Financial Literacy: An Essential Tool for Informed Consumer Choice?

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Abstract

Individuals are increasingly in charge of their own financial security and are confronted with many complex financial instruments. How well-equipped are individuals to make saving decisions; specifically, do they possess adequate financial literacy? This paper shows that financial illiteracy is widespread among the U.S. population and particularly acute among specific demographic groups, such as those with low education, women, African-Americans, and Hispanics. Financial literacy affects financial decision-making; ignorance about basic financial concepts can be linked to lack of retirement planning, lack of participation in the stock market, and financial mistakes. Financial education programs can help improve saving and financial decision-making, but much more can be done to improve the effectiveness of these programs.

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1. Introduction

Individuals are increasingly in charge of their own financial security after retirement. With the shift from Defined Benefit (DB) to Defined Contribution (DC) pensions, workers have to decide not only how much to save for retirement but also how to allocate their pension wealth. Moreover, the complexity of financial instruments has increased and individuals have to deal with new and more sophisticated financial products. How well-equipped are individuals to make saving decisions? Specifically, do they possess adequate financial literacy?

This paper shows that most individuals cannot perform simple economic calculations and lack knowledge of basic financial concepts, such as the working 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 working of mutual funds, and basic asset pricing is even scarcer. Illiteracy is widespread among the general population and particularly acute among specific demographic groups, such as women, African-Americans, Hispanics, and those with low education attainment.

Financial literacy affects financial decision-making; ignorance about basic financial concepts can be linked to lack of retirement planning, lack of participation in the stock market, and financial mistakes. 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.
The paper is organized as follows: Section 2 provides an overview of the difficulties inherent in making saving decisions; Section 3 examines the evidence on financial literacy; Section 4 reviews financial education programs; and Section 5 provides a discussion of the major findings and suggestions for public policy.

2. Theoretical framework

The theoretical framework used to model consumption/saving decisions posits that rational and foresighted consumers derive utility from consumption over their lifetimes. In the simplest format, the consumer has a lifetime expected utility, which is the expected value of the sum of per-period utility $U(c_j)$ discounted to the present (using the discount factor $\beta$), from the worker’s current age $j$ to the oldest possible lifetime $D$:

$$E \left[ \sum_{j=1}^{D} \beta^{j-1} U(c_j) \right]$$

Assets and consumption each period ($a_j$ and $c_j$) are determined endogenously by maximizing this function subject to an intertemporal budget constraint. Thus $c_j$ represents per period consumption, $e_j$ is labor earnings, $r a_j$ represents the households’ returns on assets $a_j$, and $SS$ and $PP$ represent the household’s Social Security benefits and pensions, which depend on the worker’s retirement ($R$) age:

$$y_j = e_j + r a_j, j \in \{S, ..., R - 1\}$$

and

$$y_j = SS_j(R) + PP_j(R) + r a_j, j \in [R, ..., D].$$

Furthermore, consumption from income, assets, and benefits is set so that:

$$c_j + a_{j+1} = y_j + a_j, j \in [S, ..., R - 1] \text{ before retirement (R), and}$$
$$c_j + a_{j+1} = y_j + a_j, j \in [R, ..., D]$$ from retirement to death ($D$).²

In other words, the economic 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.

Even in this basic formulation of the saving decision, the 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 expected inflation, to name just a few. Moreover, they have to perform calculations that require, at minimum, an understanding of compound interest and the time value of money.

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

3. Basic and advanced financial literacy

3.1 Basic financial literacy

Several surveys exist that report information on financial knowledge in sub-groups or among the whole U.S. population.³ However, these surveys rarely provide information on variables related to economic outcomes such as saving, asset allocation, or retirement planning. In an effort to combine data on financial literacy with data on

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² There is also the condition that assets in the last period of life are equal to zero and that the consumer does not die leaving any debt.
³ See Lusardi and Mitchell (2007b) for an overview of these surveys.
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), and this module has now been added to the National Longitudinal Survey of Youth (NLSY). These and other questions measuring financial knowledge have also been added to the Rand American Life Panel (ALP). Adding these types of questions to large U.S. surveys is important not only because it allows researchers to evaluate levels of financial knowledge but, most importantly, because it makes it possible to link financial literacy to a rich set of information about household financial behavior.

