

Quaderni di finanza

Retail investors and sustainable finance

Sustainable finance literacy, overconfidence
and the role of information and advisors

F. Corielli, D. Costa, M. Gentile, F. Saita



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Investitori *retail* e finanza sostenibile

Conoscenze sulla finanza sostenibile, *overconfidence*,
informazioni e ruolo dei consulenti

F. Corielli, D. Costa, M. Gentile, F. Saita^(*)

Sintesi del lavoro

Le decisioni di portafoglio degli investitori *retail* nell'ambito della finanza sostenibile stanno acquisendo crescente rilevanza nella ricerca economica, in virtù del ruolo centrale che gli investimenti ESG (ambientali, sociali e di *governance*) rivestono nel perseguimento degli obiettivi climatici e nella realizzazione del Green Deal europeo. La letteratura economica ha evidenziato che i possibili *drivers* delle scelte di investimento sostenibile sono molteplici e che esiste un'associazione positiva fra l'alfabetizzazione finanziaria sui temi specifici della sostenibilità (*sustainable finance literacy*, SFL) e gli investimenti ESG.

Lo studio contribuisce alla letteratura economica analizzando in modo distinto il ruolo della SFL effettiva, della percezione soggettiva della propria competenza e dell'*overconfidence*, definita come la discrepanza tra competenza percepita e competenza effettiva. Mentre è noto, in termini generali, che l'*overconfidence* è un *bias* comportamentale che può influenzare le scelte di investimento, potenzialmente portando a decisioni subottimali, il suo ruolo non era stato ancora approfondito con riferimento specifico agli investimenti in prodotti finanziari ESG, caratterizzati sovente da elevata complessità e da una limitata profondità storica di informazioni, potenzialmente amplificando il rischio di decisioni non sufficientemente consapevoli. Utilizzando i dati della Survey CONSOB 2024 sugli investitori *retail* italiani, lo studio evidenzia che l'*overconfidence* nelle proprie conoscenze di *sustainable finance* è un atteggiamento diffuso e correlato positivamente con gli investimenti in strumenti finanziari ESG con un grado di associazione quasi altrettanto forte rispetto alla SFL effettiva.

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Attraverso un'analisi econometrica basata su variabili strumentali, volta a mitigare problemi di endogeneità e di causalità inversa, si evidenzia non solo che il legame fra l'*overconfidence* nel proprio livello di SFL e investimenti in *asset* sostenibili è confermato, ma anche che l'accesso a informazioni finanziarie generali tende a incrementare la SFL effettiva senza accrescere l'*overconfidence*, mentre la disponibilità di informazioni specifiche sulla finanza sostenibile tende ad aumentare entrambe. Questi risultati suggeriscono che le politiche pubbliche orientate alla promozione di investimenti consapevoli debbano essere calibrate con attenzione, al fine di evitare effetti cognitivi distorsivi.

Il lavoro contribuisce anche al filone di studi che analizza il ruolo dei consulenti finanziari nelle decisioni di investimento in ambito di finanza sostenibile. Le evidenze empiriche, basate su dati campionari riferiti agli investitori *retail*, segnalano in particolare una significativa eterogeneità nell'approccio dei consulenti ai prodotti ESG e che una maggiore proattività dei consulenti si associa positivamente a scelte di investimenti sostenibili. Tali risultati sottolineano l'importanza di interventi formativi mirati nei confronti dei consulenti e di una supervisione regolamentare efficace per favorire pratiche d'investimento responsabili.

Nel complesso, il contributo evidenzia la necessità di un impianto normativo e informativo che non si limiti ad accrescere la SFL, ma che consideri anche le distorsioni cognitive potenzialmente indotte, al fine di promuovere decisioni d'investimento più informate, efficienti e coerenti con gli obiettivi di sostenibilità.

Retail investors and sustainable finance

Sustainable finance literacy, overconfidence and the role of information and advisors

*F. Corielli, D. Costa, M. Gentile, F. Saita**

Abstract

Investor decision-making in the realm of sustainable finance has garnered increasing scholarly and regulatory attention, particularly considering the pivotal role ESG (environmental, social, and governance) investments play in advancing climate objectives and the European Green Deal. While extant literature has underscored the multifactorial nature of sustainable investment behaviour – ranging from financial motivations to value alignment – it has also consistently identified a positive association between sustainable finance literacy (SFL) and both the propensity to invest and actual investment in sustainable assets.

This paper contributes to the literature by disentangling the roles of actual SFL, perceived SFL, and SFL overconfidence – the latter defined as the discrepancy between perceived and actual literacy. While overconfidence is known to exert a significant influence on investment behaviour, potentially leading to suboptimal outcomes, in many other investment decisions, its role has not so far been investigated in the context of ESG products, which are characterised by informational complexity and a relatively short performance history, potentially amplifying the risk of misinformed decision-making. Using data from a large survey of Italian investor, we first document the existence of SFL overconfidence, and we show that in a simple correlation analysis the relationship of SFL overconfidence with investment in sustainable assets is almost as strong as the one with actual SFL.

JEL Classifications: G11, G40, G41, G53.

Keywords: investment decisions, financial literacy; financial knowledge, sustainable finance literacy, overconfidence, advice.

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Employing an instrumental variable approach to address endogeneity concerns, we show not only that the link between SFL overconfidence and investment in sustainable assets is confirmed, but also that increased access to general financial information may enhance actual SFL without exacerbating overconfidence, whereas targeted sustainable finance information tends to increase both. These findings suggest that policy interventions aimed at fostering informed investment should carefully calibrate the dissemination of financial and sustainability-related information to mitigate unintended cognitive biases.

Furthermore, our analysis extends the emerging literature on the role of financial advisors in shaping sustainable investment decisions. Survey-based evidence indicates substantial perceived heterogeneity in advisors' engagement with sustainable products, with more proactive advisory behaviour positively associated with investment in sustainable assets. This underscores the importance of advisor training and regulatory oversight in promoting responsible investment practices.

Overall, our findings highlight the necessity of a nuanced policy framework that not only seeks to elevate sustainable finance literacy but also actively monitors and manages the cognitive distortions that may arise in its wake, thereby fostering more informed and resilient investor behaviour in the sustainable finance domain.

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1 Introduction

Understanding investors' attitudes and decisions concerning sustainable investments has become over the last decade a crucial topic for academics, regulators and for asset managers as well. A number of new products devoting or claiming to devote specific attention to ESG (environmental, social and governance) features of investable stocks or bonds have been launched, ESG rating companies have become more popular and sustainability characteristics have shown to have a material impact on aggregate fund flows (Hartzmark *et al.*, 2019). Significant efforts by regulators and supervisors have been made, particularly in Europe, to define a taxonomy of sustainable products, to promote elicitation of investors' sustainability preferences when offering investment advice, and to prevent potential greenwashing practices. Despite these efforts, sustainable products may still be associated with significant complexity, while their relatively more recent introduction has not allowed yet many investors to learn through direct experience about the potential benefits and limitations of ESG products. From a policy standpoint, it is therefore important to understand how to create the conditions for conscious investment decisions about sustainable products, either by regulating industry players or by increasing investors' ability to make informed decisions. Particular attention has been devoted to this issue in Europe, especially considering that sustainable investments have become very important and instrumental in achieving climate goals, European Green Deal (Eurosif, 2018 and 2021, European Commission, 2024) and reorienting investment towards the technologies and sectors that could support European competitiveness¹.

Understanding investors' decisions as far as sustainable assets are concerned is complex considering the interaction of factors that can contribute to the decision to invest or not to invest in those assets. One relevant strand in the literature has investigated the different reasons to invest in sustainable assets, and whether the decision may mostly be driven by *«regarding the ESG qualities of an investment as important to its financial value or, as consistent with one's values»* (Starks, 2023), or by a combination of both factors. The investigation of the role of non-pecuniary factors in sustainable assets investment decisions has been conducted both by evaluating the willingness to pay for sustainability or for impact in the context of stated choice experiments and simulated portfolio decisions (Heeb *et al.*, 2023; Brunen *et al.*, 2022; Rossi *et al.*, 2019) and by observing the role of non-pecuniary motives in actual investment decisions (Døskeland *et al.*, 2016; Riedl *et al.*, 2017; Gutsche *et al.*, 2021; Bauer *et al.*, 2021; Anderson *et al.*, 2022; Giglio *et al.*, 2024²). Socio-demographic characteristics and personal traits also play a role (Wins *et al.*, 2016; Alemanni, 2022; Costa *et al.*, 2022) in a decision which is clearly influenced by multiple factors (Pasquino *et al.*, 2025).

1 Consequently, sustainable investments have been given substantial attention in the harmonisation efforts for European Union Capital Markets and in the Savings and Investment Union project (European Commission, 2025).

2 Degryse *et al.* (2023) with a sample of 1550 Dutch participants try to identify the peculiar characteristics of value vs values investors. Giglio *et al.* (2025) explore investors' motivations for ESG investing among a large sample of U.S. investors show that there is a strong link between reported ESG investment motives and their actual investment, even if there is a large portion of values investors who also expect higher returns from ESG investments.

A second strand of literature has pointed out the importance of traditional financial literacy, environmental literacy (i.e. the knowledge of environmental aspects), or sustainable finance literacy. Anderson and Robinson (2022), connecting the responses to administrative data of a large sample of Swedish households, show that pro-environment households are not more likely to hold pro-environment portfolios and that green financial engagement is stronger in settings where financial literacy is higher or where informational hurdles are lower. Bethlendi *et al.* (2022) point out a positive relationship between green/financial knowledge 'ecoliteracy' and personal green attitude, but this is a non-sufficient condition to choose a 'green' financial product.

