Waiting for Reforms that Never Come: Saving and Work in Germany

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This draft: March, 2006 (first draft March 2004)

Abstract

Using a survey of German households we build an indicator of concerns regarding the sustainability of the pay-as-you-go pension system. We then use it to estimate the extent to which such concerns affect savings and labor supply decisions. German households who are relatively more concerned work more hours. This increase is the result of three separate decisions: households members who were already working, work longer hours; some members who were not working decide to join labor market and some postpone the date of retirement. We find these results surprising since it is a commonly held view that European labor markets are rigid and labor supply inelastic. Households who are relatively more concerned save more. At 60 years old, a level of concerns one standard deviation higher then the co-hort mean lowers consumption by about 5 per cent. Finally we estimate an upper bound for the increase in the median saving rate induced by an increase in concerns: 6.65 per cent compared with a correctly measured saving rate of 38 per cent.

*Bocconi, CEPR, NBER and LSE, CEP and Bank of England respectively. This paper was started when both authors were at the Bank of England. The paper represents the views of the authors and not necessarily those of the Bank of England. Francesco Giavazzi thanks the Houblon-Norman Fund at the Bank of England for support. We are also grateful to Daron Acemoglu, Olivier Blanchard, Nicola Fuchs-Schuendeln, Xavier Gabaix, Tullio Jappelli, Eliana Laferrara, Steve Pischke, Guido Tabellini and Guglielmo Weber for helpful comments. The data used in this paper were made available to us by the German Socio-Economic Panel Study (GSOEP) at the German Institute for Economic Research (DIW), Berlin.

1 Introduction

Prolonged political debates about how to reform a country's system of public welfare are common in many countries. Underlying these debates–which postpone the adoption of reforms–is often a 'war of attrition' among various groups in society, each trying to protect itself and to shift the burden of the reforms on someone else. A typical case are reforms of pay-as-you-go pension systems. There is rarely a disagreement regarding the need to change the existing rules, because unchanged rules would imply very large tax increases to keep the system solvent. But as one reform plan after the other is considered, changes in the existing rules keep being postponed, as the government is unable to decide on how the burden should be shared between the young and the old.[1]

People do not simply sit and wait. If households are forward looking, the war of attrition and the debates that surround pension reform will affect their behavior even if, for the time being, the existing rules remain unchanged. Households may act in anticipation of the possible effects of the reforms being debated, or they may simply respond to an increase in uncertainty. Whatever their motives, postoponing a reform will not come without costs. But not–or not only–for the simple reason that the longer you wait the more serious the imbalances will become. There may be additional costs: assume that the uncertainty created by these 'wars of attrition' induces households to save more. Consumption will fall and the economy might slow down for no other reason than the inability to agree on a reform.

In this paper we study this effect–that is on how households react to

[1]Boeri, Borsch-Supan and Tabellini (2001), using survey data, analyze the opinions of European citizens regarding pension reform trying to understand why a political consensus is so difficult to achieve. They find that conflicts of interests over welfare reform are generally aligned along three main dimensions: age, income, and the insider/outsider status in the labor market.

public debates about a reform that everybody understands is unavoidable but still is not undertaken because of the inability to agree on who should bear the burden. We do this by exploiting an episode occurred during the debate sorrounding pension reform in Germany

In 2002 Germany adopted a law that admittedly did nothing to stop the growth of pension spending (estimated to rise from 12% of GDP in 2000 to 17% in 2050, Oecd, 2005), but had the stated purpose of preparing German households for the unavoidable pension reform. The main provision of the law was the introduction of tax incentives to induce people to contribute to private pension plans.

In a survey conducted in early 2002, the year after law was introduced, when people were asked "Do you believe that the recent reform has stabilized the system", 10% of the interviewees answered yes; 50% answered that the 2001 reform represented just a first step toward stabilization, and 40% answered that it had done nothing to stabilize the system[2]. If the 2001 law did nothing to stop the growth in pension spending, it conveyed an important message: by stating that its goal was to prepare the ground for the forthcoming reform, it signalled that a change in the rules was unavoidable and forthcoming–it was only a matter of achieving a political consensus. The 2001 law can thus be treated as a "natural experiment": an exogenous increase in the public's awarness that a reform had become unavoidable.

We study how households responded to the adoption of the 2001 law by using data from a survey conducted in early 2002. The survey provides direct information on the extent to which an individual is concerned about the sustainability of the existing pension rules. We use this information to build a variable that we call *'pension concern'*. We then interact this variable with the right-hand variables in regressions that explain the labor

[2]See Boeri and Tabellini (2001).

supply and saving decisions within a household. Our estimates thus provide information on the extent to which pension concerns affect labor supply and retirement decisions.

Our findings are surprising in more than one dimension. First, we find that German households who are relatively more concerned work more hours. The increase in hours worked is the result of three separate decisions: households members who were already working, work longer hours; household members who have come close to the date of retirement, postpone retirement and some members who were not working decide to join labor market. The effects we find are significant. For instance, a level of concern one standard deviation higher than the mean for the cohort to which an individual belongs raises weekly hours worked by 2.2 hours at age 60, when the (working) individuals in our sample work on average 38 hours a week. We find these results surprising since it is a commonly held view that European labor markets are rigid and labor supply is inelastic.

We also find that households who are relatively more concerned save more. The higher savings are also the result of three separate decisions: an increase in the share of household income that is saved; more household members joining the labor market, which means higher social security contributions (also a form of saving); household members who are close to retirement age postponing the date of retirement, which means a reduction in negative saving associated with pension payments.

We find that both effects–on hours worked and saving–are stronger the closer a person is to the age of retirement. The finding is not surprising, since the closer a person is to the age of retirement, the smaller becomes the elasticity of his total labor supply. This is evidence for an effect which is sometimes discussed in the literature (see e.g. Chetty, 2004), namely that an individual's degree of risk aversion decreases with the elasticity of labor

supply. As people approach retirement the elasticity of their *total* labor supply decreases and risk aversion rises.

Aggregate labour market participation did increase in Germany between 2000 and 2002, particularly for those aged 55-64, despite the weak economic situation. Aggregate saving also increased in those years. Our results can only explain cross-sectional differences among households, and therefore cannot measure the extent to which 'pension concerns' lie behind these aggregate effects, but they are suggestive of what could be an important channel. In the case of savings we estimate an upper bound for the effect of pension concerns on the average saving rate: 6.65 per cent compared with a correctly measured saving rate of 38 per cent.

The paper is organized as follows. Following this introduction, Section 2 describes our data. Section 3 contains the results for hours worked. Section 4 discusses savings. Section 5 concludes.

2 Data

Our data are from the German Socioeconomic Panel (GSOEP). The survey, first conducted in 1984, is a yearly longitudinal study which covers some 10,000 German households providing information on numerous aspects of their life, including household composition, family biographies, employment, social security and earnings, health, as well as subjective questions on worries and feelings within a household.

Two main questionnaires are conducted each year. The first is an individual questionnaire in which all adult household members answer questions regarding their own situation. The second is a household questionnaire in which the head of the household is asked questions regarding the entire household. We have used the household questionnaire and we have combined the information about the head of the household–such as his/her

age, employment status, subjective feelings about the prospect of pension reform–with information relating to the entire household: income, consumption, saving and other household characteristics. The concept of saving we use thus refers to the entire household.[3]

The 2002 GSOEP survey was conducted early in the year, soon after the 2001 law was adopted and includes a section on the new law.

2.1 The concern for pensions in the GSOEP survey

One section in the individual questionnaire for 2002 refers specifically to the 2001 law discussed in the introduction. [4] The question asked is: *"From January 2002 onwards the pension reform will take effect, which places a greater burden on private contributions towards the provision for old age. How do you personally see this for yourself?"* The question is then broken up in four separate questions. We use the answers to these four questions to construct an indicator of an individual's concern regarding pension reform. (The four questions are described in Table 1.)

One of the four questions asks: *"How important to you are state contributions in order to save money and invest money for old age?"* The answers are coded from 1 to 5. Those who reply 'very important' and 'important' (codes 1 and 2) are likely to be most concerned about pension reform, while those who answer 'not very important', or 'not at all important' (codes 3 and 4), or are already retired or drawing a pension, (code 5) are likely to be less concerned.