Given the limited number of questions that can effectively be added to surveys, researchers have to infer financial literacy from a handful of questions only. It’s important to consider what should be asked to assess whether respondents possess financial literacy. Moreover, since financial literacy itself could be a choice variable, it is important to consider what additional questions should be added to surveys to be able to assess the effect of literacy on financial behavior.5

The three questions Lusardi and Mitchell (2006) devised for the HRS measure basic but fundamental concepts, such as the working of interest rates, the effects of inflation, and the concept of risk diversification. 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?

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4 Moreover, they have been added to the 2005 Dutch DNB Household Survey (van Rooij, Lusardi and Alessie 2007), a 2007 pilot survey of participants in Mexico’s privatized Social Security plan (Hastings 2007) and to other surveys covering specific groups of the U.S. population, such as participants to the state employees plan in the state of Nebraska (Medill 2007).

5 For a discussion of the measurement of financial literacy, see van Rooij, Lusardi, and Alessie (2007).
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.”

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.

Results from this survey module reveal an alarmingly low level of financial literacy among older individuals in the United States. The sample covers respondents who are 50 or older, with the average age being 65. 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. This is not only an important finding but it also allows researchers to differentiate among different levels of financial sophistication even when using a limited number of questions to measure financial literacy.

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. These segment is particularly useful to study as they should be close to the peak of their wealth accumulation and should have dealt with many financial

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6 In addition to the list of answers provided above, respondents can also choose that they do not know the answer to the question (DK), or they can refuse to answer (refusal).
7 See Lusardi and Mitchell (2006) for details.
decisions already (mortgages, car loans, credit cards, pension contributions, etc.). The following questions were posed to these respondents in the 2004 HRS core data: 8

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. While more than 80 percent of respondents were able to do a simple percentage calculation, only about half could divide $2 million by 5. Remarkably, 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. Lusardi and Mitchell (2007b) and Smith and Stewart (2007) survey the evidence on financial literacy in the United States and in other countries and report similar findings.

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8 While the module only covers a subset of respondents in the HRS, these questions were asked to all Early Baby Boomers in the 2004 HRS.
3.2 Advanced literacy

To competently make saving and investment decisions, individuals need knowledge beyond the fundamental financial concepts discussed above, including understanding of the relationship between risk and return; how bonds, stocks and mutual funds work; and basic asset pricing. To quantify how knowledgeable individuals are in this area, Lusardi devised several additional questions for the ALP. Most of these questions were earlier added to the Dutch DNB Household Survey\(^9\) and are similar to questions used in other U.S. surveys.\(^{10}\) Because the question about risk diversification was found to be hard 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 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. Safer: 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

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\(^9\) See van Rooij, Lusardi, and Alessie (2007) for a detailed explanation and review of these questions.

\(^{10}\) 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.
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
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.

The average age of the ALP sample is almost 53, and most respondents are between the ages of 40 and 60. The sample is composed mostly of highly educated (over half have at least a college education) and high-income (almost 30 percent earn $100,000 or more) respondents. This sample characteristic is partly due to the fact that the survey is done online, and frequent internet users are not a representative sample of the U.S. population. Yet it is useful to see how these respondents fare when asked questions about financial concepts they should have dealt with in their financial decisions.11

Responses to the more complex battery of advanced 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 only about one-third of the sample knows about the relationship between bond pricing and interest rates, indicating striking ignorance of how assets are priced.12 Moreover, while the large

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11 See Lusardi and Mitchell (2007c) for details.
12 Very similar findings are provided by Moore (2003), which also reports that the fraction of correct responses to questions measuring sophisticated knowledge is very low.
majority of respondents responded correctly to several of the more advanced questions, only one-fifth of respondents were able to answer all of these questions correctly (Table 2, panel B). Thus, advanced knowledge is not widespread, even among a sample of highly educated respondents.13