In the context of sustainable investments, a crucial concept is represented by sustainable finance literacy (SFL), which can be defined as «*the knowledge and skill of identifying and assessing financial products according to their reported sustainability-related characteristics*» (Filippini *et al.*, 2024). In other words, sustainable finance literacy may consider knowledge on sustainable finance and sustainable finance products, including basic terms, regulation, investment strategies, as well as impact on ESG-factors (environmental, social, and governance) and therefore differs from the more general concept of financial literacy which is defined as the «*ability to process economic information and make informed decisions about financial planning, wealth accumulation, debt, and pensions*» (Lusardi, 2015). Recent studies provide evidence that the level of sustainable finance literacy appears to be positively correlated with investment in sustainable assets (Filippini *et al.*, 2024; Degryse *et al.*, 2023, Strauß *et al.*, 2023 and Yucel *et al.*, 2023). However, while often a subjective measure of sustainable finance literacy is used, only Filippini *et al.* (2024) try to define an objective SFL measure using multiple-choice questions. Moreover, Filippini *et al.* (2024) differentiate sustainable finance literacy from both 'environmental literacy', which describes knowledge about the environment but does not include sustainable finance and sustainability literacy which includes the environmental, economic, and social dimensions of sustainable development and governance perspectives³.

Our paper is mostly related to this second strand of literature, and its main contribution is to try to point out the role of both actual (i.e., objective) SFL and perceived SFL, or, in alternative, the combined role of actual SFL and SFL overconfidence, measured as the difference between perceived and actual SFL. There are multiple reasons to investigate the potential role of perceived SFL and SFL overconfidence. The first one is that in the context of financial literacy, there is evidence that perceived financial literacy may matter more than actual. In particular, Anderson *et*

3 Other literature demonstrates the role of information in individuals' orientation towards sustainable investments, showing that information barriers may be key drivers for not investing sustainably (Degryse *et al.*, 2023; Gutsche *et al.*, 2023; Wins *et al.*, 2016) and hinder the translation of sustainability preferences to investment decisions, particularly for less literate individuals (Anderson *et al.*, 2022). For example, a recent study finds that both financial return information and ESG impact information stimulate ESG investment and investors satisfaction with the information they received (Seifert *et al.*, 2024). Sustainable finance literacy might also support investors in their decisions and allow them to gain additional information to verify that a product meets their expectations.

al. (2017) using a large survey among LinkedIn members show that when considering retirement planning and precautionary savings «respondents' mistaken beliefs about their financial literacy drive their behaviour at least the same degree as their actual literacy». The potential role of overconfidence has been analysed in the literature under many different perspectives. Even concentrating just on its potential role in investment and trading decisions, overconfidence has been linked to excessive trading (Odean, 1998a, Glaser *et al.*, 2007), poor diversification (Goetzmann *et al.*, 2008), and increased risk taking (Dorn *et al.*, 2005), may explain security market over and under-reaction (Daniel *et al.*, 1998) and reduce the demand for financial advice (Gentile *et al.*, 2016). At least potentially, SFL overconfidence could be equally important in the context of investment in sustainable assets. For instance, Giglio *et al.* (2024) document the great heterogeneity in investors' expectations about ESG investments' expected returns, as well as their frequent update over time, also due to the relatively shorter history of ESG investments. Combining the complexity of ESG characteristics, the relatively short history of most sustainable products and the limited competencies of a large portion of potential investors, trying to understand whether overconfidence may exist also in the sustainable finance domain and whether it can potentially influence investors' decision is a relevant issue from a policy perspective⁴.

From the standpoint of supervisors, this is further reinforced by the fact that the general finding that higher SFL is positively correlated with investment in sustainable assets, and the intuition that it would tend to qualify a more conscious and informed investor, would generally lead to suggesting as a policy implication that increasing SFL among investors (e.g. by spreading information on sustainability and sustainable finance products) would be beneficial. However, if SFL overconfidence exists and it may play a role, it is also important to understand whether and how it is possible to enhance actual sustainable finance literacy while controlling as far as possible the level of overconfidence.

Our paper also partially relates to the literature concerning the role of financial advisors in sustainable assets' investments (see, in particular Paetzold *et al.*, 2015; Margot *et al.*, 2022; CONSOB, 2024a; CONSOB, 2024b; Lanciano *et al.*, 2024) or financial advisors' attitude towards sustainable products (Bongini *et al.*, 2025). Results are suggestive of a relevant role of the financial advisors, even if there appears to be heterogeneity in their approach towards sustainable products and investment in sustainable assets is largely associated with a more proactive advisor.

4 On the role of perceptions or misperceptions of sustainable assets as a barrier to investing sustainably see also Meunier and Ohadi (2022). It must also be noted that if there are good reasons to expect overconfidence in security investment in general, considering that it may be more difficult than in other fields to obtain a clear feedback that can help calibrating one's abilities (see the detailed discussion of this issue in Odean 1998b) this problem can be even more serious when it comes to assessing the sustainability features of an investment product.

2 Data and sample

Our empirical analysis is based on the proprietary database 'CONSOB 2024 Survey', which collects data on a sample of 2,011 individuals' representative of Italian financial decision-makers who declare that they own one or more financial assets (referred to as 'retail investors')⁵. The survey was carried out between February and March 2024, targeting households holding financial assets⁶. The sampling method relied on territorial quotas (regions and size of urban center), as well as gender and age quotas. Moreover, consistency with respect to other key socio-demographic variables, such as education and occupation, was verified⁷.

Once the households had been sampled, selection criteria were applied to identify the person in each household who was required to respond to the interview. The interviewees were the highest income earner in the household, invested in at least one financial asset and affirmed to be the main manager of the household's finances. They also had to be 'aware investors', meaning they knew about at least one financial instrument; lastly respondents' ages ranged from 18 to 75. These selection criteria were adapted from OECD experience in surveys targeting financial education. The aim of this survey plan is to obtain an accurate measure of respondents' financial knowledge, particularly in the field of sustainable finance.

Based on CONSOB survey data, Italian retail investors in 2024 are mainly men (78%)⁸, married (57%), and have a lower education level than university degree (68%); moreover, the average age of respondents is 51. Most investors are employed (62%)⁹; with financial wealth included between 10,000 and 50,000 euros (40%)¹⁰. Households' net monthly income ranges from 1,200 and 3,000 euros (57%), while only 29% of investors' income ranges between 3,000 and 5,000 euros.

5 Data was collected by Dogma Research.

6 The list of financial instruments includes time deposits, postal savings bonds and/or bank certificates of deposit, bonds, shares or capital shares (in shares of companies listed in Italy and abroad or in family businesses), government securities, mutual funds, PACs (accumulation plans), ETFs (Exchange Traded Funds or passively managed mutual funds), asset management (movable asset management, fund-based asset management, fund policies), financial life insurance policies (unit-linked/ index-linked), PIR (Savings Investment Plans) in support of SMEs (small/medium enterprises), alternative products (e.g. hedge funds, private equity funds, closed-end real estate funds, contracts for difference), derivatives (e.g. options, futures, certificates), Eltif (European long-term investment fund), Exchange Traded Commodities, Repurchase Agreements (Repos); crypto-currencies (e.g. Bitcoin, Ether, Ripple), stablecoins (e.g. Tether), investment-based crowdfunding or lending-based crowdfunding.

7 To allow for a longitudinal comparison of data collected across the two editions, the sampling quotas in the survey carried out in 2024 were kept closely aligned with those used in 2022.

8 All the statistics reported in this section are computed applying sample weights. For details regarding the methodology used for computation see CONSOB (2024b).

9 The remaining investors are self-employed (17%) or retired (15%). A further 4% include housewives, students and people without an occupational status.

10 Financial wealth is included between 50,000 and 250,000 euro for 32% of investors, it is over 250,000 euro in 12% of the cases, while for the remaining 15% is below 10,000 euro.

The sampling plan described in the previous section aims to develop an accurate measure of investors' financial knowledge. In particular, the questionnaire includes a sustainable financial literacy test based on the following definition by Filippini *et al.* (2024): sustainable financial literacy is the knowledge of regulations, norms, and standards about financial products with sustainable characteristics. It allows identifying and assessing financial products according to their reported sustainability-related characteristics.

This characterisation entails not only economic and financial topics, but also knowledge regarding norms and rules. A high level of literacy should enable, indeed, investors to identify and evaluate assets related to sustainable finance¹¹.

Our metric of sustainable financial literacy measures each interviewee's performance in a test covering the following six concepts: sustainable development, corporate sustainability, the meaning of the acronym ESG, ESG rating agencies, the definition of sustainable economic activity according to the Sustainable Finance Disclosure Regulation (SFDR) and green bonds¹². The questionnaire is based on financial literature (Anderson *et al.*, 2022; Filippini *et al.*, 2024; Gutsche *et al.*, 2023; Rossi *et al.*, 2019; Strauß *et al.*, 2023; see Section 1), as well as OECD INFE examples of surveys designed to measure skills and knowledge.

On average, the proportion of correct answers to the sustainable financial literacy test is estimated to be 43%¹³, which is significantly lower than the proportion of correct answers related to basic financial knowledge¹⁴ (76%¹⁵) and slightly lower than the digital score (51%¹⁶). Respondents most frequently provide correct answers to two (around 27%) or three (24%) out of six questions in the sustainable financial literacy test: rarely they manage to correctly answer all questions (2%; see Figure 1).

11 Even if we use the definition provided by Filippini *et al.* (2024) as our reference point, we innovate the questionnaire to make it more suitable respect to the specific aims of our research. One question on the definition of sustainable development is included by Filippini *et al.* (2024) among sustainability literacy question, and a second question – on the ESG acronym – is extremely similar to one SFL question in their paper. A third question concerning investor's consciousness about an "ESG label" has been changed into a more specific question on ESG rating companies. A fourth question concerning the definition of sustainable investment has been linked more clearly to SFDR, and we also defined a question about the relevant dimensions to judge sustainability for a company and about the definition of green bonds.

