Financial literacy and numeracy of consumers and retail investors

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> "No matter what disclosures are mandated, they will not have the intended effect if the investor either does not read and/or understand the information provided" (the International Organisation of Securities Commissions, 2009)

There has been recent calls from international organisations to improve consumer protection in financial markets by demanding increased disclosures. Extensive studies on financial literacy and numeracy, however, pose serious questions and challenges to this agenda. Firstly, they demonstrate how financial illiteracy negatively affects the ability of consumers to read, understand, and employ disclosures. Secondly, they suggest that the lack of numeracy skills prevents consumers from engaging in sound, credible and welfare-enhancing analysis of financial information. And finally, they argue that the effectiveness of disclosures becomes very problematic in the light of consumer unwillingness to invest time and effort in learning more about financial markets. So what, specifically, does research on financial literacy and numeracy involve, and what kind of evidence is produced to support these findings?

1. Methodology and results of financial literacy research

There are many methodological approaches used to study and map financial (il)literacy. However, consumer/population surveys and questionnaires are the most common. They are used to describe and assess, qualitatively and/or quantitatively, levels of financial (il)literacy.

The scope of each questionnaire/survey is different and diverse. They differ in geographic scope, population size, source of commissioning, and definitional meanings of (il)literacy.

Specifically, some financial literacy surveys are national in their scope, whereas others are international and seek to compare literacy levels across different countries. Some surveys target the population at large, while others focus on specific social groups, such as young people, women or the elderly. Financial literacy surveys can also be categorised as private or public, depending on who is conducting and funding the survey. Even the concept of financial literacy used for questionnaires often varies, rendering the results of some surveys more comprehensive and thorough than others. For example, while some surveys focus on consumers' knowledge of certain financial concepts,[1] others also include exercises that test their financial behaviour and attitudes to money.[2]

Regardless of the differences, financial literacy surveys tend to find consumer literacy and numeracy levels to be overwhelmingly low. What is arguably more important, financial literacy surveys document serious limitations on the ability of consumers to comprehend, process, and evaluate financial information presented to them. So what are those limitations and what do they tell us, more generally, about how consumers make financial decisions?

2. Familiarity with financial terminology and information-processing skills

Lack of awareness and knowledge of specialized, financial terms and concepts is reported to have an adverse effect on people's abilities to understand financial products and their disclosures. The Standard & Poor Global FinLit Survey illustrates this point quite well. It is an international financial literacy survey designed to specifically test consumers' knowledge of

[1] The Standard and Poor's Ratings Services Global Financial Literacy Survey.

[2] The Financial Conduct Authority (FCA) and the Organisation for Economic Cooperation and Development (OECD).

four financial concepts: risk diversification, inflation, compound interest, and basic numeracy. The Survey is based on 150,000 interviews and compiles data from more than 140 countries.[3] The Survey has found that only one in three adults are financially literate and numerate. A person is financially literate if she correctly understands at least three concepts out of the four listed above. Basic numeracy and inflation are the least difficult concepts to understand, while risk diversification and compound interest are the most difficult ones.

Almost identical findings have been reported by the OECD financial literacy survey. Developed in 2011, the OECD questionnaire and survey is arguably the most common assessment tool used by countries across the world to measure national, financial literacy levels. The survey, amongst other things,[4] tests consumers' comprehension of financial terms.[5] The concepts of 'inflation', 'risk diversification' and 'risk and return on investment' are chosen to assess the general awareness and understanding of specialized, financial terminology.[6] The survey findings in 14 countries[7] had revealed that consumers are more familiar with the concept

[3] Leora Klapper, Annamaria Lusardi, and Peter van Oudheusden, 'Financial literacy around the world: insights from the Standard & Poor's ratings services global financial literacy survey' (*FINLIT*, 2015) <http://gflec.org/wp-content/uploads/2015/11/Finlit_paper_16_F2_singles.pdf> accessed 19 March 2016.

[4] The survey also assesses people's attitudes to money and their financial behaviour.

[5] Diversification, compound interest, inflation, and basic numeracy.

