

## **POLICY BRIEF**

### **The Importance of Financial Literacy: Evidence and Implications for Financial Education Programs\***

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Workers and retirees have increasingly been asked to take unprecedented responsibility for their retirement and other saving, as defined benefit pensions decline and government programs face insolvency in one country after another. As a result, consumers now confront a bewildering array of financial decisions and a wide range of financial products ranging from 401(k) plans and Roth and regular Individual Retirement Accounts to phased withdrawal plans, annuities, and many more. This process implies that it is becoming ever more important for households to acquire and manage economic know-how. But in practice, there is widespread financial illiteracy. Many households are unfamiliar with even the most basic economic concepts needed to make sensible saving and investment decisions. This has serious implications for saving, retirement planning, retirement, mortgage, and other financial decisions, and it highlights a role for policymakers working to boost financial literacy and education in the population.

### **U.S. Evidence on Financial Literacy**

Researchers have undertaken several studies of financial literacy in the United States. For instance, a survey conducted for the National Council on Economic Education (NCEE) in 2005 indicated that nearly all U.S. adults believe that it is “important to have a good understanding of economics.” But despite this goal, the evidence shows that actual financial knowledge is sorely deficient for both high school students and working-age adults. The survey consisted of a 24-item questionnaire on topics grouped into categories including “Economics and the Consumer;” “Money, Interest Rates and Inflation;” and “Personal Finance.” When results were tallied using standard grading criterion, adults had an average score of C while the high school population fared even worse, with most earning an F.

Low levels of financial literacy are confirmed by related research by the Jump\$tart Coalition for Personal Financial Literacy focusing on U.S. high school students (Mandell, 2004). In both recent surveys (2004 and 2006) on basic personal financial management skills and how to improve them, students fared poorly on credit management and personal finance questions and knew little about stocks, bonds, and other investments.

Americans' lack of financial knowledge has been confirmed in the larger population by Hilgert and Hogarth (2002), who used data from the University of Michigan's Survey of Consumers. Some 1,000 respondents between the ages of 18 and 97 were given a 28-question True/False Financial Literacy quiz, with questions examining knowledge about credit; saving patterns; mortgages, and general financial management. Overall, that study found that respondents could answer only two-thirds of the questions correctly. They were best informed regarding mortgages (81% correct responses), followed by saving patterns (67% correct), credit cards (65% correct), and general financial management (60% correct). Respondents were less knowledgeable about mutual funds and the stock market: Only half knew that mutual funds do not pay a guaranteed rate of return, and 56% knew that "over the long-term, stocks have the highest rate of return on money invested" (for an overview, see Hogarth (2006)).

All of these studies found substantial differences among demographic groups: Those with low education, women, and Blacks and Hispanics display very low financial literacy, a common finding in other studies reported below.

To explore financial literacy in more depth, we have devised and fielded a purpose-built module on planning and financial literacy for the 2004 Health and Retirement Study (HRS), a survey that covers respondents over the age of 50 (Lusardi and Mitchell, 2006). This module includes questions measuring how workers made saving decisions, how they collected the

information for making these decisions, and, most important, whether they possessed the financial literacy needed to make informed decisions. Our research shows that only half of the HRS respondents surveyed could answer two simple questions regarding interest compounding and inflation correctly. Furthermore, only one in three could correctly answer those two questions plus an additional one on risk diversification. We also found that financial illiteracy was particularly acute for Blacks and Hispanics, women, and those with low educational attainment.

In related work, we employed data from the 2004 HRS to evaluate whether Baby Boomers are relatively well informed about financial matters (Lusardi and Mitchell, 2007a). Specifically we focused on Early Boomers (age: 51-56) in 2004. The following financial literacy questions were posed to these respondents:

- 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?”*

We called these variables, respectively, the “Percentage Calculation,” the “Lottery Division,” and the “Compound Interest” questions. Table 1 summarizes how this group of Boomers answered these questions. The good news is that over 80% got the Percentage Calculation question correct. But only about half could divide \$2 million by 5 to get the Lottery Division right, and only 18% correctly computed the compound interest question. Of those who got that

interest question wrong, 43% undertook a simple interest calculation, thereby ignoring the interest accruing on both principal and interest. These are uncomfortable findings, especially considering that these respondents are only a dozen years from retirement and, one surmises, have handled numerous financial decisions during their lives.

