as a principal-agent problem and showed how to design a system that would make individuals save more for their retirement using their natural tendency to postpone savings.

Actual behaviour at retirement also depends on several factors deeply rooted in psychology. For instance, the timing of the retirement decision depends on the behaviour of peers, which is an important determinant of the saving decision (e.g. Brown [2013] or Chalmers et al. [2008]). Also, the exact timing of retirement depends on many individual factors and conditions that may differ from those prevalent at the time when the plan was made, such as health status, family needs or simply demand for leisure (e.g. Chevalier et al. [2013]). Moreover, research shows that this decision also depends on one's current labour market status and stock market conditions. For instance, Coile and Levine [2011] found that less educated workers react to changes in unemployment and advance the retirement decision when labour market conditions are unfavourable and more financially literate workers tend to postpone that decision if stock market return rates are lower, allowing to accrue more on their pension accounts. They show that the former effect outweighed the latter during the last financial crisis. Conversion of retirement plans into actual behaviour is a very important policy issue, which needs to be addressed to ensure sufficient replacement rates.

THE POLISH CONTEXT

Given the rapidly ageing Polish population, examining retirement strategies and financial knowledge should become the first step in addressing the gaps by policies. There are few hurdles on the way to build individual retirement strategies. First, individuals need to be correctly informed about the mechanics of the pension system and on the projected replacement rates levels. Second, they need to react properly to these incentives, by planning their retirement – in particular by shaping their saving behaviour and increasing life-long employability. Saving behaviour is especially important in Poland, where (contrary to the US) saving plans are still not popular and no significant incentives to participate in private plans appear. As most studies are based on the US case, there is a gap in the literature regarding

retirement behaviour in European institutional context. Third, the abovementioned plans need to be implemented and converted into actual behaviour. All require high level of confidence in the system and institutions constituting it, in particular in their persistence. In this paper, we will address the first and second issues – therefore, we will show how much individuals know about their future retirement in the context of Polish pension system and assess how this knowledge translates into retirement strategies, declared saving behaviour and future retirement plans.

METHODOLOGY

DATASET

In this paper we make use of the micro-database from the *Pension awareness of Poles* survey [Czapiński & Góra 2016]. This computer-assisted personal interview (CAPI) was commissioned by Gdansk Institute of Market Economy and conducted by PBS survey company in 2016. Its main purpose was to assess the level of pension knowledge and real actions undertaken on one's initiative. To our knowledge, this is the most informative database on what Poles expect regarding future pensions and what is the level of preparedness to deterioration in material conditions resulting from shift in the pension system, including both saving practice and labour market participation.

The survey covered 1006 working individuals, aged 18-67, regardless of their type of contract. Multi-stage sampling was applied. Due to weighing, the sample is representative for the Polish working population in terms of gender, age, education and place of residence. The sampling frame was taken from the Central Statistical Office of Poland. The sample characteristics are presented in the Table 1.

Table 1. Sample characteristics

variable	categories	N	variable (cont.)	categories	N
sex	Female	551	labour-market status	open-ended labour-code contract	555
	Male	455		fixed-term labour-code contract	279
age group	18-29	183		fixed-term civil-law contract	84
	30-44	492		self-employment	26
	45-59	304		own business	35
	60+	27		own farm	42
education level	primary	15		student	13
	vocational	231		0-500	17
	secondary	429		501-1000	26
	tertiary	331		1001-1500	69
place of residence	rural areas	379	personal net income [in PLN]	1501-2000	216
	urban areas, pop. <50,000	224		2001-2500	194
	urban areas, pop. 50,000-200,000	133		2501-3000	122
	urban areas, pop. >200,000	270		3001-4000	64
household size	1	159		4001-5000	18
	2	316		above 5000	20

	3	274		refusal	260
	4	184	total		1006
	5+	73			

Source: authors' own elaboration.

Note: 1. pop. - population. 2. 1 PLN \approx 0.23 EUR

Analysing the working population has an important rationale. First, workers are a far more homogenous group than the whole labour force (the latter also covers parental leave users, long-term unemployed, frictionally unemployed, youth entering the labour market, disability pensioners, etc.). Despite the wide spectrum of contracts and working conditions, restricting the sample to the working respondents leads to more adequate and precise conclusions. The sample is sufficient to ensure the representativeness of the population. Second, workers should be on average more up-to-date with the rules and changes implemented in the labour market and pension regulations. Finally, asking working individuals excludes unnecessary assumptions on the potential behaviour of the non-working population. Relationship between preferences and actions should be disturbed neither by lack of resources, nor by additional public transfers. Due to this assumption, six respondents combining paid work with receiving (old-age) pension were removed from the sample.

It is also worth mentioning that 2016 offered an interesting context for the study, both in political and economic terms. It was characterised by political climate conducive to interest in public affairs (diametrically changed political scene as a result of parliamentary and presidential elections, open political conflicts regarding decreasing legal retirement age, the role of policy for senior citizens etc.). At the same time, it was a year of modest prosperity, close to cycle average. The labour shortages started to be visible and elder individuals became a low-hanging fruit – especially keeping in mind the mass-scale retirement of post-war baby-boom cohort. 2016 was the first year in which all working cohorts were covered by the system introduced in 1999 (apart from certain occupations). Moreover, first benefits from the new system were paid and their amount was below 1 PLN in several highly-publicised cases [Rzemek 2018]. Thus, for elder individuals (55 and above) work and retirement became a real alternative. Moreover, until 2015 contributions have not been paid from civil-law contracts. In consequence, the issue of individual responsibility was even more tangible.

QUESTIONNAIRE

The questionnaire consists of over 40 questions, predominantly close-ended and ordinal-scale ones. The topics include: (1) thinking about own future as a retiree, (2) characteristics of current pension contributions, (3) preference towards their alternative use, (4) preferred retirement age – absolute and relative, (5) expected material conditions in old age, (6) characteristics of actions undertaken in order to counteract the deterioration in material conditions, (7) strategies

to supplement insufficient income in the last stage of life, (8) preferred characteristics of the pension system, (9) space for additional long-term savings. The questions on pensions system are supplemented by a wide range of socio-economic variables including sex, age, education level, household size and structure, place of residence, region, labour market contract, income, labour market experience etc.

The following questions are in the core interest of this study:

1. What material conditions do you expect as a retiree? (better/similar/worse than current retirees with similar tenure and occupation, don't know (DK))
2. Do you undertake any actions in order to avoid significant deterioration in the material conditions after retiring? (yes, no)
3. What type of actions do you undertake? (multiple choice with eight categories)
4. Would you make ends meet if you were an old-age pensioner with minimal benefit today [in 2016 approx. 880 PLN]? (yes, no)
5. Assuming not making ends meet, would you consider following actions? (multiple choice with six categories, none, DK)

Additionally, several questions are treated as proxies of pension knowledge:

- Do you pay a compulsory pension contribution? (yes, no, DK)
- What is the amount of contributions paid (as % of remuneration)? (open-ended question; 0-100%)
- Would postponing the retirement beyond the legal retirement age lead to increased benefit? (yes, no, DK)
- How much would working for 5 years after the legal retirement age increase the benefit? (multiple choice with four categories, DK)

Several questions are treated as proxies of preferences regarding the political economy of the pension system:

- Would you prefer to increase your net remuneration by the amount of the contribution paid by your employer? (yes, no, DK)

- How much of the increased remuneration would you spend on pension contributions by yourself? (multiple choice with 7 answers, DK)
- What should be the source of pension? (individual account, common source, both, DK)
- Should the pension system be universal for all occupational groups? (yes, no)
- Should the supplementary saving be co-financed and by whom? (from general taxes, by employer, both, none, DK)
- Should there be a top-up payment for the individuals who saved too little? (yes, no, DK).

