
The Impact of Framing and Anchoring on Postponing Labour Market Exit – Evidence from Polish NDC+FDC Pension Scheme

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Abstract:

Purpose: The article examines whether the level of effective retirement age can be shifted upwards by increasing awareness of the consequences of premature retirement.

Design/Methodology/Approach: The study uses multinomial logistic regression on the representative survey data for Polish working population. Special interest is given to the questionnaire with framing and anchoring effects included.

Findings: The findings reveal strong retirement preferences of a minimum retirement age being the reference point and the natural anchor. However, these might change once framing is provided. Pension awareness is a significant predictor of postponing retirement. There can be distinguished a segment of working population with extremely low pension literacy.

Practical Implications: Increasing effective retirement age is among most important factors reducing labour supply deficits and improving long-term sustainability of public finance. Special interest should be given to rational individuals with wrong assumptions on the mechanics of the pension scheme and individuals with extremely low pension knowledge in order to avoid severe old-age poverty.

Originality/value: The study confirms that use of framing in increasing financial literacy leads to significant postponement of the labour market exit declared. Furthermore, there is a segment of the Polish working population with extremely low pension knowledge which should be educated.

Keywords: Labour market, pension, retirement age, retirement savings, framing effect, anchoring effect, financial literacy.

JEL code: J21, J26, H55, G53.

Paper type: Research article.

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1. Introduction

Effective retirement age - the age at which an individual leaves the labour market permanently - is a parameter of high importance for public policy. Its low levels may reflect several unfavourable phenomena: low legal (statutory) retirement age, low propensity to economic activity (due to objective barriers, including poor health, insufficient skills, and care commitments, or subjective barriers, incl. low value of work), widespread eligibility to early retirement based on acquired rights (incl. occupational pension schemes), widespread availability of benefits economically equivalent to the old-age pension benefit (including pre-retirement benefits), tacit consent to pensioners' work in the grey economy, low financial literacy of the pension scheme participants, existence of subsidized transfers (minimum pension benefit, extra payments), shifting the opportunity cost of paid work, low stability of pension system regulations, public policy for senior citizens.

Typically these phenomena are interlocking. Low effective retirement age driven by all of the abovementioned factors can be found for instance in Poland (Buchholtz *et al.*, 2021; Chłoń-Domińczak *et al.*, 2020, Buchholtz, 2019; Chybalski, 2018), which shows that solving this problem may be a complex process. Its coexistence with late entry to the labour market and increasing life expectancy further raises its priority status. Relatively small output is created and distributed in the many years of old age. Given demographic ageing, this means either higher risk of poverty (for an actuarially balanced pension scheme) or subsidising myopic individuals (for an imbalanced one). In the latter case budget expenditures are crowded out by the cost of old-age pension benefits (either today or in the future through public debt). Both affect intergenerational solidarity negatively.

This is the reason why public policy needs to focus on extending the period of economic activity and achieving a sound ratio between it and the length of the period when benefits are received through stability of the social contract on pension security, increasing the profitability of paid work, reducing barriers to economic activity and widespread education leading to rational decisions of the system participants.

In this article we focus on the latter aspect. We aim at examining whether the declared retirement age can be shifted upwards by increasing awareness of the consequences of a premature exit with the use of framing and anchoring of pension information. This article contributes to the literature twofold. First, it confirms that extending the information pool leads to better decisions regarding labour market exit. Second, this improvement might be - at least partially - explained by behavioural economics. We proved that, if designed properly, the pension information may influence declared age of labour market exit even when a minimum retirement age remains a strong anchor. But to achieve so, the anchor has to be placed among the less and more favourable retirement options.

The article is structured as follows. Section 2 diagnoses the patterns of old-age economic activity and their long-term consequences. Section 3 summarises literature review referring to life-cycle savings, financial literacy and financial decisions of individuals and behavioural economics. Chapter 4 presents the Polish pension system. In Chapter 5 we describe methodology. Chapter 6 provides results of statistical and econometric analysis with necessary discussion. Chapter 7 concludes.