These figures hide wide differences among demographic groups. For example, financial literacy rises steeply with education: the more educated are much more likely to answer the questions correctly. Moreover, Blacks and Hispanics are much less likely to answer correctly than Whites.

Our findings confirm those provided by Bernheim (1998), who was among the first to warn of the lack of financial literacy among savers and investors. It also confirms the findings of studies on smaller samples. For example, the State of Washington sponsored a survey to assess financial literacy among its residents (Moore, 2003) and concluded that people are particularly uninformed about financial instruments. More than one third did not know that stocks had higher returns than bonds over the last forty years, and many did not know about risk diversification. Respondents were also uninformed about mutual funds: Many did not know what a no-load mutual fund was, or that mutual funds do not pay a guaranteed rate of return. Finally, a large fraction of these respondents did not understand interest rates, which was especially troublesome since a subset of the respondents had applied for loans. This study confirmed conclusions from surveys conducted by the Employee Benefit Research Institute. For example, their survey in 1996 showed that only 55 percent of workers knew that U.S. government bonds provided lower returns than the U.S. stock market over the past 20 years.

### **International Evidence on Financial Literacy**

Evidence on financial literacy from outside the United States 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 investment fundamentals, retirement planning and financial records, to basic arithmetic. In the Financial Terms section of the survey, 67% of respondents said they understood compound interest, but a mere 28% were rated as having a “good level” of comprehension when faced with an actual problem to solve. As in the United States case, those with low levels of financial literacy also had low education and income. This survey also confirmed the gender gap, with women concentrated in the lowest 20% of the literacy distribution. In the New Zealand survey of respondents age 18+, similar results obtained. Some 54% of respondents believed that fixed income investments would provide higher returns than stocks over an 18-year period, and again financial literacy was strongly positively correlated with socio-economic status.

The results extend to Europe, where 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. 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% of adult respondents knew little about equity and bond investments, and more than 50% lacked any knowledge of financial products (OECD, 2005). A Korean youth survey conducted by the Jump\$tart coalition in 2000 showed that young Koreans fared no better than their American counterparts when tested on economics and finance knowledge, with most receiving a

failing grade. Again, a positive correlation was detected between family income and education and the students' performance on the financial literacy test (OECD, 2005).

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

### **Linking Financial Literacy and Economic Behavior**

While the low levels of financial literacy are troubling in and of themselves, policymakers are most concerned by the potential implications of financial illiteracy for economic behavior. One example is offered by Hogarth, Anguelov, and Lee (2005), who demonstrate that consumers with low levels of education are disproportionately represented amongst the "unbanked," those lacking any kind of transaction account.

To further examine how financial illiteracy is tied to economic behavior, we used the 2004 HRS to connect financial knowledge to retirement planning abilities (Lusardi and Mitchell, 2007a). We found that those who are more financially knowledgeable are also much more likely to plan for retirement. Specifically, planners are most likely to know about interest compounding, which is clearly a critical variable to devise saving plans. Even after accounting for factors such as education, marital status, number of children, retirement status, race, and sex, we still found that financial literacy plays an independent role: Those who understand compound

interest and can do a simple lottery division are much more likely to have planned for retirement. This is important, since in related work, we have shown that lack of planning is tantamount to lack of saving (Lusardi and Mitchell, 2006).

Other authors have also confirmed the positive association between knowledge and financial behavior. For example, Calvet, Campbell, and Sodini (2005) find that more financially sophisticated households are more likely to buy risky assets and invest more efficiently. Van Rooji, Lusardi and Alessie (2007) find that respondents who are more financially sophisticated are more likely to invest in stocks. Hilgerth, Hogarth, and Beverly (2003) and Hogarth (2006) also document a positive link between financial knowledge and financial behavior.

