

Financial Literacy and Economic Outcomes: Evidence and Policy Implications

Olivia S. Mitchell and Annamaria Lusardi

January 2015

PRC WP2015-01

Pension Research Council
The Wharton School, University of Pennsylvania
3620 Locust Walk, 3000 SH-DH
Philadelphia, PA 19104-6302
Email: prc@wharton.upenn.edu
<http://www.pensionresearchcouncil.org>

The authors are grateful for support provided by the Pension Research Council and Boettner Center at the Wharton School of the University of Pennsylvania. All findings, interpretations, and conclusions of this paper represent the views of the authors and not those of the Wharton School or the Pension Research Council. © 2015 Pension Research Council of the Wharton School of the University of Pennsylvania. All rights reserved.

Financial Literacy and Economic Outcomes: Evidence and Policy Implications

Abstract

This paper reviews what we have learned about financial literacy and its relationship to financial decision-making around the world. Using three simple questions, we have surveyed people in many countries to determine whether they have the fundamental knowledge of finance needed to function as effective economic decision makers. We show 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 newly-released 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: D91

Olivia S. Mitchell

The Wharton School, University of Pennsylvania

3620 Locust Walk, 3000 SH-DH

Philadelphia, PA 19104

mitchelo@wharton.upenn.edu

Annamaria Lusardi

The George Washington School of Business

2201 G Street, NW, Suite 450E, Duquès Hall

Washington, DC 20052

alusardi@gwu.edu

Financial Literacy and Economic Outcomes: Evidence and Policy Implications

Olivia S. Mitchell and Annamaria Lusardi

Introduction

The modern economy increasingly requires consumers to make many complex and sometimes bewildering financial choices. Almost daily, our students, colleagues, relatives, and airplane seatmates ask us the difficult questions they confront along these lines, such as: “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?”

While everyone does not need an economics degree, people do require some financial knowledge to make such decisions. Yet our research, described below, shows that many people make poor economic decisions because they are financially illiterate. As we show, financial ignorance can be expensive or even ruinous for many.

This paper offers an overview of the existing work in this important field and covers new evidence from the Organisation for Economic Co-operation and Development (OECD)’s Programme for International Student Assessment (PISA). We also discuss the implications of our findings for policy.

Financial Illiteracy Is Widespread in the United States

Our first examination of financial literacy was fielded using 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 could answer two basic questions correctly about compound interest and inflation (Lusardi and Mitchell, 2011a). And but one-third knew the right answer for these two plus a third question on risk diversification (the questions are listed below).

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, and our findings widely confirmed. 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

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 two asterisks.

Financial Literacy Is No Better Elsewhere

Wondering whether Americans might be unusual in their financial knowledge, next we launched several comparable international surveys (see Lusardi and Mitchell, 2011b; 2014).

Again to our dismay, however, we found widespread financial illiteracy even in relatively rich countries with well-developed financial markets such as Germany, the Netherlands, Switzerland, Sweden, Japan, Italy, France, Australia and New Zealand. Performance was markedly worse in Russia and Romania.

While being better-educated was always associated with having more financial knowledge (Figure 1) across the countries we examined,¹ our research also showed that education is not enough. That is, even well-educated people are not necessarily savvy about money.