ANALYTICAL FRAMEWORK

The analytical framework in this paper is based on the observation that providing necessary consumption level in the last stage of life under the new universal pension system in Poland is individuals' responsibility. Regardless of how poorly individuals do manage their pension wealth, they have to consume the old age. In consequence, we can distinguish two decision steps. First, we examine actions aimed at providing necessary level of pension wealth (including compulsory and voluntary savings, no matter whether from dedicated tools or not). This issue is covered by questions 1-3 from the previous section. Second, we examine actions oriented at making ends meet, provided insufficient pension benefit levels. In other words, we analyse what other sources may supplement low pension benefits. This issue is covered by questions 4-5. These two steps are perceived as an approximation of pension strategy. Keeping in mind the historical context, this framework seems to be accurately describing pension strategies of the Poles.

METHODS

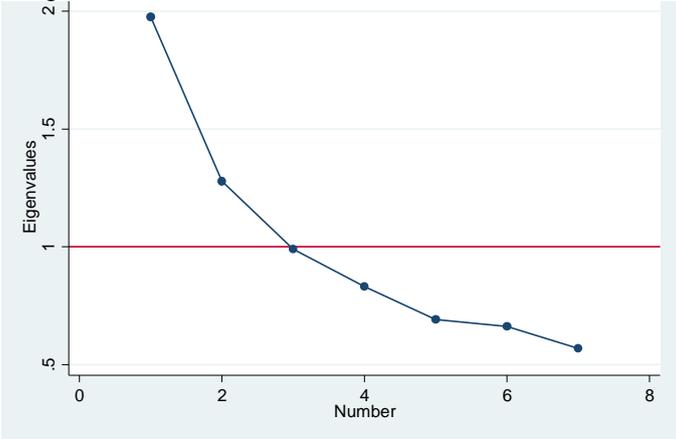
In this paper we make use of quantitative methods: binary logistic regression and principal component analysis (PCA). Their use is described below.

Binary logistic regression measures the impact of an incremental change in an independent variable on the odds of an event or a state measured by the dependent variable. In this case, we measure the impact of a wide spectrum of demographic and socio-economic variables on undertaking the voluntary actions of any kind to counteract the deterioration in material conditions as a retiree. Individuals who declared doing so, were assigned as 1, and 0 otherwise. The descriptors included: sex (female, male), age (four age groups: 18-29, 30-44, 45-59, 60-67), education level (primary, vocational, secondary, tertiary), place of residence

(rural areas and three urban areas depending on the population size), household size (1, 2, 3, 4, 5 and over), personal net income (five categories and refusals), labour market status (six categories). We run five models with same set of descriptors. They were tested on various subsamples: whole sample, individuals who declared paying compulsory contributions (as a most general act of pension awareness), individuals expecting: (1) no better, (2) worse or similar, (3) worse material conditions. We also run one simplified model omitting the descriptor of labour-market status on the complete sample.

Principal component analysis (PCA) is a technique used to reduce various strategy combinations to a few, easy to interpret dimensions. This method was unsuccessful in distinguishing savers (it extracted only two categories: savers and non-savers) and useful in identification of the general groups of actions provided insufficient levels of income in the last stage of life. The scree plot of eigenvalues identified three components (Figure 1). In order to make the interpretation clearer we additionally implement VARIMAX rotation procedure and restrict the values displayed to those above 0.3 or below -0.3 (rule-of-thumb). Quality of sampling adequacy was examined successfully with Kaiser-Meyer-Olkin test (0.6504).

Figure 1. Scree plot of eigenvalues after PCA



Source: authors' own estimations.

The abovementioned methods were supplemented with descriptive statistics with chi-square test, where necessary (the test refers to the unweighted values). We assume $\alpha=0.05$.

EMPIRICAL FINDINGS

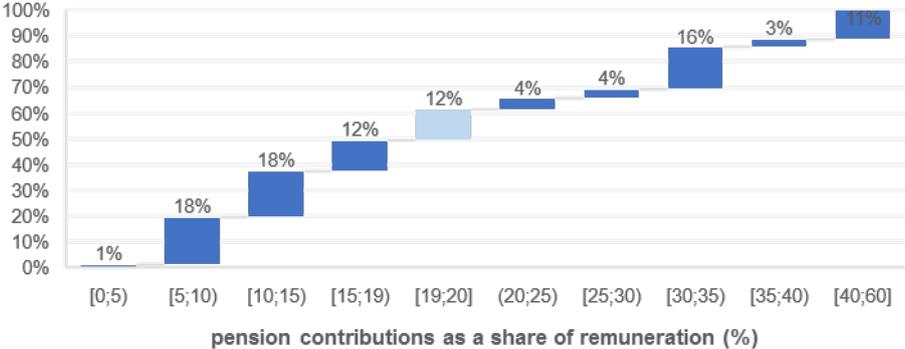
CONTEXTUAL ANALYSIS

PENSION LITERACY

Virtually all respondents declare they pay their pension contributions. Verification of this declaration may be performed only for several types of contracts (labour-code contracts, self-employed, running own business, farmers). Except for the latter group, approx. 4% of respondents declare not paying contributions or no awareness of doing it. By contrast, all farmers (covered by other dedicated social insurance scheme) confirmed paying their contributions. The most complicated situation refers to the fixed-term civil-law contract holders. Only 60% of them confirmed paying, 31% denied, and 9% did not know, which was quite possible when referring to the 2015 conditions.

For those covered by an universal pension scheme and paying contributions (80% of the sample), approx. 75% refused answering the questions on the amount. The remaining 25% declared values ranging from 3% to 60% (Figure 2). The interval closest to the real value (19.52%) for respondents with labour-code contract was indicated by 12% of respondents, while half of this subsample underestimated their contribution. For fixed-term civil-law contract holders the issue is more complicated, as for many years only the first contract was subject to contributions, which created a space for abuse. In addition, samples for civil-law contract holders, self-employed and firm owners are insufficient to perform robust comparative analysis. Nowadays the pension contributions are covering income to the value of minimal pay. In both cases the share of contributions would be lower compared to the regular labour-code contract.

Figure 2. Perceived amount of pension contributions as a share of remuneration



Source: authors' own elaboration.
 Note: n=209 (individuals working on the basis of labour-code contract, declaring paying contributions and able to answer the question)

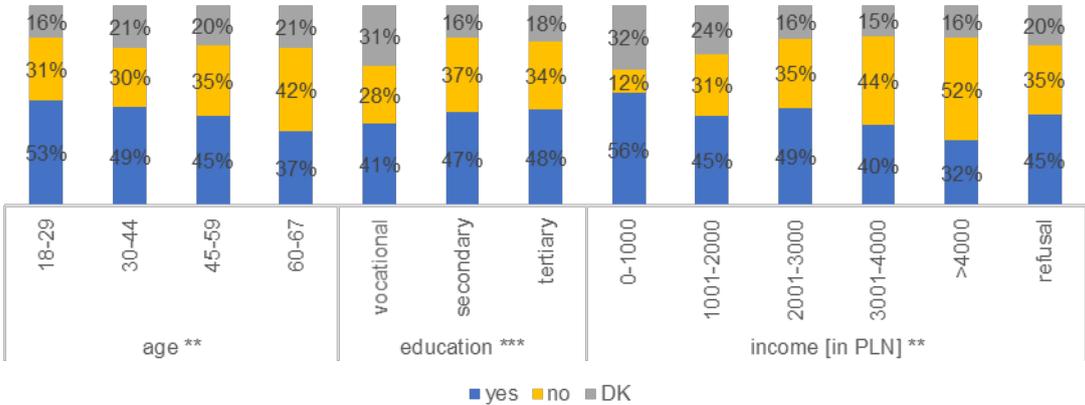
49% of respondents fails to see the connection between longer employment and higher benefits. In other words, no trade-off between working beyond the legal pension age and benefit level is perceived. Statistically significant (at 5% level) differences between answers are observed for work as a farmer, education level, labour-code contract holders, sex and age groups. Furthermore, even high education levels do not necessarily translate into

comprehensive knowledge. In this group, one in four respondents is unable to estimate how much postponing retirement will increase the old-age pension benefit. One in three estimates that between 6% and 10%, 17% less than 5%. 20% indicate the 11-20% interval. In addition, the higher the income, the bigger the perceived benefits of postponing retirement (a statistically significant relationship).

