



# Subjective financial literacy and retail investors' behavior

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## ABSTRACT

This paper investigates the relationship between *subjective* financial literacy, i.e. self-reported by investors, and trading behavior. In particular, we use the level of financial knowledge and experience reported in the MiFID tests by retail investors. Such tests are implemented in the EU from the so-called Markets in Financial Instruments Directive since November 2007. We show that subjective financial literacy helps explain cross-sectional variations in retail investors' behavior. Investors who report higher levels of financial literacy seem to invest *smarter*, even after controlling for gender, age, portfolio value, trading experience and education. They trade more and are less prone to the disposition effect. They tend to concentrate their portfolios on a small set of stocks and achieve diversification through investment funds holding. Their trading behaviors allow them to display higher gross and net returns as well as higher excess Sharpe ratios. Our findings are relevant for both policy making and understanding retail investors' behavior.

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## 1. Introduction

Lusardi and Mitchell (2014) define *financial literacy* as the ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt and pensions. In order to assess such an ability, these authors have designed a set of questions built on the three following basics: numeracy and capacity to do calculations related to interest rates, understanding of inflation, and understanding of risk diversification.<sup>1</sup> Their set of questions is now recognized as a standard in the literature. It has been administered to populations of different ages in the US (Lusardi and Mitchell, 2011a) but also in other countries such as the Netherlands (Van Rooij et al., 2011) and Japan (Sekita, 2011). The main empirical findings all converge at a widespread low level of financial literacy. Beyond the level of individuals' knowledge of financial concepts, several authors show that financial literacy is effectively related to different aspects of financial behavior. For example, Hilgert et al. (2003) document a strong correlation between financial literacy and day-to-day financial management skills. In the same vein, Lusardi and Mitchell (2007) find that individuals with low financial literacy are less likely to plan for retirement and therefore accumulate less wealth during their lifetime. As for

Guiso and Jappelli (2008), they provide evidence that measures of financial literacy are strongly correlated with the degree of portfolio diversification. Finally, a bunch of papers highlight the positive relationship between financial literacy and stock market participation (a.o. Kimball and Shumway, 2006; Christelis et al., 2010; Van Rooij et al., 2011).

Most of the above papers refer to *objective* measures of financial literacy, i.e. based on a set of questions designed to assess how people deal with fundamental concepts at the root of saving and investment decisions. Such objective measures reveal individuals' *actual* knowledge, where the latter is based on correct answers. By contrast, *subjective* measures of financial literacy rely on questions asking people to indicate their self-assessed financial knowledge and expertise. Such subjective data may best capture psychological drivers affecting the individual's decision-making process. Their use remains however quite infrequent in the financial literature, despite the growing amount of papers relying on surveys to elicit investors' attributes (a.o. Glaser and Weber, 2007; Graham et al., 2009; Merkle and Weber, 2014). The reluctance towards such data is mainly an a priori skepticism: Can we trust what people state? Can we use this information to understand how they behave? And for financial literacy in particular, respondents are expected to be rather confident about their financial knowledge and, overall, overestimate how much they actually know. According to the literature, the relationship between *objective* and *subjective* literacy may not be taken for granted (Lusardi and Mitchell, 2014). While some authors document a strong positive relationship between both measures

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<sup>1</sup> For more details, see Lusardi and Mitchell (2008, 2011a, 2011b).

(Dorn and Huberman, 2005; Van Rooij et al., 2011), others report only a weak relationship (Guiso and Jappelli, 2008; Lusardi, 2011; Bucher-Koenen et al., 2012). Xia et al. (2014) even use the difference between both measures as a proxy of overconfidence.

In this paper, we investigate the relationship between subjective financial literacy and actual trading behavior. For that purpose, we use subjective measures of financial literacy available in the so-called MiFID tests. The latter are implemented in the EU since the Markets in Financial Instruments Directive<sup>2</sup> came into force in November 2007. This piece of European regulation was wide and far reaching; it covered all forms of intermediation/services or dealing activities and impacted all financial intermediaries, their clients (either professional or retail) and the majority of financial instruments. In a nutshell, MiFID has made compulsory for investment firms to collect specific information about their retail clients' needs and preferences. Accordingly, investment firms operating in the EU are obliged to submit tests to their clients in order to determine their level of knowledge and experience, their investment objectives as well as their financial capacity. Such tests should help offer investors suitable services. Specifically, *suitability* assessment is required before providing investment advice or portfolio management services while *appropriateness* assessment is required before providing execution and transmission of orders (what is called "execution only" in the industry) on complex financial instruments. Basically, the *Suitability* test aims at understanding the types of investments that will be suitable for the investor while the *Appropriateness* test should assess the investor's knowledge and experience in complex financial instruments so as to protect those who would not understand or be aware of the potential implications and level of risk involved in a "complex" transaction (i.e. involving "complex" instruments such as derivatives).

