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## Financial Literacy and Economic Outcomes: Evidence and Policy Implications

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### Abstract

This paper reviews what we have learned over the past decade about financial literacy and its relationship to financial decision-making around the world. Using three questions, we have surveyed people in several countries to determine whether they have the fundamental knowledge of economics and finance needed to function as effective decision-makers. We find that levels of financial literacy are low not only in the United States, but also in many other countries including those with well-developed financial markets. Moreover, financial illiteracy is particularly acute for some demographic groups, especially women and the less-educated. These findings are important since financial literacy is linked to borrowing, saving, and spending patterns. We also offer new evidence on financial literacy among high school students drawing on the 2012 Programme for International Student Assessment implemented in 18 countries. Last, we discuss the implications of this research for policy.

### Keywords

Financial literacy; financial decision-making; financial education

### JEL classification

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The modern economy increasingly requires consumers to make many complex and sometimes bewildering financial choices. Almost daily, our students, colleagues, relatives, and even strangers on airplanes ask us difficult questions including: “How many credit cards should I have, and how do I select them? Should I borrow for college, and how much is too much to pay? How much should I save in my 401(k) plan, and where do I invest it? Should I lease or buy a car? Should I rent or buy a place, and how much do I need to put down and what can I afford to pay? When can I afford to retire?” Obviously, not everyone needs an economics degree, but people do require some financial knowledge to make such decisions,

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or they should consult an advisor to help with these decisions. Nevertheless, our research shows that many people make poor economic decisions because they are financially illiterate. As we show below, financial ignorance can be expensive and even ruinous, for many.

Our goal in this paper is to provide an overview of existing work in this important field, and also we provide new evidence from the data collected by the Programme for International Student Assessment (PISA) of the Organisation for Economic Co-operation and Development (OECD). We conclude with a discussion of the implications of our findings for policy.

## Financial Illiteracy in the United States Is Widespread

Our first examination of financial literacy was fielded in 2004 in the Health and Retirement Study (HRS), a nationally representative survey of Americans over the age of 50. In that work we were astonished to learn that only half of older Americans knew the right answer to two basic questions about interest rates and inflation (and only one-third knew the right answer for these two plus a third question on risk diversification; the specific questions are listed below).<sup>1</sup>

Our three basic questions (since dubbed the “Big Three”) have now been fielded in numerous other surveys including several representative of the entire U.S. population, such as the American Life Panel and the National Financial Capability Study, and our findings widely confirmed.<sup>2</sup> The Big Three questions we designed, and which are reported below, have the virtue of being simple, relevant, brief, and good differentiators. Each of these aspects is an important attribute in the context of face-to-face, telephone, and online surveys.

### The “Big Three” Financial Literacy Questions

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
- Do not know
- Refuse to answer

2) Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account?

- More than today
- Exactly the same
- Less than today\*\*
- Do not know
- Refuse to answer

<sup>1</sup>See Lusardi and Mitchell (2011a).

<sup>2</sup>See Lusardi and Mitchell (2009c, 2011c).

**The “Big Three” Financial Literacy Questions**

3) Please tell me whether this statement is true or false. “Buying a single company’s stock usually provides a safer return than a stock mutual fund.”

- True
- False\*\*
- Do not know
- Refuse to answer

Source: Lusardi and Mitchell (2011a).

Note: Correct answers are indicated with asterisks.

## Financial Literacy Is Little Better Elsewhere

Wondering whether Americans might be unusual in their (lack of) financial knowledge, we launched several comparable international surveys (see Lusardi and Mitchell, 2011b; 2014; and Boisclair, Lusardi, and Michaud, 2014). Though some respondents responded more accurately than did Americans, we still found widespread financial illiteracy even in relatively rich countries with well-developed financial markets. These included Canada, Germany, the Netherlands, Switzerland, Sweden, Japan, Italy, France, Australia and New Zealand. Performance was markedly worse in Russia and Romania.

Being better-educated was always associated with having more financial knowledge (Figure 1) across the countries we examined,<sup>3</sup> yet we also found that education is not enough. That is, even well-educated people are not necessarily savvy about money.