PREFERENCES REGARDING POLITICAL ECONOMICS OF PENSION SYSTEM

When it comes to potential substitutability between transferring compulsory contributions and increasing employee’s net remuneration, decisions vary across the working population. 45% of respondents would prefer doing so, and 20% is not sure. Statistically significant differences are observed for various age, income and education groups (Figure 3), as well as among individuals running own businesses comparing to others – this category is suffering from small sample, though. When analysing how much of this increased net remuneration would be saved for retirement, only 7% declared nothing, but 48% between 1% and 30% of the additional net income. 15% would allocate the whole sum to contributions and 13% could not estimate the share.

Figure 3. Preference for replacing compulsory contributions with higher net remuneration – by statistically significant cross-sections



Source: authors’ own elaboration.
 Note: 1. n=877 (individuals declaring paying compulsory contributions in universal pension scheme). 2. Category of primary education omitted due to small number of observations.

No clear preference of the source old-age pensions should be financed from is observed. For 48% it should be co-financed by individuals and some common source – all other categories (including DK) accounted for 16-18% each. Again, statistical significance is observed for age, income and education, as well as for individuals running their own companies. Greater agreement prevails when asked about the support for those who saved too little. At least minimal form of support was mentioned by 71% of respondents. Within this group, for 35%

respondent the threshold should be related to minimal pension, for 23.6% should even exceed this level. One in ten individuals is against any form of support. Preference regarding this issue varies among income (the higher the income, the lower the support) and sex (males are generally against). Quite symmetrical is the case of additional co-financing for supplementary savers, where slightly above 10% is against, 20% does not have opinion, while remaining 70% is divided into those who would prefer co-financing from general budget and by employer (36%), 14-18% who prefer one of these options. In this case socio-economic and demographic characteristics largely affect the decisions – statistical significance at typical levels is observed for sex, education and income, as well as among self-employed and company owners.

An even more widespread consensus is recorded when considering whether the universal pension system should incorporate all occupational groups. Such preference was declared by over 86% of working Poles. Remaining 14% listed few exceptions, mainly those whose workplaces are especially risky. Statistical differences are observed among sexes, as well as for representatives of labour-code contract holders (towards unification) and farmers (already under a separate occupational scheme, and against unification).

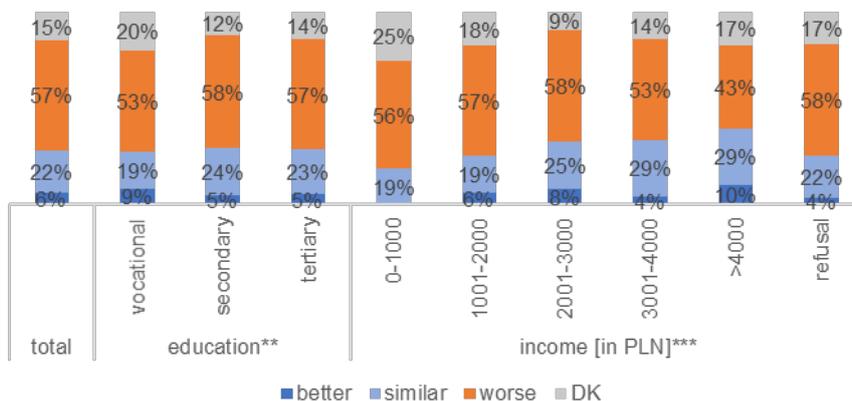
EXPECTATIONS OF FUTURE LIVING STANDARDS

Approximately 57% of respondents expect worsening living conditions compared to today's old-age pensioners with similar occupation and tenure. This share is quite similar for the majority of analysed cross-sections, except for income and education (Figure 4). The higher the income, the better the prospects. In general, individuals representing the lowest levels of income are least prone to optimism - but at the same time, they most often declare not expecting anything. By contrast, individuals with vocational education are more optimistic or simply do not know what to expect, comparing to counterparts with secondary or tertiary education.

Future living standard does not transfer easily to replacement rate. For 38% of respondents it is impossible to estimate the expected replacement rate. The remaining part declares 0-30%, 30-50% and over 50% (20-21%) in almost equal amounts. This picture looks completely different when cross-sectioned by assessment of future conditions. The shares of DKs are high, and the better conditions are expected, the more individuals refuse to predict their replacement rates (despite large intervals). Moreover, those who are not able to describe their expectations either cannot translate them into values (69%) or wild-guess (31%). Significant confounders included also education, income and type of labour contract (fixed-term civil-law contract, running own company). When analysing education, as its level increases, so does

the share of answers below 50% and the share of DK answers decreases. For income, the relationship is more complex. Individuals with lowest income frequently indicate DK, so are those who do not want to disclose their income. Most sure about low replacement rates (below 50%) are individuals with the highest income.

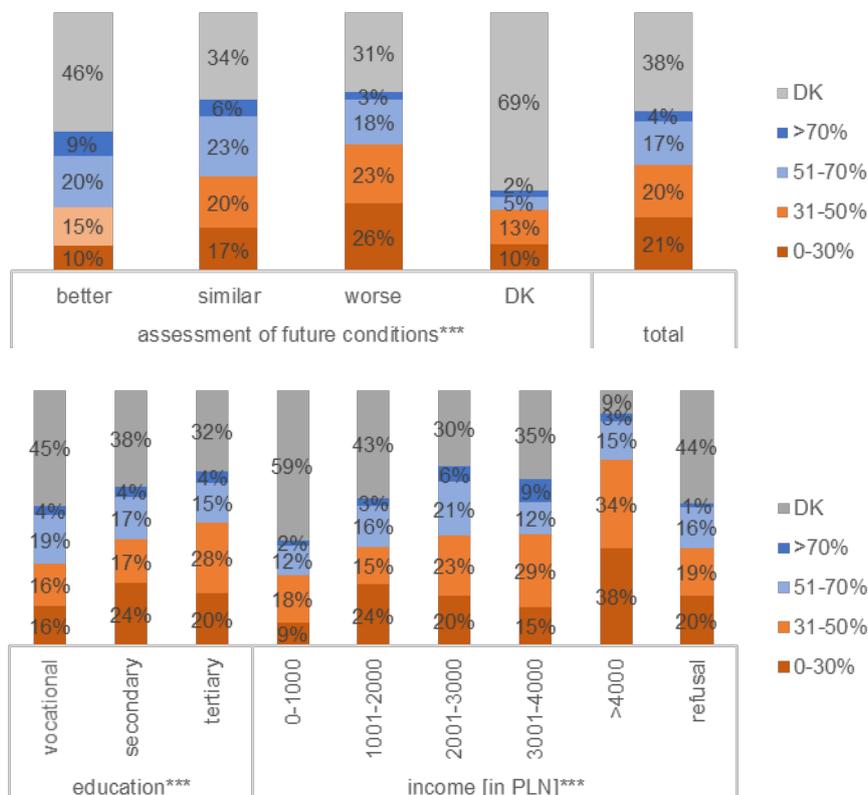
Figure 4. Expectations of future living standard as a pensioner, comparing to today's old-age pensioners with similar tenure and occupation – by statistically significant cross-sections



Source: authors' own elaboration.

Note: 1. n=1000. 2. Category of primary education omitted due to small number of observations.

Figure 5. Expected replacement rate – by statistically significant cross-sections: categories of assessment of future conditions (top panel) and by education and income (bottom panel)

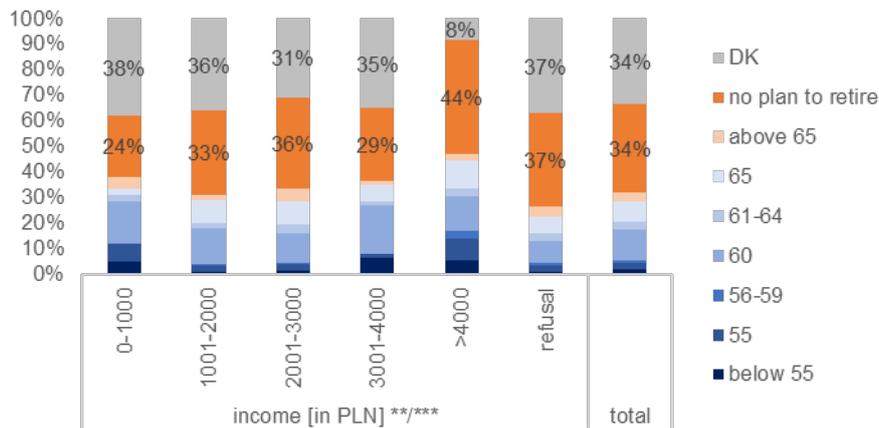


Source: authors' own elaboration.