[6] OECD, 'Measuring Financial Literacy: Questionnaire and Guidance Notes for Conducting an Internationally Comparable Survey of Financial Literacy' (OECD report, 2011) <http://www.oecd.org/finance/financial-education/49319977.pdf> accessed 15 March 2016.

[7] Amongst these are: Albania, Armenia, Czech Republic, Estonia, Germany, Hungary, Ireland, Malaysia, Norway, Peru, Poland, South Africa, the British Virgin Islands, and the UK.

of inflation,[8] but less so with what 'portfolio diversification'[9] or 'risk and return on investment'[10] mean.

Lack of adequate command of financial terminology also seems to reduce the effectiveness of disclosures. Disclosures are essentially designed to inform and protect consumers in financial markets. Empirical studies that have looked at the effects of disclosures on consumer decision-making suggest, however, that consumers lack the skills and abilities to understand and evaluate them.[11] Loan price disclosures, for example, which often contain information about origination fees, balloon payments and APRs have been shown to cause great difficulties to consumers. In that, not only do consumers find it very hard to understand these financial terms, they also fail to perform accurate calculations.

A related example is the IFF Research and YouGov project that examines the UCITS disclosure document. Conducted in 2009, the study tested whether the prospective investors in UCITS funds can read and understand disclosure documents, termed as the Key Investor Information. This comprehensive research project, amongst other things, looked at the ability of investors to interpret financial words and concepts presented in disclosure documents. The

[8] The response rate of correct answers range from 57% in Armenia to 94% in the UK.

[9] The highest score of correct answers is recorded in Albania (63%), and the lowest of 41% in the British Virgin Islands.

[10] The survey has found that Hungary is the most aware of the concept (86% of correct answers), while Norway is the least aware with only 18% of respondents selecting the correct answer.

[11] See Marsha J Courchane, Brian J Surette and Peter M Zorn , 'Subprime borrowers: Mortgage Transitions and outcomes' (2004) 29 Journal of Real Estate Finance and Economics 4, 365; Jinkook Lee and Jeanne M Hogarth, 'The price of money: consumers' understanding of APRs and contract interest rates' (1999) 18 Journal of Public Policy & Marketing 1, 66; Alan M White and Cathy L Mansfield, 'Literacy and Contract' (2002) 13 Law and Policy Review 233.

project concluded that a great number of consumers are uncomfortable with some of the financial terminology used to describe the funds' strategy and objectives:

> This was particularly the case with the Absolute Return Fund where the specific financial techniques such as arbitrage, relative price values and market direction were felt to be confusing, despite them each being followed by a short explanation. The instruments which would be invested in were also unfamiliar to some, especially convertible bonds.[12]

Even basic words, terms, and expressions can pose difficulties for consumers to understand the information presented to them. In the same study conducted by the IFF Research and YouGov, respondents were presented with key investor information about an emerging markets fund, and were asked to evaluate a series of true/false statements. The key investor information document stated that: "at least 60% of the fund is invested in shares of companies traded on emerging countries' stock exchanges, such as Brazil, Russia and China".[13] It also said that "up to 40% of the fund may be invested in any government bonds or highly rated corporate bonds, not just those of emerging countries".[14] When presented with the false statement that "the fund may invest in all bond types", only 35% of respondents understood that the investment strategy was limited to government bonds or highly rated corporate bonds. 36% of respondents could not understand that the fund can invest in bonds from any country,

[12] IFF Research and YouGov, 'UCITS Disclosure Testing: Research Report' (Report prepared for European Commission, 2009) <http://ec.europa.eu/finance/investment/docs/other_docs/research_report_en.pdf> accessed 10 March 2016.

[13] ibid.

[14] ibid 12.

and 49% of respondents failed to see that all assets of the fund could be invested in shares from emerging countries such as Brazil, Russia and China.[15]

These findings point to and reflect a prevailing problem amongst consumers: they tend to have low proficiency in literacy skills. By which it is meant that they have limited "ability to understand, evaluate, use and engage with written texts".[16] There is much support for this current research. A case in point is the OECD Survey of Adult Skills, which measures proficiency in a number of information-processing skills, including literacy and numeracy.

