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Luc Bissonnette

Jan Nelissen

Arthur van Soest

Retirement Expectations in the Netherlands

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Retirement Expectations in the Netherlands[1]

Luc Bissonnette, Tilburg University

Jan Nelissen, CentERdata

Arthur van Soest, Tilburg University and Netspar[2]

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Abstract

We analyze expectations of the Dutch population of ages 25 and older concerning the future generosity of Dutch state and occupational pensions, the two main pillars of the Dutch pension system. Since the summer of 2006, monthly survey data were collected on the expectations of Dutch households concerning purchasing power of occupational pensions, eligibility and purchasing power of old age social security benefits, and the average retirement age ten or twenty years from now. We investigate how these expectations have changed over time and how they vary with socio-economic characteristics. Exploiting the fact that our data also cover 2008 and the first half of 2009, we also analyze the effect of the recent financial and economic crisis. We find significant differences in expectations of different socio-economic groups, mainly suggesting that groups who are probably better informed were also more pessimistic.

JEL codes: D84, H55, J26

Key words: subjective probabilities, old age social security, occupational pensions

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[2] Correspondence: L.Bissonnette@uvt.nl, J.H.M.Nelissen@uvt.nl, and A.H.O.vanSoest@uvt.nl, Tilburg University, P.O. Box 90153, 5000 LE Tilburg, Netherlands.

1. Introduction

In models of life cycle behavior and inter-temporal decision making under uncertainty, expectations play an important role. For example, consumption, saving, and labour supply decisions of individuals and households not only depend on their current tastes and opportunities, but also on what they expect to be the future prices, their future income, etc.

Future expectations often remain unobserved, and traditional macro- or micro-economic models typically make assumptions on how they are formed, e.g. assuming rational expectations. The conclusions from these models may be biased if the assumptions on expectations are not satisfied. To solve the problem that expectations are unobserved, many recent empirical studies aim at measuring expectations directly using survey questions. See, for example, Manski (2004) for an assessment of the validity of this approach. Examples are Keane and Runkle (1990) on inflation expectations, Dominitz and Manski (2005) on expectations of equity returns, Dominitz and Manski (1997), Das et al. (1999) and Dominitz (2001) on income expectations, Hurd and McGary (1995) on length of life expectations, Stephens (2004) on job loss expectations, Benitez-Silva and Dwyer (2005) on retirement expectations, Dominitz and Manski (2006) on pension benefit expectations, and Delavande and Rohwedder (2008) on expectations of old age social security income.

In this paper, we analyze expectations of the Dutch population of ages 25 and older concerning the future generosity of the two main pillars of the Dutch system of income provision to the elderly – old age social security benefits (AOW) and occupational pensions (mandatory for almost all employees). Like in many other European countries, sustainability of income provision at old age has become an important issue in public policy discussions due to the ageing of the population; see, e.g., Bovenberg and Gradus (2008). Generous early retirement benefits are gradually being phased out and replaced by actuarially fair flexible retirement systems and the idea of working after the normal retirement age of 65 years has slowly become a real option, although impediments remain (e.g., Van Solinge and Henkens, 2007). The debate has been reinforced by the financial and economic crisis, leading to additional pressure on old age social security due to government budget concerns and to pressure on occupational pensions due to the reduced value of the assets of occupational pension funds, who have invested part of the pension savings of their clients in equity. This makes it particularly interesting to analyze how different socio-economic groups forecast the future of the Dutch pension system and whether and how these forecasts have changed during the recent years under the influence of the public discussion and the financial and economic crisis.

Since the summer of 2006, monthly survey data were collected on the expectations of Dutch households concerning occupational pensions, old age social security, and the average retirement age ten or twenty years from the time of the interview. The same data (but for a shorter time period) have been analyzed by Van der Wiel (2009) who focuses on the effect of the number of newspaper articles on the volatility of social security expectations, and Van der Wiel (2008) who analyzes the relation between these expectations and savings decisions. We will investigate how social security, occupational pension and average retirement age expectations have changed over time and how they vary with socio-economic characteristics. Since we use data collected until the summer of 2009, we can also analyze the effect of the recent crisis.

The remainder of this paper is organized as follows. In section 2, we describe the sample design and the expectations questions. Section 3 describes how the answers vary over time and associates this with the public policy debate in the Netherlands. In section 4, we analyze some empirical models relating pension expectations to background characteristics. Section 5 concludes.

2. Sample Design and Survey Questions

The survey was administered to members of the CentERpanel, an ongoing Internet panel managed by CentERdata, a data collection and applied research institute affiliated with Tilburg University. The sample is based upon a simple random sample from the population in the Netherlands of ages 16 and older and consists of over 2000 households in which one or more adults complete questionnaires at home every weekend over the Internet. Households without Internet access are provided with Internet access by CentERdata so that the survey also covers households without Internet or without a personal computer. About 75% of all panel members respond to the questions in a given weekend. Rich background information about the panel respondents is available from previous interviews.[3]

The specific survey on pension expectations works with a rotation period of three months. The total sample of respondents of ages 25 and older was randomly split into three subsamples of about the same size. One subsample gets the questions in January, April, July and October; the second subsample in February, May, August and November, etc. This implies that there are observations for one third of the sample in each month.[4] In this study, we draw on all the data collected between May 2006 and July 2009.

In addition to the questions on future expectations that we will analyze, the survey asks questions on the respondents' personal retirement situations, on their satisfaction with several aspects of their retirement provisions, and on opinions on and satisfaction with the pension system in general. These questions are analyzed elsewhere (De Bresser and van Soest, 2009). The expectations questions have been asked in the form of subjective probabilities. According to Manski (2004), this is the best way to elicit information concerning people's subjective distributions of future outcomes. Subjective probability questions have been extensively used and

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[3] See http://www.centerdata.nl/en/TopMenu/Wat_doen_we/Dataverzameling/CentERpanel/index.html and http://www.centerdata.nl/en/TopMenu/Projecten/DNB_household_study/.

[4] In May and June 2006 (the first two months of the survey) everyone was invited to participate instead of one third of the sample.

validated in US surveys, particularly the Health and Retirement Study which has subjective probability questions on expected retirement age, on expected old age social security income, on expected length of life, on future health problems that limit the ability to work, and on the probability to leave a bequest (see Juster and Suzman, 1995; Hurd, 2009).

The first questions are about old age social security benefit levels (AOW: Algemene Ouderdoms Wet). According to the current system, everyone who has been a resident of the Netherlands from age 15 to age 65 is fully eligible for these benefits. The amount is determined by the official minimum subsistence level[5] and depends on partnership status but usually not on earnings or employment history. There is one exception: if one spouse is older than 65 and the other is younger than 65, the couple receives the amount for singles if the younger spouse has a paid job, but the full amount for the couple if the younger spouse does not do any paid work; the additional amount received in the latter case is called the “partner allowance”. It will be abolished in 2015. The wording of the questions was:

> *What do you think is the probability that 10/20 years from now the purchasing power of AOW benefits will on average be …*
>
> > *Less than now?*
> > *At least 10 percent less than now?*
> > *More than now?*
> > *At least 10 percent more than now?*
>
> *Please answer on a scale from 0 to 100 percent, where 0 means it will definitely not happen and 100 means it will certainly happen.*

Half of the sample got the questions with 10 years from now; the other half with 20 years from now, with randomized assignment.[6] All answers from 0 to 100 were allowed for; consistency restrictions (e.g., second answer larger than the first one) were not imposed and were indeed sometimes violated by the respondents. Note that the first and third answer may well add up to less than 100 since people may attach a positive probability to the event that purchasing power remains the same. This applies in particular to the purchasing power of AOW benefits since in the current system these are the same as the minimum subsistence level and reforms proposed until now do not change that (though for couples to whom the “Partner allowance” applies, the purchasing power of the total benefit will decrease in 2015 – see above).

