Financial disclosure, risk perception and investment choices

Evidence from a consumer testing exercise

M. Gentile, N. Linciano, C. Lucarelli, P. Soccorso

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M. Gentile*, N. Linciano*, C. Lucarelli**, P. Soccorso*

Executive summary

This paper investigates the subjective understanding and perception of financial information and their impact on investment decisions. A consumer testing approach is applied in order to explore: i) how different representation formats (or Templates) are appraised in terms of complexity, usefulness and information content, ii) how different Templates influence risk perception, iii) how different Templates affect willingness to invest.

A sample of 254 Italian investors were submitted different Templates, each delivering in different modes the same information on risk, return and costs of four financial instruments (two structured bonds - one outstanding and the other newly issued - negotiated on the Italian retail bond market and two Italian listed stocks).

Risk is alternatively disclosed through four approaches. The first relies on a synthetic risk indicator, aggregating information on market, liquidity and credit risks. The second discloses unbundled quantitative measures of the market risk (volatility and value at risk), the liquidity risk (turn-over ratio) and the credit risk (Moody's official rating and expected default probability). Both the synthetic and unbundled formats compare the risk/return characteristics of the product with the risk/return attributes of a benchmark portfolio. The third mode is based on what-if scenarios. The fourth resorts to probabilistic modelling of expected returns. Costs are disclosed according to three options. The first shows the impact of costs on the internal rate of return. The second highlights the impact of costs on principal and interest. The third unbundles the product fair value into its bond and derivative components, with specific indication about costs.

First, investors were asked to rate the complexity and the usefulness of the Templates and to assess the riskiness of the presented products. In order to control for familiarity bias, in the first stage of the test neither the issuer's name nor the type of the assets were disclosed. Perceived complexity turns out to rise moving from the synthetic representation to the unbundled one and reaches its highest for the performance scenarios (both what-if and probabilistic). As for usefulness, both what-if and probabilistic modelling are perceived to be less useful than the synthetic and unbundled representations. Perceived complexity and perceived usefulness of financial information are

generally inversely related: in other words, the higher the complexity of the information, the lower the perceived usefulness.

Second, in order to assess the relation between information disclosure and risk perception investors were asked to rank products by their riskiness. In general, risk perception results to be positively affected by perceived complexity of the information disclosure. The percentage of respondents correctly ranking the risk of products is higher when unbundled formats are used, whereas performance scenario representations are associated with a higher percentage of wrong answers in ranking products' riskiness. In details, risk tends to be more frequently over-estimated when participants inspect the what-if scenario representation and to be more frequently under-estimated when probabilistic modelling is taken into account.

Finally, respondents were asked how much they would invest in each product, given an initial endowment, a time horizon and an investment objective. This allowed observing propensity towards investment driven exclusively by the representation of the financial information. As expected, perceived complexity results to be the main driver of the willingness to invest, since it always contributes to reduce propensity to invest. To this respect, perceived complexity seems to trigger a standard adverse selection problem: it is as if difficulty of understanding cast individuals into uncertainty, leading them to abstain from entering into the market.

Financial knowledge, personal traits and investment habits do play a role in the perception of complexity and risk as well as in the attitude towards investment, although with a certain degree of heterogeneity across different representation modes. Higher levels of financial knowledge are generally negatively associated with perceived complexity and with indecision individuals may experience in the assessment of products' risk. However, being less hesitant is generally associated with the wrong risk ranking. Another interesting consideration is that, in line with the insights of the behavioural literature, in our sample high financial 'literate' individuals are not necessarily free of inclination towards behavioural biases. This evidence, coupled with a positive correlation between risk propensity (as measured through the Grable & Lytton test) and the inclination towards behavioural biases, would point to a latent variable, i.e. the overconfidence fed by a good level of financial knowledge, driving the positive relation between high knowledge and inclination towards behavioural biases. This point claims for financial education initiatives attuned also as debiasing programs, in order to be an effective investor protection tool.

Finally, making frequently investment decisions, delegating investment choices to an expert, trusting financial advisors are all associated with an easier understanding of financial information and a higher propensity to invest. This evidence indirectly confirms that financial experts and advisors may actually make the difference, by playing an educational role and, by this way, changing individuals' attitude towards financial choices.

Overall, the present paper shows that risk perception is context-dependent and mainly determined by the way financial information is disclosed. It adds to the existing literature by providing new evidence on the impact of framing of different representation modes, partially overlapping with the formats mandated by regulators and supervisors and/or used by the industry. Relying on the actual appraisal elicited from a sample of Italian investors, the study provides insights on how people actually read and understand financial information, which may turn useful in the design of financial disclosure and investor education programmes. For instance, it highlights that simplifying financial disclosure is not sufficient to ensure correct risk perception and unbiased investment choices. Moreover, evidence about investors' heterogeneity and behavioural biases affecting risk perception supports the idea that the 'optimal' disclosure may not exist and the 'one-size-fits-all' approach cannot be effective in ensuring a suitable level of investors protection.

This paper is in line with the approach adopted by some regulators increasingly engaged in the definition of evidence-based rules and may offer useful insights for the design of effective investor education programmes.

Rappresentazione dell'informazione finanziaria, percezione del rischio e scelte d'investimento

Risultati di un esercizio di *consumer testing*

M. Gentile*, N. Linciano*, C. Lucarelli**, P. Soccorso*

Sintesi del lavoro

Come si evince dagli studi di finanza comportamentale, le scelte di investimento degli individui sono influenzate dal rischio percepito piuttosto che dal rischio oggettivamente misurato. La percezione del rischio è a sua volta condizionata da molteplici fattori, tra i quali si annoverano deficit cognitivi e distorsioni comportamentali, caratteristiche socio-demografiche e, non ultimo, il modo in cui l'informazione finanziaria è rappresentata.

Il presente lavoro analizza la relazione tra rappresentazione delle caratteristiche di uno strumento finanziario, percezione del rischio e propensione a investire degli individui, utilizzando le evidenze raccolte attraverso un esercizio di *consumer testing* che ha coinvolto 254 investitori *retail* italiani, relativamente a 4 prodotti finanziari (un'obbligazione strutturata in circolazione, un'obbligazione strutturata di nuova emissione e 2 strumenti azionari). Tali evidenze riguardano, in particolare: i) il giudizio in termini di complessità, utilità e contenuto informativo; ii) il rischio percepito; iii) la disponibilità a investire rispetto a diverse rappresentazioni di rischio e rendimento.

Il rischio è stato rappresentato nell'ambito di schede prodotto basate su quattro approcci alternativi. Il primo fa riferimento a un indicatore sintetico, che aggrega i valori espressi da indicatori di rischio di mercato, liquidità e credito del titolo (scheda sintetica). Il secondo è basato su di un elenco dettagliato di diversi indicatori di rischio (in particolare, per il rischio di mercato sono riportati volatilità storica e Value at Risk; per il rischio di liquidità il *turn-over ratio*; per il rischio di credito, il rating ufficiale emesso dall'agenzia Moody's e la probabilità di fallimento dell'emittente o Edf; scheda dettagliata). Sia nella scheda sintetica sia nella scheda dettagliata il profilo di rischio-rendimento del prodotto è stato comparato con le caratteristiche di rischio-rendimento di un portafoglio-*benchmark*. Il terzo e il quarto approccio si rifanno ai cosiddetti scenari di *performance*, costruiti a partire da metodologie di calcolo standard, rispettivamente l'analisi *what-if* e la modellistica dei rendimenti attesi. L'obbligazione strutturata in circolazione è stata alternativamente rappresentata tramite la scheda sintetica, quella dettagliata e quella basata sugli scenari *what-if*; l'obbligazione strutturata in emissione è stata illustrata da una scheda sintetica e dalla scheda con gli scenari di rendimento; le due azioni sono state illustrate, rispettivamente, tramite una scheda sintetica e una dettagliata.

I costi sono stati rappresentati usando tre diversi approcci: 1) ponendone in evidenza l'impatto sul tasso interno di rendimento; 2) riferendo dell'impatto su montante e interessi maturati; 3) riportandone l'ammontare separatamente dal *fair value* del titolo e dal valore della componente derivativa.

Il *consumer testing* è stato articolato in più fasi. Nella prima, i partecipanti hanno espresso un giudizio in merito a complessità, utilità e quantità di informazioni (poche/troppe) delle schede prodotto, sottoposte alla loro attenzione una per volta, senza essere a conoscenza né della tipologia degli strumenti illustrati (azioni, obbligazioni o altro), né dell'abbinamento di più schede a uno stesso strumento. Secondo le valutazioni dei soggetti intervistati, la complessità percepita è minore per la rappresentazione sintetica e maggiore per quella dettagliata, raggiungendo il massimo in corrispondenza delle rappresentazioni basate sugli scenari di *performance*. Queste ultime, inoltre, sono percepite meno utili ai fini della decisione d'investimento rispetto alle rappresentazioni sintetiche e dettagliate. In generale, complessità e utilità sono inversamente correlate: una scheda risulta tanto meno utile quanto più viene giudicata complessa.

Durante la seconda fase del test, ai partecipanti è stato richiesto di ordinare le schede in funzione del livello di rischio, allo scopo di verificare la relazione tra modalità di rappresentazione dell'informazione finanziaria e percezione del rischio. In un primo momento, i soggetti hanno preso visione contemporaneamente delle schede relative al medesimo prodotto (ossia, tre nel caso dell'obbligazione strutturata in circolazione e due nel caso del titolo strutturato in emissione) e sono stati invitati a individuare il prodotto più rischioso. Solo una percentuale contenuta di intervistati ha compreso che le schede confrontate si riferivano allo stesso prodotto. Successivamente, ai partecipanti è stato richiesto di ripetere l'operazione utilizzando soltanto le schede diverse da quella sintetica. In altre parole, è stato chiesto loro di ordinare dal meno rischioso al più rischioso i documenti illustrativi della obbligazione strutturata in circolazione (rappresentata sia tramite la scheda con indicazione dettagliata dei parametri di rischio sia tramite la scheda con gli scenari *what-if*), dell'obbligazione strutturata in emissione (rappresentata attraverso la modellistica sui rendimenti attesi) e di una delle due azioni (ossia, quella illustrata tramite la scheda dettagliata). La visione della scheda dettagliata è risultata associata a una maggiore percentuale di risposte corrette (sia rispetto all'obbligazione strutturata in circolazione sia per quella riferita all'azione). Alla rappresentazione basata sugli scenari di *performance* è risultata associata, invece, una più elevata percentuale di risposte errate. In particolare, il rischio tende ad essere più frequentemente sovra-stimato in corrispondenza della scheda *what-if* e più frequentemente sotto-stimato in corrispondenza della modellistica sui rendimenti attesi. In generale, al crescere della complessità percepita di una determinata rappresentazione aumenta il rischio percepito.

Nella terza fase del test, i soggetti intervistati hanno espresso la disponibilità a investire nel prodotto corrispondente a una determinata rappresentazione, partendo da una condizione predefinita in termini di risorse destinabili all'investimento, orizzonte temporale e obiettivo di investimento. Anche in questa fase, come nella precedente, la complessità percepita è risultata essere il principale *driver* dei comportamenti individuali. La propensione a investire, infatti, diminuisce al crescere del giudizio di complessità espresso nei confronti della scheda. A parità di condizioni, tuttavia, la disponibilità a investire sembra aumentare per i soggetti che dichiarano di essere stati colpiti da uno o più elementi della scheda (sia informativi sia di *lay-out*), a testimonianza del fatto che quando l'informazione viene ritenuta saliente, ossia importante, si rileva una maggiore comprensione delle schede e una maggiore disponibilità a investire. Viceversa, se gli elementi delle schede risultano oscuri, incomprensibili o incapaci di catturare l'attenzione dell'intervistato, la difficoltà a comprendere l'informazione può indurre ad astenersi dall'investimento.

Ulteriori evidenze sono emerse con riferimento alla relazione tra percezione del rischio e variabili socio-demografiche, conoscenze finanziarie, tratti caratteriali e abitudini all'investimento dei soggetti intervistati. In particolare, queste ultime sembrano avere un impatto significativo sia sul gradimento delle schede prodotto e sulla comprensione dell'informativa finanziaria, sia sulla propensione a investire nei prodotti presentati nel corso del test. Una frequenza più elevata delle decisioni di investimento, l'abitudine alla relazione con l'intermediario, un maggior grado

di fiducia nel consulente, ad esempio, si associano alla percezione di una maggiore semplicità delle schede e a una più elevata disponibilità all'investimento. Anche le conoscenze finanziarie degli intervistati, rilevate rispetto ai concetti riportati nelle schede informative, sembrano agire sul rischio percepito riducendo sia il giudizio di complessità di tutte le schede (ad eccezione della rappresentazione *what-if*), sia il grado di indecisione sperimentato dagli intervistati chiamati ad assegnare un livello di rischio ai prodotti riferibili alle schede. La minore indecisione, tuttavia, si associa generalmente a una errata identificazione del rischio. Tale risultato, da approfondire con ulteriori analisi, potrebbe essere interpretato come un'evidenza nota agli studiosi di finanza comportamentale, secondo la quale livelli più alti di conoscenza finanziaria possono alimentare negli individui un atteggiamento di *overconfidence*, ossia una tendenza a sovrastimare le proprie capacità in tema di investimenti, che può non corrispondere a un'effettiva maggiore competenza.

Un ulteriore spunto di riflessione deriva da un'altra regolarità empirica, ben nota in letteratura e confermata dai nostri risultati, secondo la quale i soggetti con più elevate conoscenze finanziarie possono mostrare una maggiore attitudine verso *bias* comportamentali. Tale associazione non sorprende, poiché conoscenze e distorsioni comportamentali afferiscono a due processi cognitivi differenti, il ragionamento e l'intuizione, che non necessariamente interagiscono tra loro (Kahneman, 2002). In altri termini, i *bias* comportamentali, sistematici ed espressione del processo intuitivo, non vengono necessariamente 'neutralizzati' attraverso un ampliamento delle conoscenze individuali: al contrario, come ricordato poc'anzi, soggetti più 'istruiti' potrebbero diventare più *overconfident* (Willis, 2008) e, per tale via, più esposti a distorsioni comportamentali. Nel nostro campione, la correlazione positiva tra la tolleranza al rischio, rilevata attraverso il test di Grable & Lytton, e l'attitudine ai *bias* deporrebbe a favore dell'esistenza di una *overconfidence* latente che diventerebbe più significativa nei soggetti più 'colti' e quindi più esposti a errori comportamentali.

Il presente studio si inscrive nell'approccio alla trasparenza informativa adottato di recente anche dal legislatore comunitario e noto come *cognitive disclosure*. Tale approccio, staccandosi dalle ipotesi di razionalità e omogeneità delle scelte individuali alla base del paradigma classico, fonda la definizione delle regole soprattutto sulle evidenze concrete relative ai comportamenti degli investitori. In tale contesto, il lavoro contribuisce in maniera innovativa al dibattito, fornendo indicazioni interessanti sulla relazione tra rappresentazione dell'informazione, rischio percepito e scelte d'investimento. In particolare, dallo studio emerge che la complessità è il *driver* principale della percezione del rischio e della propensione a investire. La semplificazione dell'informativa di prodotto non necessariamente si associa a una migliore percezione del rischio e in questo senso non può essere di per sé sufficiente a orientare gli investitori verso una comprensione corretta delle informazioni finanziarie. Inoltre, caratteristiche socio-demografiche, tratti caratteriali e abitudini all'investimento giocano un ruolo importante, sebbene talvolta eterogeneo rispetto alle forme di rappresentazione considerate nel *consumer testing*. La significativa eterogeneità degli investitori suggerisce che la scheda-prodotto ideale non esiste e che l'approccio 'one-size-fits-all' può non assicurare adeguate tutele all'investitore *retail*. La ricerca della *disclosure* più efficace deve accompagnarsi a opportune iniziative di educazione finanziaria, tese non solo all'innalzamento delle conoscenze ma anche alla correzioni dei *bias* comportamentali più diffusi o quanto meno alla prevenzione di quelle distorsioni (come ad esempio l'*overconfidence*) che possono essere alimentate da maggiori conoscenze finanziarie. Infine, le differenze nella comprensione dell'informazione finanziaria, nella percezione del rischio e nella disponibilità a investire associate alle abitudini di investimento, unitamente alla grande eterogeneità dei comportamenti individuali, ripropongono la centralità della relazione intermediario-cliente, secondo un paradigma, evidenziato anche dagli studiosi di finanza comportamentale, che attribuisce a tale relazione la maggiore efficacia nell'educare e orientare il cliente verso scelte di investimento prese nel suo migliore interesse.

Contents

1 Introduction and main findings

Several behavioural and experimental studies have long shown that risk preferences and financial decisions are sensitive to framing, i.e. the way financial information is disclosed. Heuristics, the level of financial literacy and emotional components of the investors' decision-making process may strengthen framing effects further, leading to biased choices.

This evidence has spurred a growing debate on how financial information can be best delivered to consumers. Indeed, several cases of mis-selling of financial instruments supported the idea that removing information asymmetries through detailed disclosure may not be effective in protecting retail investors. Therefore, regulators are increasingly becoming aware of the need to refine disclosure by departing from the rational individual hypothesis, so deeply entwined in economic analysis and in the standard regulatory approach, and by referring to actual behaviours. The Key Investor Information Document (so called KIID) for European investment funds is an example of how the representation of the characteristics of financial products can be designed on an evidence basis, i.e. by taking into account how consumers actually read and use financial disclosure.

This research analyses individuals' appraisal of alternative representation modes of the characteristics of financial instruments as well as the impact of representation on risk perception and investment choices through a consumer testing. A sample of 254 Italian investors were submitted different representation modes of risk/return and costs characteristics of four financial instruments negotiated on the Italian trading venues: an outstanding structured bond, a newly issued structured bond and two stocks.

Risks were alternatively disclosed through: a synthetic indicator (aggregating market, liquidity and credit risks); unbundled indicators (delivering separately quantitative measures of market, liquidity and credit risks); two performance scenario approaches, including the so called what-if scenarios and a probabilistic modelling of expected returns (so called probabilistic scenarios).

Costs were alternatively disclosed according to three options: the first showing the effect of costs on the internal rate of return; the second highlighting the impact of costs on principal and interest; the third unbundling the product fair value into its bond and derivative components and costs.

First, investors were asked to rate the complexity and the usefulness of the different representation modes. In order to control for familiarity bias, in the first stage of the test neither the issuer's name nor the type of the asset were disclosed.

Perceived complexity turns out to rise moving from the synthetic representation to the unbundled one and reaches its highest for the performance scenarios (both what-if and probabilistic modelling). As for usefulness, both what-if and probabilistic modelling are perceived to be less useful than the synthetic and unbundled representations. Perceived complexity and perceived usefulness of financial infor-

mation are generally inversely related: in other words, the higher the complexity of the information, the lower the perceived usefulness.

Second, in order to assess the relation between information disclosure and risk perception, investors were asked to rank products by their riskiness. In general, risk perception results to be positively affected by perceived complexity of the information disclosure. The percentage of respondents correctly ranking the risk of products is higher when unbundled formats are used, whereas performance scenario representations are associated with a higher percentage of wrong answers: in details, risk tends to be more frequently over-estimated when participants inspect the what-if scenario representation and to be more frequently under-estimated when looking over probabilistic modelling.

Finally, respondents were asked how much they would invest in each product, given an initial endowment, a time horizon and an investment objective. The specification of a predefined framework allowed observing propensity towards investment driven exclusively by the representation of the financial information. As expected, the main driver of the willingness to invest is perceived complexity, which always contributes to reduce propensity to invest. To this respect, perceived complexity seems to trigger a standard adverse selection problem: it is as if difficulty of understanding cast individuals into uncertainty, leading them to abstain from investment.

Financial knowledge, personal traits and investment habits do play a role in the perception of complexity and risk as well as in the attitude towards investment, although with a certain degree of heterogeneity across different representation modes. Our proxy of financial knowledge seems to impact on risk perception through two channels. First, it affects perceived complexity, although not homogenously across representation modes: in general terms, it seems to lower complexity for all modes but what-if performance scenario (when knowledge and complexity show a positive correlation). Second, when participants are asked to rank products by their risk, higher levels of knowledge are associated with a lower indecision, as if knowing more about some basic financial concepts would help respondents forward the fulfilment of the risk-ranking task assigned to them. However, being less hesitant is generally associated with the wrong risk ranking. Drawing on a recognised finding of the behavioural studies, this might be interpreted as a signal of overconfident behaviour prompted by a higher level of knowledge, although we do not have enough evidence to substantiate it. Another interesting consideration is that, in line with the insights of the behavioural literature, in our sample high financial 'literate' individuals are not necessarily free of inclination towards behavioural biases. This is not surprising since knowledge and biases refer to two different types of cognitive processes, i.e. reasoning and intuition, which do not necessarily interact each other (Kahneman, 2002). In other words, systematic biases induced by intuitive processes may not be ruled out simply by raising knowledge, which in fact may even exacerbate behavioural biases by making individuals more confident (Willis, 2008). This might be the case in our sample, where the presence of a positive correlation between risk propensity, as measured through the Grable & Lytton test, and the inclination towards behav-

ioural biases would point to a latent variable, i.e. the overconfidence fed by a good level of financial knowledge, driving the positive relation between high knowledge and inclination towards behavioural biases. This point claims for financial education initiatives attuned also as debiasing programs, in order to be an effective investor protection tool.