This survey has found that more than 48% of respondents are proficient at the lowest levels in literacy. This, in essence, means that they are capable of:

> regularly complet[ing] tasks that involve very few steps, limited amounts of information presented in familiar contexts with little distracting information present, and that involve basic cognitive operations, such as locating a single piece of information in a text or performing basic arithmetic operations, but have difficulty with more complex tasks.[17]

The survey also suggests that respondents with low proficiency levels in literacy generally lack higher-order cognitive skills that would allow them to make complex inferences,

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[15] ibid 12.

[16] The OECD Survey of Adult Skills categorises adult literacy into 5 proficiency levels. Level 5 is the highest proficiency level on the literacy scale. Only 0.7% of respondents have the highest proficiency in literacy and "can perform tasks that involve searching for and integrating information across multiple, dense texts; constructing syntheses of similar and contrasting ideas or point of view, or evaluating evidence and arguments". Level 1, on the other hand, is the lowest proficiency level in the literacy scale. Respondents falling within this scale can only "complete simple forms, understand basic vocabulary, determine the meaning of sentences, and read continuous texts with a degree of fluency".

[17] OECD p. 56

disregard irrelevant or inappropriate details, and identify, interpret and evaluate more than one piece of information.

This basically suggests that the ability of consumers to read and understand various disclosures is heavily dependent on their cognition; that is, extensive mental processes involved in acquiring and comprehending knowledge.[18] This is in line with empirical findings in behavioural economics and psychology, where cognition has been found to influence and shape individual and consumer decision-making.[19]

3. Low quantitative literacy

Not only are people shown to have poor literacy skills and limited command of financial language, they also appear to lack adequate numeracy skills. Quantitative literacy or numeracy is generally defined as the ability to understand, process and work with numbers. This can range from simple capabilities and skills necessary to understand and compare numbers, to those that require a higher level of arithmetic calculation and understanding. To comprehend the complexity of financial products and evaluate them accordingly, consumers often need to calculate simple and compounding interest, consider amortization costs and probabilistic information, particularly when assessing the risk factors of a financial transaction. A number

[18] This involves various processes such as language, attention, memory, problem solving, perception, judgement, evaluation, reasoning, computation, recognition, comprehension, etc.

[19] John B Best, *Cognitive Psychology* (John Wiley & Sons 1998); Nick Chater, Steffen Huck and Roman Inderst, 'Consumer Decision-Making in Retail Investment Services: A Behavioural Economics Perspective' (Report to the European Commission 2010); Jacob Jacoby, Robert W. Chestnut and William A. Fisher, 'A Behavioral Process Approach to Information Acquisition in Nondurable Purchasing' (1978) 15 Journal of Marketing Research 4, 532; Barbara Loken, 'Consumer Psychology: Categorization, Inferences, Affect, and Persuasion' (2006) 57 Annual Review of Psychology 453; Sigmund A. Wagner, *Understanding Green Consumer Behaviour: A Qualitative Cognitive Approach* (2nd edn, Rutledge 2003);

of long-term financial commitments, such as getting a mortgage or planning for retirement, involve making sound judgements about risk, probabilities and chance. Financial literacy surveys repeatedly find that consumers are not equipped enough to make such difficult choices.

For example, a 2006 study conducted in the US assessed the analytical and statistical abilities of some 1 700 Baby Boomers, aged from 51 to 56.[20] Three financial literacy questions were posed to 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?
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?[21]

Over 80% of respondents knew how to calculate percentages, and only 50% answered the lottery question correctly. The most challenging task was to compute the compound interest rate, where as little as 18% of respondents answered this question correctly.

The above questions, and an additional two[22] were included in the English Longitudinal Study on Aging in 2007. The study has found low levels of quantitative numeracy in England, with only 11% of respondents answering all five questions correctly.[23] A related study was run

[20] Annamaria Lusardi and Olivia S Mitchell, 'Financial Literacy and Retirement Preparedness: Evidence and Implications for Financial Education' (2007) 42 Business Economics 35.

[21] ibid.

[22] These are the following: 1) In a sale, a shop is selling all items at half price. Before the sale, the sofa costs $300. How much will it cost on the sale? 2) A second hand car dealer is selling a car for $6,000. This is two-thirds of what it cost new. How much did the car cost new?