The second set of questions concerns the purchasing power of second pillar pensions. Essentially all employees in the Netherlands participate in mandatory pension schemes

[5] The 2009 amounts (including vacation allowance) are €1068 for singles and €1469 for couples.
[6] This randomization was independent across waves, so the same person could get the questions with 10 years in one wave and with 20 years in another wave; in a given wave, all questions (in all four sets) for a given respondent had 10 years, or they all had 20 years.

organized at the firm or industry level, which in most cases guarantees them a defined benefit occupational pension that increases with their earnings. There are differences, however, in, e.g., how the pension level varies with the pattern of life cycle earnings or whether pension benefits keep track with inflation. The wording of the questions was similar to that for AOW benefits:

> *What do you think is the probability that 10/20 years from now the purchasing power of occupational pensions will on average be …*
>
> > *Less than now?*
> > *At least 10 percent less than now?*
> > *More than now?*
> > *At least 10 percent more than now?*
>
> *Please answer on a scale from 0 to 100 percent, where 0 means it will definitely not happen and 100 means it will certainly happen.*

The answers to these questions may be affected by the problems faced by occupational pension funds due to the financial crisis. Many pension funds have experienced a reduction of the accumulated pension wealth of their clients due to falling stock prices, and have announced not to compensate pension amounts for inflation in the near future to cope with this problem. In the long run, this may lead to much lower pension levels in real (purchasing power) terms.

The third set of questions is about the eligibility age for old age social security benefits:

> *What do you think is the probability that 10/20 years from now the age at which people are entitled to AOW benefits will on average be …*
>
> > *Higher than now?*
> > *At least two years higher than now?*
> > *Lower than now?*
> > *At least two years lower than now?*
>
> *Please answer on a scale from 0 to 100 percent, where 0 means it will definitely not happen and 100 means it will certainly happen.*

This question touches the core of the current (2008-2009) policy discussion, which is mainly about increasing the eligibility age for AOW benefits from 65 to 67 for cohorts younger than a certain age.[7]

The final set of questions we will analyze refers to the retirement age.[8] The wording of the questions about the retirement age is:

[7] The current plan (launched in September 2009) is implementing the changes 10 years from now, not affecting those who are currently younger than 55.

What do you think is the probability that 10/20 years from now the age at which people stop working will on average be …

Higher than now?

At least two years higher than now?

Lower than now?

At least two years lower than now?

Please answer on a scale from 0 to 100 percent, where 0 means it will definitely not happen and 100 means it will certainly happen.

Although the current policy debate is more about postponing AOW benefits than about fixing the retirement age, the common view is that later entitlement to AOW benefits will also lead to later retirement.

3. Time Trends and Age Patterns in Pension Expectations

Figures 1a and 1b show how the average answers to the probability questions on the purchasing power of AOW benefits have developed over the time period covered by the survey.[9] Before discussing the time patterns, some other findings are worth noting. First, the average probabilities are consistent, in the sense that the first probability ("less than now") always exceeds the second one ("at least 10% less than now"), the third probability ("more than now") always exceeds the fourth one ("at least 10% more"), and the sum of the first and third probability is always much less than 100%, implying that, on average, a substantial positive probability of about 30% is attached to the event that the purchasing power of AOW benefits will not change.

Second, the figures are asymmetric, revealing a general sense of "pessimism": the average probability that purchasing power will fall is much larger than the probability that it will rise; and the average probability that purchasing power will fall by at least 10% is much larger than the probability that it will rise by at least 10%. This may seem surprising since there are no plans to change the purchasing power of these benefits, which, as explained above, are determined by the official poverty line. On the other hand, it might reflect that some respondents are aware of the future removal of the "Partner allowance", which, although it applies to a limited subgroup of the elderly only, will reduce the average benefit per person or per household.

Third, there seem to be no systematic differences between the "10 years from now" and the "20 years from now" probabilities, although there are some non-negligible differences in specific months. Perhaps most respondents see 10 or 20 years simply as in the long run and do not make any distinction.

[8] We did not feel it was useful to ask about the eligibility age for occupational pensions, because with increasing flexibility and actuarially fair choices, the formal eligibility age can be quite low but with unattractively low pension benefits this is not very meaningful.

[9] The figures are weighted with sample weights to correct for unit non-response related to gender, age, and education.

Figure 1a: The probability of changes in the purchasing power of the AOW benefits 10 years from now

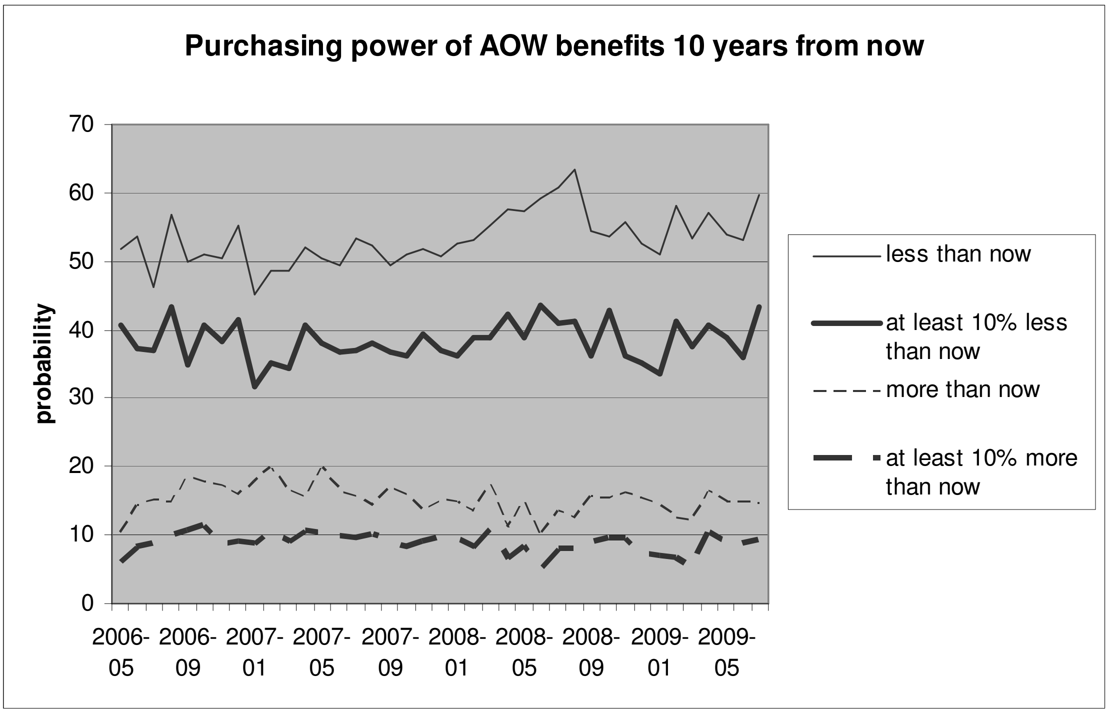
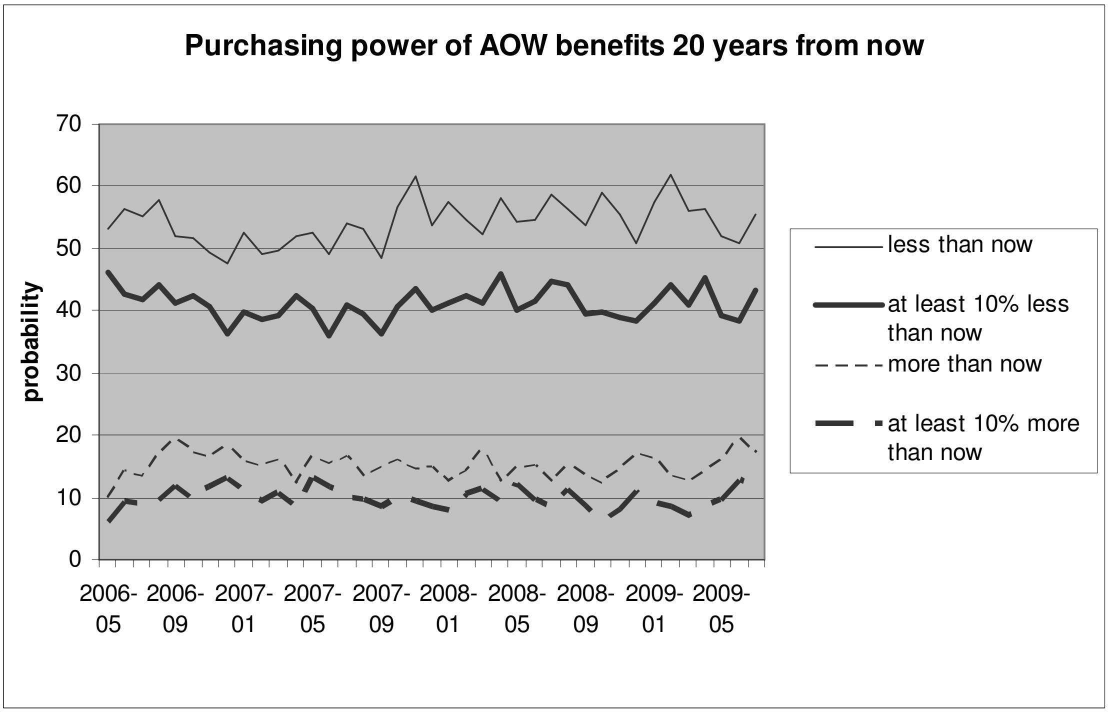