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 2007). 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.” When results were tallied using standard grading criterion in 2005, adults had an average score of C, while the high school population fared even worse, with most earning an F. Hilgert, Hogarth, and Beverly (2003) examine

13 When levels of literacy are low, one may wonder whether respondents even understand the meaning of the questions they are asked. To investigate whether the wording of questions matters, two randomly chosen groups of respondents to the ALP were posed the same questions but with different wording. This was implemented for three questions: a rather simple question about the risk differences between bonds and stocks (a first group was asked: “Stock are normally riskier than bonds; true or false?” while a second group was asked: “Bonds are normally riskier than stocks; true or false?”); a more difficult question about risk diversification (a first group was asked: “Buying a company stock usually provides a safer return than a stock mutual fund; true or false?” while a second group was asked: “Buying a stock mutual fund usually provides a safer return than a single company stock; true or false?”); and the most difficult question about the link between bond prices and interest rates (a first group was asked: “If the interest rate falls, what should happen to bond prices?” and a second group was asked: “If the interest rate rises, what should happen to bond prices?”). The wording of the question did not matter for the first two questions, but it did matter for the third question, showing a fair amount of guessing and measurement error in the responses to complex financial literacy questions. See Lusardi and Mitchell (2007c) for details.
data from the 2001 Survey of Consumers, where 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 and Moore 2003).

3.3 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/cohort (Figure 1a). 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 (Figure 1b). Financial literacy varies widely among education groups (Figure 1c). Only half of respondents with less than a high school education can do a simple calculation about interest rates, and close to 20 percent state they do not know the answer to this question. 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 (Figure 1d). Approximately half of African-Americans correctly answer the question about interest rate calculations, and the proportion of correct answers is even smaller among Hispanics.
These results are not specific to the age groups covered in the HRS, but are common to many other surveys on financial literacy.\textsuperscript{14} Moreover, the findings outlined above are already present among young respondents. For example, Mandell (2007) focuses on a small group of students who are determined to be financially literate (defined by using a cut-off 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.\textsuperscript{15} 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.

3.4 Does financial literacy matter?

As mentioned before, one of the major advantages of inserting questions about financial literacy in major U.S. surveys is that researchers can assess whether literacy

\textsuperscript{14} See Lusardi and Mitchell (2007b) for a review.
\textsuperscript{15} See van Rooij, Lusardi, and Alessie (2007).
influences financial decision-making. Table 3 displays the relationship between financial literacy and retirement planning, which is a powerful predictor of wealth accumulation. Clearly, 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 noted before women, minorities and those with low education are disproportionately less likely to be financially literate. Even after accounting for many demographic characteristic, Table 3 (column III) shows that financial literacy continues to be an important determinant of planning.16

One may argue that financial literacy and retirement planning are both decision variables and that planning may also affect financial knowledge. For example, 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 an individual’s current financial literacy. Lusardi and Mitchell (2007c) address this issue using information on financial literacy in the past—prior to individuals entering the job market. They find that those who were financially literate when young are more likely to plan for retirement later in life, showing that it is literacy that affects planning and not the other way around.

16 See, also, Lusardi and Mitchell (2006).
Advanced financial literacy also matters for financial decision-making. Van Rooij, Lusardi, and Alessie (2007) show that financially sophisticated households are more likely to participate in the stock market. They overcome the problem that participation in the stock market or success in investing may also influence financial knowledge using the same methodology of Lusardi and Mitchell (2007c), i.e., they rely on individuals’ financial knowledge prior to investing in the stock market. They find that who were literate when young are more likely to invest in stocks, again showing there is an independent effect of literacy on stock market participation.

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 lower amounts of wealth. Brown, Casey, and Mitchell (2007) show that those who are more financially literate are more likely to annuitize rather than take retirement wealth as a lump-sum. Agarwal et al. (2007) show that financial mistakes are most prevalent among the young and the elderly—demographic groups that display the lowest amount of financial knowledge and cognitive ability. Hilgerth, 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 were disproportionately investors with low education. Those investors also seem less likely to know the terms of their mortgages, including the interest rates they pay (Bucks and Pence 2006 and Moore 2003).
4. Financial education

As additional evidence that financial illiteracy is considered a severe impediment to saving, both the government and employers have promoted financial education programs. Most large firms, particularly those with DC pensions, offer some form of education programs (Bernheim and Garrett 2003). The evidence on the effectiveness of these programs is so far mixed.17 Only a few studies find that those who attend financial education programs, such as retirement seminars, are much more likely to save and contribute to pensions (Bernheim and Garrett 2003 and Lusardi 2002, 2004).

