14

Attitude Toward Risk and Financial Literacy in Investment Planning

Gianni Nicolini, Tommy Gärling, Anders Carlander and Jeanette Carlsson Hauff

14.1 Introduction

Dictionary definitions imply that risk in common language is related to negative events. For instance, the Oxford dictionaries' (Oxford dictionaries 2016) definition of risk refers to "a situation involving exposure to danger," and in additional explanations of risk is related to "the possibility that something unpleasant or unwelcome will happen." In the Cambridge dictionary, risk is "something bad that might happen" (Cambridge dictionary 2016). In financial and business glossaries, the definition of risk differs in being related to the uncertainty of both positive and negative events. In a financial framework, risk is defined as "the measurable uncertainty that an investment will not generate the expected returns" (Lexicon—The Financial Times 2016) or "the chance

G. Nicolini (✉)
University of Rome "Tor Vergata", Rome, Italy
e-mail: gianni.nicolini@uniroma2.it

T. Gärling · A. Carlander · J.C. Hauff
University of Gothenburg, Gothenburg, Sweden

A. Carretta et al., *Risk Culture in Banking*, Palgrave Macmillan Studies in Banking and Financial Institutions,
DOI 10.1007/978-3-319-57592-6_14

that an investment's actual return will be different than expected" (Investopedia 2016).

The contrast between the common-sense definition of risk and its technical financial definition represents our starting point for an analysis of attitude toward risk (or "appetite for risk") in lay man's financial investments. If risk is the likelihood of a negative outcome, a rational decision should obviously be to avoid or minimize risk. In contrast, if it is understood that risk is also related to a positive outcome, it may instead be rational to take risk. In financial markets, investors are driven toward unbiased asset allocations by knowledge of the (usually) positive relationship between risk and returns and thus awareness that positive returns are attained only by taking risk. Conversely, a lack of knowledge of a basic financial concept such as risk may represent an obstacle to optimal and efficient asset allocations.

Assuming that all relevant information about an investment is available and the investor understands and manages to analyze this information in order to assess risk and expected returns of an investment product, the decision to invest or not will only be influenced by risk tolerance. Thus, the same investment product may be purchased by an investor with a higher risk tolerance and not by an investor with a lower risk tolerance. Yet, in a market which is not ideal in such a way that every investor understands the available information and is able to use it to fully assess the risk and the returns of investment products, the lack of knowledge of the concept of financial risk may render available information ineffective in reducing the assessed risk, with the result that it remains high. We conjecture that the risk attitude of financially illiterate investors would, ceteris paribus, be more negative than the risk attitude of financially literate investors.

The aim of the present study is to investigate whether financially illiterate individuals have more negative attitudes toward risk in investments than financially literate individuals. Using survey data from three European countries collected in 2015, a measure of financial literacy is developed from answers to multiple-choice questions. The measure is compared to a measure of the survey respondents´ risk attitude. Demonstrating a negative relationship between financial literacy and risk attitude will contribute to an increased understanding of investor's

behaviors. For instance, a negative attitude toward risk due to the inability to use the available information and to understand investment products may explain the preference for investments having low risk and low returns, deviating from optimal asset allocations. A low stock-market participation may be related to an unjustified negative risk attitude and, even in the case of stock-market participation, a negative risk attitude may cause an overreaction to a fall of the market with an increase of volatility. Strongly risk-adverse investment behavior due to financial illiteracy, causing a negative risk attitude, may lead to decisions to delegate investment decisions. Even though delegating to a financially literate adviser should in general be rational, delegation also incurs an unknown risk of being a victim of financial fraud.

