Excessive discounting, longevity expectations, and retirement saving: an online survey.

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PII: S2214-8043(24)00103-4
DOI: https://doi.org/10.1016/j.socec.2024.102266
Reference: JBEE 102266

To appear in: *Journal of Behavioral and Experimental Economics*

Received date: 24 October 2023
Revised date: 29 May 2024
Accepted date: 10 July 2024

Please cite this article as: Michal Krawczyk , Excessive discounting, longevity expectations, and retirement saving: an online survey., *Journal of Behavioral and Experimental Economics* (2024), doi: https://doi.org/10.1016/j.socec.2024.102266

Highlights

- I elicit expectations about one's own longevity and incentivized measures of discounting in a large, heterogeneous sample
- Both measures show expected correlations with retirement savings
- They are not significantly correlated – the effects of biased expectations and of myopia operate independently

Excessive discounting, longevity expectations, and retirement saving: an online survey.

Michal Krawczyk, University of Warsaw[1]

Abstract: I report results of a major online experiment focused on two behavioural mechanisms that might affect long-term saving: impatience (excessive discounting) and distorted beliefs about own longevity. I observe the longevity expectations to be generally reasonable, both in terms of their mean values and their determinants, although the estimates show large variance and, on balance, slight pessimism. In line with previous studies, I find excessive discounting and (self-reported) insufficient retirement saving to be prevalent. Both expectations and excessive discounting affect retirement saving in the natural direction. However, there is no link between these two determinants: neither overly optimistic nor pessimistic predictions concerning own longevity seem to be systematically linked to excessive discounting. Thus, these two behavioural effects neither strengthen nor cancel each other out.

Keywords: retirement saving, discounting, longevity expectations

Introduction

Increasing individual retirement savings is of paramount importance, particularly in countries in which old-age pensions are projected to be much lower than wages. Unfortunately, a number of biases, such as excessive discounting, may discourage long-term saving. As a result, most people feel that they are saving too little (Choi et al, 2002) and, once older, regret that they have not saved more (Börsch-Supan et al, 2023).

There are but a few empirically important deviations from rational planning and behaviour that may lead to *increased* retirement saving. Optimism concerning one's own longevity is one of them. Indeed, longer expected age at death means more years in retirement and, correspondingly, greater financial needs in this period. An overly optimistic view on one's own longevity could thus be very fortunate for those individuals, who would otherwise have a tendency to spend nearly all of their earnings right away.

In this project, I thus seek to answer three interrelated questions. First, are predictions of one's own longevity generally reasonable? Second, do overly optimistic predictions correlate with biases that may *discourage* saving, such as excessive discounting? Third, how do excessive discounting and predictions of one's own longevity affect saving behaviour?

[1] Helpful comments from Karol Pogorzelski and Joanna Tyrowicz are gratefully acknowledged. Zofia Miarczyńska provided research assistance. The study was supported by the NGI Group (Think Forward Initiative) and Poland's National Science Centre (grant no: 2014/15/G/HS4/04638). All mistakes are mine.

I address these questions in a novel online experiment in which I obtain individual discount rates and longevity expectations and link them to self-reported saving behaviour. A key contribution to existing literature is that all the measures are elicited jointly in the same sample and at the individual level. I also believe it is a valuable contribution that the participants are recruited in Poland, a country representing an interesting case for such a study. It is the largest of post-communist EU members and, like many transition countries, has seen a quick improvement in longevity (81.1 for women and 73.4 for men in 2022, compared to 75.2 and just 66.2 respectively in 1990, as reported by the Central Statistical Office of Poland), accompanied by a steep drop in birth rate (around 1.2 in 2023, down from 2.0 around 1990). In other words, Poland epitomises ageing Europe, where, on average, these processes have the same direction but lower velocity. As a result, projections of retirement replacement ratio for the current young adults hover around the grossly insufficient value of 0.35, thus requiring an immediate intervention.

Literature review

Extensive literature explores behavioural effects which make long-run saving difficult. For example, researchers found evidence of systematic underestimation of exponential growth (Eisentein and Hoch, 2007; Stango and Zinman, 2009; Goda et al., 2015) and showed how interventions aimed at correcting this misconception may increase savings rates (Song, 2011; Goda et al., 2012). Similarly, several papers studied inattention to retirement saving (Karlan et al., 2016; Abebe et al., 2018). A number of field experiments proved effectiveness of nudges, typically involving default enrollment into a saving plan (Madrian and Shea 2001; Choi et al., 2004; Cronqvist and Thaler, 2004; Thaler and Benartzi, 2004; Ashraf et al., 2006).

The literature studying the impact of subjective life expectancy (measured e.g. as estimated probability of living to a certain age – subjective survival probability, SSP) on saving behaviour is obviously directly relevant for the current project. It has been long noted that individuals expecting to live longer should, other things being equal, accumulate more wealth (Lee et al., 2000). Deaton and Paxson (2000) and Bloom et al. (2004) argued that higher SSPs should typically lead to a more advanced individual retirement age, not a higher savings rate. Consequently, there are studies linking SSP to timing of claiming retirement benefits. Using US Health and Retirement Study data, Coile et al. (2002) and Hurd et al. (2004) indeed found that optimists claimed social security benefits later (the former paper using realised mortality as a proxy for expectations) but the effects were moderate. Van Solinge and Henkens (2009) observed in their Dutch sample that those with higher SSPs only *declared* they wanted to work longer (an effect also reported for the US by Khan et al, 2014) but actually did not implement this plan.

Of course, greater wealth accumulation at the onset of retirement can only be achieved by delayed claiming of benefits if retirement age is actually flexible, which for legal or practical purposes is not true in many countries, opening the door for the effect via savings rate. Empirically, Tsai et al. (2000) and Bloom et al. (2003) showed how the link between expectations and saving is consistent with the patterns of increases in savings rates at country level. Indeed, these generally accompany improvements in life expectancy. The most closely related literature focused on the role of *individual* longevity expectations on savings rate is much less developed.

Hurd et al. (1998) showed that savings rate was positively associated with SSP. However, this was only true upon a sophisticated transformation of the latter (because raw data showed a peculiar distribution, with the vast majority of responders estimating the probability of their living for another 12 years or so to be 0%, 50%, or 100%). Moreover, the authors did not validate these survival

probabilities (for example by relating them to the actual mortality data for the sample in question). Finally, the effect was only found for couples, not singles.

More recently, Apouey (2018) observed in their 50+ French sample that individuals expecting to live longer also declared better preparedness for old age, including higher savings rate. O'Dea and Sturrock (2023) observed that individuals who were more pessimistic about their own life expectancy were less likely to purchase annuities. Bloom et al. (2006) showed that HRS responders with more optimistic forecasts of their own longevity had accumulated more wealth (presumably thanks to increased saving). They used parents' age at death as an instrument for SSP to reduce issues of endogeneity and measurement error. Post and Hanewald (2013) focused on longevity *risk* (uncertainty about survival rates) and found that it affected saving behaviour, but mostly due to the disagreement between the forecasters *per se*, not due to precautionary saving. Overall, it is a common finding that while their mean values and correlations with demographics may be reasonable, SSPs are rather noisy (see Bago d'Uva, 2020, and papers cited therein).

This research also builds upon voluminous literature reporting studies eliciting individual discount rates. A thorough review is clearly beyond the scope of this paper. A recent meta-analysis of relevant experiments (Matousek et al., 2022) shows that discount rates vary widely, depending on population, domain, framing, and study-specific elicitation methods, but overall they are quite high with the corrected mean annual discount rate of 0.33, assuming the normatively correct exponential discounting model.

However, numerous studies show that discounting is not smooth, notably due to the so-called "present bias", a tendency to treat "now" in a qualitatively different manner from "later", giving rise to quasi-hyperbolic discounting. As estimated in a meta-analysis by Cheung et al. (2021), such instant discount factor averages .87 when publication bias is corrected for. Moreover, as found in some studies, presence bias is predictive of lower retirement savings (Goda, 2015) or earlier timing of retirement (Merkle et al., 2022) even when other plausible determinants are controlled for.

Design and procedures

The participants were recruited from the subject pool of the Laboratory of Experimental Economics at the University of Warsaw, as well as the online survey platform answeo.com. In total, 987 individuals took part in the study[2], of which 64% were female, while the age ranged from 17 to 76 years, with the mean of 37.3 and the standard deviation of 14.8. Fifty-five percent had higher education and 36.1% were still studying. Sixty-one percent lived in a big city. Thus, the sample, while highly heterogeneous, was more urban, younger, and better educated than the general population; the share of women was also higher.

The survey consisted of four blocks of questions: 1) demographic questions 2) questions concerning life expectancy and retirement plans 3) discount rate elicitation task (DRET) and 4) health and lifestyle questions, see Appendix A for the translation of the Polish original. Block 1 was always displayed first (except for some more sensitive questions, notably about income, which were always displayed last to reduce negative attitudes and drop-outs). By contrast, the order of blocks 2-4 was randomised; this turned out to have only a minor impact on most results, which are thus reported jointly.

