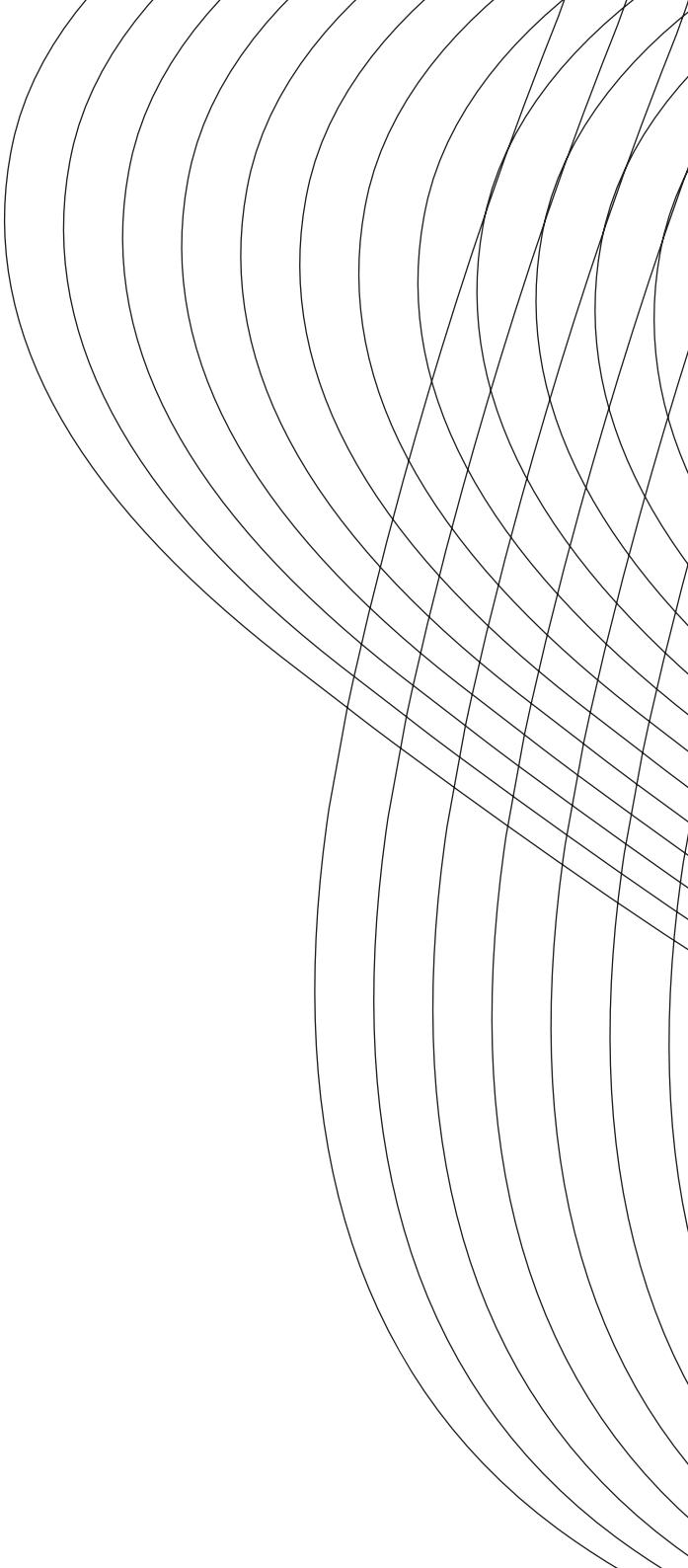




Netspar Panel Papers

Annamaria Lusardi and Maarten van Rooij

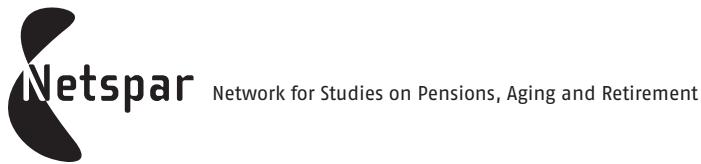
Financial Literacy: Evidence and Implications for Consumer Education



Annamaria Lusardi and Maarten van Rooij

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PREFACE

Netspar stimulates debate and fundamental research in the field of pensions, aging and retirement. The aging of the population is front-page news, as many baby boomers are now moving into retirement. More generally, people live longer and in better health while at the same time families choose to have fewer children. Although the aging of the population often gets negative attention, with bleak pictures painted of the doubling of the ratio of the number of people aged 65 and older to the number of the working population during the next decades, it must, at the same time, be a boon to society that so many people are living longer and healthier lives. Can the falling number of working young afford to pay the pensions for a growing number of pensioners? Do people have to work a longer working week and postpone retirement? Or should the pensions be cut or the premiums paid by the working population be raised to afford social security for a growing group of pensioners? Should people be encouraged to take more responsibility for their own pension? What is the changing role of employers associations and trade unions in the organization of pensions? Can and are people prepared to undertake investment for their own pension, or are they happy to leave this to the pension funds? Who takes responsibility for the pension funds? How can a transparent and level playing field for pension funds and insurance companies be ensured? How should an acceptable trade-off be struck between social goals such as solidarity between young and old, or rich and poor, and individual freedom? But most important of all: how can the benefits of living longer and healthier be harnessed for a happier and more prosperous society?

The Netspar Panel Papers aim to meet the demand for understanding the ever-expanding academic literature on the consequences of aging populations. They also aim to help give a better scientific underpinning of policy advice. They attempt to provide a survey of the latest and most relevant research, try to explain this in a non-technical manner and outline the implications for policy questions faced by Netspar's partners. Let there be no mistake. In many ways, formulating such a position paper

is a tougher task than writing an academic paper or an op-ed piece. The authors have benefitted from the comments of the Editorial Board on various drafts and also from the discussions during the presentation of their paper at a Netspar Panel Meeting.

I hope the result helps reaching Netspar's aim to stimulate social innovation in addressing the challenges and opportunities raised by aging in an efficient and equitable manner and in an international setting.

Henk Don
Chairman of the Netspar Editorial Board

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FINANCIAL LITERACY: EVIDENCE AND IMPLICATIONS FOR CONSUMER EDUCATION

1. Introduction

Over the past thirty years, individuals have had to become increasingly responsible for their own financial security following retirement. The shift from defined benefit (DB) to defined contribution (DC) plans in the United States and other countries has meant that those in the workforce today have to decide both how much they need to save for retirement and how to allocate pension wealth. Furthermore, in most countries financial instruments have become increasingly complex and individuals are presented with new and ever-more-sophisticated financial products. Access to credit is easier than ever before, opportunities to borrow are plentiful and the number of financial products to choose from is very large. But are individuals equipped with sufficient knowledge and skills to be able to navigate through this new financial system?

This report shows that in the United States, the Netherlands, and other countries as well, most individuals cannot perform simple economic calculations and lack knowledge of basic financial concepts such as the workings of interest compounding, the difference between nominal and real values, and the basics of risk diversification. Knowledge of more complex concepts, such as the difference between bonds and stocks, the workings of mutual funds, and basic asset pricing, is even scarcer. Financial illiteracy is widespread among the general population and particularly acute among specific demographic groups such as women, minorities, and those with low educational attainment.

Financial literacy affects financial decisions; ignorance about basic financial concepts can be linked to lack of retirement planning, lack of participation in the stock market, and poor borrowing behavior. Several initiatives have been undertaken to foster saving and financial security. The evidence is, in some cases, mixed, but several programs have proven

effective in fostering saving and increasing participation in pension plans. However, much more can be done to improve the effectiveness of these programs. Furthermore, initiatives should consider a wider spectrum of financial behavior; not only saving, asset allocation, and pension planning but also borrowing behavior and competence in making saving decisions. The majority of research has been done on U.S. data, but here, in the second part of this paper, we also discuss the Dutch experience. Contrary to the situation for U.S. workers, individuals in the Netherlands do not have to make decisions about how to allocate their pension wealth but, like Americans, are increasingly in charge of securing their financial well-being during their lifetime and after retirement.

2. Theoretical Framework

The theoretical framework used to model consumption/saving decisions posits that rational and foresighted consumers derive utility from consumption over their lifetime. In the simplest format, the consumer has a lifetime expected utility, which is the expected value of the sum of per-period utility discounted to the present from the consumer's current age to his/her oldest attainable age. Assets and consumption each period are determined endogenously by maximizing this utility function subject to an intertemporal budget constraint, which represents the present discounted value of future resources (which include earnings, Social Security, and pensions). This model posits that the consumer holds expectations regarding discount rates, investment returns, earnings, pension and Social Security benefits, and inflation. Further, it posits that the consumer uses that information to formulate and execute optimal consumption/saving plans. In other words, the consumer looks ahead and plans for the future, taking his/her lifetime resources into account.

Even in this basic formulation, the actual requirements for making saving decisions are demanding: Individuals have to collect information and make forecasts about many variables, from Social Security and pensions to interest rates and projected inflation, to name just a few. In addition, they must form expectations and collect information on the costs of education, children, medical care, and other expenses as well as their life expectancy.¹ Moreover, they have to perform calculations that require, at minimum, an understanding of compound interest and the time value of money. Decisions about how much to accumulate and how much to borrow to be able to smooth consumption over the life-cycle also require an understanding of the workings of interest rates.

