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**FINANCIAL LITERACY AND RETIREMENT PLANNING  
IN SWEDEN**

**Johan Almenberg  
Jenny Säve-Söderbergh**

# Financial Literacy and Retirement Planning in Sweden<sup>1</sup>

Johan Almenberg<sup>2</sup> and Jenny Säve-Söderbergh<sup>3</sup>

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## Abstract

We examine the relationship between financial literacy and retirement planning in a representative sample of Swedish adults. We find significant differences in financial literacy between planners and non-planners. Financial literacy levels are also lower among older people, women and those with low education or earnings. When we control for demographic variables we do not find an association between a narrow measure of financial literacy and planning, but with a broader measure the association is positive and statistically significant. We relate these findings to features of the Swedish pension system.

*Keywords: financial literacy, pensions, planning*

*JEL Classification: D10, H55, H75, I22*

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<sup>2</sup> Ministry of Finance, Sweden. The views expressed here are the views of the authors in their capacity as researchers and do not represent the views of the Swedish Ministry of Finance.

<sup>3</sup> The Swedish Institute for Social Research, Stockholm University.

## **Introduction**

Many countries need to reform their pensions systems in order to meet the demands of an ageing society. Sweden is considered a front runner in reforming its pension system and much can be learnt from the Swedish experience (Diamond, 2009; Sundén, 2009). The reformed pension system is fiscally sustainable, with built-in balancing mechanisms, and relatively user-friendly with an emphasis on providing information to the public.

Like in other countries, Sweden's move toward a funded defined contribution system has greatly increased the importance of individual financial literacy, as financial risk is shifted from the state and the employer to workers, and as individuals are offered an unprecedented amount of influence on how their pensions are managed.

A growing body of research has documented that many households are not well equipped to make complex financial decisions (Campbell, 2006), and the Swedish pension system is reasonably well-designed in the light of this. First, the downside is capped: an individual's pension cannot fall below a floor regardless of investment decisions. Second, only a minor part of public pension contributions are directed toward mandatory funded accounts that allow for individual investment choices. For occupational pension plans there is more choice, but these only make up a large part of pension contributions if the individual has high income. If financial literacy is positively correlated with income, individuals with more discretionary influence on the management of their pensions can also be expected to be more financially literate. Third, the pension system provides a great deal of information to everyone that is eligible for a public pension, both about the functioning of financial markets and about the forecast value of an individual's future pension benefits. Annual forecasts are provided automatically by mail and expressed in very simple terms. Updated forecasts are available on-line all year round using a password that is provided in the mail-out.

Thus, while Sweden like many other countries has moved toward more individual involvement in managing pensions, the pension reform is likely to have raised financial literacy levels in the population thanks to the large amount of financial information that has been disseminated, and to have lowered the barriers to planning for retirement in terms of the demands on financial literacy.

We examine the relationship between financial literacy and retirement planning using Swedish survey data from 2010. The data was collected through a telephone survey of a representative sample of about 1,300 Swedish adults that was commissioned by the Swedish Financial Supervisory Authority (Finansinspektionen). We use three standard questions for measuring financial literacy, two of which conform exactly with the questions selected for the FLat World project and one which is similar but slightly more difficult. The aim of the FLat World project is to use a common measure to compare both financial literacy levels and the relationship between financial literacy and pension planning across countries. Previous research has shown that also narrow measures of financial literacy can be good predictors of financial decision making, including planning for retirement (e.g., Lusardi and Mitchell 2007a, 2007b).

Our main finding is that there are significant differences in financial literacy between planners and non-planners, and between demographic groups. In a regression framework where we control for demographic variables we do not find an association between a narrow measure of financial literacy and planning. However, with a broader measure of financial literacy the association is positive and statistically significant. We discuss our findings in relation to features of the Swedish pension system, in particular with regard to information provision.

### **Background: pension reform, financial literacy and planning**

The current pension system was introduced in 1999 following a broad parliamentary agreement on pension reform. In essence, a partially funded defined-contribution (DC) scheme replaced a defined-benefit pay-as-you go system. The link between individual contributions and benefits was strengthened. Fiscal sustainability is assured by automatic indexation of current and future benefits in a way that reflects economic and demographic developments.

The reformed system contains three pillars. The first pillar, the public pension, is primarily a notional DC scheme largely based on lifetime pensionable income. Annual contributions amount to 18.5 per cent of pensionable income. A fixed proportion of this, 2.5 percentage points, is invested in mandatory individual accounts in a funded DC scheme (the *premium pension*, or “PPM”). Returns to savings in the funded accounts are

not taxed as capital income, but pension benefits are subject to income tax when withdrawn.

The second pillar, the occupational pension, is a funded DC scheme. Such schemes are in principle voluntary, but through collective agreements a small number of occupational pension schemes cover almost 90 percent of employees (Lindquist-Sjögren and Wadensjö, 2007). Contributions are typically 2-5 percent of wages. As for the public pension, income tax is deferred until withdrawal.

The third pillar, private supplementary pension plans, also enjoys deferred income tax but only for contributions up to a low limit of less than 2 000 USD per year. Private pension plans range from traditional life insurance with moderate risk to pure investment portfolios of mutual funds or other securities with little or no insurance component. Private pensions can be withdrawn from the age of 55. In a recent year (2004) about 25-30 percent of all workers contributed on average about 1000 USD to private pension plans (Lindquist-Sjögren and Wadensjö, 2007).