Finally, investment habits seem to be important both in the appraisal of the representation modes in terms of comprehensibility and in the willingness to invest in the products presented in the consumer testing. Making frequently investment decisions, delegating investment choices to an expert, trusting financial advisors are all associated with an easier understanding of financial information and a higher propensity to invest. Moreover, in some cases, interviewees with a higher level of education and with higher financial knowledge show to be more cautious in their investment choices when they over-estimate the risk associated with the inspected financial instrument. This evidence indirectly confirms that financial experts and advisors may actually make the difference, by playing an educational role and, by this way, changing individuals' attitude towards financial choices.

Overall, the present paper shows that risk perception is context-dependent and mainly determined by the way financial information is disclosed. It adds to the existing literature by providing new evidence on the impact of framing of different representation modes, partially overlapping with the formats mandated by regulators and supervisors and/or used by the industry. Relying on the actual appraisal elicited from a sample of Italian investors, the study provides insights on how people actually read and understand financial information, which may turn useful in the design of financial disclosure and investor education programmes. For instance, it highlights that simplifying financial disclosure is not sufficient to ensure correct risk perception and unbiased investment choices. Moreover, evidence about investors' heterogeneity and behavioural biases affecting risk perception supports the idea that the 'optimal' disclosure may not exist and the 'one-size-fits-all' approach cannot be effective in ensuring a suitable level of investors protection. In this context, financial advice is crucial in supplementing financial disclosure and investor education and in guiding consumers to make decisions that best serve their interests.

The paper is in line with the evidence-based approach towards which some regulators are currently moving and gives an example of an evidence-based methodology that could be used to improve the effectiveness of investor protection tools.

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The paper is organised as follows. Section 2 surveys the empirical literature investigating the relationship between investment choices and financial disclosure, both in terms of risk and costs of financial products. Section 3 briefly reviews some examples of evidence-based rules and supervision practices that some European regulators and supervisors are developing along the lines of the cognitive approach. The design of our consumer testing, with reference to the questionnaires used and to the research questions investigated, is detailed in Section 4, whereas the sampling procedure and the sample are described in Section 5. Sections 6 and 7 report a de-

tailed analysis of the individuals' disclosure appraisal, risk perception and willingness to invest. Section 8 deals with the evaluation and understanding of the alternative cost representations that were submitted during the consumer testing. Section 9 concludes.

2 Literature review

2.1 Risk representation, risk perception and investment decisions

Investment decisions rely on risk understanding and risk perception. According to the classical theory of finance, the risk of an investment option can be objectively measured. Moreover, given well-defined individual preferences and the availability of adequate information, people make rational decisions, i.e. choose the utility maximising alternative out of several options, after having correctly processed all the information available.

However, as shown by the behavioural finance literature, the perception of risk is seldom consistent with objective measures. As pointed out by Slovic (2000), '*risk is inherently subjective*', context-dependent and prone to an assessment process relying on assumptions and judgements. Moreover, people conceptualise risk in a number of different ways and may use different risk measures and more than one at the same time.[1]

In this context, framing effects, mental shortcuts (so called heuristics), emotions and gut feelings, information overload, as well as financial literacy and socio-demographic factors may hinder the understanding of objective measures of risk by triggering inconsistent and irrational choices.[2]

Framing effects are a perceptual phenomenon, equivalent to visual illusion, implying that different presentations of the same information may lead to different choices. They can derive from narrative elements and graphic features (worded, pictured, described, categorised etc.), prior beliefs, wrong and/or incomplete information. Framing effects narrow the definition or the presentation of an issue, by leading to focus only on aspects considered salient, or to divert the attention towards an intentionally highlighted specific or one-sided interpretation (the half empty or half full glass). Tversky and Kahneman (1981), in the famous 'Asian disease' experiment, found

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1　Risk perception may be linked to rules aimed at minimizing possible below-target return or maximizing possible gain (Slovic, 1972); imagery and affective ratings (MacGregor, Slovic, Dreman and Berry, 2000); potential for large loss, feeling of control, and level of knowledge about an investment (Olsen, 1997); contextual (domain-specific) factors concerning a specific investment class, such as the stress associated with monitoring the performance of an investment, the performance predictability, potential loss-of-capital, perceived adequacy of regulation (MacGregor and Slovic, 1999, on financial advisors). Other studies show that risk measures deemed as relevant by individuals may also vary across products: for instance, semi-variance – accounting only for negative deviations from the mean or another benchmark – may be important for stock investors, while probability of loss for bond holders (Veld and Veld-Merkoulova, 2007).

2　See Célérier and Vallée (2013), performing a lexico-graphic analysis of the term Sheets of all the retail structured products issued in Europe since 2002 in 17 countries and showing how hard it is for investors to understand a product and compare it with possible alternatives.

that when the problem was framed positively participants avoided the risky option, but preferred the risky option when the problem was framed negatively. This inconsistency can be cast within the framework of the Prospect theory (Kahneman and Tversky, 1979), which departs from the expected utility theory by emphasizing the individuals' attitude to transform stated gains, losses and probabilities when choosing among alternatives. In particular, gains and losses are appreciated according to a value function.[3] Given the properties of the value function, people are risk averse in the gain domain and risk seeker in the loss domain; moreover, the displeasure of a loss is greater than the pleasure of the same amount of gain (loss aversion); finally, risk attitude seems to depend on outcomes of prior decisions also. In addition, probabilities are replaced by subjective values (decision weights), which are a non-linear transformation of the objective ones and depend also on their 'position' in the interval (0, 1). This transformation introduces a distortion, which is different from and additional to the one deriving from errors in the estimation of probabilities. Some experiments show that preference reversal and the transformation of gain, losses and probabilities can be restrained through a proper representation of information.[4]

Framing effects have some relation with heuristics, that is the intuitive rules used by individuals when gathering and processing information. These rules, whose role was first acknowledged by Kahneman and Tversky (1974), allow to solve problems and make judgments quickly but lead also to systematic and significant errors in risk assessment.[5] Representativeness, based on simplified stereotypes, and availability, building on familiarity (i.e. on the reliance on the first perception/interpretation of reality), may trigger framing effects.

Heuristics may bias risk perception also by generating overconfidence, i.e. a subjective confidence in one's own judgments reliably greater than the objective accuracy. Overconfidence derives from the apparent ease with which a forecast can be made on the basis of memories (availability), commonplaces (representativeness) and external reference points (anchoring).[6] Related to overconfidence is optimism, leading to systematically upward-biased forecasts (among others see Kaplanski et al. (2014)).

Besides heuristics, emotional factors may play a crucial role in the perception of the risk-return relationship. As shown in Loewenstein et al. (2001), the decision making process under uncertainty is based not only on a 'cognitive/rational' assessment of the risk but also on the affective response ('risk-as-feelings'). This may

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3   The value function is defined on deviations from a reference point and is normally concave for gains (implying risk aversion), commonly convex for losses (risk seeking) and is generally steeper for losses than for gains (loss aversion).

4   Some experiments show that introducing context cues reduces the individuals' need to transform objective gains, losses and probabilities into subjective values. In other words, the transformation process may be influenced by context cues implicitly or explicitly provided when a scenario is presented and only apparently unrelated to the verbal description of the task (for an overview see Schwarz,1994; for an application to the Asian disease problem see Bless, Betsch and Franzen, 1998).

5   In particular, information gathering is often carried out on the basis of the heuristic of availability, whereas information processing is guided by the heuristics of representativeness and anchoring (see Linciano, 2010, for a detailed description).

6   Overconfidence can determine an overestimation of the variability of a phenomenon (the above mentioned miscalibration); it can foster the better than average effect; it can cause the so-called illusion of control, that is the tendency to over-emphasize the role of personal skill.

lead investors judging the risk-return profile to formulate an overall 'good/bad' opinion mainly on the basis of the feelings they have towards an asset. To this respect, interesting insights into individuals' financial decision making processes may be gained also from the latest neuroscience and neurobiology findings, exploring how brain works and how decision processes are carried out on a dual or multiple basis (Brocas & Carrillo, 2014; Alós-Ferrer & Strack, 2014).

Provided that risk perception is highly context dependent, proper communication of risk has an increasingly practical relevance. This communication needs to be modelled taking into account not only the type but also the format and the presentation of investment information.

Among more recent contributions, Weber, Siebenmorgen and Weber (2005) carried out an experiment ascertaining the impact that the type and the presentation format of financial information have on investors' expectations about asset risk, returns, and volatility. The authors find that providing historical return information in the form of an estimated density function rather than as a bar graph of annual returns leads to greater estimates of volatility and risk, probably because of an initial anchoring to the end-points (extreme values) of the distribution, which the density function format make perceptually more salient than the bar graphs (thus resulting in greater estimates of asset risk). Moreover, the knowledge of the name and the type of the assets led to higher estimates of expected returns and to lower estimates of volatility and risk. The evidence also shows that perceived risk is not synonymous with expected volatility and that asset selection is driven by perceived risk, rather than expected volatility.

The importance of the presentation format of past performances (histogram versus price index) over different time intervals is confirmed also by Diacon and Hasseldine (2005). To prevent any bias, the authors suggest providing several representations of the same phenomenon, although this could generate information overload.

Some authors elicited people preferences towards different representations capturing different dimension of risk (volatility, probability of loss, etc.). Vlaev et al. (2009) asked the participants to the experiment to rate eleven representation formats about the same financial products, according to three criteria: usefulness to make financial decisions, complexity and suitability of the product. All representations used a verbal (words and numbers) description of risk except one, relying on a graphical element. The information framing receiving the highest rating presents risk as variation between minimum and maximum values with an average in between. This risk framing also prompts more stable risk preferences (over a three month testing period) in comparison to standard measures of risk aversion.

Wang et al. (2011) show that when people rate certain assets as easier to understand (probably driven by a familiarity bias), they also perceive them as less risky. Following the psychometric paradigm adopted by Fischhoff et al. (1978), the authors asked participants to rank 20 investment products on seven scales. The first three scales (understanding, expert knowledge, and prevalence) correspond to the familiarity, and the last four scales (risk of capital loss, risk of lower-than-expected

return, variation and chance of higher-than-inflation return) correspond to the different statistical measures of risk. Moreover, participants were asked to rate the perceived risk of each product. Results show a high degree of inter-correlation among the seven judgment scales and the overall perceived risk. In particular, the perceived risk is almost perfectly correlated with the scale 'risk of capital loss', 'risk of lower-than-expected-return', and 'variation of gains and losses', whereas the correlation between perceived risk and the 'chance of higher-than-inflation return' is the lowest, implying that the gain potential is less prominent than the loss potential and volatility for the risk judgment.

A number of experiments ascertained visual framing effects and behavioural biases linked to various presentation formats, data aggregation and lexico-graphic elements. Early studies show that risk taking may vary depending on whether information on past performance is delivered in charts representing the historical asset prices or histograms representing the historical returns.[7] Among recent analyses, Kaufmann et al. (2013) find that greater risky allocations are associated with decreased risk perception, increased confidence in financial instruments and a lower estimation of the probability of a loss.

Dolan et al. (2012) explored the role of 'contexts' in determining people's investment choices. They argue that raising the level of information and education and changing the context, i.e. the environment and the architecture of choices may successfully improve investors' financial capability and change investment habits.

2.2 Costs representation and investment decisions

The perception of investment costs is prone to some of the bias affecting risk perception. Choi et al. (2010) find that even with simple products, such as index funds, people frequently fail to identify the lowest cost alternative, while Agnew et al. (2005) ascribe to information overload the inability of customers to select their optimal contribution plan.

Simplifying information formats may not be sufficient, as shown by the available empirical evidence. Wilcox (2003) and Beshears et al. (2009) find that the summary prospectus of mutual funds, introduced by the Securities and Exchange Commission to simplify information, did not enhance the quality of investors' portfolio choices, as one might expect. Beshears et al. (2009) also focus on the investors' understanding of sales loads and conclude that subjects either don't know how these fees work or don't take them into account in making investment decisions. Barber et al. (2005) find that investors are more sensitive to in-your-face fees (like front-end loads and commissions) – which are generally large, salient, onetime fees – than operating expenses – which are smaller, ongoing and easily masked by the volatility of equity returns. Moreover, investors do not perceive marketing or advertising costs, which are often embedded in funds' operating expenses.

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7   See some early studies cited in Weber, Siebenmorgen and Weber (2005), in particular Unser (1999) and Ibrekk and Morgan (1987).

Given this evidence, some scholars argue that information disclosure needs to be not only simple, but also salient (i.e. noticeable, capable to draw attention and to appear important for the decision to be made). Disclosure formats should make all the fees transparent and adequately recognisable as costs. Prospectuses should allow greater transparency into the total cost of holding an asset and into the impact on the total asset net value over an appropriate time horizon (Wilcox, 2003). Properly designed graphs might improve the accuracy of information compared to other formats (such as tables or a combination of graphs and tables; Desanctis and Jarvenpaa, 1989). Also visual priming (i.e. any implicit memory effect in which exposure to one stimulus influences a response to another stimulus) can increase the effectiveness of disclosure (as compared to just plain text; about the use of visual priming, see for example Wang et al., 2010).

However, presentation modes need to be carefully assessed, given that they may be highly misleading if improperly designed (Penrose, 2008) or may prompt some biases, although being 'resilient' to others. For instance, while representing costs in percentage terms could encourage the use of simplifying heuristics, using absolute values could evoke different reference context and induce subjective evaluation (Weathers et al., 2012).

3   The international experience

The insights of behavioural finance and neuro-economics are increasingly becoming relevant also in the policy debate. How to shape disclosure in order to improve its effectiveness is indeed becoming a growing concern of legislators and regulators. Traditionally, transparency as a tool of investor protection has been based on detailed disclosure (so called 'information based' rules). However, several cases of mis-selling of financial instruments showed that the information based approach may perform poorly, even when information is simply and clearly delivered. Indeed, as shown also by the academic literature, simplicity and clarity may not be enough if consumers' heterogeneity and behavioural biases affecting risk perception and investment choices are not taken into account. The so-called 'cognitive disclosure' departs from the hypothesis of rational and homogenous individuals and grounds on the empirical analysis on how people actually behave.

Some regulators are moving towards the cognitive approach by designing evidence-based rules. For a given conduct/phenomenon to be regulated, the definition of evidence-based rules entails a specific methodology, based first of all on the identification (through surveys, consumer testing, experiments and consultations) of the most common behaviours and heuristics that might be relevant in the decision process. Second, the consequent potential risks for investors have to be ascertained. Finally, by relying on the collected evidence, regulators define the measures, whose effectiveness might be assessed ex-post, following again an evidence-based approach.

The cognitive methodology is more expensive than the traditional one and may suffer from the behavioural biases of the regulator himself. However, it may help regulators to deliver disclosure rules that are more effective in protecting retail investors and enhancing their awareness of risks and costs of financial products.

In the following, we briefly survey some significant examples of cognitive approach, building on the evidence on individuals' understanding of financial disclosure and incorporating behavioural insights.

3.1 An evidence-based disclosure of financial products' characteristics

The revised UCITS Directive (2009/65/EU, so called UCITS IV) and the implementing Regulation (EU) No. 583/2010, detailed in the CESR Guidelines issued at the end of 2010, innovated the way information on investment funds is delivered to investors by replacing the former Simplified Prospectus for UCITS with a new form of disclosure named Key Investor Information Document (KIID henceforth). The KIID format and content were specified following the evidence from a consumer testing, run on a sample of consumers and intermediaries across some Member States and exploring preferences on a number of disclosure options.[8]

The consumer testing analysed the retail investors' information needs, the clarity of different presentation approaches of the items to be included in the KIID (funds' strategy and objectives, past performance, risk, charges, etc.) and the real employment of KIID in the decision making process. The test showed that most consumers are not willing to read too long documents, with information hidden in the small print, or with large blocks of text, whereas the use of more visual approaches, such as graphs, was felt to make the document more engaging. Consumers paid most attention to the risk and return profile sections, while sometime missing more subtle messages delivered by the KIID. Moreover, financial knowledge and investment experience were positively associated with the actual use of the document. As for the risk/reward profile, a synthetic indicator and a narrative approach were tested. The synthetic indicator scored better, being perceived by most investors as delivering information on the fund profile both clearer and more comparable than the narrative approach.

The European Commission is currently applying the consumer testing approach also in the definition of the format and content of the Key Information Doc-

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8 See IFF Research and YouGov (2009). In a similar vein, the Association of British Insurers published the results of a research about the relation among risk presentation and investment choices (Driver et al., 2010). The study investigated whether there is a way of presenting the risks associated with different investment funds that would help people make better investment decisions. In order to assess the effectiveness of financial disclosure, alternative representation modes, based on a pictorial presentation of a synthetic risk-return indicator, were assessed according to the following features: the usability of the disclosure designs, the ability of people to rank different funds according to risk and return and their ability to assess the suitability of funds when making decisions. The evidence collected shows that a pictorial description of risk would be more effective at helping consumers in making financial decisions than a text-based disclosure. Moreover, authors find that people's ability in investment decisions benefits from the standardization of the disclosure and that introducing charts can reduce the ability to understand the information.

ument (KID henceforth) to be produced by the manufacturers of packaged retail and insurance-based investment products (PRIIPs henceforth). This follows the European Commission approval on April 15, 2014 of the PRIIPs Regulation.

As for UCITS, the KID for PRIIPs shall be accurate, fair, clear and not misleading. It shall be a stand-alone document, written in a concise manner in order to maximize understanding of the information and comparability among products. It shall be focused on the information about the main features of the PRIIP and of its manufacturer: Finally it shall include a description of the consumer type to whom the PRIIP is intended to be marketed and a comprehension alert reminding that the product is not simple and may be difficult to understand.

Concerning risks and return disclosure, the Regulation requires that in every KID investors will find a summary risk indicator, accompanied by a narrative explanation of the indicator itself; a warning about the possible maximum loss of invested capital; appropriate performance scenarios and the assumptions made to produce them.

As for costs, the KID shall include information about both direct and indirect costs to be borne by the investor and, in order to ensure comparability, summary indicators of these costs, expressed in monetary and percentage terms, to show the compound effects of the total costs on the investment.

According to the Regulation, the European Supervisory Authorities[9] are in charge with the definition of draft regulatory technical standards (RTS), specifying the details of the presentation and of the content of each section of the KID, as well as the methodology for calculation of risks, return and costs. The RTS shall take into account existing and on-going research on consumer behaviour, as well as the results from the EC consumer testing mentioned above.

3.2 Behavioural finance as a tool of financial market supervision

A number of authorities as the Netherlands Authority for the Financial Markets (henceforth AFM), the British Financial Services Authority (FSA, now Financial Conduct Authority, FCA) and the Australian Securities and Investments Commission (ASIC) are increasingly using the behavioural economic approach in their regulatory and supervisory activities.

In particular, the AFM developed a methodology relying on the design of evidence based rules in order to improve consumers' financial decision-making process and to achieve a more balanced relation between consumers and financial institutions. Over-exposure to debt, for instance, was dealt with along the lines of the behavioural approach. After having analysed the most common households' choices, the AFM led an online survey, involving 800 respondents, in order to identify risks to con-

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9   They include the European Banking Authority (EBA), the European Insurance and Occupational Pensions Authority (EIOPA) and the European Securities and Markets Authority (ESMA).

sumer protection due to behavioural biases and to design appropriate disclosure measures, throughout a consumer testing exercise (AFM, 2014).

The British FCA has increasingly resorted to an evidence based methodology too. A mystery shopping exercise was undertaken to gather evidence on the fairness of firms' conduct when selling financial products to retail investors and on their compliance with FCA rules (FSA, 2013). Moreover, the FCA used experimental methods to investigate whether the offer of insurance as an add-on to another (primary) product, together with limited transparency on the unbundling of the price components of the insurance and the matched product, may impede effective competition by preventing buyers' from searching for stand-alone products (FCA, 2014). More recently, the FCA conducted a survey which investigated how well consumers understand and value structured deposits and whether giving targeted information improves their evaluation. Authors' main findings suggest that investors' understanding of structured product is inadequate due to behavioural biases and cannot always be improved by providing information. Given these results, the FCA intends to extend the work in order to understand exactly which combinations of product features and biases drive investors' misperceptions of complex investments (FCA, 2015).

Finally, the Australian ASIC led a research to understand the social and emotional impacts of financial losses arising from the misconduct of financial services providers and to assess the effectiveness of the current compensation system. To meet the research objectives, a multi-method, multi-stage quantitative and qualitative research study was designed. The quantitative methodology allowed, through an online research panel, to collect data about the demographic characteristics of investors who lost money, the impact of losses on their lives and the proportion of investors who sought compensation. This exercise resulted in the selection of 29 representative investors, who were interviewed in order to assess the depth and breadth of their experiences with the various kinds of financial loss and the different compensation mechanisms used (ASIC, 2011).

4 Financial disclosure, risk perception and investment choices: the design of the consumer testing

4.1 Alternative representation modes of the characteristics of financial products

Our consumer testing is aimed at investigating the impact of financial information disclosure on risk perception and investment decisions. In more details, our research questions (RQ) are the following:

RQ1) How are different risk-return representations appraised in terms of complexity, usefulness and information content?

RQ2) Does risk-return representation affect risk perception?

RQ3) Does risk-return representation affect investment choices?

RQ4) How are different cost representations appraised in terms of complexity, usefulness and information content?