12 See Appendix for details on the questionnaire.

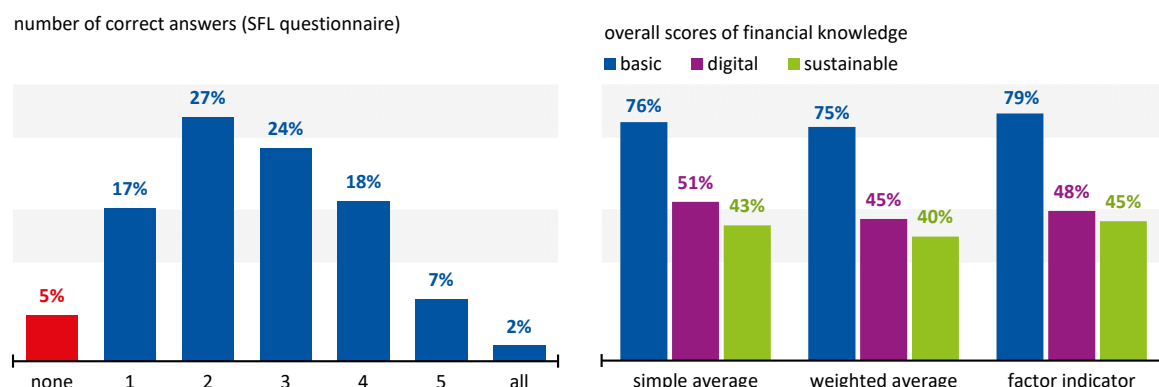
13 Estimates are obtained by applying sample weights. For details on the methodology see CONSOB, 2024b.

14 Questionnaire for basic financial knowledge includes the following 5 topics: 1) risk return relationship, interest, inflation, mortgages, diversification (see for details CONSOB, 2024b).

15 For details on the methodology used in the computation see Report on financial investments of Italian households (2024).

16 Questionnaire for digital knowledge includes the following 6 concepts: personal data sharing, bitcoin as means of payment, bitcoin investment riskiness, safeguard of digital products/services, bitcoin complaints, digital financial service supervision (see for details CONSOB, 2024b).

Figure 1 – Actual sustainable financial literacy



Source: CONSOB (2024b). Note: On the right-side graph, the 'simple average' indicator accounts for the percentage of correct answers; the 'weighted average' indicator considers also the easiness of questions, by weighing more those recording lower sample frequencies of correct answers; the 'factor' indicator is the first principal component of correct answers, rescaled by the easiness of questions and normalised between 0 and 1.

Since we base our analysis on data obtained from a survey by a marketing research company run on its field of incentivised respondents, self-selection issues should not be a major concern. On the other hand, social desirability biases in survey responses (e.g. affirming to hold sustainable investments when this is not true, assuming this may be socially desirable) may potentially exist. To reduce the risk that such possible behaviour may affect our analysis, exploiting the larger set of questions in the survey, we ran some coherence checks. First, we excluded all cases where respondents declared to own sustainable products but were unable to specify which financial instrument is in their portfolio. Secondly, we excluded those cases in which the specific ESG investments declared by the respondent is inconsistent with the answer provided, much earlier in the survey, about which types of financial instruments were owned by the respondent. This led to excluding, for instance, respondents who declared they invested in ESG stocks, while they did not earlier declare to hold stocks in their portfolio. These checks, leading to drop just 62 out of 2,011 observations, hopefully leave the analysis less exposed to social desirability bias for the key question used as a dependent variable in our analysis.

3 The determinants of sustainable financial literacy: actual and perceived knowledge

In this section, we develop an econometric framework aimed at estimating the significance and sign of the associations between sustainable financial literacy and explanatory factors, which can be categorised as socio-demographic variables (e.g. gender, age, marital status, education, income and financial wealth) or personal traits (e.g. altruism, risk preference, trust and time preference)¹⁷. Financial market

¹⁷ See Appendix for details on the questionnaire.

experience, measured as the number of years participating in the financial market, has also been added as an explanatory variable.

In the first model uses actual sustainable financial literacy (ActSFL) is the dependent variable and it is measured as the performance in the specific test already described in the previous section. We define the number of correct answers, ranging from 0 ('no correct answers') to 6 ('all answers correct').

We measure not only effective sustainable financial literacy, but also investors' perception of it. Indeed, before taking the test, we ask respondents how much they think they know about sustainable finance; score (Perceived SFL) options range from 0 ('I don't know anything') to 6 ('I am fully aware'). Only 5% of investors declare that they know nothing about sustainable finance, while 7% of them affirm that they are fully aware; lastly, 48% of respondents give a score ranging from 3 to 4.

By comparing perceived and actual knowledge we define a measure of SFL overconfidence ex ante (OCanteSFL) defined as:

$$\text{OCanteSFL} = \text{Perceived ex Ante SFL} - \text{ActSFL}$$

which ranges from -6 to 6, increases when overconfidence becomes more likely and is strictly greater than zero in 51% of cases. We consider these variables as the key measure of perceived SFL and overconfidence, and we label them as Perceived ex ante SFL/Ex ante overconfidence since the self-assessment on the individual's SFL is asked before submitting the questions on sustainable finance literacy (OCanteSFL). As further control, we also built a measure of ex-post perceived SFL by asking respondents just after the six SFL questions how many correct answers he or she believes to have provided. The difference between ex post perceived SFL and actual SFL is labelled ex post SFL overconfidence (OCpostSFL) and will be used in robustness checks later. In general, we will mostly refer to ex ante perceived SFL and ex ante SFL overconfidence since this concept is much more general and does not depend on the specific set of items in the SFL questionnaire¹⁸.

We also measured actual financial literacy, using a set of five standard questions, and defined the variable ActFL (actual financial literacy) as the number of correct financial literacy questions. We also derived a measure of (ex ante) financial literacy overconfidence (OCanteFL) by comparing the self-assessment about the knowledge about finance and investments on a 0 to 5 scale (which was requested before submitting the financial literacy questions) with ActFL. We also derived, in a way similar to SFL, a measure of ex post FL overconfidence by asking to the respondent after the five financial literacy questions the expected number of correct answers, and by subtracting the number of actually correct answers. This variable was labelled as ex post FL overconfidence (OCpostFL). These variables will be used later in sections 5 and 6¹⁹.

18 See Appendix for details on the questionnaire.

19 See Appendix for details on the questionnaire.

3.1 The determinants of actual sustainable financial literacy

In the following section, we estimate the strength of the associations between sustainable financial literacy and the explanatory variables by applying a multivariate ordinal probit²⁰. We identify a few positive relationships with education, particularly regarding economic and financial themes (Table 1). Personal traits do not appear to be relevant, except for altruism, while long financial experience plays a key role. However, experience, which is quantified as the length of participation in the financial market, partially offsets the impact of financial wealth which is significant only in Models 3 and 4 which do not include this explicative factor. In line with the literature that points towards the presence of a gender gap, the sign of the 'woman' parameter is negative. However, in our analysis, which relies on a sample mainly composed of men, this coefficient is not significantly different from zero.

The link between education and sustainable financial literacy is in line with the literature. For instance, Lusardi *et al.* (2023) emphasise that financial education in schools and workplaces significantly improves financial literacy, supporting better decision-making in areas including sustainable finance. Varmaz *et al.* (2021) find that individuals with prior investment experience and higher financial literacy are more likely to understand and favour sustainable investment options. Lastly, Lanciano *et al.* (2025) find that higher financial literacy is strongly associated with greater awareness of sustainable finance. Individuals with better understanding of ESG principles are more likely to invest in sustainable financial products. Financial education plays a crucial enabling role in promoting responsible and sustainability-oriented financial choices.

3.2 The determinants of overconfidence

In this section, we present estimates of ordinal probit models where overconfidence is the dependent variable (OCanteSFL). As in the previous case, results highlight few significant associations. Specifically, overconfidence decreases with age and level of general education if not focused on economic or financial themes (Table 2). Notably, correlations with trust and risk tolerance are significant. Lastly, results related to financial market experience seem not to be robust because they change depending on the way we aggregate years of participation to financial markets. Financial wealth and monthly income are never significant.

20 The ordinal probit model is a statistical technique used to analyse ordinal dependent variables. The model assumes the existence of an unobserved continuous variable that underlies the observed ordinal responses. This latent variable is modelled as a linear combination of explanatory variables plus a normally distributed error term. The observed outcome is determined by where the latent variable falls relative to a set of threshold values. The model estimates the probability that an observation falls into each category using the cumulative distribution function of the standard normal distribution. As robustness checks we repeated the estimation process by using sample weights. Results, available at request, do not significantly change.

Table 1 – Determinants of actual sustainable financial literacy

ActSFL	(1)	(2)	(3)	(4)	(5)	(6)
education						
upper secondary	0.2374*	0.2264*	0.2271*	0.2198*	0.2083	0.2086
	-0.1236	-0.1315	-0.1315	-0.1317	-0.1315	-0.1315
university degree	0.5768***	0.5595***	0.5587***	0.5507***	0.5343***	0.5323***
	-0.1251	-0.1378	-0.1379	-0.138	-0.1379	-0.1378
education focused on economic and financial themes						
little	0.223***	0.1577**	0.1621**	0.1536**	0.1408*	0.1419*
	-0.0668	-0.073	-0.0739	-0.0742	-0.074	-0.0738
medium	0.377***	0.2972***	0.3025***	0.2982***	0.2761***	0.2747***
	-0.0692	-0.0762	-0.0779	-0.0785	-0.078	-0.0777
a lot	0.291***	0.2032*	0.1887*	0.1778	0.1547	0.1614
	-0.0951	-0.1084	-0.1114	-0.1116	-0.111	-0.111
altruism			0.0415***	0.0420***	0.0427***	0.0429***
			-0.0154	-0.0154	-0.0154	-0.0154
financial market experience						
short financial market experience (<=3 years)						-0.034
						-0.0835
long financial market experience (> 4 years)						0.1614**
						-0.0706
over 10 years				0.2555*	0.2811**	
				-0.1386	-0.1379	
gender (being woman)	Yes	Yes	Yes	Yes	Yes	Yes
age	Yes	Yes	Yes	Yes	Yes	Yes
geographical area	Yes	Yes	Yes	Yes	No	No
marital status (being single)	Yes	Yes	Yes	Yes	Yes	Yes
professional status	No	Yes	Yes	Yes	Yes	Yes
financial wealth	No	Yes	Yes	Yes	Yes	Yes
monthly income	No	Yes	Yes	Yes	Yes	Yes
trust	No	No	Yes	Yes	Yes	Yes
risk preferences	No	No	Yes	Yes	Yes	Yes
time preferences	No	No	Yes	Yes	Yes	Yes
number of observations	1,944	1,728	1,728	1,728	1,728	1,728
Pseudo R ²	0.0165	0.0226	0.0247	0.0247	0.0256	0.0245

Source: our elaborations on CONSOB Survey 2024 data. Note: Standard errors significance levels: *** p<0.01, ** p<0.05, * p<0.1. 'Geographical area' is North or South of Italy. See the Appendix, for details on professional status, financial market experience and financial wealth / monthly income brackets.