Clearly, those who attend seminars are not necessarily a random group of individuals. Because attendance is voluntary, it is likely that workers who attend already have a proclivity to save, and it is hard to disentangle whether it is seminars per se or the characteristics of seminar attendees that explain the higher saving rates of attendees shown in the empirical estimates. However, Bernheim and Garrett (2003) argue that seminars are often remedial, i.e., offered in firms where workers do little or no saving. If this is the case, the effect of seminars is underestimated under conventional estimation methods.

Lusardi (2004) uses data from the HRS and confirms the findings of Bernheim and Garrett (2003). Consistent with the fact that seminars are remedial, she finds that the effect of seminars is particularly strong for those at the bottom of the wealth distribution and those with low education. As shown in Table 4, retirement seminars are found to have a positive effect mainly in the lower half of the wealth distribution and particularly for those with low education. Estimated effects are sizable, particularly for the least

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wealthy, for whom attending seminars appears to increase financial wealth (a measure of retirement savings that excludes housing and business equity) by approximately 18 percent.\textsuperscript{18} Note also that seminars affect not only private wealth but also measures of wealth that include pensions and Social Security wealth, perhaps because seminars provide information about pensions and encourage workers to participate and contribute (Gustman and Steinmeier 2007).

One can also learn from the experience of Individual Development Accounts (IDAs), which are subsidized savings accounts targeted to the poor. One of the features of IDAs is that they require general financial education; participants are offered several hours and sessions of financial education. Financial education proves effective and is associated with a sizable increase in savings among IDA participants (Schreiner and Sherraden 2007). However, the effect of education is non-linear; after 10 hours of education, there seems to be no additional discernible effects on saving (Sherraden and Boshara 2007). This suggests that the payoff in financial education can be reaped by offering a sizable, yet limited, number of financial education sessions.

In addition to fostering saving among the poor, financial education can also affect behavior toward debt. For example, there is some evidence that financial counseling can be effective in reducing debt levels and delinquency rates (Hirad and Zorn 2001 and Elliehausen, Londquist, and Staten 2003).

Clark and D’Ambrosio (2007) have examined the effects of seminars offered by TIAA-CREF to a variety of institutions. The objective of the seminars is to provide

\textsuperscript{18} Moreover, Lusardi (2005) uses the supply of retirement seminars to pin down the direction of causality between seminars and saving. Specifically, she uses the proportion of large firms across states as an instrument for retirement seminars. She finds that those who are more likely to be exposed to retirement seminars because they live in states with a high proportion of big firms accumulate more wealth.
financial information that would assist individuals in the retirement planning process. Their empirical analysis is based on information obtained in three surveys: Participants completed a first survey prior to the start of the seminar, a second survey at the end of the seminar, and a third survey several months later. Respondents were asked whether they had changed their retirement age goals or revised the desired level of retirement income after the seminar.

After attending the seminar, several participants stated an intent to change their retirement goals and many revised their level of retirement income. While a small percentage of respondents changed their desired retirement age, more than a quarter altered their retirement income goals, showing that the information provided in the seminars did have some effect on behavior. Women were particularly receptive of seminars. Before attending the seminars, women reported less confidence in their ability to attain their retirement goals than men. But women were substantially more likely than men to increase their expected retirement age and also to alter their retirement goals. Thus, women seem more responsive to financial education, perhaps because they are less likely to be financially literate.