[23] James Banks and Zoë Oldfield, 'Understanding pensions: Cognitive functions, numerical ability and retirement saving' (2007) 28 Fiscal studies 2, 143.

in Europe. The Survey of Health, Retirement and Aging in Europe examined numeracy levels of the elderly population[24] in 11 countries.[25] It mapped and measured literacy levels across these countries and detected the highest levels of literacy in Sweden, Germany and Denmark, and the lowest in Greece, Spain and Italy.[26] Similar tendencies have, also, been observed amongst the young. In one of its most recent studies on financial literacy, the OECD assessed the mathematical and numeracy skills of 29, 000 students in 18 countries.[27] It found that only one in ten students were able to solve the hardest financial literacy tasks in PISA 2014.[28]

The results of these financial literacy surveys are further underpinned by empirical research that documents consumers' "poor arithmetic intuition"[29] in the area of fractions and probabilities. In 2005, a group of economists investigated whether investment decision-making is affected by the format within which information is provided to individuals.[30] Information on investment was presented to participants in two ways: "as a percentage of variation between the buying value and the actual value (e.g., 24%), [and] as a monetary difference between the

[24] Aged 50 and older.

[25] Austria, Belgium, Denmark, France, Germany, Greece, Italy, the Netherlands, Spain, Sweden, and Switzerland.

[26] Dimitris Christelis, Tullio Jappelli, and Mario Padula, 'Cognitive abilities and portfolio choice' (2010) 54 European Economic Review 1, 18.

[27] Australia, Belgium, the Czech Republic, Estonia, France, Israel, Italy, New Zealand, Poland, the Slovak Republic, Slovenia, Spain and the United States, Colombia, Croatia, Latvia, the Russian Federation and Shanghai-China.

[28] OECD, 'OECD PISA Financial Literacy Assessment' (OECD Publishing, 2014) <http://www.oecd.org/finance/2014-launch-pisa-financial-literacy-students.htm> accessed 16 March 2016.

[29] Lauren E Willis, 'Against Financial Literacy Education' (2008) 94 IOWA Law Review, 1, 197.

[30] Enrico Rubaltelli and others, 'Numerical Information Format and Investment Decisions: Implications for the Disposition Effect and the Status Quo Bias' (2005) 6 The Journal of Behavioral Finance 1, 19.

buying price and the actual price (e.g., $0.24)".[31] The study suggests that consumers' perceptions are shaped by the format of information presented to them. Participants in the experiment felt that the investment fund lost more when the information on fund performance was presented in percentage terms than in monetary terms. In effect, it demonstrates a common "tendency (among individuals) to perceive numerical value according to absolute magnitude instead of statistical meaning."[32]

Additionally, most consumers have great difficulties dealing with and understanding numbers when the amounts substantially exceed their daily experience.[33] As Willis has pointed out, "someone who easily distinguishes between $250 per month and $300 per month for health insurance could fail to appreciate the difference between a $252,000 and a $259,000 mortgage after a $7000 broker fee is added. Large dollar values can be too big to comprehend for those who rarely encounter them."[34]

Financial literacy surveys also document serious limitations on the ability of consumers to understand and manage risk. Defined as the inability to make rational decisions on uncertain future, risk illiteracy has been found to exist nationally and internationally. For instance, the UK financial capability survey shows that consumers tend to underestimate potential risks of unexpected life events, or ignore them altogether.[35] This research conducted by the Money Advice Service demonstrates that "not only do people underestimate the likelihood and

[31] ibid 24.

[32] Rubeltelli and others (n 23).

[33] Willis (n 22).

[34] ibid 223.