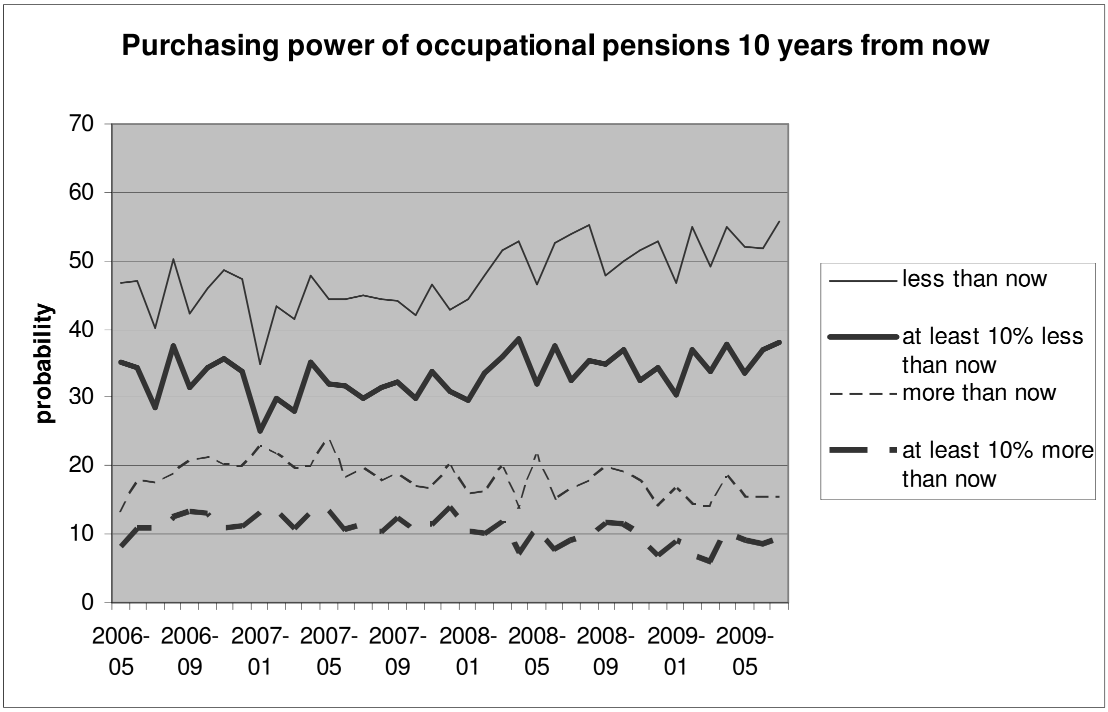
Figure 1b: The probability of changes in the purchasing power of the AOW benefits 20 years from now



Hardly any time trend is found in the probabilities of an increase, an increase by 10% or more, or a fall by 10% or more. The only small time trend we find is for the probability that benefits will fall in real terms, although even here, the pattern is not completely consistent and somewhat different for the 10 and 20 years groups. Still, one might conclude that pessimism has increased somewhat since the beginning of 2008. The lack of time trend may reflect the fact that the current policy debate does not concern the level of AOW benefits (the decision to remove the "Partner allowance" was already made in 1995).

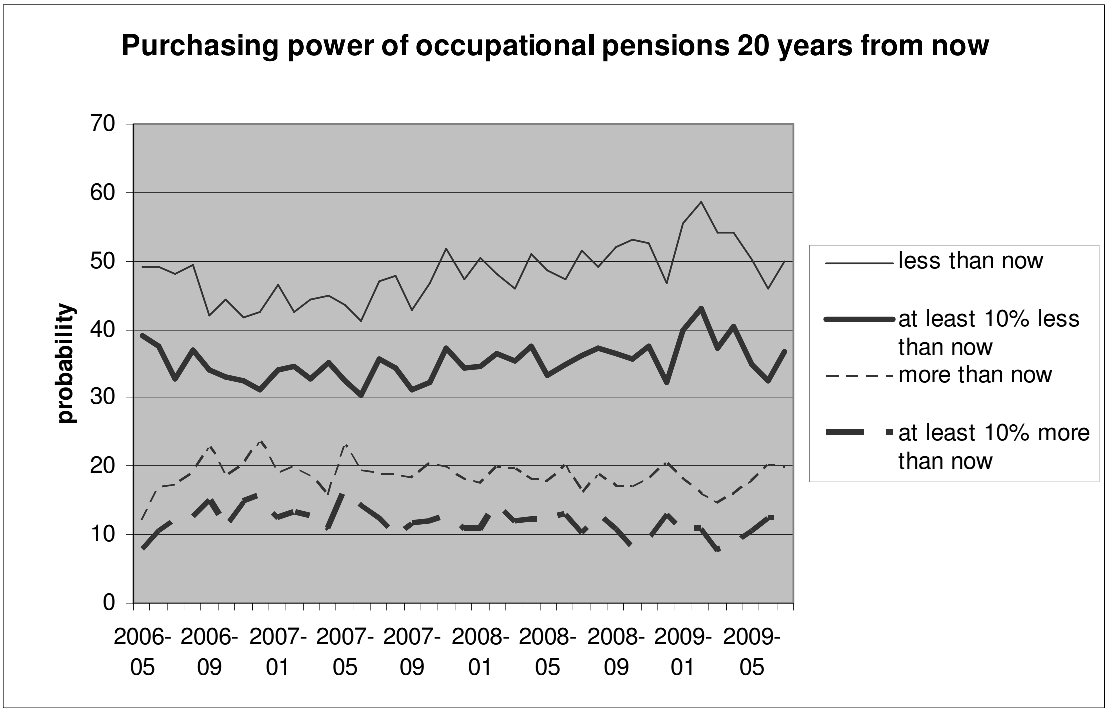
Figures 2a and 2b show the average answers to the probability questions on occupational pension levels, separately for the groups who got the "10 years from now" and the "20 years from now" questions. We find the same asymmetry revealing a general sense of pessimism. This may seem less surprising than for the state benefits, since the debate on sustainability of pensions due to the ageing of the population was already quite active in 2006. Still, in principle occupational pensions are fully funded and workers save for their own occupational pension, so that population ageing should not directly affect the purchasing power of these pensions if pension premiums and returns to the assets in which they are invested remain at the same level. As before, there are no systematic differences between the 10 and 20 years groups.