Table 2 – Determinants of overconfidence

OCanteSFL	(1)	(2)	(3)	(4)	(5)	(6)
education						
upper secondary	-0.3226***	-0.3679***	-0.3571***	-0.3490***	-0.3334***	-0.3414***
	-0.1218	-0.1296	-0.1297	-0.1299	-0.1298	-0.13
university degree	-0.4496***	-0.5593***	-0.5719***	-0.5687***	-0.5459***	-0.5489***
	-0.1232	-0.1358	-0.136	-0.1361	-0.136	-0.1359
education focused on economic and financial themes						
little	0.2679***	0.2940***	0.2261***	0.2127***	0.2295***	0.2427***
	-0.0659	-0.0722	-0.0731	-0.0734	-0.0732	-0.073
medium	0.5797***	0.6066***	0.5013***	0.4815***	0.5106***	0.5309***
	-0.0687	-0.0758	-0.0774	-0.0779	-0.0775	-0.0772
a lot	1.1448***	1.1056***	0.9519***	0.9514***	0.9821***	0.9824***
	-0.0961	-0.1091	-0.1116	-0.1118	-0.1114	-0.1113
personal traits						
trust			0.0674***	0.0623***	0.0629***	0.0683***
			-0.0123	-0.0124	-0.0124	-0.0123
risk preferences			0.0581***	0.0565***	0.0540***	0.0556***
financial market experience						
short financial market experience (<=3 years)						0.0258
						-0.0826
long financial market experience (> 4 years)						0.0098
						-0.0698
2 years				0.3450**	0.3283*	
				-0.174	-0.1733	
3 years				0.5007***	0.4887***	
				-0.15	-0.1499	
> 3 years and <= 5 years				0.3471**	0.3195**	
				-0.1404	-0.14	
> 6 years and <= 10 years				0.5490***	0.5186***	
				-0.1434	-0.143	
over 10 years				0.2592*	0.2143***	
				-0.137	-0.1362	
further controls						
gender (being woman)	Yes	Yes	Yes	Yes	Yes	Yes
age	Yes	Yes	Yes	Yes	Yes	Yes
geographical area	Yes	Yes	Yes	Yes	No	No
marital status	Yes	Yes	Yes	Yes	Yes	Yes
professional status	No	Yes	Yes	Yes	Yes	Yes
financial wealth	No	Yes	Yes	Yes	Yes	Yes
monthly income	No	Yes	Yes	Yes	Yes	Yes
time preferences	No	No	Yes	Yes	Yes	Yes
altruism	No	No	Yes	Yes	Yes	Yes
number of observations	1,944	1,728	1,728	1,728	1,728	1,728
Pseudo R ²	0.0301	0.0401	0.0505	0.0541	0.0519	0.0481

Source: our elaborations on CONSOB Survey 2024 data. Note: Standard errors significance levels: *** p<0.01, ** p<0.05, * p<0.1. 'Geographical area' is North or South of Italy. See the Appendix, for details on professional status, financial market experience and financial wealth / monthly income brackets.

Although overconfidence signals a misalignment between perceived and actual knowledge, it tends to be associated with behaviours that could appear to reduce the bias itself. Indeed, based on mean sample tests, overconfident investors seem to be more propense to seek out information on sustainable finance and more willing to learn (see Table 3). For an econometric analysis which tries to untangle the relationships among overconfidence, information and sustainable investment see Section 5.

Table 3 – Propensity to get information about sustainable finance, willingness to improve knowledge and expected performance of sustainable products by overconfidence

	OCanteSFL>0	OCanteSFL≤0	<i>all investors</i>
I get information on sustainable finance at least once a week	57%***	36%	<i>47%</i>
I get information on sustainable finance very scarcely	24%***	42%	<i>33%</i>
sustainable investments offer higher returns than traditional investments (1= strongly disagree... 5=strongly agree)	2.86***	2.48	<i>2.67</i>
sustainable investments have lower risk than traditional investments (1= strongly disagree... 5=strongly agree)	2.97***	2.59	<i>2.79</i>
sustainable investments have lower costs than traditional investments (1= strongly disagree... 5=strongly agree)	2.98***	2.55	<i>2.77</i>
sustainable investments are more suitable for a longer time horizon (1= strongly disagree... 5=strongly agree)	3.59***	3.36	<i>3.47</i>
I would like to know more about sustainable finance topics and inform myself better (1=completely disagree... 5=completely agree)	3.79***	3.62	<i>3.71</i>

Source: our elaborations on CONSOB Survey 2024 data. Note: in the table we report outcomes of mean difference sample test (group 1 = overconfident investors; group 2= other investors); significance levels: *** p<0.01, ** p<0.05, * p<0.1.

4 Actual and perceived SFL and investment in sustainable assets

4.1 SFL, actual investment and propensity to invest in sustainable assets

In this section we try to investigate the association between actual and perceived sustainable finance literacy and investment, or propensity to invest in sustainable assets. We will first consider as our dependent variable, similar to Filippini *et al.* (2024), the answer to the question 'Do you own sustainable investments (for instance, green bonds or sustainable mutual funds)?' with the possible answers 'Yes', 'No', 'I don't know'. We are aware that using this variable rather than administrative data proving the ownership of sustainable investments is subject to limitations. As

pointed out by Filippini *et al.* (2024), using the same dependent variable, the answer may depend on the individual's subjective evaluation about how sustainable one investment may be, and does not consider the share of an investor's wealth actually invested in sustainable assets. Moreover, as long as investing in sustainable assets may be perceived to be socially desirable by the respondent, he or she may be tempted to answer affirmatively even when no sustainable investment is actually owned (we applied the checks of consistency described earlier in section 4 to limit this risk)²¹. We believe however that this dependent variable still remains relevant. Of course, its potential limits must be considered in the interpretation of results.

We begin with a simple OLS regression (Table 4). The dependent variable is self-declared actual investment in sustainable assets, with value 1 in case of positive answer and 0 otherwise ('No'/'Don't know').

In the first three columns, with different combinations of controls, we delve into the association between actual SFL and investment in sustainable assets. Results support the evidence by Filippini *et al.* (2024) on Swiss investors finding that investment in sustainable assets is positively correlated with the level of actual SFL.

However, we want in particular to investigate the possibly different role of actual with respect to perceived SFL. In column 4, by inserting perceived ex ante SFL we can see that its relevance is greater than the one of actual SFL. The model in column 5 is similar but, rather than including self-assessed perceived SFL, considers overconfidence in SFL, measured as the difference between perceived and actual SFL. By comparing the coefficients of actual SFL and SFL overconfidence, we can see that the coefficient of overconfidence is almost as high as the one of actual SFL. Of course, in interpreting our results about the linkage between SFL overconfidence and investment in sustainable assets, two main concerns could immediately emerge. The first one concerns potential simultaneity/reverse causality in the relationship between actual SFL and SFL overconfidence on one hand and investment in sustainable assets on the other hand. As far as possible using survey data, this issue is addressed later on in Section 5 through instrumental variable analysis.

21 In particular, we excluded individuals who declared to own sustainable assets but were either unable to specify which types of sustainable assets they were owning or were declaring assets that were inconsistent with the list of assets in which they declared to invest in at the beginning of the survey (e.g. affirming they were investing in sustainable mutual funds while at the beginning they did not declare to invest in mutual funds).

Table 4 – Actual and perceived sustainable finance literacy and investment in sustainable assets (OLS)

	(1)	(2)	(3)	(4)	(5)	(6)
ActSFL	0.0313*** (0.00687)	0.0235*** (0.00728)	0.0215*** (0.00734)	0.0149** (0.00749)	0.0481*** (0.00896)	0.0444*** (0.00856)
ActFL	-0.00865 (0.00821)	-0.0165* (0.00866)	-0.0109 (0.00862)	-0.00786 (0.00863)	-0.00786 (0.00863)	-0.0116 (0.00864)
PanteSFL				0.0332*** (0.00677)		
OCanteSFL					0.0332*** (0.00677)	
OCpostSFL						0.0309*** (0.00651)
female	0.0125 (0.0233)	0.0123 (0.0237)	0.0145 (0.0237)	0.0106 (0.0237)	0.0106 (0.0237)	0.0136 (0.0237)
age	-0.000192 (0.000854)	-0.00244** (0.00112)	-0.00221** (0.00112)	-0.00188* (0.00111)	-0.00188* (0.00111)	-0.00248** (0.00112)
single	-0.0385* (0.0222)	-0.0173 (0.0261)	-0.0139 (0.0260)	-0.0116 (0.0261)	-0.0116 (0.0261)	-0.00766 (0.0260)
trust			0.0101** (0.00452)	0.00752* (0.00449)	0.00752* (0.00449)	0.00902** (0.00449)
risk appetite			-0.00158 (0.00514)	-0.00397 (0.00518)	-0.00397 (0.00518)	-0.00232 (0.00509)
time preferences			0.00129 (0.00657)	-0.00124 (0.00653)	-0.00124 (0.00653)	-0.000906 (0.00647)
altruism			0.0123** (0.00509)	0.0110** (0.00508)	0.0110** (0.00508)	0.0127** (0.00506)
further controls						
education	Yes	Yes	Yes	Yes	Yes	Yes
economic studies	Yes	Yes	Yes	Yes	Yes	Yes
occupation	No	Yes	Yes	Yes	Yes	Yes
income	No	Yes	Yes	Yes	Yes	Yes
wealth	No	Yes	Yes	Yes	Yes	Yes
constant	0.108 (0.0726)	0.0869 (0.128)	-0.0569 (0.140)	-0.0856 (0.146)	-0.0856 (0.146)	-0.109 (0.142)
observations	1,779	1,591	1,591	1,591	1,591	1,591
R-squared	0.115	0.207	0.216	0.227	0.227	0.227