Another question asks *"How much have you concerned yourself with setting up a private pension plan in order to supplement the statutory pension?"*

[3] We make use of the variables constructed using GSOEP responses and contained in the Cross-National Equivalent File (CNEF) - see Burkhauser et al. (2001) for details.

[4] The GSOEP survey is the only one that asks at least one question concerning the effects of social reforms.

Answers range from 'very strongly', to 'not at all' and are also coded from 1 to 5. The few non-responses (1.7% of all answers) are assigned a value of -1: we set this value equal to 5 (unconcerned) if the individual is are already drawing a pension, and drop the observation otherwise. We interpret this variable as decreasing in the level of concern about pension reform.

The next question asks those who are not already retired or drawing a pension: *"How well do you think you will be able to support yourself on the statutory pension or your private pension?"* Answers range from 'Very well' (5), to 'Very badly' (1). If the respondent is already drawing a pension the answer is coded as (6). This variable is also decreasing in the level of concern about pension reform: if respondents believe they will be unable to support themselves and their family with their current pension arrangements they are likely to be more concerned about any possible reductions in generosity of the pension system.

The last question asks: *"In the future, will you make a greater effort than before towards contributing to your private pension when state contributions [to private pensions] are introduced?"* The question refers to the 2001 law. There are four possible answers: 'Yes, definitely' (1), to 'No' (4). Those already retired are unlikely to be able to contribute more to a private pension plan, and so we assume that their answer is 'No'. We assume that those who say that after the pension reform they intend on contributing more to a private pension plan are most concerned about future reforms.

There are two problems with these questions. One is that only the first and last questions are directly related to the effects of pension reform; the other two are more about the adequacy of an individual's pension provisions. The answers to the four questions, however, are highly correlated and our results are robust to different ways of combining them. A second problem arises from the possibility that the answers reflect an individual's personal

characteristics (such as the extent to which he has provided for his old age and his degree of risk aversion) rather than his genuine concern for pension reform. If this were the case we would not be estimating how different levels of concern for pension reform affect hours worked and saving, but simply how these decisions are affected by a set of personal characteristics reflected in the answers to the four questions asked.

We address this problem in two ways. Firstly we estimated a panel with individual fixed effects. Secondly, when using simply the cross-section for 2002, we try to capture individual characteristics by including in the regression variables–such as whether or not the interviewee has a private health plan, whether he has a private or company pension and how worried he is about his personal finances in general–that should control for differences in the provision for old age. This is on top of age, sex, education, type of occupation, that control for the direct wealth effect of the reform.

We construct a 'pension concern' variable, combining the four responses described above and transforming them into a 0-10 variable. To do this we sum the answers given to each question by each individual. This yields a variable which ranges between 4 and 20, with low answers reflecting a relatively higher level of concern. We then invert this variable (so that it increases in the level of concern), and normalize it to range between 1 and 10, with 10 indicating the highest level of concern. The combined variable is described in Table 2. In order to score the highest possible score (10, which identifies individuals with the highest degree of pension concern), the interviewee would need to say that he believes that (i) social security is a key saving mechanism for old age, but (ii) that he does not think it will be able to support him in old age, and (iii) that, as a consequence, he is very much concerned with setting up a private pension plan and will definitely take advantage of any government scheme (such as the one provided by the

2001 law) designed to help setting up such a private plan.

Insert Tables 1 and 2

2.2 Who is more concerned about pension reform?

Figure 1 (a) shows the age distribution of the 'pension concern' variable. Not surprisingly given our construction of the variable, people are less concerned about pension reform as they get older. The level of concern falls abruptly after retirement, an indication that people do not expect pension reform to affect the benefits of those already retired. Remember however that what we shall exploit is not the variation of the concern variable across individuals of different age but within the same age group.

Table 3 shows further distribution statistics for the 'pension concern' variable, disaggregating households by occupation of the head of the households, household size, geography, etc. The surprising fact is how similar the 'concern' variable is across households with different characteristics. This suggests that the differences in the effects of concerns that we find in the cross-secton and panel regressions are related to individual characteristics other than those analyzed in Table 3.

2.3 Hours worked

The GSOEP survey reports the typical hours worked by the head of the household each week. The question asked is: '*How many hours do your actual working-hours consist of, including possible over time?*' The age distribution of the answers is also shown in Figure 1 (b) and distribution statistics for various groups are shown in Table 4. There is significant variation in hours worked even in sectors, such as manufacturing, where most workers are covered by national agreements, suggesting more flexibility, in-

cluding the use of overtime, part-time or temporary jobs, than one would expect.

The survey also reports the number household members who work, and the weekly hours they work. It also reports the number of household members who are retired. This information allows us to investigate the response of labor supply to concerns along different dimensions: hours worked by individuals already working, new household members joining the labor market, household members postponing retirement.

Insert Figure 1 and Tables 3 and 4

2.4 Household saving

The GSOEP survey asks about household savings posing the following question: *"Do you usually have an amount of money left over at the end of the month that you can save for larger purchases, emergency expenses or to acquire wealth?"*. In the presence of a pay-as-you-go pension system the answers to this question miss two portions of actual household saving:

- social security contributions by workers and by firms[5], which are not reported as savings although they are a form of saving (which increases with income). Thus reported savings increase over a person's working life by less than "true" saving;

- pension payments an individual receives, which are mis-reported as income, rather than being considered negative savings. Thus reported savings remain positive even after retirement when actual savings is likely to be negative.[6]

[5]We do not observe social security contributions paid by firms. As discussed in the Appendix we assume, consistent with the German social security system, that firms pay a contribution on behalf of workers that is equal to that paid by workers.

[6]To be precise, the mis-reporting does not concern the total pension payments received,

A similar problem arises for private pension plans. In the GSOEP survey, individual contributions to such plans are correctly reported as saving[7], but money withdrawn from a private plan is reported as income.

The bottom line is that the savings reported in the GSOEP answers to the question reported above represent a fraction of actual household saving. This problem emerges clearly from Figures 2 and 3. Figure 2 shows the age profile of the German saving rate (defined as the ratio of reported saving to disposable income for 2002). The figure is at odds with the life cycle hypothesis: the difference is particularly sharp when we compare it with the U.S. profile obtained for instance from the PSID survey (also shown in Figure 2 and reported in Poterba, 1994). Rather than hump-shaped, as implied by the life-cycle hypothesis, the saving rate of German households seems to be unaffected by an individual's age.[8]

Figure 3 shows instead the saving rate once we correct it by including contributions and excluding pension benefits from the measure of disposable income, as discussed above (the correction is described in detail in the Appendix). The 'corrected' age-saving profile resembles more closely that predicted by the life-cycle hypothesis.

Insert Figures 2 and 3

The reported and the corrected saving rates are shown in Tables 5 and Table 6. The saving rates reported in the two tables (means in Table 5 and medians in Table 6) are computed as the ratio of household saving to

since part of this is an implicit return on pension wealth, and therefore is indeed income. We have overlooked this fact. For a discussion of this correction see Jappelli and Modigliani (2005).

[7]The survey does not report the contributions to private pension plans made by firms on behalf of workers.

[8]This fact is well known from the work of Borsch-Supan et al. (1991, 2000) and Borsch-Supan (2003). Poterba (1994) makes the same observation for Japan. The age profile of the Japanese saving rate reported by Poterba is also shown in Figure 2.

household consumption: this is the variable we shall use in the regression. We scale saving using consumption, rather than disposable income, because ideally we would like to scale saving with a measure of permanent income, and consumption may approximate permanent income better than current disposable income.

For instance, the median household whose head is 50 years old reports an 11.3 per cent saving rate. However, total social security contributions (including those made by the firm) raise this saving rate from 11.3 to 38 per cent of household consumption. Similarly, the median household whose head is 65 years old–and is most likely retired–reports a positive savings rate: 14.3 per cent. However, when we subtract pension payments from the income that is reported, the saving rate becomes negative: - 77.3 per cent.