Figure 2a: The probability of changes in the purchasing power of occupational pensions 10 years from now



The trend towards larger pessimism is stronger here than in the expectations concerning AOW benefits. Subjective probabilities that occupational pensions will fall in real terms have clearly risen since early 2008. This suggests that respondents have anticipated the problems that pension funds were going to face due to the financial crisis. Not much has changed in 2009 when it became clear that many pensions were no longer fully funded. The probabilities that occupational pensions will fall by at least 10% have risen as well, though by much less. Accordingly, the probabilities that the purchasing power of occupational pensions will increase or will increase by 10% or more have fallen, particularly in 2009.

Figure 2b: The probability of changes in the purchasing power of occupational pensions 20 years from now



Figures 3a and 3b show how expectations concerning the eligibility age for state benefits change over time. Here the asymmetry is even larger than for the pension and AOW levels. The average reported probability that the eligibility age will fall (or will fall by at least 2 years) is quite small and might be upward biased by reporting errors of respondents who did not understand the questions or did not answer them seriously. The average reported probability that the eligibility age will increase over the next ten years was already about 60% in May 2006 and rose to about 70% in the summer of 2009. A similar clear trend towards more pessimism can be observed for the "20 years from now" group. The trend is quite plausible and in line with the announced reforms.

Figure 3a: The probability of changes in the eligibility age for the AOW 10 years from now

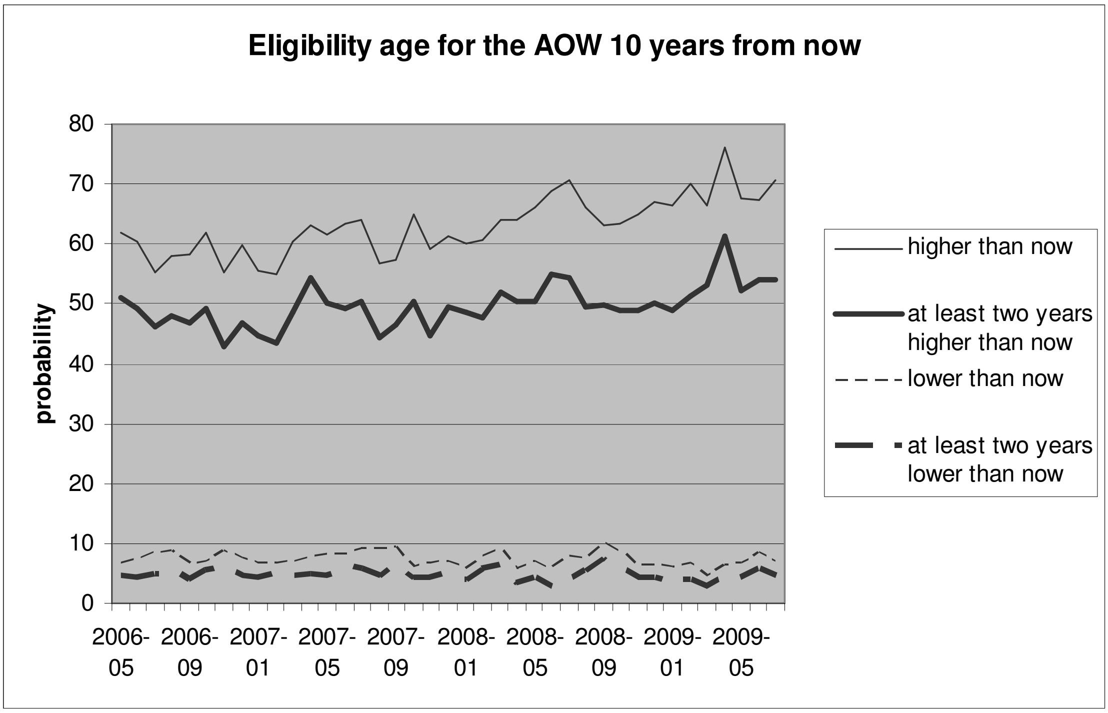
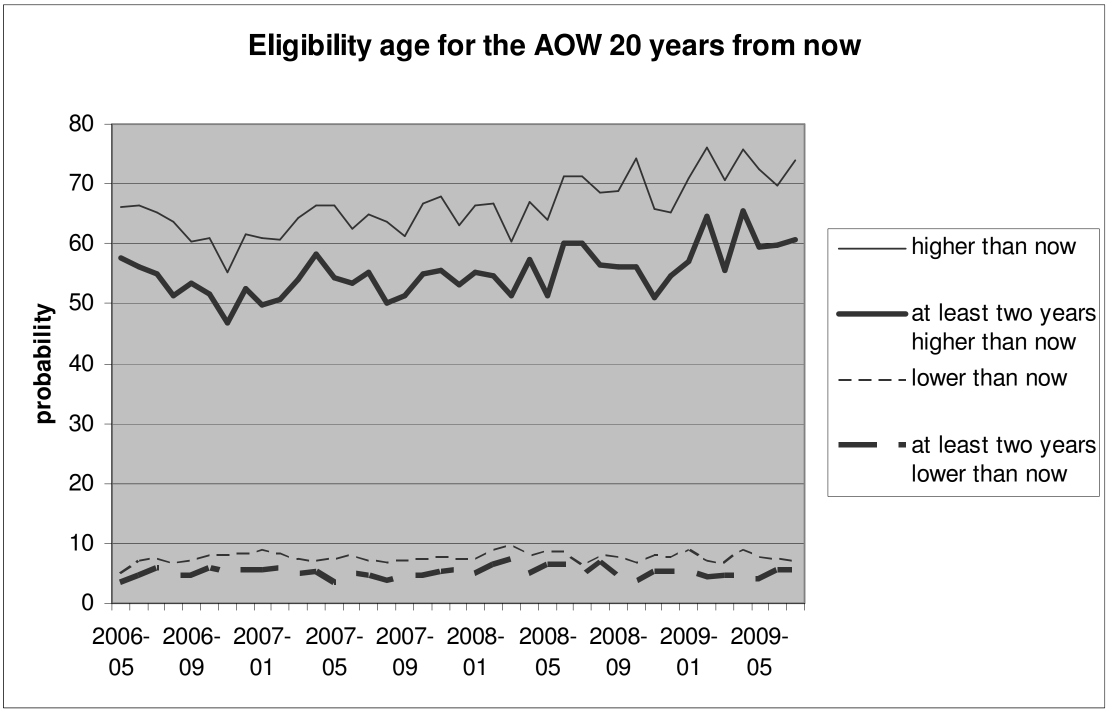


Figure 3b: The probability of changes in the eligibility age for the AOW 20 years from now