[35] TNS BMRB, 'Financial Capability and Wellbeing: a qualitative report' (Money Advice Service, March 2015) <https://masjumpprdstorage.blob.core.windows.net/cms-production/financial-capability-and-wellbeing.pdf> accessed 18 March 2016.

financial impact of a life event, they also overestimate their financial resilience – including how long savings would last and what other sources of income would be at their disposal."[36] It further indicates that some consumers purposively avoid thinking about a probability of bad events happening to them, or if they do, they are overly optimistic about their ability to cope.[37]

Global financial literacy studies too reveal widespread innumeracy amongst consumers. The Global Economic Crisis survey is one of such studies. Conducted in 2009 across a set of countries,[38] the survey finds consumers' risk literacy to be alarmingly low. The survey asked three risk literacy questions to individuals: the first to test their ability to evaluate the chance of winning a lottery; the second, to evaluate their capacity to calculate the ratio for the risk and return on investment; and the third, to measure whether they can evaluate the risk diversification of an investment. Respondents to the survey did not seem to fully comprehend probabilities in winning the lottery, with only around 40% getting the answer right. Correct calculations on risk and return were disappointing across surveyed countries, ranging from 24 % in France to 41% in the US.[39] And although respondents were better at identifying single stock investments as being riskier, correct answers ranged from only 42% in France to 61% in the UK and US.

4. Ignorance and unawareness of illiteracy

The lack of effective literacy and numeracy skills is further exacerbated by psychological factors that shape and influence consumer financial decision-making. First and foremost, consumers have been found in surveys to be overconfident in their financial skills and

[36] ibid.

[37] ibid.

[38] The concerned countries are: United States, Great Britain, Canada, France, and Germany.

[39] The Global Economic Crisis Survey 2009.

knowledge. A great number of national and international financial literacy surveys, for example, have revealed that consumers often overestimate how much they know. Studies conducted in the US, UK, Canada, Australia and Europe have showed how consumers are unable to solve basic financial literacy and numeracy problems, but claim to have confidence in their knowledge and skills to do so.[40] One could argue that this potentially translates into consumer lack of basic prudence when dealing with financial matters. It also could result in increased consumer vulnerability in the financial services market. It could even discourage consumers from actively seeking more information or professional advice.[41]

Consumer ignorance is another factor that is likely to complicate financial decision-making. Studies and surveys have documented the tendency of consumers to ignore financial information, terms and conditions of contracts, and various disclosures and treat them as

[40] See OECD, 'Improving financial literacy: analysis of issues and policies' (OECD Publishing 2005); The Financial Consumer Agency of Canada, 'General Survey on Consumers' Financial Awareness, Attitudes and Behaviour' (Financial Consumer Agency of Canada, 2006); The International Bank for Reconstruction and Development and The World Bank, 'The Case for Financial Literacy in Developing Countries: Promoting Access to Finance by Empowering Consumers' (2009) <https://www.globalbrigades.org/media/Financial_Literacy.pdf> accessed 20 March 2016; Commonwealth Bank Foundation, 'Improving Financial Literacy in Australia: Benefits for the Individual and the Nation' (2006) <https://www.commbank.com.au/about-us/download-printed-forms/2010commbankfoundation-improving-financial-literacy.pdf> accessed 20 March 2016; European Central Bank, (Working Paper Series No 1299, 2011) <https://www.ecb.europa.eu/pub/pdf/scpwps/ecbwp1299.pdf?ce13373f9d7d8fc4eb2fffe7e04582b9> accessed 20 March 2016.

[41] Marc M Kramer, 'Financial Literacy, Overconfidence and Financial Advice Seeking' (University of Groningen 2014) <http://www.efmaefm.org/0EFMAMEETINGS/EFMA%20ANNUAL%20MEETINGS/2015-Amsterdam/papers/EFMA2015_0067_fullpaper.pdf> accessed 20 March 2016.

"incomprehensible legally mandated gobbledygook".[42] A recent study conducted by the US Securities and Exchange Commission (SEC), for instance, has shown how complex disclosures result in increased consumer ignorance. This has been supported by other investigations into investor disclosures, which have concluded that the timing, content and format of disclosures have great significance to retail investors in their dealings with financial markets.[43] They have shown that if disclosure documents are lengthy and presented in complex, unintelligible terms, they are unlikely to be read and understood by retail investors. Other studies show that even clearer and shorter disclosures might not be effective at furthering consumer engagement with retail financial markets. As the UK financial capability report of the Money Advice Service has shown, some consumers simply lack time or motivation to keep on top of their financial affairs.[44]

5. Demographic dimensions of financial literacy: some concluding remarks

In addition to documenting existing levels of financial literacy and numeracy, most studies and surveys collect information on respondents' age, gender, educational attainment, ethnicity, class, and religion. This information is then deployed to make broader observations and conclusions about consumers' financial literacy levels and the socio-cultural, economic context within which they live. According to these surveys, women are less financially literate then

[42] Lauren E Willis, 'Decisionmaking and the Limits of Disclosure: the Problem of Predatory Lending: Pricing' (2006) 65 Maryland Law Review 3, 707.