2. Patterns of Economic Activity and Their Long-Term Consequences

The duration of working time varies in EU countries. Economic activity of men is systematically longer than that of women. This can be attributed to the social norm of male breadwinner, career breaks, and (in some countries) earlier female retirement opportunities built into pension schemes. The lower bound in EU-28 is defined by countries with traditionally low female economic activity.

Despite these differences, between 2000 and 2019 the EU has recorded significant progress in extending the period of economic activity among both sexes. Apparently, picking low-hanging fruits happens: bigger improvement is observed for women, and closing the gap between leaders and laggards occurs to a largest extent through shifting lower bounds. According to Eurostat data, after 20 years the EU's poorest performer increased the average duration of working time of women by almost a decade (9.7 years, to 27.3 years) - in the meantime the leaders managed to extend activity by additional 4.7 years (to 41.0 years). For men, the improvement is more modest, albeit still visible: minimum duration increased by 4.2 years (to 34.5 years), maximum - by 2.9 years (to 43.3 years). In practice it means not only a significant improvement but also closing the gap between men and women, necessary to reduce the risk of old-age poverty gender gap.

Poland recorded modest progress, comparing to the starting point, the pace of population ageing and European peers. In 2019 the average duration for females was 30.7 years (improvement by 1.9 years in 20 years). For males the respective values were 36.3 and 3.0. It should be stated that due to phasing out benefits related to economic restructuring (economically equivalent to old-age pensions), until 2008-2009 the average duration for both sexes was below the 2000 levels. As a consequence, Poland systematically lags behind even the laggards from EU-28. In 2019 the distance to the poorest performer was 1.8 year for men (Croatia) and 3.4 year for women (Italy).

The opportunity cost of early labour market exit is high. Under Polish universal pension scheme early withdrawal means low benefit (the consequence of algorithm in which the amount of pension account is divided by remaining life expectancy). Low benefits can be supplemented with labour income, however, only in the early phase of old age. As individuals age, their needs increase (e.g. caregiving), while options of paid job shrink, leading to increasing risk of poverty and social exclusion in the last stage of life. In 2020 the replacement rate of old-age pension in Poland is

57.8% of average wage, and the ILO safety threshold of 40% will be reached in 10 years.

3. Literature Review

3.1 Life-Cycle Savings

Retirement is traditionally discussed in the context of Ando and Modigliani's (1963) life-cycle theory. One of the conclusions drawn from it is the following: if the gap between the levels of income during economic activity and thereafter is significant, a rational individual should either save more earlier or extend the period of economic activity. These two strategies result in accumulating pension savings sufficient to smooth consumption once the individual retires.

This theory has been criticised due to conservative assumptions. One of them refers to missed interactions between pension system and individual savings. First, contributions may be transformed into future savings based on population characteristics instead of individual ones. Second, private savings may be crowded out by social security transfers (Feldstein, 1974). Remaining savings may act as a buffer for those who fall below the pre-retirement income level, due to larger expenditure or crisis (Cavasso and Weber, 2013). The level of savings should affect the decision on the labour market exit (Disney, 1996).

Another criticism refers to individual rationality in the decision-making process over the life cycle. Under this assumption, individuals have significant financial literacy and ability to estimate crucial variables: one's own wealth, future consumption and life expectancy. If this assumption is broken (*bounded rationality*, Simon, 1972), individuals may underestimate pension wealth necessary to smooth their consumption or overestimate the dynamics of their pension wealth accumulation. Recent two decades of research provided robust evidence that future pensioners are far from rational.

The period prior to the 2008-2009 global financial crisis was one of low pension literacy and light-heartedness. Knowledge of the demographic processes was not widespread while groundless optimism prevailed - especially among potentially more vulnerable groups (Guiso *et al.*, 2013; Bissonnette and van Soest, 2010).

From this perspective the crisis had a strong signalling effect. First, it showed that favourable conditions intertwine with recessions. Second, prospects of unsustainable public budgets due to the negative demographic dividend forced governments to reduce incentives to early labour market exit and encouraged individuals to prolong employment. In defined contribution pension systems this, however, requires financial literacy and decent levels of pension awareness.