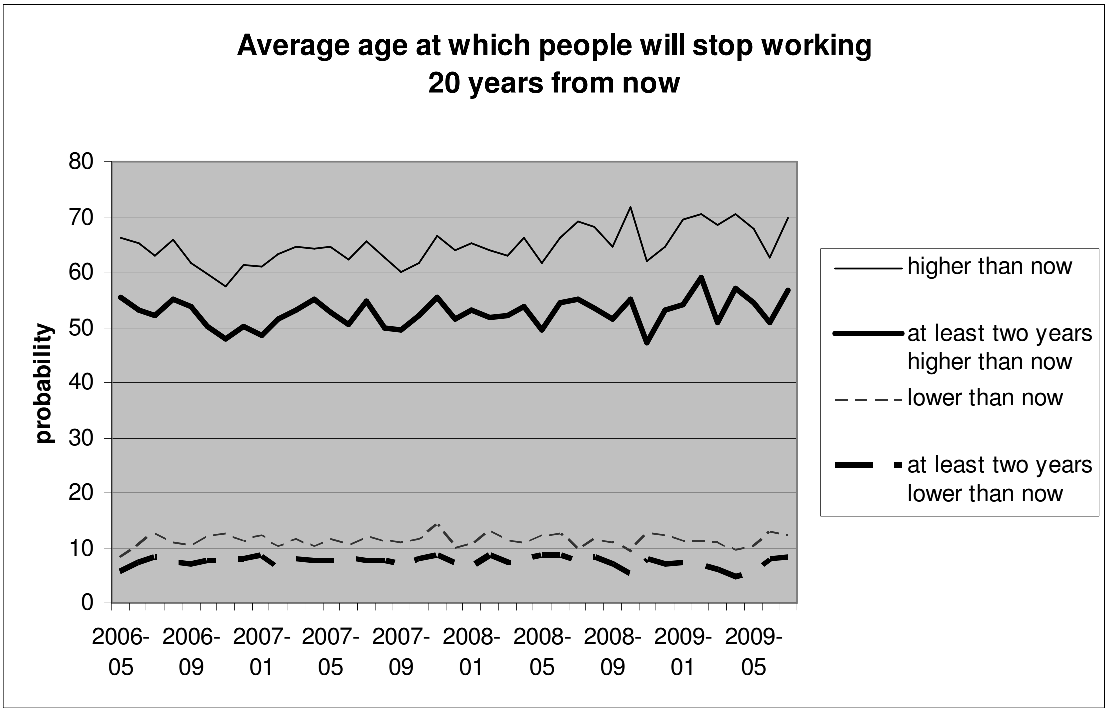


The figures also reveal that respondents were relatively pessimistic in the first few months of the survey (May and June 2006), probably due to the fact that the Social Democrats announced they wanted to reduce eligibility or generosity of AOW benefits to cope with the increasing costs due to population ageing. In the months after that, these plans were weakened and other parties expressed disagreement, which is probably why respondents became less pessimistic over the summer of 2006. Respondents' optimism rose until the general elections in November 2006. Shortly after that, several groups revitalized the discussion on increasing the AOW eligibility age and labour force participation of older workers, and pessimism increased. Particularly in late 2008 and 2009, influenced by the budget problems caused by the crisis, government plans to change the AOW eligibility age took concrete form, and increasing pessimism seems perfectly justified.

Figures 4a and 4b show the development over time of expectations concerning the average age at which people will stop working 10 or 20 years from now. The asymmetry is similar to that for the AOW eligibility age. The average reported probability that the retirement age will increase over the next ten years rises from about 60% to about 70% between 2006 and 2009. The trend is similar but somewhat less salient for the "20 years from now" group. On the other hand, the probability that in the next ten years the retirement age will rise by two or more years remains stable at about 50%.

Figure 4a: The probability of changes in the average age at which people will stop working 10 years from now

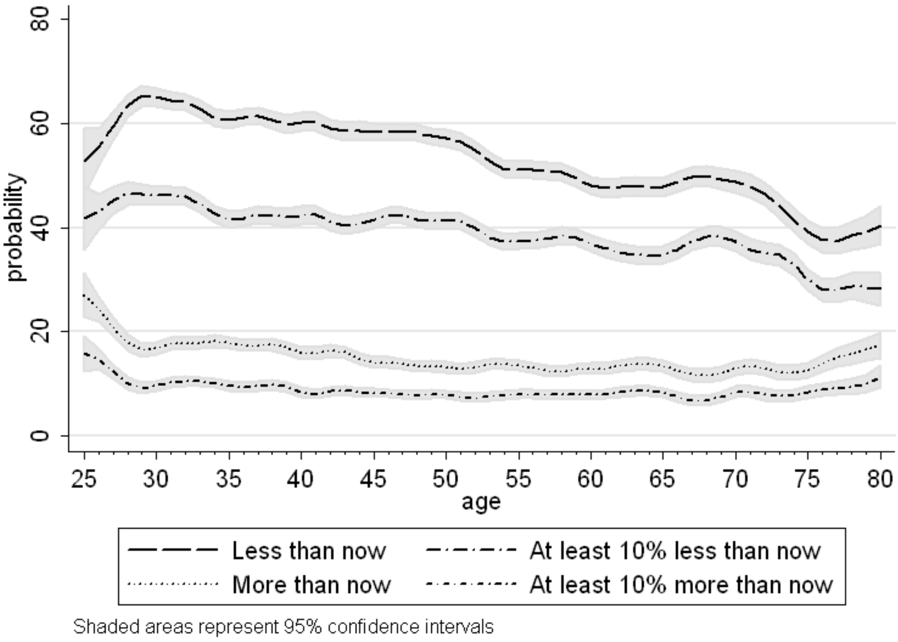
Figure 4b: The probability of changes in the average age at which people will stop working 20 years from now



The patterns in 2006 are similar to those in Figures 3a and 3b. People are pessimistic at first (Summer 2006) but pessimism falls until the general elections in November. In the first few months of 2007, the new government launched a plan to stimulate labour force participation of older workers by making AOW benefits dependent on participation in the years before the normal retirement age. In response to this, the number of respondents expecting an increase in the average retirement age rose. The effect disappeared when the government plans appeared to be infeasible. In spring 2008 the expected average retirement age rose again, possibly because some respondents already feared that the financial crisis would affect the accumulated pension wealth invested by pension funds. Respondents' expectations then remained approximately constant until the summer of 2009, with the exception of the last two months of 2008 for the "20 years from now" group. It is not clear why respondents were so optimistic in these two months, since the news in that period mainly concerned the financial problems of pension funds.

The probability questions ask about general events and if everyone would have the same information set and the same way of forming their subjective distributions (like rational expectations), there should be no systematic association with respondent characteristics. We will analyze this for a large set of individual characteristics in multivariate regressions in the next section. Here we present the bivariate relation between the probabilities and one of the regressors of interest – the respondent's age. Figures 5-8 show how the subjective probabilities vary with respondent age, combining data from all available time periods.[10] These figures show an age pattern that is surprisingly consistent across questions and seems to be stronger than the time patterns discussed above: pessimism concerning pension provisions falls with age. For example, the average percentage probability that the purchasing power of occupational pensions benefits will fall is about 60% for respondents of 30 years old, but less than 40% for respondents older than 65 (Figure 6). The average probability that the same purchasing power falls by at least 10% is about 40% for the youngest group and less than 30% for the oldest age group. Similar substantially declining patterns are observed in Figures 5, 7 and 8; only for the expected retirement age the age effect is somewhat weaker, though still negative. Interpreting them in terms of general optimism or pessimism, these results suggest the opposite of those of Dominitz and Manski (2005), who find that young people have more optimistic expectations on equity returns than older people.

Figure 5. Expectations concerning the purchasing power of AOW benefits 10 or 20 years from now as a function of respondent age



[10] Estimations obtained using local linear regression with Gaussian kernel and a bandwidth of 2 years.