Source: our elaborations on CONSOB Survey 2024 data. Note: Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

The second concern consists in the fact that SFL overconfidence is derived as the difference between the respondent self-assessed knowledge and the actual number of correct answers to our set of SFL questions. If the set of questions does not represent a reasonable measure of SFL, then the difference between perceived SFL and the correct number of answers may have little to do with overconfidence. This is why in column 6 we substitute ex ante SFL overconfidence with ex post SFL overconfidence, which is measured by asking to the respondent (after the SFL questions) how many questions he or she expects to have answered correctly, and subtracting to this the true number of correct answers. As we can see, results appear extremely similar to those of the model using ex ante SFL overconfidence.

Investments in sustainable assets are also strongly positively correlated with higher brackets of wealth, while they do not show a significant correlation with monthly income (as in Filippini *et al.*, 2024) and are also negatively correlated with age and positively correlated with trust, altruism and the amount of time devoted to financial and the presence of economics topics in the study path of the respondent.

Considering that wealth could be distributed unevenly between individuals in different age brackets, we also repeat a similar exercise considering as the dependent variable the individuals self-assessed propensity to invest in sustainable assets. For this we base our analysis on the question 'Assuming that over the next 12 months you may have money to invest/reinvest, would you be interested in investing in sustainable financial products, on a 1 to 5 scale where 1=I am not interested at all and 5=I am very interested?'. This propensity is arguably less dependent on the individual's wealth and hence on the fact that a larger portfolio more likely contains some sustainable assets. However, the main pattern of interest, i.e. the positive correlation between not only actual SFL but also perceived SFL and SFL overconfidence (again, with a coefficient for SFL overconfidence relatively close to the one for actual SFL) is confirmed (see Table 5). The same is valid for the positive correlation with trust and altruism and the negative correlation with age. However, the amount of time devoted to financial and economics topics during school/university studies is no longer relevant, while there is a positive correlation with time preferences (modelled, according to Falk *et al.*, 2022 and Filippini *et al.*, 2024, as the willingness to give up something today to benefit more from that in the future) and there is a higher sustainable investment propensity for females. Again, results do not substantially change if ex post rather than ex ante SFL overconfidence is used.

Table 5 – Actual and perceived sustainable finance literacy and propensity to invest in sustainable assets (OLS)

	(1)	(2)	(3)
ActSFL	0.0617*** (0.0190)	0.292*** (0.0260)	0.221*** (0.0245)
ActFL	-0.00852 (0.0219)	-0.00852 (0.0219)	-0.0332 (0.0220)
PanteSFL	0.231*** (0.0205)		
OCanteSFL		0.231*** (0.0205)	
OCpostSFL			0.152*** (0.0206)
female	0.237*** (0.0661)	0.237*** (0.0661)	0.259*** (0.0679)
age	-0.000941 (0.00283)	-0.000941 (0.00283)	-0.00460 (0.00292)
single	-0.101 (0.0665)	-0.101 (0.0665)	-0.0860 (0.0682)
trust	0.0454*** (0.0134)	0.0454*** (0.0134)	0.0581*** (0.0138)
risk appetite	-0.00305 (0.0162)	-0.00305 (0.0162)	0.00988 (0.0165)
time preferences	0.0960*** (0.0211)	0.0960*** (0.0211)	0.103*** (0.0219)
altruism	0.104*** (0.0182)	0.104*** (0.0182)	0.115*** (0.0185)
further controls			
education	Yes	Yes	Yes
economic studies	Yes	Yes	Yes
occupation	Yes	Yes	Yes
income	Yes	Yes	Yes
wealth	Yes	Yes	Yes
constant	1.564*** (0.311)	1.564*** (0.311)	1.509*** (0.344)
observations	1,591	1,591	1,591
R-squared	0.320	0.320	0.289

Source: our elaborations on CONSOB Survey 2024 data. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4.2 Subsample analysis by gender and age

While using ex post SFL overconfidence rather than ex ante is already a relevant robustness check, as further check we replicate the analysis of the relationship between investment in sustainable assets and actual SFL and SFL overconfidence breaking up the sample by gender and by age group. We report the analysis in Table 6 (model 1 in this table reports the full sample analysis and coincides with column 5 in Table 4).

Table 6 – Actual and perceived sustainable finance literacy and investment in sustainable assets: subsample analysis by gender and age (OLS)

	(1) full sample	(2) male	(3) female	(4) age 19–50	(5) age 51–75
ActSFL	0.0481*** (0.00896)	0.0573*** (0.0104)	0.00805 (0.0180)	0.0626*** (0.0137)	0.0416*** (0.0120)
ActFL	-0.00786 (0.00863)	-0.0189* (0.0102)	0.0206 (0.0187)	-0.0113 (0.0110)	-0.00695 (0.0142)
OCanteSFL	0.0332*** (0.00677)	0.0351*** (0.00783)	0.0254* (0.0146)	0.0391*** (0.00956)	0.0332*** (0.00970)
female	0.0106 (0.0237)			-0.00718 (0.0296)	0.0374 (0.0394)
age	-0.00188* (0.00111)	-0.00226* (0.00123)	-0.00127 (0.00255)	-0.00276 (0.00243)	-0.00160 (0.00317)
single	-0.0116 (0.0261)	-0.00371 (0.0300)	0.00174 (0.0595)	0.00149 (0.0329)	-0.0580 (0.0422)
trust	0.00752* (0.00449)	0.0107** (0.00530)	-0.00395 (0.0104)	0.000487 (0.00660)	0.0122* (0.00665)
risk appetite	-0.00397 (0.00518)	-0.000315 (0.00595)	-0.0102 (0.0115)	-0.00181 (0.00803)	-0.00884 (0.00674)
time preferences	-0.00124 (0.00653)	-0.00330 (0.00735)	-0.00265 (0.0138)	0.00230 (0.0102)	-0.00695 (0.00835)
altruism	0.0110** (0.00508)	0.00863 (0.00579)	0.0216* (0.0121)	0.0111 (0.00731)	0.00835 (0.00730)
further controls					
education	Yes	Yes	Yes	Yes	Yes
economic studies	Yes	Yes	Yes	Yes	Yes
occupation	Yes	Yes	Yes	Yes	Yes
income	Yes	Yes	Yes	Yes	Yes
wealth	Yes	Yes	Yes	Yes	Yes
constant	-0.0856 (0.146)	-0.0720 (0.158)	-0.669** (0.260)	-0.123 (0.176)	0.280 (0.264)
observations	1,591	1,271	320	800	791
R-squared	0.227	0.217	0.382	0.351	0.144

Source: our elaborations on CONSOB Survey 2024 data. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 7 reports the same analysis considering as the dependent variable the propensity to invest in sustainable assets (the first column reporting full sample results corresponds to column (2) in Table 5).

Table 7 – Actual and perceived sustainable finance literacy and propensity to invest in sustainable assets: subsample analysis by gender and age (OLS)

	(1) full sample	(2) male	(3) female	(4) age 19–50	(5) age 51–75
ActSFL	0.292*** (0.0260)	0.304*** (0.0288)	0.258*** (0.0655)	0.256*** (0.0395)	0.337*** (0.0354)
ActFL	-0.00852 (0.0219)	-0.0147 (0.0257)	0.0163 (0.0469)	0.0184 (0.0283)	-0.0348 (0.0343)
OCanteSFL	0.231*** (0.0205)	0.235*** (0.0232)	0.237*** (0.0432)	0.223*** (0.0304)	0.229*** (0.0283)
female	0.237*** (0.0661)			0.123 (0.0806)	0.342*** (0.108)
age	-0.000941 (0.00283)	-0.00243 (0.00322)	0.00821 (0.00599)	-0.00765 (0.00502)	-0.00102 (0.00803)
single	-0.101 (0.0665)	-0.0994 (0.0751)	-0.0308 (0.159)	-0.133 (0.0813)	-0.115 (0.117)
trust	0.0454*** (0.0134)	0.0457*** (0.0150)	0.0539* (0.0310)	0.0392** (0.0179)	0.0486** (0.0200)
risk appetite	-0.00305 (0.0162)	-0.00662 (0.0179)	0.0216 (0.0372)	0.0388 (0.0258)	-0.0343 (0.0209)
time preferences	0.0960*** (0.0211)	0.105*** (0.0237)	0.0511 (0.0471)	0.121*** (0.0324)	0.0701** (0.0285)
altruism	0.104*** (0.0182)	0.109*** (0.0198)	0.0942** (0.0418)	0.0716*** (0.0249)	0.133*** (0.0260)
further controls					
education	Yes	Yes	Yes	Yes	Yes
economic studies	Yes	Yes	Yes	Yes	Yes
occupation	Yes	Yes	Yes	Yes	Yes
income	Yes	Yes	Yes	Yes	Yes
wealth	Yes	Yes	Yes	Yes	Yes
constant	1.564*** (0.311)	1.495*** (0.355)	1.110* (0.667)	2.054*** (0.397)	1.144 (0.724)
observations	1,591	1,271	320	800	791
R-squared	0.320	0.334	0.377	0.376	0.324

Source: our elaborations on CONSOB Survey 2024 data. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Overall, the strength of the association between both actual SFL and of SFL overconfidence and either actual investment in sustainable assets or propensity to invest in such assets is confirmed also within subsamples. Generally, significant parameter estimates lie in a ± 2 interval with respect to the full sample estimates. The

only exception is represented by actual SFL and actual investment in the female subsample, that may be due to the small size of the corresponding subsample with respect to the other subsamples.