3.2 Determinants of Good Life-Cycle Financial Decisions

The number of financial decisions to be made in a lifetime is growing - lives are getting longer, more financial decisions are being borne by individuals and financial markets are becoming increasingly complex. Under such conditions the role of financial literacy is increasing. It allows individuals to act instead of passively observe (Bernheim and Garrett, 2003; Choi *et al.*, 2006, Ambuehl *et al.*, 2015 on the difference between passive knowledge and literacy) and - especially - to act properly.

From this perspective wealth at retirement is the outcome of at least three decades of pension decisions that are considered to be the most important stressors (Joo, 2008).

Literature provides robust evidence that financial literacy is positively correlated with pension wealth (Ekerdt *et al.*, 2001; Yuh and DeVaney, 1996) and makes financially savvy people capable of handling unexpected shocks (Hasler *et al.*, 2018). By contrast, financially illiterate individuals are characterised by lower probability of retirement planning, higher propensity for excessive consumption, lower saving rate, worse asset portfolio returns, and make more errors (Klapper *et al.*, 2012). They usually borrow more, save less (Behrman *et al.*, 2012; Stango and Zinman, 2009), and retire early more frequently (Allen *et al.*, 2012).

Many known patterns of financial literacy on the individual level were confirmed. Some studies prove that educated people make better financial decisions much more often than less educated ones (Hershey and Walsh 2000; Hilgert *et al.*, 2003; Calvert *et al.*, 2005). Men are more knowledgeable than women, even after controlling for age, education and income; prime-age individuals - more than youngest and oldest adults; more affluent individuals comparing to poorer ones (and the gap is larger for major advanced economies). Labour market activity is typically correlated with higher share of financially savvy citizens than being out of the workforce (Klapper and Lusardi, 2020; Lusardi and Mitchell, 2014).

3.3 Improving the Quality of Life-Cycle Financial Decisions

Acquiring financial literacy comes at a cost. Wrong decisions usually lead to suboptimal results. Reasons are numerous: lack of cognitive ability, insufficient power to tackle the problem, overconfidence, or not following rational economic decision-making (Tapia and Yermo, 2007). In fact, many studies proved the existence of bounded rationality (Simmon, 1972; Thaler, 1980; 2015; Zaleśkiewicz, 2015) leading to suboptimal decisions. Bounded rationality is driven by self-control, imperfect knowledge and cognitive biases. Non-financial determinants were applied by Shefrin and Thaler (1988) to develop behavioral life-cycle (BLC) hypothesis. They expanded the classical life-cycle theory to make it more behaviorally realistic. Three psychological factors were included to the model: self-control, mental accounting and framing.

In old-age pension systems self-control problems are limited to a great extent by making the participation mandatory. However, one area left for individual decisions could be the moment of retirement when pension law indicates only a minimum retirement age. Knowledge deficits regarding the rules of pension system operation may result in exiting the labour force too early and receiving relatively low level of pension benefit, even if an individual is able and willing to work longer. Retirement decisions may be affected by cognitive biases - systematic errors in thinking, influencing judgement and decision making (Kahnemann, 2013), i.e., anchoring, adjustment and framing effect.

Anchoring and adjustment relate to human tendencies to rely on the first piece of information received when making decisions (Tversky and Kahnemann, 1974). Adjustments are based on a reference point that is usually insufficient, giving the initial anchor great influence on decisions and leading people to make errors reducing the rationality of their choices (Kahneman, 2013; Thaler and Sunstein, 2009; Ariely, 2008). More knowledgeable people are less sensitive to anchors (Furnham and Boo, 2011; Mussweiler *et al.*, 2000; Wilson *et al.*, 1996), so are the individuals with higher cognitive abilities (Bergman *et al.*, 2010).

The statutory or minimum retirement age may be an anchor in retirement decisions. The amount of benefit that an individual expects to receive after retirement could also be one. We assume that the anchor in the form of minimum retirement age impacts individuals and their declared retirement decisions but these could be changed when framing is applied.