Since income taxes on labor are progressive higher earners can lower their lifetime tax burden by deferring income until retirement. Moreover, returns to savings in both occupational and private pension plans are taxed at half of the statutory tax rate for capital income. These factors may in part explain the popularity of occupational and private pension schemes in Sweden, which amount to about half of the financial assets of Swedish households. Approximately three quarters of this is occupational pension schemes and one quarter private retirement accounts.

The pension reform introduced a great deal of individual choice regarding when to withdraw benefits as well as how to allocate pension savings. As a result, Swedish pensions increasingly rely on the individuals' capability and interest in making adequate financial decisions with regard to saving for retirement.

Public pensions can be withdrawn any time after the age of 61, as opposed to automatic withdrawal upon turning 65, and benefits increase the longer the person waits before withdrawing funds.

For the mandatory individual accounts individuals decide on the allocation across up to five funds from a large selection. In other words, almost the entire Swedish workforce has been given the opportunity to affect the investment direction for their

public pensions – a development that has been referred to as the “Big Bang” of the Swedish financial sector (Palme et al, 2007). The default option is a state-managed life-cycle fund where equity exposure automatically declines with age.

The government agency managing the life-cycle fund also offers three funds with different equity exposure but that do not change with age. The bond/equity proportions and the fund names are, respectively, 65/35 (“cautious”), 50/50 (“balanced”) and 25/75 (“aggressive”), thus offering a salient reminder to consumers about the relative risk of equities compared to bonds.

A key feature of the Swedish pension reform is that a great deal of financial information has been widely distributed to everybody eligible for a pension, independent of income or expressed interest. For example, prior to introducing the mandatory individual accounts the responsible government agency distributed a large amount of financial information to all eligible investors, including a catalogue with facts about the funds as well as an explanation of how the choice of risk level might affect the future value of pensions. A risk measure based on the 3-year average standard deviation for the three preceding year was assigned to each fund and displayed next to the fund description. Significantly, the degree of risk for a given investment option was explicitly measured, illustrated with color, and comprehensively explained. In addition, as occupational pension schemes have increasingly opened up for individual investment choices, there has been further financial information distributed among a large share of the population.

In sum, this widespread dissemination of financial information is likely to have raised the levels of financial literacy in the population. Even inexperienced investors have had the opportunity to learn and to make reasonably informed choices. The introduction of the mandatory individual accounts in the public pension system involved almost the entire working population and was exogenous to the individual investor, and has hence attracted interest among researchers.

We can anticipate some differences in respondents’ financial literacy on the basis of lessons drawn from the introduction of these accounts. First, equity exposure is on average high in the individual mandatory accounts, around 70 percent. The introduction of the accounts in the year 2000 greatly increased participation in stock mutual funds,

from 50 percent in 1999 to 85 percent by 2001 (Engström and Westerberg, 2004). In addition, direct stock market participation is high in Sweden compared to many other countries (Christelis et al, 2010). Hence, a fair amount of households can be expected to have some knowledge of both stock and or mutual funds concepts.

Second, active choice was initially very common but then declined. When introduced in 2000, about two thirds of investors made active choices, whereas the percentage of active investors in later eligible cohorts has only been around 10 percent or less (Sundén, 2004). To the extent that financial knowledge increases through financial experience, we should expect financial knowledge to be lower among younger respondents if younger cohorts make less active choices in their pension plans.

Third, investors expected to have previous financial knowledge as measured by education, income or wealth, or who had own equities as part of their non-pension portfolios, or who had tax-deferred pension savings, where also more likely to make actively participate and to have chosen more exposure to equities (Säve-Söderbergh, 2010). Thus we should expect financial knowledge to differ along the lines of these characteristics among respondents in our survey.

In contrast to previous findings on 401-k plans, women and men chose a similarly high degree of stock market shares in their portfolios (Säve-Söderbergh, 2010). Moreover, active choice has been more common among women than among men (Engström and Westerberg, 2003). Thus we may expect gender differences in financial knowledge to be less pronounced than in many other countries.

However, there is also ample evidence of investor mistakes in the individual account setting, such as, for example, not rebalancing, (Sundén, 2004), exhibiting home-bias (Palme et al 2007), using heuristics such as a  $1/n$ -rule to choose investments (Cronqvist and Thaler 2004, Hedesström et al, 2004) and inattention to past performance (Dahlquist and Martinez, 2010). Many individuals clearly display limited financial capability in choosing their investments.

Another important informational feature of the pension system is that planning for retirement has been greatly simplified through the provision of individual-specific forecasts about expected future pension benefits that are provided regularly to everyone who has accumulated benefits in the system.

A letter, the so call *Orange Envelope*, is distributed by the government pension agency once a year and contains individual information about (i) contributions during the preceding calendar year, (ii) the rate of return to account balances during the year<sup>4</sup>, (iii) account balances at the end of the year, and (iv) an individual-specific projection translating the account balances into an expected monthly pension benefit calculated at three different retirement ages (61, 65 and 70). These projections are calculated for two assumptions about real wage growth (0 and 2 percent) that are shown in adjacent columns. The information is parsimonious and the projections are contained on a single page. In addition, the Orange Envelope contains a simple description of the pension system emphasizing the link between lifetime earnings and benefits.