Figure 6. Expectations concerning the purchasing power of occupational pensions 10 or 20 years from now as a function of respondent age

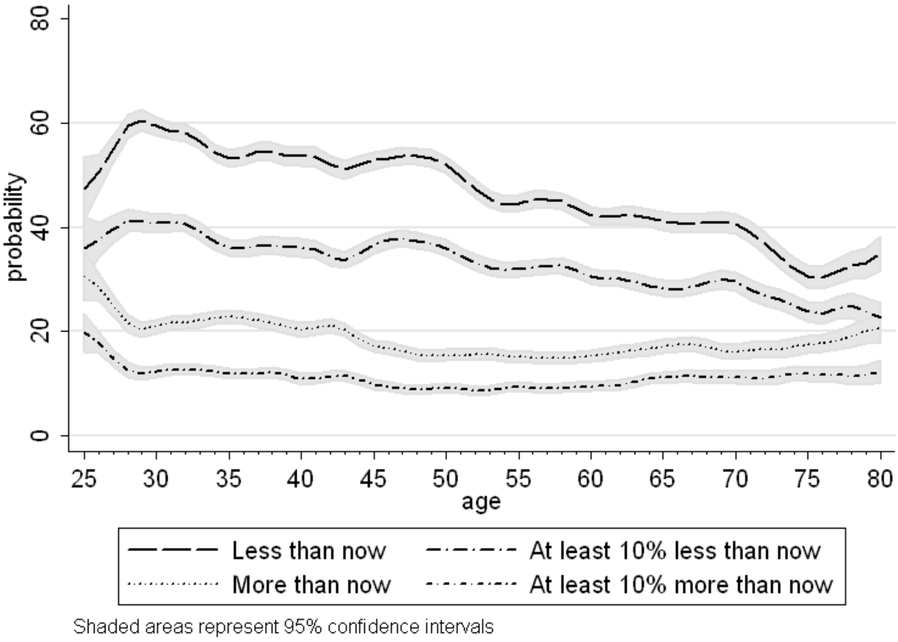


Figure 7. Expectations concerning the eligibility age for AOW benefits 10 or 20 years from now as a function of respondent age

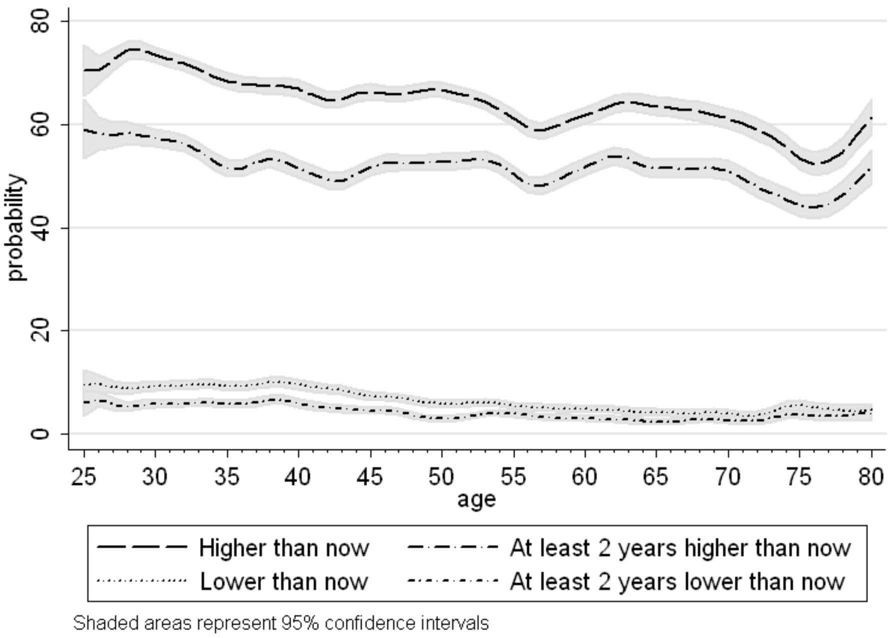
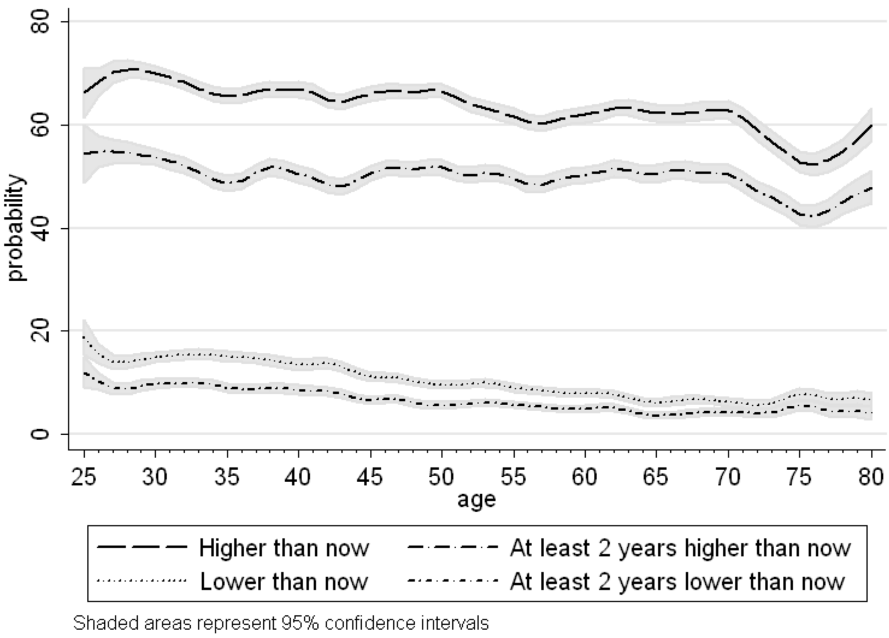


Figure 8. Expectations concerning the age at which (on average) people stop working 10 or 20 years from now as a function of respondent age



4. Empirical models of beliefs

In this section, we will assess the impact of respondents' demographic characteristics on their reported retirement expectations. We are interested in knowing if some groups in society are particularity pessimistic or display unwarranted optimism toward retirement.

There are two reasons why we think this is important. The first reason to study subjective beliefs is its importance for economic modelling. Many studies in the past, some already reviewed above, disproved the rational expectation hypothesis as the heterogeneity in beliefs observed in elicited subjective expectations is at odds with the rationality hypothesis. In our sample, all the respondents are asked to predict the same outcome and in principle have access to the same information, so that under the assumption of rational expectations, they should all come to the same conclusion. Our data reveal that they do not. One of the explanations for this heterogeneity could be that some groups lack the proper cognitive skills or are not willing to invest time to form rational beliefs. Analyzing how groups with different socio-economic characteristics very in their subjective expectations will be one way to test the assumption of rational expectations for the population as a whole (although it will not be possible to determine who has rational expectations and who has not, or which mechanisms drives the non-rationalities). Moreover, it is of interest to analyze to which extent the heterogeneity in beliefs can be explained by observable respondent characteristics, since this determines the usefulness of collecting this type of information at the micro level in future surveys. If socio-economic characteristics would perfectly predict the beliefs, the subjective beliefs would not contain additional information.

The second reason to study heterogeneity of beliefs follows from the fact that erroneous expectations toward the future could have an important negative impact on well-being for vulnerable groups in society (see Rohwedder and van Soest, 2006, for a discussion of this issue). Misguided perception of the future can lead to suboptimal choices of saving, in particular "under-saving." It is important to see if different socio-economic groups have realistic views of the future, and to what extent their misconceptions could impair their future well-being. This information could be useful for economists concerned with the mechanisms behind the formation of beliefs and could offer policy makers new ways of designing effective solutions to improper saving among the different groups.

Model specification

Following the concerns expressed above and the descriptive results in the previous section, we focus our attention on the questions concerning negative outcomes. Given the current situation of pensions, changes to the actual policy that would curb the cost of the systems are more relevant than changes that would exacerbate them. We model eight dependent variables: the answers to the questions concerning a general decrease or a decrease of more than 10% in the generosity of the old age social security benefits (AOW) and of occupational pensions, and the answers to questions concerning a general increase or an increase of at least two years in the age of eligibility to AOW benefits and of the average retirement age in the Netherlands. All dependent variables are subjective probabilities and take values between 0 %-points and 100 %-points, and a large number of respondents used these extreme values as answers. We take into account the censored nature of the variables in our estimations by estimating two-limit tobit specifications.

Over time, all respondents were asked to answer the questions up to 15 times, allowing us to control for unobserved heterogeneity at the respondent level, using panel data techniques. The models to be estimated are therefore random-effects Tobit models with censoring both on the left at 0, and on the right at 100.[11] The models are estimated using maximum likelihood. Estimates are obtained using *Stata*.