[2] The number of observations for some questions may be a bit lower because some participants refused to answer them or because they were logically irrelevant due to participant's characteristics. Also, two questions were omitted in the small number of initially administered surveys due to a human error.

Main variables

I now briefly describe the key variables, while controls are listed in the next subsection. Questions concerning life expectancy and retirement plans ran as follows:

- Do you save for your retirement on top of the compulsory social security contributions? (No; Yes but not enough; Yes, enough)
- At what age do you think you will retire?
- For how many years do you think you are going to be retired?
- What do you think is the probability that you will live to be at least 65 years of age?
- What do you think is the probability that you will live to be at least 75 years of age?

Of course, each question was only asked provided it was (still) relevant given each participant's age and retirement status. The participants were also asked how sure they were when answering these questions. From the first two questions I could calculate the total number of years an individual expected to live (ImpliedAgeDeath). For example, if someone said she would retire at 65 and be retired for 15 years, her ImpliedAgeDeath would be 80.[3]

DRET was based on the Multiple Price List design, which several authors, possibly starting with Coller and Williams (1999), applied to eliciting discount rates over a wide range of amounts and time horizons. The method was selected for its simplicity and widespread evidence that binary choices are cognitively easier for participants than e.g. matching tasks.

It involved binary choices between immediate and delayed payments. Option Left always meant receiving 400 PLN (ca. 106 USD/94 EUR) with no delay. In the first table of DRET, Option Right meant receiving the money with a delay of 30 days, whereas the delay was 12 months in the second table. The amounts involved in Option Right started from 400 PLN and improved in each row, with discount factor corresponding to indifference being equal to $1, 0.97, 0.94, \ldots, 0.4$. The tables' last rows thus involved a choice between 400 PLN now and 432 paid in 30 days in the case of the first table and a choice between 400 PLN now and 1000 PLN paid in 12 months in the case of the second table. The vast majority of subjects were consistent, i.e. they picked Option Left in the early rows and then at some point switched to Option Right, which they would also pick in all the remaining rows. The discount factors were calculated as the mean between the discount factor corresponding to the last row in which the participant chose Left and that corresponding to the first row in which she chose Right. For example, if somebody switched between rows two and three in the second table, disc12months was calculated as 0.955.

Using the standard quasi-hyperbolic model (Laibson, 1997), in which the parameter β measures how all of the future is discounted compared to immediate consumption, while δ operates as it does in the standard exponential model, this gives $\beta\delta = 0.955$. Supposing that the same person switched between rows 1 and 2 in the other table (in which the payments in the Option Right were only delayed by one month) we could conclude that $\beta\delta^{1/12} = 0.985^{1/12}$, so that estimates of β and δ could be calculated easily.[4]

[3] This calculation is based on the assumption that the responders understood the question about the expected duration of the retirement correctly. Some of them may have thought about expected value conditional on surviving till retirement age. The concept of conditional probability (or: expected value) is often found to be difficult to grasp intuitively (Tarr and Lannin, 2005). In any case, the probability of surviving to the retirement age is generally very high, so this distinction is of secondary practical importance.

[4] The estimated values can be interpreted as discount factors of utility only under the simplifying assumption of (locally) linear utility of money. Studies show that accounting for non-linear utility affects estimates of discount factors. This is of secondary importance here in view of the goals of the project.

About 5% of participants were inconsistent, i.e. they preferred "later" to "now" in some earlier row but preferred "now" to "later" in some later row. Most of these participants were "almost consistent", e.g. option Left was preferred in rows 1-12 and row 14, whereas option Rights was preferred in row 13 and rows 15-21. Discount rates assigned to these participants hwere those corresponding to consistent patterns of choices involving the same number of choices Left and Right. In the example above, it would be the discount rates corresponding to choosing Left in rows 1-13 and Right thereafter.

Three participants were randomly chosen and one of their binary decisions was implemented for real, all payments being made by bank transfer. Expected payment given participants' choices was ca. 500 PLN conditional on being selected and some 2.5 PLN overall (including a small fixed fee given to all responders). While this is a modest amount, it must be remembered that this online experiment only took about 12 minutes of participants' time on average. The expected payment is comparable to the amounts typically paid out to participants of brief research experiments conducted on Amazon Mechanical Turk among others.

Other variables

As mentioned before, several demographic variables were elicited: gender, country and year of birth, education, marital status, employment status and income, size of the place of residence. The set of questions concerning health and lifestyle covered subjective health, chronic diseases (see also Appendix A for the list), depression, physical activity, drinking, and smoking. We also elicited height and weight and whether someone in the respondent's family lived to be 90 years old. These variables allow us to assess the robustness of the main links of interest when other factors are controlled.

Data

Table 1 provides summary statistics for the numeric variables, see Appendix A for the questions corresponding to particular variable names.[5]

Table 1. Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Female	987	0.641	0.4798	0	1
Age	987	37.284	14.815	17	76
StillAtSchool	987	0.361	0.480	0	1
CitySize:					
Village	987	0.089	0.285	0	1
SmallTown (<20k)	987	0.049	0.217	0	1
Town (20-100k)	987	0.144	0.352	0	1
City/100-500k	987	0.109	0.312	0	1
BigCity/>500k	987	0.609	0.488	0	1
Education:					
Primary	987	0.012	0.110	0	1
Secondary	987	0.431	0.495	0	1
Higher	987	0.556	0.497	0	1

[5] These values were obtained after marking a handful of obviously incorrect values as missing. These included an individual who reported having smoked for 3020 years and 15 individuals claiming they were more likely (typically: just slightly more) to live to be at least 75 years than to live to be at least 65 years old.

EmploymentStatus:					
Inactive	987	0.121	0.326	0	1
Unemployed	987	0.059	0.237	0	1
PartTime	987	0.225	0.418	0	1
FullTime	987	0.493	0.500	0	1
OnPension	987	0.017	0.130	0	1
Retired	987	0.083	0.276	0	1
HouseholdIncome:					
<1.5k	859	0.068	0.251	0	1
1.5-3k	859	0.196	0.397	0	1
3-5k	859	0.265	0.441	0	1
5-7k	859	0.195	0.396	0	1
7-10k	859	0.181	0.385	0	1
>10k	859	0.082	0.275	0	1
SubjectiveHealth (0-4)	987	2.283	1.002	0	4
ChronicDisease	987	0.339	0.473	0	1
NumberDiseases*	987	0.832	1.118	0	7
Diabetes	987	0.059	0.237	0	1
Hypertension	987	0.166	0.372	0	1
EmotionalDisorders	987	0.128	0.335	0	1
SadDepressed	987	0.713	0.452	0	1
CigarettePast	987	0.352	0.478	0	1
CigarettePresent	987	0.170	0.376	0	1
SmokingYears	987	5.172	9.852	0	65
CigarettesPerDay	983	4.345	8.787	0	150
DrinkingFrequency:					
NotOnceIn3Months	987	0.391	0.487	0	1
LessThanOnce/month	987	0.226	0.419	0	1
1-2x/month	987	0.223	0.417	0	1
1-2x/week	987	0.110	0.313	0	1
3-4x/week	987	0.032	0.177	0	1
5-6x/week	987	0.008	0.089	0	1
EveryDay	987	0.009	0.095	0	1
IntensPhysActivity:					
Rarely/Never	987	0.126	0.331	0	1
1-3x/month	987	0.174	0.379	0	1
1x/week	987	0.261	0.439	0	1
MoreThanOnce/week	987	0.438	0.496	0	1
MediumPhysActivity:					
Rarely/Never	987	0.042	0.202	0	1
1-3x/month	987	0.105	0.307	0	1
1x/week	987	0.242	0.428	0	1
MoreThanOnce/week	987	0.609	0.488	0	1
Height	984	170.843	13.362	152	200
Weight	986	71.866	16.015	40	140

MaritalStatus

Single	987	0.571	0.4955	0	1
Married	987	0.306	0.461	0	1
Separated	987	0.011	0.105	0	1
Divorced	987	0.077	0.266	0	1
Widow/er	987	0.033	0.179	0	1
YearsMarried	983	2.596	8.187	0	56
NoChildren	987	0.627	0.483	0	1
Children	987	0.661	0.987	0	4
PeopleHousehold	987	2.590	1.371	1	8
Pred65	903	0.789	0.225	0	1
Pred75	967	0.666	0.263	0	1
RetirementAge	897	65.569	6.075	35	100
YearsRetired	855	17.067	8.157	0	50
ImpliedAgeDeath	855	82.639	8.196	46	100
disc30days	987	0.678	0.236	0.385	1.015
disc12months	987	0.729	0.211	0.385	1.015
Beta	987	0.992	0.029	0.923	1.092
Delta	987	0.738	0.218	0.352	1.017
NoSaving	809	0.621	0.485	0	1
TooLittleSaving	809	0.271	0.444	0	1
EnoughSaving	809	0.109	0.312	0	1