Framing effect relates to ways of presenting information (Kahnemann and Tversky, 1981). Generally, people tend to evaluate the decisions not in terms of their consequences for individual wealth or situation but rather in relative terms as losses and gains with reference to some given point. Natural loss aversion leads individuals to choose those options from those available, that allow them to avoid losses. Prospect Theory (Tversky and Kahnemann, 1979) states that people are more averse to losses than they are attracted by gains.

Fetherstonhaugh and Ross (1999) examined framing effects in retirement decisions using a social experiment in which they asked people about the declared retirement age with two optional answers but presented randomly in different order. So participants were manipulated with different retirement age with decision options presented as gains or losses from the first answer being the reference point. They proved huge influence of framing on late retirement choices but found no significant effect when framing for gains and losses of earlier than standard retirement. They also showed greater preference of one-time bonus over yearly increments. MacGowan *et al.* (2018) found that framing a pension benefit as a lump sum increases people's expectations about annuity conversion rates and makes them less likely to opt for an annuity at present market rates. They also observed that framing

the old-age benefit as regular income rather than a lump sum had a greater effect on the willingness to choose the annuity than a ten-year increase in expected longevity.

4. Polish Old-Age Pension System

In 1999 a universal defined benefit (DB) pension system in Poland was replaced with a defined contribution (DC) one with a multi-pillar structure according to the World Bank concept (World Bank 1994). The first two pillars represent the universal and mandatory systems while the third pillar includes all forms of both occupational and individual supplementary pension plans.

The first element is a PAYG system managed by Social Insurance Institution (*Zakład Ubezpieczeń Społecznych*, ZUS) and based on a nonfinancial defined contribution (NDC) formula. The second element was initially fully funded defined contribution (FDC) and consisted of open pensions funds (*otwarte fundusze emerytalne*, OFE) managed by pension societies (*powszechnie towarzystwa emerytalne*, PTE). But the pension reform of 2014 made open pension funds voluntary and introduced NDC sub-accounts managed by ZUS as a default option for the second pillar. The funded element of the universal system survived but took the form of a partial and voluntary opt-out. The mandatory pension contribution amounts to 19.56% of a gross wage. Every pension contribution paid to the system increases the balance of an individual account of the insured in both first and second pillar. The first pillar account is indexed with wage bill growth and inflation while in the second pillar nominal GDP growth (sub-accounts managed by ZUS) or a rate of return (OFE) is applied.

The old-age pension benefits from Polish universal public pension system depend on a balance of individual accounts in both NDC and FDC pillars. If an insured participated in the funded second pillar, its capital gathered in OFE is transferred to sub-accounts managed by ZUS prior to retirement. The pension benefit is calculated according to the following formula: the balance of pension entitlements in both individual accounts is divided by the average life expectancy at retirement. As the pension entitlements are old-age pension contributions indexed or capitalised for the whole accumulation period, the amount of benefit depends on the contributions paid, the rate at which they are accumulated, the length of contributing period and the retirement age. Individuals highly aware of these basic principles know that postponing retirement for one year results in ca. 8% increase of a public pension benefit.

The minimum retirement age for women and men in Poland is currently 60 and 65 respectively. It was planned to be increased gradually to 67 for both sexes starting from 2013 by increasing it by three months every year. The target minimum retirement age was to be achieved in 2020 for men and in 2040 for women. However, the government backtracked in 2017. Although the minimum retirement age was brought back to 60 and 65, the real retirement age is expected to increase

due to progressive internalization of DC pension system rules by individuals. There is no maximum retirement age so the insured could postpone the retirement as long as they wish and are able to do so. But to make a rational retirement decision they need to be provided with adequate pension information that allows them to understand the possible options.

5. Research Methodology

5.1 The Research Tool

In this article we use a dataset from the survey *Pension awareness of Poles* (Czapiński and Góra, 2016) as a secondary data source. Its original purpose was to assess the knowledge regarding the mechanisms of the Polish universal pension scheme, awareness of the consequences of participation, and types of action undertaken by the individuals in order to maintain the necessary income level in old age.

