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**Financial Literacy: Where Do We Stand?**

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Financial literacy has gained a great deal of attention both by policymakers and financial safety net institutions, with the OECD leading the way with its International Network on Financial Education (OECD/INFE). Concerned parties fear that consumers may lack the minimum knowledge of financial concepts that is needed for taking informed financial decisions, including well-informed saving and investment decisions, better debt management, more careful retirement planning. Such lack of financial literacy has been widely acknowledged as an aggravating factor in the recent financial crisis (OECD/INFE, 2009). At the same time, the crisis has exacerbated the risks faced by less financially literate consumers: lacking the sophistication required to absorb financial shocks, they are more vulnerable to financial market fluctuations (Jappelli, 2010).

Although efforts worldwide have increased to fill the gaps in financial literacy so as to «identify individuals who are most in need of financial education and the best ways to improve that education» (OECD, 2005), far less attention has been devoted both to the question of what is financial literacy – the conceptual definition is vital in order to correctly measure the phenomenon – and to that of how people acquire and ‘deploy’ financial literacy.

There is a number of different definitions of financial literacy, depending on the notions of financial knowledge, skills and behaviors that are adopted<sup>1</sup>.

This notwithstanding, when referring to the financial literacy of an individual, two – not mutually exclusive – definitions are typically used. The first, proposed by Lusardi and Mitchell (2014), sees financial literacy as «people’s ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions»<sup>2</sup>. The second, supported by OECD/INFE (a framework created in 2008 to promote and facilitate international co-operation between policy makers and other

<sup>1</sup> Houston (2010) and Remund (2010) provide a good starting point to frame the issue of the conceptual definition of what financial literacy is or should be.

<sup>2</sup> Lusardi and Mitchell have been among the first to study, both theoretically and empirically, the issue of individuals and societies’ financial literacy (see e.g. Lusardi *et al.*, 2011; 2013).

stakeholders on financial education issues worldwide), looks at financial literacy as «a combination of awareness, knowledge, skill, attitude and behaviour necessary to make sound financial decisions and ultimately achieve individual financial well-being».

Quite obviously, the methods used to measure financial literacy vary according to the conceptual definitions used. As a matter of fact, without an agreed-upon definition, financial literacy has been measured differently in different studies and we still lack a standardized measure of financial literacy based on rigorous psychometric analyses. Indeed, the notion of financial literacy has been operationalized in different ways, accounting for a variety of financial topics (such as debt, insurance, spending, investments and retirement savings, budgeting, inflation) or, conversely, focusing on a single dimension<sup>3</sup>. Lusardi and Mitchell (2007) translate their definition of financial literacy into just three fundamental financial literacy questions that have been implemented in numerous exercises in the U.S.A. and abroad. Their questions focus on: *i*) numeracy and capacity to do calculations related to interest rates; *ii*) understanding of inflation; *iii*) understanding of risk diversification. These questions measure knowledge of the building blocks for decision-making in an intertemporal setting and relate to concepts pertinent to people's day-to-day financial decisions.

The OECD/INFE approach is based on a much longer and articulated questionnaire than that by Lusardi and Mitchell, including several questions aimed at capturing: *i*) the behaviors, attitudes and knowledge of the adult population; *ii*) information about a wide range of financial literacy issues (related to keeping track of finances, making ends-meet, longer-term financial planning including retirement saving, and the selection of financial products); *iii*) information on product awareness and holdings in order to inform the work on financial inclusion; *iv*) levels of financial well-being. Overall, financial literacy can be considered a latent variable to be measured by investigating individual financial *knowledge, behavior and attitudes* relating to various aspects of personal finance, including budgeting and money management, short and long term financial plans and financial product choice.

Across surveys, both performance tests (based on multiple-choice questionnaires) and self-report methods have been employed to measure financial literacy. Performance tests are mainly knowledge-based while self-reports are intended to assess perceived knowledge. More recently, however, there has been a tendency to design tests aimed at assessing both objective and perceived knowledge. Interestingly, even though actual financial literacy levels tend to be rather low, respondents are generally overconfident of their financial knowledge (Lusardi and Mitchell, 2014). Behavioral finance and its well-known heuristics are intertwined with the issue of financial literacy and a combination of these two strands of literature could deliver fruitful results.

It is important to stress that responses to survey questions cannot be taken at face value. There is in fact a relevant problem of «framing» – a well-known issue in the domain of behavioral finance – that could influence the ability of respondents to deliver the correct answer. Lusardi and Mitchell (2009) and van Rooij *et al.* (2011) find that individual responses are generally sensitive to the wording of questions.