Insert Tables 5 and 6

The correction computed in Tables 5 and 6 should be considered with some caution. Ot assumes that contributions increase a person's future pension, something that is far from obvious in a PAYG system. Treating pension income as negative saving is also troublesome: for instance in a perpetual youth model pension wealth does not decrease with age. Something similar may be happening with the contributions to, and the income from, private pension plans. In this case we have information on the income received, but not on the contributions paid into such plans. We have thus corrected for the income received as in the case of social security payments, but we are unable to correct for contributions paid (which we do not observe). We have therefore assumed that they are correctly reported as saving. Because some arguments suggest we should simply use the reported amount of savings, while other suggest we should use the corrected saving rate, we have run our regressions using both definitions.

Finally, the GSOEP survey reports saving only for those households that declare positive saving: if a household has negative saving, the question about saving is left unanswered. Income is instead reported for all households. The number of households for which there is no information about saving is significant: 4,315 out of 10,598. These are quite evenly spread out along the age distribution: 20% are over 65 and 11% under 30. Among the heads of household who do not report saving 13% are unemployed We have estimated the saving rate for those households who do not report it, proceeding as follows. We start from households that declare positive saving and we compute consumption as income minus saving (consumption is not reported directly in the survey). We then use these data on consumption to estimate a consumption function. (The arguments in the estimated consumption function are income, wealth, expenditure on specific items such as food, demographic variables and personal characteristics such as lifestyle and the level of worries of the head of household. Browning and Leth-Petersen (2003), amongst others, discuss the issue of imputing consumption using similar household surveys.) Using the estimated parameters of this consumption function we construct an estimate of consumption for those households who did not report saving and for whom we only have information on income, and the other arguments in our consumption function. Using these estimates of consumption we finally obtain an estimate of saving. Our reported regressions include only those households who report positive saving, but the results are similar if we use the sample which also includes households for whom savings are estimated.

3 Hours worked and the concern for reforms

We begin by estimating the effect of pension concerns on hours worked. We organize our data in a panel that uses the GSOEP surveys for six years, from 1997 to 2002. In the survey the questions about pension reform were asked only once, in 2002.[9] We thus proceed as follows. We regress the dependent variable on individual fixed effects, year dummies, and an interaction of the 2002 year dummy with our 'pension concern' variable. The interaction term thus measures the effect of pension concerns on a household's decisions about hours worked (and in section 4 below on saving) once we correct for household fixed effects and for the specific year effect, 2002.

The results for the hours worked by a head of household are reported in Table 7, columns 1-2. The year dummies in columm (1) indicate a pattern of general decline in average hours worked in Germany over that period (exception is 1999 which saw a temporary pick-up from 1998). Since the average level of concerns (in 2002) is 3.5, the average reduction in hours worked, relative to 1997 is – 1.5 hours = - 3.21 + (3.5*0.49). The absolute reduction in hours worked is smaller when we control for unemployment: -1.1 hours = -2.53 + 3.5*0.42. The reduction in average hours worked could reflect the trend decline in hours worked in Germany as well as the slowing of the economy in 2000 to 2002–a period characterized by rising unemployment and therefore by lower average hours, as more heads of household worked zero hours.

Our main interest, however is in the variation across individuals characterized by a different level of concerns. Heads of household who are relatively more concerned about pension reform work longer hours. In the

[9]The 1997 survey asked individuals about some aspects of the social security system and their attitude toward it. While these questions were also asked in 2002, they don't address pension reform as directly as the questions that we use from the 2002 survey.

baseline regression (column 1) the estimated coefficient on the interaction of the pension concern variable with the 2002 dummy (0.49) tells us that individuals who are relatively more concerned for pension reform worked more hours, in 2002, relative to individuals with an average level of concerns. While a household head with an average level of concerns worked 2.9 hours less in 2002 relative to 1997, one who was more worried than the average, worked more in 2002 than he had in 1997. For instance those who were one standard deviation more worried (corresponding to 2.2 points on the concern variable) worked an extra 1.1 hours: 0.49 x (6.2 - 4).

Insert Table 7

People will respond to concerns differently, depending on the number of years they expect to remain active: the closer one is to the age of retirement, the less time one has left to increase his lifetime labor supply. We use age as a proxy for the (unobserved) distance from retirement. Age is not be a bad proxy since we exclude those individuals who are already retired and control for those who report that 2002 is their last year of work because they are about to retire (we also exclude unemployed heads of household in this regression).

We estimate how the response of hours worked to concerns changes with the time left to retirement interacting the concern variable with the age of the head of household. We do this using the cross section of households for 2002 rather than the panel. A cross section obviously does not allow to control for individual fixed effects. We thus introduce a number of variables which control for individual characteristics: a measure of financial wealth, whether or not the household owns the house in which they live, family and personal characteristics, as well as individual characteristics that either influence or reflect the respondent's attitude to risk: private health insurance,

how worried he is about his personal finances in general.

The estimated equation is equation (1). The left-hand side variable is weekly hours worked by the head of the household, H_j, where j denotes the $j-th$ household in the cross-section; on the right hand side we have his or her age, age_j, the "concern for pension reform" variable, R_j, and the interaction term. Since we use age as an interaction term, we also include it separately in the regression; we do the same for R_j. We also interact pension concerns with a measure of household wealth.

$$H_j = \delta_0 + \delta_{11} age_j + \delta_{12} (age_j * R_j) + \delta_3 R_j + \delta_4 (wealth_j * R_j) + \delta_4 controls_j + \varepsilon_j \quad (1)$$

We report the estimated coefficients of equation (1) in Table A2 in the Appendix.[10] The different interaction terms make these coefficients difficult to interpret. A better way to understand what they mean is to compute by how much hours increase if the head of household has a level of concern one standard deviation higher than the mean for his age group (the choice of one standard deviation is obviously arbitrary). We compute this for different age groups. These computations are shown in the top panel of Table 8. In doing this we assume that each age group is characterized by the average level of concern of the household heads belonging to that age group. We use group averages also for other characteristics such as disposable income. Household heads who are relatively more concerned work longer hours, the more so the closer they are to the age of retirement. For instance, at age 60 a head of household whose level of concern is one standard deviation higher than the

[10]Equation (1) is estimated jointly with the saving regressions discussed in the next section, as a system of seemingly unrelated regressions–which in this case does not correspond to OLS because the two equations include different right-hand side variables. This because the error terms of the two equations are likely to be correlated.

mean for his co-hort works, on average, 2.2 more hours per week, when the mean (of those working) at his age is 38 hours per week.

To test the robustness of these results, we re-ran the regressions of hours worked by head of household by different characteristics; those in manufacturing industries, those in services, home owners, those with a private pension plan, and those who are self-employed. These results are reported in the second panel of Table 8 and are very similar to the results for the entire sample–and so is their statistical significance.[11] The increase in hours when concerns are one standard deviation above the mean are largest for the self employed: 2.9 more hours per week at 60 years of age, compared with an average of 2.2. This is not surprising, considering that self-employed workers are likely to have more flexibility. What is surprising is the result for workers in manufacturing industries: taking again the results for a 60-year old head of household, his weekly hours increase by 2.6 hours, not far from the increase for the self-employed. Since the working hours of German manufacturing workers are regulated by nation-wide contracts, this suggests either a significant use of overtime, or of second jobs.

The survey also asks whether interviewees have a second source of employment. We use this information to create a variable that measures total household hours worked in a secondary job per year, which we then use in the regression reported described in the bottom panel of Table 8. There is indeed an increase in yearly hours worked in secondary jobs in households where the head is more concerned. Though insignificant for younger households, the effect is statistically significant at 90% level for households aged 55 and above. These results suggest that although many households have

[11] In order to ensure that the results of our regression make use of the large sample size, we implemented these robustness tests by including interaction terms for the characteristic of interest with each of the key regression variables. We then calculated the response to higher concern assuming that the characteristic holds true. We do not report the significance here to preserve space.

no workers involved in 2nd jobs, those concerned households where the head is 65 years of age work up to 650 hours per year in 2nd jobs–approximately 12.5 hours per week.

Insert Table 8

In Table 9 we report the results of similar regressions for:

- the weekly hours worked by household members other than the head of the household,
- the number of household members who have a job,
- the number of retirees in the household.