The same independent variables were included in all eight models. We first include "the usual suspects," a set of basic demographic and socio-economic respondent and household characteristics: a dummy variable with value 1 if the respondent is a male, age of the respondent, age-squared, a dummy variable taking the value 1 if the respondent lives with a partner. We control for education using dummies for middle and high education, using low education as the

[11] In some households, both spouses answered the questions. We do not account for the potential correlation between error terms of individual effects of respondents in the same household.

reference class. To capture employment status, we include dummy variables with value 1 if the respondent is retired, disabled (or partially disabled), unemployed, homemaker, and for working in the public sector; the benchmark group are those who work in the private sector. We included time dummies for each month (except one) in order to control for macro-economic shocks on beliefs, like the financial and economic crisis. We also included a dummy variable that takes the value of 0 if the question concerned a 10-year horizon and a value of 1 if the question concerned a 20-year horizon.

Controlling for the net income of the respondents leads to several issues. First, the survey asked for monthly income, but some respondents reported an amount that is unreasonably large for this period. These respondents possibly gave their yearly income. Hence, we considered observations with income larger than €8,000 a month as outliers and removed them from the sample. The second problem is widespread in surveys where respondents are asked to disclose their income: there is a large number of respondents answering “don’t know” or “refuse.” In our case, the respondents were offered the explicit choice not to answer the question concerning income. Only a handful of them used this option. However, and this is our third problem, a large number of respondents reported a net personal income of 0 and many of these answers should probably be interpreted as refusals. The 0-answers raise two problems. The first is that income will be measured with error if some of these 0 are indeed non-response. The second problem arises because we follow the usual strategy to include log-income rather than income. We included the log-income when available, replacing it by 0 for missing values and for a reported income of 0. We then included two additional dummy variables: one for those who declared an income of 0 and one for unknown or undisclosed incomes.

In Table 1, we present the mean values of the explanatory variables included in our models in the first month (when everyone of age 25 and older was asked to participate in the survey) and in the last three months (when one third participated each month, so that the last three months cover the complete sample). The table shows that the means of most of the variables are quite stable over time. We also see that very few respondents did not report an income (none in the first month, 10 in the last three months). Not all respondents always answered the questions, due to refreshment, attrition, or temporary non-participation (e.g., holidays). About 1,300 respondents answered in the first month and in the last three months, but in total, 2,780 respondents took part in the survey over time. Average age is relatively high, because all respondents of age 25 and older are asked to answer the questions (with no upper age limit). Median net personal income (zeros excluded) rises from €1,200 in the first month to about €1,330 at the end of the survey period; there is no correction for inflation. The average education level also increases over time (low education is the reference category). The fraction of homemakers is falling over time, while the number of public sector employees is rising. A large fraction of all workers (almost 40%) are in the public sector, which is defined in a broad sense, including e.g. the (semi-public) health and education sectors. The dummy “In 20 years” has value 1 if the questions referred to 20 years from now and 0 otherwise; the time period in the questions was randomly drawn, independent of all other variables and with equal probabilities for “10 years” and “20 years” so that by design its *ex ante* mean should be equal to 0.5. The *ex post* mean is somewhat different, mainly due to non-response.

Table 1: Means[12] of the explanatory variables in different time periods.

	May 2006	May, June, July 2009
Male	0.489	0.489
Partner	0.766	0.780
Age	49.92	50.22
age-sq./100	27.17	27.36
Log net-inc.	7.088	7.192
Income=0	0.116	0.104
Unk. Income	0.000	0.007
EducMed	0.254	0.242
EducHigh	0.625	0.666
Disabled	0.052	0.051
Retired	0.202	0.191
Unemployed	0.020	0.010
Homemaker	0.166	0.143
Public sector	0.217	0.241
In 20 Years	0.511	0.492
Observations	1325	1273

Estimation results

The estimation results are presented in Table 2. We estimated the equations separately and hence do not consider the correlations between the error terms or between the unobserved heterogeneity terms of the different equations. We consider a 5%-significance level in the discussion of which variables are significant and insignificant. Note that the models all explain the subjective probability of a negative outcome, so a positive sign in the estimates indicates an increase in pessimism if the independent variable increases.[13]

The results vary across the eight probabilities, but we observe some common patterns. First, males express significantly lower probabilities when it comes to the four worst-case scenarios, indicating that men are less pessimistic than women, in line with findings in the finance literature (Barber and Odean, 2001). Second, respondents with a partner are significantly more pessimistic in their four answers concerning age of eligibility to AOW and retirement age. A

[12] Means are weighted with sample weights based upon age, gender and education.
[13] The estimates of the slope coefficients cannot be interpreted as marginal effects on the expected subjective probabilities, due to the non-linearity of the model. The marginal effect of a covariate is equal to the estimated parameter times the probability to be uncensored (which depends on all the covariates and on the individual effect).

possible explanation is that couples are more concerned about retirement issues than singles and therefore pay more attention to the public debate. Another possible explanation could be that respondents with partners are often secondary earners working part-time, for whom income is not a good proxy to financial literacy or interest in financial matters (see below).

Table 2: Estimaton Results (Random Effects Tobit models)

	Generosity AOM		Generosity Occ.		Eligibility AOW		Retirement age	
	Less than now	More than 10% less than now	Less than now	More than 10% less than now	Later than now	More than 2 years later than now	Later than now	More than 2 years later than now
Male	-1.614	-4.665***	-2.779**	-4.986***	-1.045	-5.789***	-0.969	-5.382***
	(-1.207)	(-3.953)	(-2.144)	(-4.370)	(-0.830)	(-4.707)	(-0.828)	(-4.765)
Partner	1.491	1.889*	0.682	0.365	5.023***	3.787***	4.196***	3.109***
	(1.178)	(1.674)	(0.556)	(0.335)	(4.265)	(3.269)	(3.830)	(2.915)
Age	0.630**	0.288	0.226	-0.110	-0.433*	-0.547**	0.213	-0.0108
	(2.363)	(1.219)	(0.877)	(-0.480)	(-1.735)	(-2.239)	(0.917)	(-0.0481)
age-sq./100	-1.060***	-0.543**	-0.715***	-0.221	0.0941	0.396*	-0.425*	-0.0858
	(-4.079)	(-2.353)	(-2.839)	(-0.990)	(0.387)	(1.662)	(-1.884)	(-0.392)
Log net-inc.	1.790**	0.140	0.0613	-1.170	2.124***	0.872	2.139***	1.765**
	(2.177)	(0.187)	(0.0769)	(-1.632)	(2.770)	(1.153)	(3.044)	(2.548)
Income=0	11.20**	0.862	0.655	-7.201	12.87**	6.993	14.78***	12.40***
	(2.000)	(0.168)	(0.121)	(-1.470)	(2.471)	(1.358)	(3.094)	(2.626)
Unk. Income	9.151	7.724	2.055	-1.192	13.21**	3.737	9.715	10.68*
	(1.260)	(1.163)	(0.292)	(-0.188)	(1.966)	(0.563)	(1.575)	(1.751)
EducMed	-3.956	-2.258	0.0443	0.452	-3.327	-0.767	-0.374	1.072
	(-1.457)	(-0.944)	(0.0169)	(0.196)	(-1.303)	(-0.308)	(-0.158)	(0.469)
EducHigh	5.098*	1.135	4.792*	1.000	0.916	-0.702	3.675	0.0976
	(1.936)	(0.489)	(1.882)	(0.446)	(0.369)	(-0.290)	(1.595)	(0.0440)
Disabled	-3.653	-2.511	-3.452	-1.836	-2.598	-0.484	-3.149	-1.004
	(-1.573)	(-1.205)	(-1.533)	(-0.912)	(-1.213)	(-0.228)	(-1.590)	(-0.515)
Retired	1.501	0.816	0.465	0.945	2.954*	1.151	1.628	1.136
	(0.850)	(0.512)	(0.271)	(0.615)	(1.812)	(0.716)	(1.081)	(0.768)
Unemployed	1.689	5.397**	1.308	6.447***	4.491*	7.011***	4.677**	6.505***
	(0.620)	(2.176)	(0.501)	(2.744)	(1.842)	(2.882)	(2.081)	(2.902)
Homemaker	-2.655	-3.523**	-3.480*	-4.132**	-2.014	-3.249*	-2.746*	-2.521
	(-1.377)	(-2.029)	(-1.862)	(-2.475)	(-1.130)	(-1.845)	(-1.666)	(-1.557)
Public	2.122*	0.996	2.100*	1.347	1.001	1.245	1.553	1.591
	(1.709)	(0.896)	(1.747)	(1.259)	(0.870)	(1.102)	(1.463)	(1.535)
In 20 Years	0.305	3.064***	-0.269	1.895***	4.625***	7.744***	2.559***	5.472***
	(0.675)	(7.242)	(-0.613)	(4.688)	(11.46)	(19.18)	(6.902)	(14.69)
Constant	38.03***	45.18***	54.35***	57.36***	65.78***	62.96***	46.59***	41.90***
	(4.277)	(5.674)	(6.300)	(7.475)	(7.900)	(7.707)	(6.060)	(5.588)
Observations	19,939	19,818	20,032	20,009	20,046	20,021	20,055	20,046
Number of id	2,759	2,756	2,756	2,755	2,756	2,755	2,759	2,759
ρ	0.442	0.397	0.440	0.406	0.481	0.456	0.485	0.450
σ_u	26.00	22.42	25.23	21.82	24.93	24.16	23.27	22.17
σ_e	29.22	27.61	28.44	26.39	25.92	26.40	23.98	24.50