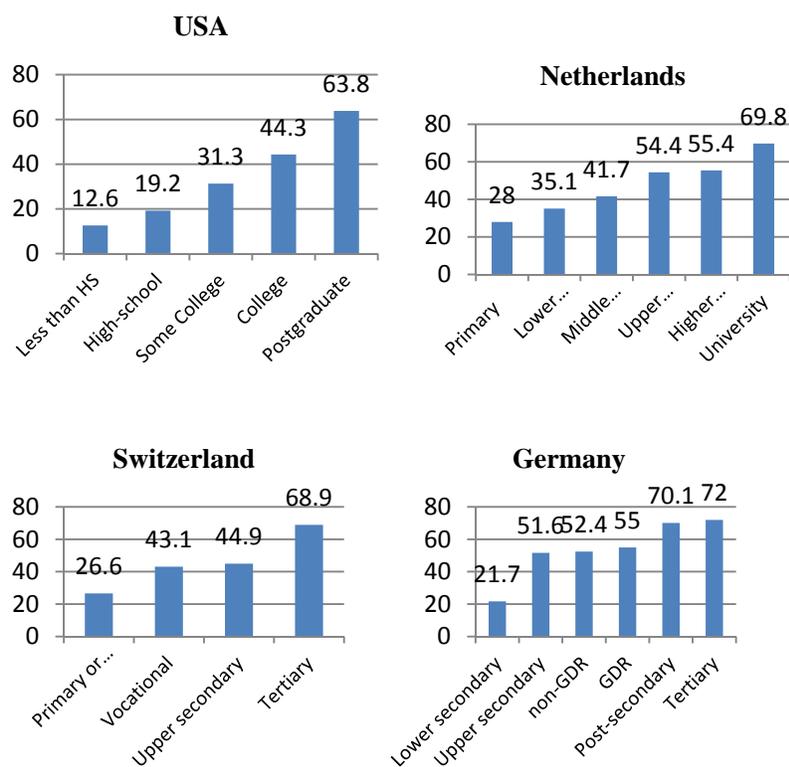


Figure 1: Financial Literacy by Education: % providing correct answers to all three financial literacy questions
Source: Lusardi and Mitchell (2014).

¹ For brevity, we only report the evidence for four countries below. Nevertheless results are similar in the other countries covered in our international comparison of financial literacy (Lusardi and Mitchell, 2014).

Another striking finding common to all of the countries we studied is that men are much more likely than women to be able 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). Some have suggested that it results from the traditional family structure in many countries. That is, to the extent that husbands traditionally worked for pay and wives tended to be less exposed to the marketplace, men were more exposed to financial decision making in the past. If so, one would anticipate the performance differences would narrow over time. Nevertheless there is little evidence of a closing gap among the young (Bucher-Koenen, Lusardi, Alessie, and van Rooij, 2014)

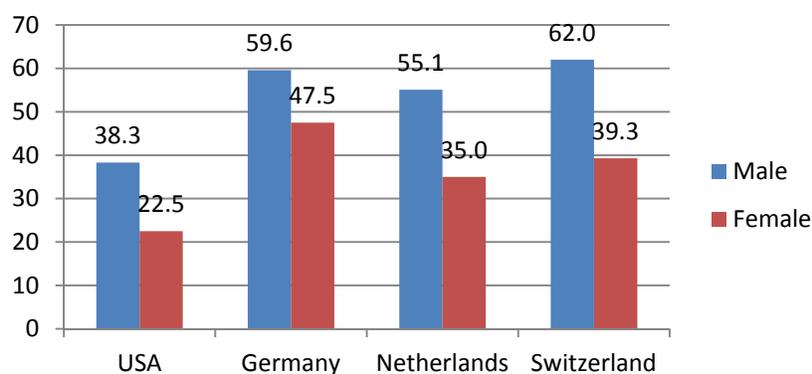


Figure 2: Financial Literacy by Sex: % providing correct answers to all three financial literacy questions

Source: Lusardi and Mitchell (2014).

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

We also found low levels of financial literacy among younger respondents. For instance, we have reported that respondents at the beginning of their working careers (age 23-28) display little knowledge of interest compound, inflation, and risk diversification (Lusardi, Mitchell, and Curto, 2010).

New International Evidence on High School Students

To determine whether these financial knowledge problems are being remedied by the educational system, an international assessment was fielded in 2012 by the OECD's PISA². The goal was to assess high school students age 15 on their financial knowledge and their ability to apply that knowledge to make financial decisions and plans for their future. Eighteen countries participated in the assessment.³

This is important since young people today are confronting ever-more sophisticated financial products and services than their parents did. They also have more opportunity to take on financial risks compared to their parents, particularly in an environment where individuals must make choices regarding debt, spending, saving, healthcare coverage, and retirement planning. Moreover, in many nations, high school students must make one of their 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.

² See <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-vi.htm>.

³The 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.

Interestingly, results mimic those from the adult populations cited above. As before, U.S. respondents ranked in the middle of the pack, despite the fact that the U.S. plays such a key role in the global economy. Their near neighbors from a performance standard were Spain and Slovenia, with better performance from Australians and New Zealanders. The top-scoring students were found in Shanghai, China (Figure 3).