In order to investigate these questions, we submitted to a sample of 254 investors (out of an initial selected sample of 300 individuals) different representation modes of risk/return and costs characteristics of four financial instruments negotiated on Italian trading venues. In details, the financial products we took into account are two structured bonds (one outstanding and the other newly issued), both negotiated on the Italian retail bond market, and two stocks included in the FTSEMIB basket (for details, see Appendix I). The time-to-maturity of the selected bonds is approximately equal to 3-4 years.[10]

As for risk/return representation we compared four Templates including, alternatively:

- a synthetic risk indicator (Template 1 or T1, henceforth), ranging from 1 (low risk) to 5 (high risk), which aggregates information on market, liquidity and credit risks and accounts also for the comparison between the risk characteristics of the selected product and the risk attributes of a benchmark portfolio.[11] Besides T1, a Template 1_{bis} (or $T1_{bis}$, henceforth) is presented as a synthetic indicator of risk/return characteristics reported in the probabilistic modelling Template referred to the same product (see Template 4 detailed below);

- an unbundled Template (Template 2 or T2, henceforth), which separately discloses quantitative measures of market risk (volatility and value at risk), liquidity risk (turn-over ratio) and credit risk (Moody's official rating and expected default probability). As above, the risk characteristics of the product are compared with the risk/return attributes of a benchmark portfolio;

- a what-if scenario (Template 3 or T3, henceforth), including three example scenarios which describe the product's return in case of three hypothetical situations (i.e. low, medium or high return corresponding to hypothetical developments in prices or other conditions of financial assets and indices underlying and determining the product's performance). The scenario approach was mandated for structured UCITS by the revised UCITS Directive (2009/65/EU) and the implementing

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10 This is consistent with the holding period which participants were given in order to elicit their willingness to invest in the preferred financial product (see Section 6).

11 The benchmark portfolio for bonds was defined by including financial instruments listed on DomesticMot and as similar as possible to the selected bond with respect to coupon structure, time to maturity (approximately equal to 3-4 years), issuer sector, and lot size (1,000 euro). As for stocks, the benchmark portfolio was defined by using the matching sample technique (Davies and Kim, 2008; O'Hara and Yee, 2011), being the matching criteria price level and market value (for details, see Appendix I).

Regulation (EU) No. 583/2010 and was detailed in the CESR Guidelines issued at the end of 2010;[12]

- probabilistic modelling (Template 4 or T4, henceforth), providing also information on the likelihood of the outcomes. The Template describes a worst, average and best case scenario. The worst case scenario corresponds to the 10th percentile of the expected rates of return, thus indicating an estimated 10% probability that the rate of return is likely to be less than that stated. The average case scenario corresponds to the mean of the expected rates of return, thus indicating an estimated 50% probability that the rate of return is likely to be less than that stated. The best case scenario corresponds to the 90th percentile of the expected rates of return, indicating an estimated 90% probability that the rate of return is likely to be less than that stated (for details, see Appendix I).

Information Sheets were presented and explained to interviewees by two researchers, specifically trained to run the consumer testing consistently among respondents.

The Templates listed above were used to define the Information Sheets describing the four financial products mentioned above (see Appendix II). In details, each product was matched with two or more Information Sheets, each defined according to one of the Templates, as follows[13]:

- outstanding structured bond: Information Sheets A (Template 1 or synthetic approach), B (Template 2 or unbundled), C (Template 3 or what-if-scenarios approach)

- newly issued structured bond: Information Sheets D (Template 1_{bis}) and E (Template 4 or probabilistic modelling approach)

- stocks: Information Sheets F (Template 1) and G (Template 2).

As for costs, we tested alternative representations only with respect to the newly issued structured bond. In the Information Sheet E (Template 4) we added three alternative presentation options. The first showed the effect of costs on the internal rate of return (E1 henceforth). The second option showed the impact of costs on principal and interest (E2 henceforth). Information Sheets E1 and E2 reported the effect of costs for all the scenarios (worst, average and best) described in the risk-return section. The third Template unbundled the product fair value into its bond and derivative components with specific indication about costs (E3 henceforth; for details, see Appendix I). Table 1 summarises the design of the Templates and their matching with the products and the Information Sheets.

12 CESR (2010), Selection and presentation of performance scenarios in the Key Investor Information document (KII) for structured UCITS; http://www.esma.europa.eu/system/files/10_1318.pdf.

13 Where applicable; for details, see Appendix II.

Table 1 – Products, Information Sheets and Templates

Product and assessed risk level[1]	Information sheet	Template			
		Type	Risk representation[1]	Return representation	Cost representation
Outstanding structured bond Risk level 2	A[2]	T1: synthetic	synthetic risk indicator, ranging from 1 (low risk) to 5 (high risk) and aggregating information on market, liquidity, and credit risks benchmark included	charting of historical returns benchmark included	no
	B[2]	T2: unbundled	several indicators of market risk (volatility and value at risk), liquidity risk (turnover ratio), and credit risk (Moody's official rating and expected default probability) benchmark included	percentage of historical returns benchmark included	no
	C	T3: what-if scenario	what-if scenarios		no
Newly issued structured bond Risk level 4	D[3]	T1bis: synthetic	synthetic risk embedded in the synthetic risk/return indicator		no
	E[3]	T4: probabilistic modelling	probabilistic modelling		no
	E1				internal rate of return gross and net of cost
	E2				principal and interest gross and net of cost
	E3				value unbundling of derivative and bond components
Stock 1[4] Risk level 3	F	T1: synthetic	synthetic risk indicator benchmark included	charting of historical returns benchmark included	no
Stock 2[4] Risk level 4	G	T2: unbundled	several risk indicators benchmark included	percentage of historical returns benchmark included	no

[1] Risk level was assigned to each financial product according to a methodology described in Appendix I. [2] The same information is differently disclosed through Template 1 (synthetic Information Sheet) and Template 2 (unbundled Information Sheet). [3] The same information is differently disclosed through Template 1bis (synthetic Information Sheet) and Template 4 (probabilistic modelling). [4] Stock 1 and Stock 2 have different risk levels but similar price level and market value, which are the characteristics used to select them through the matching sample technique. Please see Appendix I.

Table 2 gives an overall and synthetic picture of the representation modes used for the different products.

Individuals' appraisal of different Templates, as well as risk perception and investment decisions were investigated through a four-section questionnaire (Questionnaire A or QA henceforth), which will be detailed in the following paragraph. The researchers supported respondents in filling in the whole Questionnaire A and asked them to rate the representations according to the perceived complexity, usefulness and information content (*appraisal*); to rate the products represented in the Infor-

mation Sheets according to the perceived risk (*risk perception*); to choose whether to invest and how much in the product underlying each Information Sheet, given a hypothetical setting, specified in terms of initial endowment, time horizon and investment objective (*investment choices*).

This setting allowed us to explore: i) how Templates are appraised in terms of complexity, usefulness and information content; ii) whether different Templates influence differently risk perception; iii) whether different Templates affect differently investment decisions.

Table 2 – Products and representation modes at a glance

Product	Information Sheet		Template
Outstanding structured bond	A		Template 1: synthetic
	B		Template 2: unbundled
	C		Template 3: what-if scenario
Newly issued structured bond	D		Template 1$_{bis}$: synthetic
	E		Template 4: probabilistic modelling
		E1	probabilistic modelling with effect of costs on the internal rate of return
		E2	probabilistic modelling with effect of costs on principal and interest
		E3	probabilistic modelling with value unbundling
Stock 1	F		Template 1: synthetic
Stock 2	G		Template 2: unbundled

4.2 The elicitation of appraisal of representation modes, risk perception and investment choices (Questionnaire A)

In order to elicit respondents' appraisal on the representation modes reported in Templates 1 to 4, the interviewers submitted the Information Sheets mentioned above and administered Questionnaire A. This questionnaire consists of four Sections, briefly recalled in Table 3 and fully reported in Appendix III.

First, respondents were invited to express their opinion about what is the purpose of information on financial products, by choosing among a few alternatives.

Second, the interviewers ascertained the knowledge of market risk, liquidity risk, credit risk and internal rate of return, which the Information Sheets refer to (Section 0 of the Questionnaire A). If respondents declared to be knowledgeable, they continued the interview; otherwise they were shown an educational video and were given a leaflet including the information displayed by the video (for details, see Appendix IV).

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Table 3 – The Questionnaire A

section	areas	brief description
Section 0: **Introduction**	Perceived usefulness of financial disclosure	One question about the purpose of financial information.
	Knowledge of risk dimensions represented in the Information Sheets	Four questions about the knowledge of the main financial concepts that are used in the test: market/price risk; liquidity risk, credit risk, internal rate of return.
		Lack of knowledge is amended with a documental (see Appendix IV) and video educational tool (available, only in Italian, at: http://www.risktolerance.univpm.it/ricerca-consob/).
Section 1: **Appraisal of the presentation of financial information**	Assessment of perceived complexity, usefulness and information content of financial disclosure about risk and return	**Step 1:** Comparison of Information Sheets A, B and C, matched with the outstanding structured bond. Respondents are asked to randomly select, one-by-one, Information Sheets A, B, C, which present three different Templates (Template 1, 2, 3) disclosing the same financial product (an outstanding structured bond). Neither the issuer's name nor the type of the asset are disclosed; moreover, at this stage, the interviewers do not reveal that Information Sheets might refer to the same financial product. Then investors are asked how much they would invest in each product. Finally respondents are asked to assess the risk related to the same product represented through the different Information Sheets.
	Analysis of the impact of financial disclosure on risk perception (Intra-product comparison) Analysis of the impact of financial disclosure on investment decisions	**Step 2:** Comparison of Information Sheets D and E, matched with the newly issued structured bond. Respondents are asked to randomly select, one-by-one, Information Sheets D and E, which present two different Templates (Template 1_{bis} and 4) disclosing the same financial product (a newly issued structured bond). Neither the issuer's name nor the type of the asset are disclosed; moreover, at this Step, the interviewers do not reveal that Information Sheets might refer to the same financial product. Then investors are asked how much they would invest in each product. Finally respondents are asked to assess the risk related to the same product represented through the different Information Sheets.
		Step 3: Comparison of Information Sheets F and G, each matched with one listed stock. Respondents are shown Information Sheets F and G, which present two different Templates (Template 1 and 2) disclosing two stocks. Neither the issuers' name nor the type of the assets are disclosed. Then investors are asked how much they would invest in each product. Finally respondents are asked to assess the risk related to the same product represented through the different Information Sheets.
		Step 4: Disclosure that Template 1 and 2, referred to Information Sheets F and G, rest on the same informative set. Respondents are asked to assess ease of understanding and usefulness of Information Sheets F and G
Section 2: **Ease of understanding and comprehension of risk disclosure**	Risk assessment after the disclosure of the product typology	Presentation of Information Sheets B, C, E and G (Templates 2, 3, 4; i.e, excluding Template 1 and 1_{bis}). Respondents are asked to rank these product by their riskiness.
		Respondents were told which products the Information Sheets refer to (B and C correspond to the same outstanding structured bond, E to a newly issued structured bond, G to a stock).
		Conclusive investment choice, between B, E and G; written representation of the choice, with the signature on two identical Sheets, one given to the respondent, the other left with the researcher.
Section 3: **Ease of understanding and comprehension of cost disclosure**	Assessment of perceived complexity, usefulness and information content of three alternative presentation options of costs.	Presentation of Information Sheets E1, E2 and E3. The first shows the effect of costs on the internal rate of return; the second option shows the impact of costs on principal and interest; the third Template unbundles the product fair value into its bond and derivative components with specific indication of costs.

Third, participants were submitted the Information Sheets A – G (described in the previous paragraph and recalled in Table 1 and Table 2) and were elicited to appreciate them in terms of complexity, usefulness and information content (Section 1 of the Questionnaire A). At this stage, the interviewers did not disclose that two or more Information Sheets might refer to the same product, in order to prevent the appraisal on a given Template from being driven by familiarity, anchoring and representativeness heuristics, i.e. in order to have individuals' evaluations exclusively driven by the way information was delivered (framing). Moreover, all the Information Sheets were covered up and respondents were asked to randomly select them one-by-one, in order to have answers independent of the sequence by which the Templates had been inspected.

In particular, respondents were asked to compare:

- Information Sheets A, B, C referring to the outstanding structured bond and displaying, respectively, the synthetic, unbundled and what-if representations (Step 1);

- Information Sheets D and E, referring to the newly issued structured bond and displaying, respectively, the synthetic mode and the probabilistic modelling (Step 2);

- Information Sheet F and G, referring to Stock 1 and Stock 2, respectively, and displaying the synthetic and the unbundled modes (Steps 3 and 4).

At each step, respondents were asked to rate complexity, usefulness and information content of the Templates over a ten-point Likert range. Then, participants were asked how much they would invest in each product, given a hypothetic initial endowment of 10,000 euros, a time horizon corresponding to 3 to 5 years and capital appreciation as the investment objective.

In the following stage of the interview, participant were asked to assess the risk related to the same product represented alternatively through different Information Sheets, in order to evaluate the impact of the disclosure format on risk appraisal.

The ease of understanding of risk disclosure was investigated also by asking respondents to rank Information Sheets B, C, E and G (all reporting the unbundled or the performance scenario Template) according to the perceived risk (Section 2 of Questionnaire A). In the next step, the interviewers disclosed the matching between these Templates and the underlying products (i.e. B and C and the outstanding structured bond, E and the newly issued structured bond, G and Stock 2) and asked respondents which product, between B, E and G, they would invest in and how much of their hypothetic endowment.[14] Both the product chosen and the amount participants were willing to invest were recorded in order to run a follow-up phase after six

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14   See questions 2.0.2 and 2.0.3 of Questionnaire A.

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months. Such a follow-up, currently in progress, is aimed at checking the actual understanding of the Information Sheets submitted during the test, as well as the stability of both disclosure appraisal and investment choices.

In details, participants will be told the six-months performance of the chosen product and will be asked to answer a brief questionnaire ascertaining: i) their actual understanding of the Information Sheet; ii) the misalignment (if any) between the real and the expected performance (given the information acquired six months before).

Finally, as for investment charges, respondents were shown three alternative representation modes of the costs referring to the newly issued structured bond, as described in the Information Sheet E, and asked to rate complexity, usefulness and information content of the three options (Section 3 of the Questionnaire A).

4.3 Socio-demographic characteristics and personal traits (Questionnaire B)

We also collected data on socio-demographic characteristics, investment habits and experience, financial knowledge, personal traits such as risk tolerance, attitude towards behavioural biases and impulsivity through a four-section questionnaire filled in autonomously by respondents (Questionnaire B or QB, henceforth; see Appendix III).[15]

In details, Section 1 referred to socio-demographic characteristics of respondents. Attitudes towards behavioural biases were elicited through questions on loss aversion, disposition effect, naive diversification, risk propensity and other investors' beliefs.

Section 2 was designed to investigate knowledge both of the main financial concepts (risk-return trade-off, portfolio diversification principle, inflation, as well as the basic notions of risk mentioned in Section 0 – Questionnaire A) and of some financial products. Furthermore, one question explored the logical-mathematical attitudes of respondents.

Section 3 and 4 were aimed at eliciting risk tolerance and impulsivity through the well-known Grable and Lytton questionnaire (2003) and the Impulsivity Test by Patton et al. (1995), respectively.

Table 4 reports a summary of the aims of the consumer testing, the research questions mentioned in Section 4.1 and the areas of investigations as well as the reference to the corresponding Section of Questionnaire A and Questionnaire B.

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15 The two researchers were available for any clarification needed.

Table 4 – Consumer testing design and research questions

research questions	additional items		corresponding sections of Questionnaires A and B
How are different risk-return representations appraised in terms of complexity, usefulness and information content? (RQ1)	What is the relationship, if any, among perceived complexity, usefulness and information content of a given Information Sheet? Do different Information Sheets induce the perception of a different information content?	Respondents' opinion on the purpose of information about financial products Relationship among appraisal of Information Sheets and socio-demographic characteristics of respondents	QA, Section 0 QA, Section 1 QB
Does risk-return representation affect risk perception? (RQ2)		Intra-product comparison Comparison across unbundled and performance scenario Templates Relationship among risk perception and socio-demographic characteristics of respondents	QA, Section 1 QA, Section 2 QB
Does risk-return representation affect investment choices? (RQ3)	Do specific features of disclosure draw the attention of investors?	'Attention effect' on specific items of the Information Sheets Evidence collected before the disclosure of product typology	QA, Section 1 QA, Section 2
How are different cost representations appraised in terms of complexity, usefulness and information content? (RQ4)			QA, Section 3

Note: For each research question, we controlled for socio-demo characteristics, personal traits, financial knowledge, investment habits and experience.

5 The sample

5.1 The sampling procedure

Our final sample includes 254 individuals, selected among the customers of 8 Italian banks and satisfying the following requisites:

-   they held securities in their portfolios;

-   they shuffled their investments at least once in the previous year;[16]

-   they were under 70.

These criteria were aimed at selecting out individuals completely inexperienced or extraneous to any investment decision. As expected, our sample consists of individuals whose age, education and level of wealth (illustrated in more details below) are higher than the Italian population average.[17]

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16 In the case of joint ownership, we excluded those customers who were inactive.

17 According to GfK Eurisko - Multifinanziaria Retail Market survey data, referring to a representative sample of approximately 2,500 Italian households, the household financial decision maker is aged on average within 35 and 39

The sampling was realized through a two-steps procedure. The first step allowed to obtain a stratification of geographical areas/cities which could be representative of the Italian territory. The second step consisted of a random selection of individuals among the population of customers of each bank/city previously extracted (for details, see Appendix V).

In order to stimulate participation and reliable answers, sampled customers received a 50 euro worth reward.

5.2 Characteristics of the sample

In the following, we describe the sample in terms of socio-demographic characteristics, investment habits and experience, financial knowledge and personal traits, such as a tendency towards behavioural biases, risk attitude and impulsivity (for more details, see Appendix VI).

Socio-demographic attributes

About 63% of participants are men. Almost 67% of respondents are married or cohabitee, while less than 18% are single. On average, they are 56 years old. As for education, more than 40% completed high school and more than 45% earned a bachelor's degree or a post-graduate degree. As for professional status, 32% of the respondents are retired, 20% are open-ended employees, 18% self-employed, whereas the other categories (fixed-term contract employee, financial sector employees, managers and entrepreneurs) range between 3% and 8%. Households count on average 2.6 members and 0.4 kids. As for the financial situation, the monthly family income falls in the range 2,000-5,000 euros in 51% of the cases. The majority of respondents (63%) believe that their income will remain stable in the future, while 14% expect an increase. 46% of the interviewees reported a financial wealth ranging from 50,000 to 500,000 euros, while 20% of participants declared a financial wealth greater than 500,000 euros. As for real estate ownership, 35% of the families own one, 22% two and 28% three or more properties (Appendix VI, Table a.7).

Investment habits and experience

In our sample, saving is a widespread behaviour: 57% of people declare to be able to 'save something' or 'enough'.

A large part of respondents are used to making their investment decisions after having consulted with a financial expert (43%), typically their bank advisor, while 33% of people make decision on their own (75% of them are male). We also asked about shopping around before investing: 45% of the respondents do consider a number of products of different companies before choice, 24% consider a number of

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years hold and holds a bachelor's degree only in 15% of the cases. Moreover, the average household wealth falls in the range 11,000 – 25,000 euros.

products of the same company, while about 20% usually buy the product advised by his/her consultant. The vast majority of people delegating investment decisions trust their advisor (72%). Moreover, 74% declare that their trust in financial advisors has remained stable or improved with respect to the previous year. The majority of the respondents (88%) received a financial products/services bid in the previous twelve months. Nearly 40% of the subjects spend about 30 minutes reading information when making investment decisions, 32% spend some hours, more than 20% even more than one day, while almost 30% of respondents are not used to reading any newspaper or financial magazine. Only a small percentage of individuals declares to be confident in making financial decision (9%).

The vast majority of respondents know and use current accounts, plain vanilla corporate bonds and stocks. In addition, government bonds and bank deposits are well-known and widespread.

Almost all of the participants declare to know exactly or almost exactly how their investments performed in the previous year (96%). Over half subjects up-date their investment decisions more than once a year and about 20% once a year. Finally, we asked whether the sovereign debt crisis has affected participants' investment choices: the answer was negative for 75% of the interviewees (Appendix VI, Table a.8).

Financial knowledge and mathematical attitudes

Despite showing on average a high level of education and familiarity with investment decisions, respondents know precisely the meaning of portfolio diversification and of the risk-return trade-off only in 27% and 54% of the cases, respectively.[18] Inflation is correctly understood by 74% of the participants. Most of the subjects (69%) are not able to correctly identify the definition of market risk, and a large part of the respondents does not understand the liquidity risk or the credit risk (50% and 44%, respectively).

Only 10% of people is able to identify the right definition of 'net investment yield', 'nominal yield rate' and 'investment value'. More than 55% of the subjects are not able to answer a mathematical question.

On average, the percentage of correct answers to the questions reported above is 50%. Moreover, half of the respondents might be defined as 'high financial literate', with a percentage of correct answers above the median of the sample distribution (Appendix VI, Table a.9).[19]

Finally, we defined a variable accounting for the gap between self-assessed and objective knowledge, that is the mismatch between respondents' declared knowledge about the financial concepts mentioned above (market risk, liquidity risk,

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18 I.e. only 27% (54%) of respondents gave the right answer to all the questions about diversification (risk-return trade-off) reported in Section 2 of Questionnaire B.

19 The mean coincides with the median of the distribution.

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credit risk and internal rate of return) and their actual knowledge. The comparison between self-perceptions and actual literacy has long been explored by academics (among others see also Van Rooij, Lusardi and Alessie (2011)). For instance, Anderson et al. (2015) found that financial participation is mostly driven by perceived rather than actual financial literacy. This finding suggests that the link between financial education, financial literacy and financial capability depends critically on behavioural factors. Moreover, it supports the concerns of those questioning the effectiveness of standard investor education programmes, potentially spurring over-confidence and, by this way, enhancing potential misalignment between actual and perceived financial knowledge. Depending on the financial concept considered, the financial-literacy-gap ranges from 8% to 48% of respondents (Appendix VI, Table a.10).