A finding that is common in financial literacy programs is that, for many participants, intentions did not translate into actions. When surveyed several months later, many of those who had intended to make changes had not implemented them. Thus, financial education programs may be of limited effectiveness in the short run; it may take several months or years for programs to work. Moreover, it may be important to find ways to more effectively stimulate an active choice among seminar participants.19

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19 See Lusardi, Keller and Keller (2007) for an alternative program aimed to stimulate an active choice among new hires at a non-for-profit institution.
Other papers have reported more modest effects of education programs. Duflo and Saez (2003, 2004) investigate the effects of exposing employees of a large not-for-profit institution to a benefit fair. This study is notable for its rigorous methodology; a randomly chosen group of participants was given incentives to participate in the benefit fair, and their behavior was compared with that of another similar group, which was not offered incentives to attend the fair. This methodology overcomes the problem mentioned before that those who attend education programs may already be inclined to save. This is clearly important, and findings from this study show that the benefit fair induced participants to increase their participation in pensions, but the effect on saving was almost negligible. Perhaps the most relevant result of this study is how pervasive peer effects are; not only participants but also their colleagues who did not attend the benefit fair were affected by it, providing evidence that individuals rely on the behaviors of those around them to make financial decisions, a finding documented in many other studies (Brown et al. 2007 and Hong, Kubik, and Stein 2004).  

Financial education programs deliver disappointing results among high school students. As reported by Mandell (2007), students who took courses in financial management or personal finance did not do any better on financial literacy tests than students who did not take any such course. This finding does not seem to be explained by either the quality of the students who enroll in such courses, the training of the teachers, or the quality of the courses. However, a school-based educational program that is consistently related to higher financial literacy scores is the stock market game. Those who play a stock market game in class do 3 to 4 percentage points better than all students.

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20 For a discussion of the tools and sources of advice that individuals use to make financial decisions, see Lusardi (2007).
on financial literacy tests. This may provide some guidance on how literacy courses could be improved upon.

5. Discussion

As shown throughout this paper, the existence of financial literacy should not be taken for granted. Financial illiteracy is widespread and particularly acute among specific groups, including those with low education, women, and minorities. Given the increased complexity of day-to-day financial transactions, the evidence of illiteracy raises important questions for policy.

The mixed evidence on the effectiveness of financial education programs has led some to question whether it is worth trying to improve financial literacy. In fact, it is not clear there is even a choice. As it was impossible to live and operate efficiently in the past without being literate, i.e., knowing how to read and write, so it is very hard to live and operate efficiently today without being financially literate. Given the complexity of current financial instruments and the financial decisions required in everyday life, from comparing credit card offerings, to choosing methods of payments, to deciding how much to save, where to invest, and how to get the best loan, individuals need to know how to read and write financially.

Note that, as with reading and writing, the objective of a policy for financial literacy should be basic knowledge. While it may not be feasible to transform financially illiterate people into sophisticated investors, it may be possible to teach them a few principles about the basics of saving and investing. Moreover, as illiteracy was not
eradicated with a handful of lessons or in a matter of months, so financially illiteracy cannot be eradicated with a few seminars or one benefit fair.

Set in this framework, it is clear that some standards for financial literacy are needed. What do people need to know? What should be the pillars of financial literacy programs? Setting these standards will be the backbone of devising financial education programs. There are obvious benefits of having one institution that presides over or establishes those standards, and the Treasury Department seems an obvious candidate for this role.

Technology makes it possible to use interactive methods to teach. Thus, “students of financial literacy” do not necessarily have to attend classes at school, but can learn from courses on-line (or from CDs or DVDs) from their home. Courses can also be customized and tailored to the different needs and levels of financial knowledge. Moreover, as the evidence on the effectiveness of the stock market game in high schools seems to suggest, it may be important to find ways to make courses engaging and to stimulate interest in acquiring financial literacy.

New ideas also deserve consideration. For example, as discussed by Sherraden and Boshara (2007), it is not necessarily the case that people first become financially literate and then save and accumulate assets. It may also be that, when people begin to accumulate assets, they become more interested in improving their literacy. Thus, providing economic incentives, such as a small fund for children’s education or for retirement, may be one way to encourage people to become financially literate.