Campbell (2006) has highlighted how household mortgage decisions, particularly the refinancing of fixed-rate mortgages, should be understood in the larger context of 'investment mistakes' and their relation to consumers' financial knowledge. This is a particularly important topic, given that most US families are homeowners and many have mortgages. In fact, many households are confused about the terms of their mortgages. Campbell (2006) also finds that younger, better-educated, better-off White consumers with more expensive houses were more likely to refinance their mortgages over the 2001-2003 period when interest rates were falling. His findings are confirmed by Bucks and Pence (2006), who examine whether homeowners know the value of their home equity and the terms of their home mortgages. They show that many borrowers, especially those with adjustable rate mortgages, underestimate the amount by which their interest rates can change and that low-income, low-educated households are least knowledgeable about the details of their mortgages. Further evidence of biases is provided by Stango and Zinman (2006), who thoroughly document the systematic tendency of people to underestimate the interest rate associated with a stream of loan payments. The consequences of

this bias are important: Those who underestimate the annual percentage rate (APR) on a loan are more likely to borrow and less likely to save.

Consumers are not only poorly informed about mortgages or confused about interest rates, they also know little about Social Security and pensions, two of the most important components of retirement wealth. Close to half of workers in the HRS sample analyzed by Gustman and Steinmeier (2004) could not report their type of pension plan, and an even larger number were ignorant of future Social Security benefits.

### **Programs Aimed at Fostering Retirement Saving**

Responding to reports of widespread financial illiteracy and workers' under-saving, some employers have begun to offer employees 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 and willingness to participate in these voluntary saving programs. Whether such programs have an impact is, of course, a key question (see Lyons et al, 2006).

The idea is that if seminars provide financial information and improve financial literacy, they should reduce workers' planning costs and thus enhance retirement saving. 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 the workers who attend them probably differ from those who do not (for instance, they 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 also be more patient or diligent, personal characteristics associated with higher wealth accumulation. Third, as noted by Bernheim and Garrett (2003), employers may

offer retirement education as a remedial device, when they perceive workers to be under-saving. 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.

Fortunately, the HRS can overcome some of these data challenges. For instance, Lusardi (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 HRS 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. Estimated effects are sizable, particularly for the least wealthy, for whom attending seminars appears to increase financial wealth (a measure of retirement savings that excludes housing equity) by approximately 18%. Other authors have also suggested that financial education can be effective when targeted at the least well-off (Caskey 2006).

Yet even when the impacts work in the predicted direction, they can be rather small in dollar terms. Thus Duflo and Saez (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 (2007) report that exposing workers to retirement seminars does influence workers' stated desire to save more. Yet many fail to follow through with their plans.

Further findings on the impact of financial education programs are available from Schreiner, Clancy, and Sherraden (2002). That project studied the effectiveness of Individual Development Accounts (IDAs), which are subsidized savings accounts targeted at the poor that provide matching contributions if the balance is used for a specific purpose (e.g. home purchase, starting a business, etc.). As part of the American Dream Demonstration, that study included 2,364 participants ages 13-72 (in 2001), of whom 80% were female. The project had a financial education component, and the authors found that those with no financial education saved less than those exposed to the educational program. But the effect was nonlinear: After 8–10 hours of financial education, the result tapered off with no appreciable additional increases in saving.

### **Concluding Remarks**

Financial literacy surveys in many developed nations show that consumers are poorly informed about financial products and practices. This is troubling because financial illiteracy may stunt peoples' ability to save and invest for retirement, undermining their wellbeing in old age. It is also a matter of significant concern that these deficiencies are concentrated among particular population subgroups—those with low income and low education, minorities, and women—where being financially illiterate may render them most vulnerable to economic hardship in retirement.

While more is being learned about the causes and consequences of financial illiteracy, it is still the case that one must be cautious when concluding that financial education has a potent effect on retirement saving. First, a small fraction of workers ever attend retirement seminars, so many are left untouched by this initiative. Second, widespread financial illiteracy will not be “cured” by a one-time benefit fair or a single seminar on financial economics. This is not

because financial education is ineffective, but rather because the cure is inadequate for the disease. Third, the finding that people have difficulty following through on planned actions suggests that education alone may not be sufficient. Rather, it is important to give consumers the tools to change their behaviors, rather than simply delivering financial education. Fourth, people differ widely in their degree of financial literacy and saving patterns are very diverse. Accordingly, a “one-size-fits-all” education program will do little to stimulate saving and could even be a disincentive to participate in a financial literacy effort.