Note: 1. n=1000. 2. replacement rate as a share of current remuneration – age not significant.

Even though the replacement rates are either unknown or lower than contemporary ones, there is an option to raise it by postponing the retirement age, in particular – by postponing the moment one starts receiving old-age pension. The whole population can be divided into three almost equal parts: those who indicate a specific retirement age, those who have no plan to retire (it may not mean the same as *work as long as possible*, though), and those who do not know yet (Figure 6). When performing cross-sections of this variable by socio-economic characteristics, only income was significant at highest levels of significance. Individuals with the lowest declared personal income were most prone to declare specific, low retirement age. By contrast, respondents with highest income were most frequently indicating no plans to retire. When choosing the specific retirement age, they also declared a higher one.

Figure 6. Preferred retirement age – by statistically significant cross-sections

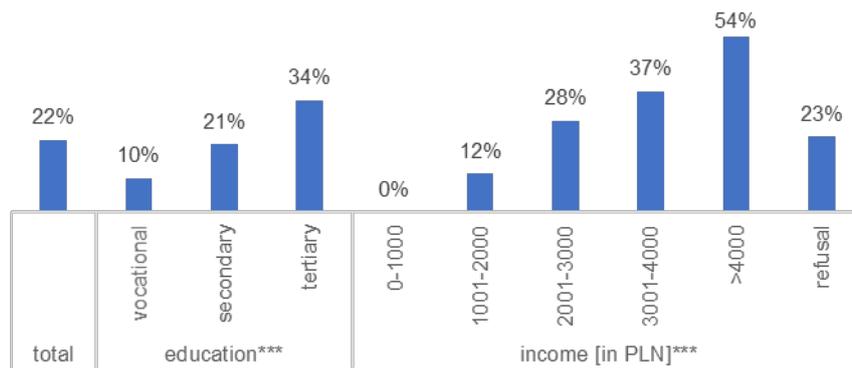


Source: authors' own elaboration.

Note: 1. N=1000. 2. ** refers to the distinguishing between no plan to retire, *** to age categories

However, expecting worse conditions does not necessarily mean counteracting it. When individuals expecting deterioration in material conditions were asked about such actions, only about 1 in 5 persons declares doing so (Figure 7). Once again, the actions are statistically significant when using cross-sections with education and personal income, as well as for self-employed and running own business (for the latter two cases low samples should be mentioned). The situation does not improve much when we extend the sample by individuals expecting similar conditions or with no expectations. By contrast, only education is a statistically distinctive variable in describing propensity to take precautionary matters among individuals who expect improvement.

Figure 7. Actions undertaken to counteract deterioration in material conditions in old age, providing deterioration expectations – by statistically significant cross-sections



Source: authors' own elaboration.

Note: 1. N=566 (individuals expecting material deterioration). 2. Category of primary education omitted due to small number of observations.

The Polish pension system provides three dedicated tools for additional long-term saving: IKE, IKZE, PPE (individual retirement accounts, individual retirement protection accounts, employee pension schemes). There are also endless forms of saving and investment available on the financial markets and in alternative forms. They are not especially popular - in the complete sample additional long-term saving was declared by approx. 20% of respondents, and the most popular tool is a saving account or cash (13.3%). Second place is taken by tangible investments (especially real estate) and third – apart from *other* category – is raising a caring child (3.1% and 2.7%, respectively). Dedicated instruments were mentioned even less often: IKE by 1.4% and IKZE and PPE by 0.1% each. The *Other* category included a wide range of actions: from side jobs, through investment in own employability, to obtaining a gun licence. Saving using more than one tool is almost non-existent. Moreover, for those using saving account or saving in cash no other instrument is used (Table 2).

Table 2. Spearman's correlation of the use of additional saving instruments

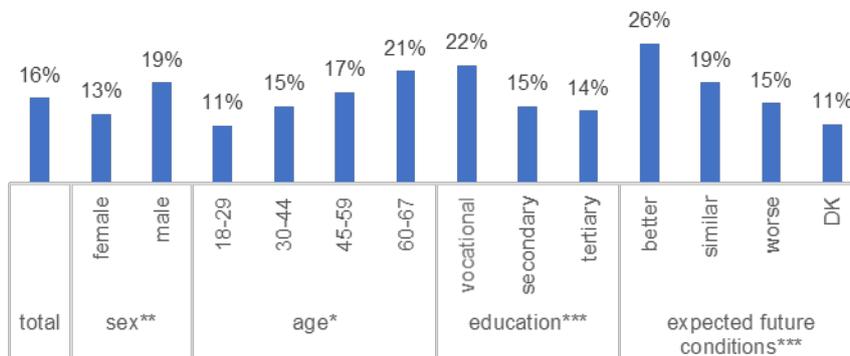
	saving account/ in cash	raising caring children	tangible investment	IKE	IKZE	PPE	insurance-based investment product	other
saving account/ in cash	1							
raising caring children	-0.1137	1						
tangible investment	-0.1673*	0.1320	1					
IKE	-0.3242*	-0.0558	-0.1203	1				
IKZE	-0.1310	-0.0359	-0.0398	-0.0284	1			
PPE	-0.1609*	-0.0441	0.0641	0.1121	-0.0115	1		
insurance-based investment product	-0.3058*	0.0102	-0.0554	-0.0712	0.0982	-0.0488	1	
other	-0.3175*	0.0756	-0.0547	-0.0773	-0.0256	-0.0314	-0.1083	1

Source: author's own estimations.

Note: 1. N=215 (individuals who declared at least one method of additional saving), 2, * for significance at 0.05 level

Keeping in mind the fact that replacement rates of Polish pensioners expected to decrease to 40% in 2030, expecting benefit levels close to current minimal pensions [880 PLN] is a good enough guess. When asked whether they would be able to make ends meet with this amount each month, 16% of respondents confirmed, and almost 84% denied (Figure 8). Statistically significant differences were recorded for sex, education, and – to lesser extent – also age, as well as for farmers comparing to other labour market groups.

Figure 7. Share of individuals declaring ability to make ends meet with minimal old-age pension [approx. 880 PLN]



Source: authors' own elaboration.

Note: 1. n=566 (individuals expecting material deterioration). 2. Category of primary education omitted due to small number of observations.

PENSION STRATEGIES

FIRST-BEST SOLUTION

We have run six binary logistic regressions in order to identify the determinants of supplementary saving. We assume drivers of supplementary saving should increase if one expects material deterioration in the last stage of life. This landscape is, however, much more complex. The results are presented in the Table 3.

Regardless of specification and sample selection, several conclusions can be drawn. Firstly, only few categories are statistically significant at typical levels of significance. The higher the education level, the higher the odds of supplementary saving. Similarly, personal income is a statistically significant descriptor (with exception of *refusal* category). Generally, higher levels declared are associated with higher odds of saving. The monotonical pattern is observed for the whole sample, and among payers of compulsory contributions, but not among those who are pessimistic about their future material conditions. In this group maximum odds are

observed for respondents declaring income between 3,000-4,000 PLN, when median salary was 3,511 PLN. Some statistical regularities can be drawn for various household sizes. In general, large households tend to save more than single households, while medium-sized ones always save less than the reference category. When analysing age groups, the youngest category represents the lowest propensity to save – except for those who expect deteriorating material conditions, while the eldest represent almost twice as high odds of saving than the prime-age group. Last, but not least, labour market status was analysed. As individuals are able to work on the basis of more than one type of contract, we could distinguish the impact of each category. However, this practice emphasized only a clear, statistically significant impact for the self-employed, who save systematically more often than other categories (however, we should keep in mind the small sample in this case).