Moreover, as mentioned before, illiteracy can be linked to financial mistakes. Who will pay for these mistakes? The individual or society at large? If taxpayers will be
asked to support those who have made mistakes, there is a role for regulation and for implementing “mandatory” programs. One such program could be to require people to acquire some basic financial knowledge (Alesina and Lusardi, 2006). In the same way people are required to have a driving license before they venture out on the road, a “financial license” could be required before individuals contribute to their pensions, invest their pension assets, or borrow to buy a house. In this way, individuals may learn about some basic financial concepts and may reduce their reliance on random advice and potentially misleading tips from those around them.

Several initiatives have been undertaken in other fields with the objective “to educate” consumers, and they provide suggestions for financial education as well. For example, in the field of health, several guidelines have been offered on how to eat healthily. In the same way that a “food pyramid” provides general guidelines on how people should eat, a “saving pyramid” could provide general guidelines on how to save and invest. Principles such as diversification of investments, exploitation of the power of interest compounding, taking advantage of tax-favored assets or employer matches are basic concepts that can benefit every investor. Clearly, there is already a lot of information on these topics. However, as there are many books about diets, so there are many books about how to save and invest, and it may be important to provide a “seal of approval” from experts in the field. For example, one official website that people can turn to may be more powerful than the many websites that are now available and for which there is no guarantee about quality.

Given the current low levels of financial literacy, employers and the government should devise and encourage programs that simplify financial decision-making as well as
provide sources of reliable financial advice. One way to reduce the barriers that individuals face when making saving decisions is to simplify their planning process. For example, Lusardi, Keller and Keller (2007) used a social marketing approach to develop a planning aid to motivate and encourage new hires at a not-for-profit institution to open and contribute to supplementary retirement accounts. The planning aid they designed displays several interesting features. First, it breaks down the process of enrollment in supplementary pensions into several small steps, describing to participants exactly what they need to do to be able to enroll online. Moreover, the aid provides several pieces of information to help overcome barriers to saving, such as describing the low minimum amount of income employees can contribute (in addition to the maximum) and indicating the default fund that the employer has chosen for them (a life-cycle fund). Finally, the planning aid contains pictures and messages designed to motivate participants to save.

The planning aid was designed following thorough data collection. They devised a survey asking explicitly about barriers to saving, sources of financial advice, level of financial knowledge, and attractive features of a pension plan. Moreover, they conducted focus groups and in-depth interviews (with both employees and human resources administrators) to shed more light on the impediments to saving. These data-collection methods, common in the field of marketing, are well suited to capturing the wide heterogeneity relating to individuals’ saving decisions. The program was very successful; contribution rates to supplementary pensions tripled after the introduction of the planning aid.

The results of this program have implications for financial education programs and policies to foster saving. First, while economic incentives such as employers’
matches or tax advantages may be useful, there are many more methods that can be employed to make people save. In fact, given the massive lack of information and lack of financial knowledge that exists in the general population, programs aimed to simplifying saving decisions might be more cost effective alternatives than tax incentives. Second, individuals are most prone to decision-making in specific time periods. For example, the start of a new job pushes people to think about saving (often because they have to make decisions about their pension) and it may be very important to exploit those “teachable moments.” Third, to be effective, programs have to recognize the many differences among individuals, not only in terms of preferences and economic circumstances, but also in their existing levels of information, financial sophistication, and ability to carry through plans. In other words, relying on “one-size-fits-all” principles can lead to rather ineffective programs.
References


http://www.dartmouth.edu/~vox/0607/0724/lusardi.html


Table 1: Financial Literacy Among Early Baby Boomers

<table>
<thead>
<tr>
<th>Question Type</th>
<th>Correct (%)</th>
<th>Incorrect (%)</th>
<th>Do Not Know (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage Calculation</td>
<td>83.5</td>
<td>13.2</td>
<td>2.8</td>
</tr>
<tr>
<td>Lottery Division</td>
<td>55.9</td>
<td>34.4</td>
<td>8.7</td>
</tr>
<tr>
<td>Compound Interest*</td>
<td>17.8</td>
<td>78.5</td>
<td>3.2</td>
</tr>
</tbody>
</table>

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).
Table 2A. Advanced financial literacy
Weighted percentages of total number of respondents (N=812)