<sup>3</sup> The number of questions used to assess financial literacy levels varies widely, ranging from 3 to 45 total items.

The next step – constructing indexes that summarize the level of financial literacy – is not simpler than defining the concept itself. Insofar, the process of data analysis has been little investigated, and even less literature is available on the issue of measurement error in assessing financial literacy.

The two most popular frameworks in educational measurement are the classical test theory (CTT) and the item response theory (IRT). In general the CTT approach has dominated the area of standardized testing, as it requires weak assumptions and it is easy to interpret. This notwithstanding, the CTT has been heavily criticized mainly based on the observation that the score in a test is not an absolute characteristic of a respondent, but it depends on the content of the test. Moreover the difficulty of different items may vary depending on the sample of respondents who take a specific test, which makes it difficult to compare respondents' results between different tests. Based on CTT, the responses to all questions proposed in a survey are summed up to generate an index (score) of financial literacy, which typically ranges between zero and the maximum number of correct answers. Subsequently, standard econometric techniques are typically applied to relate such scores to a set of explanatory variables (e.g. socio-demographic and covariates capturing investment or debt attitudes).

Conversely, the Item Response Theory provides a metric that considers both the test's difficulty and the respondents' specific abilities. IRT aims at measuring one or more ordinal/quantitative latent variables on a metric level of measurement. The IRT framework encompasses different classes of models, among which Rasch models are the best known. The latter are used to quantify aspects such as ability and personal traits and have been widely adopted in educational research and psychometrics: for instance, PISA surveys have been adopting Rasch models since 2000.

So far, only a few studies have approached the measurement of financial literacy by introducing a psychometrically developed index (see e.g. Bongini *et al.* 2012; Knoll and Houts, 2012; Despard and Chowa, 2014). Their results are quite encouraging in that the usage of Rasch analysis endows policy makers with a proper metric that can highlight the specific areas where deficiencies more often occur and that can help identifying the groups of individuals suffering from relevant knowledge deficits.

More precisely, the available empirical evidence (focusing on different countries and on samples of individuals of different age – adult population, young persons, high school students, university students, etc. –) suggests that the degree of financial literacy is low and mainly predicted by factors such as education, income, employment status and, to some extent, age<sup>4</sup>. Family background is also particularly important. Respondents' financial literacy seems to be positively and significantly correlated with parental education and with the presence of forms of financial socialization within the family (i.e. children observing their parents' saving and investment behaviors, or receiving more formal financial education from them).

The relationship between gender and financial education is somewhat more controversial. Indeed, if we focus on the adult population, gender disparities seem to be a

<sup>4</sup> The life cycle of financial literacy is hump-shaped, with the young and the old showing the lowest levels of financial literacy.

common feature, irrespective of the country considered. These differences have been ascribed to the different roles undertaken within the household (Hsu, 2011), with men specializing in financial decision-making and women in the traditional role of nursing and nurturing. However, when focusing on young persons, and in particular on the more educated ones (college students), empirical results are mixed. On the one hand, studies of financial literacy conducted on high school and college students reveal gender differences in financial knowledge (Chen and Volpe, 2002) while, at the same time, recording wiser financial behaviors by females, who are more likely to rely on a written budget, plan their spending and keep their bills and receipts under control (Hayhoe *et al.*, 2000; Joo *et al.*, 2003). On the other hand, more recent surveys concentrating on business undergraduates, do not find significant differences between males and females' test scores (see e.g. Koshal *et al.*, 2008; Wagland and Taylor, 2009; Marriot *et al.*, 2010).

An important question relates to whether and how financial literacy matters for economic decision-making. Several studies examined the relationship between financial literacy and economic behavior. The available evidence (see Lusardi and Mitchell, 2014) shows that financial (il)literacy has an important impact on key outcomes, both during work life and after retirement. In particular, a lower level of financial literacy reverberate in: *i*) high costs level of household borrowing (Moore, 2003; Lusardi and Tufano, 2009; Stango and Zinman, 2009; Lusardi and de Bassa Scheresberg, 2013); *ii*) limited holding of precautionary savings (Jappelli and Padula, 2013; de Bassa Scheresberg, 2013); *iii*) inadequate retirement planning (Hilgert *et al.*, 2003; Lusardi and Mitchell, 2007, 2011); *iv*) inadequate stock market participation (Christelis *et al.*, 2010; van Rooij *et al.*, 2011; Arrondel *et al.*, 2012); *v*) poorer life outcomes, especially concerning health (Joo and Garman, 1998; Peters *et al.*, 2007).