The results are reported–as we did in Table 8–computing by how much each variable changes in households where the head has a level of concern one standard deviation higher than the mean for his age group (remember that we only observe the concern variable for the household head). The larger effects are on the weekly hours worked by household members other than the head of the household. For instance, in a household whose head is 60 years old and has a level of concern one standard deviation above the mean, other members work 8.1 more hours per week, doubling total hours worked relative to the sample mean for those households–where household members excluding the head work on average 7.7 hours. This result must be related to the fact that in such a household more members work (second panel in Table 9). In these households (where the head is 60 years old) the sample mean for the number of members working not counting the head, is 0.78, whereas in concerned households the number of members working increases to 0.89.

Households where the head is relatively more concerned postpone retirement (bottom panel of Table 9): where the head is 65 years old, the number of (non-head of household) retirees falls by about 80% for a one standard deviation increase in concern - the mean is almost zero (0.15) but the effect of concerns is -0.12.

Insert Table 9

To test the robustness of these results, we ran a number of further regressions:

- we re-estimated each regression excluding controls that might be endogenous because they are likely to be affected by a pension reform. For instance, the decision to buy a life insurance, or to enroll in a company pension plan could be endogenous, that is depend on the individual's views as to the prospect of a pension reform. Excluding such controls left the main results unchanged (these regressions are not reported here);

- we re-estimated each regression truncating the sample at age 60, and excluding anyone listed as retired (who are excluded from the first regressions anyway). This eliminates the possibility that the results for hours worked might depend on the peculiar response of individuals who are relatively old. The results (also not reported here), were again similar.

We have also run a probit regression taking our panel forward. We use the data from 2002, 2003 and 2004 and estimate the effect of pension concerns in 2002 on the decision of working household heads to reitre in 2003 or to retire in 2004, controlling for the respondants age. The results

are reported in Table 10. We find (colimn 1) that higher concerns about pension reform reduce the likelihood of retirement in 2003; for a given age in 2002, 1 point higher concern reduces the probability of retirement by 50%. This result, though slightly weaker, remains statistically when we consider retirement in 2004 (column 3). We also estimated these equations only including those members who in 2002 were both working and over at least 60 years of age; the results (columns 2 and 5) are similar.

Insert Table 10

How should we interpret these results? The simple interpretation is a wealth effect. Households are forward looking: those who are relatively more concerned anticipate a larger fall in wealth as a result of the anticipated reform of pension rules. Thus they work more: by increasing working hours, by sending more household members to work and by postponing retirement. The wealth effect of a given pension reform is however likely to be similar for two individuals with the same age, same wealth, who work in the same industry and have similar family and schooling characteristics. If these individuals respond differently, for instance by raising the number of hours worked by a different amount, this mus be capturing something that goes beyond a simple wealth effect. One possibility is perceived uncertainty. Those who are more concerned perceive higher uncertainty and, to the extent that they are risk averse, work more, retire later, etc. As mentioned in the introduction, these findings are consistent with the model described in Chetty (2004) who shows that an individual's degree of risk aversion decreases with the elasticity of labor supply. As people approach retirement the elasticity of their *total* labor supply decreases and risk aversion rises.

4 Saving and the concern for reforms

Does the concern for pension reforms induce households to save more? The question is suggested by the increase in the German household saving rate, which occurred around the time our data on concerns were collected: from 9.6 per cent of disposable income in 2000 to almost 11 per cent in 2003. Interacting pension concerns with year dummies in our panel regressions would allow us to detect whether an increase in concerns can explain the observed increase in household savings. This is not something we can do, since, as we know, the concern question was only asked once, in 2002. Thus we do not know by how much average concerns increased, in 2002, relative to previous years. We can however estimate an upper bound of the increase in household savings that could be explained by the increase in concerns for pension reform.

Our panel estimates are reported in Table 11. We use, as dependent variable, both the reported and the corrected saving rate. Both measures of savings decrease over time. The increasingly negative coefficients on the time dummies are consistent with a cohort effect: as people get older, more people move into the negative part of the saving cycle and save less. This effect is less clear for the flatter reported saving rates and disappears if we exclude retirees (who dissave increasingly over time).

By how much did concerns raise the avergae saving rate from 2001 to 2002? Consider the baseline regression reported in column 1. Since the average level of concerns (in 2002) is 3.5, the corrected savings in 2002 is 6.65 = (3.5*1.88) percent higher than it would have been absent concerns–a sizable increase considering that the median corrcted saving rate is about 38 per cent. This assumes no previous concerns about pension reform and so represents an upper bound for the effect of concern on savings from 2001 to 2002.

Insert Table 11

Next, as in the case of hours, we estimate how the response of household savings changes with age using the cross-section data for 2002 and interacting the concern variable with the age of the head of household. The estimated equation is (2):

$$\begin{aligned} S_j/C_j &= \beta_0 + \beta_{11} age_j + \beta_{12}\left(age_j * R_j\right) + \beta_{21} age_j^2 + \beta_{22}\left(age_j^2 * R_j\right) + \beta_{21} Y^d + \beta_{21} Y^d + \\ &\quad \beta_{22}\left(Y_j * R_j\right) + \beta_3 R_j + \beta_4\left(wealth_j * R_j\right) + \beta_4 controls_j + \eta_j \end{aligned} \tag{2}$$

The dependent variable is the ratio of total saving (both reported and corrected savings) of household j , S_j to household consumption,C_j, for the reason mentioned above. There are two differences between equations (1) and (2). Here age enters both in levels and squared–this is to allow for the age-saving relationship to be hump-shaped–and the concern variable R_j is interacted both with age and age square. Among the controls–which are otherwise the same as in the hours regression–we add disposable income.[12] As in the case of hours we report the estimated coefficients of equation (2) computing by how much household savings increase if the head of household has a level of concern one standard deviation higher than the mean for his age group. These computations are shown in Table 12.

Estimates that use the *reported saving rate* show no effect of 'concerns' on savings–top panel of Table 12. The coefficients on the interaction terms are insignificant whether we use only households who report positive savings,

[12]As described above, the regressions we show include only those households who report positive saving, but the results are similar if we use the sample which also includes households for whom savings are estimated in the way discussed above.

or the full sample. They also do not change when we use income as the scaling variable, or look separately at different groups–by age, education, employment status, etc. (None of these results are reported). This finding differs from the results of the panel regressions where instead we had found a significant effect of concerns on reported savings.

When instead we use the *corrected saving rate* as dependent variable–that is when we recognize that contributions are part of savings, and pension payments represent dis-saving–we find, as in the case of hours, that households in which the head is relatively more concerned save more, the more so the closer she or he is to the age of retirement. These results are reported in the bottom panel of Table 12. Consider again a head 60 years old, with a level of concern one standard deviation higher than the mean for his co-hort. The saving rate of this household will increase, on average, by 4.8 per cent of consumption, when the mean saving rate for households with a head aged 60 is 7.8 per cent. Thus a level of concern one standard deviation higher then the co-hort mean lowers consumption by around 5 per cent.

Insert Table 12

The finding that the corrected measure of saving increases with the level of concerns, while reported savings do not, suggests that what may respond to concerns are the various corrections terms. There are two candidates (we rule out contributions to private pensions, because only a small fraction of the households in our sample, 7 per cent, sign up to a private plan):

- the social security contributions of new household members who join the labor market,
- the decision to postpone retirement. In households where the head is relatively more concerned, workers, including the head of the house-

hold, could retire later and thus keep paying contributions and postpone drawing their pensions.

In the corrected saving rate both decisions would result in an increase in the corrected saving rate–and in fact, as shown in the previous section, in households where the head is relatively more concerned, more members join the labor market and members postpone retirement.

To further test the robustness of these results, we ran–as hours worked– a number of further regressions. We re-estimated each regression excluding controls that might be endogenous because they are likely to be affected by a pension reform and we split the sample according to the occupation of the head of household running a separate regression for each group. Once again the results are broadly unchanged.

5 Conclusions

While few Germans would dispute the need to reform the country's pension rules, implementation of any reform proposals involves a prolonged process of negotiation between social partners. During this time people may become increasingly uncertain that a resolution will be reached in time, and to what extent any reforms will affect them. In this paper we have used a German household survey to show that in response to such pension reform uncertainty people do not sit and wait. We find that households who are relatively more concerned work more hours. This increase is the result of three separate decisions: households members who were already working, work longer hours; some members who were not working decide to join labor market and some household members postpone the date of retirement.