Some personal traits

As recalled in Section 2, the behavioural finance literature shows that risk perception and risk attitude may be affected by several personal traits and framing effects. In the following, some descriptive statistics on these features are reported (Appendix VI, Table a.10).

<u>Volatility aversion and loss aversion</u>. Risk may mean different things to different people and several risk dimensions may be equally relevant to the same individual. For some subjects, risk may be mainly related to the probability of loss, to its potential maximum value or to the possibility of achieving a below-of-the-target return. Others may be more sensitive to the overall variability of returns (Duxbury and Summers, 2004). Risk measures may trigger subjective assessments differing across individuals depending on the risk dimension they are more sensitive to. When downside risks are more relevant to investors, asymmetric risk measures (i.e. the Value at Risk) may be more appreciated than symmetric measures (i.e. the volatility of returns).

In order to control for such heterogeneity in individual risk perception, we collected data on respondents' loss aversion and volatility aversion. In particular, 32% of the interviewees resulted to be volatility averse, whereas the percentage of individual classifiable as loss averse (i.e. showing a strong attitude to avoid losses) ranges from 45% to 48% loss aversion, depending on the definition adopted. [20]

In the multivariate analysis, we will test whether these personal traits affect risk perception and investment decisions. The appraisal of the Information Sheets

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20 Volatility aversion is detected through questions 1.21 and 1.23, QB, whereas loss aversion was explored through questions 1.18 and 1.31 (Appendix VI). In detail, question 1.18 asked 'What is the maximum loss you would accept before deciding to sell?', being the answers: 'I can't invest at a loss; Only a very small loss; Up to one fourth of my investment; One half; More than half; I hold on to my investment even at a loss'. Question 1.31 asked 'What is the lowest percentage of investment loss that worries you?', being the answers defined as the steps reported in the following scale:

0.1%	1%	5%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

might be driven also by the presence of specific risk measures, drawing individuals' attention because of their perceived salience. Indeed, Information Sheets exhibit different risk indicators, depending on the Template (e.g. VaR is reported only in the unbundled Template), and different warnings on capital protection depending on the product (i.e. Sheets F and G referred to stocks highlight that the buyer of the product is not guaranteed to be reimbursed 100% of the capital at maturity; see Section 4.1).

Attitude towards disposition effect. The disposition effect is the attitude of investors to sell too quickly positive performers (the winners) and hold too long losers (Shefrin and Statman, 1985). This behaviour, as predicted by the prospect theory mentioned above (Section 2.1), implies a risk attitude reversal, i.e. individuals turn out to be risk averse in the gains domain and risk seeker in the loss domain, and may be inconsistent with a profit maximizing behaviour.[21]

It may be interesting to check whether this behavioural bias, rooted also in loss aversion alongside with framing effects, impacts on investment choices and subsequent portfolio adjustments. In our sample, 62% of respondents exhibit an attitude towards the disposition effect (see questions 1.19 and 1.20 of Questionnaire B).[22] In our sample, also individuals characterized by a higher level of financial knowledge are prone to this bias, as shown by the significant positive correlation between the attitude towards disposition effect and our proxy of financial literacy. Moreover, the presence of a positive correlation between risk propensity, as measured through the Grable&Lytton test, and the inclination towards behavioural biases, on one hand, and high financial knowledge, on the other, would point to a latent variable, i.e. the overconfidence fed by a good level of financial knowledge, driving the positive relation between high knowledge and inclination towards behavioural biases (for details see Appendix VI, Tables a.11 and a.12).

Optimism. The behavioural finance and experimental literature show that optimism, i.e. the tendency to believe that one's life does get better than the others', may be relevant in the investment decision making process. We collected data on this attitude through question 1.38 of Questionnaire B, asking people whether they believe in the future. Respondents answering that they do believe account for 54% of the whole sample.

Risk tolerance and impulsivity. We used three measurers of risk tolerance. First, we checked whether participants have ever invested a huge sum of money just for thrill (1.17 of Questionnaire B): only 9% gave an affirmative answer. We defined risk seeking attitude also as individuals' propensity towards variability of returns in the domain of both losses and gains (questions 1.22 and 1.23 of Questionnaire B).

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21 This attitude conflicts with the standard theory for two reasons: first, losses are treated differently depending on whether they are only accrued or realized; second, sunk costs, related to already made and irreversible choices, affect future decisions while they shouldn't.

22 In detail, question 1.19 asked: 'Imagine you bought a share of XYZ Company at the price of 60 euros per share. In the last month the price rose to 120 euros. If any new information potentially affecting XYZ Company is known, what do you do?', being the answers: 'I double my investment; Nothing; I sell some stocks; I divest'. Question 1.20 asked: 'Imagine you bought a stock at the price of 60 euros. In the last month price went down to 30 euros. If any new information about your product is known, what do you do?', being the answers: 'I double my investment; Nothing; I buy more stocks; I divest'.

This trait was recorded in 9% of the cases. Finally, we administered the Grable and Lytton test (2003), which identified almost 52% of the individuals in our sample as risk lover. Impulsivity, i.e. the predisposition towards rapid and unplanned reactions to internal or external stimuli with no regard to the negative consequences of these, seems to be a relevant personal trait for 52% of the respondents.[23]

6 Disclosure appraisal, risk perception and investment choices: a descriptive analysis

Aa preliminary step, participants were invited to state what kind of information should be delivered through financial disclosure investigation, by choosing among a few alternatives on the purpose of financial information.

Awareness of risks is deemed as the most relevant item by almost the three-fourth of interviewees (72%), thus strengthening the motivation of the present study, i.e. the analysis of the relationship between the presentation of financial information and risk perception. The completeness of information is the second item to be evaluated as important. Understanding of costs and returns score equally, whereas comparability among products and awareness of potential losses are deemed as relevant purposes by about half of the respondents (Figure 1).

Figure 1 – The purpose of information about financial products
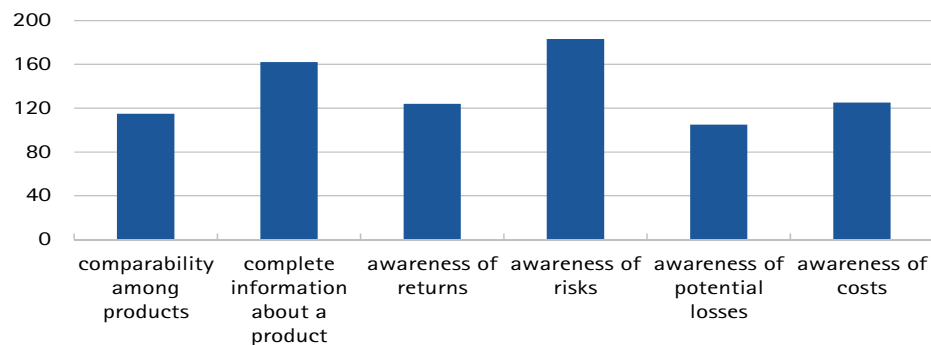
Note: Figure refers to question 0.0.1, Questionnaire A: 'In your opinion, what is the purpose of information about financial products?'. The answers were: 'To ensure comparability among different financial products; To ensure complete information about the characteristics of a given product; To ensure awareness of financial products' returns; To ensure awareness of financial products' risks; To ensure awareness of financial products' potential losses; To ensure awareness of financial products' costs' (multiple answers were allowed).

6.1 Appraisal and understanding of risk-return representation

How are different risk-return representations appraised in terms of complexity, usefulness and information content?

In order to answer to this research question, respondents were asked to rate the submitted Information Sheets in terms of complexity, usefulness and information content on a 0-10 Likert range.

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23 Figures refer to respondents whose scores in the Grable and Lytton test and in the Impulsivity Test (Patton et al., 1995) are higher than the median score of the sample.

Our experimental protocol envisaged a random extraction of the Information Sheets, in order to exclude biases in respondents' perception due either to a 'first impression' effect, for the first lay-out presented, or a 'comparison effect', for the Sheets following the first.

Therefore, as a preliminary check, we tested for any effect due to the selection order. As shown in Table 2, the impact of the selection order is significant only for the perception of complexity of Information Sheets A and C. In more detail, A's rating in terms of complexity decreases further when it is appraised after the other Sheets. The opposite holds true for C, as if in the (implicit) comparison across Sheets A is regarded as a benchmark of simplicity (Complexity average scoring per order selection is reported in Appendix VII, Figure a.1).

Table 5 – Correlation between Information Sheets selection order and perceived complexity, usefulness and information content

Information Sheets	complexity	usefulness	information content
A	–0.2072**	0.0157	0.0107
B	0.0503	0.0371	–0.0598
C	0.1325**	0.0260	–0.0139
D	–0.0070	0.0936	–0.0089
E	0.0636	–0.0767	–0.0075

Note: ** indicates that the correlation coefficient is significant at 5%. Selection order goes from 1 to 3 for Information Sheets A, B and C and from 1 to 2 for Information Sheets D and E. We did not test the selection order effect for Information Sheets F and G since for these Templates we did not ask respondents to assess complexity, usefulness and information content on a 0–10 range.

The average scoring of perceived complexity rises moving from the synthetic representation (A and D, i.e. Template 1 and 1_{bis}) to the unbundled one (B, i.e. Template 2) and reaches its highest for the performance scenarios (both what-if and probabilistic modelling, respectively C and E, Templates 3 and 4).[24] This evidence is consistent with the respondents' opinions on Information Sheets F and G, which were compared in pairs, rather than assessed separately on a 10-point Likert range: the synthetic representation is considered the most understandable (Figure 2).

As for usefulness, what-if scenarios (Information Sheet C, i.e. Template 3) are perceived to be less useful than the synthetic and unbundled approaches (Information Sheets A and B, i.e. Templates 1 and 2 respectively), which score similarly (Figure 3). The synthetic Template 1_{bis} in the Information Sheet D outperforms also the probabilistic modelling (i.e. Template 4 in the Information Sheet E).[25]

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24 Complexity average scoring per order selection and the distribution of the answers by the 10-point Likert range is reported in Appendix VII, Figures a.1 and a.2.

25 Usefulness average scoring per order selection and the distribution of the answers by the 10-point Likert range is reported in Appendix VII, Figures a.3 and a.4.

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Figure 2 – Perceived complexity of the Information Sheets

complexity average scoring
(Likert range)

according to you, which of the two information sheets is the most understandable?
(number of respondents)
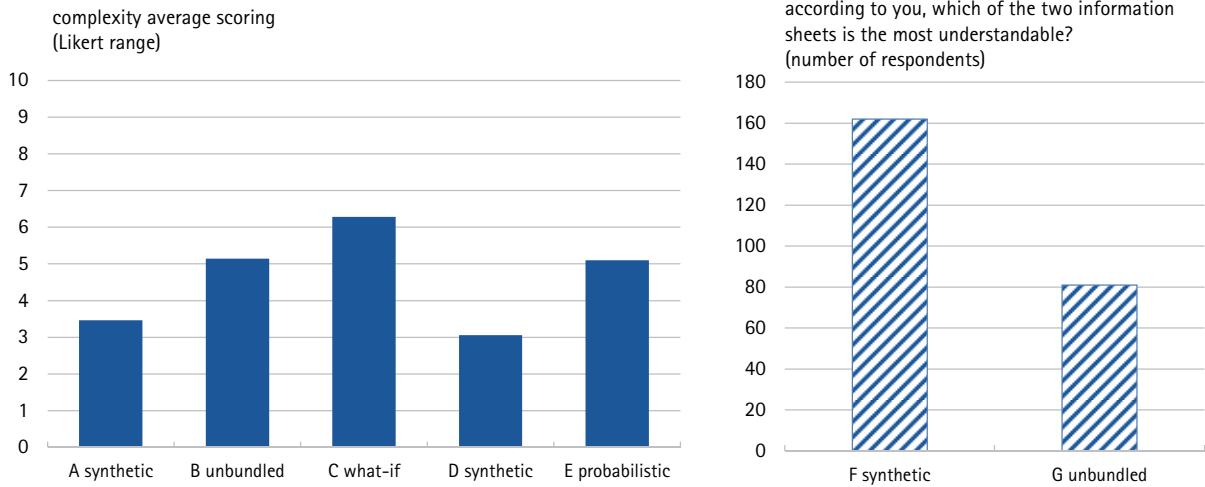
Note: Figure on the left side collects answers to the following: 'Please consider the [...] Information Sheets one at a time and assess their simplicity [...] on a 0-10 scale', questions 1.1.1 and 1.2.1, QA. Figure on the right side refers to question 1.4.1 QA. The selection order of the Information Sheets is not taken into account.

Figure 3 – Perceived usefulness and perceived information content of the Information Sheets

usefulness average scoring

information content average scoring
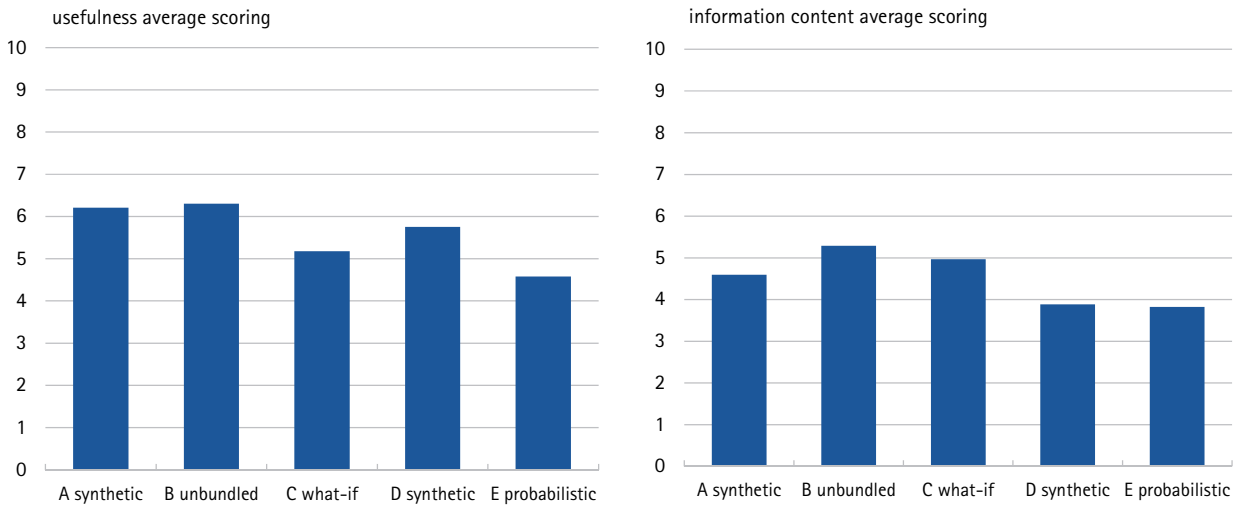
Note: Figures collect answers to the following: 'Please consider the [...] Information Sheets one at a time and assess their [...] information content and usefulness on a 0-10 scale', questions 1.1.1 and 1.2.1, QA. The selection order of the Information Sheets is not taken into account.

Finally, the perceived 'amount' of information content does not significantly differ across Information Sheets referred to the same product, probably because people were not able to assess it.

What is the relationship, if any, among perceived complexity, usefulness and information content of a given Information Sheet?

Perceived complexity and perceived usefulness of financial information are always inversely related: in other words, the higher the complexity of the infor-

mation, the lower the perceived usefulness (Table 14). [26] Complexity is also positively correlated with the perception of a greater amount of information: however, this correlation is statistically significant only for the Information Sheets submitted in the first phase of the consumer testing (i.e. A, B and C). The layouts perceived as more informative are also perceived as more useful: this positive association does not hold for Sheets B and C, though.

Table 6 – Correlation between perceived complexity, usefulness and information content of the Information Sheets A – E

Product	Information Sheet	complexity and usefulness	complexity and information content	information content and usefulness
outstanding structured bond	A (synthetic)	-0.2**	0.2**	0.3**
	B (unbundled)	-0.4**	0.2**	- 0.04
	C (what-if)	-0.4**	0.2**	0.09
newly issued structured bond	D (synthetic)	-0.2**	0.1	0.5**
	E (probabilistic modelling)	-0.4**	0.02	0.4**

Note: ** indicates that the correlation coefficient is significant at 5%. We did not test the correlation between perceived complexity, usefulness and information content of Information Sheets F and G since for these Templates we did not ask respondents to assess complexity, usefulness and information content on a 0-10 range, we asked only which of the two Documents was regarded as the most understandable and which as the most useful. The correlation between comprehensibility and usefulness is significant at 5% level and equal to 0.4 for both Information Sheets F and G.

Is there a relationship among appraisal of Information Sheets and socio-demographic characteristics of respondents?

In order to gain a first, although partial, insight on the relationship among the appraisal of the representation of financial products and the respondents' socio-demographic characteristics, we tested for group differences in the perceived complexity and perceived usefulness, by dividing the sample into mutually exclusive groups along the lines of the attributes of a dichotomous independent variable.[27] In particular, we selected eight variables: gender, age, marital status, employment status, economic capability (as measured by income, property and financial wealth) and area of residence and used them to split the sample into eight couples of sub-samples (respectively, male versus female; under versus over 50, married or cohabitee versus single, self-employed versus employee, high versus low income, high versus low property wealth, high versus low financial wealth, living in the south versus other areas; Table 7 and Table 8).

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26 As for Information Sheets F (the synthetic Template) and G (the unbundled Template), referred to Stocks 1 and 2, we measured perceived complexity and usefulness through a straight comparison between the Sheets by asking participants which of the two was the most understandable and useful. G was regarded to be more useful than F by 60% of the participants, although only 32% of them deemed it to be less complex than F.

27 Test on the means provides an insight on the impact of each socio-demographic characteristic and personal trait one at a time, that is without controlling for all the explicative factors. As consequence, results could be biased. However, the significance of each relation will be checked in the econometric analysis (see Section 7).

Table 7 – Perceived complexity and socio-demographic characteristics and investment habits

	A (synthetic)	B (unbundled)	C (what–if)	D (synthetic)	E (probabilistic modelling)
male vs female					-
under vs over 50	-	-	-		
married or cohabitee vs single				+	
self–employed vs employee	-				-
high vs low income			+		
high vs low property wealth			+	+	
high vs low financial wealth			+	+	
south vs rest of Italy	+	-		+	+
making frequent financial decisions		-		-	
supported by experts in financial decisions				-	+
trusting in financial advisors			-		

Note: Perceived complexity is defined as the average score on the 0-10 Likert range. High income is a dummy variable equal to 1 if income is above the sample median. High real estate is a dummy variable equal to 1 if property wealth is above the sample median. High financial wealth is a dummy variable equal to 1 if financial wealth is above the sample median. The notation +/- indicates the sign of a 5% statistically significant difference (according to a two sample t-test on the means) between the perceived complexity of the two groups selected by dividing the sample along the lines of the attributes of the dichotomous independent variables reported in the Table. As a way of example, with respect to Sheet E, perceived complexity of men and women is significantly different, with men assigning on average lower scores than women. Blanks indicate that the difference in the means is not statistically significant.

Table 8 – Perceived usefulness and socio-demographic characteristics and investment habits

	A (synthetic)	B (unbundled)	C (what–if)	D (synthetic)	E (probabilistic modelling)
male vs female				-	
under vs over 50	-		-	-	-
married or cohabitee vs single					
self–employed vs employee				-	
high vs low income					
high vs low property wealth			+		
high vs low financial wealth	-		-	-	-
south vs rest of Italy					
making frequent financial decisions			+		
supported by experts in financial decisions	-	-			-
trusting in financial advisors			+		

Note: Perceived usefulness is defined as the average score on the 0-10 Likert range. High income is a dummy variable equal to 1 if income is above the sample median. High real estate is a dummy variable equal to 1 if property wealth is above the sample median. High financial wealth is a dummy variable equal to 1 if financial wealth is above the sample median. The notation +/- indicates the sign of a 5% statistically significant difference (according to a two sample t-test on the means) between the perceived usefulness of the two groups selected by dividing the sample along the lines of the attributes of the dichotomous independent variables reported in the Table. As a way of example, with respect to Sheet D, perceived usefulness of men and women is significantly different, with men assigning on average higher scores than women. Blanks indicate that the difference in the means is not statistically significant.

In our sample, gender results to be relevant only when it comes to the assessment of the complexity of Sheet E (on average, men judge it simpler than women do) and usefulness of Sheet D (on average, men judge it more useful than women do). Interviewees under 50 almost always assigned lower scores on the 0-10 Likert range, regardless of the item evaluated. On average, people from the south of Italy perceived the Sheets as more complex than the others do (with the exception of Sheets B and C). Group differences rarely turned out to be significant when groups where defined along income and wealth variables. Finally, as for investment habits, perceived complexity is lower for interviewees used to making frequent decisions, or to being supported by an intermediary and among individuals trusting in financial advisors.[28] This evidence could point to the educational effect indirectly played by intermediaries frequently interacting with their customers.

Is there a relationship among the appraisal of the Information Sheets and some personal traits and financial knowledge of respondents?