Although the MiFID tests have now been implemented for several years, they have raised little interest so far, whether in academia or in the financial industry. MiFID deserves though a particular attention since it requires investment firms to gather survey data about their clients but without defining standard questionnaires.<sup>3</sup> MiFID mainly requires that suitability assessment covers three sets of items: investment objectives, financial capacity, experience and knowledge. As for appropriateness assessment, it has to be based on experience and knowledge only. Furthermore, MiFID does not impose the use of objective measures of financial literacy and most of the time investors are rather asked to self-assess their level of financial knowledge. For example, they are required to estimate their own level of knowledge and experience about risks and potential obligations inherent to specific financial instruments and select among 'no knowledge', 'average knowledge', and 'good knowledge'. The wide latitude for interpretation left by MiFID has led to a large diversity of questionnaires since each investment firm has developed its own tests for profiling its clients.<sup>4</sup>

As for academic research addressing this topic, it is still in its infancy. Marinelli and Mazzoli (2011) document the differences characterizing the MiFID tests across 14 Italian investment firms. These authors show that the questionnaires largely diverge in their structure and content. According to them, this huge heterogeneity may have side effects leading to inconsistent profiling.<sup>5</sup> Linciano and Soccorso (2012) also analyze the questionnaires used by several Italian intermediaries and confirm that they depend on the firm's business model. These authors point out a lack of appropriate training courses for the advisors who have to administer these MiFID tests to clients.<sup>6</sup> Furthermore, they report that the tests under scrutiny mainly require self-assessment from clients and include several ambiguous questions that are easy to misunderstand. More recently, Mazzoli and Marinelli (2014) have focused on risk profiling for a sample of 1149 suitable portfolios and conclude that information gathered in the tests are not sufficient to determine an investor's risk profile.<sup>7</sup>

In contrast with the aforementioned papers, we aim at finding whether the answers given by retail investors in the MiFID tests are informative and consistent with their trading behavior. Specifically, we focus on financial literacy since it is included in both tests and should help investment firms elicit the degree of their clients' knowledge and experience. As such, this paper is, to the best of our knowledge, the first paper investigating the informativeness of financial literacy in the MiFID tests. Guiso and Jappelli (2008) document that "eliciting financial literacy by simply asking people if they know finance is bound to lead to serious mistakes [...] To put it simply, using self-assessment to rank investors on the basis of their financial knowledge for regulatory purposes is confounded by investors' over- or underconfidence." Our aim is therefore to determine whether the investors' self-assessment of their financial literacy may be useful for characterizing investors' trading behavior and may be reliable for both regulators and investments firms.

Our research question is relevant because the extant literature is still scarce and the results are often mixed. Dorn and Huberman (2005) are some of the first authors to confront investors' portfolios and trading activity with their own statements. They highlight that the inclusion of subjective investor attributes offers several insights into investor behavior. Regarding the relationship between self-assessment of financial literacy and trading behavior, they find ambiguous evidence. On the one hand, they report that investors who perceive themselves as more knowledgeable about financial securities display a better diversified portfolio. On the other hand, those who perceive themselves as better informed about financial securities than the average investor churn over their portfolios more, which may be evidence of overconfidence. Graham et al. (2009) focus on the "competence effect" and its impact on financial behavior.<sup>8</sup> They find that investors who feel competent trade more often and have more internationally diversi-

<sup>2</sup> The Markets in Financial Instruments Directive is usually referred to as MiFID. Formerly known as Investment Services Directive II, this directive was the second step in the harmonization of the European capital markets industry. It essentially aimed at adapting the first Investment Services Directive (ISD 1, issued in 1993) to the realities of the current market structure. On October 2011, the European Commission adopted a legislative proposal for the revision of MiFID. This revision took the form of a revised Directive (MiFID II) and a new Regulation (MiFIR). In a nutshell, MiFID II came into force in January 2018 and confirms the role of the MiFID tests by strengthening conduct rules such as an extended scope for the Appropriateness test and reinforced information to clients. For more details, see the European Commission website ([http://www.ec.europa.eu/internal\\_market/securities/isd/mifid2/index\\_en.htm](http://www.ec.europa.eu/internal_market/securities/isd/mifid2/index_en.htm)).

<sup>3</sup> The European regulator only provided guidelines and general rules for implementing the MiFID tests.

<sup>4</sup> Supervisory authorities have taken initiatives to both evaluate how well the questionnaires used in practice comply with MiFID requirements and improve the implementing guidelines (a.o. AMF, 2010; FSA, 2011; ESMA, 2012; FSMA, 2014). The

resulting evidence tends to reveal the poor quality of suitability tests, the poor quality of client profiling, and poor advisory services as a consequence.

<sup>5</sup> They show that the same investor could be characterized as 'cautious' or 'dynamic', depending on the test that is used.

<sup>6</sup> While in a few cases the staff has been specifically trained, the training was limited to refresher courses on the legal aspects, or generic training courses for advisers. Workshops on the design of questionnaires were rarely included in the training sessions, nor explicit references to the potential issues of cognitive and behavioural biases affecting the administration of questionnaires. According to Linciano and Soccorso (2012), this represents a major issue since building valid and reliable questionnaires requires specific multidisciplinary skills.

<sup>7</sup> In particular, they put forward variables that are directly related to both the risk-holding and risk-allocation decisions of the Italian households in their sample.

<sup>8</sup> The competence effect could be related to the self-perceived financial literacy we analyze since it is defined as the fact of feeling skillful or knowledgeable in an area. The authors suggest that the competence effect is particularly relevant to investors' behavior as investors are constantly required to make decisions based on subjective probabilities.

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