* See Appendix A for all the diseases: only the most common ones are listed here

A few comments on the key variables may be worthwhile. First, SSPs varied widely and so did the predicted number of years in retirement. Still, as many as 48% of responders were “quite sure” or “very sure” about their predictions, and only 7% were “very unsure”. Second, these answers were rather internally consistent. For the vast majority of participants, the difference between the SSPs, Pred65-Pred75 was in the plausible range of 0-0.3; the correlation between the two was 0.8433. ImpliedAgeDeath was also highly correlated with both SSPs (0.4830 with Pred65 and 0.6149 with Pred75). Furthermore, among participants for whom ImpliedAgeDeath exceeded 75, only 8.3% said that their probability to live to be at least 75 was lower than 50%. Third, overall the participants discounted heavily. Interestingly, it was almost entirely due to the low “standard” discount factor δ, whereas the “behavioural” β measuring present bias was generally very close to its normatively correct value of 1. Finally, Principal Component Analysis showed that almost 40% of variance of responses to health-related questions was explained by one component (and much less by any other), which we will thus use to reduce dimensionality. The component can be interpreted as signalling poor subjective health.

Results: comparison to the objective values

I now turn to the comparison of the SSPs with the objective values. This is of interest because if people overestimate their longevity, this is expected to make them retire later and/or save more for retirement, other things being equal, while naturally the opposite is true for overly pessimistic views. Figure 1 compares SSPs to longevity statistics published by the Central Statistical Office of Poland. As can be seen, even controlling for age, there is great variability in individual SSPs. Yet, overall, the mean SSPs as reflected by the LOWESS are reasonably close to the statistical values and show a similar slope, although they tend to be slightly lower. In other words, participants are, on average,

pessimistic: they expect to live shorter than the statistics would dictate. Also the oldest participants, close to the target age, tend to underestimate the (actually very high) probability that they will reach the target age (although caution is recommended because of the modest number of observations, especially for older men). By contrast, the youngest men's SSPs of living to be 75 are the only ones that are accurate or even slightly too high on average.

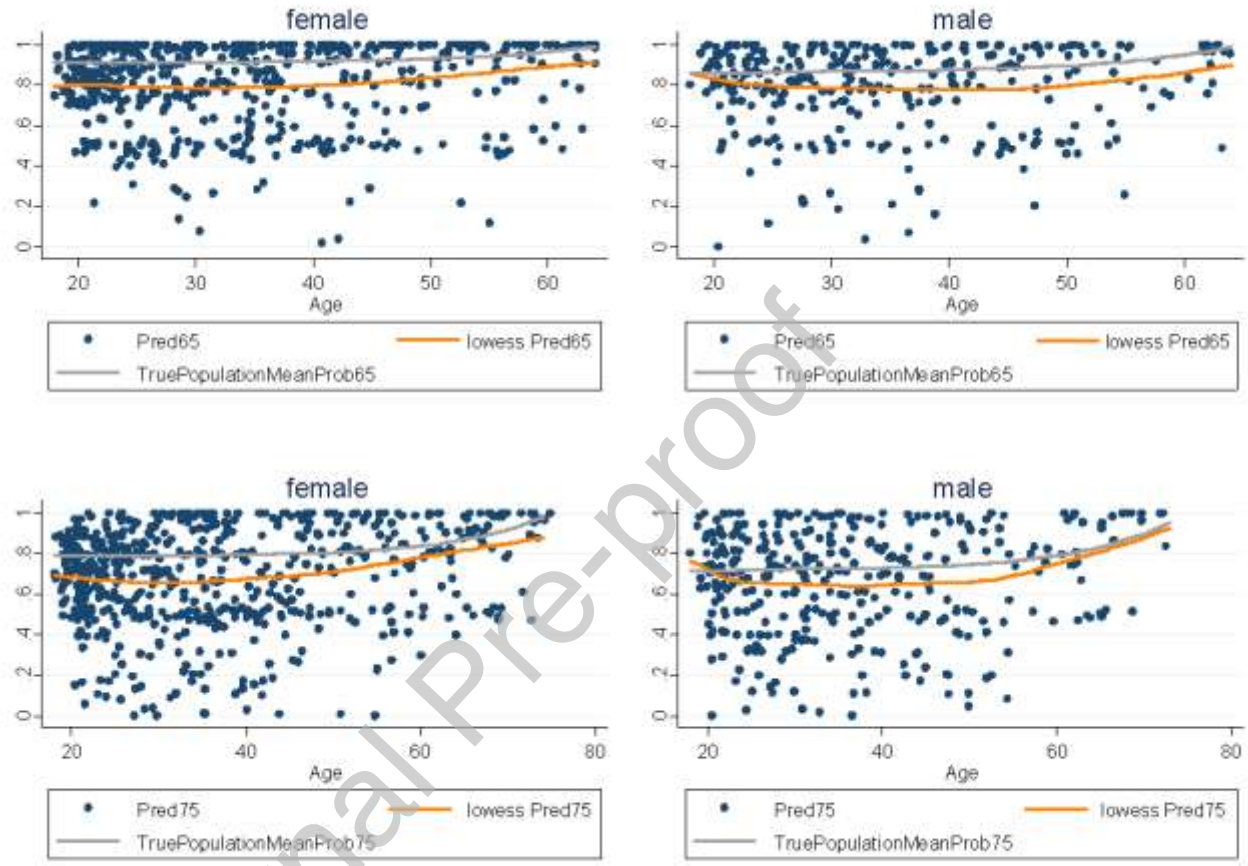


Figure 1. Subjective vs. objective survival probabilities, by age and gender

Figure notes: The left (right) panels show the data for women (men). The upper (lower) panels show subjective probabilities to live to be at least 65 (75). The horizontal axis shows participant's age, while the vertical the survival probabilities. The dots represent individual forecasts, with a slight tremble (jitter) added to show multiple identical observations. The solid orange lines show the results of LOWESS (Locally Weighted Scatterplot Smoothing) procedure applied to the individual subjective survival probabilities. The solid grey lines represent age-specific probabilities taken from national mortality statistics, with a correction for our sample's superior education level guided by Nocko (2017).[6]

[6] It would have been highly desirable to calculate "objective" probabilities of survival for each individual in the sample, given their demographic and health characteristics. Unfortunately, relevant Polish data that would have been necessary to do it is not available.

The comparison shown in Figure 1 involved correcting national statistics to account for our sample's average education level being higher than that of the public. An alternative approach would involve weighing observations depending on each participant's characteristics, i.e. assigning a lower weight to university educated, big-city dwellers that were overrepresented in our sample compared to the general population and then relating the resulting weighted gender-and-age-specific averages to the relevant standard (i.e. un-corrected) objective survival probabilities. Qualitatively, the findings turn out to be analogous, they are available from the author upon request. A final caveat is that the national statistics are based on the latest available data, i.e. they assume no changes in mortality in the (sufficiently distant) future. While it would be naïve to expect comeback of the quick decrease in mortality rates observed for about 25 years after the fall of communism in Poland (for example, mortality jumped again during Covid-19 pandemic), some modest improvement could reasonably be projected for the decades to come. If reasonable future survival probabilities are indeed a bit higher than current ones, it only strengthens our general finding of responders' pessimism.