As above, we tested for group differences along the level of financial knowledge, as measured through Questionnaire B (Section 2 of Questionnaire B), and some individual personal traits, i.e. risk tolerance as measured by the Grable and Lytton score (Section 3 of Questionnaire B) and impulsivity as measured by the Impulsivity Test score (Section 4 of Questionnaire B).[29]

When group differences are significant, perceived complexity turns out to be lower for individuals showing a higher level of financial knowledge, a higher risk tolerance, a lower impulsiveness and a higher attitude towards behavioural biases (Table 9).[30] The fact that respondents appraising a lower complexity are more frequently financially literate and prone to behavioural biases points to a correlation between knowledge and attitude towards biased behaviours, which is consistent with the descriptive evidence reported in Section 5.2 (and in Appendix VI, Tables a.11 and a.12). This correlation is in line with the insights of the behavioural literature, showing that knowledge and biases are not mutually exclusive, since they refer to two different types of cognitive processes, i.e. reasoning and intuition, respectively (Kahneman, 2002).

Consistently with the evidence reported above, participants showing higher financial knowledge and risk propensity scored perceived usefulness of all the Sheets but A higher than individuals featured by low level of financial knowledge and risk aversion, whilst high impulsivity is a personal trait common in respondents giving a lower utility assessment to the whole set of Information Sheets (Table 10).

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28 We have different evidence only for Information Sheet E.

29 We ruled out any dependence among the eleven variables accounting for personal traits and socio-demographic characteristics through a Pearson's chi-squared test.

30 This does not hold for Information Sheet B, whose complexity tends to be perceived higher by individuals with a higher attitude towards volatility bias.

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Table 9 – Perceived complexity and some personal traits

	A (synthetic)	B (unbundled)	C (what–if)	D (synthetic)	E (probabilistic modelling)
high vs low financial knowledge	-	-		-	-
high vs low risk tolerance	-	-	-	-	-
high vs low impulsiveness	+	+			
behavioural biased vs not biased	-				-
volatility biased vs not biased		+			-
disposition effect vs not	-				

Note: Perceived complexity is defined as the average score on the 0-10 Likert range. Financial knowledge is a dummy variable equal to 1 if the percentage of correct answers to questions 2.1 – 2.8 and 2.11 of QB is above the sample median of correct answers. Risk tolerance is a dummy variable equal to 1 if the Grable and Lytton score is above the sample median. Impulsivity is a dummy variable equal to 1 if the Impulsivity Test score is above the sample median. The notation +/- indicates the sign of a 5% statistically significant difference (according to a two sample t-test on the means) between the perceived complexity of the two groups selected by dividing the sample along the lines of the attributes of the dichotomous independent variables reported in the Table. As a way of example, with respect to Sheet A, complexity perceived by individuals with high financial knowledge is significantly different from complexity perceived by individuals with low financial knowledge, with the formers assigning on average lower scores than the latters. Blanks indicate that the difference in the means is not statistically significant.

Table 10 – Some personal traits and perceived usefulness

	A (synthetic)	B (unbundled)	C (what–if)	D (synthetic)	E (probabilistic modelling)
high vs low financial knowledge		+	+	+	+
high vs low risk tolerance		+	+	+	+
high vs low impulsiveness	-	-	-	-	-
behavioural biased vs not biased		+			
volatility biased vs not biased				-	
disposition effect vs not	-	+		-	

Note: Perceived usefulness is defined as the average score on the 0-10 Likert range. High financial knowledge is a dummy variable equal to 1 if the percentage of correct answers to questions 2.1 – 2.8 and 2.11 of QB is above the sample median of correct answers. High risk tolerance is a dummy variable equal to 1 if the Grable and Lytton score is above the sample median. Impulsivity is a dummy variable equal to 1 if the Impulsivity Test score is above the sample median. The notation +/- indicates the sign of a 5% statistically significant difference (according to a two sample t-test on the means) between the perceived complexity of the two groups selected by dividing the sample along the lines of the attributes of the dichotomous independent variables reported in the Table. As a way of example, with respect to Sheet B, usefulness perceived by individuals with high financial knowledge is significantly different from usefulness perceived by individuals with low financial knowledge, with the formers assigning on average higher scores than the latters. Blanks indicate that the difference in the means is not statistically significant.

Do different Information Sheets induce the perception of a different information content?

To investigate this question we submitted to the participants Sheets A (synthetic) and B (unbundled) standing for the outstanding structured bond, and asked them whether the Sheets were based on the same information set (although differently represented) or not.[31] The same question was made also with respect to Sheets D (synthetic) and E (probabilistic modelling), standing for the newly issued structured

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31 In other words, interviewees were clearly asked to state whether, in their opinion, two different Information Sheets rested on the same informative set (i.e. on the same type of information) and not whether the Information Sheets referred to the same product.

bond. Indeed, across the Sheets referring to the same product we used the same information set, while changing exclusively its presentation.[32]

As shown by the following Table, in our sample lay-outing brings about the perception of a different information set for almost 32% of the respondents in the case of the comparison between A and B and for about 40% of the respondents in the case of the comparison between D and E.

Table 11 – Perception of differences in the information content across Information Sheets referring to the same product and based on the same information[1]
(percentages)

In your opinion Information Sheets A (synthetic) and B (unbundled) rely on ...			In your opinion Information Sheets D (synthetic) and E (probabilistic) rely on ...		
the same information		56.3	the same information		41.7
different information		31.9	different information		39.4
of which:	*B more than A*	*25,9*	*of which:*	*E more than D*	*27,1*
	A more than B	*6.0*		*D more than E*	*12,3*
don't know		11.8	don't know		18.9
	total	*100.0*		*Total*	*100.0*

1 A and B refer to the outstanding structured bond. D and E refer to the newly issued structured bond.

6.2 Risk representation and risk perception

Does risk-return representation affect risk perception?

In order to investigate this research question, we first ranked our products on a 5-point scale (being 1 equal to low risk and 5 to high risk). Ranking was based on the aggregation of different types of risk (market, liquidity and credit risk, measured as reported in the unbundled Template B), each compared with the corresponding risk dimension of a benchmark portfolio properly defined.[33] According to our methodology, the newly issued structured bond and Stock 2 are the riskiest products, followed by Stock 1 and the outstanding structured bond (Table 12).

Table 12 – Product ranking by risk level

Product	risk level	Information Sheet	Template
outstanding structured bond	2	A	Template 1: synthetic
		B	Template 2: unbundled
		C	Template 3: what-if scenario
newly issued structured bond	4	D	Template 1bis: synthetic
		E	Template 4: probabilistic modelling
stock 1	3	F	Template 1: synthetic
stock 2	4	G	Template 2: unbundled

32 Information Sheet C has not been considered since the what-if representation rests on a different informative set.

33 For more details, see Appendix I.

Then, we went through two rounds of comparisons: intra-product and across unbundled and performance scenario Templates comparisons, respectively.

Intra-product comparison

In intra-product comparison, respondents assessed the risk related to the same product represented alternatively through different Information Sheets (i.e. risk was constant across Templates referring to the same product). At this stage, participants did not know neither about the matching nor about the type of products corresponding to the Sheets.[34] In other words, participants were asked to rank according to their perceived risk levels the Information Sheets as if they referred to different products. If representation did not affect risk perception, on average respondents should be able to assess the same level of risk for the same product across the different Templates inspected.

Figure 4 – Representation and perceived risk in the intra-product comparison
Which of these Information Sheets refers to the riskiest financial product?
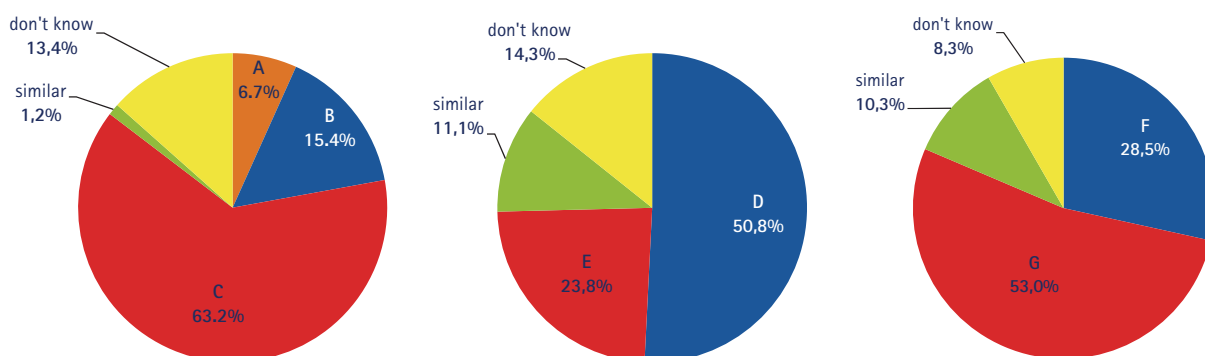
Note: Please refer to questions 1.1.14, 1.2.10 and 1.3.6 QA.

When comparing Information Sheets A (synthetic indicator), B (unbundled document) and C (what-if scenario), only slightly more than 1% of the respondents assign the same risk level. The riskiest product was deemed that represented through Information Sheet C by more than 60% of the respondents, while those represented through B and A were regarded as the riskiest by 15% and almost 7% of the interviewees respectively (Figure 4).

When comparing Information Sheets D and E, the percentage of respondents assessing the same risk level rose up to 11%. Around 51% of the respondents considered document D as referring to the riskiest product, whereas E was deemed the riskiest in 24% of the cases.

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34 In this stage, the type of the product was not disclosed to prevent familiarity effects. Indeed, familiarity could stimulate an emotional reaction of appreciation that could prevail over the 'rational' assessment of risk. As shown by several experimental studies, this could drive the investors' global attitude towards assets on which they have no information but to which they have been 'exposed' in some way. The sign of the risk-return relationship seems to be correctly judged when enough information is provided; in this case, the global attitude towards products is guided by perceived risk and return (rather than the contrary; see, among others, Statman et al., 2008 and Ganzach, 2000).

Overall, this preliminary evidence shows that representation does matter. Only a few respondents (only 1% when comparing Information Sheets A, B and C and 11% when comparing Information Sheets D and E) were able to recognize that Information Sheets referred to equally risky products (or, more precisely, to the same product).

Finally, respondents were submitted also F (Template 1) and G (Template 2), where F refers to Stock 1 and G to Stock 2 and where the first product is less risky than the second. Comprehensibility of Information Sheets F and G results to be negatively associated with risk perception. As for risk ranking, 53% of the participants answered properly, by indicating G as the Information Sheet of the riskiest product (see Appendix VII, Table a.13).

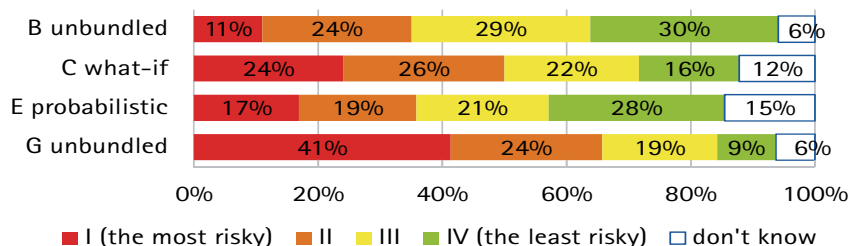*Comparison across unbundled and performance scenario Templates*

The second round of comparison was undertaken using only a sub-set of Templates, that is all Templates but the synthetic ones where the risk level was directly scored. In other words, we employed only the unbundled variant (i.e. the one reporting quantitative measures of different types of risks) and the performance scenario representations (both what-if and probabilistic modelling). In details, respondents were shown Information Sheets B (unbundled), C (what-if), E (probabilistic modelling) and G (unbundled) and were asked to rank them from the most (I) to the least risky (IV).

Recall that, according to our methodology[35], relative ranking classifies as most risky the products represented through Information Sheets E and G (level 4 on an increasing 5 grade scale), whereas assigns a risk level of 2 to Information Sheets B and C.

The comparison across unbundled and performance scenario Templates confirms the impact of representation of financial information on risk perception and gives insights on how this relationship may bias risk assessment (Figure 5 and Figure 6). In more detail, the unbundled Templates (i.e. Sheets B and G) record the highest percentage of correct answers (respectively, 30% and 41%) and the lowest percentage of hesitant individuals (6% in both cases). The performance scenarios (i.e. Sheets C and E) show the lowest percentages of correct answers (respectively, 16% and 17%) and the highest percentages of uncertain respondents (respectively, 12% and 15%). The what-if Template (C) is associated to a higher percentage of people over estimating risk, whereas the probabilistic Template (E) is associated with a higher percentage of people under estimating risk. This evidence is consistent with the experimental findings of previous studies, highlighting that perceived risk is negatively associated with perceived complexity (Wang et al. 2011).

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35 Our methodology takes into account different types of risk (market, liquidity and credit risk) and the comparison among the risks of the single product and those of a benchmark including similar products. For more details, please see Appendix 1.

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Figure 5 – Representation and perceived risk. Comparison across unbundled and performance scenario Templates
Can you rank these products (please, see Information Sheets B, C, E and G) from most to least risky?

Note: Please refer to question 2.0.1, QA.

Figure 6 – Comparison across unbundled and performance scenario Templates and perceived risk level

risk level 2
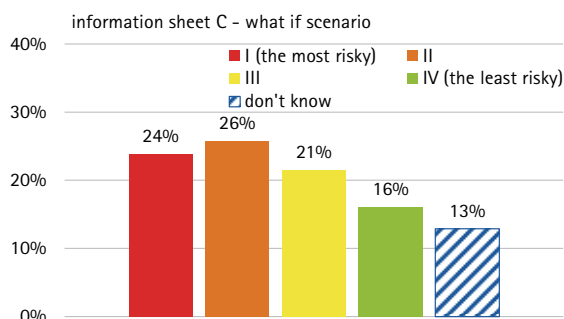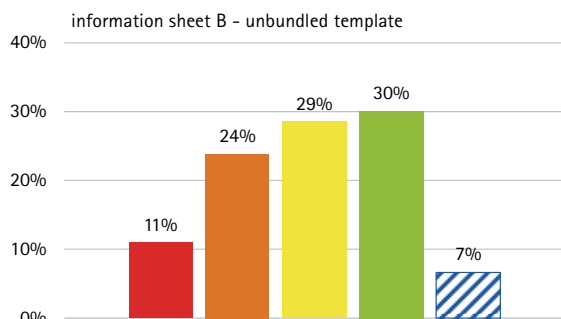
risk level 4
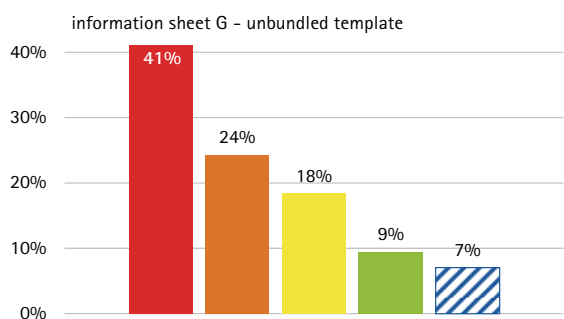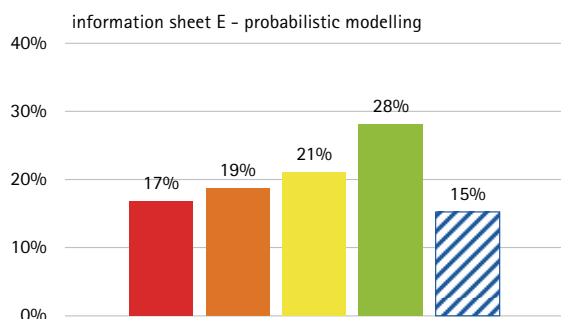
Note: Please refer to question 2.0.1, QA.

For a given risk representation, is risk perception similar across individuals showing similar socio-demographic characteristics and personal traits?

We tested for group differences along some variables accounting for individuals' characteristics with respect to participants' intra-product risk assessment and individuals' incapacity to rank products by risk. As before, we considered eight variables, accounting for socio-demographic characteristics and economic features, and three variables proxing some personal features of the participants, as financial knowledge, risk tolerance and impulsivity and. As for the former feature, we could not

detect any regular pattern.[36] As for the second feature, we found evidence on low-financial-literate individuals and richer individuals (with property above the sample median) being more frequently unable to rank A, B and C. Participants unable to assess the risk of D and E belonged more frequently to the group of people having higher property wealth, whereas under 50 and higher property participants had more frequently difficulties in ranking Sheets F and G (see Appendix VII, Table a.14).

The same analysis was carried out with respect to the comparison across unbundled and performance scenario Templates (Table 13) and provided a few remarkable insights about the relationship between individual profiles and risk perception. In detail, the following Table reports the results of the test for statistical significance of the difference in mean values of the participants' perception of a given Sheet as representing the riskiest product and their socio-demographic features and personal traits. Respondents identifying Sheet B as corresponding to the riskiest instrument exhibited a significantly lower financial wealth and were from the south of Italy. Interviewees classifying C as the riskiest were predominantly married, men, with a higher level of financial knowledge and with a tendency to behavioural biases. Attitude towards biases is also recurrent in respondents assessing Information Sheet G as the most risky. Finally, the perception of low risk associated with Information Sheet E is due to self-employed, with high income and financial wealth, whereas individuals with high risk propensity tend to assign a higher score to E.

Table 13 – High risk perception and socio-demographic characteristic and personal traits

	risk level 2		risk level 4	
	B (unbundled)	C (what-if)	E (prob. modelling)	G (unbundled)
high vs low financial knowledge		+		
high vs low risk tolerance			+	
high vs low impulsiveness				
male vs female		+		
under vs over 50				
married or cohabitee vs single		+		
self-employed vs employee			-	
high vs low income			-	+
high vs low property wealth				
high vs low financial wealth	-		-	
south vs rest of Italy	+			
behavioural biased vs not biased		+		
volatility biased vs not biased				
disposition effect vs not		+		+

Note: High financial knowledge is a dummy variable equal to 1 if the percentage of correct answers to questions 2.1 – 2.8 and 2.11 of QB is above the sample median of correct answers. High risk tolerance is a dummy variable equal to 1 if the Grable and Lytton score is above the sample median. High impulsivity is a dummy variable equal to 1 if the Impulsivity test score is above the sample median. The notation +/- indicates the sign of a 5% statistically significant difference (according to a Pearson's chi-squared test) between the risk ranking of the two groups selected by dividing the sample along the lines of the attributes of the dichotomous independent variables reported in the Table. As a way of example, on average individuals with high financial knowledge classify C as the riskiest product more frequently than individuals with low financial knowledge do. Blanks indicate that the difference in the means is not statistically significant.
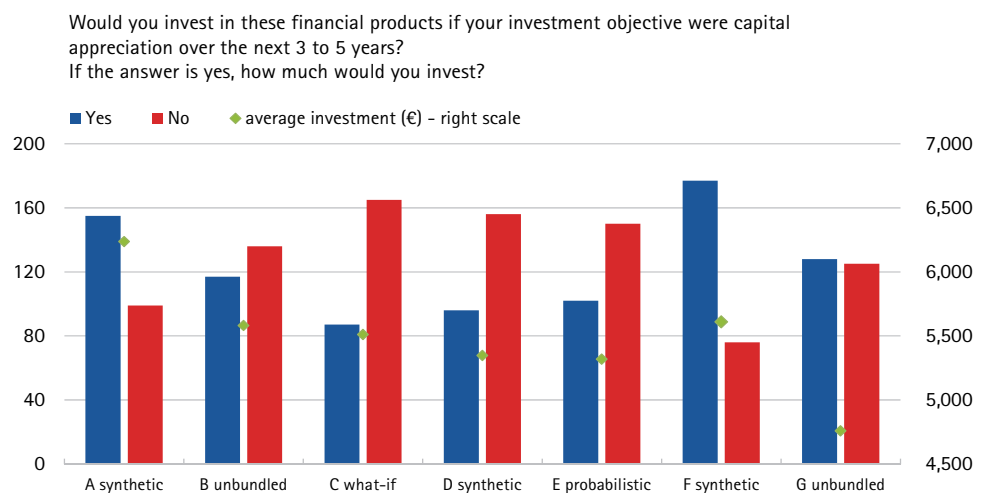
36 For instance, when comparing A, B and C respondents with lower financial knowledge seem to have a lower propensity to judge B as the riskiest and a higher propensity to regard C as the riskiest. When comparing D and E, more literate individuals turn out to evaluate D less risky than respondents with lower financial knowledge do. Data are available on request to the authors.

6.3 Risk representation and investment choices

Does risk-return representation affect investment choices?

After eliciting the appraisal of different presentations of financial information, respondents were asked to state their willingness to invest in each of the product represented through the Information Sheets inspected. Recall that at this stage, we controlled for familiarity effects by keeping concealed the type of products corresponding to the Information Sheets. Moreover, in order to control for individual time horizon, investment objectives, wealth and mental accounting effects, all subjects were given the same hypothetical framing. In other words, they were invited to assume that, after working 5 years, they had 10,000 euros in cash, no property, no financial instrument and no debt and that their investment objective was capital appreciation over the subsequent 3 to 5 years. Then, they were invited to state whether and how much they would invest in the financial product represented through Information Sheets A or B, C, D, etc. (see Figure 7 and Appendix VII, Table a.15).[37]

Figure 7 – Investment decision before the disclosure about products' typology

Would you invest in these financial products if your investment objective were capital appreciation over the next 3 to 5 years?
If the answer is yes, how much would you invest?

Note: Figure refers to the 'pre-disclosure phase' (see questions 1.1.4, 1.1.5, 1.1.7, 1.1.8, 1.1.10, 1.1.11, 1.2.4-1.2.7, 1.3.2 – 1.3.5, QA).

According to our results, perceived complexity and perceived risk (as appraised in the previous stages of the interview) are inversely related with the willingness to invest and the average amount to be invested. This pattern is particularly evident for Sheets A, B and C (where C was judged as the most complex among the three) and Sheets F and G (this latter being regarded as the most complex among the two). Instead, documents D and E do not exhibit significant variation across Information Sheets either in the number of investors willing to invest or in the amount invested (Figure 7, Figure 2 in Section 6.1 and Figure 4 in Section 6.2).