The effects of concerns on labour supply may be larger than those we have estimated, since what we observed is the labour market outcome, and

various rigidities may prevent workers from working as much as they would like at the prevailing wage rate.

Our second main result is that worried German households appear to save more relative to less concerned households. There seem to be three channels through which this effect operates: more workers in a household contributing to notional pension saving through social security, deferred retirement (recognizing that social security contributions are part of savings, and pension payments are negative saving), as well as a direct increase in reported saving.

What does this mean for the economy? In some respects these results are comforting: German households are taking action–partly in response to the incresae in uncertainty, partly to try to make up for the potential fall in their pension wealth. Any time series conclusion, however, is limited by the fact that the GSOEP survey posed the question about 'pension concern' only once. We are thus unable estimate, for instance, the extent to which higher concern are responsible for the increase in the national saving ate, although the upper limit we compute is indicative.

6 References

Attanasio, Orazio P. and Agar Brugiavini (2003), Social security and households' saving, *Quarterly Journal of Economics*, 118, 3, pp.1075-1120 (2003).

Boeri, Tito, Axel Börsch-Supan and Guido Tabellini (2001), Would you like to shrink the welfare state? A survey of European citizens, *Economic Policy* 32, 9-50

Borsch-Supan, A. (2003), *Life-Cycle Savings and Public Policy: A Cross-National Study of Six Countries.* New York, Academic Press.

Borsch-Supan, A., Reil-Held, A., Rodepeter R., Schnabel, R., and Winter, J. (2000), "The German Savings Puzzle", *Research in Economics.*

Borsch-Supan, A and K Stahl (1991), "Life-Cycle Savings and Consumption Constraints", *Journal of Population Economics* (4), pp. 433-455.

Browning, M. and S. Leth-Petersen (2003), "Imputing Consumption from Income and Wealth Information", *The Economic Journal*, 113 (June), 2003.

Burkhauser, Richard V., Butrica, Barbara A., Daly, Mary C. and Lillard, Dean R. (2001), "The Cross-National Equivalent File: A product of cross-national research" in Becker, Irene, Ott, Notburga and Rolf, Gabriele (editors), *Soziale Sicherung in einer dynamsichen Gesellschaft. Festschrift für Richard Hauser zum 65. Geburtstag.* Campus, Frankfurt/New York, pp. 354-376.

Chetty, R. (2004), "Labor Supply and Risk Aversion: A Calibration Theorem", mimeo, University of California at Berkeley.

Gale, William G. (1998), The effect of pension wealth on household wealth: a reevaluation of theory and evidence, *Journal of Political Economy* 106, 706-23.

Jappelli, Tullio and Franco Modigliani (2005), "The Age-Saving Profile and the Life-Cycle Hypothesis", in *The Collected Papers of Franco Modigliani, vol. 6*, chpt. 5. Cambridge, Mass., MIT Press.

OECD (2005), "Pensions at a Glance: Public Policies across OECD Countries", OECD, 2005.

Poterba, J. M. (1994), 'Introduction' in J. M. Poterba (editor), *International Comparisons of Household Saving*, National Bureau of Economic Research, 1994.

Appendix: Correcting the reported household saving rate

Consider an economy with a pay-as-you-go pension system (and no private pension system at present). At each point in time some people will be paying social security contributions (assume the contribution rate is τ_s) while others will receive pension payments p. Let y denote non-pension income and let τ_{tax} the income tax rate. Social security contributions are $\tau_s.y$. Household disposable income, y^d, as normally reported is

$$\begin{aligned} y_t^d &= \textit{income - government deductions} \\ &= y_t + p_t - (y_t\tau_{tax} + y_t\tau_s) \\ &= y_t\left(1-\tau_{tax}\right) + p_t - y_t\tau_s \end{aligned}$$

and household saving, also as normally reported, is

$$\begin{aligned} s_t &= y_t^d - c_t \\ &= y_t\left(1-\tau_{tax}\right) + p_t - y_t\tau_s - c_t \end{aligned}$$

Therefore the reported saving rate is

$$\begin{aligned} sr_t &= \frac{s_t}{y_t^d} = \frac{y_t^d - c_t}{y_t^d} = 1 - \frac{c_t}{y_t^d} \\ &= 1 - \frac{c_t}{y_t\left(1-\tau_{tax}\right) + p_t - y_t\tau_s} \end{aligned}$$

This expression shows how a reform of the pension system affects the reported saving rate. For a given level of consumption, if the generosity of the

pensions system falls (p declines), the reported saving rate increases. Moreover, if the reduction in pension payments is accompanied by an increase in contribution rates (τ_s increases), the reported saving rate will increase even further. A pension reform will therefore affect measured saving even if consumption is unaffected by the reform.

Consider instead the correctly measured saving rate. To build this variable we need to adjust disposable income to account for social security payments as saving, and pension income as dis-saving–overlooking once again the implicit return on pension wealth, see footnote 7. It is thus given by

$$\begin{aligned} y_t^{dc} &= y_t^d + \tau_s y_t - p_t \\ &= y_t \left(1 - \tau_{tax}\right) \end{aligned}$$

where y_t^{dc} is the corrected measure of disposable income. Correctly measured saving is

$$\begin{aligned} s_t^c &= y_t^{dc} - c_t \\ &= y_t \left(1 - \tau_{tax}\right) - c_t \end{aligned}$$

A change in the generosity of the pensions system, or an increase in contribution rates by workers, does not affect the correctly measured saving rate. In other words, if s^c moves, it can only be because an individual has changed his consumption.

In reality, pay-as-you-go systems usually operate alongside private pension plans. This means that should a household wish to increase the level

of saving for retirement, one way of doing this is through higher private pension contributions; apart from the direct impact of higher social security contributions through working more, and therefore earning more, it is not typically easy to increase contributions to the public pension system.

The measure of saving reported in the GSOEP survey is household saving after other regular payments (question 51 of the household survey): *"Do you usually have an amount of money left over at the end of the month that you can save for larger purchases, emergency expenses or to acquire wealth?* This question comes after questions which ask about income less deductions, and money used to pay off debts, loans and other regular payments. In that private pension assets are a form of wealth, we have assumed that respondents correctly include such private pension payments in their saving.

Therefore we take the measured saving rate in the GSOEP survey and correct it for this measure of saving that is consistent with the life-cycle hypothesis. It should be noted that according to ESA95 standards of national accounting, national accounts measures of saving rates are corrected for contributions to private pensions and the dissaving when such pensions are drawn, but are not corrected for the similar effect of social security saving schemes. In this respect, our measure of corrected saving rates could be seen as more ideal than national accounts corrections.

Therefore, we can compute the difference between the two measures of the saving rate, including a private pension system, as:

$$\begin{aligned} s_t^c &= y_t\left(1-\tau_{tax}\right) - c_t - pri\_p_t \\ &= y_t^d + \tau_s y_t - pub\_p_t - pri\_p_t - c_t \\ &= y_t^d - c_t + \tau_s y_t - pub\_p_t - pri\_p_t \\ &= s_t + \tau_s y_t - pub\_p_t - pri\_p_t \end{aligned}$$

$$\begin{aligned} \text{where } pri\_p_t &= \text{private pension 'income'} \\ pub\_p_t &= \text{public pension 'income'} \end{aligned}$$

In order to calculate the corrected saving rate, we use GSOEP/CNEF data on disaggregate (by household) income and taxes. Table A1 defines the main data that we use

Insert Table A1 here

With this data, measured saving is given by:

$$\begin{aligned} Saving(measured) &= total\ measured\ income\ -taxes\ -\ consumption \\ &= labour\_inc + asset\_inc + priv\_trans + priv\_pen \\ &+ pub\_trans + SS\_pen\ -\ Fed\_tax\ -\ SS\_tax\ -\ con \end{aligned}$$

Corrected saving is given by:

$$\begin{aligned} Saving(corrected) &= labour\_inc + asset\_inc + priv\_trans \\ &+ pub\_trans\ -\ Fed\_tax\ -\ consumption \end{aligned}$$

Therefore, as above, the difference between the two measures is:

$$Saving(corrected) = Saving(measured)\ -\ priv\_pen\ -SS\_pen\ +\ SS\_tax$$

i.e. we are removing the two forms of 'income' that are actually dissaving, and adding the 'tax' that is actually a form of saving.