14.2 Previous Research on Financial Literacy and Risk Attitude

The analysis of investors' behavior, their attitude toward financial risk, and the role of financial literacy in risk assessment requires a clear conceptualization and definition of financial literacy. Several studies since the 1990s have proposed definitions of financial literacy. They all include as key elements (i) an ability to understand financial concepts, (ii) awareness of financial products, and (iii) skill in making effective financial decisions. In one of the first definitions, financial literacy was defined as "*the ability to make informed judgements and to make effective decisions regarding the use and management of money*" (Noctor et al. 1992). Later studies recognized the need to separate financial knowledge from financial skills. Knowledge of basic general economic principles (of inflation, interest, risk and returns, etc.) is considered as a prerequisite to develop financial skills defined as the ability to apply such knowledge in making financial decisions. The US President's Advisory Council on Financial Literacy (2009) referred to financial literacy as "*the ability to use knowledge and skills to manage financial resources effectively for a lifetime of financial well-being*." In reviewing over 70 studies with the aim to identify the key elements of financial literacy in providing a comprehensive definition, Huston (2010)

reached the conclusion that "*financial literacy consists of both knowledge and application (ability) of human capital specific to personal finance*." Remund (2010) reached a similar conclusion with a definition of financial literacy that includes a clear distinction between financial knowledge and financial skills, "*financial literacy is a measure of the degree to which one understand key financial concepts (knowledge) and possesses the ability and confidence to manage personal finances through appropriate, short-term decision-making and sound, long-range financial planning*." Other studies (e.g., FSA 2005) have suggested that attitude toward making financial decisions should be included as a third element. It is then assumed that financial knowledge and the ability to apply the knowledge in making financial decisions would not be sufficient to avoid mistakes if individuals do not have confidence. Whereas confidence in making financial decisions reflects personal factors, perhaps influenced by psychological and cultural biases, financial knowledge and financial skills are objective and not as easily influenced by such biases. Even though financial knowledge and financial skill in themselves are not sufficient for making rational financial decisions if influenced by a negative attitude, low financial knowledge is still likely to substantially reduce the ability to make rational financial decisions. It should be noted that previous research on financial literacy (reviewed below) has usually been confined to merely measuring financial knowledge. Caution needs to be exercised then in interpreting the results of such studies bearing in mind that they may only be valid when applied to low levels of financial knowledge. It is at the same time unfortunate that most studies have only demonstrated low financial knowledge, thus reducing the possibility to investigate the consequence of high financial knowledge.

Several studies have examined how much people know about saving and investing. In 2003, the US National Association of Securities Dealers (NASD 2003) conducted an online survey to investigate investors' level of financial knowledge. Ten basic knowledge questions were asked (e.g. what are the risks of investing in stocks, bonds, T-bills; what is the relationship between risk and returns, etc.). Respondents were people in the 21–69 age range who had made at least one stock, bond, or mutual fund transaction between October 2002 and early

April 2003. Despite the fact that the sample probably on average was more knowledgeable than the general population, the results showed that only 35% were able to answer seven out of the ten basic knowledge questions correctly. Almost 10 years later the Security and Exchange Commission (SEC 2012) conducted a survey of about 4800 participants within the American investors finding that many investors did not understand key financial concepts such as diversification or the differences between stocks and bonds, and were not fully aware of investment costs and their impact on investment returns. Lusardi and Mitchell (2006) reported similar results from other countries. They stressed that in a German survey conducted in 2003, most respondents (80%) were confident in their understanding of financial investments but only 42% could answer half of the survey questions correctly. In their paper, reference is made to a Japanese consumer finance survey showing that 71% of the adult respondents knew little about equity and bond investments, and more than 50% lacked any knowledge of financial products. Even in this case, much does not seem to have changed over time because a few years later, Sekita (2011) analyzed a Japanese nationwide representative sample of about 5000 individuals (males and females aged 20–69 years) and found that more than half failed to correctly answer a question, namely that, which is the more risky investment option of investing: whether in a single stock or in a stock mutual fund?

Some other research studies have investigated the possible consequences of low financial knowledge. In a study of retirement saving needs, Lusardi (2004) reported that participants in financial education seminars became more likely to hold stocks in their portfolios. In a case study of retirement planning by 225 employees of an American firm, Dolvin and Templeton (2006) found that the attendance of a seminar about the functioning of different investment options was associated with increased portfolio diversification and improved risk management. In their conclusions, the authors highlighted how improved financial knowledge made the employees switch to different risk–return combinations in order to create more efficient portfolios. By doing this, they reduced their negative risk attitude in such a way that they allocated a larger portion of their investments to equities. In analyzing data from a survey of Italian customers of one of the main national banks, Guiso

and Jappelli (2009) found that poor financial literacy is a significant factor in explaining low portfolio diversification. They also reported that only 39.9% of the respondents agreed that financial diversification means "to invest in assets to limit risk exposure." In a study assessing the welfare cost of financial mistakes by Swedish households, Calvert and Campbell (2005) showed that more financially literate households are more likely to buy risky assets and invest more efficiently. Kimball and Shumway (2006) used data from a nationally representative sample of approximately 500 American adults and reported a large positive correlation between financial sophistication and rational portfolio choices.