Do individuals possess the level of financial knowledge and skills necessary to perform the calculations mentioned above? Does saving and borrowing behavior follow the predictions of these simple models? While financial literacy has often been overlooked in previous studies, it can be an important predictor of financial behavior. The next section provides an examination of the numeracy and the level of financial knowledge individuals possess.

¹ These are not easy tasks. A recent survey by the Dutch Institute of Family Finance Information (NIBUD) among parents of young children shows that many parents state they had no idea of the cost of children before their children were born.

3. Measuring Literacy

Several surveys exist that report information on financial knowledge in the United States and in other countries, as will be explained later.² However, these surveys rarely provide information on variables related to economic outcomes such as saving, borrowing, or retirement planning. In an effort to combine data on financial literacy with data on financial behavior, Lusardi and Mitchell (2006) have pioneered inserting questions measuring financial literacy into major U.S. surveys. They first designed a special module on financial literacy for the 2004 Health and Retirement Study (HRS); this module has now been added to the National Longitudinal Survey of Youth (NLSY). These and other questions measuring financial knowledge, first piloted in the Dutch DNB Household Survey (DHS), have also been added to the Rand American Life Panel (ALP) and to other surveys covering specific sub-groups of the population.³ The addition of these types of questions to existing surveys not only allows researchers to evaluate levels of financial knowledge but, most importantly, makes it possible to link financial literacy to a rich set of information about household financial behavior. We first describe the findings on financial literacy in several surveys and later in this paper we discuss the relationship between financial literacy and financial outcomes.

3.1 Basic Financial Literacy

Given the limited number of questions that can effectively be added to surveys, researchers have to assess financial literacy from only a handful of questions. So which questions should be asked to determine whether respondents possess financial literacy? Moreover, which data allow researchers to most accurately assess the effect of literacy on behavior? As will be reported below, it is possible to gauge financial knowledge from responses to a limited set of questions.

2 See Lusardi and Mitchell (2007b) for an overview of these surveys.

3 These questions have been added to a survey of participants in the state of Nebraska's employee retirement plan (Medill 2007). Moreover, they have been added to the 2006 Italian Household Survey on Income and Wealth (Monticone 2009), a 2007 pilot survey of participants in Mexico's privatized Social Security plan (Hastings 2007), and a survey on entrepreneurs in Sri Lanka (de Mel, McKenzie, and Woodruff 2008).

The three questions Lusardi and Mitchell (2006) devised for the HRS measure basic but fundamental concepts relating to financial literacy: the workings of interest rates, the effects of inflation, and the diversification of risk. The questions are as follows:

- 1) *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?*
- 2) *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?*
- 3) *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."*⁴

The first two questions (*compound* and *inflation*) evaluate whether respondents display knowledge of fundamental economic concepts and competence with basic financial numeracy. The third question (*stock risk*) evaluates respondents' knowledge of risk diversification, a crucial element of any informed investment decision.

The HRS sample covers respondents who are 50 or older, with the average age being 65. Results from this survey module reveal an alarmingly low level of financial literacy among older individuals in the United States. Only 50 percent of respondents in the sample were able to correctly answer the first two questions, and only one-third of respondents were able to answer all three questions correctly. The question that was most difficult for respondents to answer was the one about risk diversification: more than one-third of respondents reported they did not know the answer.⁵ Not only is the finding that most respondents do not grasp the concept of risk diversification an important one, but posing difficult questions allows researchers to differentiate among varying levels of financial sophistication, even when using a limited number of questions to measure financial literacy.

⁴ In addition to the list of possible answers shown here, respondents can choose that they do not know the answer to the question (DK), or they can refuse to answer (refusal).

⁵ See Lusardi and Mitchell (2006) for details.

Lusardi and Mitchell (2007a) have also examined numeracy and financial literacy among a younger segment of the population, the Early Baby Boomers, who were 51 to 56 years old in 2004. This segment of the population is particularly useful to study as respondents in this age group should be close to the peak of their wealth accumulation and should have dealt with many financial decisions already (mortgages, car loans, credit cards, pension contributions, etc.). The following questions were posed to these respondents in the 2004 HRS:

- 1) *If the chance of getting a disease is 10 percent, how many people out of 1,000 would be expected to get the disease?*
 - 2) *If 5 people all have the winning number in the lottery and the prize is 2 million dollars, how much will each of them get?*
- For respondents who answered either the first or the second question correctly, the following question was asked:
- 3) *Let's say you have 200 dollars in a savings account. The account earns 10 percent interest per year. How much would you have in the account at the end of two years?*

Table 1 summarizes how Early Boomers answered these questions. Again, numeracy is found to be low among respondents: only about half could divide \$2 million by 5. The responses to this question measuring ability and common knowledge is evidence of a major lack of basic numerical skills, which are, however, crucial for financial decision-making.

Moreover, the large majority did not have a good grasp of the power of interest compounding: only 18 percent correctly computed the compound interest question. Of those who got the interest question wrong, 43 percent undertook a simple interest calculation, thereby ignoring the interest accruing on both principal and interest. These are not comforting findings, especially considering that these respondents have already dealt with many financial decisions during their lifetimes.

These findings are confirmed in several other studies. Bernheim (1995, 1998) was one of the first to emphasize that most individuals lack basic financial knowledge and numeracy. The OECD report (2005), Lusardi and Mitchell (2007b), and Smith and Stewart (2008) examine the evidence on financial literacy in the United States and in other countries and report similar findings. Lusardi and Tufano (2009) report that the vast majority of respondents in a representative sample of U.S. households have limited *debt literacy*.

Table 1: Financial Literacy Among Early Baby Boomers in the United States

Question Type	Correct (%)	Incorrect (%)	Do Not Know (%)
Percentage Calculation	83.5	13.2	2.8
Lottery Division	55.9	34.4	8.7
Compound Interest*	17.8	78.5	3.2

Note: *Conditional on being asked the question. Percentages may not sum to 100 due to a few respondents who refused to answer the questions. Observations weighted using HRS household weights. The total number of observation is 1,984. Adapted from Lusardi and Mitchell (2007a).

3.2 Advanced Literacy

To competently make saving and investment decisions, individuals need knowledge beyond the basic financial concepts discussed above, including an understanding of the relationship between risk and return; how bonds, stocks, and mutual funds work; and asset pricing. To quantify how knowledgeable individuals are in this area, Lusardi devised several additional questions for the ALP. Most of these questions had earlier been added to the Dutch DNB Household Survey⁶ and are similar to questions used in other U.S. surveys.⁷ Because the question about risk diversification had been found to be difficult to answer, it was included in the set of questions on advanced financial literacy.

The exact wording of these questions is as follows:

1. Function of Stock Market

Which of the following statements describes the main function of the stock market? (i) The stock market helps to predict stock earnings; (ii) The stock market results in an increase in the price of stocks; (iii) The stock market brings people who want to buy stocks together with those who want to sell stocks; (iv) None of the above; (v) DK; (vi) Refuse.

2. Knowledge of Mutual Funds

Which of the following statements is correct? (i) Once one invests in a mutual fund, one cannot withdraw the money in the first year; (ii) Mutual funds can invest in several assets, for example invest in both

⁶ See van Rooij, Lusardi, and Alessie (2007) for a detailed explanation and review of these questions.

⁷ Specifically, questions were taken from the National Council of Economic Education Survey, the NASD Investor Knowledge Quiz, the 2004 Health and Retirement Study module on financial literacy and planning, the Survey of Financial Literacy in Washington State, and the 2001 Survey of Consumers.

stocks and bonds; (iii) Mutual funds pay a guaranteed rate of return which depends on their past performance; (iv) None of the above; (v) DK; (vi) Refuse.

3. Relationship Between Interest Rates and Bond Prices

If the interest rate falls, what should happen to bond prices? (i) Rise; (ii) Fall; (iii) Stay the same; (iv) None of the above; (v) DK; (vi) Refuse.

4. Risk Diversification: Company Stock or Mutual Fund?

True or false? Buying a company stock usually provides a safer return than a stock mutual fund. (i) True; (ii) False; (iii) DK; (iv) Refuse.

5. Riskier: Stocks or Bonds?

True or false? Stocks are normally riskier than bonds. (i) True; (ii) False; (iii) DK; (iv) Refuse.

6. Long Period Returns

Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return? (i) Savings accounts; (ii) Bonds; (iii) Stocks; (iv) DK; (vi) Refuse.

7. Highest Fluctuations

Normally, which asset displays the highest fluctuations over time? (i) Savings accounts; (ii) Bonds; (iii) Stocks; (iv) DK; (v) Refuse.

8. Risk Diversification: Spreading Money Among Different Assets

When an investor spreads his money among different assets, does the risk of losing money: (i) Increase; (ii) Decrease; (iii) Stay the same; (iv) DK; (v) Refuse.