The pension agency website also provides an on-line calculator that individuals can use at any time of the year in order to estimate their expected benefits given their account balances and assumptions about future earnings and retirement age. Like the Orange Envelope, the calculator uses the individual's own data, hence offering a tailor-made forecast about future pension benefits. A password for the calculator is enclosed in the Orange Envelope. The calculator offers a user-friendly way of making a wider range of projections than what is available in the Orange Envelope. The on-line calculator also draws on information about the individual's occupational pension plan, hence giving a more complete picture than the Orange Envelope which only covers the public pension.

We should expect individuals to be more likely to try to plan actively for their retirement as a result of these features of the pension system. Most importantly, given that this information is provided to everyone and expressed in simple terms, financial literacy may become a less important determinant of who plans for retirement. On the other hand, not everybody bothers to open the Orange Envelope, and even if they do this is no guarantee that they will absorb the information. Even though most recipients claim to read the information in the Orange Envelope, fewer than half report having a good understanding of the pension system and many report that they lack sufficient knowledge to manage their individual accounts (Sundén, 2009).

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<sup>4</sup> The rate of return for the notional account reflects indexation, primarily the rate of wage growth in the economy. The rate of return for the funded account reflects the individual's investment choices and is shown in total as well as separately for each individual fund. Fund fees are stated separately.



## Data

In order to get a picture of financial literacy in the Swedish population, data was collected through a telephone survey of approximately 1,300 Swedish adults aged 18-79. The survey was commissioned by the Swedish Financial Supervisory Authority (Finansinspektionen; hereafter FI) and executed by the private contractor Svenskt Kvalitetsindex in May-June 2010.

An independent random sample that is representative of the Swedish population between aged 18-79 was generated using the data from *Statens personadressregister* (SPAR), a database that contains all individuals registered as being resident in Sweden at any given time, irrespective of their citizenship. Phone numbers for the individuals in the sample were collected from the PAR-database. The phone numbers in PAR are collected from all the major phone providers in Sweden, and includes both fixed numbers and registered cell phone numbers. In order to minimize non-response, the individuals in the sample were called up to 8 times at different times of day and on different days until contact was made. The participation rate was 45 percent. There were no monetary incentives for participation.

The survey was targeted at individuals, rather than households, and participation was not conditional on being the main decision maker about the household's finances. However, respondents were asked if they were the main financial decision maker in the household. A binary variable representing the yes/no response to this question allows us to control for this when analyzing the data.

The data is cross-sectional. The respondents had not received the questions before. The sample is evenly divided between men and women, 49 and 51 percent respectively and the average age is 44 years. Education was measured as belonging to one of eight categories, from primary school and increasing to advanced degrees, including Ph.D. The distribution of educational backgrounds is summarized in Appendix 2. Due to relatively small number of respondents holding a M.Phil or Ph.D., these are grouped together with holders of master's degrees as one category in our analysis. Individuals were asked to report their monthly pre-tax income in SEK (1 SEK = approx USD 0.15). The majority of the individuals in our sample are employed (57 percent). The second largest group are retired (16 percent) followed by unemployed (8 percent),

students (12 percent) and self-employed (6 percent). The category “employed” includes individuals in part-time employment. The category “unemployed” includes those on long term sick leave. About one third of the respondents were single (36 percent) and about two thirds reported being in a relationship, either living together (61 percent) or apart (3 percent). 8 percent of the respondents were born outside Sweden, mostly in other European countries.

## **Empirical Results I: Levels of Financial Literacy**

The questionnaire includes several questions measuring financial literacy, largely based on the financial literacy questions designed by Annamaria Lusardi and Olivia Mitchell for the HRS and the ALP (see Lusardi and Mitchell, 2006 and 2007b). Three of the questions are directly relevant for FLaT WORLD and are reproduced in English below. The Swedish wording used in our survey and the original HRS questions are reported in Table A1 in the Appendix.

*Understanding of Interest Rate (Numeracy):* “Suppose you have 200 SEK in a savings account. The interest is 10 per cent per year and is paid into the same account. How much will you have in the account after two years? Do not know, refuse to answer.”

*Understanding of Inflation:* “Suppose the interest on your bank account is 1 per cent and inflation is 2 per cent. If you keep your money in the account for a year, will you be able to buy more, as much, or less at the end of the year? Do not know, refuse to answer.”

*Understanding of Risk and Diversification:* “Do you think that the following statement is true or false? Buying stock in a single company is usually safer than buying shares in a mutual fund. True or false? Do not know, refuse to answer.”

The questions about inflation and risk and diversification were translated into Swedish with only minor modification of the content, but the first question, about compound interest, is more complicated than the original HRS wording. Because it places

larger demands on numeracy, it is unclear whether incorrect answers are due to not understanding compounding or not being able to perform the calculation.

Table 1a displays the answers to the interest rate question. Only slightly more than one third, 35 percent, provided a correct answer by providing the exact estimate. About half of the respondents, 49 percent, gave incorrect answers and 16 percent said they did not know the answer, suggesting that a majority of the respondents lack the ability to calculate compound interest. We cannot rule out, however, that some respondents understand interest compounding quite well but made a minor mistake in the calculation, thus providing an incorrect answer.