Another striking finding common to the countries we studied is that men were much more likely than women to answer our questions correctly (Figure 2). Understanding why this is true and its potential consequences is an intriguing area for future research (Lusardi and Mitchell, 2008; Bucher-Koenen, Lusardi, Alessie, and van Rooij, 2014). It may result from traditional family structures in some countries: that is, to the extent that husbands traditionally worked for pay and wives were less exposed to the marketplace, men likely made more financial decisions than their wives. If so, one would anticipate the performance differences would narrow over time. Yet there is little evidence of a closing gap among the young (Lusardi, Mitchell and Curto, 2010; Bucher-Koenen, Lusardi, Alessie, and van Rooij, 2014 and the references therein).

Another striking finding which is also consistent across countries is that men are more confident about their financial knowledge than they should be. That is, even when they were wrong, they reported being ‘very confident’ about their answers. By contrast, women on average answered fewer of the financial knowledge questions correctly, but they were more likely to admit when they did not know how to answer our questions. This suggests that financial education may be more welcomed by women, should the opportunity arise.

<sup>3</sup>For brevity, we only report evidence for four countries; results are similar in the other countries covered in our international comparison of financial literacy (Lusardi and Mitchell, 2014).

We also found low levels of financial literacy among younger respondents. For instance, respondents at the beginning of their work careers (age 23–28) display little knowledge of interest compound, inflation, and risk diversification (Lusardi, Mitchell, and Curto, 2010). Similar findings are reported among the so-called Millennials (age 23–35), including those who have a college degree (de Bassa Scheresberg and Lusardi, 2014; de Bassa Scheresberg Lusardi and Yokoboski, 2014).

## New International Evidence on High School Students

Results discussed thus far cover mainly the adult population, but data recently collected by the OECD in the PISA study included international assessment among high school students.<sup>4</sup> The goal was to assess young students' (age 15) financial knowledge along with their ability to apply that knowledge to make financial decisions and plans for their future. This is important since young people today are confronting ever-more sophisticated financial products and services than did their parents. They also have more opportunity to take on financial risks, particularly in an environment where individuals must make choices regarding debt, spending, saving, healthcare coverage, and retirement planning. And finally, in many nations, high school students are charged with making some of the most important financial decisions of their lifetimes, namely whether to go to college, and if so, what to study.

To assess young peoples' level of financial sophistication, the PISA test covered money and transactions, planning and managing finances, risk and reward, and the financial landscape. As of 2012, some 18 countries participated in the assessment.<sup>5</sup> Interestingly, results mimic those from the adult populations cited above.<sup>6</sup> Figure 3 shows that, as before, U.S. respondents ranked in the middle, despite the fact that the U.S. plays such a key role in the global economy and has quite-developed financial markets. Near neighbors (from a performance standard) are Spain and Slovenia, with better performance from Australians and New Zealanders. Top-scoring students were found in Shanghai, China.

Several other important findings also emerge from these data. First, many more boys perform at both the top and bottom of the financial literacy scale, compared to girls. Second, a sizeable part of the variation in financial literacy is explained by student socio-economic backgrounds. In other words, inequality in financial literacy is already apparent in high school, and these differences appear to increase later in life.

## Why Financial Literacy Matters

Particularly in the wake of the financial crisis, it is important to ask whether financial illiteracy translates into costly economic behavior and outright financial mistakes. We argue that there is substantial evidence that more financially savvy people are more likely to plan, save, invest in stocks, and accumulate more wealth (Lusardi and Mitchell, 2014). They also

<sup>4</sup>See <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-vi.htm>.

<sup>5</sup>The 18 countries were Australia, Belgium (Flemish Community), China (Shanghai), Colombia, Croatia, Czech Republic, Estonia, France, Israel, Italy, Latvia, New Zealand, Poland, Russia, Slovak Republic, Slovenia, Spain, and the United States.