One of the areas covered by the questionnaire is the preferred retirement age. The question is asked twice: for the first time in a crude form, and for the second - using the anchor and framing effect (Tversky and Kahnemann, 1981) with the *reference point* (Tversky and Kahnemann, 1974; Zaleśkiewicz, 2015) being a pension benefit amounting to PLN 1000 at the age of 67. In February 2016 when the survey was conducted, the minimum retirement age was on the way to rise and equalled to 61 years and 1 month for women and 66 years and 1 month for men. So the respondents declared the age at which they would like to retire keeping in mind the target minimum retirement age of 67. Questions drawn for the questionnaire are given below.

1. Bearing in mind that the amount of the old-age pension depends on the amount of funds accumulated during the period of economic activity, at what age would you like to retire? (options: age number, as long as possible, I don't know).
2. Delayed retirement allows for a significant increase in the amount of the old-age pension from the general system. This is illustrated by the example of a person who, at the age of 67, would receive a pension of PLN 1,000.

What would you decide having the same knowledge as in the example above? (options: I would retire at the lowest possible age no matter what; I would delay receiving the benefit: for a year, ... for two years, ... for three years, ... as long as possible, I don't know).

The reference point, i.e., the theoretical pension benefit paid when retiring at the minimum retirement age (67), was placed in the centre of the table. The given choice of retirement age was framed as a potential loss or a potential gain of a

pension benefit for those who decide to retire before and after 67 respectively. We allowed people that declared to retire earlier than at 67 to face a loss of benefit amounting to ca. 8% per every year of earlier retirement. Symmetrically, for those who declared late retirement we show the gains they get in form of higher benefits.

3. Do you think that delaying your retirement will increase the amount of the benefit? (options: yes, no, I don't know)

Questions 1 and 2 allow to assess the impact of incremental knowledge on the individual decision on retirement age. The analytical strategy includes the description of preferred retirement age - unconditional and conditional on additional information - and finally, identifying determinants of preferred retirement age, including the behavioural effects.

Table 1. *Simulation of the monthly old-age retirement benefit amount depending on the age of retiring - the example given in the questionnaire*

age	62	63	64	65	66	67	68	69	70
benefit in PLN	654	711	774	843	918	1000	1090	1190	1300
benefit in EUR	145	158	172	187	204	222	242	264	289

Note: Amount in EUR originally not disclosed. Bolding of 1000 original.

Source: Czapiński and Góra, 2016, authors' translation.

5.2 The Sample Population

The data was gathered in telephone interviews conducted by a commissioned company. Initial survey sample covered 1006 individuals aged 18-67, virtually all economically active, the majority of whom participated in Polish universal pension scheme. Due to importance weighting the results are representative by gender, age, education and urbanisation for the Polish working population. However, in order to focus on the framing effect, we needed to remove the individuals covered by various occupational pension schemes from the sample. For such respondents conditions and incentives built into their schemes differ significantly (Walczak, 2019). We also removed six (old-age) pensioners. The final sample includes 910 observations. By reducing the sample we improved the results of the analysis with virtually no impact on representativeness. Largest differences (1.5-2.6 pp.) are the effect of removing farmers, whose separate pension scheme offers low contributions, early benefits of low value and correlated urbanisation structure. The sample characteristics are described in Table 2.

Table 2. *Sample characteristics*

variable		initial sample		reduced sample		difference (p.p.)
	total	1,006	100.0%	910	100.0%	0.0
gender	female	551	54.8%	505	55.5%	0.7