37   As mentioned in Section 4.2, in the last stage of the interview, respondents were disclosed the matching between the Templates and the underlying products and were asked which product between products B (the outstanding structured bond), E (the newly issued structured bond) and G (Stock 2) they would invest in and how much of their hypothetic endowment. Answers were recorded in order to run a follow-up phase and are shown in Appendix VII, Figures a.5 and a.6.

Do specific features of disclosure draw the attention of investors?

When eliciting the intra-product comparison and for each Information Sheet, we asked participants which element of the Template had drawn their attention the most (also 'attention effect', henceforth). In the following, Figure 8 reports the answers of the individuals who declared to be willing to invest in one of the financial instruments corresponding to the inspected Sheets, whereas Figure 9 refers to respondents who chose not to invest.

As for the first sub-sample, answers show a certain variation across the different presentation formats (Figure 8). Risk measures (i.e. the synthetic indicator and the unbundled indicators reported, respectively, in the synthetic and unbundled Templates) drew the attention of respondents mainly with respect to Sheets A, B, F and G. Information on risk was not deemed relevant when assessing the performance scenario Templates (both the what-if scenario and the probabilistic modelling). In particular, with respect to Sheet E, the majority of the answers referred to the information on returns as the most attractive. Finally, layout features (i.e. picture elements, charts, red warning, etc.) result to be more eye-catching in the synthetic Templates.

Looking at the sub-sample of respondents who were not willing to invest, the first remarkable difference with respect to those who would invest is the distribution of individuals declaring that no element drew their attention (Figure 9). While shrinking to almost zero for the synthetic Template (corresponding to Sheets A, D and F), the percentage of respondents who were not attracted by any feature rose for the other Templates, especially for the performance ones (i.e., C and more substantially E). The salience of risk representation declined for Sheets A, B and F and remained substantially unchanged for all the other Sheets but D, which recorded a steady increase.

Figure 8 – 'Attention effect' in respondents willing to invest
For each Information Sheet, please specify the element (quantitative, qualitative, layout) that draws your attention the most.
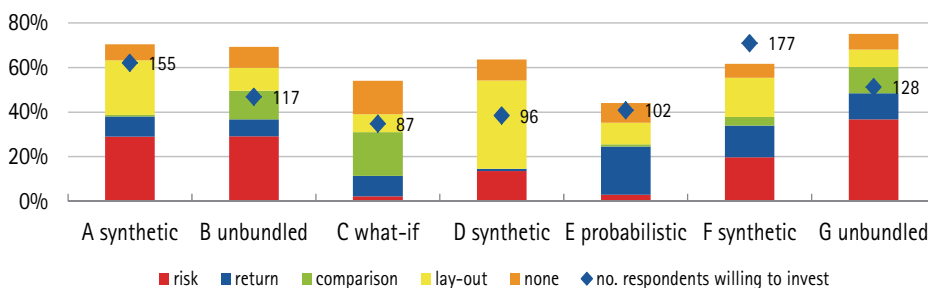
Note: Figures refer to the percentage of respondents who state to have paid attention to the specific characteristic of the Information Sheet and then choose to invest in the product represented through the same Information Sheet (questions 1.1.13, 1.2.9, 1.3.1, QA). Respondents did not answer in 9 cases.

Figure 9 – 'Attention effect' in respondents not willing to invest
For each Information Sheet, please specify the element (quantitative, qualitative, layout) that draws your attention the most.
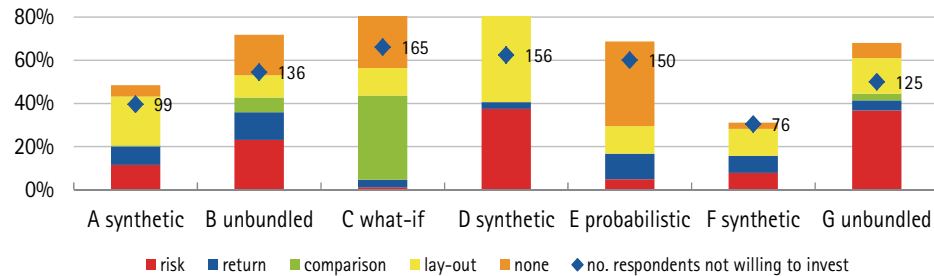
Note: Figures refer to the percentage of respondents who state to have paid attention to the specific characteristic of the Information Sheet and then choose not to invest in the product represented through the same Information Sheet (questions 1.1.13, 1.2.9, 1.3.1, QA). Respondents did not answer in 9 cases.

The negative correlation between the 'attention effect' and the perceived complexity of the Information Sheets is consistent with the hypothesis that salient information (i.e. noticeable, capable to draw attention and to appear important for the decision to be made) may help respondents in dealing with large amounts of information and thus reducing perceived complexity (Table 14).

Table 14 – Correlation between the 'attention effect' and perceived complexity or comprehensibility

Product	Information Sheet	complexity and 'attention effect'	comprehensibility and 'attention effect'
outstanding structured bond	A (synthetic)	0.1	n.a.
	B (unbundled)	–0.2**	n.a.
	C (what–if)	–0.2**	n.a.
newly issued structured bond	D (synthetic)	–0.1	n.a.
	E (probabilistic modelling)	–0.3**	n.a.
stock 1	F (synthetic)	n.a.	0.04
stock 2	G (unbundled)	n.a.	0.2**

Note: ** indicates that the correlation coefficient is significant at 5%. We did not test the correlation between perceived complexity, usefulness and information content of Information Sheets F and G since for these Templates we did not ask respondents to assess complexity, usefulness and information content on a 0–10 range, we asked only which of the two Documents was regarded as the most understandable (see question 1.4.1, QA).

After having asked participants to choose the product they would be willing to buy, we evaluated the 'attention effect' also with respect to specific features of Sheets A, B, C and E (explicitly recalled in the questionnaire). In particular, participants were asked to rate on a 0–10 Likert range the impact of these features on their willingness to invest (or not to invest). Respondents were invited to abstain from rating the information they did not find clear. For each item and each Sheet, Table 15 reports both the percentage of individuals who did not understand and the average

score assigned by the individuals who deemed the item relevant for their decision. These figures are shown for both the sub-sample of people who declared their willingness to buy the product and the sub-sample of people who chose not to invest at all.

While average scores (ranging from 5 to 7 for almost all the Information Sheets) are substantially similar across the two sub-samples of subjects, the percentage of individuals who were not able to understand any of the recalled elements of the Templates is remarkably higher among respondents who decided to not invest (especially for Sheets B, C and E). This evidence confirms that perceived complexity may be a significant driver of the choice of abstaining from investing.

Table 15 – Understanding and relevance to investment decisions of specific pieces of information by Information Sheet
Please consider all the details of Information Sheet and assess their impact on your investment choices on a 0 – 10 scale (please, disregard any information you did not understand):

Item	investing		not investing	
	average score	information was not understood (% of subjects)	average score	information was not understood (% of subjects)
Information Sheet A (Template 1)				
type of information (historical data)	5	12%	5	17%
comparison with the benchmark	5	9%	6	10%
synthetic risk indicator	7	5%	6	9%
warning on capital guarantee	7	6%	5	14%
past returns (historical yield)	6	7%	8	6%
Information Sheet B (Template 2)				
comparison with the benchmark	6	9%	7	27%
market risk indicator (volatility)	6	7%	5	31%
market risk indicator (VaR)	6	9%	5	35%
liquidity risk indicator (turn over ratio)	6	6%	6	32%
credit risk indicator (default frequency)	7	4%	6	29%
credit risk indicator (rating)	6	9%	6	29%
warning on capital guarantee	5	6%	7	25%
Information Sheet C (Template 3)				
type of information (projected performance)	6	7%	6	32%
performances scenario	6	9%	6	33%
past performance of the underlying parameters	6	11%	6	32%
Information Sheet E (Template 4)				
type of information (projected performance)	6	2%	6	25%
internal rate of return	7	3%	6	31%

Note: Please refer to questions 1.1.6, 1.1.9, 1.1.12 and 1.2.8, QA. Respondents did not answer in 9 cases.

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7 Disclosure appraisal, risk perception and investment choices: a multivariate analysis

7.1 The model specification

The bivariate probit

In order to investigate the interaction between financial information lay-outing and risk perception, we estimated a recursive simultaneous bivariate probit model estimating the determinants of risk perception and complexity perception as appraised by the respondents in the intra-product comparison.

In more detail, for each Information Sheet submitted to the interviewees (but A and B[38]), we specified a *risk perception model* as conditioned on an *endogenous variable*. The endogenous variable was alternatively specified as the *perceived complexity*, the *perceived usefulness* and the *perceived information content* referred to the Information Sheet. In the following, we will comment the estimation results of the bivariate probit having perceived complexity as endogenous variable, given that this latter resulted to be the only one significantly affecting risk perception.

We defined *Risk Perception* (RP) as a binary variable equal to one if, following the intra-product comparison, a given Information Sheet was thought as referring to the riskiest product (questions 1.1.14 and 1.2.10, QA). *Perceived Complexity* (PC) was defined as a binary variable equal to one if it recorded a score greater than 7 on the 10-point Likert range (questions 1.1.1 and 1.2.1, QA). For Sheets F and G, PC is replaced by a dichotomous variable, equal to 1 when individuals appraised the Sheet as comprehensible (questions 1.4.1 and 1.4.2, QA).

Therefore, the bivariate probit estimating the perceived risk (RP) conditioned on perceived complexity is the following:

$$RP_{i,k} = \mathbf{1}(\alpha_{1i} + \beta_i PC_{i,k} + X'_{1k}\gamma_{1i} + \varepsilon_{1i,k} > 0)$$

$$PC_{i,k} = \mathbf{1}(\alpha_{2i} + X'_{2k}\gamma_{2i} + \varepsilon_{2i,k} > 0)$$

$$\begin{pmatrix} \varepsilon_{1i,k} \\ \varepsilon_{2i,k} \end{pmatrix} | X_{1k}, X_{2k} \sim N\left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_i \\ \rho_i & 1 \end{pmatrix}\right]$$

where $\mathbf{1}(.)$ is the indicator function taking value 1 if the statement in the brackets is true; *i* stands for Sheets C, D, E, F and G; *k* indicates the interviewee; X_1 is the matrix of independent variable observations in the perceived risk equation and X_2 the matrix of the independent variable observations in the perceived complexity equation.

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38 We did not estimate the bivariate probit for A and B because the percentage of respondents perceiving these Sheets as representing risky products was too low to produce reliable estimates.

In particular, the perceived risk equation and the perceived complexity equation include (for details on the variables' definition see Appendix VIII):

- variables proxing some personal traits (such as volatility aversion, loss tolerance, risk tolerance, propensity towards a disposition effect) and individual characteristics (optimism, impulsivity);

- a proxy of financial knowledge, defined as the knowledge of some basic financial notions (market risk, liquidity risk, credit risk and internal rate of return) investigated through the interview.[39] We also included the variable *gap*, accounting for the mismatch between respondents' self-assessed knowledge and their actual knowledge. This variable might also be gender sensitive (Lucarelli and Brighetti, 2015);

- investment habits (making frequently investment decisions, being solicited to invest, consulting an expert or delegating financial decisions to an expert, trust in advisors);

- socio-demographic characteristics (gender, age, marital status, employment status, living in the south);[40]

- financial capability (financial and property wealth, income, expectations on future income and adverse events in the last 12 months).

Moreover, the perceived complexity equation includes also a variable accounting for the order by which a given Information Sheet was selected, to control for a possible 'learning effect' versus a possible 'comparison effect'.[41] If individuals' awareness grows Sheet after Sheet because of a learning process, perceived complexity should be lower for the Templates coming last. Vice versa, we could assume that no learning effect can take place because of the sensible differences in the representation modes across Templates. Furthermore, since the synthetic Templates are regarded as the simplest modes by the vast majority of respondents (Figure 2), we could expect that perceived complexity of Information Sheets B, C, E and G rises when they are selected as last because of what we call a 'comparison effect'.[42]

Finally, we estimated also an alternative specification of the perceived risk equation, including the 'attention effect' variable as defined in Section 6, in order to test whether risk perception is affected by the subjects' appraisal of at least one element (either a specific piece of information, layout, etc.) of the inspected Templates.

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39 Depending on the model specification we used alternatively either the percentage of correct answers to the questions about basic notions, or the dummy identifying 'high financial literate' individuals (see Appendix VIII for details on variables definition).

40 According to some studies, risk perception and risk taking may differ greatly by gender and financial literacy level. Women generally are more prudent when making investment decisions (Eckel and Grosmann 2002; Merrill Lynch, 1996). In married couples, however, gender differences seem to influence and balance each other according to dynamics depending on the distribution of financial wealth within the family, the professions and the financial literacy of individuals (Gilliam et al., 2010).

41 The variable ranges from 1 to 3 for Sheets A, B and C, and either 1 or 2 for Sheets D and E.

42 As for Information Sheet C, this hypothesis is grounded on the evidence reported in Table 5.

The multinomial logit

In order to check for the robustness of the bivariate probit results, we estimated also a multinomial logit. This model was specified by taking into account that the answers to the intra-product risk ranking questions (i.e., questions 1.1.14, 1.2.2 and 1.3.6 QA) basically correspond to three alternative options: the first identifying a given Sheet as the riskiest; the second being unable to establish a risk ranking; the last one classifying Information Sheets as equally risky. The probability of each outcome was estimated for the three groups of Information Sheets (i.e. A–B–C, D–E, F–G), according to the following specification:

$$Pr[risk_k = j] = \frac{\exp(\alpha_{1j} + \sum_{i=1}^{n} PC_{i,k}\,\beta_{ij} + X'_{1,k}\gamma_{1j} + \eta_{j,k}\delta)}{1 + \sum_{j=1}^{m} \exp(\alpha_{1j} + \sum_{i=1}^{n} PC_i\,\beta_{ij} + X'_{1,k}\gamma_{1j} + \eta_{j,k}\delta_j)}$$

$$PC_{i,k} = \mathbf{1}(\alpha_{2i} + X'_{2k}\gamma_{2i} + \varepsilon_{i,k} > 0)$$

$$\eta_{j,k} \sim N(0,1)$$

$$\varepsilon_{i,k} \sim N(0,\sigma)$$

where j corresponds to the possible outcomes (no risk attribution, one Template is the most risky one, equal risk among Templates); *i* stands for the Information Sheet; *n* is the number of Templates in the intra-product comparison and *m* is the number of possible outcomes. Finally, the explicative variables (matrixes X_1 and X_2) are the same used in the bivariate probit.[43]

In the following, we will discuss the estimation results of both bivariate probit and multinomial logit, in order to point out the main relations among risk and complexity perceptions and their determinants as estimated with respect to one or more Sheets (for details please refer to Appendix VIII).

7.2 Estimation results

The estimation outcomes highlight two main results. First, as expected, the main driver of the perceived risk seems to be perceived complexity, as the latter always contributes to raise perceived risk (see Appendix VIII, Table a.16).

Second, both perceived complexity and perceived risk are affected by a number of variables, whose impact and significance change across Information Sheets. This heterogeneity is consistent with the hypothesis that risk perception is context-dependent and is mainly determined by the framing effect, i.e. by the way financial information is disclosed. Indeed, framing makes unstable the impact of per-

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43 When estimating perceived risk, as in the bivariate probit we included perceived complexity of Information Sheets among the regressors. In order to solve the endogeneity issue, we estimated simultaneously the coefficients of the multinomial logit and of the complexity model equation.

sonal traits, financial knowledge and investment habits. For instance, financial knowledge may affect differently individual appraisal of complexity and risk depending on whether the contents represented through a given Template are familiar to the respondent.

In more details, perceived complexity rises when the Sheets C and E (i.e. the what-if and probabilistic modelling representations) are shown after the other Templates referring to the same product (i.e., respectively, A and B, and D), thus pointing out that the 'comparison effect' goes beyond any possible 'learning effect' (see Appendix VIII, Table a.17). This evidence can be easily explained by the sensible differences across Templates (synthetic and unbundled, on one hand, and performance scenarios, on the other), which make comparison difficult and rule out any learning process.

The salience of a particular feature of the Templates, as measured by what we called 'attention effect' (Figure 8 and Figure 9), may help respondents in ranking large amounts of information by importance and thus guiding the appraisal of complexity and risk. To test this hypothesis, we run an alternative specification of the bivariate probit, including a dichotomous variable equal to one when individuals' attention was drawn by at least one element of the inspected Sheets. Such a variable turns out to be negatively correlated with perceived complexity of all the Sheets but F (Model 5 in Tables a.16 and a.17, Appendix VIII).[44] When turning to risk perception, the 'attention effect' has a positive sign in the appraisal of Sheets C and E.

Personal traits seem to have an impact on complexity and risk perception, although its significance and sign exhibit a certain variability across Information Sheet. For instance, risk tolerance is negatively associated with perceived complexity in Sheets C, D and E, whereas loss tolerance raises perceived complexity of Sheet D. This heterogeneity is not surprising, given that we are modelling the relationship between human behaviour and subjective characteristics and given the great role played by the frame by which financial information is presented.

The knowledge of some basic financial concepts, proxing the individuals' financial knowledge, is positively correlated with perceived complexity in Information Sheets C, D and F (see specifications 1 to 4 in Table a.17, Appendix VIII). Financial knowledge seems to play a role also in reducing respondents' indecision in risk ranking as estimated through the multinomial logit specification (see Appendix VIII, Table a.18). In particular, in the intra-product comparison involving Sheets A, B and C, the higher the knowledge the lower the probability of hesitating in assessing the risk level of a given Sheet. However, this association does not lead towards the correct ranking (i.e., assessing equal risk across A, B and C).

The variable gap shows a significant correlation with perceived complexity of Sheet C and E, although with opposite signs: positive and negative, respectively.

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44 We also tested whether the perception of equality of information content across Sheets affects the appraisal of complexity and risk of a given Template. Its coefficient turned out to be significant and negative in the appraisal of complexity of Sheet E, probably signaling a better understanding of the financial information and consequently a higher ability of comparison among different representations.

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The evidence for C is quite counterintuitive and needs further investigation, since by definition, knowledge is ascertained mainly with respect to financial concepts which are not present in this Template. In the intra-product comparison, the multinomial logit model shows that as the mismatch between self-assessed and actual knowledge rises, the probability to be hesitant declines (at least for Sheets A, B and C, and F and G).

Finally, investment habits do exhibit a correlation with both perceived risk and perceived complexity, although heterogeneously across Sheets. The same heterogeneity stems from the estimation results of the multinomial logit, where only for Sheets D and E respondents that delegate their financial decision to an expert are more likely to correctly recognize that the two Templates signal the same level of risk. Overall, this evidence seems to support again the idea that representation is the main driver of complexity and risk perceptions, thus preventing from finding a regularity in the relationship among respondents' traits and habits and their appraisal of financial disclosure.

7.3 Risk representation, risk ranking and investment choices

As mentioned above, after eliciting the appraisal of different Information Sheets, respondents were asked if they would invest in each of the products corresponding to Sheets from A to G. Recall that in this phase, the type of products was not disclosed in order to control for familiarity effects due to product knowledge or usage.

Taking into account the evidence of the descriptive analysis reported above (see Section 6), we included the Sheet perceived complexity among the explicative variables of the participants' stated willingness to invest. Using perceived complexity as a regressor may raise an endogeneity issue, which we solved by running a bivariate probit (see Section 7.1) :

$$IC_{i,k} = \mathbf{1}(\alpha_{1i} + \beta_i PC_{i,k} + X'_{1k}\gamma_{1i} + \varepsilon_{1i,k} > 0)$$

$$PC_{i,k} = \mathbf{1}(\alpha_{2i} + X'_{2k}\gamma_{2i} + \varepsilon_{2i,k} > 0)$$

$$\begin{pmatrix} \varepsilon_{1i,k} \\ \varepsilon_{2i,k} \end{pmatrix} | X_{1k}, X_{2k} \Big) \sim N\left[\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \begin{pmatrix} 1 & \rho_i \\ \rho_i & 1 \end{pmatrix} \right]$$

where $IC_{i,k}$ is equal to 1 if the interviewee k decides to invest in the Information Sheet i.

Moreover, we analyse the influence of the laying-out on financial decisions also by including in the explicative variable set the 'attention effect' factor already illustrated in the risk-perception model.

The impact of financial knowledge on investment choices has been estimated by simultaneously considering three alternative proxies, that are the frequency of

financial readings, education and the number of correct answers to financial education questions in the survey. Moreover, we build a synthetic indicator by applying principal component analysis (for details about the correlation among financial literacy proxies and perceived complexity and risk, see Appendix VIII, Tables a.19 and a.20).

The other explicative factors are almost the same as the ones entering the risk perception model, i.e. personal traits, individual and socio-demographic characteristics and investment habits.

Estimation outcomes highlight the following findings. When respondents can rely only on the information reported in the Templates and do not know the type of product, they are mainly driven by perceived complexity. Indeed the latter is negatively correlated with the willingness to invest in all the Sheets (see Appendix VIII, Table a.21). Respondents who managed to focus on at least one of the specific elements of the Templates (so called 'attention effect') show a positive attitude towards investments in Sheets B, C and G.

Interviewees with a higher level of education and with higher financial knowledge show to be more cautious in their investment choices (Information Sheets A,C,D,E). The frequency of reading, which is, instead, positively correlated with the frequency of financial decision, has a positive impact on the willingness to invest in F and G.