The fact that overconfidence in SFL can be strongly associated with investment in sustainable assets and that this relationship (as we shall discuss in the next section, we cannot unconditionally claim for causality) appears to be almost as strong as the relationship with actual SFL has potentially many relevant policy implications.

If we assume that the relationship of actual SFL and SFL overconfidence with the possession of sustainable assets is mostly driven by the first two variables influencing the third one, then it becomes important, in a policy setting, not only to improve actual SFL but also to control and possibly limit SFL overconfidence.

In fact, overconfidence may potentially lead to overinvesting in sustainable assets without a proper understanding and to subsequent disappointment and refusal to further consider investment in sustainable assets. It would also be important to understand which instruments, if any, could be used to raise actual SFL, and to which extent we can avoid raising, at the same time, investor's overconfidence.

Clearly, as warned above, a causal interpretation is, for now, unwarranted. Coefficients estimates observed so far can clearly be influenced by the fact that while it is possible that actual SFL and SFL overconfidence may influence the decision to invest in sustainable assets, the fact of having already invested in sustainable assets may also make the investor learn more about SF or may make he or she simply believe to know more.

Our next crucial step, then, is to resort to instrumental variable analysis both to help clarify, for what is possible with survey data, the potential simultaneity issue and to understand better the potential effect of a few simple instruments on both actual SFL and on SFL overconfidence.

5 Possible policy implications: instrumental variable analysis

The models summarised in the present paper are, for the main part, an anatomy of the correlations among the answers to the survey questions. This is what, in general, is possible to do on the basis of survey data. Any causal or 'what if' interpretation in the context of survey data is possible only under very strong hypotheses whose validity, in general, cannot be checked. This point is generally clearly understood in the literature about sustainable finance literacy and sustainable investments which often does not attempt a causal analysis but is limited to a general description of multivariate correlations. However, it is legitimate and interesting to speculate about possible policy implications of our results. To do this in a survey setting we shall recur to instrumental variables. We are conscious that any choice of instruments implies the choice of a specific structural reading of the phenomenon under

analysis and that any such choice cannot really be supported by valid statistical testing.

Actually, as we shall comment below, we run all the usual tests for the validity of instruments and the result is that the model seems to be a good representation of the data. However, it is to be noticed that such test are quite weak in terms of power and that even a positive result does not exclude that other possible instrument specifications are well adapted to the same data. What follows, then, must be seen as a possible, and we believe reasonable, view of how the results of this paper can be interpreted in a policy setting.

In this section we therefore reexamine model 5 in Table 4, and in particular the contributions of variables ActSFL (actual SFL knowledge) and OCanteSFL (over confidence ex ante on SFL knowledge) taking into account that part of the correlation between these variables and the dependent variable (actual holding of SFI) is likely to be affected by simultaneity/endogeneity. Having an investment in SF may be influenced but also arguably influences the attitude toward information and SFL.

While, from the point of view of forecasting the investor's behaviour, simultaneity is a minor problem, this is not at all the case if we aim at deriving policy implications from this analysis (for instance, claiming that improving SFL may contribute to lead more investors to invest in sustainable assets). We try to address the simultaneity issue, as far as possible in a survey dataset, by reinterpreting model 5 in Table 4 on the basis of instrumental variables. This reinterpretation is crucially based on a choice of instruments and, as said above, we are conscious that there are several possible choices of this kind.

Our hypothesis is that the exogenous component of ActSFL and OCanteSFL can be recovered by instrumenting these variables with two sets of, arguably exogenous, variables. The first set represents the general attitudes of the investor and contains:

1. Financial market experience;
2. Donations in the last 12 months;
3. Use of the Internet in the last 12 months;
4. OCanteFL (financial literacy overconfidence ex ante);
5. OCpostFL (financial literacy overconfidence ex post).

The second set, including some possible policy instrument, is given by:

1. Attention to climate change;
2. Amount of available information sources on sustainable finance;
3. Frequency of reading articles on sustainability or sustainable finance;
4. Frequency of access to information on finance.

Among the general attitude variables, OCanteFL and OCpostFL could, arguably, be acted upon with longer horizon financial education programs but, for the sake of the current analysis, we shall not consider this point.

The Instrumental Variable (IV) model yields some interesting results. Let us begin by comparing OLS and IV second stage estimates (Table 8).

Table 8 – Comparison between OLS and IV estimates

	OLS Estimate	IV Estimate
ActSFL	0.0481*** (0.0090)	0.0920*** (0.0366)
ActFL	-0.0786*** (0.0086)	-0.0056 (0.0145)
OCanteSFL	0.0332*** (0.0068)	0.0754*** (0.0212)
female	0.0106 (0.0237)	0.0052 (0.0243)
age	-0.0019 (0.0011)	-0.0014 (0.0011)
single	-0.0116 (0.0261)	-0.0082 (0.0267)
trust	0.0075** (0.0045)	0.0050 (0.0050)
risk appetite	-0.0040 (0.0052)	-0.0082 (0.0054)
time preferences	-0.0012 (0.0065)	-0.0054 (0.0068)
altruism	0.0110*** (0.0051)	0.0100*** (0.0057)
further controls		
education	Yes	Yes
economic studies	Yes	Yes
occupation	Yes	Yes
income	Yes	Yes
wealth	Yes	Yes
constant	-0.0856 (0.1456)	-0.0905 (0.1611)
observations	1591	1574
R-squared	0.2270	0.2055

Source: our elaborations on CONSOB Survey 2024 data. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The IV estimates for the instrumented variables parameters are roughly double the corresponding OLS estimates²². Among the other variables, the most noticea-

22 As customary, the usual tests for overidentifying restrictions, endogeneity of instrumented variables and weak instruments were run. We use many instruments; hence, we expect the model to be overidentified. In fact, the p-value against the hypothesis of overidentification is 0.1114 so the hypothesis of overidentification is not rejected. Both the F and the Chi square test for exogeneity of instrumented variables reject the null (exogeneity) with p-values 0.00005 and 0.0007. The test for weak instruments, which considers overidentification (CLR test), rejects the hypothesis of weak instruments with a p-value which is 0 to the fourth decimal. In summary and recalling that these tests tend to have low power, the IV model in this specification seems in agreement with the data. This, obviously, does not exclude that other possible specifications of instruments may also agree with data.

ble change is in the parameter estimate for ActFL which is about 1/10 of the OLS value.

There are no other relevant estimate changes while, as expected, the IV second stage R square is smaller than the OLS R-square.

The fact that the IV estimate is considerably bigger than the corresponding OLS estimate can be interpreted, with some care, as the effect of simultaneity which, when corrected by IV, reveals a combination of positive correlation between the predetermined part of the instrumented variables and negative retroaction from SF investment toward the instrumented variables.

Going deeper into this would require a more general structural model, which is not the objective of the present paper. This result is, in any case, a good example of the complex connections between information and investment decisions as revealed by this survey.

As we see, both instrumented variables are positively related to the investment decision. From a policy perspective, however, assuming there can be an impact of the level of SFL on the propensity to consciously invest in sustainable assets, two key questions are (a) which actual levers can be used to raise the level of actual SFL and (b) if overconfidence in SFL is a potential concern (since a decision influenced by overconfidence could be followed by regret), whether there are instruments that can increase ActSFL without influencing OCanteSFL as well. These questions can be at least partially addressed by looking at first stage regressions of our instrumental variable analysis.

If, in the first stage regressions (Table 9), we look at the parameter estimates for the four instruments we consider amenable to a policy action, we see that, in the regression for ActSFL, both the amount of available information sources on sustainable finance and the frequency of access to information on finance are relevant and with positive sign. However, in the first stage for OCanteSFL only the former (information availability on sustainable finance) is relevant (still with positive sign).

Table 9 – First stage OLS

	ActSFL OLS Estimate	OCanteSFL OLS Estimate
amount of available information sources on sf	0.0996** (0.0457)	0.1906*** (0.0565)
frequency of reading articles about sustainability or sf	0.0332 (0.0244)	0.0958*** (0.0306)
frequency of access to information about finance	0.0856*** (0.0264)	-0.0186 (0.0340)
observations	1574	1574
R-squared	0.2717	0.2055

Source: our elaborations on CONSOB Survey 2024 data. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

While survey data should not ideal as a tool to measure causal relationships, if these results were to be confirmed in an experimental or pseudo-experimental setting, we could conclude that making it easier to access more frequently information on general finance, which only influences ActSFL and not overstressing specific SFL oriented information, which influences both ActSFL and OCanteSFL, could contribute to favour sustainable investment while avoiding to increase SFL overconfidence. We must add that we are not considering here the further effect that more frequent information on general finance might (at least potentially) create on FL (rather than SFL) overconfidence, since in case more frequent finance information could help generating more FL overconfidence greater caution from a policy standpoint would be needed.

This is in accord with the literature about 'framing' and overconfidence. The fact that a more general 'framing' can be useful to avoid overconfidence in specific knowledge topics, while a narrow focus on specific topics may have the opposite effect, is a well-known observation in general cognitive psychology, and is not new in finance, too²³.

While the idea is not new, finding a rather clearcut example of this setup in the present context is both new and interesting. We must stress again that causal, hence policy oriented, interpretation of this result is not warranted by the kind of data we are using. However, pointing out on one hand that overconfidence on sustainable finance may be an issue and on the other hand suggesting – even if only an experimental or quasi experimental setting could resolve the question – the existence of possible differential effects of general finance information provision and sustainable finance information provision on actual SFL and SFL overconfidence, may be important from a policy standpoint.