Low financial literacy is not only related to suboptimal asset allocations. Using data from Chile, Behrman et al. (2010) showed that a lack of general financial knowledge may be associated with a later retirement age and other negative retirement outcomes. A positive role of financial literacy in financial good practices was found by Clark et al. (2003). Surveying a sample of American adults, they found that improving the understanding of basic financial principles made individuals likely to re-evaluate their savings and consumption related to retirement plans. A better understanding of how their future pension depends on savings encouraged many workers to increase their saving rate in order to achieve modified retirement goals. In their conclusions, the authors suggested that increased knowledge may lead households to become less risk averse and thus increase investments in assets with a higher level of risk and returns.

The role of financial literacy in explaining investors' risk attitude was examined by Agnew and Szykman (2004). They stressed that information overload has the potential to reduce risk taking and push investors to refrain from purchasing investment products. By testing different scenarios, it was found that increasing the number of investment options and decreasing the differences between options resulted in more choices of a default option (if present) or in not investing at all. The results furthermore showed that financially illiterate individuals choose the default options in 20% of cases, while the same frequency of choice of the default option for the financially literate individuals is 2%. In the study, it was also reported that financially illiterate individuals became overwhelmed by a choice task entailing comparisons between available investment alternatives. The consequence was that they preferred

"an easy way out". Such a consequence for financially illiterate individuals was also noted by the Financial Service Authority in the UK (FSA 2004) in analyzing consumers' understanding of financial risk. It was found that those who were most worried by risk actively sought to avoid being exposed. These individuals thus avoided investment or limit investment to saving accounts. At the same time, people with low and high financial literacy differ by the strategies they use to assess risk. Those having a low financial literacy would rely more on the fund managers' reputation and information in the news than on a financial adviser. Those having a high financial literacy would instead rely on information about past performance, the fund manager, and available information about the company. In addition to this evidence, suggested effects of a negative risk attitude and low stock-market participation rate for investors with low financial literacy have been found in The Netherlands (van Rooij et al. 2011), Sweden (Almenberg and Dreber 2011); and France (Arrondel et al. 2012), while negative effects on retirement planning, due to a lack of financial literacy, have been found in the USA (Lusardi and Mitchell 2011; Yoong 2011), Japan (Sekita 2011), Germany (Pahnke and Honekamp 2010), Italy (Fornero and Monticone 2011), Sweden (Almenberg and Säve-Söderberg 2011), The Netherlands (Alessie et al. 2011), and Switzerland (Brown and Graf 2013).

Financial literacy seems to matter also when the quality of the investment is considered. Muller and Weber (2010) used data from an online survey of 3228 respondents. The survey conducted in 2007 in cooperation with a German newspaper (Frankfurter Allgemeine Sonntagszeitung) showed that less financially literate people are less likely than more financially literate people to invest in low-cost fund alternatives. Moreover, it was shown that financially literate investors make a more realistic return and risk assessments concerning their investments, indicating that financially literate people are better equipped to learn from their past financial mistakes.

The overall picture that comes out from the review of the research quite clearly supports the conclusion that a connection exists between financial literacy and financial behaviors and that a lack of financial literacy can explain a relevant part of the investment mistakes. Our next aim is to increase the understanding of this connection.