Data collected from ALP respondents include the usual demographic and economic attributes (education, age, sex, income, wealth). The average age of the sample is almost 53, and most of the respondents are between the ages of 40 and 60 (Lusardi and Mitchell 2007c). The sample is relatively highly educated (over half have college or more years of education) with relatively high income (almost 30 percent of respondents earn \$100,000 or more per year). Given the composition of the sample and the fact that weights are not yet available to convert the results into a more representative picture of the U.S. population, our findings below will tend to overstate the level of financial literacy in the overall population.

Responses to the new, more sophisticated financial literacy questions are summarized in Table 2. Panel A shows that most respondents, over three-quarters, do get most of the answers right, so they have some

knowledge of how the stock market and risk diversification work. They are also more likely to be knowledgeable about fluctuations in assets than they are about patterns of asset returns. But a very difficult question for respondents is the one linking bond prices and interest rates—only about a third of the sample is able to answer this correctly, indicating striking ignorance of how assets are priced. There is also a wide range of incorrect versus DK responses, with the DKs ranging from 5 to 22 percent. Also of interest is the fact documented in Panel B, which indicates that only one-fifth of respondents could answer all of these sophisticated questions accurately. Accordingly, sophisticated financial literacy, like basic financial literacy, is not particularly widespread.

Several other surveys covering the U.S. population or specific sub-groups have also documented low levels of advanced financial knowledge across the age spectrum. For example, data from five surveys from the Jump\$tart Coalition for Personal Financial Literacy spanning from 1997 to 2006 show that only a small minority of high school students score above a passing grade in financial literacy. Low scores are not only pervasive among high school students but have changed little over time (Mandell 2008). These findings are confirmed by the National Council of Economic Education (NCEE), which periodically surveys high school students and working-age adults to measure financial and economic knowledge. The NCEE survey consists of a 24-item questionnaire on topics including "Economics and the Consumer," "Money, Interest Rates, and Inflation," and "Personal Finance." Adults got an average score of C on these questions, while the high school population fared even worse, with most earning an F. Hilgert, Hogarth, and Beverly (2003) examine data from the 2001 Survey of Consumers, in which some 1,000 respondents (ages 18–98) were given a 28-question true/false financial literacy quiz covering knowledge about credit, saving patterns, mortgages, and general financial management. Again, most respondents earned a failing score on the quiz, documenting widespread illiteracy among the population. Similar findings are reported in smaller samples or specific groups of the population (Agnew and Szykman 2005). Moore (2003) examines financial literacy in Washington State and reports low levels of financial knowledge in that state. A more recent survey specifically targeted to measuring knowledge related to borrowing decisions highlights poor levels of debt literacy (Lusardi and Tufano 2009).

Table 2. Descriptive Results for Advanced Financial Literacy Questions in the United States

A. Percent Correct, Incorrect, and Do not Know (DK)	Correct	Incorrect	DK
Q1. Main function of the stock market	75.5	17.7	6.8
Q2. Knowledge of mutual funds	72.4	11.3	16.3
Q3. Relation between interest rate and bond prices ^b	36.7	41.1	22.2
Q4. What is safer: company stock vs. stock mutual fund ^b	80.2	3.3	16.5
Q5. Which is riskier: stocks vs. bonds ^b	81.7	4.6	13.8
Q6. Highest return over long period: savings accounts, bonds, or stocks	70.1	20.6	9.4
Q7. Highest fluctuations: savings accounts, bonds, stocks	88.8	3.7	7.5
Q8. Risk diversification	81.2	12.9	5.9

B. Percent Correct: Summary of Responses to Advanced Literacy Questions (11 questions total)										
Number of Correct, Incorrect, and DK answers										
	None	One	Two	Three	Four	Five	Six	Seven	All 11	Mean
Correct	.7	2.7	3.6	6.2	8.9	13.3	17.7	25.6	21.4	5.9
Incorrect	35.6	33.0	18.4	8.1	3.5	1.5	0	0	0	1.2
DK	56.5	18.7	11.0	6.3	3.3	1.9	.6	1.2	.5	1.0

Evidence from outside the United States on financial literacy is no more comforting. In 2005, the ANZ Banking Group conducted an extensive survey on the financial practices of consumers in Australia and New Zealand. The Australian survey of some 3,500 randomly chosen respondents age 18+ evaluated understanding of topics ranging from basic arithmetic to investment fundamentals, retirement planning, and financial records. In the Financial Terms section of the survey, 67 percent of respondents said they understood compound interest, but a mere 28 percent were rated as having a "good level" of comprehension when faced with an actual problem to solve. In the New Zealand survey of respondents age 18+, similar results were obtained. Some 54 percent of respondents believed that fixed income investments would provide higher returns than stocks over an 18-year period.

Miles (2004) showed that UK borrowers display a weak understanding of mortgages and interest rates. The UK Financial Services Authority also concluded that younger people, those in low social classes, and those with low incomes were the least sophisticated financial consumers.

C. Percent Correct by Advanced Literacy Question and Socioeconomic Characteristic								
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Age ≤ 50 (N=350)								
Correct	68.0	69.1	32.6	74.9	82.3	67.7	88.6	76.3
Incorrect	23.4	11.7	42.3	4.0	4.3	22.9	3.4	17.7
DK	8.6	19.1	25.1	21.1	13.4	9.4	8.0	6.0
Age > 50 (N=462)								
Correct	81.2	74.9	39.8	84.2	81.2	71.9	89.0	84.8
Incorrect	13.4	11.0	40.3	2.8	4.8	18.8	3.9	9.3
DK	5.4	14.1	19.9	13.0	14.1	9.3	7.1	5.8
Education LT college (N=389)								
Correct	65.0	62.7	25.2	71.2	75.3	58.9	84.1	73.0
Incorrect	23.4	13.6	48.6	3.6	4.1	29.3	4.4	18.3
DK	11.6	23.7	25.2	25.2	20.6	11.8	11.6	8.7
Education College + (N=423)								
Correct	85.1	81.3	46.3	88.4	87.5	80.4	93.1	88.7
Incorrect	12.5	9.2	34.3	3.1	5.0	12.5	3.1	8.0
DK	2.4	9.5	19.4	8.5	7.6	7.1	3.8	3.3
Male (N=363)								
Correct	84.3	81.3	47.1	86.2	84.8	83.2	90.4	88.7
Incorrect	12.4	9.6	39.9	3.6	5.2	11.8	4.4	7.4
DK	3.3	9.1	12.9	10.2	9.9	5.0	5.2	3.9
Female (N=414)								
Correct	68.4	65.3	28.3	75.3	79.1	59.5	87.5	75.1
Incorrect	22.0	12.7	42.1	3.1	4.0	27.6	3.1	17.4
DK	9.6	22.0	29.6	21.6	16.9	12.9	9.4	7.6

Notes: Correct, Incorrect, and Do not know (DK) responses may not sum to 100 percent because of refusals. Percentages of total number of respondents provided (N=812) b) This question was phrased two different ways.

Christelis, Jappelli, and Padula (2005) documented that respondents in several European nations scored low on financial numeracy and literacy scales.

Meanwhile, on the other side of the Pacific, a Japanese consumer finance survey showed that 71 percent of adult respondents knew little about equity and bond investments and more than 50 percent lacked any knowledge of financial products (OECD 2005). A Korean youth survey conducted by the Jump\$tar^t coalition in 2000 showed that young Koreans fared no better than their American counterparts when tested on

economics and financial knowledge, with most receiving a failing grade (OECD 2005).

While financial knowledge is weak, it is also the case that people tend to be more confident in their abilities than should be warranted. For instance, a German survey conducted by Commerzbank AG in 2003 found that 80 percent of respondents were confident about their understanding of financial issues but only 42 percent could answer half of the survey questions correctly (OECD 2005). Similar patterns are found in the United States, the United Kingdom, and Australia. Indeed, consumer overconfidence regarding personal financial knowledge may be a deterrent to seeking out professional advice, thus widening the "knowledge gap".

4. Who Is Financially Literate?

Financial illiteracy is not only widespread, it is particularly acute among specific demographic groups. For example, financial literacy, as measured by the three questions in the 2004 HRS module, declines strongly with age/cohorts. This is an important finding as individuals are required to make financial decisions until late in the life cycle and there is mounting concern about the incidence of financial scams that prey upon the elderly. There are sharp gender differences in financial literacy, with women displaying a lower level of knowledge than men, particularly with regard to risk diversification. Lusardi and Mitchell (2008) examine this issue in more detail and warn about the difficulties women may face in making financial decisions, particularly after the death of a spouse. Financial literacy varies widely among education groups. Only half of respondents with less than a high school education correctly answer the question requiring a simple calculation of interest rates, and close to 20 percent state they do not know the answer to this question. The large majority of those without a college degree do not know or answer incorrectly the question about risk diversification. Similarly, there are major differences in financial literacy across racial groups, with African-Americans and Hispanics displaying much lower levels of financial literacy than whites. Approximately half of African-Americans correctly answer the question about interest rate calculations, and the proportion of correct answers is even smaller among Hispanics. Lusardi and Mitchell (2007a) document similar findings when using different measures of literacy among a sample of Early Baby Boomers.