<sup>6</sup>Lusardi chairs the Financial Literacy Expert Group that designed the PISA financial literacy assessment.

have been shown to be less likely to have credit card debt, and when they do borrow, they manage loans better, paying off the full amount each month rather than just the minimum due (Lusardi and Tufano, 2009, 2015). They also refinance their mortgages when it makes sense to do so, tend not to borrow against their 401(k) plans, and are less likely to use high-cost borrowing methods (e.g. payday loans, pawn shops, auto title loans, and refund anticipation loans).<sup>7</sup> Gerardi, Goette, and Meier (2013) showed that numerical ability (assessed with questions measuring financial literacy and math knowledge) contributed substantially to widespread defaults on subprime mortgages in the recent financial crisis. Agarwal, Driscoll, Gabaix, and Laibson (2009) focused on financial “mistakes” related to decisions about debt, showing not only that these were consequential in terms of costs but also that they were prevalent among the young and the old, groups with the lowest levels of financial literacy.

It is worth highlighting our conclusion that financial literacy can be particularly important for the young. In the U.S., for instance, the so-called Millennials (those born from XX to YY) are now entering the labor market burdened by much credit card and student loan debt (de Bassa Scheresberg and Lusardi, 2014; de Bassa Scheresberg, Lusardi and Yakoboski, 2014). Young people also rely on high-cost methods of borrowing (e.g., pay-day loans; see de Bassa Scheresberg, 2014). Their lack of clear understanding regarding basic financial concepts is therefore likely to undermine efforts to establish themselves as well-functioning adults (Lusardi, Mitchell, and Curto, 2010).

Financial knowledge can also pay off in terms of saving and investment efficiency. In a recent study we explored a unique dataset from a large financial institution which reported on employees’ financial knowledge along with administrative information drawn from that firm’s retirement plan (Clark, Lusardi, and Mitchell 2014). Our analysis of financial knowledge and investor performance showed that more knowledgeable individuals invest in more sophisticated assets, generating higher expected returns on retirement saving along with lower nonsystematic risk.

Additionally we have shown that answering just one additional financial question correctly is associated with a 3–4 percentage point greater probability of planning for retirement in the United States, Japan, Canada, and Germany. Financial literacy has the strongest impact in the Netherlands, where knowing the right answer to one more financial literacy question is associated with a 10 percentage point higher probability of planning.

Financial literacy is also invaluable during the retirement phase: for instance, in an experimental setup, we have shown that many people do not understand lifetime income streams. In other words they indicate that they would pay very little if given a chance to *buy* \$100 more in lifetime retirement income, but they would also demand far more if asked to *sell* the same \$100 flow for a lump sum. Interestingly, the more financially literate provide more internally consistent answers, indicating they better understand the financial product and hence can better protect themselves against longevity risk in retirement (Brown, Kapteyn, and Mitchell, 2013).

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<sup>7</sup>See Lusardi and Mitchell (2014) and the references therein.

Recent work also shows that advisors sometimes influence workers to shift their retirement funds into high fee investment vehicles, casting doubt on the less-financially literate to rely on financial advice (Turner, Klein and Stein, 2015). Other studies show that financial literacy and financial advice are complements rather than substitute (Collins, 2012).

## The Question of Causality

One question often raised has to do with the direction of causality between financial literacy and economic behaviors. That is, we have established that financially literate individuals do plan better, save more, earn more on their investments, and manage their money better in retirement. Yet there remains the possibility of reverse causality: perhaps some people are savvier because they have the money in the first place.

To unravel this causality question, we recently reviewed an extensive body of evidence on financial literacy and economic outcomes around the world. This comprehensive study (Lusardi and Mitchell, 2014) arrived at an unambiguous conclusion: even after correcting for a variety of econometric estimation issues, financial literacy proves to be even more powerful than can be concluded from simple correlations.