In previous studies, financial literacy is measured by using only few items (answers from 3 to 5 questions about financial knowledge) in investigating general financial principles (e.g., inflation, compound interest, and bond pricing), whereas data in our study are more extensive, by increasing both the quantity and quality of measurement. Furthermore, the data include ten items specifically developed to assess knowledge about risk in investment (or "investment risk"). Using a measure of financial literacy that best fits with the aim of the study to investigate the relation between financial literacy and risk attitude, the reliability and the validity of the results will likely increase. Aggregating data from three different countries will counteract cultural and national biases that would otherwise affect the external validity of the results. Moreover, a direct measure of risk attitude is used instead of being inferred indirectly from other measures. By asking people about their risk attitude in saving and investments without inferring it from their portfolio composition, we are able to measure their risk attitude isolated from any external influences (e.g., broker recommendations, financial advices, etc.) that would affect their investment decisions and asset allocation.

14.3 Study

14.3.1 Method

During 2014 a research network between universities, financial authorities and NGOs—the Consumer Finance Research Center (CFRC)—was developed with the aim to stimulate studies on financial literacy and consumer financial behavior. The Italian branch of the network at the University of Rome "Tor Vergata" (Rome, Italy) played a leading role in the organization and management of the network. In 2015, a survey of consumers' financial literacy and financial behavior was conducted in different countries. Here we report the data collected in Italy, Spain, and Sweden. In all the countries, participants were adults (at least 18 years old) and stable residents of the country. A total number of 1150 individuals were recruited. At a national level, 500 observations were analyzed for Italy and Sweden and 150 observations for Spain. We choose to here report answers to a subset of ten multiple-choice

Table 14.1 Percentage distribution of correct answers to financial literacy questions in the country samples

	Number of correct answers										
	0	1	2	3	4	5	6	7	8	9	10
Italy%	7.8	8.6	11.2	11.4	15.3	13.3	11.8	11.2	7.2	2.2	0.2
	67.5						32.5				
Sweden%	22.8	8.3	9.6	7.9	9.3	13.2	8.5	8.3	9.1	2.7	0.2
	71.2						28.8				
Spain%	8.8	2.7	3.4	5.4	6.1	15.5	18.2	15.5	12.2	11.5	0.7
	41.9						58.1				

Source Consumer Finance Research Center (CFRC) 2015 financial literacy survey

Table 14.2 Percentage distribution of risk attitude in investment planning in the country samples

	Risk attitude (1 = Low; 7 = High)							
	1	2	3	4	5	6	7	"Do not know" OR "Prefer not to say"
Italy%	20.1	12.7	14.1	15.3	15.9	9.4	3.0	9.4
Sweden%	13.8	12.4	10.7	20.1	8.6	5.8	2.8	25.6
Spain%	22.3	10.8	18.9	12.8	12.8	8.8	2.7	10.8

Source Consumer Finance Research Center (CFRC) 2015 financial literacy survey

questions related to knowledge of investment risks. The topics of the questions included default risk, liquidity risk, interest rate risk, risk diversification, and risk and mutual funds. The sum of correct answers to these questions is used as an index of financial knowledge. With the aim to test the role of financial literacy in explaining the attitude to risk in investment, the values of this index have been summarized in a dichotomous variable equal to one if the number of correct answers to the ten questions on financial risk knowledge is larger than 5 and zero otherwise. Table 14.1 shows the percentage distribution of correct answers in the three country samples.

Answers to the question "Thinking of your financial investments, how willing are you to take risks?" represented the direct measure of risk attitude. The respondents answered on a seven-step numerical scale ranging from one (low) to seven (high). The percentage distributions of the risk attitude in the three country samples are reported in Table 14.2.

14.3.2 Results and Discussion

A cross-tabulation of financial literacy and risk attitude reveals a more negative attitude toward risk in investments for individuals who are less financially knowledgeable than for those individuals who are more financially knowledgeable. To find statistical support for this observation, independent *t*-tests were performed comparing the risk attitudes by groups with high and low financial knowledge. The *t*-tests of the mean differences in the risk attitudes between individuals with high and low financial literacy are shown in Table 14.3. The two groups of individuals varying in financial knowledge are dichotomized by the number of correct answers lower than 6 or higher than 5, whereas risk attitude is measured on the 1–7 scale. The *t*-tests are reported separately for each country (Italy, Sweden and Spain). As may be seen, the results confirm that low financial literacy is related to a more negative attitude toward risk. Thus, the mean difference between the low and high financial literacy groups is statistically significant for all three countries. In Sweden, the difference is the highest (0.97), while in Italy it is the lowest (0.32).