Table 2 (Panel C) offers insight into financial literacy patterns that vary by age, educational attainment, and sex in the ALP. Younger respondents are less well informed than their older counterparts: 60 percent of younger respondents versus 69 percent of older respondents know about mutual funds. The younger group is also 20 percentage points less likely to correctly judge that owning company stock is riskier than investing in an equity mutual fund. This corroborates our findings from another study using the module on financial literacy in the recent wave of the National Longitudinal Survey of Youth, which finds that financially illiteracy is widespread among young adults (Lusardi, Mitchell, and Curto 2009). In discussing debt literacy and borrowing decisions Lusardi and Tufano (2009) show that the elderly also know less than other age groups,

even though they think they know more than they actually do. Table 2 (panel C) further shows that better educated respondents are more knowledgeable than their less educated counterparts, with those having at least some college demonstrating much more accurate views of what the stock market does and the expected long-run return advantage for stocks. Sex differences are sharp, in that women know substantially less than men with regard to mutual funds, risk diversification, long-term returns, and the relationship between bond prices and interest rates.⁸ While for illustrative purposes the figures reported here discuss only the bivariate correlation between financial literacy and socio-demographic characteristics, the relationships we find hold true in a multivariate setting.

These results are not specific to the HRS or the ALP but are common to many other surveys on financial literacy.⁹ Moreover, the findings outlined above are already present among young respondents. For example, Mandell (2008) focuses on a small group of high school students who are defined as being financially literate (all received a score of 75 percent or more on a financial literacy test) in the 2006 Jump\$tart Coalition survey. Note that this group represents a tiny fraction of the whole sample: only 7 percent. The financially literate students are overwhelmingly white, male, and the children of college graduates. Thus, the correlation between literacy and gender, race, and education is present at early stages of the life cycle.

Lusardi and Mitchell (2007c) show that financial literacy is highly correlated with exposure to economics in school. Those who studied economics (in high school, college, or at higher levels) were much more likely to display higher levels of financial literacy later in life, a finding which is also present in data from other countries such as the Netherlands.¹⁰ They use this information to assess the impact of financial literacy on financial behavior later in life. Because financial literacy can be affected by experience with saving and investing—learning by doing—data on literacy early in life (or on other determinants of financial literacy) is necessary to evaluate the impact of literacy on financial behavior, as will be explained in the next section.

⁸ See also Lusardi and Tufano (2009) for evidence of lower “debt literacy” among women.

⁹ See Lusardi and Mitchell (2007b) for a review.

¹⁰ See van Rooij, Lusardi, and Alessie (2007).

5. Does Financial Literacy Matter?

As mentioned earlier, one of the major advantages of inserting questions about financial literacy into national surveys is that researchers can assess whether literacy influences financial decision-making. Table 3 displays the relationship between financial literacy and retirement planning as measured in the 2004 HRS core data (see Lusardi and Mitchell 2007a). As shown by Lusardi (2003), Lusardi and Beeler (2007), and Lusardi and Mitchell (2007a), retirement planning is a powerful predictor of wealth accumulation; those who plan have more than double the wealth of those who have not done any retirement planning.

Financial literacy matters for planning: Those who are more financially knowledgeable are much more likely to have planned for retirement. In terms of economic importance, both the knowledge of interest compounding and the ability to perform simple calculations (such as a lottery division) are the strongest predictors of planning. This is to be expected, given that any saving plan requires some numeracy, the ability to calculate present values, and an understanding of the advantages of starting to save early in life. Financial literacy is not simply a proxy for low education, race, or gender; as has been noted, women, minorities, and those with low educational attainment are disproportionately less likely to be financially literate. Even after accounting for many demographic characteristics, financial literacy continues to be an important determinant of planning.¹¹ In other words, financial literacy has an effect on planning above and beyond the effect of demographic characteristics.

One may argue that financial literacy and retirement planning are both decision variables and that the act of planning may enhance financial knowledge. In other words, the nexus of causality goes from planning to financial knowledge rather than the other way around: those who want to plan for retirement may invest in acquiring financial knowledge. To evaluate the relationship between literacy and planning, it is important to have information beyond individuals' current levels of financial literacy. Lusardi and Mitchell (2007c) use information on individuals' past financial literacy, prior to their entering the job market. They find that those who were financially literate when young are more likely to

¹¹ See also, Lusardi and Mitchell (2006).

Table 3: Empirical Effects of Financial Literacy on Retirement Planning in the United States

	Probability of Being a Retirement Planner		
	I	II	III
Correct Percentage Calculation	-.016 (.061)	-.012 (.062)	-.034 (.060)
Correct Lottery Division	.059* (.030)	.034 (.031)	.001 (.032)
Correct Compound Interest	.153*** (.035)	.149*** (.035)	.114*** (.039)
DK Percentage Calculation		.021 (.068)	.054 (.067)
DK Lottery Division		-.154*** (.050)	-.141*** (.051)
DK Compound Interest		-.114 (.080)	-.073 (.081)
Demographic controls	No	No	Yes
Pseudo R ²	.031	.038	.074

Note: This table reports Probit estimates of the effects of literacy on planning; marginal effects reported. Analysis sample consists of HRS Early Baby Boomers who responded to financial literacy questions. Being a planner is defined as having thought a little, some, or a lot about retirement. Demographic controls include age, education, race, sex, marital status, retirement status, number of children, and a dummy variable for those not asked the question about interest compounding. Regressions also include dummies for political literacy (knowing who the president and vice president of the United States are). DK indicates respondent who did not know the answer. Observations weighted using HRS household weights. The total number of observations is 1,716. * Significant at 10% level; ** significant at 5%level ; *** significant at 1% level. Adapted from Lusardi and Mitchell (2007a).

plan for retirement, showing that the nexus of causality does go from literacy to planning. This conclusion is robust to using other instruments for financial literacy, such as employer-provided financial education programs.

Other studies have confirmed the positive association between financial knowledge and household financial decision-making. Stango and Zinman (2007) show that those who are unable to correctly calculate interest rates out of a stream of payments end up borrowing more and accumulating less wealth. Lusardi and Tufano (2009) find that those who severely underestimate the power of interest compounding are

more likely to experience difficulties repaying debt. Agarwal et al. (2007) show that financial mistakes related to credit cards and mortgages are most prevalent among the young and the elderly—demographic groups that display the lowest levels of financial knowledge and cognitive ability. Hilgert, Hogarth, and Beverly (2003) also document a positive link between financial knowledge and financial behavior. Campbell (2006) further demonstrates that many investors failed to refinance their mortgages during a period of falling interest rates. This finding is consistent with lack of literacy, as those who failed to refinance are disproportionately investors with low levels of education. Those investors also seem less likely to know the terms of their mortgages, including the interest rates they pay (Bucks and Pence 2008 and Moore 2003). Moore (2003) also shows that borrowers who took out high-cost mortgages display little financial literacy.

6. Addressing Financial Illiteracy and Lack of Retirement Savings

Responding to reports of widespread financial illiteracy and undersaving among employees, a number of employers in the United States have begun to offer financial education in the workplace. For instance, retirement seminars are often provided by firms that offer defined contribution pensions (DC) in order to enhance employee interest in and willingness to participate in these voluntary saving programs. Whether such programs have an impact is, of course, a key question.

The idea is that if seminars provide financial information and improve financial literacy, they should reduce employees' planning costs and thus enhance retirement savings. Yet it is difficult to evaluate the impact of such retirement seminars for several reasons. One is that participation in these seminars is typically voluntary, so workers who attend them probably differ from those who do not (for instance, those who attend may have more retirement wealth and thus stand to benefit differently from seminars than low wealth workers). Another is that workers who participate in a retirement seminar may be more patient or diligent, personal characteristics associated with higher wealth accumulation. Additionally, as noted by Bernheim and Garrett (2003), employers may offer retirement education as a remedial device, a response to the perception that workers are undersaving. This leads to a negative rather than positive correlation between seminars and saving. These complexities have meant that few researchers have been able to sort out the effects of seminars cleanly, and empirical findings are mixed.¹²

Fortunately, the HRS can overcome some of these data challenges. For instance, Lusardi (2002, 2004) posits that if financial education is offered to those who need it most, the saving impacts would be strongest among the least educated and least wealthy. The data bear this out: retirement seminars are found to have a positive wealth effect mainly in the lower half of the wealth distribution and particularly for the least educated. Other authors have also suggested that financial education can be effective when targeted at the least well-off. For instance, Caskey (2006) finds that personal financial management education has positive impacts on the wealth and credit patterns of low- and moderate-income households.

¹² See the review in Lusardi (2004) and the reference therein.

Yet even when the impacts work in the predicted direction, they can be rather small in dollar terms. Thus Duflo and Saez (2003, 2004) focus on non-faculty employees at a large university who were given financial incentives to participate in an employee benefits fair. The authors compared pension participation and contributions in that group with that of employees not induced to participate. Overall, they found that the program had fairly small effects: attending the fair did induce more employees to participate in the pension, but the increase in contributions was negligible. And good intentions do not always translate into desired behavior. For instance, Clark and D'Ambrosio (2008) report that exposing workers to retirement seminars does influence workers' stated desire to save more. Yet seminar participants who say they will start contributing to pensions or boost their contributions often fail to actually do so.