	male	456	45.3%	405	44.5%	-0.8
age group	18-29	183	18.2%	169	18.6%	0.4
	30-44	343	34.1%	319	35.1%	1.0
	45-59	240	23.9%	215	23.6%	-0.2
	60+	240	23.9%	207	22.7%	-1.1
education	primary	15	1.5%	11	1.2%	-0.3
	vocational	231	23.0%	201	22.1%	-0.9
	secondary	429	42.6%	390	42.9%	0.2
	tertiary	331	32.9%	308	33.8%	0.9
urbanisation	rural areas	379	37.7%	326	35.8%	-1.8
	urban areas, population < 50,000	224	22.3%	216	23.7%	1.5
	urban areas, population 50,000- 200,000	133	13.2%	116	12.7%	-0.5
	urban areas, population >200,000	270	26.8%	252	27.7%	0.9
net personal income (EUR)	0-230	43	4.3%	32	3.5%	-0.8
	231-460	285	28.3%	263	28.9%	0.6
	461-690	316	31.4%	290	31.9%	0.5
	691-920	64	6.4%	57	6.3%	-0.1
	>920	38	3.8%	32	3.5%	-0.3
type of labour contract	labour-code contract	831	82.6%	775	85.2%	2.6
	fixed-term civil-law contract	84	8.3%	76	8.4%	0.0
	self-employment	26	2.6%	23	2.5%	-0.1
	business owner	35	3.5%	34	3.7%	0.3
	farm owner	42	4.2%	14	1.5%	-2.6
	pensioner	4	0.4%	0	0.0%	-0.4
	old-age pensioner	2	0.2%	0	0.0%	-0.2

Source: Own study.

5.3 Data Analysis

In order to answer the research question, we use multinomial logistic regression with the dependent variable of preferred retirement age. In multinomial logit four options are available: retiring below retirement age, retiring at this age, retiring above this age or don't know. Independent variables cover demographic characteristics (gender, age), descriptors of interest in own future as a retiree, knowledge (link between delaying retirement and increase in benefit) as well as impact of framing and anchoring. Neither socio-economic variables, nor political opinions on sustainability of the pension system were statistically significant. The model combines dummy, continuous and categorical variables. The regression is supplemented with descriptive statistics.

6. Findings and Discussion

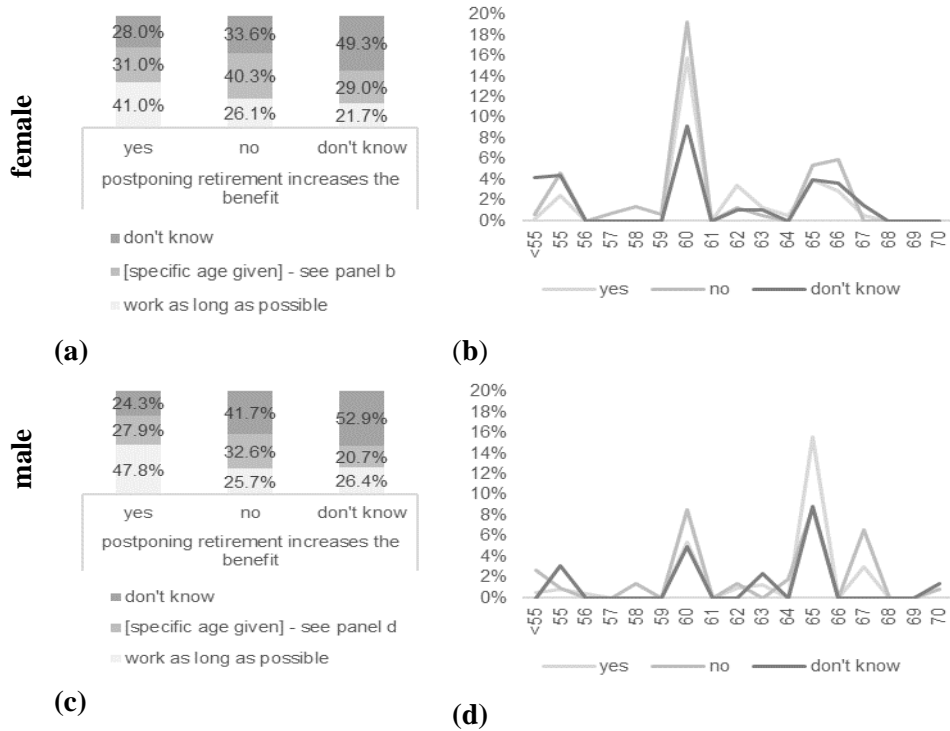
Analysis of the preferred retirement age suggests that gender only partially explains individual preferences regarding the retirement age. With three possible options (specific age given, “as long as possible” and “don’t know”), men tend to choose working as long as possible instead of choosing a specific age. However, when a specific age is preferred, both genders are anchored to the existing levels of minimum retirement age - not lower (early retirement) and not higher than the already set thresholds. As retirement age should be binding for the majority of the labour force, these decisions reveal limited progress in raising awareness of the retirees-to-be. The share of individuals setting the age of retirement at least at 67 (target minimum retirement age when the survey was conducted) is negligible.