6 Sustainable assets' investment and the role of the financial advisor

Considering the complexity of properly evaluating financial investment products and even more prominently of sustainable assets, a potential key role in the decision by many investors can be played by 'external advice'. This may come from professional financial advisors, or, possibly, it could manifest as the informal advice provided by relatives or friends.

In the Italian market, professional financial advice can typically take the form of either a bank officer operating in a branch who is specialised in assisting retail investors in their investment decisions, or of networks of personal financial

23 For a discussion of this idea in finance, see, for instance: Barberis, N., Huang, M. (2009) and Liu, W., Wang, P., Zhao, L. (2010).

advisors who are mainly linked to a bank or a banking group as well and are allowed to meet the investor even outside the bank's premises.

With the aim of capturing the potential effect of the professional financial advisor, in one of these two forms, respondents have been first asked how they primarily take investment decisions. Knowing that a lot of different combinations are possible, respondents were allowed to select multiple answers among (a) deciding completely autonomously (without consulting anyone), deciding after consulting with family members, or with friends or colleagues, or with a professional advisor/bank officer, or following the advice from social networks' 'experts'. They were also asked whether they tend to mainly delegate the decision to the professional advisor or bank officer.

The different multiple answers were recoded considering as the base case the fully autonomous investor (i.e. respondents who declared to be autonomous and did not mention interaction with either relatives or friends or colleagues or professional advisors).

The alternative investment process options were analysed by creating a few extra variables.

- FINADV (financial advice) is equal to 1 when decisions are taking consulting with or delegating to a professional financial advisor.
- INFADV (informal advice) is set equal to 1 when decisions are taken only through informal advice (i.e. by consulting with relatives/friends and there is no professional financial advisor).
- FA+INF identifies (dummy equal 1) investors whose decisions are taken resorting to both a professional financial advisor and informal advice.
- DEL is set to 1 when the investor leaves the investment decision to the professional financial advisor (since in this case also FINADV=1, the coefficient can be interpreted as the additional effect of delegation).
- SOCNET is set to 1 when social networks' experts are considered²⁴.

We run the OLS regression considering as dependent variable actual investment in sustainable assets comparing the base model in our analysis, i.e. model (5) in Table 4 considering as key independent variables actual SFL and SFL overconfidence and the full list of controls, with a model that adds the potential effects of the type of investment process, with a special attention to the impact of professional financial advice (FINADV). Results are reported in the first two columns of Table 10.

24 Since investors using social networks also generally declared to be autonomous, this could have been interpreted as the extra effect of social networks but given the limited number of respondents who claimed to use them its coefficient did not prove to be statistically significant.

Table 10 – Sustainable investments and the role of financial advice

	(1)	(2)	(3)
ActSFL	0.0481*** (0.00896)	0.0490*** (0.00894)	0.0347*** (0.00836)
OCanteSFL	0.0332*** (0.00677)	0.0337*** (0.00680)	0.0234*** (0.00630)
ActFL	-0.00786 (0.00863)	-0.00926 (0.00854)	-0.00469 (0.00793)
female	0.0106 (0.0237)	0.00605 (0.0232)	-0.00594 (0.0216)
age	-0.00188* (0.00111)	-0.00206* (0.00112)	-0.00185* (0.00105)
single	-0.0116 (0.0261)	-0.0120 (0.0261)	-0.0186 (0.0228)
trust	0.00752* (0.00449)	0.00578 (0.00451)	0.00493 (0.00427)
risk appetite	-0.00397 (0.00518)	-0.00318 (0.00514)	-0.00248 (0.00460)
time preferences	-0.00124 (0.00653)	-0.00116 (0.00650)	-0.00220 (0.00598)
altruism	0.0110** (0.00508)	0.0102** (0.00510)	0.0116** (0.00484)
FINADV		0.0481* (0.0259)	-0.0893*** (0.0224)
INFADV		-0.0121 (0.0232)	-0.0206 (0.0231)
FA+INF		0.0214 (0.0336)	-0.00222 (0.0294)
DEL		0.0560 (0.0502)	-0.00567 (0.0395)
SOCNET		-0.0119 (0.0452)	-0.00619 (0.0443)
sustainable preference elicitation			0.456*** (0.0572)
SF knowledge check			-0.159** (0.0621)
autonomous explanation on sustainable products			0.143** (0.0619)
explanation after request on sustainable products			0.0934* (0.0482)
further controls			
female + single	Yes	Yes	Yes
risk app + time preferences	Yes	Yes	Yes
education + economic studies	Yes	Yes	Yes
occupation + income + wealth	Yes	Yes	Yes
constant	-0.0856 (0.146)	-0.0899 (0.154)	0.0253 (0.139)
observations	1,591	1,591	1,591
R-squared	0.227	0.235	0.342

Source: our elaborations on CONSOB Survey 2024 data. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Results show a positive correlation between the presence of a professional financial advisor and actual investment in sustainable assets. In interpreting this result, we must take into account that wealthier investors are certainly more likely to have a professional financial advisor, which may also suggest that when the existence of a professional financial advisor is not considered in a survey regression part of the effect of wealth on investment in sustainable financial assets might be due to portfolio size and part might derive from the effect of professional financial advice. However, what we wanted to investigate in greater detail were the potentially heterogeneous effects of the role of financial advisor. Respondents were therefore asked whether the professional financial advisor had (1) ever asked about the investor's sustainability preferences regarding investment products, (2) asked specific questions to verify the investor's level of knowledge about sustainable products, (3) explained the characteristics of a sustainable investment product and how it differs from a traditional product.

To the first two questions the respondent could answer 'Yes'/'No'/'I don't know', while in the third one he was also asked when answering Yes to distinguish whether the explanation was an autonomous initiative of the advisor or whether it came at the request of the investor²⁵.

Of course, in interpreting these results a substantial amount of caution is needed. On one hand, a causal interpretation of the effects of having a financial advisor on sustainable investments cannot be derived from survey data alone. On the other hand, the specific questions concerning the advisor's efforts devoted to sustainable preferences and assets do not perfectly capture whether an investor has been asked about his or her sustainable preferences, but at best whether this happened and at the same time whether the investor remembers it.

However, these variables can still be very useful in a first effort to analyse whether there can be heterogeneous effects depending on the advisor's attitude, care and proactivity. In the third column of Table 8 we therefore add a third model with four extra dummy variables, identifying the cases in which the investors answered positively and distinguishing between the case of an autonomous or a non-autonomous explanation of sustainable products characteristics.

Results are particularly interesting, since they are consistent with the possibility of largely heterogeneous effects of having a professional financial advisor.

Having been asked for sustainability preferences, or having been offered an explanation on sustainable products, in particular when this happened for an autonomous initiative of the advisor, is strongly correlated with investment in sustainable assets.

At the same time, interestingly, the coefficient for FINADV, which in this case identifies advisors who apparently took no action at all, becomes negative. It is also interesting to point out that the case in which the advisor has tried to test the

25 See Appendix Table a.6 for the wording of the three questions.

investor's knowledge of sustainable products is negatively associated with investment in sustainable assets.

Potentially, this could also be explained by the existence of significant SFL overconfidence by investors, which might have led some consultants, after a check of investors' competencies, to refrain from proposing to invest in sustainable assets given the mismatch between product characteristics and investors' expectations.

However preliminary and while not providing evidence of causality, this analysis confirms the attention that should be devoted to the role of professional advice in sustainable assets' investment decisions, and to the different attitudes of the advisor towards sustainable products.

7 Conclusions and policy implications

Understanding the decision-making processes of investors with regard to sustainable investments has become increasingly important for both academic research and policy design. Assessing the sustainability characteristics of financial products and their potential impact often remains a complex task for the average investor, despite the continuous efforts of supervisory authorities to clarify labelling standards for sustainable products and to prevent greenwashing practices.

The existing literature has, on the one hand, highlighted the various motivations that may lead investors to allocate resources to sustainable assets and the distinction between value and values investors. On the other hand, it has consistently documented a positive relationship between the level of sustainable finance literacy (SFL) and both actual investment in, and the propensity to invest in, sustainable assets. From a policy perspective, this evidence would naturally suggest that improving SFL is beneficial for fostering more informed investment decisions and for promoting the wider diffusion of sustainable investments.

Our analysis, however, emphasises the need to account for the joint role of both actual SFL and SFL overconfidence. While both variables tend to be positively correlated with investment behaviour, they are not equally desirable. Investors who overestimate their understanding of sustainable finance may make suboptimal choices, potentially leading to subsequent dissatisfaction. Hence, from a policy standpoint, it is essential not only to identify strategies that effectively enhance SFL, but also to consider the unintended effects such interventions might have on overconfidence.

Through an instrumental variable approach – aimed at addressing potential issues of simultaneity and reverse causality between SFL, SFL overconfidence, and investment in sustainable assets – we show that greater access to general financial information positively affects actual SFL alone. In contrast, broader availability of information specifically related to sustainable finance increases both actual SFL and SFL overconfidence. These findings call for a balanced policy approach that (as long as we concentrate on SFL, and assuming greater access to financial information does not generate overconfidence about standard financial literacy of an individual) care-

fully integrates general and sustainable finance education, with the goal of fostering more conscious and responsible investment decisions.

Finally, our paper contributes to the growing literature on the role of financial advisors in sustainable investment decisions. Previous studies have typically examined either the correlation between the presence of a financial advisor and sustainable investment behaviour or have explored advisors' own attitudes toward sustainable products. Using survey data, our analysis suggests that not only the presence but the proactivity of the advisor seem to matter and is correlated with holding sustainable assets. Of course, much remains to be investigated with respect to the role of the advisor, considering that it could potentially have a significant effect on investors' decisions both directly, and indirectly by influencing their SFL and overconfidence levels.