[INSERT TABLE 1a]

The answers to the inflation question are summarized in Table 1b. Around 60 percent of all respondents correctly answered that they would be able to buy less at the end of the year. Around 24 percent gave incorrect answers and 16 percent answered that they did not know. Thus, 40 percent of the respondents seem to lack basic understanding of inflation and its impact on purchasing power. Similar to Germany and many other countries, older generations have far more experience of high inflation. Sweden had inflation in the 5-15 percent range of most of the 1970s and 80s. Following a move to explicit inflation targeting and central bank independence in the 1990s, inflation declined and has hovered around 2 percent for most of the last decade.

[INSERT TABLE 1b]

The risk and diversification question aims at measuring advanced financial knowledge. Table 1c displays the answers to the third question. In all, the respondents show a good understanding of risk and diversification as 68 percent correctly stated that the statement was false. Only 13 percent incorrectly said the statement was correct and 18 percent answered that they did not know. As described above, we would expect Swedish respondents to have a fairly high degree of financial knowledge on the basis of the

experience of the individual accounts and broad stock market participation in general. This good performance is hence in line with our expectations.

[INSERT TABLE 1c]

[INSERT TABLE 1d]

The overall performance of respondents is summarized in Table 1d. Only about a fourth of the respondents correctly answered the first two questions on interest and inflation. Moreover, only 21 percent answered all three questions correctly. Yet, the poor performance could derive from the inability to provide an exact answer to the question on interest as about 46 percent of the sample answered question 2 and 3 correctly. We also evaluate overall performance from the number of incorrect answers and “do not knows” provided. About 15 percent gave no correct answer to any of the three questions. Moreover, more than a third of the respondents, 35 percent, answered at least 1 do not know, yet only 3 percent answered do not know to all questions.

Next, we analyze overall performance on the three financial literacy questions and how performance varies across demographic groups. Previous literature has found that financial literacy levels are lower among individuals with low income or low education, and among women (e.g. Lusardi and Mitchell, 2008). Table 2 reports the answers to the three questions and overall performance across different demographic characteristics.

[INSERT TABLE 2]

**Age.** Financial literacy follows a hump-shaped age pattern for overall performance as well as for each question separately, in line with previous research (see Agarwal et al, 2009). The differences in means between all age groups are statistically significant (two sided t-tests).<sup>5</sup> The best performance is found among respondents who are between 36

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<sup>5</sup> All p-values are below 0.001 apart for the differences in the means between being below 36 vs. 51-65 (p-value is 0.003), being below 35 vs. older than 65 (p-value is 0.100) and 36-50 vs. 51-65 (p-value is 0.012).

and 50 years of age. The worst performance, apart from for the understanding of inflation, is found among respondents who are older than 65.

Similarly, the proportion of respondents that reply that they do not know the answer to one of the three questions follow a U-shaped pattern for all questions apart from the inflation question. The do not know answers to the question on inflation typically fall with age suggesting that it is the younger group that displays a lower knowledge. As mentioned above, this pattern is expected as these cohorts have not experienced inflation and hence may be unfamiliar with the concept to the same extent as the older cohorts have.

**Gender.** Women perform significantly worse than men on each of the three financial literacy questions as well as in overall performance. This is consistent with previous research (see, for example, Lusardi, 2008). Only 14 percent of the women provided correct answers to all three questions, compared to 29 percent of the men. Moreover, almost half of the female respondents answered do not know to at least one question. This could also indicate that women are aware of their lack of financial knowledge. Two-sided t-tests also confirm that differences in the means between men and women in overall performance, as well as in having at least one “don’t know”, are significantly different from zero. One possible explanation is that the gender differences in financial literacy are due to women not making the economic decisions in the household. We discuss this in more detail in a separate section below.

**Education.** Financial literacy is highly correlated with education. Among those with lower secondary schooling only about 4 percent answer all three questions correctly, compared to 46 percent among those with the highest level of schooling. Similarly, over half of the respondents with less than high school education responded “do not know” to at least 1 question, compared to only 12 percent among those with post-graduate education. Two-sided t-tests confirm the pattern, with all differences between educational groups being statistically significant except high-school versus some college or vocational education. We find similar patterns for all three questions separately.

In the survey we also have information on what topics people major in college. Out of the 491 respondents with a college degree, 27 percent did engineering, 17 percent

economics, 18 percent social sciences, 19 percent arts and humanities and 15 percent medicine (3 percent answered do not know). We find large differences between college majors, with quantitative majors performing better. Almost half of the respondents with a major in economics or engineering got all three questions right compared to about one quarter among each of the other majors. The largest difference is found in the fraction of correct answers to the first and second question, where 68 percent and 82 percent of those with an economics major answered question 1 and 2 correctly, compared to 36 percent and 66 percent among other college majors. A noticeable result is that there is no large difference in answering question 3 correctly among the college majors (81, 75, 81, 74 and 67 percent, respectively, for the five groups), in line with our expectation that an understanding of risk and diversification is widespread in Sweden.

***Occupational status.*** Financial literacy also varies with employment status. The lowest financial literacy is found among those not working. This is true for all questions taken separately. We find the same pattern if we evaluate financial literacy from having at least 1 do not know answer. For the three questions taken separately we find a similar pattern. Yet it is noticeable that there are much smaller differences across employment status in the answers to question three on risk and diversification. This too may reflect the fact that an understanding of risk and diversification is widespread among the population, in part due to the pension reform.

**COUNTRY SPECIFIC PART: *How do Swedish women fare?*** We find a large gender difference in financial literacy. The lower financial literacy among women is noteworthy given that Swedish women have a high labor force participation rate and have been found to be as active, or even more active, than men in managing their pension savings.