The results suggest that financial literacy, even if only measuring financial knowledge, has an influential role in investment decisions. The fact that a lack of knowledge increases individuals' negative risk attitude may increase the likelihood that they misallocate their savings, with not only negative consequences for the investor but also for the functioning of the financial system. A hypersensitivity to risk biasing consumers

Table 14.3 *t*-tests of the mean differences in risk attitude between high and low financial literacy groups in the three different countries

	Risk attitudes [1–7]		
	Italy	Sweden	Spain
Low financial literacy *(from 0 up to 5 correct answers on 10)*	3.27	3.01	2.69
High financial literacy *(at least 6 correct answers on 10)*	3.59	3.98	3.54
Pr ($T < t$) = * < 0.10; ** < 0.05; *** < 0.01	0.0364**	0.0000***	0.0041***

Source Authors' analysis on data from the 2015 CFRC financial literacy survey

with low financial literacy may explain their reluctance to invest in the stock market and the acceptance of negative rates of return from investment grade bonds. At the same time, an extreme risk aversion and possibly lack of confidence in making investment decisions will expose financial consumers to the risk of buying investment products that are not suitable for their financial needs due to the misinterpretation of the functioning of the product or because of the inappropriate selling practices of brokers and issuers. At the same time, an investor who does not possess the basic knowledge about investments and is only looking for safe investment options may easily become the victim of financial frauds that promise zero risks and high returns.

14.4 Conclusions

This study investigated the conjecture that individuals with a lack of financial knowledge would have a negative risk attitude that may seriously bias their investments. Data from Italy, Sweden, and Spain collected in 2015 by three national surveys, related to the same research project and based on the same questionnaire, were used to measure financial literacy and risk attitude. The results showed that the risk attitude was on average more negative among the respondents who were classified as low in financial knowledge compared to those who were classified as high in financial knowledge.

The evidence that financial consumers lacking financial literacy (or only knowledge) have a negative attitude toward taking financial risks may have negative consequences both at a micro and macro levels. Individuals who overestimate the risk of investing in risky assets will not be able to construct optimal portfolios in a risk–return framework. At the same time, a preference to delegate the investment decisions to financially literate others may expose them to the risk of unfair selling practices or even to the risk of being the victim of financial frauds. If a high portion of investors in a financial market are affected by an extremely negative risk attitude, this would contribute to phenomena such as very high market volatility and irrational preferences for investment options with negative returns. The negative consequences of a

financial system with, on average, investors with poor knowledge should be a warning and a strong incentive to improve financial education in order to augment rational investments and bringing the market closer to being efficient.

Bibliography

Agnew, J. and Szykman, L. "Asset Allocation and Information Overload: The Influence of Information Display, Asset Choice and Investor Experience." *Center for Retirement Research at Boston College Working Paper* 15 (2004).

Alessie, R., Van Rooij, M. and Lusardi, A. "Financial Literacy, Retirement Preparation and Pension Expectations In The Netherlands." *NBER Working Paper* 17109 (2011).

Almenberg, J. and Dreber, A. "Gender, Financial Literacy and Stock Market Participation." *SSE/EFI Working Paper Series in Economics and Finance* 737 (2011). Available at: http://ssrn.com/abstract=1880909.

Almenberg, J. and Säve-Söderberg, J. "Financial Literacy and Retirement Planning in Sweden." *NETSPAR Discussion Paper* (2011).

Arrondel, L., Debbich, M. and Savignac, F. "Stockholding and Financial Literacy in the French Population." *International Journal of Social Sciences and Humanity Studies* 4 (2012): 285–294.

Behrman, J., Mitchell, O. S., Soo, C., and Bravo, D. "Financial Literacy and Wealth Accumulation." *Population Aging Research Center Working Paper* (2010).

Brown, M. and Graf, R. "Financial Literacy and Retirement Planning in Switzerland." *Numeracy—Advancing Education in Quantitative Literacy* 6 (2013).

Calvert, L. and Campbell, J. P. "Down or Out: Assessing the Welfare Costs of Household Investment Mistakes." *NBER Working Paper Series* 12030 (2005).