SECOND-BEST SOLUTION

As we mentioned earlier, 84% of respondents denied being able to make ends meet with minimum old-age pension. Keeping in mind the fact that most of them expect worsening material conditions and that the dominant expected replacement rate was well below 50%, a logical question to raise is what are the alternative sources that would enable financing the consumption in the last stage of life. The most popular option was having a paid job (58.7%). Less popular alternatives include support from acquaintances (28.2%), and social assistance (24.4%). Protesting was mentioned by 12.5% of respondents expecting insufficient income in the future. By contrast, only 4.2% indicated that would use none of them.

In the next step we analysed how these second-best actions interact with each other and translate into strategies. The screeplot of eigenvalues identified three components (Table 4). Component 1 included support of social assistance, charity and acquaintances. Component 2 included a paid job and no action. Component 3 included protesting and breaking the law. Thus, it would seem that available strategies concentrate around 3 types of actions: managing with the insufficient income on one's own (with particular focus on paid job), asking for external support, and rebelling.

Table 3. Determinants of supplementary saving – binary logistic modelling

variable		whole sample					whole sample					individuals paying compulsory contributions				
		OR	SE	p-value	95% CI		OR	SE	p-value	95% CI		OR	SE	p-value	95% CI	
sex	male	ref.					ref.					ref.				
	female	0.948	0.164	0.759	0.676	1.330	0.981	0.172	0.915	0.697	1.383	1.010	0.182	0.955	0.709	1.439
age	18-29	0.460	0.122	0.003	0.273	0.773	0.432	0.120	0.003	0.251	0.745	0.402	0.117	0.002	0.227	0.711
	30-44	ref.														
	45-59	0.997	0.217	0.989	0.650	1.528	0.954	0.211	0.830	0.618	1.471	0.895	0.204	0.627	0.572	1.399
	60-67	1.283	0.309	0.301	0.800	2.056	1.295	0.316	0.290	0.802	2.089	1.327	0.331	0.256	0.814	2.164
education	primary	empty					empty					empty				
	vocational	0.505	0.127	0.006	0.309	0.826	0.510	0.129	0.008	0.310	0.839	0.501	0.131	0.008	0.301	0.835
	secondary	ref.														
	tertiary	1.966	0.382	<0.001	1.344	2.877	1.867	0.369	0.002	1.267	2.751	1.815	0.371	0.004	1.215	2.711
place of residence	rural areas	0.766	0.196	0.298	0.464	1.265	0.833	0.218	0.486	0.499	1.392	0.796	0.215	0.400	0.468	1.353
	urban areas, pop. <50,000	1.025	0.280	0.927	0.601	1.750	1.032	0.287	0.911	0.598	1.779	1.058	0.303	0.844	0.603	1.856
	urban areas, pop. 50,000-200,000	ref.					ref.					ref.				
	urban areas, pop. >200,000	0.880	0.229	0.621	0.529	1.464	0.926	0.245	0.772	0.551	1.557	0.976	0.268	0.930	0.570	1.673
household size	1	ref.														
	2	0.737	0.183	0.220	0.453	1.200	0.783	0.199	0.336	0.477	1.288	0.763	0.202	0.306	0.455	1.281
	3	0.546	0.143	0.021	0.327	0.911	0.560	0.149	0.029	0.333	0.944	0.514	0.144	0.017	0.298	0.889
	4	0.527	0.157	0.031	0.294	0.943	0.536	0.164	0.041	0.295	0.975	0.511	0.162	0.034	0.275	0.951
	5+	1.789	0.617	0.091	0.910	3.516	1.831	0.639	0.083	0.924	3.627	1.894	0.683	0.076	0.935	3.840
personal net income [in PLN]	0-1000	0.545	0.364	0.363	0.147	2.018	0.502	0.349	0.321	0.129	1.957	0.392	0.313	0.241	0.082	1.873
	1001-2000	ref.					ref.					ref.				
	2001-3000	1.963	0.476	0.005	1.220	3.157	1.949	0.477	0.006	1.206	3.149	2.121	0.537	0.003	1.292	3.482
	3001-4000	4.283	1.486	<0.001	2.170	8.454	3.884	1.363	<0.001	1.953	7.725	4.183	1.576	<0.001	1.999	8.753
	>4000	3.800	1.581	0.001	1.682	8.587	2.864	1.300	0.020	1.176	6.971	3.336	1.632	0.014	1.279	8.700
	refusal	1.516	0.384	0.100	0.923	2.489	1.455	0.373	0.144	0.880	2.405	1.519	0.402	0.114	0.904	2.552
labour market status [yes]	labour-code contract						1.878	1.530	0.440	0.380	9.278	1.980	1.644	0.411	0.389	10.080
	fixed-term civil-law contract						1.574	1.328	0.591	0.301	8.225	1.486	1.302	0.651	0.267	8.278
	self-employment						6.140	5.077	0.028	1.214	31.046	5.603	4.711	0.040	1.079	29.110
	own business						2.283	2.010	0.349	0.406	12.826	1.928	1.738	0.466	0.330	11.277
	own farm						1.359	1.283	0.746	0.214	8.644	1.417	1.364	0.717	0.215	9.344
	student						3.760	2.956	0.092	0.806	17.550	5.485	5.149	0.070	0.871	34.535
constant		0.2512	0.0928	<0.001	0.1218	0.5184	0.124	0.110	0.019	0.022	0.706	0.124	0.112	0.021	0.021	0.729
N		985					985					917				
correct predictions		78.4%					78.9%					79.0%				

Table 3. Determinants of supplementary saving – binary logistic modelling (cont.)