Is there any particular question that differs by gender? Looking at the compounding interest question, a large gender difference is found in answering correctly, that is by providing an exact estimate; 44 percent of the men compared to 26 percent of the women answered with the exact estimate. There is also a significant gender difference in providing the do not know-answer where 23 percent of the women. Thus, the gender

difference in not answering does not arise from incorrect estimates but from women being more likely to say do not know.

Similarly for the inflation question, the gender difference appears to arise from more women than men answering that they do not know. Men and women were equally likely to be wrong, with approximately 24 percent, while 69 percent of men compared to 51 percent of women answered correctly.

We do not find as strong gender differences when we evaluate financial sophistication in terms of understanding the risk and diversification question. 73 percent of men compared to 65 percent of women correctly answered that a stock entails a higher risk compared to a mutual fund. The gender difference again arises from a larger share of women answering with do not know.

In all, we find a large gender difference in financial literacy. The lower financial literacy among women is noteworthy given that Swedish women have a high labor force participation rate, thus entailing that women take part of the public retirement programs and occupational pension plans to a similar extent as men, and that women have been found to be as active, or even more active, than men in managing their pension savings.

One possible interpretation is that the gender differences in financial literacy are due to women not making the economic decisions in the household. In Table 3 we provide a division of the sample between being single-handedly or jointly responsible for the economic-decision making.

[INSERT TABLE 3]

First, very few respondents state that either their partner or the respondent single-handedly is responsible for the economic-decision making. Therefore comparisons to these groups are not possible. If we instead compare answers from singles to those in relationships with joint decision making we find a similar pattern for men and women. The lowest financial literacy is found among those that are single. Men who are joint decision makers do best on overall performance, while single women do worst on overall performance. The same pattern is found if we evaluate the do not know answers.

## **Empirical results II: financial literacy and retirement planning**

In the survey respondents were asked the following question about financial planning for retirement:

*“I have tried to figure out much I need to save until I retire.”*

Respondents were asked to indicate a response on a scale from 1 to 10, where 1 represents “I don’t agree at all” and 10 represents “I completely agree”.

[INSERT FIGURE 1]

Figure 1 shows that the distribution of responses is heavily concentrated at the lower end. The median response is 2 and the average response is 3.4. Most of the respondents in the lowest group gave the response 1, i.e. “I don’t agree at all”.

From this index we categorize individuals into two groups, planners and non-planners. Respondents in the top quarter of responses (6 or higher) are classified as planners. With this categorization, 76.2 percent are non-planners in the narrow sense that they have not tried to figure out how much they need to save for retirement.

In Table 4 we display correlations between being a retirement planner and the level of financial literacy. Planners and non-planners do not differ in their ability to calculate compounded interest, but planners are more likely to understand the concept of inflation and interest. A two-sided t-test confirms that this difference is significantly different from zero at the 10 percent level. Planners are more likely get the risk and diversification question right compared to non-planners, although the difference is not statistically significant. A large share of non-planners answer that they do not know. Overall performance is better among planners than non-planners. The difference in the means of number of correct answers is statistically significant at the 5 percent level.

[INSERT TABLE 4]

We have shown that planners have somewhat higher financial literacy than non-planners. Next, we conduct a multivariate regression analysis with the planning variable as the



dependent variable (0-10). We control for age, gender, education, income group, marital status, household size, employment status, being a home-owner and living in the northern regions of Sweden.

In the first specification financial literacy is a dummy variable that equals one if a respondent correctly answered all three financial literacy questions (Table 5, column 1). In the second specification the financial literacy variable is the number of correct answers to the three financial literacy questions (Table 5, column 2).

Our main finding is that neither measure of financial literacy appears to be linked to planning. By contrast, we find a link between planning and age, with older individuals being far more inclined to plan. We do not find a statistically significant link between education and planning while there is a positive and significant relationship between having a higher income and planning.

[INSERT TABLE 5]

We also report three other empirical specifications. By adding three dummy variables for having correctly answered each of the three questions separately, reported in column 3, we find that two of the questions have opposite impact on planning, thus together yielding a zero impact on planning. Being correct on the question on risk and diversification is positively correlated with planning, whereas providing an exact estimate to the question on interest compounding is negatively correlated with planning. The interest question in our survey is considerably more difficult than the HRS original and arguably it measures numeracy rather than financial literacy, whereas the question measuring more advanced financial sophistication (the risk and diversification question) has a positive and statistically significant effect on planning.

In column 4 we elaborate with the number of do not know responses as a measure of financial literacy. We find a clear negative and statistically significant association between being less financially literate, measured as the number of don't know responses, and planning.

The final specification, reported in column 5, uses a wider measure of financial literacy. Our questionnaire contains four more questions measuring financial literacy, but

which were not part of the FLat World design. When we include the number of correct answers on the full set of financial literacy questions we find a strong positive relationship between this broader measure of financial literacy, suggesting that individuals with higher financial literacy are indeed more likely to plan for retirement also in Sweden, but that the narrow measure based on just three questions insufficient to measure the link. A possible reason for this is that the question that is normally used to measure financial sophistication, i.e., the question about risk diversification, may work less well in Sweden because the pension reform has exposed most of the population to stocks and hence broad groups in the population are knowledgeable about stocks. Consistent with this, the fraction of respondents getting this question right was very high compared to many other countries, thus giving us less variation in our financial literacy measure. In addition, our first financial literacy question differs from the original HRS wording, placing much more demands on numeracy. While related, numeracy and financial literacy are not the same thing (Hung et al, 2009).