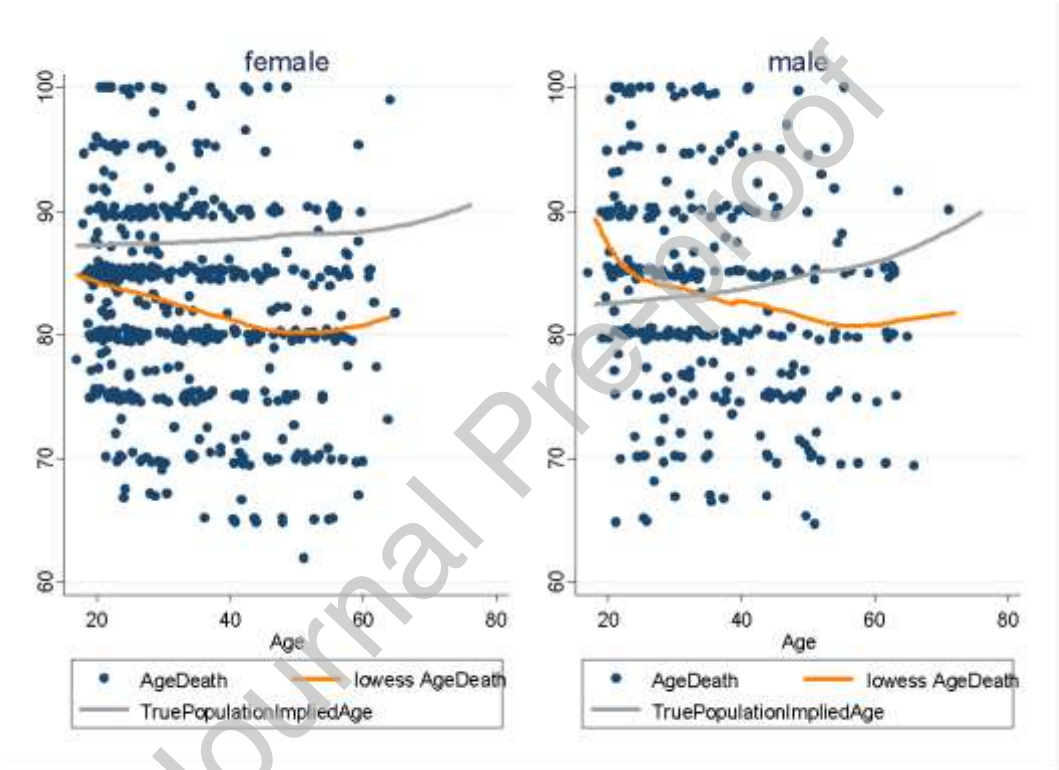


Figure 2. Implied subjective vs. objective age at death, by age and gender

Figure notes: the left (right) panel shows data for women (men). The horizontal axis shows the participant's age, while the vertical – expected age at death. The dots represent implied expected age at death, calculated as expected RetirementAge + YearsRetirement, with a slight tremble (jitter) added to show multiple identical observations. The solid orange lines show the results of the LOWESS (Locally Weighted Scatterplot Smoothing) procedure applied to the individual values of ImpliedAgeDeath. The solid grey lines represent age-specific expected age at death, calculated from the national mortality statistics, with a correction for our sample's superior education level, guided by Nocko (2017).

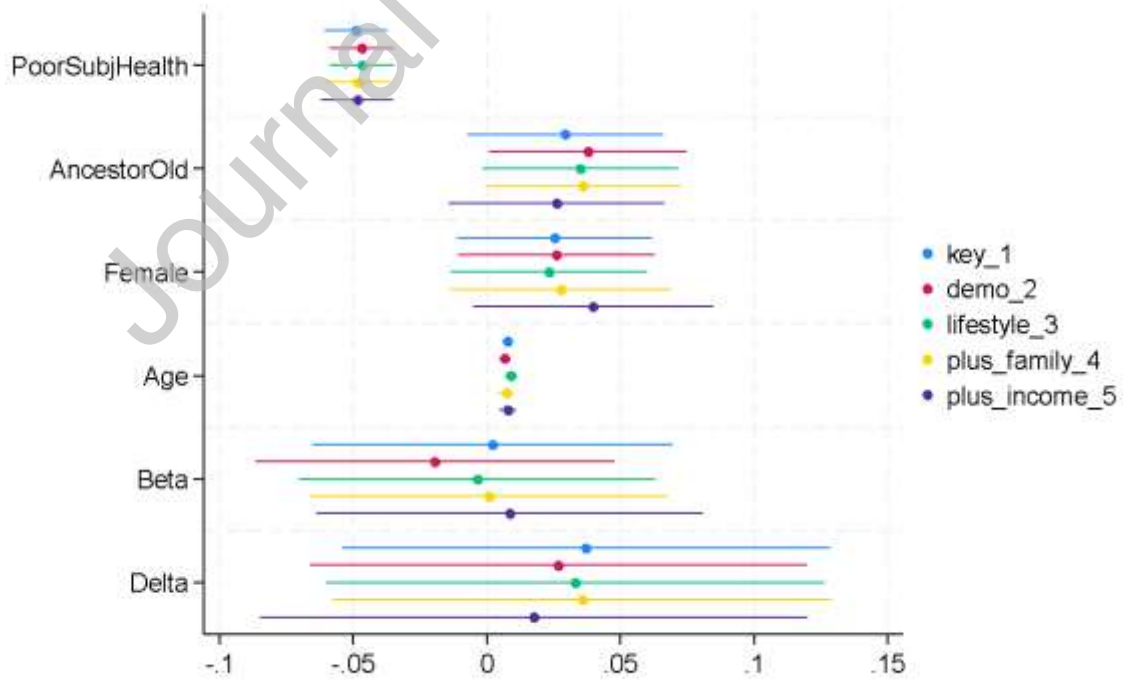
The effect of relatively optimistic young men is even more striking when we look at individual implied forecasts of age at death rather than survival probability, see Figure 2. Again, I compare against the objective, statistical values. Except for the youngest men, pessimism also prevails within this measure and is now especially visible for older individuals.

Results: determinants of SSPs

In the previous section, we compared mean values of SSPs to official statistics. Another reality check for the SSP is to inspect their determinants. On top of the effects of age and gender already shown in the previous section, we would expect that better (self-reported) health would correspond to more optimistic longevity predictions. Specific determinants of SSPs reported by individual participants are shown in Tables 2 and 3. Several different specifications are shown to test robustness of the results. All the models are tobit regressions with the upper limit of 1, because 21.7% of Pred65 observations and 11.9% of Pred75 take the logically maximal value of 1 (by contrast, the values of 0 are incidental; as a side note, some of them could simply reflect unwillingness to provide a meaningful answer).

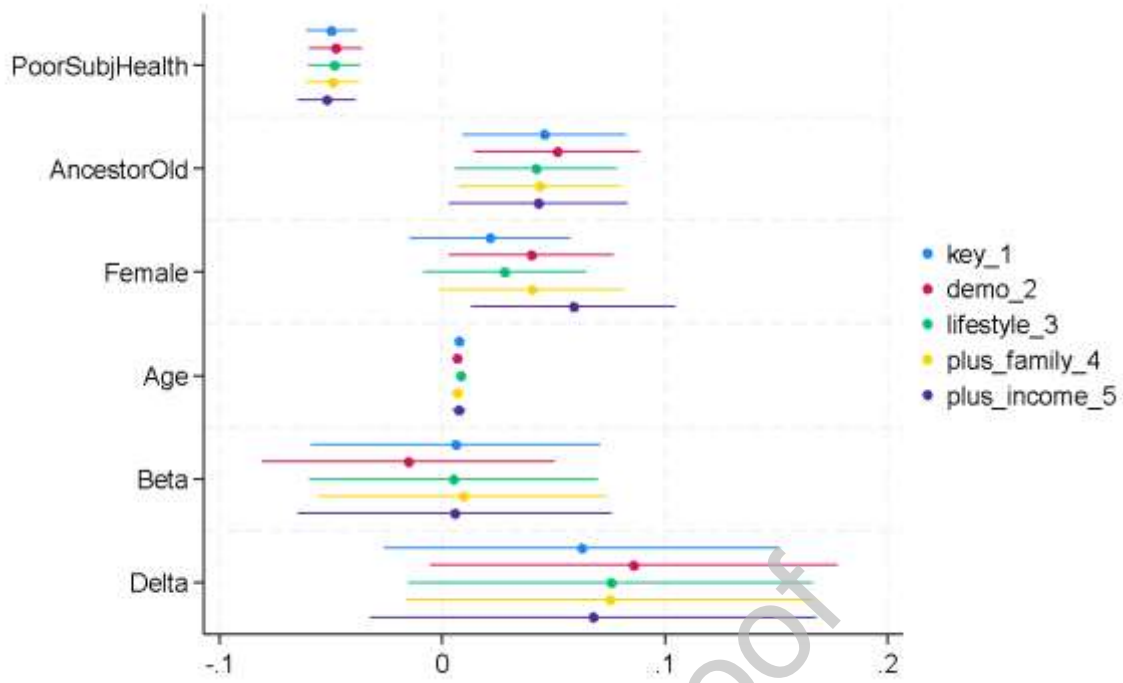
The variables included in specific models are as follows. Key variables: age, gender, beta, delta, poor subjective health component, and having an ancestor who lived past 90 are included in all the models. Models (2) (4) and (5) additionally cover other demographic variables. Model (3), by contrast, includes lifestyle variables. Model (4) does not cover them but, along lifestyle variables, it adds data on the household. Finally, Model (5) is identical to (4), except that it also considers income (which lowers the number of observations as some participants refused to report it). The estimates for key variables are represented in Figure 3 and 4, while all estimates can be found in Appendix B (tables B1 and B2).

The specific choice of variables included in particular models is arguably arbitrary but it makes very little difference; overall, the results are highly robust. Higher subjective survival probabilities are associated with being older, having better (subject) health, having an ancestor who lived to be 90 or more, having high income and living in a big city. Intriguingly, there is an effect of gender for Pred75 only and it is not very large. Addressing the research question of whether people who are prone to optimism concerning their longevity also tend to be impatient as revealed in the discounting task, we see no such link – the estimates for Beta and Delta are not significantly larger than zero.