<table>
<thead>
<tr>
<th>Question</th>
<th>Correct</th>
<th>Incorrect</th>
<th>Do not Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Which statement describes the main function of the stock market?</td>
<td>75.5</td>
<td>17.7</td>
<td>6.8</td>
</tr>
<tr>
<td>2) Function of mutual fund.</td>
<td>72.4</td>
<td>11.3</td>
<td>16.3</td>
</tr>
<tr>
<td>3) If the interest rate falls/rises, what should happen to bond prices:</td>
<td>36.7</td>
<td>41.1</td>
<td>22.2</td>
</tr>
<tr>
<td>rise/fall/stay the same/none of the above?</td>
<td>2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4) Buying a company fund/stock mutual usually provides a safer</td>
<td>80.2</td>
<td>3.3</td>
<td>16.5</td>
</tr>
<tr>
<td>return than a stock mutual fund/a company fund. True or false?</td>
<td>2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5) Stocks/Bonds are normally riskier than bonds/stocks. True or false?</td>
<td>81.7</td>
<td>4.6</td>
<td>13.8</td>
</tr>
<tr>
<td>6) Considering a long time period (for example 10 or 20 years), which</td>
<td>70.1</td>
<td>20.6</td>
<td>9.4</td>
</tr>
<tr>
<td>asset normally gives the highest return: savings accounts, bonds or</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stocks?</td>
<td>7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7) Normally, which asset displays the highest fluctuations over time:</td>
<td>88.8</td>
<td>3.7</td>
<td>7.5</td>
</tr>
<tr>
<td>savings accounts, bonds, stocks?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8) When an investor spreads his money among different assets, does the</td>
<td>81.2</td>
<td>12.9</td>
<td>5.9</td>
</tr>
<tr>
<td>risk of losing money increase, decrease or stay the same?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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. Adapted from Lusardi and Mitchell (2007c).

Table 2B. Advanced literacy: Summary of responses
Weighted percentages of total number of respondents (N=812)

| Number of correct, incorrect and do not know answers (out of eleven questions) |
|---------------------------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| None                            | .7      | 2.7     | 3.6     | 6.2     | 8.9     | 13.3    | 17.7    | 25.6    | 21.4    | 5.9     |
| Correct                         |         |         |         |         |         |         |         |         |         |         |
| Incorrect                       | 35.6    | 33.0    | 18.4    | 8.1     | 3.5     | 1.5     | 0       | 0       | 0       | 1.2     |
| Do not know                     | 56.5    | 18.7    | 11.0    | 6.3     | 3.3     | 1.9     | .6      | 1.2     | .5      | 1.0     |

Note: Categories do not sum up to 100% because of rounding. Adapted from Lusardi and Mitchell (2007c).
Table 3: Empirical Effects of Financial Literacy on Retirement Planning

<table>
<thead>
<tr>
<th>Probability of Being a Retirement Planner</th>
<th>I</th>
<th>II</th>
<th>III</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct Percentage Calculation</td>
<td>-.016</td>
<td>-.012</td>
<td>-.034</td>
</tr>
<tr>
<td></td>
<td>(.061)</td>
<td>(.062)</td>
<td>(.060)</td>
</tr>
<tr>
<td>Correct Lottery Division</td>
<td>.059*</td>
<td>.034</td>
<td>.001</td>
</tr>
<tr>
<td></td>
<td>(.030)</td>
<td>(.031)</td>
<td>(.032)</td>
</tr>
<tr>
<td>Correct Compound Interest</td>
<td>.153***</td>
<td>.149***</td>
<td>.114***</td>
</tr>
<tr>
<td></td>
<td>(.035)</td>
<td>(.035)</td>
<td>(.039)</td>
</tr>
<tr>
<td>DK Percentage Calculation</td>
<td>.021</td>
<td></td>
<td>.054</td>
</tr>
<tr>
<td></td>
<td>(.068)</td>
<td></td>
<td>(.067)</td>
</tr>
<tr>
<td>DK Lottery Division</td>
<td>-.154***</td>
<td>-.141***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.050)</td>
<td>(.051)</td>
<td></td>
</tr>
<tr>
<td>DK Compound Interest</td>
<td>-.114</td>
<td>-.073</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(.080)</td>
<td>(.081)</td>
<td></td>
</tr>
<tr>
<td>Demographic controls</td>
<td>No</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>.031</td>
<td>.038</td>
<td>.074</td>
</tr>
</tbody>
</table>