7. The Dutch experience

7.1 Financial literacy in the Netherlands

It is useful to compare the reported evidence from the United States (and other countries) with data from the Netherlands, a country with a very different retirement savings system (Van Els, Van Rooij, and Schuit 2007). All individuals in the Netherlands are entitled to a flat, pay-as-you-go financed state pension benefit (AOW). On top of that, the vast majority (over 90%) of employees contribute a compulsory amount to their company pension plan for a supplementary retirement benefit. Freedom of choice is limited as investment decisions are made by the pension funds, which also determine the level of pension premiums (together with trade unions). A typical pension fund runs a defined benefit average wage retirement plan. Contributions are set so as to create solvency buffers that ensure that pension funds are able to pay out nominal pension benefits. When it comes to making retirement saving decisions, Dutch households have much less of an incentive to become financially knowledgeable than do citizens of the United States (and other countries) whose retirement plans are, to a large extent, characterized by DC pension plans. Despite this lack of incentive, Dutch consumers do not seem to be less financially knowledgeable than their U.S. counterparts.

Van Rooij, Lusardi, and Alessie (2007) report the results from a representative sample of 1,508 households surveyed in a special module of the Dutch DNB Household Survey. These questions are similar to the ones included in the ALP and thus can be compared with the findings from the United States.¹³ Responses to five simple questions included in the survey to measure understanding of basic economic concepts reveal that many Dutch households display knowledge of concepts such as interest compounding, inflation, and the time value of money. However, while the majority of respondents were able to choose the right answer for individual questions, only four out of ten respondents were able to answer all five questions correctly. Thus, results are rather similar to the findings in the United States.

Findings based on responses to the literacy questions measuring more advanced concepts, such as the workings of financial markets

¹³ These are preliminary comparisons. As mentioned before, the ALP data is unweighted and not fully representative of the U.S. population.

Table 4A. Advanced Financial Literacy in The Netherlands
Weighted percentages of total number of respondents (N=1,508)

	Correct	Incorrect	Do not Know
Which statement describes the main function of the stock market? ¹⁾	67.0	12.9	19.7
What happens if somebody buys the stock of firm B in the stock market? ¹⁾	62.2	25.7	11.0
Which statement about mutual funds is correct? ¹⁾	66.7	11.1	21.7
What happens if somebody buys a bond of firm B? ¹⁾	55.6	17.8	26.4
Considering a long time period (e.g. 10 or 20 years), which asset normally gives the highest return: savings accounts, bonds, or stocks?	47.2	30.1	22.3
Normally, which asset displays the highest fluctuations over time: savings accounts, bonds, stocks?	68.5	12.7	18.4
When an investor spreads his money among different assets, does the risk of losing money increase, decrease, or stay the same?	63.3	17.4	19.0
If you buy a 10-year bond, it means you cannot sell it after 5 years without incurring a major penalty. True or false?	30.0	28.3	37.9
Stocks are normally riskier than bonds. True or false? ²⁾	60.2	15.1	24.3
Buying a company fund usually provides a safer return than a stock mutual fund. True or false? ²⁾	48.2	24.8	26.6
If the interest rate falls, what should happen to bond prices: rise/fall/stay the same/none of the above? ²⁾	24.6	37.1	37.5

1) See exact wording in the text.

2) This question has been phrased in two different ways.

Note: Correct, incorrect, and do not know responses do not sum up to 100% because of refusals.

and financial instruments such as stocks, mutual funds, and bonds, are largely comparable to results of U.S. surveys, as reported in the first part of this paper, and reveal that many Dutch households lack sufficient knowledge to make sound portfolio choice decisions (Tables 4A and 4B). In particular, knowledge of bonds is low. Moreover, less than half of the population knows that a mutual fund provides a safer return than a single stock, and the demonstrated knowledge of the riskiness of stocks versus bonds and savings accounts is better than the ability to assess

*Table 4B. Advanced literacy: Summary of Responses
Weighted percentages of total number of respondents (N=1,508)*

	Number of correct, incorrect and do not know answers (out of eleven questions)												Mean
	None	1	2	3	4	5	6	7	8	9	10	All	
Correct	7.6	5.1	5.2	6.4	7.3	10.0	11.1	11.3	10.8	10.6	9.8	5.0	5.93
Incorrect	18.7	20.2	19.8	16.8	10.4	7.1	4.7	1.6	0.6	0.1	0.0	0.0	2.33
DK	44.2	11.4	8.0	6.1	5.1	3.7	4.1	4.2	2.8	3.2	3.5	3.6	2.65

Note: DK='Do not know'; Categories do not sum up to 100% because of rounding and means do not sum up to 11 due to refusals.

relative return patterns. Similar to the United States, in the Netherlands there are large difference in scores between gender and among education level (van Rooij, Lusardi, and Alessie 2007). A multivariate regression of financial literacy on socio-demographic and economic characteristics confirms the importance of gender and education for financial literacy, but does not find a role for age/cohort effects in the Netherlands.

Differences in financial literacy prove to be important for making financial decisions. Van Rooij, Lusardi, and Alessie (2007) show that individuals with low financial literacy are less likely to invest in stocks: a finding that contributes to the explanation of the stock market participation puzzle. Moreover, individuals with low financial literacy are less likely to plan for retirement (Van Rooij, Lusardi, and Alessie 2009). Table 5 documents a strong positive relationship between financial literacy and planning, as found in the U.S. data. Financial literacy is also correlated with wealth holdings: after correcting for differences in age, income, education, and household composition, differences in real and financial wealth (net of debt, not including mandatory pension savings) due to differences in financial literacy are found to be as large as €80000 in the Netherlands (Van Rooij, Lusardi, and Alessie 2008).¹⁴ Thus, more financially sophisticated households hold higher amounts of non-pension wealth. Interestingly, after correcting for financial literacy the level of formal education has no predictive value for financial behavior at all, i.e. there is no effect of education on stock market participation, retirement planning nor in wealth accumulation.

¹⁴ Estimates are calculated using the difference between the 25th and 75th percentiles of the financial literacy distribution.

*Table 5. Retirement Planning and Financial Literacy in The Netherlands
Weighted household percentages*

Advanced financial literacy	How much have you thought about retirement?					N
	A lot	Some	A little	Hardly	DK	
1 (low)	8.8	46.4	31.7	10.4	2.7	330
2	10.6	49.4	31.6	8.4	0.0	354
3	14.2	52.7	26.1	7.0	0.0	371
4 (high)	18.0	55.8	22.8	3.0	0.4	453
Total	12.9	51.1	28.1	7.2	0.8	1508

Pearson chisq(12) = 81.46 (p=0.000)

Note: DK = 'Do not know' or 'Refusal'; Percentages may not sum up to 100 due to rounding. Adapted from Van Rooij, Lusardi, and Alessie (2009).

While these findings are based on Instrumental Variable techniques suggesting a causal relationship from financial knowledge to financial behavior, it is important to note that higher wealth holdings might also have an impact on financial literacy as wealthy households have an incentive to invest in financial education and might learn from experience as well. At the same time, one might worry about other personal traits driving both financial literacy and wealth holdings. Therefore, it is important to note that also after controlling for individual heterogeneity in basic ability, self-control, time preferences, risk aversion or carefulness the impact of financial literacy on wealth accumulation continues to hold (Van Rooij, Lusardi, and Alessie 2008).

7.2 Additional empirical evidence: The Dutch financial capability survey
 Following the OECD recommendations to promote financial education among its member states, in 2006 the Dutch Ministry of Finance founded CentiQ (Platform for Financial Awareness). CentiQ's goals are to create not only well-informed and educated consumers but also consumers who are motivated to make (and confident in making) financial decisions. CentiQ is a collaborative enterprise made up of representatives from over thirty partner organizations within the financial sector, the government, consumer organizations, and the academic community. Following the example of the UK Financial Services Authority, in 2007 CentiQ commissioned a survey on financial capability, covering a representative sample of 4,280 Dutch consumers aged 18 and older. The survey was

aimed to measure the financial behavior, knowledge, and skills of Dutch households.

Findings from this survey are summarized in a report by Antonides, De Groot, and Van Raaij (2008). The report defines good financial management as having the motivation to organize financial affairs properly, to refrain from impulse purchases, to pay bills on time, and to save rather than borrow. According to the findings of this survey, over all, Dutch consumers can get by. Nevertheless, one in ten consumers has difficulty making ends meet and four in ten consumers are not prepared for large unforeseen expenditures or a substantial reduction in income due to unemployment, divorce, or the onset of a chronic illness.