This is important since more knowledgeable people are also more resilient in the face of economic shocks (including the 2008–9 financial crisis). While a few studies have challenged the importance of financial literacy for financial decision making, arguing that financial literacy has little effect on economic outcomes, we believe otherwise. For example, Hastings, Madrian and Skimmyhorn (2013) and Fernandes, Lynch, and Netemeyer (2014) summarized several studies linking financial and educational measures with behavior, and they argued that financial literacy could explain little of the variance in financial behavior, especially for the low-income. While these were useful exercises, they also suffered from key drawbacks.<sup>8</sup> For instance previous studies differ enormously in terms of their approach and empirical rigor, type of intervention, and tests conducted. Grouping them together cannot provide a consistent picture of the state of research on financial literacy. Indeed financial literacy measured using questions such as those we have recommended prove significant, consistent with the analysis mentioned previously.<sup>9</sup> Additionally, it is not surprising that some interventions in the distant past (i.e., the 1960s and '70s) including retirement seminars, sending employees to benefit fairs, or mandating financial literacy in high school, had little lasting impact on lifetime financial outcomes. This occurs not because financial literacy is ineffective, as those authors suggested, but because limited and far-ago interventions may not remedy widespread illiteracy.<sup>10</sup> In other words, what might be called for is a higher rather than a lower dosage of financial literacy.

<sup>8</sup>And a recent meta-analysis on financial literacy's impact on behavior came to a different conclusion, underscoring the difficulties of comparing such a wide range of different studies (Miller, Reichelstein, Salas, and Zia, 2014).

<sup>9</sup>Those authors contend that the effect of "measured" financial literacy diminishes substantially or recedes when accounting for omitted variables such as correlated traits, according to their estimates using a small sample of US adults. Yet the "propensity to plan" is considered a correlated trait, and it is unclear why it is a good measure of literacy given that it is constructed from questions such as "I put money aside on a regular basis for the future" or "I save now to prepare for my old age." Indeed, as we show, financial literacy affects this behavior directly (Lusardi and Mitchell, 2009, 2011c). For this reason, it is not surprising that these controls diminish the measured effects of conventional financial literacy variables. Similarly, those authors suggest that numeracy is something like an innate "trait," but our work which controls on factors such as IQ still find that financial literacy is empirically important (XXXXCITE\_).

A related consideration is that many empirical studies on the topic have not relied on a theoretical model, though this shortcoming is required to evaluate how financial literacy should be expected to affect financial behavior (Lusardi, Mitchell, and Michaud, 2014). For example, if consumers have insufficient income to save, boosting financial literacy is unlikely to translate into higher saving. In other words, financial literacy may not be ineffective *per se*; rather it might not be able to translate into changes in financial behavior. Likewise, since financial knowledge is costly to acquire and does not promise the same benefit to all, some individuals will not invest in knowledge and will also let it depreciate. Again, this is not because financial knowledge does not work, but because different behavior is optimal for different people (Lusardi, Michaud, and Mitchell, 2013). This explains, for example, why financial literacy tends to be lower in a low-income sub-sample, and why we should anticipate a weaker effect of financial literacy in those subsectors of the population.

## What Works?

Many employers, teachers, and policymakers have jumped on the financial literacy bandwagon in recent years, offering courses, programs, and new degrees. This provides some independent evidence of the importance of financial literacy, suggesting that many individuals and institutions are recognizing its relevance. Such programs offer another way to assess the effects of financial literacy, as reviewed in our prior work (Lusardi and Mitchell, 2014).

In view of the findings, two initiatives seem particularly well-suited to improve financial literacy. These are financial education in school, and in the workplace. As discussed earlier, financial literacy is low among high school students, even though these young people will soon need to make important decisions such as whether to go to college and how to finance the education. Similarly, workers are increasingly being asked to make decisions about their retirement savings, from how much to contribute to their accounts, how to invest their retirement savings, and how to draw down their wealth during retirement. Our work has shown that financial illiteracy can influence all of these decisions.