variable		individuals expecting no better material conditions					individuals expecting worse or similar material conditions					individuals expecting worse material conditions				
		OR	SE	p-value	95% CI		OR	SE	p-value	95% CI		OR	SE	p-value	95% CI	
sex	male	ref.					ref.					ref.				
	female	0.946	0.170	0.757	0.665	1.346	0.957	0.183	0.820	0.658	1.393	0.877	0.205	0.574	0.554	1.386
age	18-29	0.443	0.127	0.004	0.253	0.775	0.573	0.171	0.062	0.319	1.028	0.575	0.207	0.124	0.283	1.165
	30-44	ref.														
	45-59	0.930	0.212	0.751	0.595	1.455	0.957	0.234	0.858	0.593	1.545	0.865	0.262	0.633	0.478	1.567
	60-67	1.343	0.336	0.239	0.822	2.192	1.418	0.377	0.189	0.842	2.386	1.875	0.632	0.062	0.969	3.629
education	primary	empty					empty					empty				
	vocational	0.483	0.128	0.006	0.287	0.810	0.503	0.143	0.016	0.288	0.880	0.357	0.130	0.005	0.174	0.730
	secondary	ref.														
	tertiary	1.777	0.361	0.005	1.194	2.645	1.972	0.425	0.002	1.292	3.010	1.866	0.498	0.019	1.106	3.148
place of residence	rural areas	1.016	0.279	0.953	0.593	1.741	1.099	0.322	0.747	0.619	1.952	1.444	0.560	0.344	0.675	3.089
	urban areas, pop. <50,000	1.071	0.312	0.814	0.605	1.896	1.145	0.357	0.665	0.621	2.109	1.420	0.576	0.387	0.641	3.145
	urban areas, pop. 50,000-200,000	ref.					ref.					ref.				
	urban areas, pop. >200,000	0.988	0.274	0.965	0.574	1.702	0.921	0.273	0.782	0.516	1.646	1.328	0.503	0.453	0.633	2.789
household size	1	ref.														
	2	0.742	0.195	0.256	0.444	1.241	0.712	0.199	0.223	0.412	1.230	0.676	0.229	0.248	0.348	1.313
	3	0.551	0.151	0.030	0.322	0.944	0.559	0.165	0.049	0.313	0.998	0.493	0.176	0.048	0.245	0.992
	4	0.501	0.158	0.028	0.271	0.929	0.454	0.154	0.020	0.234	0.884	0.639	0.256	0.264	0.292	1.402
	5+	1.689	0.609	0.146	0.833	3.424	1.496	0.568	0.288	0.711	3.147	0.912	0.430	0.845	0.362	2.300
personal net income [in PLN]	0-1000	0.519	0.361	0.346	0.133	2.030	0.630	0.452	0.520	0.154	2.571	empty				
	1001-2000	ref.					ref.					ref.				
	2001-3000	2.085	0.528	0.004	1.268	3.426	2.134	0.575	0.005	1.259	3.617	2.441	0.797	0.006	1.287	4.630
	3001-4000	4.213	1.519	<0.001	2.078	8.542	4.559	1.752	<0.001	2.146	9.683	3.107	1.540	0.022	1.176	8.206
	>4000	2.798	1.348	0.033	1.088	7.193	3.640	1.984	0.018	1.251	10.596	4.188	2.830	0.034	1.114	15.749
	refusal	1.456	0.386	0.156	0.867	2.447	1.466	0.419	0.181	0.837	2.568	1.547	0.535	0.207	0.785	3.048
labour market status [yes]	labour-code contract	1.758	1.455	0.495	0.347	8.904	2.027	1.895	0.450	0.324	12.665	0.925	1.023	0.944	0.106	8.074
	fixed-term civil-law contract	1.352	1.156	0.724	0.253	7.219	1.754	1.675	0.556	0.270	11.397	1.036	1.178	0.975	0.111	9.633
	self-employment	7.814	6.617	0.015	1.486	41.084	12.878	12.921	0.011	1.802	92.014	10.524	12.939	0.056	0.946	117.134
	own business	2.195	1.965	0.380	0.380	12.689	2.047	2.045	0.473	0.289	14.501	1.006	1.196	0.996	0.098	10.341
	own farm	1.163	1.105	0.874	0.180	7.493	1.515	1.588	0.691	0.194	11.810	0.684	0.821	0.752	0.065	7.201
	student	3.899	3.085	0.085	0.827	18.387	3.512	2.937	0.133	0.682	18.091	1.708	2.003	0.648	0.171	17.007
constant		0.130	0.118	0.024	0.022	0.769	0.109	0.111	0.030	0.015	0.808	0.186	0.230	0.175	0.016	2.113
N		921					779					538				
correct predictions		78.9%					77.7%					77.5%				

Source: author's own estimation.

Table 4. Principal component analysis of the actions undertaken provided insufficient old-age pension levels

Variable	before rotation			after VARIMAX rotation			unexplained
	comp 1	comp 2	comp 3	comp 1	comp 2	comp 3	
social assistance support	0.4611	0.1555	-0.4186	0.6224	-0.0827	0.1335	0.3754
charity support	0.5016	0.1820	-0.2397	0.5780	-0.0770	0.0464	0.4038
acquaintances support	0.4084	-0.2118	-0.2154	0.4191	0.2809	-0.0590	0.5672
paid job	0.0789	-0.7120	0.1018	-0.0999	0.7159	-0.0332	0.3292
Protest	0.4723	0.1154	0.2979	0.2891	0.0427	0.4897	0.4543
breaking the law	0.2989	0.1888	0.7844	-0.0772	-0.0143	0.8569	0.1682
None	-0.2244	0.5847	-0.0803	-0.0578	-0.6276	-0.0386	0.4570

Source: author's own elaboration.

Note: 1. n=837 (individuals who declared no possibility to make ends meet with minimal old-age pension). 2. comp – component 3. bolded: levels above |0.3|.

DISCUSSION & CONCLUSIONS

The primary objective of this article was to analyse strategies working Poles undertake in order to maintain decent living conditions as retirees. By *pension strategy* we mean a sequence of actions aimed at providing the necessary level of consumption at the last stage of life, in particular saving practices and labour market activity. Our interest is strongly associated with the fact that the Polish pension system introduced in 1999 has the following basic features: (1) the system is a tool of intertemporal consumption smoothing over the life cycle; (2) pension system helps in distribution of GDP between working and non-working generations – no intended redistribution occurs; (3) system is a tool of distribution and owns only negligible assets. For the future retiree it means that the more is saved, the more can be received in old age. Moreover, the earlier the economic inactivity starts, the longer the period that has to be financed from this pension wealth. Finally, expectations regarding future material conditions can be adjusted, as system is transparent: key parameters are publicly known, and key variables communicated to the future retiree.

We used the data from the survey *Pension awareness of Poles* to show how working Poles act to maintain decent living conditions in old age, what they plan to do, and what are the assumptions underlying these plans and actions. To our best knowledge, this is the only source enabling for comparing all these issues. Our most general observation from the qualitative analysis is that no such pure pension strategy exists due to incoherence within the decision process. In particular, individual plans do not translate into actions, while deterioration in material conditions respondents fear rarely becomes an incentive for them to act. The knowledge of basic mechanisms of pension system is not widespread. In this context some plans and actions may be rational, but still unfavourable from the individual perspective.

Pension knowledge in Poland is generally low and this is rather not a surprising fact internationally. In many cases (amount of pension contributions paid, expected replacement

rates, preferred retirement age etc.) individuals admit they do not know the answers. However, it does not prevent them from wild-guessing – as in the question on replacement rates. Very even distribution of answers regarding political economy of pension system confirms our suppositions regarding insufficient knowledge to understand the consequences of various systemic solutions (sources of financing, redistribution etc.). It also becomes quite understandable that individuals prefer early labour-market exit, when half of them is not aware of the existing trade-off relationship between retirement age and benefit levels. A similar case happens with preferences by individuals for increasing their net remuneration instead of paying compulsory contributions. The acceptance for this practice is massive (including work in grey economy) [ZUS & ISP 2016], even though prospects are already poor, and estimations of [European Commission 2015] confirm further deterioration. This deep illiteracy leads to underestimating the power of long-term actions and to favouring consumption today. Moreover, the empirical literature such as Lusardi and Mitchell [2011] gives us strong grounds to believe that retirement knowledge of the non-working population (youths, long-term unemployed or economically inactive), not covered in our study, would be even worse.

In this context, one should be aware of the fact that the questions asked referred mainly to basic mechanisms of the system that should be easily observable or experienced by a working individual. These questions were selected and formulated in order to avoid requesting from the individuals the knowledge of pure theory or up-to-date legal requirements. Such approach was chosen in the report prepared for the Social Insurance Institution [ZUS & ISP 2016]. A survey based on a questionnaire including over a dozen technical issues led to conclusion that no-one can call oneself an expert in this field and the sufficient knowledge is also virtually non-existent. What would be much easier to implement in short run, is providing systemic information on potential benefits from saving and information on how to obtain its details. As for 2016, only 27% search for such information in ZUS, while half was not interested at all and remaining quarter based on TV, newspapers or family and relatives [ZUS & ISP 2016].

Very strong orientation towards low retirement age requires some additional comment. With low retirement knowledge, legal retirement age became a parameter warming the public opinion up to red, which is reflected both in the previous and recent surveys [CBOS 2016; 2008; 2005]. Even though for an ageing-proof pension system this parameter is a secondary issue, political debate concentrated mainly on it, and electoral promise to reverse its increase was fulfilled promptly.

As shown in the literature review, it cannot be excluded that illiteracy is not the only factor that affects the individual decisions. The presented results may also be interpreted in other ways.

First, they may be based on general mistrust towards pension system as a permanent social contract. This would not be very surprising keeping in mind that the current universal pension system has been implemented 19 years ago and in the meantime many elements have been dismantled (not affecting the general concept, though). If one does not trust in the pension system, immediate consumption seems to be a rational decision. Second, there is also a possibility that individuals have not internalized the features of new pension system and ascribe some features from previous system. Since in the pre-1999 system the relation between contributions and benefits was subject to many changes and in general was not very clear (e.g. based on ten years with highest earnings or latest ten years of tenure, depending on which value is higher etc.), extrapolation of these patterns on new system would affect decisions. To some extent it would be understandable, as promotional actions regarding pension were time-distant, and parts of the system were unevenly promoted.