The variable *SS_tax* includes all social security taxes and our the correction for social security pension saving must be considered separately from

other social security contributions - unemployment and health related contributions are an insurance payment rather than saving. The German social security system is based on the following split of contributions:

- Retirement Insurance is 19.5% of salary.
- Health Insurance is 13.5%, though those on reasonable high incomes can opt out.
- Long-Term Care Insurance is 1.7% of salary.
- Unemployment Insurance is 6.5% of salary.

Also, contributions are not payable on salaries above a certain threshold[13]. However, once we remove the insurance contributions, we must also correct for the fact that half of the contribution is payable by the employer and that this is not included in the SS_tax measure. These two effects offset each other.

Tables 7 and 8 in the main text highlight the effect of all these corrections on the mean (7) and median (8) households in each main age group. One point that is worth highlighting is the apparently large saving rates of even young people in the sample. This can be explained, at least partly, by the fact that these data refer to heads of household. Most of the young households whom we think would be dissaving are unlikely to be heads of houseld.

[13]These vary by Lander and also by type of contribution. For example, contributions for health insurance or old-age care are not paid on salary above €3487.50 per month, while the threshold for unemployment and pension contributions is €5150 per month.

Table 1: Selected answers to the 2002 GSOEP survey
Questions no. 81, 82, 83, 84) (percent of total answers)

How important are State contributions to your pension?		Have you concerned yourself with setting up a private pension?		How well will you be able to support yourself on your pension?		Will you make a greater effort to contribute to your private pension?	
Very important	21	Very strongly	6	Very badly	9	Yes, definitely	9
Important	28	Strongly	16	Badly	16	Yes possibly	23
Not very important	14	Moderately	24	Ok	30	Do not know yet	16
Not at all important	7	Hardly	18	Well	15	No	42
		Not at all	37	Very well	1		
Pensioner	29			Pensioner	29		

Table 2: Our constructed measure of 'concern for pension reform'
(percent of total answers)

Value of 'concern' variable	Level of concern	% of answers
0-1	Little concern/ pensioner	26
1-2		5
2-3		6
3-4		10
4-5		20
5-6		23
6-7		11
7-8		3
8-10	Extremely concerned	0

Table 3: Statistics for the 'concern for pension reform' variable

							Percentiles				
	Includes retired?	Mean	Observations	Minimum	Maximum	Standard dev	10th	25th	Median	75th	90th
Overall	Yes	3.4	10330	0	8	2.3	0	1	4	5	6
Overall	No	4.7	7326	0	8	1.3	3	4	5	5	6
Self employed	No	4.7	600	0	8	1.4	3	4	5	5.5	6.5
Part-time	No	4.5	976	0	8	1.7	2	4	5	5.5	6
Retired	Yes	0.5	3003	0	7.5	0.9	0	0	0	1	1.5
Unemployed	No	4.6	750	0	8	1.8	3	4	4.5	5.5	6
Income $>$ 100K	No	4.6	898	0	8	1.3	3	4	4.5	5.5	6
Income $<$ 30K	No	4.4	1258	0	8	1.6	2.5	4	4.5	5.5	6
Services	No	4.7	2373	0	8	1.2	3	4	5	6	6
Manufacturing	No	4.8	1570	0	8	1.1	4	4	5	6	6
West Germany	No	4.6	5575	0	8	1.4	3	4	5	6	6
East Germany	No	4.8	1752	0	8	1.2	3	4	5	6	7
Male head of hous.	No	4.7	4527	0	8	1.3	3	4	5	5.5	6
Female head of hous.	No	4.6	2800	0	8	1.4	3	4	5	5.5	6
Married	No	4.7	4245	0	8	1.3	3	4	5	5.5	6
15+ years education	No	4.6	1669	0	8	1.2	3	4	4.5	5.5	6
1-9 years education	No	4.2	816	0	8	1.6	2	3.5	4.5	5	6
Household size $>$ 5	No	4.8	620	0	8	1.1	3.5	4	5	5.5	6
Children in household	No	4.9	3211	0	8	1.1	3.5	4.5	5	5.5	6.5

Table 4: Statistics for the hours variable

							Percentiles				
	Includes retired?	Mean	Observations	Minimum	Maximum	Standard dev	10th	25th	Median	75th	90th
Overall	Yes	23	10330	0	100	22	0	0	29	42	50
Self employed	No	47	600	0	100	21	10	40	50	60	70
Part-time	No	21	976	0	90	11	7	12	20	30	35
Retired	Yes	0	3003	0	10	1	0	0	0	0	0
Unemployed	No	1	750	0	90	6	0	0	0	0	
Income > 100K	No	42	898	0	100	18	6	39	45	50	60
Income < 30K	No	18	1258	0	100	20	0	0	8	40	45
Services	No	38	2373	0	100	14	20	35	40	45	50
Manufacturing	No	41	1570	0	80	10	35	38	40	45	50
West Germany	No	33	5575	0	100	19	0	20	40	45	50
East Germany	No	31	1752	0	100	21	0	0	40	45	50
Male head of hous.	No	38	4527	0	100	18	0	38	40	48	55
Female head of hous.	No	24	2800	0	100	19	0	0	30	40	45
Married	No	34	4245	0	100	20	0	23	40	45	54
15+ years education	No	37	1669	0	99	18	0	35	42	48	54
1-9 years education	No	24	816	0	98	21	0	0	35	40	47
Household size > 5	No	33	620	0	100	21	0	10	40	45	55
Children in household	No	32	3211	0	100	20	0	16	40	45	55

Table 5. Correcting the saving rate - Mean

Mean data	Age of Head of Household									
	25	30	35	40	45	50	55	60	65	70
Saving rate (measured)	13.0	16.0	14.8	13.9	13.9	15.0	15.7	17.7	18.9	18.1
Correction term	23.1	27.3	25.3	24.3	22.2	21.0	15.7	-9.9	-77.2	-97.1
of which Social security saving	23.9	28.0	26.1	25.3	24.3	25.2	24.6	19.6	11.7	9.5
of which Public Pension dissaving	-0.8	-0.2	-0.7	-0.4	-1.9	-3.8	-7.9	-25.8	-83.5	-101.2
of which Private Pension dissaving	0.0	-0.5	-0.1	-0.5	-0.3	-0.3	-0.9	-3.7	-5.5	-5.5
Saving rate (corrected)	36.1	43.3	40.1	38.3	36.1	36.1	31.5	7.8	-58.4	-79.0

Table 6. Correcting the saving rate - Median

Median data	Age of Head of Household									
	25	30	35	40	45	50	55	60	65	70
Saving rate (measured)	9.4	12.1	11.5	10.3	10.2	11.3	11.8	14.1	14.3	15.1
Correction term	27.7	30.1	27.7	27.0	26.1	26.6	24.9	8.7	-97.6	-107.4
of which Social security saving	27.7	30.1	27.8	27.2	26.5	27.0	26.5	19.5	9.4	9.1
of which Public Pension dissaving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-96.2	-111.2
of which Private Pension dissaving	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saving rate (corrected)	38.4	43.6	40.3	38.4	37.3	38.0	36.4	23.1	-77.3	-90.6

Table 7. Panel regressions (Hours)

	(1)	(2)
	Hours	Hours
Sample	Excl retirees	Excl retirees
1998 dummy	-0.52	-0.60
	(-1.69)*	(-2.32)**
1999 dummy	0.63	0.16
	(2.08)**	(0.61)
2000 dummy	0.46	0.12
	(1.61)	(0.50)
2001 dummy	0.16	0.02
	(0.57)	(0.094)
2002 dummy	-3.21	-2.53
	(-4.59)***	(-4.31)***
PR*2002	0.49	0.42
	(3.57)***	(3.60)***
D(unemployed)		-33.15
		(-92.9)***
Disposable Income		
Constant	34.96	37.23
	(153)***	(192)***
Observations	26715	26715
Number of new_hhnum	5887	5887