Only effects of interest shown to save space. Coefficients with 95% confidence intervals.

Figure 3: Determinants of SSP to the age of 65: a tobit regression



Only effects of interest shown to save space. Coefficients with 95% confidence intervals.

Figure 4: Determinants of SSP to the age of 75: a tobit regression.

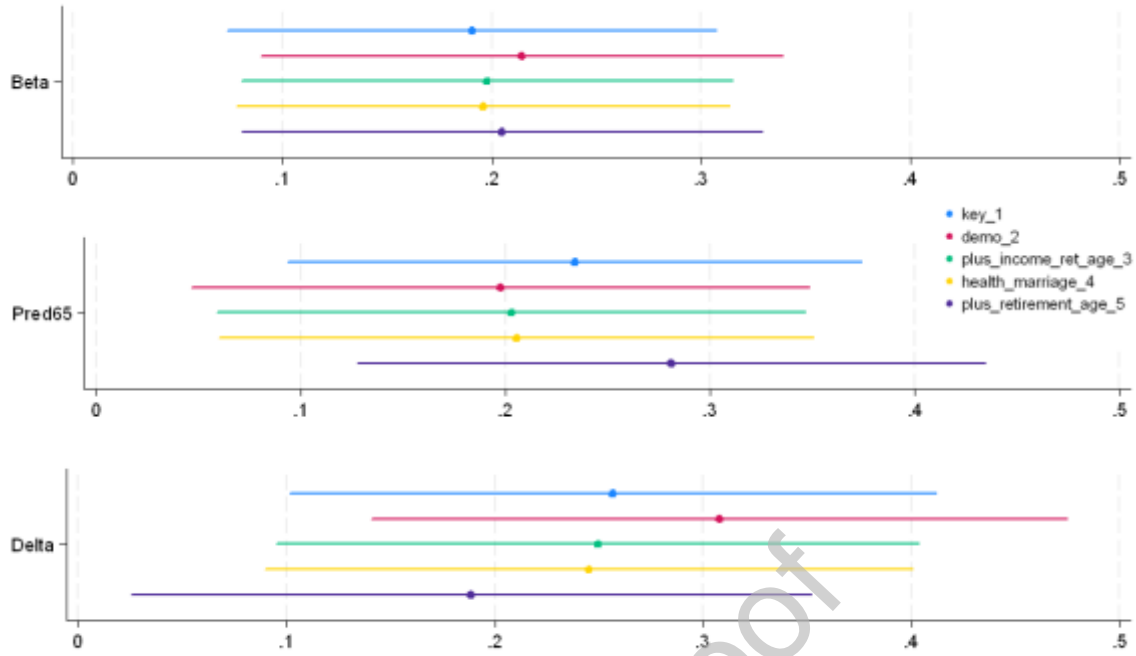
The effects of lifestyle variables such as drinking and smoking, see Appendix B, are ambiguous; it may be e.g. that people concerned about their health and longevity tend to drink less and exercise more but still are relatively pessimistic in their SSPs. It should be noted that the paradoxical positive association between drinking a substantial amount of alcohol every day and being optimistic about living to be at least 75 is driven by a very small number of observations: only 10 individuals reported drinking that much.

The determinants of the implied age at death are similar, with income, subjective health and having an ancestor who lived to be 90 or more as key determinants and, notably, no impact of gender or age, as previously seen in Figure 2. The expected age of retirement *per se* is mostly determined by gender, with women planning to retire at about 64 years and men at about 67 years on average. These analyses are suppressed to save space.

Results: determinants of voluntary saving

Both measures of longevity optimism and discounting have an impact on (self-declared) saving behaviour, see Figure 5. The dependent variable is *ExtraSaving* indicating whether the responder did some voluntary saving for retirement. Model (1) only includes Beta and Delta. Model (2) additionally controls for key demographic variables. Model (3) adds income and planned retirement age. Model (4) has health and marital status variables instead of these. Model (5) has the same variables as (4) plus retirement age. Marginal effects are shown.

More optimistic longevity predictions and more patient discounting are associated with greater propensity towards voluntary saving. Other important variables include age, having a paid job and being male. Interestingly, income has no direct impact on the dependent variable.



Only effects of interest shown to save space, see table B3 in Appendix B for full results. Marginal effects with 95% confidence intervals.

Figure 5. Determinants of voluntary retirement saving: a logit regression

Naturally, longevity predictions cannot be considered an endogenous variable measured without an error. The estimates shown in Figure 5 could therefore be biased. A natural candidate for the instrumental variable that may affect extra saving but only via longevity expectations is a dummy indicating having an ancestor who lived to be 90 or more years old. Unfortunately, it is a weak instrument, with the F statistic in the first-stage regression only reaching 4.8, and it must be treated with caution. While the estimates change substantially (in particular, the effects of Beta and Delta are no longer significant), the positive effect of Pred65 is confirmed, see Table B4 in Appendix B.

Summary and conclusions

I find that the SSPs and expectations concerning age at death are generally reasonable, both in terms of their mean values and determinants. Most individuals tend to be somewhat overly pessimistic, which would make them care less about saving for retirement. This is especially striking for individuals approaching the retirement age. How should social marketing campaigns try to encourage these populaces to make good use of the last years of their professional activity to save for old age? For one, they could try to find ways to effectively promote longevity awareness (Hurwitz et al., 2022). For example, it is a common misconception that if life expectancy at birth is, say, 75 years, someone retiring at 67 is only expected to live for eight years. Promoting longevity awareness is promising given that I find that expectations concerning own survival probabilities do have an impact on (self-reported) retirement savings.

Concerning the remaining research questions, there is a null result: neither overly optimistic nor pessimistic predictions concerning own longevity seem to be systematically linked to excessive discounting. In this sense, biased SSPs are neither particularly helpful nor particularly dangerous for the individuals suffering from the tendency to overspend.

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Appendix A: the survey

The following survey is conducted for scientific purposes only, by faculty of the University of Warsaw. The collected data will be treated as confidential and analyzed only in the aggregate form. Filling the survey will only take about 12 minutes. As part of the remuneration, we will randomly select three respondents who will receive a high monetary payment. At the end of the survey, we will ask for some contact details (for example e-mail address or telephone) so that we can contact you if you are selected.

[demographic questions]

Gender [Female]

- Female
- Male

Year of birth [Age]

_____

Country of birth
- Poland
- Other:_____

[if Other]: When did you move to Poland?

____

Size of the place of residence [CitySize]
- Village
- Small town of less than 20 000 inhabitants
- Town of 20 000 to 100 000 inhabitants
- City of 100 000 to 500 000 inhabitants
- City of more than 500 000 inhabitants

Are you still learning? [StillAtSchool]
- No, I finished my education
- Yes, in high school
- Yes, in college/university

The highest education obtained so far [Education]
- Primary at most
- Secondary
- Higher

Which of the following options best describes your professional status? [EmploymentStatus]
- I am retired
- I am a pensioner
- I work full time
- I work part-time
- Currently, I am looking for a job
- I am not professionally active

[health and lifestyle questions]

Do you think your current state of health is … [SubjectiveHealth]
- Perfect
- Very good
- Good
- Satisfactory
- Bad

Some people suffer from chronic or long-term health problems. Does this also apply to you? [ChronicDisease]
- Yes
- No

Has the doctor ever stated that you had any of the conditions or health problems from the list below? [Count reported as NumberDiseases]

- Myocardial infarction or heart attack, coronary thrombosis or any other heart disease, including congestive heart failure
- High blood pressure or hypertension
- High blood cholesterol
- Stroke or cerebrovascular disease
- Diabetes or high blood sugar
- Chronic lung disease like chronic bronchitis or emphysema
- Cancer or malignant tumor, including leukemia and lymphoma, but excluding minor cancers of the skin
- Gastric or duodenal ulcer, peptic ulcer. Parkinson's disease
- Cataract
- Fracture of the femoral neck
- Other fractures
- Alzheimer's disease, dementia, organic syndrome, senility
- Other emotional disorders, including anxiety
- Rheumatoid arthritis
- Osteoarthritis or other rheumatic disease
- Chronic renal failure
- Any other serious memory problems are nervous or psychiatric problems
- I never had any of these diseases and health problems

Have you been sad or depressed over the past month? [SadDepressed]

- Yes
- No

Have you ever smoked cigarettes, cigars, cigarillos or a pipe every day for at least one year? [CigarettesPast]

- Yes
- No

Do you smoke nowadays? [CigarettesPresent]

- Yes
- No

[if ever:] For how many years in total did you smoke? [SmokingYears]

____

[if ever:] On average, how many cigarettes did you smoke per day? [CigarettesPerDay]