Nevertheless, if not through extended working lives, one can collect pension wealth through supplementary savings. In fact, long-term saving is not very popular in Poland – as we show, such practice is performed by approximately one in five working individuals. Moreover, if it happens, inadequate instruments are used, such as saving accounts and cash, which does not promote long-term character, regularity and is in danger of withdrawal on demand [Rutecka-Góra 2016]. Our results also confirm the lack of asset diversification, typical for financially illiterate individuals.

Logistic regressions we performed emphasized several interesting patterns regarding the saving practice. Some of them are in agreement with empirical literature. First, higher education level (which is a justified proxy of literacy) doubtlessly leads to higher probabilities of supplementary long-term saving practice. Second, income – in general the higher, the higher odds of saving, however, the relationship is not always monotonical. In this context, additional educated guess arises, that – if reversed causation is holding – respondents refusing to answer on their income largely represent patterns typical for lower quantiles.

Furthermore, atypical behaviour of elder individuals is observed. In the 60-67 age group the highest odds of saving practice were observed for those who expect deterioration in material conditions in old age (that is, *soon*). This is not a sign of forward-looking behaviour, it is just enforced by raising awareness. In addition, this group has not yet experienced the increased expenses characteristic for oldest-olds. It would seem that saving practice happens either when one has sufficient income and knowledge (which, technically, are correlated), or when is forced by soon-to-be-realized poverty.

Slightly different is the case of labour contract types. Except for the self-employed (companies with one worker, namely the owner) all categories were characterised by high p-values and wide confidence intervals. Self-employed are systematically more prone to long-term saving on their own. The reason for this state of things is quite intuitive – this category was the only one not forced to pay social contributions. This situation referred to cleaning persons forced to reduce the labour costs, as well as well-paid experts optimising their incomes. While both groups have different capacities for additional saving, responsibility is completely transferred on the company.

The projections of gloomy and modest lives of future retirees, in combination with their passiveness, led us to ask, what actions are considered if the level of income will be insufficient to make ends meet. This level was approximated by today's minimum old-age pension. In some sense this is a useful, but not very precise example – the amount of 880 PLN was far above the social minimum (not to mention the subsistence minimum) and the projections of [European Commission 2015] leave no doubt this level cannot be kept. Nevertheless, only 3 people in 20 believe they would cover all their needs with this amount. It should be mentioned that as individuals age, their needs are growing, and in the future most of them will have to be satisfied with purchased goods and services (due to changing demographic structures) while the ability to earn a living will decrease.

As one may see, our question is not groundless. The principal component analysis led us to the conclusion that individuals not meeting their needs would form 3 separate strategies: to rely on themselves, in particular – search for a paid job; ask for external support (of which most popular is acquaintances support, and slightly less popular – social assistance support), or rebelling (including protesting and breaking the law). The latter was considered by approx. 15% of respondents, which is quite a lot.

All these results can – and should – be interpreted in the light of public policy. First, the introduction of the universal pension system in Poland was not preceded by significant dissemination of financial literacy. Future generations will most likely save more and retire later on the basis of the experiences of today's generations, but such a crash test for more advanced generations was not an intended outcome. In addition, polarisation of knowledge, plans and actions is observed for different education levels, income and type of contract group, which will most likely lead to unintended redistribution. Second, keeping in mind financial illiteracy, low saving rates and planned early withdrawals, in times of demographic ageing, the role of politicians will be even more difficult. Increasing political power of elder generations will be

oriented at shifting the balance of interests between working and retiring generations. Changing it in reaction to this increasing power is an unsustainable solution.

ACKNOWLEDGEMENTS

The authors would like to thank Dariusz Stańko, Michał Gradzewicz and Piotr Bartkiewicz for useful comments to the early versions of this manuscript.

REFERENCES

- Almenberg, J., & Säve-Söderbergh, J. (2011). Financial literacy and retirement planning in Sweden. *Journal of Pension Economics & Finance*, 10(4), 585-598.
- Ameriks, J., & Yakoboski, P. (2003). Reducing retirement income risks: The role of annuitization. *Benefits Quarterly*, 19(4), 13.
- Armor, D. A., & Taylor, S. E. (2003). The effects of mindset on behavior: Self-regulation in deliberative and implemental frames of mind. *Personality and Social Psychology Bulletin*, 29(1), 86-95.
- Atkinson, A., & Messy, F. A. (2012). *Measuring financial literacy: Results of the OECD*. OECD Publishing.
- Bauer, R., Eberhardt, I., & Smeets, P. (2017). *Financial Incentives Beat Social Norms: A Field Experiment on Retirement Information Search*.
- Benartzi, S., & Thaler, R. (2002). How much is investor autonomy worth?. *The Journal of Finance*, 57(4), 1593-1616.
- Benartzi, S., & Thaler, R. (2007). Heuristics and biases in retirement savings behavior. *Journal of Economic perspectives*, 21(3), 81-104.
- Bidewell, J., Griffin, B., & Hesketh, B. (2006). Timing of retirement: Including a delay discounting perspective in retirement models. *Journal of Vocational Behavior*, 68(2), 368-387.
- Bucher-Koenen, T., & Lusardi, A. (2011). Financial literacy and retirement planning in Germany. *Journal of Pension Economics & Finance*, 10(4), 565-584.
- Buchholtz, S., Chłoń-Domińczak, A., & Góra, M. (2018) Implementing non-financial defined contribution pensions in Poland [in:] Holzmann, R., Palmer, E., Palacios, R., & Sacchi, S., (eds.) *Non-financial Defined Contribution Pension Schemes: Facing the Challenges of Marginalization and Polarization in the Economy and Society*, World Bank.

- Brown, K. M. (2013). The link between pensions and retirement timing: Lessons from California teachers. *Journal of Public Economics*, 98, 1-14.
- Brown, J. R., Farrell, A. M., & Weisbenner, S. J. (2016). Decision-making approaches and the propensity to default: Evidence and implications. *Journal of Financial Economics*, 121(3), 477-495.
- Centrum Badania Opinii Społecznej (2005). O wieku emerytalnym kobiet i mężczyzn raz jeszcze [On retirement age of women and men one more time]. <https://bit.ly/2ME0UQ6>
- Centrum Badania Opinii Społecznej (2008). System emerytalny – oceny i postulaty [Pension system – evaluation and proposals]. 169/2008. <https://bit.ly/2K074s4>
- Centrum Badania Opinii Społecznej (2016). Opinie o obniżeniu wieku emerytalnego [Opinions on decreasing the retirement age]. 140/2016. <https://bit.ly/2JXjYY3>
- Chalmers, J. M., Johnson, W. T., & Reuter, J. (2008). *Who determines when you retire? Peer effects and retirement* (No. onb08-13). National Bureau of Economic Research.
- Coile, C. C., & Levine, P. B. (2011). The market crash and mass layoffs: How the current economic crisis may affect retirement. *The BE Journal of Economic Analysis & Policy*, 11(1).
- Chan, S., & Stevens, A. H. (2008). What you don't know can't help you: Pension knowledge and retirement decision-making. *The Review of Economics and Statistics*, 90(2), 253-266.
- Chevalier, S., Fouquereau, E., Gillet, N., & Demulier, V. (2013). Development of the reasons for entrepreneurs' retirement decision inventory (RERDI) and preliminary evidence of its psychometric properties in a French sample. *Journal of Career Assessment*, 21(4), 572-586.
- Choi, S. J., Fisch, J. E., & Pritchard, A. C. (2005). Do Institutions Matter-The Impact of the Lead Plaintiff Provision of the Private Securities Litigation Reform Act. *Wash. ULQ*, 83, 869.
- Cronqvist, H., & Thaler, R. H. (2004). Design choices in privatized social-security systems: Learning from the Swedish experience. *American Economic Review*, 94(2), 424-428.
- Czapiński, J., & Góra, M. (2016). Świadomość "emerytalna" Polaków. Raport z badania ilościowego ["Pension" awareness of Poles. Report from the quantitative survey]. technical report. <https://bit.ly/2IWOgNn>.
- de Hek, P., & van Vuuren, D. (2011). Are older workers overpaid? A literature review. *International Tax and Public Finance*, 18(4), 436-460.