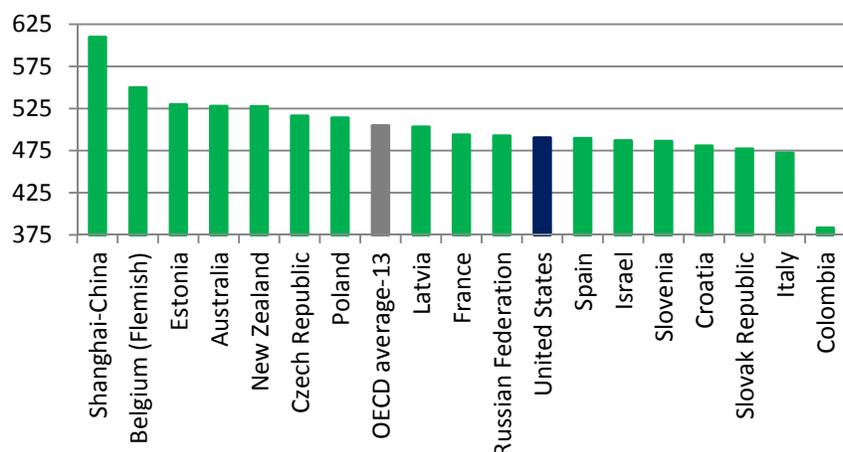


Figure 3. High School Student Performance on the 2012 PISA Financial Literacy Scale: Mean by Country.

Source: OECD (2014)

Several other important findings also emerged from these data. First, many more boys than girls perform at both the top and bottom of the financial literacy scale. 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 Illiteracy 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. There is now

ample evidence that more financially savvy people are more likely to plan, save, invest in stocks, and accumulate more wealth (Lusardi and Mitchell, 2014). They are also less likely to have credit card debt, and when they do, they manage it better, paying off the full amount each month rather than just paying the minimum due (Lusardi and Tufano, 2009a, b). 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).

It is worth noting that financial literacy is especially valuable for the young. In the U.S., for instance, the so called Millennials are currently entering the labor market suffering under a great deal of debt from credit cards and student loans (see de Bassa Scheresberg and Lusardi, 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. We recently explored a unique dataset provided to us by a large financial institution reporting on employees' financial knowledge along with administrative information drawn from that firm's retirement plan (Clark, Lusardi, and Mitchell 2013). Our analysis of financial knowledge and investor performance showed that more knowledgeable individuals invest in more sophisticated assets, suggesting that they can expect to earn higher returns on their retirement saving accounts (with lower nonsystematic risk).

Moreover, we have found that answering just one additional financial question correctly is associated with a 3-4 percentage point greater probability of planning for retirement, in

Germany, the United States, Japan, and Sweden. Financial literacy seems to have the strongest impact in the Netherlands, where knowing the right answer to one additional 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 we have demonstrated that most people do not understand lifetime income streams, using an experimental setup. That is, 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, those who were 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).

The Question of Causality

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

To examine this question, we recently reviewed an extensive body of evidence on financial literacy and economic outcomes around the world (Lusardi and Mitchell, 2014). Based on our comprehensive literature survey, we have concluded that the multivariate evidence is quite clear, using many econometric estimation methods: financial literacy proves to be even more powerful than can be detected from simple correlations. And this is important, since the

more knowledgeable are also more resilient in the face of economic shocks, including the 2008-9 financial market crisis.

What Works?

Many employers, teachers, and policymakers have jumped on the financial literacy bandwagon in recent years, offering courses, programs, and new degrees. These programs offer another way to assess the effects of financial literacy, 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 does work, a finding now confirmed in several European nations.⁴ 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 about

⁴ See Hospido, Villanueva and Zamarro (2014) and the references therein.

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.

Clearly, we continue to caution that a proper program evaluation requires carefully designed experiments and follow-ups to determine what the value-add of a specific financial literacy intervention. Much remains to be done in this young field of financial literacy.

Policy Implications

Financial knowledge is critically important for many of today's policy debates. For instance, using an intertemporal model of saving that incorporated many sources of risk, we showed what could happen when financial knowledge helps people do a better job allocating their resources over their lifetimes (Lusardi, Michaud, and Mitchell 2013). That research found 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.

Understanding how to model 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; Michaud, Lusardi, and Mitchell, 2013). And 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. 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.