Keeping in mind significant gender differences with respect to length of working life and life expectancy, we applied gender perspective to identify whether awareness of the existing link between pension levels and postponing retirement exists. In fact, we observe several common patterns (Figure 1). First, lacking knowledge about these links leads to preferring fixed thresholds. Second, uncertainty whether such link exists, is most likely a signal of broader lack of knowledge. By distinguishing between genders, it becomes clear that female preferences of fixed age are systematically lower than among men. This is particularly important to emphasize that such bias creates a double penalty for women: due to lower pension wealth and higher life expectancy.

Propensity to change one’s mind after rephrasing the question depends on the initial decision. Individuals choosing the fixed retirement age not higher than the threshold (minimum retirement age) typically stick to the lowest possible age (Table 3). Such attitude is significantly less frequent for those who initially selected working after reaching retirement age. For those who believe they will work as long as possible, in the majority of cases this decision remained unchanged even after introducing framing effects. Being unable to choose the preferred retirement age usually leads to being unable to reassess such decision. When it comes to changing one’s mind, introducing a numerical example usually leads to delay by more than one year.

As shown in the Table 4, for females comparing to males, the relative risk for preferring retirement below the pension age compared to working as long as possible would be expected to decrease almost by half, while the relative risk for preferring to retire above the pension age by almost 3.4 times (henceforth: given the other variables in the model are held constant). It would seem that females are less likely than males to prefer retirement below the pension age, and more likely to prefer working as long as possible. With all caveats regarding the intentions hidden under working *as long as possible*, this result clearly shows that low female retirement age (compared to men and compared to life expectancy) is not especially welcome.

Figure 1. Preferred age of retirement by pension literacy and gender



Source: Own study.

Table 3. Attitudes towards delaying retirement after framing and anchoring, conditional on the initially preferred retirement age

verified decision \ preferred retirement age	below the threshold	at the threshold	above the threshold	work as long as possible	don't know
retire at the lowest possible age	42.5%	45.2%	30.9%	8.7%	18.2%
delay by 1 year	3.3%	3.2%	5.1%	3.7%	4.1%
delay by 2 years	7.4%	10.4%	14.3%	9.9%	11.1%
delay by 3 years	18.7%	14.7%	22.4%	13.3%	12.7%
work as long as possible	18.7%	17.1%	19.4%	57.5%	22.8%
don't know	9.4%	9.4%	7.9%	6.9%	31.1%

Source: Own study.

Table 4. Multinomial logistic regression - relative-risk ratios of preferred retirement age

		retire below the pension age	retire at the pension age	retire above the pension age	don't know
gender	female	0.479***	1.367	3.389***	1.078
age	(cont.)	0.985	1.021*	0.996	1.000
think about own future as a retiree	no	1.693*	1.353	1.524	0.767
counteract old-age poverty	no	0.893	1.386	0.823	1.590**
propensity to save for old age	no	0.510*	0.635	1.164	0.643*
	don't know	0.562	0.642	0.812	2.052**
delaying retirement leads to higher benefit (opinion)	no	2.958***	1.034	1.596	1.973***
	don't know	2.357	0.751	1.210	1.800**
retirement reconsidered under framing & anchoring (work as long as possible - ref.)	retire at the lowest possible age	12.715***	18.183***	9.199***	4.549***
	delay retirement by 1-3 years	3.282***	3.659***	4.234***	2.546***
	don't know	3.550**	5.215***	3.247**	9.151***
constant		0.119***	0.031***	0.034***	0.241***

Note: Base outcome - work as long as possible; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Own study.