- Duflo, E., & Saez, E. (2002). Participation and investment decisions in a retirement plan: The influence of colleagues' choices. *Journal of Public Economics*, 85(1), 121-148.
- European Commission (2015). The 2015 Ageing Report. Economic and budgetary projections for the 28 EU Member States (2013-2060). *European Economy*, 3.
- Fehr, E., & Gächter, S. (2000). Fairness and retaliation: The economics of reciprocity. *Journal of Economic Perspectives*, 14(3), 159-181.
- Fornero, E., & Monticone, C. (2011). Financial literacy and pension plan participation in Italy. *Journal of Pension Economics & Finance*, 10(4), 547-564.
- Fornero, E., & Lo Prete, A. (2017). Voting in the aftermath of a pension reform: the role of financial literacy. *CeRP WP*, 171, 17.
- French, E. (2005). The effects of health, wealth, and wages on labour supply and retirement behaviour. *The Review of Economic Studies*, 72(2), 395-427.
- Gilbert, D. T., & Wilson, T. D. (2007). Propection: Experiencing the future. *Science*, 317(5843), 1351-1354.
- Główny Urząd Statystyczny (2017). Struktura wynagrodzeń według zawodów w październiku 2016 r. <https://stat.gov.pl/obszary-tematyczne/rynek-pracy/pracujacy-zatrudnieni-wynagrodzenia-koszty-pracy/struktura-wynagrodzen-wedlug-zawodow-w-pazdzierniku-2016-r-,5,5.html>
- Gottschalk, F. (2018). What Characterizes Credence Goods? A Critical Look at the Literature, SSRN Papers, 2018
- Góra, M., & Palmer, E. (2004). Shifting perspectives in pensions. IZA DP 1369.
- Gruber, J., & Wise, D. (2005). *Social security programs and retirement around the world: Fiscal implications, introduction and summary* (No. w11290). National Bureau of Economic Research.
- Harrison, T., Waite, K., & White, P. (2006). Analysis by paralysis: the pension purchase decision process. *International Journal of Bank Marketing*, 24(1), 5-23.
- Hewitt Associates. (2002). *Investing in round numbers*. unpublished paper.

- Hershey, D. A., Henkens, K., & Van Dalen, H. P. (2010). Aging and financial planning for retirement: Interdisciplinary influences viewed through a cross-cultural lens. *The International Journal of Aging and Human Development*, 70(1), 1-38.
- Hershfield, H. E., Goldstein, D. G., Sharpe, W. F., Fox, J., Yeykelis, L., Carstensen, L. L., & Bailenson, J. N. (2011). Increasing saving behavior through age-progressed renderings of the future self. *Journal of Marketing Research*, 48(SPL), S23-S37.
- Huberman, G., & Jiang, W. (2006). Offering versus choice in 401 (k) plans: Equity exposure and number of funds. *The Journal of Finance*, 61(2), 763-801.
- Hurd, M. D., Smith, J. P., & Zissimopoulos, J. M. (2004). The effects of subjective survival on retirement and social security claiming. *Journal of Applied Econometrics*, 19(6), 761-775.
- Johnson, D., & Grayson, K. (2005). Cognitive and affective trust in service relationships. *Journal of Business research*, 58(4), 500-507.
- Kerschbamer, R., & Sutter, M. (2017). The economics of credence goods—a survey of recent lab and field experiments. *CESifo Economic Studies*, 63(1), 1-23.
- Klapper, L. F., Lusardi, A., & Panos, G. A. (2012). *Financial literacy and the financial crisis* (No. w17930). National Bureau of Economic Research.
- Knoll, M. A. (2011). Behavioral and psychological aspects of the retirement decision. *Social Security Bulletin*, 71, 15.
- Kopczuk, W., & Song, J. (2008). Stylized facts and incentive effects related to claiming of retirement benefits based on social security administration data. Michigan Retirement Research Center Research Paper, 2008-200.
- Krauth, B. (2006). Social interactions in small groups. *Canadian Journal of Economics*, 414-433.
- Ljunge, M. (2011). Increasing demands on the welfare state? Trends in behavior and attitudes. *CESifo Economic Studies*, 57(4), 605-622.
- Lusardi, A., & Mitchell, O. S. (2006). *Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth* (No. w12585). National Bureau of Economic Research.
- Lusardi, A., & Mitchell, O. (2007a). Financial literacy and retirement planning: New evidence from the Rand American Life Panel.

- Lusardi, A., & Mitchell, O. S. (2007b). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics*, 42(1), 35-44.
- Lusardi, A., & Mitchell, O. S. (2011). *Financial literacy and planning: Implications for retirement wellbeing* (No. w17078). National Bureau of Economic Research.
- Lusardi, A., & Mitchell, O. S. (2011). Financial literacy around the world: an overview. *Journal of Pension Economics & Finance*, 10(4), 497-508.
- Lusardi, A., & Mitchell, O. S. (2014). The economic importance of financial literacy: Theory and evidence. *Journal of Economic Literature*, 52(1), 5-44.
- OECD (1996). *Ageing in OECD countries: a critical policy challenge*. OECD.
- Read, D., & Loewenstein, G. (1995). Diversification bias: Explaining the discrepancy in variety seeking between combined and separated choices. *Journal of Experimental Psychology: Applied*, 1(1), 34.
- Rutecka-Góra, J. (ed.) (2016). Długoterminowe oszczędzanie. Postawy, strategie i wyzwania [Long-term saving. Attitudes, strategies and challenges]. <https://bit.ly/2fEuhpr>
- Rzemek, M. (2018). Emerytury Polaków w 2018 r. - od 10 groszy do 21,5 tys. zł [Pensions of Poles in 2018 – from 0.1 to 21,500 PLN]. <https://bit.ly/2Jd51om>
- Steel, P. (2010). Arousal, avoidant and decisional procrastinators: Do they exist?. *Personality and Individual Differences*, 48(8), 926-934.
- Thaler, R. H., & Benartzi, S. (2004). Save more tomorrow™: Using behavioral economics to increase employee saving. *Journal of political Economy*, 112(S1), S164-S187.
- Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of political Economy*, 89(2), 392-406.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The quarterly journal of economics*, 106(4), 1039-1061.
- Van der Klaauw, W., & Wolpin, K. I. (2008). Social security and the retirement and savings behavior of low-income households. *Journal of Econometrics*, 145(1-2), 21-42.

- Van Erp, F., & de Hek, P. (2009). *Analyzing labour supply of elderly people: A life-cycle approach* (No. 179). CPB Netherlands Bureau for Economic Policy Analysis.
- Van Erp, F., Vermeer, N., & van Vuuren, D. (2014). Non-financial determinants of retirement: a literature review. *De Economist*, 162(2), 167-191.
- Van Rooij, M. C., Kool, C. J., & Prast, H. M. (2007). Risk-return preferences in the pension domain: are people able to choose?. *Journal of Public Economics*, 91(3-4), 701-722.
- Van Solinge, H., & Henkens, K. (2009). Living longer, working longer? The impact of subjective life expectancy on retirement intentions and behaviour. *European Journal of Public Health*, 20(1), 47-51.
- van Vuuren, D. (2014). Flexible retirement. *Journal of Economic Surveys*, 28(3), 573-593.
- Wilson, T. D., & Gilbert, D. T. (2003). Affective forecasting. *Advances in Experimental Social Psychology*, 35(35), 345-411.
- World Bank (1994). Averting the old age crisis: Policies to protect the old and promote growth. A World Bank Policy Research Report.
- Zakład Ubezpieczeń Społecznych, & Instytut Spraw Publicznych (2016). Wiedza i postawy wobec ubezpieczeń społecznych. Raport z badań [Knowledge and attitudes towards social insurance. Survey report]. <https://bit.ly/2linUlg>.