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Some extracts from CONSOB 2024 Survey questionnaire

Table a.1 – Socio-demographic factors (apart from gender and age)

Professional status	<ul style="list-style-type: none"> Individuals not in the labour force <ul style="list-style-type: none"> student homemaker retired seeking first employment unemployed, previously employed other (non-professional conditions) Employed professionals Executive <ul style="list-style-type: none"> Manager or senior officer Employee (clerical/administrative) Career military personnel Teacher Manual worker, shop assistant, employed farmer, or apprentice Self-employed professionals Entrepreneur Self-employed professional with employees Self-employed professional without employees Trader, farmer, or craftsman with employees Trader, farmer, or craftsman without employees Collaborator, service provider, etc.
Households' monthly income	<ul style="list-style-type: none"> Up to €900 From €901 to €1,200 From €1,201 to €1,500 From €1,501 to €1,800 From €1,801 to €2,100 From €2,101 to €2,400 From €2,401 to €3,000 From €3,001 to €4,000 From €4,001 to €5,000 Over €5,000
Households' financial wealth	<ul style="list-style-type: none"> Up to €5,000 From €5,001 to €10,000 From €10,001 to €20,000 From €20,001 to €30,000 From €30,001 to €50,000 From €50,001 to €100,000 From €100,001 to €250,000 From €250,001 to €500,000 Over €500,000

Table a.2 – Personal traits

Trust	I always trust others on the assumption that others are moved by the best intentions. Score ranges from 1 (I don't agree) to 10 (I completely agree)
Altruism	How willing are you to share something with others without expecting any direct and immediate benefit? Score ranges from 1 (not willing at all) to 10 (very willing)
Risk tolerance	In general, how willing (or unwilling) are you to take risks in making decisions in your life? Score ranges from 1 (not willing at all) to 10 (very willing)
Time preferences	How willing are you to give up something today to receive a greater benefit in the future? Score ranges from 1 (not willing at all) to 10 (very willing)
Financial market experience	How long have you been investing in financial markets? a) from 2023 b) from 2022 c) from 2021 d) between 3 and 5 years e) between 6 and 10 years f) over 10 years

Table a.3 – Measuring Sustainable Financial Literacy

Sustainable development	<p>In your opinion, which of the following definitions best describes sustainable development?</p> <ul style="list-style-type: none"> a) Ensuring universal access to education, health, and social services. b) Meeting current needs while minimizing the impact on the environment. c) Satisfying current needs without compromising those of future generations d) Meeting current needs while reducing social inequalities; or e) I don't know.
Sustainability for companies	<p>In your opinion, how should the sustainability of a company be measured?</p> <ul style="list-style-type: none"> a) A company's commitment to respecting the environment, social welfare, and fair and forward-looking internal governance (e.g. managing employee relations, paying employees fairly, and complying with tax obligations) throughout its operations. b) The environmental sustainability of the company's production system (e.g. reduction of CO₂ emissions, management of natural resource consumption and waste management). c) Its social sustainability, i.e. the impact of the company's activities on people and communities (e.g. fair and safe working conditions, promoting diversity and inclusion, and contributing positively to local communities). d) I don't know.
ESG acronym	<p>In the context of sustainable financial investments, the acronym "ESG" is often used. What do you think the abbreviation 'ESG' indicates?</p> <ul style="list-style-type: none"> a) Ecological (E), Standard (S) and Corporate Governance (G). b) Environmental (E), Social (S) and Corporate Governance (G) c) Environmental (E), Sustainable (S) and Green (G) d) I don't know
Rating agencies	<p>Are there any rating agencies assessing the alignment of companies, individual securities or mutual funds/investment products with ESG principles?</p> <ul style="list-style-type: none"> a) I cannot say. b) No, I don't believe there are any such agencies. c) There are rating agencies, but they only give ratings referring to the issuer's bond default risk, and there are no ESG ratings. d) Yes, there are rating agencies that assign ESG ratings to companies, securities or mutual funds, and that assign scores and differentiated ratings on several levels. e) Yes, there are rating agencies that assign ESG ratings to companies, securities or mutual funds, which are expressed as a simple yes/no rating (i.e. a security or fund is ESG, or it is not).
Definition of a sustainable investment	<p>According to the European Financial Products Transparency Regulation (SFDR), an investment must be considered sustainable if it:</p> <ul style="list-style-type: none"> a) Contributes to at least one environmental or social objective, even if it causes significant harm to at least one of the other objectives. b) Contributes to at least one environmental or social objective, provided it does not cause significant harm to any other social or environmental objectives and comply with good corporate governance standards. c) Contributes simultaneously to social and environmental objectives. d) I don't know.
Green bonds	<p>In your opinion, what is a green bond?</p> <ul style="list-style-type: none"> a) A bond denominated in U.S. dollars b) A bond that finances environmentally sound or environmentally friendly projects; c) A government bond that finances environmentally friendly public transport infrastructure d) I don't know.

Table a.4 – Measuring Financial Literacy

Numeracy	Suppose you had 100 euro in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? (i) More than 102 euro; (ii) Exactly 102 euro; (iii) Less than 102 euro; (iv) Don't know; (v) Refusal.
Inflation	Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? (i) More than today; (ii) Exactly the same; (iii) Less than today; (iv) Don't know; (v) Refusal.
Diversification	When an investor spreads his money among different assets, does the risk of losing money: (i) Increase; (ii) Decrease; (iii) Stay the same; (iv) Don't know; (v) Refusal.
Mortgages	A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest paid over the life of the loan will be less. True or false? (i) True; (ii) False; (iii) Don't know; (iv) Refusal.
Risk-return relationship	When investments offer higher rates of return, they are probably riskier than investments offering lower rates of return: (i) True; (ii) False; (iii) Don't know; (iv) Refusal.

Table a.5 – Perceived SFL, perceived FL and overconfidence

Perceived ex ante confidence in one's own financial literacy level	On a scale ranging from 0 to 5, how confident are you in your understanding of fundamental concepts in finance and investment We then define $OC_{anteFL} = \text{Perceived ex ante confidence in FL} - \text{ActFL}$ where ActFL is equal to the number of correct answers to the FL questions.
Perceived ex post confidence in one's own financial literacy level	Thinking about the financial literacy questionnaire, how many of the questions do you believe you answered correctly? (0-5 scale) We then define $OC_{postFL} = \text{Perceived ex post confidence in FL} - \text{ActFL}$
Perceived ex ante confidence in one's own sustainable financial literacy level	How would you rate your knowledge of sustainability and sustainable finance, on a 0-6 scale? We then define $OC_{anteSFL} = \text{Perceived ex ante confidence in SFL} - \text{ActSFL}$ where ActSFL is equal to the number of correct answers to the SFL questions
Perceived ex post confidence in one's own sustainable financial literacy level	Thinking about the sustainable finance questionnaire, how many of the questions do you believe you answered correctly? (0-6 scale) We then define $OC_{postSFL} = \text{Perceived ex post confidence in SFL} - \text{ActSFL}$

Table a.6 – Investment process and the role of the professional financial advisor

Autonomy in investment decisions	<p>How do you primarily make investment decisions? [Multiple answers allowed]</p> <ol style="list-style-type: none"> 1. Completely autonomously (without consulting anyone) 2. I decide after consulting with my family 3. I decide after consulting with friends and/or colleagues who do not work in the financial sector 4. I decide after consulting with friends and/or colleagues who work in the financial sector 5. I decide after consulting a financial advisor/bank representative 6. I mainly delegate my investment decisions to an advisor/manager/bank representative 7. I follow advice from experts on social networks (e.g., fin-influencers)
Financial advisor and sustainability preferences	<p>Has your financial advisor (or your reference person in the bank branch) ever asked you if you have sustainability preferences regarding investment products?</p> <ol style="list-style-type: none"> a) Yes b) No c) I don't know
Financial advisor and SFL check	<p>Has your financial advisor (or your reference person in the bank branch) asked you specific questions to verify your level of knowledge about sustainable products?</p> <ol style="list-style-type: none"> a) Yes b) No c) I don't know
Financial advisor and sustainable products' explanations	<p>Has your financial advisor (or your reference person in the bank branch) explained the characteristics of a sustainable investment product and how it differs from a traditional product?</p> <p>If yes, was the explanation on his/her initiative or after a specific request from you?</p> <ol style="list-style-type: none"> a) Yes, on the advisor's initiative b) Yes, after my specific request c) No d) I don't know

Table a.7 – Other questions used as controls or instruments

Financial market experience	How long have you been investing in financial markets? a) from 2023 b) from 2022 c) from 2021 d) between 3 and 5 years e) between 6 and 10 years f) over 10 years
Donations over the last 12 months	Over the last 12 months, have you made at least one donation to an organization aiming either at protecting the environment (e.g. WWF, Greenpeace...) or at promoting social purposes (e.g. Unicef, Save the Children...)?
Use of internet over the last 12 months	Over the last 12 months, how frequently have you used Internet/the web? 1) Never or almost never 2) Up to 3 times per month 3) Once a week 4) Up to 4 times per week 5) every day or almost every day 6) every day, multiple times a day
Attention to climate change	How much do you agree with the sentence 'Climate change is a serious problem that should be solved'? Score ranges from 1 (I don't agree) to 10 (I completely agree)
Amount of available information sources on sustainable finance	As far as you can see, how many information sources (magazine, newspapers, web resources, TV...) discussing about sustainable finance are available to you? (1-5 scale)
Frequency of reading articles on sustainability or sustainable finance	On average, how frequently do you either read articles on newspapers, magazines or on the web or watch videos about sustainability or about sustainable finance? 1) Less than once per year 2) Once/twice per year 3) 3-4 times per year 4) Once/twice per month 5) Once a week 6) Every 2-3 days 7) Once (or more) per day
Frequency of reading articles on finance	On average, how frequently do you read or listen to information about finance (e.g. for your investments) or economics? 1) Less than once per year 2) Once/twice per year 3) 3-4 times per year 4) Once/twice per month 5) Once a week 6) Every 2-3 days 7) Once (or more) per day

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