Age is significant only for individuals interested in retiring precisely at the minimum retirement age (at $p < 0.1$). In such case the relative risk ratio for an increase by one year for preferring retiring at the pension age related to working as long as possible is by 2.1% higher. It would seem that legal pension itself creates an anchor, which is observed especially among older persons. If the retirement age has a signalling effect (e.g. tenure sufficient to avoid poverty), participants with low literacy would also benefit from participation. Neither education, nor income were found to be statistically significant in explaining determinants of preferred retirement age.

Thinking about own future as a retiree distinguishes individuals preferring to retire prematurely. For those who practice it, the relative risk for preferring premature retirement relatively to working as long as possible would be expected to increase by almost 70%. For non-savers (comparing to savers), the relative risk of early exit compared to working as long as possible would be expected to decrease by almost 50%, and for individuals who have no preference, respective ratio decreases by almost 40%. By contrast, respondents not revealing retirement age are also significantly more often declaring unknown preference to saving. Such individuals seem to have no clear strategy, which increases the chance of random actions or picking low-hanging fruits, and consequently - risk of old-age poverty.

Believing that extending working life leads to higher old-age benefit is a statistically significant descriptor of preferred retirement age. For those who do not (compared to the ones that do), the relative risk of choosing premature exit is almost three times higher than for working as long as possible. For those who do not know, the respective ratio is almost two. This reveals an interesting regularity, if these respondents were right (no link between contributions and benefits was observed), their choice would be perfectly rational. Thus, by increasing the efficacy of educational actions, such segment of respondents may change their minds. In addition, again, choosing the 'don't know' option seems to be a part of deeper ignorance.

Finally, behavioural effects turned out to be significant at all typical levels, however high ratios should be interpreted with caution. With all relative ratios above one, it would seem that retiring at the latest possible moment was a modestly attractive offer. However, once the framing is made, there are still significant odds that working as long as possible will be operationalized into a specific timespan. The contribution of anchoring is puzzling, though. One possible interpretation is that displayed and bolded old-age pension benefit at 67 turns out to be insufficient comparing to the required tenure (two or seven years above 2016 pension age). Most likely, without the knowledge on life expectancy, individuals would expect benefit to rise by more than a few percent (and the concept of total value across the remaining lifetime).

Reframing the options did make individuals change their decisions. Prospective losses in benefit quota make early retirement less attractive for 48.1% of pension system participants who declared lower than minimum retirement age. We showed the framing effect also for individuals that previously declared late retirement or working as long as possible. A vast majority of them (56.2% and 80.7% respectively) would like to postpone retirement for at least 2 years after getting the information on benefit increase ratios. Hence, our results confirm the prospect theory. The anchor of minimum retirement age seems to be strong enough to dominate over other cognitive biases. A second explanation is possible, though we asked about the declared retirement age before making people acquainted with losses and gains of early and late retirement. The other factor, namely choice-supportive bias, could play a role.

When people make a choice before framing they are less willing to change the option, especially when the declared one was a strong anchor. Finally, there might be an explanation of relevant trade-offs occurring at retirement. We make one combination of gain and loss (higher and lower pension benefits) compete against other (young retirement that allows to travel or have time for family and hobbies) as Fetherstonhaugh and Ross (1999) did when they framed people to choose between standard and early retirement. As a result they do not prove framing effect for people considering lower than standard retirement age.

Our results on the framing effect may be affected by the certainty effect that leads people to overweight certainty when making judgments. If a pension system is subject to frequent changes, people tend to retire as soon as possible. That is the case of Polish old-age pension security in times we conduct our research.

7. Conclusion

This article attempts to answer whether the declared retirement age can be shifted upwards by increasing awareness of the consequences of a premature exit with the use of framing and anchoring in pension information. We identified strong retirement age preferences among working Poles. However, this preference might be changed once the framing effect is provided. Furthermore, the delays are usually significant. The preferred retirement age is determined by gender and age, but factors related to literacy are more significant. There is a segment of people whose rationality is justified under wrong assumptions. However, it cannot be ruled out that frequent changes in the pension scheme encourage choosing modest but certain outcomes. From the public policy perspective special interest should be devoted to individuals who remain consequently undecided, which may suggest poor knowledge, literacy or lack of strategy, leading to higher risk of old-age poverty.

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