References

- Behrman, Jere, Olivia S. Mitchell, Cindy Soo, and David Bravo. (2012). "Financial Literacy, Schooling, and Wealth Accumulation." *American Economic Review, P&P*. 102(3): 300–304.
- Brown, Jeffrey R., Arie Kapteyn, and Olivia S. Mitchell. (2013). "Framing and Claiming: How Information-Framing Affects Expected Social Security Claiming Behavior." *Journal of Risk and Insurance*. doi: 10.1111/j.1539-6975.2013.12004.x
- Bucher-Koenen, Tabea, Annamaria Lusardi, Rob Alessie, and Martin van Rooij. (2014). "How Financially Literate are Women? An Overview and New Insights." NBER WP 20793.
- Clark, Robert L., Annamaria Lusardi, and Olivia S. Mitchell. (2014). "Financial Knowledge and 401(k) Investment Performance." NBER WP 20137.
- de Bassa Scheresberg, Carlo. (2013). "Financial Literacy and Financial Behavior Among Young Adults: Evidence and Implications." *Numeracy*, Vol. 6: Issue 2, Article 5.
- de Bassa Scheresberg, Carlo and Annamaria Lusardi. (2014). "Gen Y Personal Finances. A Crisis of Confidence and Capability." Working Paper, Global Financial Literacy Excellence Center.
- Hastings, Justine, Olivia S. Mitchell, and Eric Chyn. (2011) "Fees, Framing, and Financial Literacy in the Choice of Pension Managers." In *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*. Eds. Olivia S. Mitchell and Annamaria Lusardi. Oxford: Oxford University Press: 101-115.
- Heinberg, Aileen, Angela Hung, Arie Kapteyn, Annamaria Lusardi, Anya Savikhin Samek, and Joanne Yoong. (2015). "Five Steps to Planning Success. Experimental Evidence from US Households." *Oxford Review of Economic Policy*, forthcoming
- Hospido, Laura, Ernesto Villanueva, and Gema Zamarro. (2014). "Financial Literacy and Educational Attainment in Compulsory Secondary Education in Spain." Working Paper, Bank of Spain.
- Kim, Hugh H., Raimond Maurer, and Olivia S. Mitchell. (2013). "Time is Money: Life Cycle Rational Inertia and Delegation of Investment Management." NBER WP 19732. *In revision*.
- Lusardi, Annamaria, Pierre-Carl Michaud, and Olivia S. Mitchell. (2013). "Optimal Financial Literacy and Wealth Inequality." NBER WP 18669. .
- Lusardi, Annamaria and Olivia S. Mitchell. (2014). "The Economic Importance of Financial Literacy: Theory and Evidence." *Journal of Economic Literature*. 52(1): 5-44. (*Lead article*)
- Lusardi, Annamaria, and Olivia S. Mitchell. (2011a). "Financial Literacy and Planning: Implications for Retirement Wellbeing." In *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*. Eds O.S. Mitchell and A Lusardi. Oxford: Oxford University Press: 17-39.

- Lusardi, Annamaria, and Olivia S. Mitchell. (2011b). "Financial Literacy around the World: An Overview." *Journal of Pension Economics and Finance*: 497-508
- Lusardi, Annamaria and Olivia S. Mitchell. (2008). "Planning and Financial Literacy: How Do Women Fare?" *American Economic Review P&P* 98(2): 413–417.
- Lusardi, Annamaria, Olivia S. Mitchell, and Vilsa Curto. (2014). "Financial Literacy and Financial Sophistication among Older Americans." *Journal of Pension Economics and Finance*: 1-20
- Lusardi, Annamaria, Olivia S. Mitchell, and Vilsa Curto. (2010). "Financial Literacy among the Young: Evidence and Implications for Consumer Policy." *Journal of Consumer Affairs*. 44(2): 358-380.
- Lusardi, Annamaria, and Peter Tufano. (2009a). "Debt Literacy, Financial Experiences, and Overindebtedness." NBER WP 14808.
- Lusardi, Annamaria, and Peter Tufano. (2009b). "Teach Workers about the Peril of Debt." *Harvard Business Review*. November: 22–24.
- Mitchell Olivia S. and Annamaria Lusardi, eds. (2011). *Financial Literacy: Implications for Retirement Security and the Financial Marketplace*. Oxford: Oxford University Press.
- OECD. (2014) *PISA 2012 Results: Students and Money* (Volume VI). <http://www.oecd.org/pisa/keyfindings/pisa-2012-results-volume-vi.htm>
- Walstad, William, Ken Rebeck and Richard MacDonald. (2010). "The Effects of Financial Education on the Financial Knowledge of High School Students." *Journal of Consumer Affairs* 44(2): 336–357.