## **Discussion**

We find significant differences in financial literacy levels among different demographic groups. In particular, women, older people, individuals with low incomes and individuals with low levels of education display lower average levels of financial literacy.

Next, we examine the relationship between financial literacy and planning for retirement and show that planners have higher levels of financial literacy than non-planners. Being a planner, however, is correlated with demographic variables, and once we control for these in a regression framework the relationship is somewhat different. We do not find an association between a narrow measure of financial literacy and planning. With a broader measure of financial literacy, however, the association is positive and statistically significant.

Our results suggest that the link between being financially literate and planning for retirement exists but is less strong in Sweden than in many other countries. This is interesting in the light of how the Swedish pension system has been reformed in the last 15 years. A key feature is the emphasis placed on providing information to the public, both at the time of the reform and continuously. A great deal of information has been provided about the functioning of financial markets, in particular the relative risks of

equities versus bonds and the appropriateness of having a high exposure to equities if not close to retirement. This can be expected to have raised awareness of basic financial concepts. In addition, individually tailored information about accrued (notional and funded) benefits, as well as forecasts about the expected future value of pension benefits, are provided to all participants in the public pension system on an annual basis through the so called Orange Envelope. The information is parsimonious and phrased in non-technical language. Up-to-date forecasts are easily obtained at any time of the year through a user-friendly on-line calculator that also draws on information about the individual's occupational pension scheme. These methods of providing information about the expected future value of pension benefits have lowered the barriers for planning for retirement.

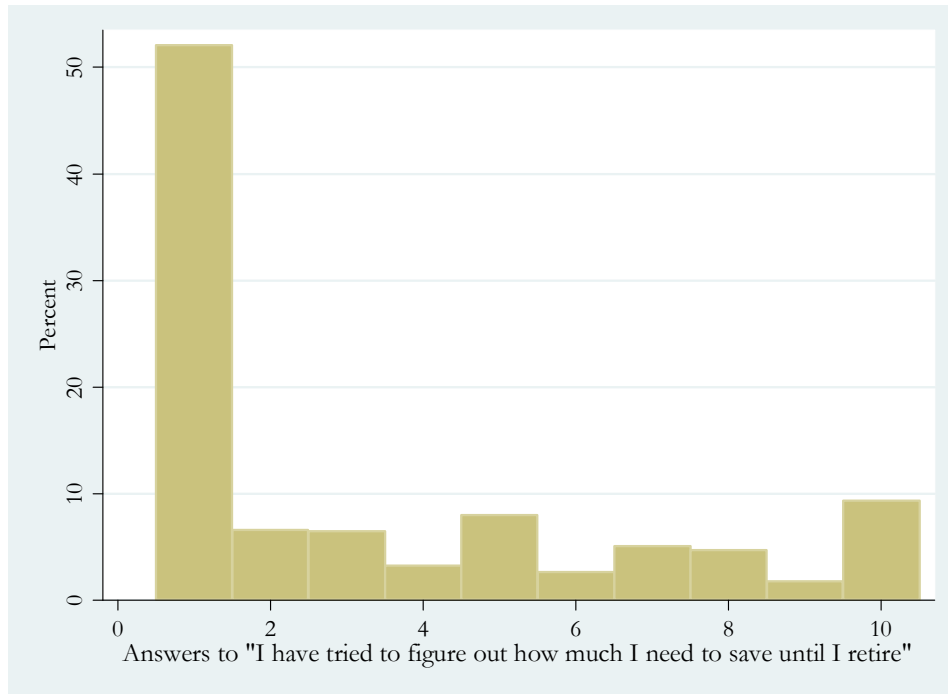
Thus, the pension reform has had two important effects: first, it has raised financial literacy across broad groups in the population, and second, it has made it easier for individuals with low levels of financial literacy to plan for retirement.

We conclude that even though there is link between financial literacy and planning for retirement in our representative sample of Swedish adults, this link is weaker than we would expect in countries that have pension systems without these features.

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## Tables and Figures



**Figure 1.** The Distribution of Responses to the Question about Planning for Retirement where 1 = “don’t agree at all” and 10 = “completely agree”.

Table 1a: Interest Question*		
	Whole sample	Age 25-65
Exactly 242 SKr	35.2	40.2
More/ less than 242 Skr	49.2	47.2
do not know	15.6	12.6
refuse to answer	n.a	n.a
N of obs.	1 302	837

*\*) Our wording was more difficult than the original HRS question. We asked: "Suppose you have 200 SEK in a savings account. The interest is 10 per cent per year and is paid into the same account. How much will you have in the account after two years?"*

Table 1b: Inflation Question		
	Whole sample	Age 25-65
Correct	59.5	65.8
Incorrect	24.0	20.2
do not know	16.5	14.0
refuse to answer	n.a	n.a
N of obs.	1 302	837

Table 1c: Risk Question		
	Whole sample	Age 25-65
correct "false"	68.4	74.4
incorrect "true"	13.1	10.3
do not know	18.4	15.3
refuse to answer	n.a	n.a
N. of obs	1 302	837