The impact of personal traits and investment habits on respondents' decisions is confirmed to be heterogeneous and not always univocal across Information Sheets. For instance, risk tolerance is positively associated with a higher attitude towards investment in Information Sheets C, D and F. The gap between self-assessed and objective knowledge turns out to be negatively correlated with propensity towards investment in Sheet E.

As for financial situation, financial wealth has a negative impact on the willingness to invest in Information Sheets C, F and G, whilst positive expectations on future income are associated with a higher propensity to invest in Sheets A, E and G. Lastly, investment habits have a significant positive influence on financial decision in Templates A and B.

# 8 Appraisal and understanding of cost representation

How are different cost representations appraised in terms of complexity, usefulness and information content?

The last Section of Questionnaire A tests the usefulness and the perceived understanding of different presentations of the investment charges. Three alternative representations were provided within the Information Sheet of product E: the first (E1) shows the effect of costs on the internal rate of return, the second (E2) shows the effect of costs on principal and interest and the third (E3) relies on the disclosure

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of product fair value (bond component and derivative component) and costs (see Appendix II).[45]

Respondents were asked to assess complexity, usefulness and information content of the three document on a 0-10 range.

Figure 10 – Appraisal of cost disclosure
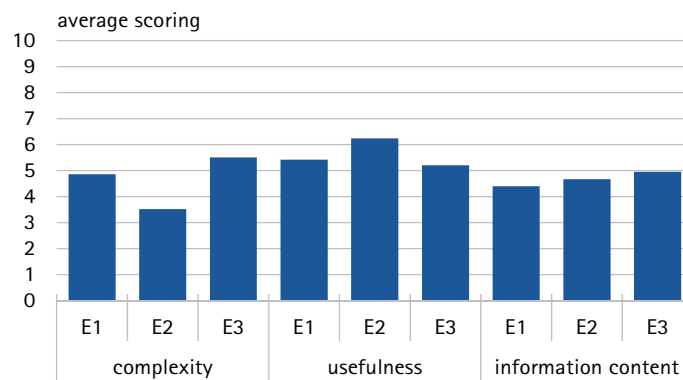
Note: Figure collects answers to the following: 'Please consider the [...] Information Sheets one at a time and assess their complexity, information content and usefulness on a 0-10 scale', question 3.0.1, QA.

Information Sheet E2 is considered to be the easiest and the most useful among the three representations submitted: this evidence would support the idea that the information on the effects of costs is more salient when it refers to the monetary amount gained at maturity. Information Sheet E3 is judged to be the most complex, whereas Information Sheet E1 is perceived as containing too little information (Figure 10).

9 Conclusions

Consistently with a well-known finding of the behavioural studies, the present paper shows that risk preferences and financial decisions are sensitive to the way financial information is disclosed. Moreover, personal traits, financial knowledge and investment habits of individuals may strengthen framing effects further, leading to a biased risk perception and investment decisions. This evidence, collected for a sample of individuals with high education and used to making financial decisions, is likely to hold also for less experienced consumers. It claims for a careful consideration on how financial disclosure and investor education programmes might be designed to strengthen investor protection.

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45 Information Sheets E1 and E2 reported the effect of costs for all the scenarios (worst, average and best) described in the risk-return section.

As for financial disclosure, the analysis highlights that simplification may not be sufficient to ensure correct risk perception and unbiased investment choices. Moreover, the interaction among investors' heterogeneity, behavioural biases and risk perception questions the existence of an 'optimal' disclosure according to a 'one-size-fits-all' approach. Providing more than one representation of the same characteristics of a financial product may be a good solution, as suggested by some scholars (Diacon and Hasseldine, 2005) and consistently with the approach followed by the European legislator in the KIID regulation for the UCITS.

Evidence on investors' appraisal of financial information and on the relationship between financial disclosure and risk perception provides useful insights also on how financial knowledge could be strengthened in order to improve the decision making process. First, educational programmes should be focused also on the documents envisaged by the regulators to empower investors. Second, provided that (as shown also by our results) financial knowledge does not necessarily free from inclination towards behavioural biases, financial education initiatives should be attuned also as debiasing programmes.

Finally, given the relation between investment habits and appraisal of financial information and risk, financial experts and advisors may actually make the difference, by playing an educational role. This consideration is in line with Kahneman and Riepe (1998) according to which '*financial advising is a prescriptive activity whose main objective should be to guide investors to make decisions that best serve their interests*', while advisors should '*be guided by an accurate picture of the cognitive and emotional weakness of investors that relate to making investment decisions*'.

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Appendix I

The selection of financial products and the representation of their characteristics

This methodological note illustrates how the financial products and their benchmark portfolios were selected, how the unbundled and the synthetic risk indicators as well as performance indicators were computed, how the 'what-if' and the probabilistic modelling were implemented and the cost-representation schemes.

1 Selection of financial products and benchmark portfolios

1.1 Bonds

The outstanding bond is listed on the Italian bond market managed by Borsa Italiana (DomesticMot) and is a retail security (i.e., its lot size is equal to 1,000 euros).

In order to evaluate the performance and the risk attributes of the outstanding bond, we created a benchmark portfolio including financial instruments listed on DomesticMot as similar as possible to the selected bond with respect to:

- coupon structure
- issue date
- time to maturity (approximately equal to 3-4 years)
- issuer sector
- lot size (1,000 euro).

1.2 Stocks

The stocks were selected using the matching sample technique (Davies and Kim, 2008; O'Hara and Yee, 2011), in order to find products that were as similar as possible to the selected stocks with respect to price level and market value.

The performance and the risk indicators of each stocks are compared with the risk-return attributes of an equally weighted benchmark portfolio, including the main firms belonging to the same sector and listed on the equity market operated by Borsa Italiana (Mercato Telematico Azionario – MTA).

2 Risk and return indicators

As performance indicator we use the monthly nominal average stock return.

2.1 Unbundled risk indicators

The market risk is measured by the annualized daily implied volatility and the daily Value at Risk (VaR) at the 99% level.

In the case of the structured bonds, VaR is estimated using the bootstrap method, which allows us to increase the number of monthly return observations, through the application of a repetitive sample procedure and to overcome the technical problems associated with the low frequency of negotiations.[1]

As for stocks, the VaR is estimated as the 1% percentile of the monthly return distribution, calculated by applying a kernel density.

The liquidity risk indicator is the turn-over ratio, i.e., the ratio of the exchange daily volume to the market value.

Last, we measured credit risk using the daily average of the 1-year-issuer's expected default probability and the Moody's rating equivalent.

2.2 Synthetic risk indicator

The synthetic risk indicator of the outstanding bond and stocks is based on the comparison of the product to the relative benchmark portfolio. In more details, it aggregates the deviations of each risk indicator (market, credit and liquidity) of the product from the benchmark's equivalent risk indicator and weighs both the number of negative deviations (i.e., the product is riskier than its benchmark) and the lack of capital guarantee. Therefore, the synthetic risk indicator of the generic financial instrument i results from the following:

$$
\begin{aligned}
Risk_i = (market\ risk_i &- market\ risk_{benchmark}) \\
&+ (liquidity\ risk_i - liquidity\ risk_{benchmark}) \\
&+ (credit\ risk_i - credit\ risk_{benchmark}) + n_i + guarantees_i
\end{aligned}
$$

where n_i is the number of negative deviations and $guarantees_i$ is a penalization score that reflects the lack of capital guarantee.

Since historical information is not available for the newly issued structured bond in order to price the product, we had to model the stochastic process of the underlying asset. We then computed the risk indicator by taking into account the following items:

- model/calibration risk,

- opportunity cost,

- guarantees on capital,

- guarantees on a minimum internal rate of return.

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1   See Efron B (1979), Bootstrap methods: another look at the jackknife, Ann. Statist. Vol. 7, n°1, pp.1–26.

The above items were given a score ranging from 0 to 1.

Model/calibration risk. When using a model to price a complex financial product, different hypotheses about the underlying stochastic process as well as differences in calibration may yield different results. The greater the dispersion of the results, the greater the model/calibration risk. In the paper we repeated Monte Carlo simulations by making twelve different hypotheses about the underlying stochastic process of the selected newly issued bond (see Table a.1):

Table a.1 – Hypotheses about the underlying stochastic process of the selected newly issued bond

hypothesis	
1	Geometric Brownian Motion. Calibration of the model: averagesof stock index return and implied volatility estimated on time series from April 2009 to April 2013;
2	Geometric Brownian Motion. Calibration of the model: averages ofstock index return and implied volatility estimated on time series from April 2012 to April 2013;
3	Geometric Brownian Motion. Calibration of the model: averages of stock indexreturn and implied volatility estimated on time series from April 2010 to April 2013;
4	Geometric Brownian Motion. Calibration of the model: averages of stock index return and historical standard deviation estimated on time series from April 2009 to April 2013;
5	Geometric Brownian Motion. Calibration of the model: averages of stock index return and historical standard deviation estimated on time series from April 2012 to April 2013;
6	Geometric Brownian Motion. Calibration of the model: averages of stock index return and historical standard deviation on time series from April 2010 to April 2013;
7	Constant Elasticity of Variance (CEV). Calibration of the model: averagesof stock index return and implied volatility estimated on time series from April 2009 to April 2013;
8	Constant Elasticity of Variance (CEV). Calibration of the model: averages ofstock index return and implied volatility estimated on time series from April 2012 to April 2013;
9	Constant Elasticity of Variance (CEV). Calibration of the model: averages of stock indexreturn and implied volatility estimated on time series from April 2010 to April 2013;
10	Constant Elasticity of Variance (CEV). Calibration of the model: averages of stock index return and historical standard deviation estimated on time series from April 2009 to April 2013;
11	Constant Elasticity of Variance (CEV). Calibration of the model: averages of stock index return and historical standard deviation estimated on time series from April 2012 to April 2013;
12	Constant Elasticity of Variance (CEV). Calibration of the model: averages of stock index return and historical standard deviation on time series from April 2010 to April 2013;

The Geometric Brownian motion is characterized by the following mathematical formalization:

$$dX_t = \mu X_t + \sigma X_t dW_t$$

while the CEV model is

$$dX_t = \mu X_t + \sigma \sqrt{X_t} dW_t$$

where μ and σ are the two parameters to be calibrated.

Monte Carlo simulations have been performed without applying risk-neutral probabilities, given that risk-neutrality hypothesis is acceptable for pricing, but not to forecast future values of an asset (Giordano and Siciliano, 2015).

The results of the Monte Carlo simulations are reported in the following table.

Table a.2 – Simulated distribution of the internal rate of return

hypothesis	10th percentile	median	90th percentile
1	0%	2%	5%
2	1%	4%	5%
3	0%	0%	2%
4	0%	3%	5%
5	4%	5%	5%
6	0%	1%	5%
7	4%	5%	5%
8	4%	5%	5%
9	0%	0%	0%
10	5%	5%	5%
11	5%	5%	5%
12	0%	0%	2%

Given that the variability in the percentiles of the distribution of the internal rate of return due to the model and the calibration hypotheses is significant, the model/calibration risk of the selected newly issued structured bond was scored 1.

In order to evaluate the opportunity cost of the selected bond, we checked whether there were alternative investment options, with the same time-to-maturity, lower credit risk, and higher returns. This option is represented by a 4-year Italian government bond, that guarantees an annual net return approximately equal to 1.5% (which is higher than the minimum estimated return corresponding to the 5th percentile, i.e. 0%) and with a S&P rating equal to BBB+ (while the selected bond issuer's S&P rating is BBB). As a consequence, the opportunity cost of our structured bond was scored equal to 1.

3 Performance scenario analysis

3.1 What–if analysis

The selected structured bond provides six fixed coupons, guarantees the recouping of the invested capital at maturity and a variable interest rate. At maturity , the payment of the variable rate depends on a basket of stock prices (Enel, Rwe Ag, Total Sa), given that it is paid only if the following conditions are met:

$$max\{((r_1, r_2, r_3) - 1), 0\} > 0$$

where:

$$r_1 = \frac{P_{maturity}^{Enel}}{4,6 \; euro}$$

$$r_1 = \frac{P_{maturity}^{RWE\ Ag}}{46,5\ euro}$$

$$r_3 = \frac{P_{maturity}^{Total\ SA}}{41,6\ euro}.$$

where the denominators of the three ratios (4,6 euro 46,5 euro e 41,6 euro) are the opening prices observed on April 18, 2011. The 'what-if' analysis requires the specification of a set of possible scenarios (a best case, a most likely case, and a worse case), which in turn depend on the trends for a set of variables. In our case the set of variables are:

- the expected stock price trends (that affect the payment of the variable rate),
- the inflation rate (applied to compute the actual values of future payoff).

In particular, Information sheet C contains a table of performance scenarios that reports the internal rates of returns corresponding to the following market conditions:

- at maturity, the inflation rate increases and the price of at least one of the three securities does not exceed the price on April 18, 2011: there is no payment for the variable rate and inflation has a negative impact on the internal rate of return;
- at maturity, the inflation rate remains stable and the price of at least one of the three securities does not exceed the price on April 18, 2011: the inflation rate does not affect the internal rate of return, but there is no payment for the variable rate;
- at maturity, the inflation rate remains stable and the prices of the three securities exceed the price on April 18, 2011: there is a payment for the variable rate.

3.2 Probabilistic modelling of expected returns

The newly structured bond provides only a variable coupon, which depends on Eurostoxx 50 performance; at maturity it returns the initially invested capital. As a consequence, the internal rate of return is a random variable whose distribution at maturity can be predicted on the basis of specific assumptions on the underlying stock index stochastic process.

In particular, the probabilistic modelling reported in the paper consists of :

i. The worst case scenario, to be displayed first, corresponding to the 10th percentile of expected rates of return, indicating that an estimated 10% probability envisages that the rate of return is likely to be less than that stated;

ii. The average case scenario indicating that an estimated 50% probability envisages that the rate of return is likely to be less than that stated;

iii. The best case scenario(corresponding to the 90th percentile of the expected rates of return), indicating that an estimated 90% probability envisages that the rate of return is likely to be less than that stated.

In carrying out the required simulations in order to comply with the prerequisites of the preceding paragraphs, the Monte Carlo method is used without applying risk-neutral probabilities, given that risk–neutrality hypothesis is acceptable for pricing, but not to forecast future values of an asset (Giordano and Siciliano, 2015).

4 Cost representation scheme

Costs are disclosed according to three presentation options: the first shows the effect of costs on the internal rate of return, the second shows the effect of costs on principal and interest and the third discloses the unbundling of the fair value of the product (i.e., the bond component and the derivative component) and the costs.

The first and the second cost representations reflect the Netherlands Authority for the Financial Markets (AFM) indications about comparative cost amount (AMF Position Paper – Comparative Cost Amount). In particular, the first representation shows how the costs that clients pay when investing in a particular product have an impact on the net internal rate of return. The second representation points out how those costs affect the amount that clients might get, gross and net of costs, provided that the investment could grow consistently with the internal rates of return computed according to the scenario analysis.

The third cost representation scheme is based on Banca d'Italia indications (consultation document on article 129 of the TUB): the measurement of costs stems from the unbundling of the price into its different components (fixed and derivatives components, commissions).

In particular, the criteria applied to evaluate the derivative component are the following:

- actualization of the cash flows by using the interest rate swap curve (ICAP rates),

- risk-free Monte Carlo simulation by assuming that the underlying follows a Geometric Brownian Motion, calibration of the volatility with the implied stock index volatility.

In the unbundling process the credit risk has been accounted for by weighting the average of the cash flows expected value by the 1-year expected default probabilities on a 4-year time horizon.

The Information Sheets

Information sheet A

A

The risk and the return of this Product are calculated on historical data and are subject to statistical error. Historical data may not be a reliable indication of future performance.

The risk and the return of this Product are compared with the risk and return of a benchmark (including similar products).

RISK

The risk of this Product is represented by a single indicator ranging from 1 (low risk) to 5 (high risk).

The risk category displayed below takes into account different types of risk:

➤ market risk (volatility and Value At Risk)
➤ liquidity risk (turn-over ratio)
➤ credit risk (expected default frequency and equivalent rating).

The risk category reflects the comparison of the risks of the Product to those of a benchmark (including similar products).

Low risk | 1 | ② | 3 | 4 | 5 | High risk

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

RETURN

Historical nominal yield

[bar chart with categories "Stock" and "stocks in the same sector", axis 0% 1% 2% 3% 4% 5% 6% 7%]

The monthly average of the annualised yield is calculated on prices from September 2012 to December 2013. It is before taxes and doesn't take into account inflation.

Information sheet B

B

The risk and the return of this Product are calculated on historical data and are subject to statistical error. Historical data may not be a reliable indication of future performance.

The risk and the return of this Product are compared with the risk and return of a benchmark (including similar products).

RISK

Market risk

Annual volatility	Product	similar products
Annualised daily average, calculated on data from September 2012 to December 2013.	6.0%	6.1%

Value at Risk (VAR)		
Threshold value such that the probability that the daily loss on the Product exceeds this value is equal to 1%. This measure is calculated on daily yields from September 2012 to December 2013.	1.2%	1.2%

Liquidity risk

Turn-over ratio	Product	similar products
Ratio between the daily average trading volume and the daily average market value from September 2012 to December 2013.	0.3%	1.2%

Credit risk

Annual expected default frequency	Product	similar products
The expected default frequency is based on the book value of the issuers' liabilities and the market value of their assets from September 2012 to December 2013.	0.2%	1.0%

Rating		
Standard & Poor's equivalent rating	BB-	B-

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

RETURN

Nominal annualised monthly average return	Product	similar products
The monthly average of the annualised yield is calculated on prices from September 2012 to December 2013. It is before taxes and doesn't take into account inflation.	1.0%	6.0%

D

Information sheet D

RISK–RETURN

The risk of this Product is represented by a single indicator ranging from 1 (low risk and, typically, low return) to 5 (high risk and, typically, high return).

The risk category displayed below is based on numeric simulations of the performance of the underlying parameter (i.e., EuroStoxx50 index). It reflects the information available on the issue date and the hypotheses of the simulations, and it may change as information and hypotheses vary. Risk category takes into account the market risk but not the credit risk or the liquidity risk of the Product.

Low risk–return   High risk–return

1	2	3	4	5

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

C

Information sheet C

RISK–RETURN

The internal rates of return displayed below reflect three different performance scenarios for the underlying parameters: the inflation rate and the prices of three securities, which at the maturity date may have either risen or fallen relative to their level on April 18, 2011. The three performance scenarios take into account the market risk but not the credit risk or the liquidity risk of the Product.

The examples of the internal rates of return are shown only to illustrate how the Product could work and do not predict its future performance.

Performance scenarios of the underlying parameters	Annual internal rate of return
At maturity, the inflation rate increases and the price of one of the three securities does not exceed the price on April 18, 2011.	2.2%
At maturity, the inflation rate remains stable and the price of one of the three securities does not exceed the price on April 18, 2011.	3.2%
At maturity, the inflation rate remains stable and the prices of the three securities exceed the price on April 18, 2011.	10.3%

Some information about the prices of the three securities.

Security	Percentage variation in securities' prices necessary to exceed the price on April 18, 2011	Percentage variation in the last 3 years
1	+26.0%	−20.8%
2	+41.1%	−49.4%
3	Current price already exceeds the price on April 18, 2011	−3.8%

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

E1

Information sheet E1

RISK-RETURN

The internal rates of return displayed below are based on numeric simulations of the performance of the underlying parameter (i.e. EuroStoxx50 index). They reflect the information available on the issue date and the hypotheses of the simulations and they may change as information and hypotheses vary. The internal rates of return take into account the market risk but not the credit risk or the liquidity risk of the Product.

Measurements in the table below are subject to statistical error. Please do not consider the percentage values to be "real" probabilities of future events: the examples of the internal rates of return are shown only to illustrate how the Product could work and do not predict its future performance.

Internal Rate of Return on 4 year horizon

The internal rate of return is lower than 0% with a probability equal to 10%

The internal rate of return is lower than 2% with a probability equal to 50%

The internal rate of return is lower than 5% with a probability equal to 90%

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

COSTS

This table shows the highest internal rates of return after 4 years, gross and net of costs.

Probability	Highest annual internal rates of return on 4 year horizon	
	gross of costs	net of costs
10%	0.0%	-0.6%
50%	2.0%	1.4%
90%	5.0%	4.4%

E

Information sheet E

RISK-RETURN

The internal rates of return displayed below are based on numeric simulations of the performance of the underlying parameter (i.e. EuroStoxx50 index). They reflect the information available on the issue date and the hypotheses of the simulations and they may change as information and hypotheses vary. The internal rates of return take into account the market risk but not the credit risk or the liquidity risk of the Product.

Measurements in the table below are subject to statistical error. Please do not consider the percentage values to be "real" probabilities of future events: the examples of the internal rates of return are shown only to illustrate how the Product could work and do not predict its future performance.

Internal Rate of Return on 4 year horizon

The internal rate of return is lower than 0% with a probability equal to 10%

The internal rate of return is lower than 2% with a probability equal to 50%

The internal rate of return is lower than 5% with a probability equal to 90%

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

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E3

Information sheet E3

RISK-RETURN

The internal rates of return displayed below are based on numeric simulations of the performance of the underlying parameter (i.e. EuroStoxx50 index). They reflect the information available on the issue date and the hypotheses of the simulations and they may change as information and hypotheses vary. The internal rates of return take into account the market risk but not the credit risk or the liquidity risk of the Product.

Measurements in the table below are subject to statistical error. Please do not consider the percentage values to be "real" probabilities of future events: the examples of the internal rates of return are shown only to illustrate how the Product could work and do not predict its future performance.