____

Do you know anyone in your family who has lived to be at least 90 years old? [Ancestor>90]

- Yes
- No

How often in the last 3 months did you drink 6 or more units of alcoholic beverages in one day?
6 alcohol units are:

1.5 liters of beer 4.5% = 3 large beers,
625 ml of wine 12% = 3.5 glasses (standard bottle is 700 ml),
200 ml of 40% vodka. [DrinkingFrequency]

- Every day or almost every day
- Five or six times a week
- Three or four times a week
- Once or twice a week
- Once or twice a month
- Less often than once a month
- Not once in the last 3 months

We would like to know something about the kind of physical activities that you undertake in your daily life. How often do you engage in intense physical activities, such as sports, intense household chores, or physical work? [IntensPhysActivity]

- More often than once a week
- Once a week
- Once to three times a month
- Very rarely or never

How often do you engage in physical activities that require moderate effort, such as gardening, car washing or walking? [MediumPhysActivity]

- More often than once a week
- Once a week
- Once to three times a month
- Very rarely or never

How tall are you (in cm)? [Height]

____

How much do you weigh (in kg), more or less? [Weight]

____

[Discount Rate Elicitation Task]

As part of the remuneration for your time, we will draw three respondents who will receive monetary payment. It will be transferred to your bank account. Provided you are drawn, you have the option of influencing the amount and date of the transfer. Please choose one of the options in each row. If we actually draw you, we will also draw one of the rows and you will receive the option you preferred in that row. It is thus in your best interest to choose in each row the option that you actually prefer. If you are drawn, your payment will be GUARANTEED BY THE UNIVERSITY OF WARSAW, regardless of its date.

Please choose the preferred option in each row: [disc30days]

	today	**in 30 days**
400 PLN today or 400 PLN in 30 days	O	O
400 PLN today or 401 PLN in 30 days	O	O

400 PLN today or 402 PLN in 30 days	O	O
400 PLN today or 403 PLN in 30 days	O	O
400 PLN today or 404 PLN in 30 days	O	O
400 PLN today or 405 PLN in 30 days	O	O
400 PLN today or 407 PLN in 30 days	O	O
400 PLN today or 408 PLN in 30 days	O	O
400 PLN today or 409 PLN in 30 days	O	O
400 PLN today or 411 PLN in 30 days	O	O
400 PLN today or 412 PLN in 30 days	O	O
400 PLN today or 414 PLN in 30 days	O	O
400 PLN today or 415 PLN in 30 days	O	O
400 PLN today or 417 PLN in 30 days	O	O
400 PLN today or 419 PLN in 30 days	O	O
400 PLN today or 420 PLN in 30 days	O	O
400 PLN today or 422 PLN in 30 days	O	O
400 PLN today or 424 PLN in 30 days	O	O
400 PLN today or 427 PLN in 30 days	O	O
400 PLN today or 429 PLN in 30 days	O	O
400 PLN today or 432 PLN in 30 days	O	O

Please choose the preferred option in for each item: [disc12months]

	today	**in 12 months**
400 PLN today or 400 PLN in 12 months	O	O
400 PLN today or 412 PLN in 12 months	O	O
400 PLN today or 426 PLN in 12 months	O	O
400 PLN today or 440 PLN in 12 months	O	O
400 PLN today or 455 PLN in 12 months	O	O
400 PLN today or 471 PLN in 12 months	O	O
400 PLN today or 488 PLN in 12 months	O	O
400 PLN today or 506 PLN in 12 months	O	O

400 PLN today or 526 PLN in 12 months	O	O
400 PLN today or 548 PLN in 12 months	O	O
400 PLN today or 571 PLN in 12 months	O	O
400 PLN today or 597 PLN in 12 months	O	O
400 PLN today or 625 PLN in 12 months	O	O
400 PLN today or 656 PLN in 12 months	O	O
400 PLN today or 690 PLN in 12 months	O	O
400 PLN today or 727 PLN in 12 months	O	O
400 PLN today or 769 PLN in 12 months	O	O
400 PLN today or 816 PLN in 12 months	O	O
400 PLN today or 870 PLN in 12 months	O	O
400 PLN today or 930 PLN in 12 months	O	O
400 PLN today or 1000 PLN in 12 months	O	O

[questions concerning life expectancy and retirement plans]
[only non-retirees] At what age do you think you will retire? [RetirementAge]

____

[only non-retirees] For how many years do you think you are going to be retired? [YearsRetired]

____

[only current age<65] What do you think is the probability that you will live to be at least 65 years of age? Please answer in percent, on a scale of 0% (when you are completely sure that you will not reach 65 years) to 100% (when you are absolutely sure that you will reach the age of 65). [Pred65]

____

[only current age<75] What do you think is the probability that you will live to be at least 75 years of age? Please answer in percent, on a scale of 0% (when you are completely sure that you will not reach 75 years) to 100% (when you are absolutely sure that you will reach the age of 75). [Pred75]

____

How sure were you of the accuracy of your answer(s)? [SurePred]

- very unsure
- rather unsure
- hard to say
- rather sure
- very sure

[extra demographic questions]
What is your marital status? [MaritalStatus]

- single

- married
- in separation
- divorced
- widow(er)

[if not single] In which year did you marry? [-> YearsMarried]

____

[if divorced] In which year did you divorce? [-> YearsDivorced]

____

How many children do you have? [Children; NoChildren = 1 iff Children = 0]

- 0
- 1
- 2
- 3
- more than 3

Including you, how many people are in your household (i.e. has a shared budget)? [PeopleHousehold]

____

What are the average monthly net income (that is, after deduction of taxes and premiums) of your household? We are talking about the total income of all its members. [HouseholdIncome]

- less than PLN 1,500
- 1,500 – 2,999 PLN
- 3,000 – 4,999 PLN
- 5,000 – 6,999 PLN
- 7,000 - 10,000 PLN
- over 10,000 PLN
- I do not know / I do not want to answer

Do you save for your retirement on top of the compulsory social security contributions?

- No [ExtraSaving=0]
- Yes, but less than I should [ExtraSaving=1]
- Yes, enough [ExtraSaving=1]

If you want to take part in the prize draw, please give us the email address or telephone number so that we could contact you:

____

Do you have any comments on this study?

____

Thank you for your time!

Appendix B: regressions

Table B1: Determinants of SSP to the age of 65: a tobit regression

VARIABLES		(1)	(2)	(3)	(4)	(5)
Female		0.0253	0.0260	0.0232	0.0276	0.0396*
Age		(0.0186)	(0.0188)	(0.0188)	(0.0210)	(0.0229)
		0.00766***	0.00657***	0.00891***	0.00733***	0.00781***
City Size	SmallTown (<20k)	(0.00111)	(0.000933)	(0.00122)	(0.00149)	(0.00161)
		0.00677		0.00454	0.00433	0.0176
	Town (20-100k)	(0.0488)		(0.0483)	(0.0483)	(0.0520)
		0.0625		0.0605	0.0607	0.0577
	City/100-500k	(0.0380)		(0.0377)	(0.0379)	(0.0420)
		0.0564		0.0624	0.0602	0.0548
	BigCity/>500k	(0.0398)		(0.0392)	(0.0397)	(0.0430)
		0.0642**		0.0648**	0.0640**	0.0635*
StillAtSchool		(0.0320)		(0.0316)	(0.0326)	(0.0360)
		0.0717***		0.0706**	0.0668**	0.0601**
Education	Secondary	(0.0277)		(0.0275)	(0.0280)	(0.0300)
		0.0179		-0.00406	0.0129	0.00945
	Higher	(0.0767)		(0.0762)	(0.0766)	(0.0815)
Employment status		0.0175		-0.0125	0.00385	-0.00297
	Unemployed	(0.0780)		(0.0777)	(0.0784)	(0.0836)
		-0.0235		-0.0301	-0.0287	-0.0494
	PartTime	(0.0432)		(0.0427)	(0.0430)	(0.0505)
		-0.00896		-0.0159	-0.0150	-0.0425
	FullTime	(0.0311)		(0.0309)	(0.0312)	(0.0353)
		-0.00369		-0.00760	-0.00478	-0.0407
	OnPension	(0.0341)		(0.0342)	(0.0350)	(0.0399)
		-0.208***		-0.212***	-0.207***	-0.222***
	Retired	(0.0726)		(0.0732)	(0.0738)	(0.0847)
		-0.0276		-0.0144	-0.00202	-0.0477
Subj. Health Status		(0.0776)		(0.0766)	(0.0788)	(0.0862)
		-0.0489***	-0.0469***	-0.0467***	-0.0482***	-0.0485***
	1.5-3k	(0.00599)	(0.00619)	(0.00618)	(0.00623)	(0.00685)
						0.109**
	3-5k					(0.0421)
						0.0259
	5-7k					(0.0405)
						0.106**
	7-10k					(0.0425)
						0.0866**
	>10k					(0.0436)
	1.5-3k					0.123**
AncestorOld						(0.0503)
		0.0292	0.0378**	0.0348*	0.0360*	0.0261
CigarettesPast		(0.0187)	(0.0188)	(0.0187)	(0.0188)	(0.0206)
			0.0183	0.0223	0.0193	0.00289