Evaluating the impact of financial education in school and in the workplace is certainly difficult, but the shift to quasi-experimental or experimental approaches has improved the rigor with which these initiatives are evaluated. The evidence is supportive of the importance of financial education. As a recent example, Walstad, Rebeck and MacDonald (2010) found that financial education in high school is invaluable, a conclusion now confirmed in several European nations.<sup>10</sup> Similarly, recent work of Brown, Collins, Schmeiser and Urban (2014) examines the effectiveness of state mandated financial education for high-school students. The study shows that if a rigorous financial education program is carefully implemented, it can improve the credit scores and lower the probability of credit delinquency for young adults. In another case, Heinberg, Hung, Kapteyn, Lusardi, Savikhin-Samek, and Yoong (2015) evaluated a program called Five Steps that taught financial planning concepts related to retirement. The authors designed a financial education program that delivered information

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<sup>10</sup>The mean number of hours of financial education/instruction reported in their review was about 10 hours.

<sup>11</sup>See Hospido, Villanueva, and Zamorro (2014) and the references therein.

about five core concepts underlying financial planning, using a program format amenable to easy low cost replication, and mass dissemination. Their results showed that short (3 minute) videos and narratives had sizable short-run effects on objective measures of respondent knowledge. Follow-up tests of respondents' knowledge approximately eight months after the interventions suggested that between one-quarter and one-third of the knowledge gain persisted. In other words, such a program can have both short and medium run positive effects, and it could readily be targeted to new employees.

## Policy Implications

Financial knowledge is critically important for many of today's policy debates. For instance, using an intertemporal model of saving that incorporates many sources of risk, we have demonstrated what can happen when financial knowledge helps people do a better job allocating their resources over their lifetimes (Lusardi, Michaud, and Mitchell 2013). That research concluded that more than one-third of U.S. wealth inequality could be accounted for by differences in financial knowledge. Additionally, we showed that consumers would be willing to give up three percent of their lifetime consumption in order to enhance their wellbeing via financial knowledge.

These findings are relevant to national educational and retirement policy. For instance, personal accounts under Social Security and increased reliance on individually-managed retirement accounts would be anticipated to lead to higher financial knowledge. Providing financial education in high school could also enhance wellbeing, not only among the young, but over everyone's life course.

Viewing financial knowledge as an investment in human capital has potentially far-reaching consequences for education and training policy (c.f., Kim, Maurer, and Mitchell 2013). When people make poor financial decisions, this can get them into deep financial trouble over their lifetimes. In turn, these difficulties can spill over to their families and the rest of the economy.

Curing and preventing financial illiteracy is not costless, but investing in financial literacy is likely to bring high payoffs (Behrman, Mitchell, Soo, and Bravo 2012; Hastings, Mitchell, and Chyn, 2011; and Michaud, Lusardi, and Mitchell, 2013). Moreover, our work demonstrates that financial literacy can benefit not only the economically vulnerable in society, but also the population at large.

Financial products and decisions about these products are likely to become increasingly complex in future years. Accordingly, they will expose people to additional financial risk and ever more sophisticated financial products. Naturally we caution that proper program evaluations require carefully-designed experiments and follow-ups to determine what the value-add of a specific financial literacy intervention. Those who regulate and supervise financial markets would do well to devote close attention to how well young people, employees, and retirees understand the economic world around them. Much remains to be done in this young field of financial literacy.