Notes: z-statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Dummy variables for time periods included but not reported

In general, high income individuals more often believe that 10 or 20 years from now, workers will retire later and the AOW eligibility age will rise. This view corresponds with the opinion of "financially literate" individuals. In half of the cases, we found a significant effect for the dummy with value 1 if reported income is 0. This dummy is significant for the questions concerning a decrease of generosity of AOW benefits, later eligibility to AOW, and for the two questions concerning age at retirement. In these four cases, the non-reporters are similar to those with a very low monthly income (below the minimum monthly wage).[14]

We found no significant education effects, perhaps because we already control for income. For the generosity of AOW benefits, the difference between highly educated and low educated respondents is almost significant at the 5% level. The higher educated are more pessimistic, which is again in line with the notion that pessimism is justified and the higher educated respondents tend to be better informed.

Some of the dummies on employment status were significant. Unemployed individuals appear to be significantly more pessimistic than private sector workers (the omitted category). They gave significantly lower answers to all "worst-case" scenarios (at least 10% less, at least 2 years later) and to the question concerning a later average age of retirement. The dummy for being a home maker is negative and significant for the two questions concerning generosity of pension plans. Retired and disabled respondents are not different from private sector workers (everything else held constant), with the exception that retired individuals seem to believe more often that in the future, the eligibility to AOW benefits will be delayed. Public sector workers are more pessimistic than private sector workers but the differences are only marginally significant.

Age generally has a significant effect and the marginal effect of age is usually negative for most of the sample. The maximum of the quadratic function of age is reached between 15 and 30 year-old in the series where at least one of the age parameters is significant. Note that our sample includes respondents aged 25 or older, and the large majority of the respondents are older than 30. Therefore, we can say that in general, keeping other characteristics constant, younger individuals are more pessimistic concerning the pension system than older ones. This is in line with the conclusion from Figures 5-8 where other characteristics were not controlled for.

Finally, there is a significant positive effect of asking questions concerning a 20-year horizon rather than a 10-year horizon, indicating that respondents are more pessimistic concerning pension provisions 20 years from now than concerning pensions 10 years from now. This could be expected from the figures in the previous section and is in line with the fact that the effect of population ageing on, for example, the ratio between the 65+ and 65- population sizes, is expected to increase further during the next twenty years.[15]

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[14] Note that ln(income) is set to zero for observations with zero income.

[15] See, for example, http://statline.cbs.nl/StatWeb/publication/?VW=T&DM=SLNL&PA=71445ned&D1=0&D2=0-19&D3=a&HD=080826-1054&HDR=T,G2&STB=G1

The estimates of the standard deviations at the bottom of the table (σ_u for the individual effects; σ_e for the error terms) indicate that there is substantial unobserved heterogeneity: between 40 and 50 percent of the total unexplained variation in the reported probabilities can be ascribed to time persistent individual effects. This also answers the second question we raised at the beginning of this section: the covariates used in our model do not capture the heterogeneity in beliefs completely, and the reported probabilities provide additional information, (not just noise – which might be the case if σ_u were negligible compared to σ_e). In light of the existing literature emphasizing the value of subjective probabilities in survey data (see, e.g., Manski 2004), this conclusion is hardly surprising and reinforces the idea that eliciting information of expectations is important for researchers interested in questions related to retirement and pensions.

Second, the expectations are associated with several socio-economic characteristics. The finding that men are less pessimistic than women is consistent with findings in existing studies in a different context. The fact that richer (and higher educated) individuals are significantly more pessimistic concerning some aspects of retirement than poorer respondents is in line with a positive association between socio-economic status and knowledge of the public debate on pension provisions. On the other hand, our finding that younger individuals are more pessimistic than older respondents is not explained by either the knowledge or the general optimism arguments. Perhaps it relates to the fact that, in spite of the fact that the question explicitly mentions “10 years from now” or “20 years from now” respondents often answer the questions thinking about their own pension provision at the time when they retire, which will probably be less generous for younger people than for those who are already approaching retirement.

5. Conclusion

We have analyzed expectations of the Dutch population of ages 25 and older concerning the system of income provision after retirement. The recent trends and policy discussions that seem to justify the expectation that future pensions will be less generous in terms of pension levels, eligibility ages, or both, are reflected in the trend in expectations, but only to a limited extent. Expectations seem to adjust only very slowly to the new reality and in this case this probably implies that the Dutch population is probably too optimistic, on average. Our micro-data also revealed substantial heterogeneity across and within socio-economic groups, suggesting that the average optimism is due to the over-optimism of a substantial subsample, whereas others may well have rational expectations.

From an economic policy point of view, the results we have obtained in models that relate expectations to socio-economic characteristics contain both good and bad news, under the assumption that pessimism is justified and the more pessimistic respondents are also the most realistic. That younger individuals are aware of the possible negative changes in pensions is certainly comforting news, as long as they will adapt their saving behaviour accordingly. The younger individuals, who are likely to witness changes to the pension system, have time and room to adapt their employment career and their life-cycle saving plans to this new reality, and can minimize an unwanted decline of well-being at retirement.

On the other hand, we view the fact that poorer individuals tend to be more optimistic as bad news. The poorer individuals depend more on the old age social security benefits than their richer counterparts, and are therefore more affected by a reduction in the generosity of these benefits. For the poorest among them, it might not make a lot of difference to anticipate the changes, as they are not able to save for retirement and their income will probably consist almost solely of social security anyhow. However, not anticipating the policy changes could have a larger negative impact on the well-being of the middle class, who are likely to save too little under erroneous beliefs concerning the future. An unrealistic view of the future of public pensions could have important welfare effects for these respondents.

Future research opportunities remain. Data collection is guaranteed until the middle of 2010 and the new data will help to better identify the consequences of the current financial and economic crisis. In addition, some methodological improvements are possible. First, we already mentioned that the full information on individual behaviour provided by the multidimensional panel structure is not fully exploited. We could control for general pessimism by estimating the equations jointly, and by allowing the terms of individual heterogeneity to be correlated among individuals. Another interesting step would be to jointly analyse the beliefs of respondents within a household, and to assess if unwarranted optimism or pessimism is contagious among partners. Finally, since respondents tend to answers our probability questions using focal answers such as "50 percent," the assumptions needed for the Tobit model may not be justified, and a model that explicitly account for the 50-50's, other focal answers, and the rounding to multiples of 5 or 10 seems worthwhile to check the robustness of our results.

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