All regressions include individual household fixed effects
Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 8: The average response to concern for pension reform

		Age of Head of Household									
a 1 standard deviation increase in concern about pension reform		25	35	35	40	45	50	55	60	65	70
excludes households in which the head is unemployed or retired											
Mean head of household hours per week		39.5	40.6	40.7	41.0	42.1	41.7	40.8	38.0	35.2	-
90% Confidence Interval, upper		0.1	0.3	0.5	0.7	1.1	1.5	2.2	3.0	3.5	-
Impact on household hours worked per week (hours per week)		-0.6	-0.3	0.0	0.4	0.7	1.1	1.7	2.2	2.6	-
90% Confidence Interval, lower		-1.3	-0.9	-0.5	0.0	0.3	0.7	1.1	1.5	1.7	-
excludes households in which the head is unemployed or retired											
Mean head of household hours per week	Characteristic										
	Manufacturing	-0.2	0.1	0.4	0.8	1.0	1.3	1.9	2.6	2.0	-
	Services	-1.1	-0.9	-0.6	-0.1	0.3	0.7	1.3	1.9	2.4	-
a 1 std. dev increase in concern	Home owner	-0.7	-0.4	0.0	0.3	0.7	1.1	1.6	2.1	2.7	-
	Private pension	-0.3	-0.1	0.2	0.5	0.7	1.1	1.7	2.0	2.6	-
	Self-employed	0.8	1.1	1.3	1.4	1.5	2.3	2.7	2.9	1.9	-
includes households in which the head is unemployed or retired											
Mean total hours in 2nd job per year (total household)		37	44	27	37	47	56	39	41	43	27
90% Confidence Interval, upper		8	12	21	32	51	83	122	273	651	840
Impact on number of workers (full-time equivalents) in household		2	5	9	15	24	41	62	141	329	423
90% Confidence Interval, lower		-4	-2	-3	-3	-3	-1	2	8	7	7

Table 9: The average response to concern for pension reform

	Age of Head of Household									
a 1 standard deviation increase in concern about pension reform	25	35	35	40	45	50	55	60	65	70
includes households in which the head is unemployed or retired										
Mean hours per week by others in household (excl. head of household)	4.5	6.3	6.6	6.0	4.9	5.5	5.9	7.7	6.2	3.7
90% Confidence Interval, upper	-0.8	-0.6	-0.2	0.2	0.8	1.6	3.1	9.1	25.0	29.5
Impact on hours worked per week by others in household	-1.3	-1.0	-0.6	-0.1	0.5	1.2	2.6	8.1	22.4	26.5
90% Confidence Interval, lower	-1.8	-1.5	-1.0	-0.4	0.1	0.9	2.2	7.1	19.8	23.5
includes households in which the head is unemployed or retired										
Mean number of workers (full-time equivalents) in household	0.85	1.08	1.13	1.17	1.31	1.33	1.26	0.78	0.28	0.10
90% Confidence Interval, upper	-0.02	0.00	0.01	0.02	0.03	0.05	0.08	0.12	0.09	0.07
Impact on number of workers (full-time equivalents) in household	-0.03	-0.01	0.00	0.01	0.02	0.04	0.07	0.11	0.08	0.06
90% Confidence Interval, lower	-0.04	-0.03	-0.01	0.00	0.02	0.03	0.05	0.09	0.07	0.05
excludes the direct effect from retired heads of household										
Mean number of retirees in household	0.00	0.00	0.01	0.01	0.03	0.05	0.06	0.12	0.15	0.21
90% Confidence Interval, upper	0.05	0.03	0.03	0.02	0.01	0.00	-0.02	-0.05	-0.10	-0.06
	0.04	0.03	0.02	0.01	0.00	-0.01	-0.02	-0.06	-0.12	-0.07
90% Confidence Interval, lower	0.03	0.02	0.01	0.01	0.00	-0.02	-0.03	-0.08	-0.15	-0.08

Table 10: Probit regression on future retirement

	(1)	(2)	(3)	(4)
	D(retire in 2003)	D(retire in 2003)	D(retire in 2004)	D(retire in 2004)
Sample	Whole Sample	Only those aged above 60	Whole Sample	Only those aged above 60
PR	-0.53	-0.42	-0.43	-0.36
	(-31.8)***	(-17.2)***	(-28.3)***	(-14.0)***
age02	0.08	0.03	0.09	0.03
	(24.1)***	(4.54)***	(27.5)***	(3.52)***
Constant	-3.39	-0.29	-3.93	0.05
	(-16.4)***	(-0.63)	(-19.4)***	(0.098)
Observations	9580	2613	9132	2455

z statistics in parentheses

* significant at 10%; ** significant at 5%; *** significant at 1%

Table 11. Panel regressions (Saving)

	(1)	(2)	(3)	(4)
	Corrected saving rate	Corrected saving rate	Measured saving rate	Measured saving rate
Sample	Incl retirees	Incl retirees	Incl retirees	Incl retirees
1998 dummy	-3.98	-4.00	-1.05	-1.04
	(-6.83)***	(-6.87)***	(-2.47)**	(-2.45)**
1999 dummy	-5.64	-5.60	-1.12	-1.14
	(-9.73)***	(-9.67)***	(-2.66)***	(-2.70)***
2000 dummy	-8.32	-8.28	-1.24	-1.26
	(-15.2)***	(-15.2)***	(-3.10)***	(-3.16)***
2001 dummy	-10.85	-10.82	-1.42	-1.44
	(-19.8)***	(-19.8)***	(-3.57)***	(-3.61)***
2002 dummy	-15.44	-15.19	-3.25	-3.37
	(-17.8)***	(-17.5)***	(-5.14)***	(-5.33)***
PR*2002	1.88	1.83	0.30	0.32
	(12.0)***	(11.7)***	(2.62)***	(2.84)***
D(unemployed)		5.95		-2.89
		(5.95)***		(-3.96)***
Disposable Income	0.00	0.00	0.00	0.00
	(11.7)***	(11.7)***	(6.02)***	(5.99)***
Constant	14.10	13.80	18.55	18.69
	(21.3)***	(20.8)***	(38.4)***	(38.6)***
Observations	27103	27103	27103	27103
Number of new_hhnum	8168	8168	8168	8168

All regressions include individual household fixed effects
Absolute value of t statistics in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 12: The average response to concern for pension reform

	Age of Head of Household									
includes households in which the head is unemployed or retired	25	30	35	40	45	50	55	60	65	70
Mean reported household saving rate	11.7	13.9	12.7	12.0	11.9	12.8	13.3	14.9	15.9	15.3
90% Confidence Interval, upper	0.8	0.6	0.4	0.4	0.3	0.3	0.3	0.2	0.1	0.1
Impact on corrected household saving rates (pp of consumption):	0.1	0.1	0.1	0.0	0.0	-0.1	-0.2	-0.5	-0.3	-0.3
90% Confidence Interval, lower	-0.5	-0.3	-0.3	-0.3	-0.3	-0.5	-0.6	-1.1	-0.8	-0.8
includes households in which the head is unemployed or retired										
Mean corrected household saving rate	36.1	43.3	40.1	38.3	36.1	36.1	31.5	7.8	-58.4	-79.0
90% Confidence Interval, upper	2.8	1.5	0.6	0.5	0.5	1.5	2.8	6.2	5.5	6.0
Impact on corrected household saving rates (pp of consumption):	1.4	0.4	-0.3	-0.2	-0.2	0.7	1.8	4.8	4.4	5.1
90% Confidence Interval, lower	-0.1	-0.7	-1.1	-0.9	-1.0	-0.1	0.8	3.4	3.3	4.2

Figure 1 (a): Age distribution of the constructed pension reform variable
Source: Authors calculations from the 2002 GSOEP survey