CigarettesPresent			(0.0312)	(0.0311)	(0.0314)	(0.0335)
			0.0236	0.0232	0.0241	0.0333
SmokingYears			(0.0313)	(0.0310)	(0.0312)	(0.0330)
			-0.00438**	-0.00482**	-0.00499**	-0.00504**
CigarettesPerDay			(0.00188)	(0.00189)	(0.00193)	(0.00204)
			5.95e-05	7.18e-05	0.000252	0.000168
LessThanOnce/month			(0.00143)	(0.00143)	(0.00144)	(0.00149)
			-0.0157	-0.0236	-0.0260	-0.0314
1-2x/month			(0.0236)	(0.0236)	(0.0236)	(0.0258)
			0.0171	0.0103	0.0134	0.00522
1-2x/week			(0.0242)	(0.0241)	(0.0242)	(0.0261)
			-0.00805	-0.0105	-0.00380	-0.0138
3-4x/week			(0.0310)	(0.0311)	(0.0313)	(0.0338)
			-0.00362	0.0115	0.0105	0.0423
5-6x/week			(0.0524)	(0.0522)	(0.0531)	(0.0581)
			0.0911	0.0866	0.0817	0.0629
EveryDay			(0.110)	(0.109)	(0.109)	(0.110)
IntPhysActivity			0.186*	0.181*	0.178*	0.166
1-3x/month			(0.109)	(0.107)	(0.107)	(0.109)
			0.106***	0.0963***	0.0929***	0.0540
1x/week			(0.0341)	(0.0340)	(0.0340)	(0.0373)
			0.0489	0.0433	0.0422	0.0169
MoreThanOnce/week			(0.0330)	(0.0330)	(0.0329)	(0.0355)
MediumPhysActivity			0.0477	0.0369	0.0306	0.00890
1-3x/month			(0.0320)	(0.0319)	(0.0320)	(0.0344)
			-0.0986*	-0.0822	-0.0866*	-0.0690
1x/week			(0.0520)	(0.0517)	(0.0522)	(0.0573)
			-0.108**	-0.0886*	-0.0909*	-0.0736
MoreThanOnce/week			(0.0490)	(0.0487)	(0.0492)	(0.0544)
			-0.0882*	-0.0735	-0.0729	-0.0548
BMI			(0.0477)	(0.0473)	(0.0479)	(0.0530)
			-3.25e-07	-2.18e-07	-2.85e-07	-6.06e-08
Marital Status	Married		(6.98e-07)	(6.91e-07)	(6.98e-07)	(7.11e-07)
					-0.00757	-0.00161
	Separated				(0.0315)	(0.0351)
					-0.0798	-0.100
	Divorced				(0.0877)	(0.0893)
					0.0327	0.0242
	Widow/er				(0.0456)	(0.0489)
					0.0902	0.0365
YearsMarried					(0.0777)	(0.0824)
					0.00182	0.00106
NoChildren					(0.00178)	(0.00189)
					-0.0726	-0.0764
Children					(0.0450)	(0.0497)
					-0.0193	-0.0141
PeopleHousehold					(0.0211)	(0.0227)
					-0.000545	-0.0144
Beta_10					(0.00807)	(0.00955)
		0.00204	-0.0195	-0.00362	0.000746	0.00847

Delta		(0.0344)	(0.0342)	(0.0341)	(0.0341)	(0.0368)
		0.0370	0.0266	0.0330	0.0358	0.0175
Constant		(0.0466)	(0.0474)	(0.0476)	(0.0476)	(0.0521)
		0.384	0.772**	0.469	0.520	0.452
		(0.366)	(0.359)	(0.367)	(0.371)	(0.401)
Observations						
VARIABLES		903	897	897	894	774

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B2: Determinants of SSP to the age of 75: a tobit regression

		(1)	(2)	(3)	(4)	(5)
VARIABLES						
Female		0.0213	0.0399**	0.0279	0.0402*	0.0588**
		(0.0185)	(0.0189)	(0.0187)	(0.0213)	(0.0234)
Age		0.00750***	0.00650***	0.00817***	0.00660***	0.00729***
		(0.00104)	(0.000778)	(0.00111)	(0.00138)	(0.00148)
City Size	SmallTown (<20k)	0.0713		0.0763	0.0778	0.0818
		(0.0493)		(0.0491)	(0.0491)	(0.0532)
	Town (20-100k)	0.0735*		0.0701*	0.0695*	0.0507
		(0.0378)		(0.0377)	(0.0378)	(0.0420)
	City/100-500k	0.0443		0.0423	0.0352	0.0256
		(0.0398)		(0.0393)	(0.0398)	(0.0434)
	BigCity/>500k	0.0827**		0.0886***	0.0830**	0.0677*
		(0.0322)		(0.0320)	(0.0330)	(0.0366)
StillAtSchool		0.0894***		0.0862***	0.0829***	0.0777***
		(0.0268)		(0.0267)	(0.0274)	(0.0296)
Education	Secondary	-0.0625		-0.0743	-0.0632	-0.0776
		(0.0794)		(0.0792)	(0.0796)	(0.0851)
	Higher	-0.0456		-0.0615	-0.0488	-0.0771
Employment status		(0.0806)		(0.0806)	(0.0813)	(0.0871)
	Unemployed	-0.00712		-0.00116	0.000807	0.0131
		(0.0442)		(0.0438)	(0.0441)	(0.0521)
	PartTime	-0.0404		-0.0483	-0.0455	-0.0562
		(0.0317)		(0.0316)	(0.0320)	(0.0362)
	FullTime	-0.0515		-0.0538	-0.0483	-0.0632
		(0.0343)		(0.0345)	(0.0352)	(0.0402)
	OnPension	-0.275***		-0.215***	-0.204***	-0.228***
		(0.0742)		(0.0755)	(0.0760)	(0.0872)
	Retired	0.0204		0.0191	0.0401	0.0218
		(0.0562)		(0.0558)	(0.0580)	(0.0637)
Subj. Health Status		-0.0500***	-0.0480***	-0.0486***	-0.0492***	-0.0520***
		(0.00582)	(0.00609)	(0.00602)	(0.00608)	(0.00674)
	1.5-3k					0.0666
						(0.0419)
	3-5k					0.00388
						(0.0407)
	5-7k					0.0374

						(0.0429)
	7-10k					0.0848*
						(0.0442)
	>10k					0.105**
						(0.0514)
AncestorOld		0.0457**	0.0515***	0.0421**	0.0436**	0.0430**
		(0.0186)	(0.0189)	(0.0186)	(0.0187)	(0.0205)
CigarettesPast			-0.00955	-0.00739	-0.0107	-0.0225
			(0.0312)	(0.0309)	(0.0311)	(0.0336)
CigarettesPresent			0.00436	0.0152	0.0174	0.0381
			(0.0305)	(0.0301)	(0.0302)	(0.0321)
SmokingYears			-0.00104	-0.00174	-0.00183	-0.00201
			(0.00161)	(0.00161)	(0.00164)	(0.00173)
CigarettesPerDay			0.000854	0.00142	0.00170	0.00168
			(0.00144)	(0.00143)	(0.00143)	(0.00150)
	LessThanOnce/month		0.0138	0.0127	0.0109	0.0152
			(0.0237)	(0.0234)	(0.0234)	(0.0257)
	1-2x/month		0.0313	0.0299	0.0341	0.0303
			(0.0245)	(0.0242)	(0.0243)	(0.0264)
	1-2x/week		0.0104	0.0237	0.0280	0.0301
			(0.0312)	(0.0309)	(0.0311)	(0.0337)
	3-4x/week		0.0195	0.0473	0.0381	0.0829
			(0.0530)	(0.0524)	(0.0532)	(0.0583)
	5-6x/week		0.141	0.161	0.151	0.156
			(0.109)	(0.107)	(0.108)	(0.110)
	EveryDay		0.277***	0.293***	0.282***	0.271**
IntPhysActivity			(0.105)	(0.103)	(0.104)	(0.106)
	1-3x/month		0.110***	0.102***	0.0995***	0.0696*
			(0.0342)	(0.0337)	(0.0338)	(0.0370)
	1x/week		0.0952***	0.0860***	0.0876***	0.0686*
			(0.0327)	(0.0324)	(0.0324)	(0.0349)
	MoreThanOnce/week		0.0932***	0.0802**	0.0794**	0.0622*
MediumPhysActivity			(0.0318)	(0.0314)	(0.0316)	(0.0339)
	1-3x/month		-0.0186	0.00853	0.00812	0.0258
			(0.0510)	(0.0502)	(0.0507)	(0.0555)
	1x/week		-0.0648	-0.0348	-0.0330	-0.0198
			(0.0476)	(0.0470)	(0.0475)	(0.0522)
	MoreThanOnce/week		-0.0236	-0.00548	-0.00273	0.0146
			(0.0462)	(0.0454)	(0.0459)	(0.0505)
BMI			-9.56e-07	-8.03e-07	-8.78e-07	-7.96e-07
			(7.07e-07)	(6.97e-07)	(7.03e-07)	(7.20e-07)
Marital Status	Married				-0.00427	0.0118
					(0.0316)	(0.0354)
	Separated				-0.0400	-0.0187
					(0.0852)	(0.0912)
	Divorced				0.0456	0.0329
					(0.0430)	(0.0465)
	Widow/er				0.0419	0.0403
					(0.0602)	(0.0654)
YearsMarried					0.00255	0.00188