The report distinguishes between financially strong and weak consumers based on information from respondents on the overview of their financial situation and how well they report being able to get by and to save. Using cluster analysis, the report identifies the groups of consumers who are at risk, therefore enabling policy makers to target educational initiatives and communication at the more vulnerable subgroups in the population. The "financially unconcerned," "financially ambitious," and "financially sound" groups are the least problematic in terms of financial behavior. On the other hand, the "financially uncertain" and "financially seeking" group have difficulties making ends meet; the good news, however, is that these groups are either relatively knowledgeable or are motivated to seek financial information. Two groups are identified as the most problematic: the "financially indifferent" and "financially illiterate" groups; in addition to having difficulties making ends meet, they report lack of interest or motivation in seeking financial information.

Overall, many respondents state there are sufficient opportunities to obtain information if desired, but a substantial number are unmotivated to spend time and effort necessary to acquire it. Moreover, more than half of the survey respondents report having little trust in financial advisors. At the same time, one-third of the respondents assess their knowledge of financial products as insufficient.

Another important finding of the Dutch capability survey is that learning to deal with money at a young age—through management of pocket money, part-time employment, or good examples set by parents—has a positive effect on financial behavior in adulthood. This corroborates the findings of Van Rooij, Lusardi, and Alessie (2007) that being exposed

to economic education when young is an important determinant of financial knowledge later in life. It also confirms the findings in U.S. data about the influence of family background on financial knowledge in adulthood (Lusardi, Mitchell, and Curto 2009).

The report concludes with several recommendations for public policy. First, it recommends initiatives to increase awareness of the importance of financial literacy and to stimulate discussion of financial matters. Second, it recommends measures to increase financial knowledge by providing information, education, and training. Third, it recommends increasing market transparency, i.e., those that provide financial products should provide clear information about their products, including the potential consequences of purchasing them. Finally, the report advocates the development of tools and initiatives that can help consumers make wise financial decisions and avoid financial mistakes.

So far, CentiQ has launched a website www.wijzeringeldzaken.nl ("wise in money matters") from which consumers can obtain a lot of financial information related to decisions at every stage of the life-cycle. The website also provides information about many of the initiatives undertaken by CentiQ and its partners. Teaching materials have also been developed (e.g., the "Geldkoffer"); they can be used by schools and are specifically directed at children ages 11 and 12. A workshop program on money management has been developed for immigrants. Moreover, a "Valentine's Day initiative" has been developed to encourage financial security after retirement among women. The site also makes available many internet tools to help consumers calculate, for example, adequate precautionary buffers ("BufferBerekenaar") and whether a loan fits their personal financial situation ("Risicometer Lenen"). Financial institutions and the supervision authority (AFM or Netherlands Authority for the Financial Markets) are also interested in the transparency of financial information and many other initiatives are under way. The plan is to repeat the financial capability survey in a few years to evaluate the effectiveness of current efforts to improve financial capability.

8. Implications for financial education and public policy

While the United States and the Netherlands have rather different pension systems, the majority of households in both countries display low financial knowledge. Because pension systems in the United States, the Netherlands, and other countries as well are evolving toward shifting the responsibility of saving and investing for retirement onto workers, the importance of having financially knowledgeable and savvy citizens is becoming a top priority. Many employers in the United States have offered financial education as well as developed initiatives to help their employees make decisions about their pensions. Currently, the majority of Dutch in the workforce seem to be satisfied with the Dutch pension system, a finding that can be attributed to employees' recognition of their low level of financial knowledge and their strong aversion to risk, particularly when dealing with retirement savings (Van Rooij, Kool, and Prast 2007). On the other hand, a substantial number of pension plan participants in the Netherlands report they would like to have more freedom of choice. One in five employees surveyed state that they would like to have a say in the investment strategy of their pension fund (Van Els, Van den End, and Van Rooij 2005). Academic studies as well have advocated greater variety in pension fund offerings and in the design of default options in pension plans (Nijman and Oerlemans 2008). The surveys make clear that especially those respondents who are very confident on their financial skills and, thus, are potentially in danger of being overconfident, are most likely to make use of this enhanced freedom of choice.

Education policies directed at improving the level of financial knowledge of the population could promote wise financial behavior and retirement readiness. However, given the low levels of financial literacy displayed in the many surveys mentioned before, increasing the level of financial literacy in the population at large is likely to be a challenging task. In the Netherlands, about three-quarters of the employees surveyed favor the mandatory aspect of pension savings mainly because they find retirement-planning decisions difficult and burdensome and they fear lack of control in savings (Van Rooij, Kool, and Prast 2007). Moreover, many employees report they would not be willing to take courses to improve their financial knowledge, even if these courses were offered free of charge. This is in line with the lack of interest about financial matters

documented in other studies (Van Els, Van den End, and Van Rooij 2005) and in the Dutch financial capability survey.

Bodie and Prast (2008) further warn that efforts to improve financial literacy are unlikely to be successful in addressing inadequate retirement savings and preventing investment mistakes. According to these authors, the policy recommendations designed to promote financial literacy, improve communication, and increase transparency (as mentioned above) are simply insufficient. They propose an alternative strategy, which has the following components: (1) workers should specify a desired and minimally acceptable level of income after retirement; (2) professionals should invest workers' contributions using hedging strategies that minimize the risk that accounts will fall below the minimally acceptable level and that maximize the probability of reaching the desired income level. This scheme has many potential advantages. For example, plan participants would have to make only a limited set of choices and would not need to deal with complex portfolio investment decisions. Moreover, the scheme would appeal to those favoring income guarantees. And, if the specification of desired income level was still viewed as too complex, the pension plan could offer a selection of smartly chosen semi-customized default options. Bodie and Prast (2008) argue that, for homogenous groups of employees, these types of smartly designed, partly individualized pension products with a limited number of pre-designed choice options should be offered by a trusted party (e.g., the employer or a not-for-profit pension fund) or via collective agreements so that pension products could be supplied at a low cost resulting from economies of scale and reduced marketing costs. An additional advantage is that, given realistic investment returns, individuals are immediately confronted with the trade-off between the contributions they make and the ambitions in terms of their desired retirement income.

While these are worthwhile initiatives to consider, the use of tailor-made pension products, pre-designed defaults, or limited choice options does not alleviate the need for financial education. For example, even in the above-mentioned scheme proposed by Bodie and Prast (2008), it is important for workers to understand the implications of the limited retirement saving choice options. In addition, workers may still find hard figuring out how much consumption they need at retirement. Moreover, individuals face many financial decisions; those in the workforce have to decide not only how much to save for retirement but

also which mortgage to take out, how much savings to hold to buffer against uninsurable shocks, and how to deal with credit card debt, among many other decisions (Lusardi and Tufano 2009). Many of these decisions are interrelated in ways that "smart" schemes cannot account for. For example, individuals carrying credit card debt should reduce their high-cost debt before enrolling in a supplementary pension plan. It is also not possible to rely simply on the development of a market for financial advice. There are important agency problems in a market where consumers are not accustomed to paying for financial advice and intermediaries can profit from provisions paid by the suppliers of financial products. The risk of selling products that are not well-suited to the needs of consumers ('misselling') increases in a competitive market, as there is an intrinsic conflict between the two major tasks of advisors: finding consumers to sell financial products to, and advising them on the suitability of the products for their specific needs (Inderst and Ottaviani 2009). Financially illiterate consumers may find it difficult to distinguish between good and bad financial advice and to discriminate between advisors of varying quality. The work of Gabaix and Laibson (2006) suggests that the benefits of competition between financial institutions are not fully exploited in a market with a large number of financially illiterate consumers, and that in such a market, bad and inefficient institutions can survive. This can also explain why households demonstrating low levels of financial literacy consider family and friends to be the most important source of information when making important financial decisions (Van Rooij, Lusardi, and Alessie 2007) as well as explain the distrust of financial advisors reported in the Dutch financial capability survey.

Many countries have started developing programs to increase financial literacy (Smith and Stewart 2008). These newly designed programs and differences therein will provide many opportunities to evaluate the success and limitations of the several approaches employed, but unfortunately not much is known yet on the optimal design of programs to enhance financial literacy. While more research on the effectiveness of financial education programs is clearly warranted, Table 6 summarizes several implications from the analysis and discussions above. Given the many economic decisions consumers are faced with and the important knowledge gaps in different age, education, gender and income sub-groups, it is important to design programs targeted to the need of these

Table 6 Implications for Financial Education Programs**Financial education should start young.**

Financial education should be provided *before* people engage in financial contracts. For example, financial education in school can provide a base level of financial literacy to help navigate an increasingly complex financial environment.

One size does not fit all.

The differences in financial literacy among the population that are highlighted in this report suggest that it is important to target specific groups in the population to best serve those most in need.

A one-time retirement seminar is likely to be ineffective.

When financial literacy is so widespread in the population, small interventions such as offering one retirement seminar to all workers are likely to be ineffective. The cure must fit the disease.

Simplification is essential for the less financially literate.

Those concerned with widespread illiteracy must find ways to simplify financial decision-making as much as possible. Further, methods of communication must be found that do not rely on percentage information, mathematical calculations, or numerical data.

Financial advice can be of substantial help to the least financially literate.