Table 1d: Answers across questions		
	Whole sample	Age 25-65
Interest & inflation	26.7	31.7
all correct	21.4	26.7
no correct	14.7	10.6
at least 1 DK	34.7	29.8
all DKs	3.2	2.3
N of obs	1 302	837

Table 2. Distribution of Financial Literacy across Demographics

	interest		inflation		risk		Overall	
	correc in percent	dk in percent	correc in percent	dk in percent	correc in percent	dk in percent	3 correct in percent	at l. 1 dk in percent
<i>Age</i>								
35 and	30.8	17.1	43.0	24.5	68.1	18.4	15.6	39.3
36 to 50	45.7	10.0	72.7	10.7	79.7	12.0	33.0	25.0
51 to 65	36.9	14.5	69.7	11.7	68.8	18.3	25.6	30.9
older than 65	26.1	21.6	64.8	12.1	53.3	27.6	12.1	42.2
<i>Gender</i>								
male	43.5	8.6	68.8	7.8	72.7	14.9	29.3	24.6
female	26.4	22.7	50.8	24.8	64.5	21.9	13.6	44.4
<i>Education</i>								
less than HS	13.6	28.0	48.5	21.2	50.0	32.6	3.8	51.5
high school	27.4	20.0	48.5	21.1	67.3	19.8	15.0	39.5
some college	31.9	13.5	60.5	14.1	64.3	19.5	17.8	34.6
college grad	45.5	10.8	68.8	13.9	74.4	14.2	30.1	29.3
post-grad	60.5	2.2	88.1	2.2	82.8	8.2	45.5	11.9
<i>Self-employed, non-employed, and workers</i>								
self-employed	50.7	11.0	71.2	12.3	74.0	11.0	32.8	20.6
non-employed	29.6	17.2	50.8	22.8	65.6	20.0	17.2	38.4
workers	37.2	13.6	61.1	15.0	74.2	15.3	24.1	32.0
<p>Source: Data from 1302 observations from telephone interviews with a representative sample of the Swedish population. The sample size is restricted to 1 277 observations with no missing values on age and education.</p>								

Table 3. Country specific: "How do you make larger financial decisions?"

	interest		inflation		risk		Overall	
	correct	dk	correct	dk	correct	dk	3 correct	at l. 1 dk
	in percent	in percent	in percent	in percent	in percent	in percent	in percent	in percent
<i>Women</i>								
Single (266 obs)	24.2	24.6	50.2	27.8	61.7	25.9	12.8	48.1
Joint (307 obs)	29.0	19.9	49.5	22.8	67.1	17.9	14.7	40.1
My Wife/Husband (13 obs)	0	61.5	38.5	38.5	30.8	38.5	0	77
Myself (30 obs)	26.7	23.3	60.0	20.0	76.7	16.7	16.7	36.7
<i>Men</i>								
Single (187 obs)	31.9	12.0	52.9	14.1	67.4	18.7	19.8	32.6
Joint (423 obs)	48.0	7.1	76.1	4.5	73.8	13.7	32.6	21.2
My Wife/Husband (3 obs)	100	0	67.0	33.0	100	0	66.7	33.0
Myself (27 obs)	59.3	0	74.1	3.7	92.6	3.7	48.1	7.4
<p>Source: Data from 1302 observations from telephone interviews with a representative sample of the Swedish population. The sample size is restricted to 1 277 observations with no missing values on age and education.</p>								



Table 4: Financial Literacy by Retirement Planning		
	planners	non-planners
<i>Interest rate question</i>		
Correct	36.3%	34.9%
do not know	15.3%	14.1%
<i>Inflation question</i>		
Correct	57.3%	65.9%
do not know	18.3%	11.6%
<i>Risk question</i>		
Correct	67.8%	73.2%
do not know	19.3%	12.7%
<i>Overall</i>		
interest and inflation correct	26.3%	31.0%
all correct	21.3%	24.7%
number of correct answers	1.61	1.74

Source: Data from 1302 observations from telephone interviews with a representative sample of the Swedish population. The sample size is restricted to 1 177 observations with no missing values on pension planning or on demographics.