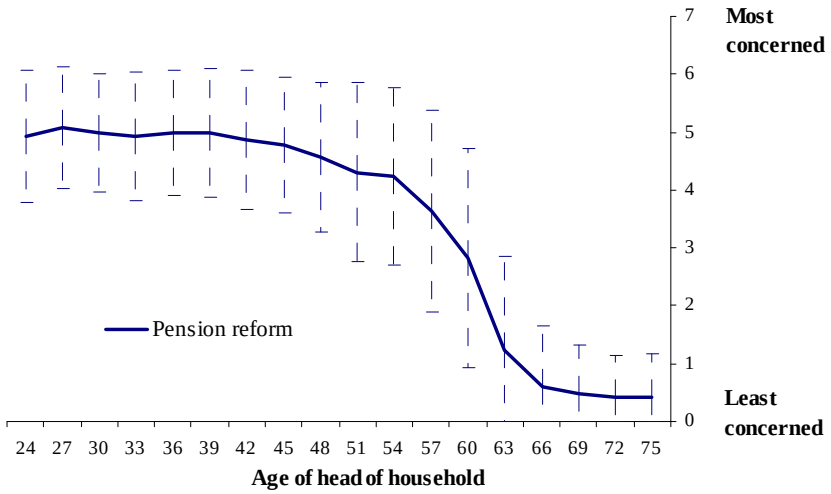

Figure 1 (b): Age distribution of hours worrked per week
Source: Authors calculations from the 2002 GSOEP survey

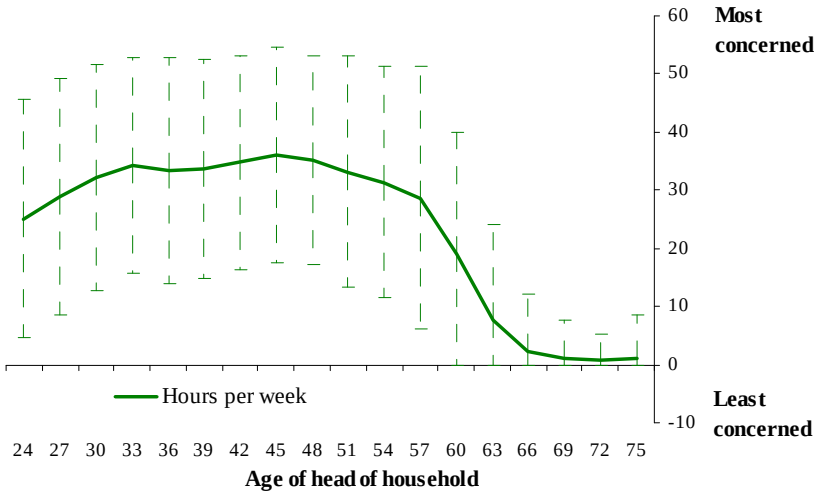

Figure 2: Age-profile of household saving rates in the US, Germany and Japan

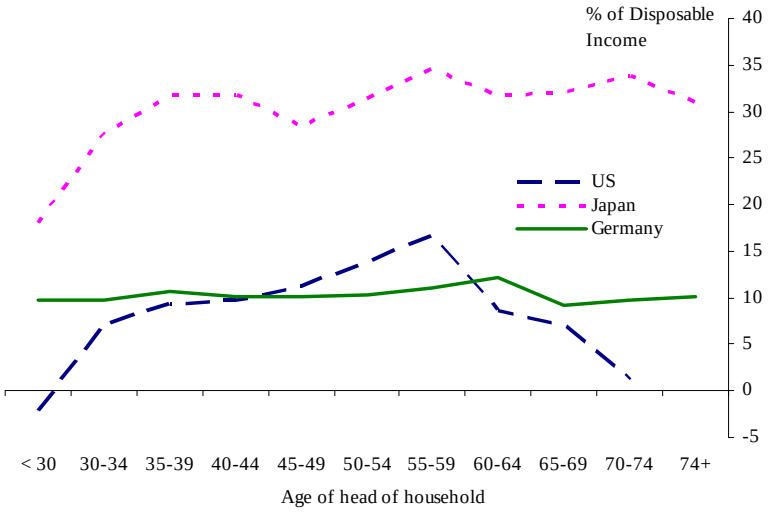

Figure 3: Age-profile of household saving, reported and corrected: Germany, 2002

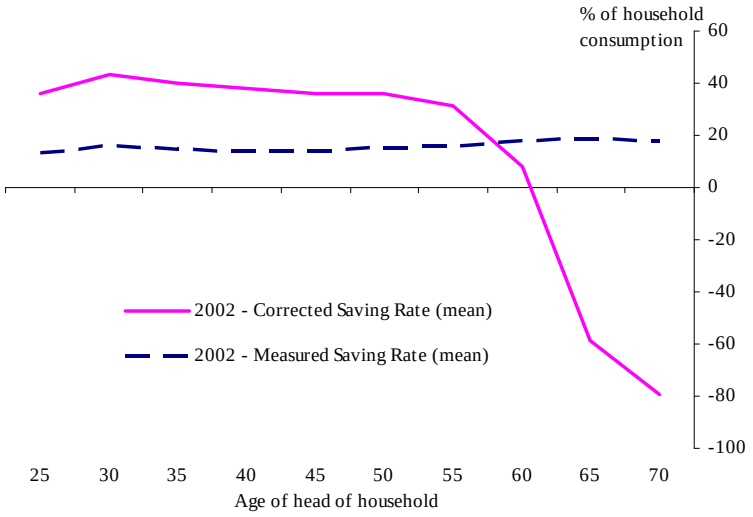

Table A1

Variable	Code	Description
Household Labor Earnings	labour_inc	Labor earnings include wages and salary from all employment including training, self-employ-ment income, and bonuses, overtime, and profit-sharing.
Household Asset Income	asset_inc	Asset flows include income from interest, dividends, and rent.
Household Private Transfers	priv_trans	Income received .from persons outside of the interviewed household by all individuals in the household 16 years of age and older
Household Private Retirement Income	priv_pen	Combined retirement income from private sources of all individuals in the household 16 years of age and older. Private pension income is the sum of supplementary civil servant pension income, company pensions, private pensions and "other" pension income.
Household Public Transfers	pub_trans	Public Transfers are the sum of individual public transfers – student grants, maternity benefits, unemployment benefits, unemployment assistance, subsistence allowance and transition pay – over all individuals in the household, plus household benefits.
Household social security retirement Income	SS_pen	Social security pensions are the sum of old-age, disability, and widowhood social security pensions. This includes German Pension Insurance (GRV), Miner's social Insurance (Knappschaft), Civil Servant Pension (Beamtenpension), War Victim Benefits (Kriegsopferversorgung), Farmer's Benefits and accident pension (GUV).
Household Federal taxes	Fed_tax	Federal income taxes of all individuals in the household 16 years of age and older.
Household Social Security Taxes	SS_tax	Social security taxes of all individuals in the household 16 years of age and older.
Household consumption	con	Includes all forms of consumption by the household, but does not include any forms of debt repayment or asset accumulation (e.g. private pension contributions).

Table A2: Cross-section regression results

	Corrected saving rates	Hours
age	-1.367	-0.335
	(-1.52)	(-4.63)***
age^2	0.015	
	(1.53)	
PR	-9.543**	-2.302***
	(-2.43)	(-3.32)
PR*age	0.480***	0.067***
	(2.62)	(4.43)
PR*(age^2)	-0.006***	
	(-2.93)	
Disposable Income	-0.036	
	(-1.17)	
PR*income	0.014**	
	(2.28)	
Wealth	0.026***	0.003
	(4.91)	(0.93)
PR*wealth	-0.004***	-0.001
	(-4.20)	(-0.89)
D(German citizen)	-0.984	-1.553*
	(-0.77)	(-1.82)
D(private health policy)	-10.344***	2.157***
	(-12.8)	(4.09)
Value (private health policy)	0.000	0.000***
	(0.41)	(6.82)
Save using fixed interest securities	1.231***	0.067
	(5.05)	(0.41)
Save using a building society	-0.386*	0.407***
	(-1.92)	(3.03)
Years of education	0.622***	0.061
	(7.26)	(1.06)
Worries about job security	1.032***	-0.384
	(2.58)	(-1.44)
worker ratio in household	0.256***	0.101***
	(25.9)	(15.3)
constant	46.633**	46.841***
	(2.38)	(12.8)
Observations	3724	3724
R^2	0.8	0.9

z statistics in parentheses; *** p<0.01, ** p<0.05, * p<0.1