Given that the cost of financial ignorance is so relevant, it is natural to ask what is the role of financial education, and to what extent it can help reducing the existing gaps in financial literacy.

The evidence on the effectiveness of financial education programs is mixed. Early evaluations (Bayer *et al.*, 1996; Bernheim *et al.*, 2001) have suggested that school or workplace financial education initiatives increase a person's financial awareness and propensity to follow recommended financial practices (i.e. save more, plan for the future, etc.). However, more recent studies fail finding empirical evidence of a positive impact of financial education on financial literacy (Atkinson, 2008; De Meza *et al.*, 2008). In particular, De Meza *et al.* (2008) argue that financial behavior may primarily depend on intrinsic psychological attributes rather than information or skills.

Overall, it seems undisputed that financial education can play a key, wide-ranging role, in different contexts, provided it is carefully designed to capture the need and the specific learning modes of its target (see Hira, 2010 for a broad overview of research on financial education over a long time span). Nonetheless, while financial education initiatives – both in schools and workplaces – are expected to enhance financial awareness and the propensity to adopt good financial practices (e.g. budgeting or joining a pension scheme as soon as possible), a genuine incremental impact of financial literacy does not necessarily follow. As Lusardi *et al.* (2013) show theoretically, there is substantial heterogeneity in individual behavior implying that not everyone will gain from financial education. Since savings

might optimally be equal to zero for some individuals, financial education programs are not necessarily expected to change their behavior. However, the ineffectiveness of financial literacy programs for those specific individuals does not imply that all financial education initiatives are useless and that policy makers should instead concentrate their actions on consumer protection regulation and, in particular, on the design of mandatory choices, as behavioral financial economists tend to propose (see Benartzi and Thaler, 2007; Thaler and Sunstein, 2010). Regulation and financial education are not necessarily substitutes, but they may rather complement each other (Lusardi and Mitchell, 2014)<sup>5</sup>.

This special issue tackles several of the fundamental themes mentioned above. In particular, it provides novel contributions on four key areas: (1) the issue of data handling, with further insights in the application of Item Response Theory to the domain of financial literacy (with the paper by Bongini, Trivellato and Zenga); (2) that of the gender gap (Bongini, Trivellato and Zenga; Agnew and Cameron-Agnew); (3) that of the effectiveness of financial education initiatives (Casarin, Casnici, Dondio and Squazzoni; Dal Santo and Martelli; Filotto, Lucarelli and Traclò); and, finally, (4) that of the effects of financial (il)literacy on economic behavior, in particular as far as risk aversion and portfolio diversification are concerned (Cavezzali, Gardenal and Rigoni; Bajo, Barbi and Sandri).

Bongini *et al.* focus on the gender gap issue concentrating on a homogeneous sample of young persons, expected to exhibit similar personal interests in economic and financial matters. They find no evidence of the existence of a gender gap, neither considering an overall measure of financial literacy (a Rasch measure), nor considering the overall difficulty of the instruments (Differential Item Functioning). The authors argue that personal interest in financial matters overcome potential gender issues in financial literacy, and should therefore be promoted, possibly by means of specific financial education programs in schools, as well as through financial socialization at home.

The issue of financial socialization is investigated by Agnew and Cameron-Agnew, who analyze whether gender stereotypes at home, along with general parental influence, cause different financial attitudes and behaviors in fifteen year old boys and girls in New Zealand. Their findings suggest that male children are exposed to earlier, and better quality financial discussions than female children. Accordingly, the authors stress the importance of making parents aware of how gender stereotypes, and the «financial culture» at home, ultimately impact on the financial knowledge, attitudes and behaviors of their children. Specifically, personal relationships and discussions with parents by both genders play a crucial role. At the same time, educational institutions need to be aware that females may be presenting different attitudes and knowledge than boys as a result of the home environment in which they live, that these differences are pervasive across all socio-economic status levels, and that they directly influence the financial behavior of girls relative to boys (think e.g. to phenomena such as impulse spending).

The special issue provides three contributions dealing with the effectiveness of financial education programs. Filotto *et al.* describe a financial education experiment organized in

<sup>5</sup> Indeed, the combination of the two may induce individuals to rely more on professional and ethical financial advice, rather than on informal sources of advice, such as the help of family and friends.