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 the President and Vice President of the United States). 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).
Table 4: The Effect of Retirement Seminars on Retirement Accumulation

<table>
<thead>
<tr>
<th></th>
<th>Total sample</th>
<th>1st quartile</th>
<th>median</th>
<th>3rd quartile</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. Financial net worth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>17.6%**</td>
<td>78.7%**</td>
<td>32.8%**</td>
<td>10.0%</td>
</tr>
<tr>
<td>Low education</td>
<td>19.5%</td>
<td>95.2%**</td>
<td>30.0%**</td>
<td>8.8%</td>
</tr>
<tr>
<td>High education</td>
<td>13.1%</td>
<td>70.0%**</td>
<td>19.4%**</td>
<td>10.2%</td>
</tr>
<tr>
<td><strong>b. Total net worth</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>5.7%</td>
<td>29.2%**</td>
<td>8.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Low education</td>
<td>3.4%</td>
<td>27.0%**</td>
<td>7.1%</td>
<td>4.0%</td>
</tr>
<tr>
<td>High education</td>
<td>7.3%</td>
<td>26.5%**</td>
<td>6.5%</td>
<td>3.6%</td>
</tr>
<tr>
<td><strong>c. Total net worth + Pensions and Social Security</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total sample</td>
<td>16.0%**</td>
<td>18.6%**</td>
<td>20.4%**</td>
<td>17.2%**</td>
</tr>
<tr>
<td>Low education</td>
<td>12.7%**</td>
<td>14.7%**</td>
<td>12.7%**</td>
<td>9.5%**</td>
</tr>
<tr>
<td>High education</td>
<td>17.7%**</td>
<td>25.4%**</td>
<td>25.8%**</td>
<td>17.0%**</td>
</tr>
</tbody>
</table>

Note: This table reports the percentage changes in different measures of retirement accumulation resulting from attending retirement seminars. Financial net worth is defined as the sum of checking and savings accounts, certificate of deposits and Treasury bills, bonds, stocks, IRAs and Keoghs and other financial assets minus short-term debt. See Table 1 for the definition of total net worth. * significant at the 10% level ** significant at the 5% level. Adapted from Lusardi (2004).
Figure 1a

Distribution of Responses Across Age

Figure 1b

Distribution of Responses Across Gender
Figure 1c

Distribution of Responses to Compound Interest Across Education

<table>
<thead>
<tr>
<th>Response</th>
<th>Elementary</th>
<th>Less than High School</th>
<th>High School</th>
<th>Some College</th>
<th>College and More</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct</td>
<td>30.20%</td>
<td>51.40%</td>
<td>64.80%</td>
<td>74.00%</td>
<td>81.20%</td>
</tr>
<tr>
<td>Incorrect</td>
<td>35.80%</td>
<td>28.80%</td>
<td>24.00%</td>
<td>20.30%</td>
<td>13.80%</td>
</tr>
<tr>
<td>DK</td>
<td>28.30%</td>
<td>17.40%</td>
<td>10.30%</td>
<td>4.70%</td>
<td>3.30%</td>
</tr>
</tbody>
</table>
Figure 1d

Distribution of Responses to Compound Interest Across Race

<table>
<thead>
<tr>
<th>Response</th>
<th>White</th>
<th>Black</th>
<th>Hispanic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct</td>
<td>72.30%</td>
<td>53.90%</td>
<td>46.70%</td>
</tr>
<tr>
<td>Incorrect</td>
<td>19.00%</td>
<td>29.20%</td>
<td>35.20%</td>
</tr>
<tr>
<td>DK</td>
<td>7.50%</td>
<td>16.30%</td>
<td>14.30%</td>
</tr>
</tbody>
</table>