[43] The US Securities and Exchange Commission, 'Study Regarding Financial Literacy Among Investors' (2012) <https://www.sec.gov/news/studies/2012/917-financial-literacy-study-part1.pdf> accessed 20 March 2016.

[44] TNS BMRB (n 28).

men, so are the young and the elderly in comparison to the middle-aged.[45] Lower financial literacy levels are also more frequently detected amongst ethnic minority groups and migrants.[46]

Thus, a study conducted by the US Securities and Exchange Commission to determine the financial literacy levels of US retail investors suggests that "women, African-Americans, Hispanics, the oldest segment of the elderly population, and those who are poorly educated, have [a…] greater lack of investment knowledge than the average general population".[47] Similar evidence is presented in other research that have linked people's financial literacy levels to their earnings, educational attainment, age, and gender.[48] Geographies of financial literacy have also been created, ranking countries like Germany, Ireland, Sweden, and Denmark as most literate, and Poland, Armenia, Italy, Greece and Spain as least literate.[49] Similar maps are replicated within countries, where some regions have been found more financially capable than others. For example, Moscow and St Petersburg are found to be the

[45] Adele Atkinson and Flore-Anne Messy, 'Measuring Financial Literacy: Results of the OECD / International Network on Financial Education (INFE) Pilot Study' (OECD working papers on finance, insurance and private pensions, 2012).

[46] ibid.

[47] The US Securities and Exchange Commission (n 36).

[48] See Chiara Monticone, 'How Much Does Wealth Matter in the Acquisition of Financial Literacy?' (2010) 44 The Journal of Consumer Affairs 2, 403; Annamaria Lusardi, Olivia S Mitchell and Vilsa Curto, 'Financial Literacy Among the Young: Evidence and Implications for Consumer Policy' (National Bureau of Economic Research Working Paper Series No. 15352, 2009); Annamaria Lusardi and Olivia S Mitchell, 'Financial Literacy Around the World: An Overview' (CeRP Working Papers, 2011); MasterCard Worldwide, 'How Well Do Women Know Their Money: Financial Literacy Across Asia/Pacific, Middle East, and Africa' (2011) <http://www.masterintelligence.com/content/intelligence/en/research/reports/2011/how-well-do-women-know-their-money-financial-literacy-across-asiapacific-middle-east-and-africa.html> accessed 20 March 2016.

[49] See Christelis (n 19); Adele Atkinson and Flore-Anne Messy (n 38).

most literate places in Russia, with literacy and numeracy levels significantly decreasing further down East. The northern part of Italy has been found more literate than the southern one, whereas the UK's southern region is reported to have higher financial literacy levels than its northern part.[50]

Most of this research, however, largely focuses on mapping out the demographic dimensions of financial literacy. It essentially draws links and connections between financial literacy survey results and the respondents' age, gender, ethnicity, religion or income levels. Yet very little work has been done to understand and explore why financial literacy or illiteracy patterns develop along these particular demographic lines. There is also, and more importantly, not much research on what other factors influence and affect consumers' low levels of financial literacy; that is, their lack of ability and skills to read, understand, process, and use information when making financial decisions?

Although further research is urgently needed to explain these important aspects of consumer financial literacy, the evidence presented so far is revealing. Studies on financial literacy call into question the ability of consumers to make sense of complex financial transactions that often requires mastering serious arithmetic, analytical, and statistical skills. Yet more importantly, even if and when information about relevant transactions is presented to consumers, most of them still fail to understand and evaluate this information adequately.

[50] Gordon L Clark, 'Roepke Lecture in Economic Geography - Financial Literacy in Context' (2014) 90 Economic Geography, 1, 1.