				(0.00156)	(0.00165)
NoChildren				-0.0951**	-0.0891*
				(0.0430)	(0.0474)
Children				-0.0401**	-0.0352*
				(0.0190)	(0.0204)
PeopleHousehold				0.00182	-0.0142
				(0.00803)	(0.00950)
Beta_10	0.00597	-0.0154	0.00488	0.00935	0.00552
	(0.0332)	(0.0335)	(0.0331)	(0.0331)	(0.0359)
Delta	0.0626	0.0858*	0.0757	0.0751	0.0676
	(0.0453)	(0.0467)	(0.0464)	(0.0465)	(0.0511)
Constant	0.245	0.411	0.156	0.220	0.261
	(0.355)	(0.351)	(0.358)	(0.362)	(0.394)
Observations	967	961	961	957	832

Table B3. Determinants of voluntary retirement saving: a logistic regression

VARIABLES		(1) y1	(2) y1	(3) y1	(4) y1	(5) y1
Pred65		0.281***	0.234***	0.197**	0.203***	0.205***
		(0.0782)	(0.0715)	(0.0771)	(0.0734)	(0.0741)
Beta_10		0.205***	0.190***	0.214***	0.198***	0.196***
		(0.0635)	(0.0597)	(0.0636)	(0.0598)	(0.0602)
Delta		0.188**	0.257***	0.308***	0.250***	0.245***
		(0.0833)	(0.0792)	(0.0852)	(0.0787)	(0.0794)
Female			-0.140***	-0.153***	-0.174***	-0.175***
			(0.0316)	(0.0353)	(0.0363)	(0.0374)
Age			0.00212	0.00272	0.00377	0.00375
			(0.00182)	(0.00194)	(0.00238)	(0.00240)
City Size	SmallTown (<20k)		0.0913	0.0974	0.0784	0.0784
			(0.0854)	(0.0908)	(0.0842)	(0.0851)
	Town (20-100k)		0.0425	0.0410	0.0260	0.0255
			(0.0648)	(0.0706)	(0.0648)	(0.0654)
	City/100-500k		0.141**	0.145**	0.124*	0.120*
			(0.0683)	(0.0735)	(0.0689)	(0.0700)
	BigCity/>500k		0.114**	0.120**	0.110*	0.110*
			(0.0563)	(0.0609)	(0.0585)	(0.0593)
StillAtSchool			-0.0332	-0.0581	-0.0137	-0.0138
			(0.0470)	(0.0504)	(0.0478)	(0.0480)
Education	Secondary		0.132	0.108	0.0813	0.0941
			(0.166)	(0.181)	(0.191)	(0.189)
	Higher		0.188	0.178	0.119	0.129
			(0.167)	(0.182)	(0.193)	(0.191)
	Employment status		0.234**	0.254**	0.237***	0.234**
	Unemployed		(0.0926)	(0.110)	(0.0919)	(0.0927)

			0.236***	0.269***	0.228***	0.230***
	PartTime		(0.0753)	(0.0880)	(0.0749)	(0.0756)
			0.357***	0.348***	0.338***	0.334***
	FullTime		(0.0761)	(0.0896)	(0.0766)	(0.0775)
			0.0621	0.103	0.110	0.110
	OnPension		(0.154)	(0.167)	(0.153)	(0.155)
			-	-	-	-
	Retired					
PC_PoorHealth					-0.0195*	-0.0182
					(0.0112)	(0.0114)
Marital Status	Married				0.103*	0.104*
					(0.0578)	(0.0581)
	Separated				-0.0715	-0.0730
					(0.160)	(0.161)
	Divorced				0.0343	0.0437
					(0.0780)	(0.0796)
	Widow/er				-0.0934	-0.0951
					(0.125)	(0.126)
YearsMarried					-0.00689**	-0.00682**
					(0.00293)	(0.00295)
NoChildren					-0.0533	-0.0537
					(0.0771)	(0.0778)
Children					-0.0341	-0.0315
					(0.0365)	(0.0368)
PeopleHousehold					-0.00449	-0.00564
					(0.0153)	(0.0154)
	1.5-3k			0.0540		
				(0.0799)		
	3-5k			0.0685		
				(0.0782)		
	5-7k			0.0542		
				(0.0797)		
	7-10k			0.136*		
				(0.0814)		
	>10k			0.134		
				(0.0950)		
Retirement				-0.00120		0.000203
				(0.00302)		(0.00279)
Observations		791	791	676	788	780

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B4. Determinants of voluntary retirement saving: probit regression with AncestorOld as instrumental variable for Pred65

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

	(1)	(2)	(3)	(4)	(5)
VARIABLES					

Pred65		2.914**	3.926***	4.064***	4.138***	4.078***
		(1.382)	(0.685)	(0.680)	(0.707)	(0.742)
Beta_10		0.464**	0.324	0.287	0.299	0.333
		(0.206)	(0.216)	(0.265)	(0.236)	(0.228)
Delta		0.378	0.363	0.453	0.302	0.353
		(0.259)	(0.303)	(0.367)	(0.318)	(0.306)
Female			-0.343***	-0.408***	-0.413***	-0.456***
			(0.121)	(0.143)	(0.155)	(0.149)
Age			-0.00632	-0.00887	-0.00510	-0.00406
			(0.00634)	(0.00747)	(0.00861)	(0.00855)
City Size	SmallTown (<20k)		0.0450	0.0259	0.0304	0.0605
			(0.245)	(0.259)	(0.240)	(0.241)
	Town (20-100k)		-0.142	-0.138	-0.221	-0.211
			(0.198)	(0.203)	(0.196)	(0.199)
	City/100-500k		0.0972	0.0991	0.00810	0.0288
			(0.233)	(0.249)	(0.239)	(0.237)
	BigCity/>500k		0.0288	-0.00727	-0.0414	-0.0209
			(0.203)	(0.223)	(0.217)	(0.217)
StillAtSchool			-0.208*	-0.204	-0.185	-0.170
			(0.125)	(0.132)	(0.128)	(0.129)
Education	Secondary		-0.0715	-0.189	-0.0656	-0.0365
			(0.491)	(0.479)	(0.469)	(0.484)
	Higher		0.0245	-0.0993	0.00443	0.0421
			(0.512)	(0.512)	(0.483)	(0.497)
	Employment status					
	Unemployed		0.616**	0.651**	0.582**	0.592**
			(0.247)	(0.298)	(0.261)	(0.257)
	PartTime		0.486**	0.553**	0.446*	0.452*
			(0.223)	(0.276)	(0.233)	(0.233)
	FullTime		0.715**	0.721**	0.647**	0.654**
			(0.298)	(0.336)	(0.311)	(0.303)
	OnPension		0.945**	1.079***	0.878**	0.759**
			(0.386)	(0.401)	(0.358)	(0.367)
PC_PoorHealth					0.113**	0.114*
					(0.0575)	(0.0580)
Marital Status	Married				0.0658	0.0718
					(0.182)	(0.183)
	Separated				-0.261	-0.298
					(0.456)	(0.460)
	Divorced				-0.145	-0.111
					(0.218)	(0.225)
	Widow/er				-0.340	-0.343
					(0.367)	(0.372)
YearsMarried					-0.0188**	-0.0179**
					(0.00885)	(0.00890)
NoChildren					0.0390	0.0499
					(0.215)	(0.220)
Children					0.0156	0.0130
					(0.105)	(0.105)
PeopleHousehold					-0.0126	-0.0102
					(0.0383)	(0.0392)
	1.5-3k			-0.194		
				(0.217)		
	3-5k			0.0666		

			(0.198)		
5-7k			-0.186		
			(0.217)		
7-10k			-0.0785		
			(0.256)		
>10k			-0.208		
			(0.300)		
Retirement			-0.0117		-0.0113
			(0.00758)		(0.00769)
Observations	791	791	676	788	780