It is important to provide guidance in making financial decisions and provide specific steps that people can act upon, particularly for the least financially literate. At the same time, the market for financial advice should be organized such that consumers can trust that professional financial intermediaries provide comprehensible information, independent financial advice and offer products with transparent cost structures.

Financial literacy is an essential tool for decision-making

Because individuals make many financial decisions and these decisions are interrelated, it is important to equip people with some basic tools. Given widespread illiteracy, people are prone to make mistakes and these mistakes can be costly.

specific subgroups. While many suggestions relate to the supply-side of financial products (i.e., helping consumers by simplifying decisions or creating opportunities to find clear and independent information and advice), it is important to also put emphasis on the demand side, i.e. how to educate consumers understand the implications of the choices they make.

References

- Agarwal, S., J. Driscoll, X. Gabaix, and D. Laibson (2007), "The Age of Reason: Financial Decisions over the Lifecycle," mimeo, Harvard University.
- Agnew, Julie, and Lisa Szykman (2005), "Asset Allocation and Information Overload: The Influence of Information Display, Asset Choice and Investor Experience," *Journal of Behavioral Finance* 6, pp. 57–70.
- Alesina, Alberto, and Annamaria Lusardi (2006), "Driving Your Financial Investment? Perhaps a License is Needed," mimeo, Dartmouth College.
<http://www.dartmouth.edu/~vox/0607/0724/lusardi.html>
- Antonides, Gerrit, Manon de Groot, and Fred van Raaij (2008), "Financieel inzicht van Nederlanders" (in Dutch), CentiQ, www.centiq.nl (for more information see the English summary of this report: 'Summary of financial insight among the Dutch', www.wijzeringeeldzaken.nl/media/1319/summary_financial_insight_amoung_the_dutch.pdf).
- Atkinson, A., S. McKay, E. Kempson, and S. Collard (2006), "Levels of financial capability in the UK: Results of a baseline survey," *Financial Services Authority Consumer Research* 47, FSA, London.
- Bernheim, Douglas (1995), "Do Households Appreciate Their Financial Vulnerabilities? An Analysis of Actions, Perceptions, and Public Policy," *Tax Policy and Economic Growth*, Washington, DC: American Council for Capital Formation, pp. 1–30.
- Bernheim, Douglas (1998), "Financial Illiteracy, Education and Retirement Saving," in Olivia S. Mitchell and Sylvester Schieber (eds.), *Living with Defined Contribution Pensions*, Philadelphia: University of Pennsylvania Press, pp. 38–68.
- Bernheim, Douglas, and Daniel Garrett (2003), "The Effects of Financial Education in the Workplace: Evidence from a Survey of Households," *Journal of Public Economics* 87, pp.1487–1519.
- Binswanger, Johannnes, and Daniel Schunk (2008), "What is an adequate standard of living during retirement?" *CentER Discussion Paper*, 82.
- Bodie, Zvi, and Henriëtte Prast (2008), "Rational pension plans for irrational people," presented at the joint Tilburg Center of Finance/Netspar pension workshop 'The Private Provision of Pensions at the University of Tilburg', 5 November 2008.
- Brown, Amy, and Kimberly Gartner (2007), "Early Intervention and Credit Cardholders: Results of Efforts to Provide Online Financial Education to New-to-Credit and At-Risk Consumers," Center for Financial Services Innovation, Chicago, IL.
- Brown, Jeffrey, Zoran Ivkovich, Paul Smith, and Scott Weisbenner (2007), "Neighbors Matter: Causal Community Effects and Stock Market Participation," NBER Working Paper n. 13168.
- Bucks, Brian, and Karen Pence (2008), "Do Borrowers Know Their Mortgage Terms?" *Journal of Urban Economics* 64, 218–33.
- Campbell, John (2006), "Household Finance," *Journal of Finance* 61, pp. 1553–1604.
- Carroll, G., J. Choi, D. Laibson, B. Madrian, and A. Metrick (2005), "Optimal defaults and active decisions," NBER Working Paper, 11074.
- Caskey (2006), "Can Personal Financial Management Education Promote Asset Accumulation by the Poor?" Mimeo, Networks Financial Institute, Indiana, IN.

- Clark, Robert, and Madeleine D'Ambrosio (2008), "Adjusting Retirement Goals and Saving Behavior: The Role of Financial Education." In Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.
- Choi, James, David Laibson, and Brigitte Madrian (2006), "Reducing the Complexity Costs of 401(k) Participation Through Quick Enrollment (TM)," NBER Working Paper n. 11979.
- Christelis, Dimitris, Tullio Jappelli, and Mario Padula (2005), "Health Risk, Financial Information and Social Interaction: the Portfolio Choice of European Elderly Households." Working Paper, University of Salerno.
- De Mel, Suresh, David McKenzie, and Christopher Woodruff (2008), "Who Are the Microenterprise Owners? Evidence from Sri Lanka on Tokman v. de Soto," mimeo, World Bank.
- Duflo, Esther, and Emmanuel Saez (2003), "The Role of Information and Social Interactions in Retirement Plan Decisions: Evidence from a Randomized Experiment," *Quarterly Journal of Economics* 118, pp. 815–842.
- Duflo, Esther, and Emmanuel Saez (2004), "Implications of Pension Plan Features, Information, and Social Interactions for Retirement Saving Decisions," in Olivia S. Mitchell and Stephen Utkus (eds.), *Pension Design and Structure: New Lessons from Behavioral Finance*, Oxford: Oxford University Press, pp. 137–153.
- Elliehausen, Gregory, Christopher Lundquist, and Michael Staten (2007), "The Impact of Credit Counseling on Subsequent Borrower Behavior," *Journal of Consumer Affairs* 41(1), pp. 1–27.
- Gabaix, X., and D. Laibson (2006), "Shrouded attributes, consumer myopia, and information suppression in competitive markets," *Quarterly Journal of Economics* 121, 505–540.
- Gollwitzer, P. (1996), "The volitional benefits of planning." In J. Bargh and P. Gollwitzer (eds.), *The Psychology of Action*, Guilford, New York, 287–312.
- Gollwitzer, P. (1999), "Implementation intentions: Strong effects of simple plans," *American Psychologist* 54, 493–503.
- Gustman, Alan, Thomas Steinmeier, and Nahid Tabatabai (2008), "Do Workers Know about Their Pension Plan Type? Comparing Workers' and Employers' Pension Information." In Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.
- Hastings, Justine (2007), "Information, Financial Literacy and Sensitivity to Fees: Evidence from Mexico's Privatized Social Security Market," mimeo, Yale University.
- Hilgert, Marianne, Jeanne Hogarth, and Sondra Beverly (2003), "Household Financial Management: The Connection between Knowledge and Behavior," *Federal Reserve Bulletin*, pp. 309–322.
- Hirad, Abdighani, and Peter Zorn (2001), "A Little Knowledge Is a Good Thing: Empirical Evidence of the Effectiveness of Pre-Purchase Homeownership Counseling," Working Paper, Freddie Mac.
- Hogarth, Jeanne (2006), "Financial Education and Economic Development," paper presented at the G8 International Conference on Improving Financial Literacy. <http://www.oecd.org/dataoecd/20/50/37742200.pdf>

- Hong, Harrison, Jeffrey Kubik, and Jeremy Stein (2004), "Social Interaction and Stock Market Participation," *Journal of Finance* 59, 137–163.
- Inderst, Roman, and Marco Ottaviani (2009), "Misselling through Agents", *American Economic Review* 99, 883–908.
- Lusardi, Annamaria (2002), "Preparing for Retirement: The Importance of Planning Costs," *National Tax Association Proceedings—2002*, pp. 148–154.
- Lusardi, Annamaria (2003), "Planning and Saving for Retirement," Working Paper, Dartmouth College.
http://www.dartmouth.edu/~alusardi/Papers/Lusardi_pdf.pdf
- Lusardi, Annamaria (2004), "Savings and the Effectiveness of Financial Education," in Olivia S. Mitchell and Stephen Utkus (eds.), *Pension Design and Structure: New Lessons from Behavioral Finance*, Oxford: Oxford University Press, pp. 157–184.
- Lusardi, Annamaria (2005), "Financial Education and the Saving Behavior of African American and Hispanic Households," Report for the U.S. Department of Labor.
http://www.dartmouth.edu/~alusardi/Papers/Lusardi_pdf.pdf
- Lusardi, Annamaria (2008), "Household Saving Behavior: The Role of Literacy, Information and Financial Education Programs," NBER Working Paper n. 13824.
- Lusardi, Annamaria, Punam Keller, and Adam Keller (2008), "New Ways to Make People Save: A Social Marketing Approach." In Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.
- Lusardi, Annamaria, and Jason Beeler (2007), "Saving Between Cohorts: The Role of Planning," in Brigitte Madrian, Olivia Mitchell, Beth Soldo (eds.), *Redefining Retirement. How Will Boomers Fare?*, Oxford: Oxford University Press, pp. 271–295.
- Lusardi, Annamaria, and Olivia S. Mitchell (2006), "Financial Literacy and Planning: Implications for Retirement Wellbeing," Working Paper, Pension Research Council, Wharton School, University of Pennsylvania.
- Lusardi, Annamaria, and Olivia S. Mitchell (2007a), "Baby Boomer Retirement Security: The Role of Planning, Financial Literacy, and Housing Wealth," *Journal of Monetary Economics* 54, pp. 205–224.
- Lusardi, Annamaria, and Olivia Mitchell (2007b), "Financial Literacy and Retirement Preparedness. Evidence and Implications for Financial Education," *Business Economics*, January 2007, pp. 35–44.
- Lusardi, Annamaria, and Olivia Mitchell (2007c), "Financial Literacy and Retirement Planning: New Evidence from the Rand American Life Panel," MRRC Working Paper n. 2007-157.
- Lusardi, Annamaria, and Olivia Mitchell (2008), "Planning and Financial Literacy: How Do Women Fare?" *American Economic Review* 98, 413–417.
- Lusardi, Annamaria, Olivia Mitchel, and Vilisa Curto (2009), "Financial Literacy Among the Young: Evidence and Implications for Consumer Policy," mimeo, Dartmouth College.
- Lusardi, Annamaria, and Peter Tufano (2009), "Debt Literacy, Financial Experience, and Overindebtedness," NBER Working Paper n. 14808.
- Madrian, Brigitte, and Dennis Shea (2001), "Preaching to the Converted and Converting Those Taught: Financial Education in the Workplace," University of Chicago Working Paper.