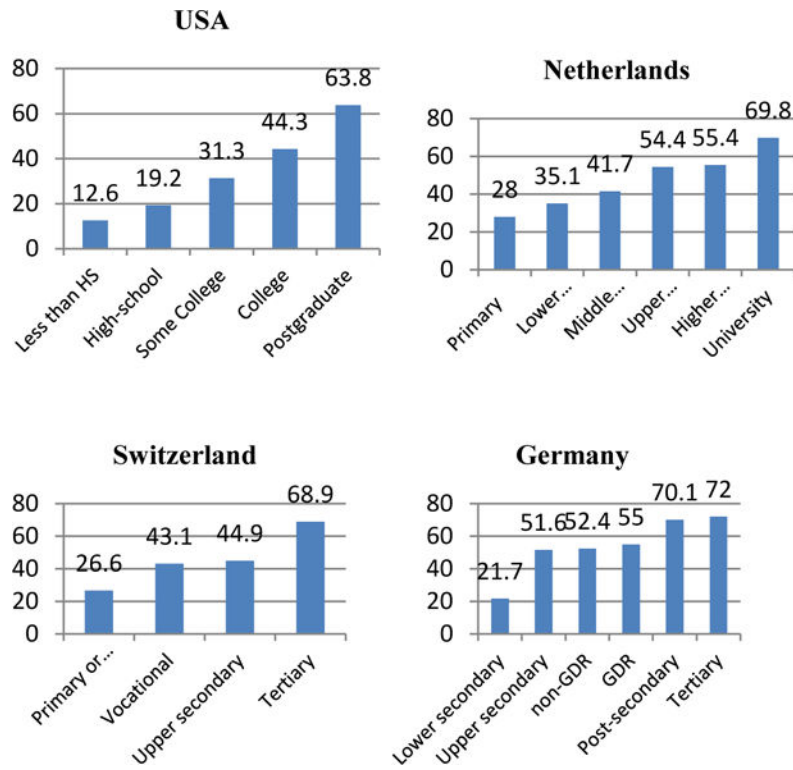
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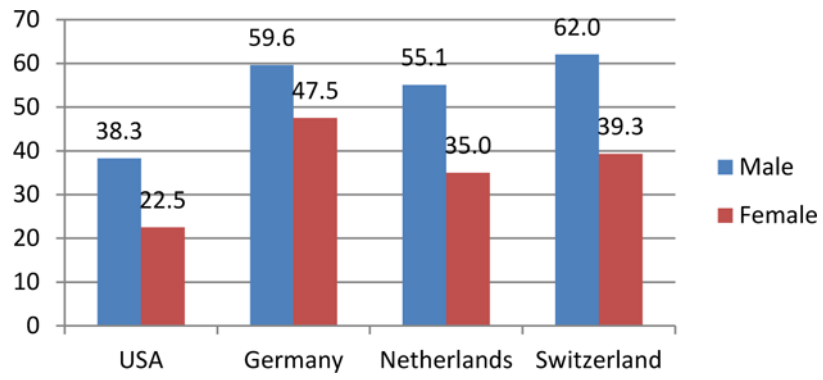
**Figure 1. Financial Literacy by Education**  
 % providing correct answers to all three financial literacy questions  
 Source: Lusardi and Mitchell (2014).

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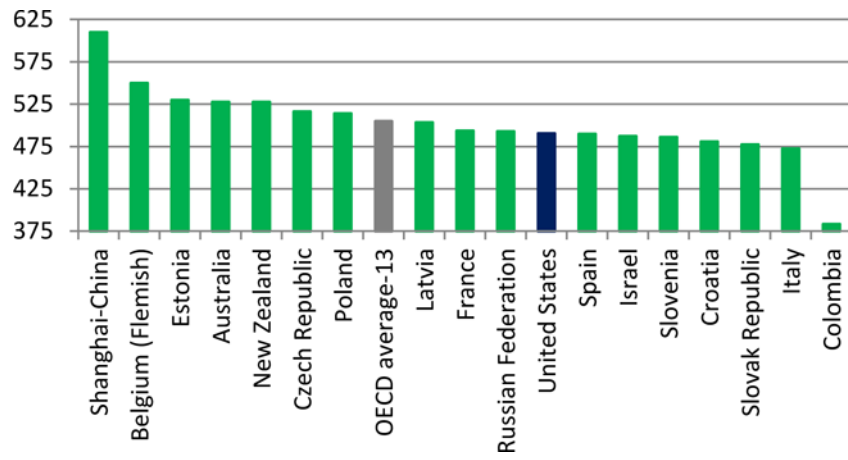
**Figure 2. Financial Literacy by Sex**  
% providing correct answers to all three financial literacy questions  
Source: Lusardi and Mitchell (2014).

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**Figure 3. High School Student Performance on the 2012 PISA Financial Literacy Scale: Mean by Country**  
 Source: Derived from OECD (2014) data.

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