Italy by the *National Association of Scholars on Financial Institutions and Markets*. While acknowledging the difficulties in the usage of financial education for enhancing financial literacy, the authors argue that some of the experienced drawbacks are due to the use of improper methodologies rather than to the ineffectiveness of financial education *per se*. In particular, they suggest the adoption of a different approach both in selecting the topics on which to build a financial education project and in the ways to teach them. Starting from an empirical analysis of financial education needs, the authors select 15 fundamental financial terms and create a corresponding number of entries to be included in an open-access WEB encyclopedia. More precisely, each of the concepts is precisely explained by scholars using a homogenous «format» (a video 120 seconds long), that has been designed in order to comply with the typical time constraints of adults, as well as to ease/foster their attitude towards learning.

We already noted above that the empirical evidence on the effectiveness of financial education initiatives, including simulations, is inconclusive. For instance, Lusardi (2004) supports these initiatives, while Benartzi and Thaler (2007) remain doubtful about their impact. The contribution by Dal Santo and Martelli investigate the potential benefits of college students' participation in investment simulations, in terms of both improved skills and knowledge, focusing on an innovative online portfolio management competition, the Fund Management Challenge, promoted by the CFA society in Italy and targeted to graduate Italian college students<sup>6</sup>. Although it is not possible to fully disentangle the direct effects of the simulation (e.g. the impact of graders' feedback) from its indirect effects (i.e. those on actions and behaviors, including attending financial courses and reading financial news that might increase students' financial knowledge), the authors' findings support the view that the participation into the Challenge encourages participants' financial learning. In particular, it seems that both the experiential learning and the monitoring component of the Challenge increase participants' knowledge: namely, experience seems to influence behavior (risk attitude), while mentoring helps in selecting better investment strategies (better portfolio diversification). Unfortunately, however, not all students appear to take advantage of the potential benefits of the simulation.

Again on the role of financial education, Casarin et al. warn against the «mantra» of online knowledge generation, and call for urgent initiatives to improve the financial literacy of online investors. The authors present a survey on a sample of online investors in a virtual community in Italy, examining the implications stemming from online exposure. By looking at motivation, risk propensity, education and online experience, the authors find that knowledge sharing and learning in virtual communities cannot compensate for the financial education gap of the investors. Furthermore, it is shown that online exposure tends to increase investors' propensity towards risk taking, which does not necessarily imply an improved portfolio performance. Indeed, only a robust education level and more trading experience is found to improve portfolio performance, and help investors keeping risk under control.

<sup>6</sup> The FMC aims at teaching graduate students to apply the principles of sound investment in real-life situations, and to learn from the experience of senior financial professionals.

The last two contributions of the special issue focus on the relationship between financial literacy, financial education and economic behavior, in particular risk aversion and portfolio diversification.

Cavezzali *et al.* investigate whether financial education and financial literacy influence the risk taking behavior of non-professional USA investors and their diversification strategies, showing that, although financial literacy (measured according to Lusardi and Mitchell (2007) metric) does not influence risk taking, financial education affects investors' investment process. In particular, whereas for uneducated investors no relationship between risk diversification strategies and financial literacy is found, financial literacy seems to foster better diversification behavior by educated investors. These results have important policy implications, suggesting that financial education can trigger relevant changes in the investment patterns of investors, fostering diversification practices that, though simple, are capable to protect from the most disruptive consequences of financial risks.

Finally, Bajo *et al.* investigate the effects of financial literacy on households risk aversion, building on about 38,000 MiFID questionnaire provided by an Italian primary bank. In line with the literature, they find that the level of financial literacy is lower for the young and the old, for women, for less-educated, less wealthy and more financial fragile individuals, living in poorer and less densely populated areas of Italy. Furthermore, past professional expertise in a finance-related field helps increasing the level of financial literacy. The most interesting result, however, is that household 'self reported' risk aversion is shown to be negatively correlated with financial literacy, as the less financially knowledgeable individuals tend to be more risk averse. *Ceteris paribus*, a lower level of financial literacy seems to make households more cautious when it comes to take investment decision. Households with poor financial literacy avoid riskier financial instruments – yet not necessarily risky *per se* – and are *de facto* precluded from most portfolio diversification strategies.

The contributions in this special issue highlight several novel results bringing new insights both in a methodological perspective (focusing on the notion and measurement of financial literacy), and in a policy perspective (assessing the relevance of financial education programs and the implications of financial literacy on agents' choices). At the same time, it is clear that much remains to be done to fully assess the impact of financial literacy on individual decision-making. In this respect, we are hopeful that this special issue may be seen as a useful reference to inform future research in the field.

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