Evidently, consumers require additional support for old-age retirement planning and saving. Also, education programs will be most effective if they are targeted to particular population subgroups, in order to address differences in saving needs and in preferences. As old-age dependency ratios rise across the developed world, and as government-managed pay-as-you-go social security programs increasingly confront insolvency, these issues will become increasingly important. As a result, the crucial challenge is to better equip a wide range of households with the financial literacy toolbox they require, so they can better build retirement plans and execute them.

## References

- Australia and New Zealand Banking Group (2005), "ANZ Survey of Adult Financial Literacy in Australia," November.
- 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.
- Bucks, Brian and Karen Pence (2006), "Do Homeowners Know Their House Values and Mortgage Terms?" Working Paper, Federal Reserve Board of Governors.
- Calvet, Laurent, John Campbell and Paolo Sodini (2005), "Down or Out: Assessing the Welfare Costs of Household Investment Mistakes," Harvard Institute of Economic Research Discussion Paper No. 2107.
- Campbell, John (2006), "Household Finance," *Journal of Finance*, 61, pp.1553-1604.
- Caskey (2006), "Can Personal Financial Management Education Promote Asset Accumulation by the Poor? Mimeo, Networks Financial Institute, Indiana, IN.
- Christelis, Dim trios, 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.
- Clark, Robert and Madeleine D'Ambrosio (2007), "Adjusting Retirement Goals and Saving Behavior: The Role of Financial Education," Working Paper, North Carolina State University.
- 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.
- Gustman, Alan and Thomas Steinmeier (2004), "What People Don't Know about their Pensions and Social Security," in William Gale, John Shoven and Mark Warshawsky (eds.), *Private Pensions and Public Policies*, Washington, DC: Brookings Institution, pp. 57-125.
- Hilgert, Marianne, Jeanne Hogarth and Sondra Beverly (2003), "Household Financial Management: The Connection between Knowledge and Behavior," *Federal Reserve Bulletin*, pp. 309-322.

Hilgert, Marianne and Jeanne Hogarth (2002), "Financial Knowledge, Experience and Learning Preferences: Preliminary Results from a New Survey on Financial Literacy," *Consumer Interest Annual*, Vol. 48, 2002.

Hogarth, Jeanne, Christoslav E. Anguelov, and Jinhoon Lee (2005), "Who Has a Bank Account? Exploring Changes Over Time, 1989-2001," *Journal of Family and Economic Issues*, Vol. 26, Number 1, March 2005.

Hogarth, Jeanne (2006), "Financial Education and Economic Development," paper presented at the G8 International Conference on Improving Financial Literacy, Moscow, November 2006.

John Hancock Financial Services (2002), *Insights into Participant Investment Knowledge and Behavior*, Eighth Defined Contribution Plan Survey.

Lyons, Angela, Lance Palmer, Koralalage Jayaratne, and Erik Scherpf (2006), "Are We Making the Grade? A National Overview of Financial Education and Program Evaluation," *Journal of Consumer Affairs*, 40, pp. 208-235.

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 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.

Mandell, Lewis (2004), *Financial Literacy: Are We Improving?* Washington, D.C.: Jump\$tart Coalition for Personal Financial Literacy.

Miles, David (2004), "The UK Mortgage Market: Taking a Longer-Term View," UK Treasury.

Moore, Danna (2003), "Survey of Financial Literacy in Washington State: Knowledge, Behavior, Attitudes, and Experiences," Technical Report n. 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.

Organization for Economics Co-Operation and Development (2005), *Improving Financial Literacy: Analysis of Issues and Policies*, Paris, France.

Van Rooij, Maarten, Annamaria Lusardi and Rob Alessie (2007), "Financial Literacy and Stock Market Participation," Working Paper, Dartmouth College.

Schreiner, Mark Clancy Margaret, and Michael Sherraden (2002), "Saving Performance in the American Dream Demonstration: A National Demonstration of Individual Retirement Accounts," Final Report, Center for Social Development, University of Washington, St. Louis.

Stango, Victor and Jonathan Zinman (2006), "Fuzzy Math and Red Ink: Payment/Interest Bias, Intertemporal Choice and Wealth Accumulation," Working Paper, Dartmouth College.

**Table 1: Financial Literacy Among Early Baby Boomers**  
(HRS observations = 1,984)

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

*Notes:* \*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. Adapted from Lusardi and Mitchell (2007a).