- Mandell, Lewis (2004), "Financial Literacy: Are We Improving?" Washington, D.C.: JumpStart Coalition for Personal Financial Literacy.
- Mandell, Lewis (2008), "Financial Literacy in High School." In Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.
- Medill Colleen (2007), "Participant Perceptions and Decision-Making Concerning Retirement Benefits," paper presented to the 9th Annual Joint Conference of the Retirement Research Consortium, Washington, D.C., August 9–10, 2007.
- Miles, D. (2004), "The UK mortgage market: Taking a longer-term view," Working Paper, UK Treasury.
- Monticone, Chiara (2009), "How Much Does Wealth Matter for Financial Literacy Acquisition?" mimeo, CeRP.
- Moore, Danna (2003), "Survey of Financial Literacy in Washington State: Knowledge, Behavior, Attitudes and Experiences," Technical report 03-39, Social and Economic Sciences Research Center, Washington State University.
- National Council on Economic Education (2005), "What American Teens and Adults Know About Economics," Washington, D.C.
- Nijman Theo and Alwin Oerlemans (2008), Netspar NEA Papers, Maatwerk in Nederlandse pensioenproducten (in Dutch), Netspar NEA Papers, 8.
- Organization for Economics Co-Operation and Development (2005), *Improving financial literacy: Analysis of issues and policies*, Paris, France.
- Schreiner Mark and Michael Sherraden (2007), *Can the Poor Save? Saving and Asset Building in Individual Development Accounts*, New Brunswick, NJ: Transaction Publishers.
- Sherraden, Michael, and Ray Boshara (2008), "Learning from Individual Development Accounts." In Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.
- Smith, Barbara, and Fiona Stewart (2008), "Learning from the Experience of OECD Countries: Lessons for Policy, Programs, and Evaluations," In Annamaria Lusardi (ed.), *Overcoming the Saving Slump: How to Increase the Effectiveness of Financial Education and Saving Programs*, University of Chicago Press.
- Stango, Victor, and Jonathan Zinman (2007), "Fuzzy Math and Red Ink: When the Opportunity Cost of Consumption is Not What It Seems," Working Paper, Dartmouth College.
- Van Dalen, Hendrik, Kène Henkens, and Douglas Hershey (2008), "Are pension savings sufficient? Perceptions and expectations of American and Dutch workers," CentER Discussion Paper, 58.
- Van Duijn, M., M. Lindeboom, P. Lundborg, and M. Mastrogiacomo (2009), "Pension plans and the retirement replacement rates in the Netherlands," CPB Discussion Paper, 118.
- Van Els, Peter, Jan Willem van den End, and Maarten van Rooij (2004), "Pensions and public opinion: A survey among Dutch households," *De Economist* 152, 101–116.
- Van Els Peter, Jan, Willem van den End, and Maarten van Rooij (2005), "Financial behaviour of Dutch households: analysis of the DNB Household Survey." In *Investigating the relationship between the financial and real economy*, BIS Papers 22, 1–40.

- Van Els, Peter, Maarten van Rooij, and Margreet Schuit (2007), "Why mandatory retirement saving?" In Onno Steenbeek and Fieke van der Lecq (eds.), *Costs and Benefits of Collective Pension Systems*, Springer, Berlin, 159–186.
- Van Rooij, Maarten, Clemens Kool, and Henriëtte Prast (2007), "Risk–return preferences in the pension domain: Are people able to choose?" *Journal of Public Economics* 91, 701–722.
- Van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie (2007), "Financial Literacy and Stock Market Participation," NBER Working Paper n. 13565.
- Van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie (2008), "Financial literacy, retirement planning, and household wealth," mimeo, De Nederlandsche Bank, Amsterdam.
- Van Rooij, Maarten, Annamaria Lusardi, and Rob Alessie (2009), "Financial literacy and retirement planning in the Netherlands," mimeo, De Nederlandsche Bank, Amsterdam.
- Van Rooij, Maarten, and Federica Teppa (2008), "Choice of no choice: What explains the attractiveness of default options," Netspar Discussion Paper 32.
- Woloshin, Steven, Lisa Schwartz , and Gilbert Welch (2002), "Risk Charts: Putting Cancer in Context. *Journal of the National Cancer Institute* 94(11), pp. 799–804.

SUMMARY OF DISCUSSION

By Kim Peijnenburg

Nathanael Vellekoop was the first discussant and started with noting that there is not a clear-cut definition of financial literacy. Both the presentation and the paper use different terms, like "financial literacy", "financial sophistication" and "financial management", but these terms are not synonyms. Annamaria Lusardi agreed with this and that the definition should come from theory, which is something she is working on. Furthermore Vellekoop was debating whether the person who answers the survey question is the same person making the decisions within the household. I suspect that there is specialization within the household about making financial decisions – most likely the man in the couple. Note that this could be efficient as well as long as the couple is together. However in cases of divorce or death of the spouse, the woman will experience the drawback of this, along with the drop in income. Extra attention to these vulnerable groups is needed. Lusardi replied to this by noting that often if the male dies, women go into poverty, which could be evidence that women are not making good decisions.

Furthermore Vellekoop argues that framing of questions is important for the answers. However, some words like return, risk or fluctuation can mean different things in common life to different people. Lusardi agrees that wording is very important and in recent work she wants to get away from "economic" wording. However in reality decisions are also not framed easily.

The discussant notes that in the questions about advanced literacy, there are questions which compare savings accounts, bonds and stocks. Could you compare the answers people give to these questions with observed behavior in savings accounts, buying bonds and participation in the stock market? Not everybody who saves, buys bonds, or participates in the stock market. There could be a bias in the answers for those who have experience with saving, but not with stock market investment. Furthermore what exactly do these questions measure? If somebody does not understand compounded interest, would that lack of knowledge refrain him from saving at all? What is exactly the underlying theoretical

model? A lower level financial literacy, influences the savings decisions, and decreases the amount of savings. In general, there are other factors recognized in the literature that influence the savings decision and the level of savings, for instance procrastination, planning horizon and thrift in general. How do these concepts relate to financial literacy, do they precede financial literacy, mediate it or confound with it?

Jan Potters was the second discussion and his comments focused on the notion that financial decisions are also made by intuition. To illustrate the importance of "psychological" variables, he started with an example in which loan offers were made to bank customers. In this experiment it was found that whether there was a picture of a female or male in the add, influenced the decision of individuals. He continued by explaining that there are two systems in decision making: reasoning and intuition, and that judgement and choice are often based on intuition. In designing policy this should be taking into account and education of agents plays an important role in this respect. From the supply side, the development of a few standard (default) products are vital. Lusardi agrees that simplification is important and that complexity confuses people. Regulation in the US is directed towards simplification and agencies are instated to protect customers. Financial education is complementary to this. Jan Potters continues with this by stating that given that intuition plays such an important role, what should we do with all the theories we as economists develop. Maybe bounded rationality should be incorporated in our models. Models which assume for instance satisficing or dual process models. Potters concludes with that it is better to be vaguely right, than to be precisely wrong.

Peter Kooreman commented that individuals have no incentive to get the questions right. Lusardi agreed with this, people might not be paying attention. Furthermore David Hollanders noted that one of the important policy implications of this research is that suppliers should be regulated.

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Annamaria Lusardi and Maarten van Rooij

FINANCIAL LITERACY: EVIDENCE AND IMPLICATIONS FOR CONSUMER EDUCATION

Over the past thirty years, individuals have had to become increasingly responsible for their own financial security following retirement. But are individuals equipped with sufficient knowledge and skills to be able to navigate through this new financial system? Annamaria Lusardi (Dartmouth College, NBER and Netspar) and Maarten van Rooij (DNB and Netspar) are lifting the veil on the public's financial literacy in this paper.