Table 5: Dependent variable: retirement planning (1 (not agree)-10 (fully agree))					
	OLS	OLS	OLS	OLS	OLS
all three correct	-0.312 (0.264)				
number correct		-0.097 (0.131)			
Q1 (interest)*			-0.678*** (0.229)		-0.728*** (0.227)
Q2 (Inflation)			-0.098 (0.257)		
Q3 (Risk)			0.521** (0.258)		
Total nr of "Do not know"				-0.346** (0.164)	
Extended Financial Literacy					0.258*** (0.092)
age	-0.141 (0.086)	-0.141 (0.086)	-0.138 (0.087)	-0.150* (0.085)	-0.155** (0.085)
age squared	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002** (0.001)	0.002*** (0.001)
female	0.319 (0.234)	0.331 (0.236)	0.274 (0.238)	0.482** (0.233)	0.391* (0.237)
high school	0.327 (0.468)	0.328 (0.470)	0.393 (0.465)	0.256 (0.459)	0.301 (0.460)
some college	0.290 (0.508)	0.288 (0.510)	0.359 (0.505)	0.170 (0.501)	0.308 (0.498)
college	0.558 (0.492)	0.543 (0.496)	0.680 (0.494)	0.383 (0.480)	0.534 (0.492)
post graduate	0.510 (0.561)	0.493 (0.565)	0.637 (0.559)	0.261 (0.549)	0.426 (0.561)
income group2	0.264 (0.485)	0.256 (0.485)	0.182 (0.489)	0.158 (0.481)	0.216 (0.489)
income group3	0.860* (0.468)	0.868* (0.470)	0.818* (0.473)	0.703 (0.465)	0.818* (0.470)
income group4	1.619*** (0.508)	1.613*** (0.513)	1.575*** (0.518)	1.382*** (0.514)	1.527*** (0.514)
missing income	1.342** (0.552)	1.340** (0.556)	1.262** (0.555)	1.151** (0.553)	1.231** (0.550)
single	-0.756** (0.303)	-0.767** (0.304)	-0.808** (0.306)	-0.767** (0.302)	-0.768** (0.304)
Household size	-0.215* (0.130)	-0.221* (0.131)	-0.226* (0.130)	-0.216* (0.128)	-0.209 (0.129)
self-employed	-0.236 (0.419)	-0.233 (0.418)	-0.162 (0.416)	-0.218 (0.414)	-0.219 (0.413)
Unemployed	0.587 (0.460)	0.587 (0.462)	0.603 (0.464)	0.474 (0.461)	0.570 (0.460)
Retired	0.775 (0.955)	0.740 (0.962)	0.914 (0.971)	0.734 (0.959)	0.840 (0.951)
North	0.088 (0.326)	0.095 (0.327)	0.040 (0.326)	0.116 (0.322)	0.076 (0.325)
Homeowner	0.496* (0.278)	0.494* (0.279)	0.529* (0.280)	0.450 (0.277)	0.524* (0.277)
Constant	4.144** (0.763)	4.260** (1.758)	3.922*** (1.771)	4.639*** (1.751)	3.663*** (1.750)
Observations	813	813	813	813	813
R-squared	0.116	0.115	0.129	0.120	0.133

Note: The data constitutes of 1302 observations from telephone interviews with a representative sample of the Swedish population. The sample size is restricted to 813 observations to include only respondents between 25 and 65 years of age with no missing information on pension planning or on demographics. Robust standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## Appendix

**Table A1. Financial Literacy Questions**

Question	Wording in the 2010 consumer survey	Original HRS wording
q1. "Understanding of interest rate" (numeracy)	"Suppose you have 200 SEK in a savings account. The interest is 10 per cent per year and is paid into the same account. How much will you have in the account after two years?"	"Suppose you had \$100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow: more than \$102, exactly \$102, less than \$102?"
q2. "Understanding of inflation"	"Suppose the interest on your bank account is 1 per cent and inflation is 2 per cent. If you keep your money in the account for a year, will you be able to buy more, as much, or less at the end of the year?"	"Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?"
Q3. "Understanding of risk and diversification"	"Do you think that the following statement is true or false? Buying stock in a single company is usually safer than buying shares in a mutual fund. True or false?"	"Do you think that the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund."

## Appendix 2

Table A2. Mean values of background variables.

		Count	Percent
<i>Gender</i>	Female	641	49%
	Male	661	51%
	Total	1302	100%
<i>Age</i>	18-29	382	29%
	30-39	176	14%
	40-49	205	16%
	50-64	318	24%
	65-79	203	16%
	Missing	18	1%
	Total	1302	100%
<i>Education</i>	Primary school	133	10%
	Secondary school	482	37%
	Vocational training	188	14%
	College studies up to Bachelors degree	357	27%
	Masters degree	106	8%
	M.Phil or PhD	28	2%
	Missing	8	1%
	Total	1302	100%
<i>Income (pre tax)</i>	Below 15 000 SEK	325	25%
	15 000 – 19 999 SEK	184	14%
	20 000 – 24 999 SEK	200	15%
	25 000 – 29 999 SEK	164	13%
	30 000 – 34 999 SEK	120	9%
	35 000 – 39 999 SEK	50	4%
	40 000 SEK or higher	105	8%
	30 000 SEK or higher	275	21%
	Missing	154	12%
Total	1302	100%	
<i>Country of birth</i>	Sweden	1194	92%
	Nordic countries (excl. Sweden)	32	3%
	Europe (excl. Nordic countries)	43	3%
	Outside Europe in total	30	2%
	Total	1302	100%
<i>County</i>	Stockholm	236	18%
	Uppsala	48	4%
	Södermanland	49	4%
	Östergötland	62	5%
	Jönköping	58	4%
	Kronoberg	28	2%
	Kalmar	36	3%
	Gotland	10	1%
	Blekinge	23	2%
	Skåne	144	11%
	Halland	39	3%
	Västra Götaland	228	18%
	Värmland	37	3%
	Örebro	47	4%
	Västmanland	35	3%
	Dalarna	34	3%
	Gävleborg	46	4%
	Västernorrland	31	2%
	Jämtland	25	2%
	Västerbotten	48	4%
	Norrbotten	36	3%
	Ingen uppgift	2	0%
Total	1302	100%	
<i>Living arrangement</i>	Home owner	815	63%
	Rental arrangement/ lives with parents/ other	487	37%
	Total	1302	100%

In the table above the distribution of answers for some of the background variables in the study are presented. The distribution resembles the distribution of the Swedish population well with one exception. There is an over-representation of individuals in the youngest age

group in the study. As we control for age in our empirical framework this should not weaken the main findings of the study.

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