Cambridge Dictionary. (2016). Definition of Risk (Online Source). http://dictionary.cambridge.org/dictionary/english/risk.

Clark, R., D'Ambrosio, M., McDermed, A., Sawant, K. "Financial Education and Retirement Saving." *Federal Reserve System* (2003).

Dolvin, S. and Templeton, W. "Financial Education and Asset Allocation." *Financial Services Review* 15 (2006): 133–149.

Fornero, E. and Monticone, C. "Financial Literacy and Pension Plan Participation in Italy." *Journal of Pension Economics and Finance* 10 (2011): 547–564.

FSA. *Consumer understanding of financial risk*. Consumer Research 33, Financial Service Authority (2004).

FSA. *Measuring Financial Capability: An Exploratory Study*. Consumer Research 37, Financial Service Authority (2005).

Guiso, L. and Jappelli, T. "Financial Literacy and Portfolio Diversification." *CSEF—Centre for Studies in Economics and Finance Working paper* 212 (2009).

Huston, S. "Measuring Financial Literacy." *Journal of Consumer Affairs* 44 (2010): 296–316.

Investopedia. (2016). Definition of Risk (Online Source). http://www.investopedia.com/terms/r/risk.asp.

Kimball, M. and Shumway, T. "Investor Sophistication and the Participation, Home Bias, Diversification, and Employer Stock Puzzle." Mimeo, University of Michigan (2006).

Lexicon. 2016. Definition of risk (Online Source). http://lexicon.ft.com/Term?term=risk.

Lusardi, A. "Saving and the Effectiveness of Financial Education. In 'Pension design and structure. New lessons from behavioral finance." *Oxford University Press* (2004): 159–169.

Lusardi, A. and Mitchell, O. S. "Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education." *Michigan Retirement Research Center Working Paper* 144 (2006).

Lusardi, A. and Mitchell, O. S. "Financial Literacy and Retirement Planning in the United States." *Journal of Pension Economics and Finance* 10 (2011): 509–525.

Muller, S. and Weber, M. "Financial Literacy and Mutual Fund Investments: Who Buys Actively Managed Funds?" Schmalenbach Business Review 62 (2010): 126–153.

NASD—National Association of Securities Dealers (2003). NASD Investor Literacy Research. https://www.finra.org/sites/default/files/InvestorDocument/p011459.pdf.

Noctor, M., Stoney, S. and Stradling, R. "Financial Literacy: A Discussion of Concepts and Competences of Financial Literacy and Opportunities for its Introduction into Young People's Learning." Report Prepared for the National Westminster Bank, London: National Foundation for Education Research (1992).

Oxford Dictionaries. (2016). Definition of Risk (Online Source). http://www.oxforddictionaries.com/definition/english/risk.

Pahnke, L. and Honekamp, I. "Different Effects of Financial Literacy and Financial Education in Germany." *MPRA, Paper* 22900 (2010).

Remund, D. L. "Financial Literacy Explicated: The Case for a Clearer Definition in an Increasingly Complex Economy." Journal of Consumer Affairs 44 (2010): 276–295.

SEC—Security and Exchange Commission (2012). Study Regarding Financial Literacy Among Investors—As Required by Section 917 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. https://www.sec.gov/news/studies/2012/917-financial-literacy-study-part1.pdf.

Sekita, S. "Financial Literacy and Retirement Planning in Japan." Journal of Pension Economics and Finance 10 (2011): 637–656.

US President's Advisory Council on Financial Literacy (2009). 2008 Annual Report to the President—Executive Summary. Available Online. (URL https://www.treasury.gov/about/organizational-structure/offices/Domestic-Finance/Documents/exec_sum.pdf.

Van Rooij, M., Lusardi, A. and Alessie, R. "Financial Literacy and Stock Market Participation." Journal of Financial Economics 10 (2011): 449–472.

Yoong, J. "Financial Illiteracy and Stock Market Participation: Evidence from the RAND American Life Panel. In "Financial Literacy—Implications for Retirement Security and the Financial Marketplace"." Oxford University Press, New York (NY, USA) (2011): 76–10.