Internal Rate of Return on 4-year horizon

The internal rate of return is lower than 0% with a probability equal to 10%
The internal rate of return is lower than 2% with a probability equal to 50%
The internal rate of return is lower than 5% with a probability equal to 90%

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

COSTS

The price of each component of the Product price is reported in the table below. The difference between the price of the Product ((C+D), supposed to be equal to 100) and the fair value of the Product (C) is due to costs (D).

Value of investment components

Bond component (A)	88
Derivative component (B)	9
Fair value (C = A+B)	97
Costs (D)	3
Price of the Product (C+D)	100

E2

Information sheet E2

RISK-RETURN

The internal rates of return displayed below are based on numeric simulations of the performance of the underlying parameter (i.e. EuroStoxx50 index). They reflect the information available on the issue date and the hypotheses of the simulations and they may change as information and hypotheses vary. The internal rates of return take into account the market risk but not the credit risk or the liquidity risk of the Product.

Measurements in the table below are subject to statistical error. Please do not consider the percentage values to be "real" probabilities of future events: the examples of the internal rates of return are shown only to illustrate how the Product could work and do not predict its future performance.

Internal Rate of Return on 4-year horizon

The internal rate of return is lower than 0% with a probability equal to 10%
The internal rate of return is lower than 2% with a probability equal to 50%
The internal rate of return is lower than 5% with a probability equal to 90%

WARNING:
If the issuer is solvent, the capital is protected only if the buyer holds the Product until the maturity date. The buyer might not recoup the full amount of his/her investment if he sells the Product before the maturity date.

COSTS

This table assumes that the investment is equal to 100 euros and shows the most the buyer might get after 4 years, gross and net of costs, provided that the investment grows consistently with the internal rates of return displayed above.

Probability	Maximum amount payable after 4 years (initial investment equal to 100 euros)	
	gross of costs	net of costs
10%	100 euros	97 euros
50%	108 euros	105 euros
90%	122 euros	118 euros

G

Information sheet G

The risk and the return of this Product are calculated on historical data and are subject to statistical error. Historical data may not be a reliable indication of future performance.
The risk and the return of this Product are compared with the risk and return of a benchmark (including similar products).

RISK

Market risk

	Product	similar products
Annual volatility	35.8%	37.7%

Annualised daily average, calculated on data from September 2012 to December 2013.

	Product	similar products
Value at risk (VAR)	6.1%	5.7%

Threshold value such that the probability that the daily loss on the Product exceeds this value is equal to 1%. This measure is calculated on daily yields from September 2012 to September 2013.

Liquidity risk

	Product	similar products
Turn-over ratio	0.3%	0.4%

Ratio between the daily average trading volume and the daily average market value from September 2012 to December 2013.

Credit risk

	Product	similar products
Annual expected default frequency	0.6%	6.9%

The expected default frequency is based on the book value of the issuers' liabilities and the market value of their assets from September 2012 to December 2013.

	Product	similar products
Rating	B	CCC-

Standard & Poor's equivalent rating.

WARNING:
The buyer of the Product is not guaranteed to be reimbursed 100% of the capital at maturity.

RETURN

	Product	similar products
Historical nominal yield	4.4%	5.1%

The monthly average yield is calculated on prices from September 2012 to September 2013. It is before taxes and doesn't take into account inflation.

F

Information sheet F

The risk and the return of this Product are calculated on historical data and are subject to statistical error. Historical data may not be a reliable indication of future performance.
The risk and the return of this Product are compared with the risk and return of a benchmark (including similar products).

RISK

The risk of this Product is represented by a single indicator ranging from 1 (low risk) to 5 (high risk).
The risk category indicated below takes into account different types of risk:
> market risk (volatility and Value At Risk)
> liquidity risk (turn-over ratio)
> credit risk (expected default frequency and equivalent rating).

The risk category reflects the comparison of the risks of the Product to those of a benchmark (including similar products).

Low risk | 1 | 2 | (3) | 4 | 5 | High risk

WARNING:
The buyer of the Product is not guaranteed to be reimbursed 100% of the capital at maturity.

RETURN

Historical nominal yield

The monthly average yield is calculated on prices from September 2012 to September 2013. It is before taxes and doesn't take into account inflation.

1. The Questionnaire A

UNIVERSITÀ POLITECNICA DELLE MARCHE

Consob – Università Politecnica delle Marche

Questionnaire A

Presentation of financial products information

February 2014

CONSOB — COMMISSIONE NAZIONALE PER LE SOCIETÀ E LA BORSA

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Section 0

Introduction

0.0.1 In your opinion, what is the purpose of information about financial products? (multiple answers allowed)

- ☐ To ensure comparability among different financial products (0.0.1.1)
- ☐ To ensure complete information about the characteristics of a given product (0.0.1.2)
- ☐ To ensure awareness of financial products' returns (0.0.1.3)
- ☐ To ensure awareness of financial products' risks (0.0.1.4)
- ☐ To ensure awareness of financial products' potential losses (0.0.1.5)
- ☐ To ensure awareness of financial products' costs (0.0.1.6)
- ☐ Other (please specify): _____ (0.0.1.7)

0.0.2 Do you know what is meant by the "market or price risk" of a financial product?
☐ Yes ☐ No

0.0.3 Do you know what is meant by the "liquidity risk" of a financial product?
☐ Yes ☐ No

0.0.4 Do you know what is meant by the "credit risk" of a financial product?
☐ Yes ☐ No

0.0.5 Do you know what is meant by the "internal rate of return" of a financial product?
☐ Yes ☐ No

If the respondents answered "Yes" to questions 0.0.2 – 0.0.5, the interviewer moves to Section 1. If the respondents answered "No" to questions 0.0.2 – 0.0.5, the interviewer plays a video explaining the different types of risks and the internal rate of return; moreover, the respondents will be given a leaflet, including the information displayed by the video, to which they can refer during the following sections of the interview.

Questionnaire A   Presentation of financial products information

Section 1

Appraisal of the presentation of financial information

This Section is designed to test complexity, usefulness and information content of different presentation of financial information. Risk and return profiles are disclosed according to four presentation options: the first relies on a synthetic risk indicator (and an explanation of how to interpret it), the second on quantitative and unbundled risk measures, the third on what-if scenarios and the fourth on probabilistic scenarios (computed according to the methodology adopted by the Portuguese Securities and Exchange Commission). In this section Information sheet E submitted by the interviewer does not include any information on charges.

Step 1

Comparison of Information sheets A, B, C (outstanding structured bond)
The Information sheets are covered up; the interviewer does not disclose that they refer to the same financial product. Respondents are asked to randomly select the Information sheets, one-by-one, and to answer the questions in this Section. Randomness ensures that the answers do not depend on the sequence in which the presentation options are disclosed. This sequence is recorded and matched with the answers.

1.1.1 Please consider the three Information sheets one at a time and assess their simplicity, information content and usefulness on a 0-10 scale.

Information sheet ...

Simple	0	1	2	3	4	5	6	7	8	9	10	Complex	[1.1.1.1.1]
Too little information	0	1	2	3	4	5	6	7	8	9	10	Too much information	[1.1.1.2.1]
Not at all useful	0	1	2	3	4	5	6	7	8	9	10	Very useful	[1.1.1.3.1]

How much of the information contained in this Information sheet did you understood? The answer is recorded [1.1.1.4.1]

Information sheet ...

Simple	0	1	2	3	4	5	6	7	8	9	10	Complex	[1.1.1.1.2]
Too little information	0	1	2	3	4	5	6	7	8	9	10	Too much information	[1.1.1.2.2]
Not at all useful	0	1	2	3	4	5	6	7	8	9	10	Very useful	[1.1.1.3.2]

How much of the information contained in this Information sheet did you understood? The answer is recorded [1.1.1.4.2]

Information sheet ...

Simple	0	1	2	3	4	5	6	7	8	9	10	Complex	[1.1.1.1.3]
Too little information	0	1	2	3	4	5	6	7	8	9	10	Too much information	[1.1.1.2.3]
Not at all useful	0	1	2	3	4	5	6	7	8	9	10	Very useful	[1.1.1.3.3]

How much of the information contained in this Information sheet did you understood? The answer is recorded [1.1.1.4.3]

1.1.2 In your opinion, Information sheets A and B rely on:
□ The same information set (available information is the same but the sets are represented differently)
□ Different information
□ I don't know

1.1.3 If the answer is "Different information", which of the two Information sheet is based on more information?
□ A □ B

Imagine that after working 5 years you have 10,000 euros in cash right now, no property, no financial instrument and no debt.

1.1.4 Would you invest in financial product A if your investment objective were capital appreciation over the next 3 to 5 years?
□ Yes
□ No

1.1.5 If the answer is yes, how much would you invest? _____

1.1.6 Please consider all the details of Information sheet A and assess their impact on your investment choices on a 0 – 10 scale *(please, disregard any information you did not understand)*:

	No impact at all										Very high impact
1.1.6.1 Type of information (historical data)	0	1	2	3	4	5	6	7	8	9	10
1.1.6.2 Comparison with the benchmark	0	1	2	3	4	5	6	7	8	9	10
1.1.6.3 Synthetic risk indicator	0	1	2	3	4	5	6	7	8	9	10
1.1.6.4 Warning on capital guarantee	0	1	2	3	4	5	6	7	8	9	10
1.1.6.5 Past returns (historical yield)	0	1	2	3	4	5	6	7	8	9	10

1.1.7 Would you invest in the financial product B if your investment objective were capital appreciation over the next 3 to 5 years?
□ Yes
□ No

1.1.8 If the answer is yes, how much would you invest? _____

1.1.9 Please consider all the details of Information sheet B and assess their impact on your investment choices on a 0 – 10 scale *(please, disregard any information you did not understand)*:

	No impact at all										Very high impact
1.1.9.1 Comparison with the benchmark	0	1	2	3	4	5	6	7	8	9	10
1.1.9.2 Market risk indicator (volatility)	0	1	2	3	4	5	6	7	8	9	10
1.1.9.3 Market risk indicator (VAR)	0	1	2	3	4	5	6	7	8	9	10
1.1.9.4 Liquidity risk indicator (turn over ratio)	0	1	2	3	4	5	6	7	8	9	10
1.1.9.5 Credit risk indicator (default frequency)	0	1	2	3	4	5	6	7	8	9	10
1.1.9.6 Credit risk indicator (rating)	0	1	2	3	4	5	6	7	8	9	10
1.1.9.7 Warning on capital guarantee	0	1	2	3	4	5	6	7	8	9	10

1.2.2 In your opinion, Information sheets D and E rely on:
□ The same information set (available information is the same but the sets are represented differently)
□ Different information
□ I don't know

1.2.3 If the answer is "Different information", which of the two Information sheet is based on more information?
□ D □ E

Imagine that after working 5 years you have 10,000 euros in cash right now, no property, no financial instrument and no debt.

1.2.4 Would you invest in financial product D if your investment objective were capital appreciation over the next 3 to 5 years?
□ Yes
□ No

1.2.5 If the answer is yes, how much would you invest? _____

1.2.6 Would you invest in financial product E if your investment objective were capital appreciation over the next 3 to 5 years?
□ Yes
□ No

1.2.7 If the answer is yes, how much would you invest? _____

1.2.8 Please consider all the details of Information sheet E and assess their impact on your investment choices on a 0 – 10 scale (please, disregard any information you did not understand):

	No impact at all										Very high impact
1.2.8.1 Type of information (projected performance)	0	1	2	3	4	5	6	7	8	9	10
1.2.8.2 Internal rate of return	0	1	2	3	4	5	6	7	8	9	10

1.2.9 For each of the two Information sheets D and E, please specify the element (quantitative, qualitative, layout) that draws your attention the most.
1.2.9.1 D: _____   1.2.9.2 E: _____

1.2.10 According to you, which of the two Information sheets refers to the riskiest financial product?
□ D □ E

Step 3

Comparison of Stock 1 (Information sheet F – synthetic representation) and Stock 2 (Information sheet G – unbundled representation)
The Information sheets are covered up; the interviewer does not disclose that they refer to the same type of financial product. Respondents are asked to randomly select the Information sheets, one at a time, and to answer the questions in this Section. Randomness ensures that the answers do not depend on the sequence in which the presentation options are disclosed. This sequence is recorded and matched with the answers.

1.3.1 For each of the two Information sheets F and G please specify the element (quantitative, qualitative, layout) that draws your attention the most.
1.3.1.1 F: _____   1.3.1.2 G: _____

1.1.10 Would you invest in the financial product C if your investment objective were capital appreciation over the next 3 to 5 years?
□ Yes
□ No

1.1.11 If the answer is yes, how much would you invest? _____

1.1.12 Please consider all the details of Information sheet C and assess their impact on your investment choices on a 0 – 10 scale (please, disregard any information you did not understand):

	No impact at all										Very high impact
1.1.12.1 Type of information (projected performance)	0	1	2	3	4	5	6	7	8	9	10
1.1.12.2 Performance scenario	0	1	2	3	4	5	6	7	8	9	10
1.1.12.3 Past performance of the underlying parameters	0	1	2	3	4	5	6	7	8	9	10

1.1.13 For each of the three Information sheets A, B, C please specify the element (quantitative, qualitative, layout) that draws your attention the most.
1.1.13.1 A: _____   1.1.13.2 B: _____   1.1.13.3 C: _____

1.1.14 According to you, which of the three Information sheets refers to the riskiest financial product?
□ A □ B □ C

Step 2

Comparison of Information sheets D and E (newly issued structured bond).
The Information sheets are covered up; the interviewer does not disclose that they refer to the same financial product. Respondents are asked to randomly select the Information sheets, one at a time, and to answer the questions in this Section. Randomness ensures that the answers do not depend on the sequence in which the presentation options are disclosed. This sequence is recorded and matched with the answers.

1.2.1 Please consider the two Information sheets one at a time and assess their simplicity, information content and usefulness on a 0–10 scale.

Information sheet …

Simple	0	1	2	3	4	5	6	7	8	9	10	Complex	(1.2.1.1.1)
Too little information	0	1	2	3	4	5	6	7	8	9	10	Too much information	(1.2.1.2.1)
Not at all useful	0	1	2	3	4	5	6	7	8	9	10	Very useful	(1.2.1.3.1)

Information sheet …

Simple	0	1	2	3	4	5	6	7	8	9	10	Complex	(1.2.1.1.2)
Too little information	0	1	2	3	4	5	6	7	8	9	10	Too much information	(1.2.1.2.2)
Not at all useful	0	1	2	3	4	5	6	7	8	9	10	Very useful	(1.2.1.3.2)

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2.0.2 Let us now return to the question you were asked at the beginning of the questionnaire. Imagine that after working 5 years you have 10,000 euros in cash right now, no property, no financial instrument and no debt. If your investment objective were capital appreciation over the next 3 to 5 years, which product would you choose to invest in?
(you can choose only one option)

☐ Product B - outstanding structured bond
☐ Product E - newly issued structured bond
☐ Product G - stock

2.0.3 How much would you invest? euros _____

Let us record your choice. You will be informed of the performance of your investment over 6 months from now. At that time you will be asked to indicate how satisfied you are with your choice.

Ease of understanding and comprehension of cost disclosure

Section 3

This Section is designed to test the usefulness and the perceived understanding of different presentations of the investment charges. Respondents are shown the Information sheets on the financial products including the information about charges and fees. Costs are disclosed according to three presentation options: the first relies on the disclosure of product fair value (bond component and derivative component) and costs (explicit and implicit costs), the second shows the effect of costs on the internal rate of return and the third shows the effect of costs on principal and interest.

3.0.1 Concerning only the section about costs, please consider the three Information sheets (E1, E2 and E3) and assess their simplicity, information content and usefulness on a 0-10 scale.

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Imagine that after working 5 years you have 10,000 euros in cash right now, no property, no financial instrument and no debt.

1.3.2 Would you invest in financial product F if your investment objective were capital appreciation over the next 3 to 5 years?

☐ Yes
☐ No

1.3.3 If the answer is yes, how much would you invest? _____

1.3.4 Would you invest in financial product G if your investment objective were capital appreciation over the next 3 to 5 years?

☐ Yes
☐ No

1.3.5 If the answer is yes, how much would you invest? _____

1.3.6 According to you, which of the two Information sheets refers to the riskiest financial product?

☐ F   ☐ G

Step 4

After being told that Information sheets G and F refer to the same information set:

1.4.1 According to you, which of the two Information sheets is the most understandable?

☐ F   ☐ G

1.4.2 According to you, which of the two Information sheets is the most useful?

☐ F   ☐ G

Ease of understanding and comprehension of risk disclosure

Section 2

Respondents are shown Information sheets B, C, E and G in the quantitative variant (i.e., the one reporting quantitative measures of different types of risks) and are asked to answer the following questions.

2.0.1 Can you rank these products (please, see Information sheets B, C, E and G) from most to least risky?

Most risky   Least risky

Product   Product   Product   Product
(2.0.1.1)   (2.0.1.2)   (2.0.1.3)   (2.0.1.4)

After being told which products the Information sheets refer to (B and C correspond to the same outstanding structured bond, E to a newly issued structured bond, G to a stock), respondents are asked to answer the following question.

2. The Questionnaire B

Consob – Università Politecnica delle Marche

Questionnaire B

Presentation of financial products information

February 2014

CONSOB
COMMISSIONE NAZIONALE
PER LE SOCIETÀ E LA BORSA

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DELLE MARCHE

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Section 1

Socio-demographic questions

Please complete the following items with regards to your existing situation and to your family status (if necessary).

1.1 In what year were you born? _____

1.2 In which state and ZIP code is your main residence? _____

1.3 What is your gender? ☐ M ☐ F

1.4 What is your marital status?
☐ Unmarried
☐ Cohabitating
☐ Married
☐ Separated or divorced
☐ Widowed

1.5 How many people are currently living in your household, including yourself?
☐ Number of people: _____ (1.5.1)
☐ Of these people, how many are children? _____ (1.5.2) Age: _____ (1.5.5)
☐ Of these people, how many are adults? _____ (1.5.3)
☐ Of the adults, how many bring income into the household? _____ (1.5.4)

1.6 What is the highest level of education you completed?
☐ Less than high school
☐ Completed high school
☐ Bachelor's degree Subject: _____
☐ Completed masters degree or Ph.D.

1.7 How would you describe your current employment status? (multiple answers allowed):
☐ Fixed-term contract employee (1.7.1)
☐ Open-ended contract employee (1.7.2)
☐ Bank employee or financial agent (1.7.3)
☐ Retired (1.7.4)
☐ Manager (1.7.5)
☐ Self-employed (1.7.6)
☐ Entrepreneur (1.7.7)
☐ Other (please specify): _____ (1.7.8)

1.8 According to your expectations, your family income will:
☐ decline
☐ remain stable
☐ increase

Questionnaire B
Presentation of financial products information

1

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1.16 If yes, what financial products/services were offered to you? Who made the bid? (multiple answers allowed)

Type of products		Offered by	
□ Government bonds		□ Your advisor	(1.16.1)
□ Stocks		□ Financial agent	(1.16.2)
□ Plain vanilla bonds		□ Another bank	(1.16.3)
□ Ucits		□ Another investment firm	(1.16.4)
□ Other investment funds		□ An insurance company	(1.16.5)
□ Portfolio management		□ Postal Service	(1.16.6)
□ Structured bonds			(1.16.7)
□ Derivatives			(1.16.8)
□ Index and unit linked insurance products			(1.16.9)

(1.16.10)
(1.16.11)
(1.16.12)
(1.16.13)
(1.16.14)
(1.16.15)

1.17 Have you ever invested a huge sum of money just in order to seek the thrill
□ No
□ Seldom
□ Yes

1.18 What is the maximum loss you would accept before deciding to sell?
□ I can't invest at a loss
□ Only a very small loss
□ Up to one fourth of my investment
□ One half
□ More than half
□ I hold on to my investment even at a loss

1.19 Imagine you bought a share of XYZ Company at the price of 60 euros per share. In the last month the price rose to 120 euros. If any new information potentially affecting XYZ Company is known, what do you do?
□ I double my investment
□ Nothing
□ I sell some stocks
□ I divest

1.20 Imagine you bought a stock at the price of 60 euros. In the last month price went down to 30 euros. If any new information about your product is known, what do you do?
□ I double my investment
□ Nothing
□ I buy more stocks
□ I divest

1.21 Which of the two following investment options would you prefer?

	Investment 1	Investment 2
Your average expected yield is equal to:	- 100 euros	- 100 euros
Your yield might record a variation of:	± 20%	± 40%

□ Investment 1
□ Investment 2
□ I don't know

1.22 Why? _____

Questionnaire B
Presentation of financial products information

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1.9 In the last 12 months did anything happen that reduced your family income? (e.g., job loss, illness, divorce, etc.)
□ Yes
□ No

1.10 Does your income cover your monthly family expenses?
□ No: we fall into debt
□ No: we use our savings
□ Yes: income just balances expenses
□ Yes: we are able to save something
□ Yes: we are able to save sufficiently

1.11 How many real estate owned properties do you own?
□ 0
□ 1
□ 2
□ 3
□ more than 3

1.12 How often do you up-date your investment decisions?
□ More than once a year
□ Once a year
□ Less than once a year
□ I do not make investment decisions

1.13 How do you make investment decisions? (multiple answers allowed)
□ I do not make investment decisions (1.13.1)
□ I make decisions on my own (1.13.2)
□ I make decisions together with my family (1.13.3)
□ I make decisions after listening to friends/colleagues (1.13.4)
□ I delegate my investment decisions to a financial expert (1.13.5)
□ I make decisions after consulting with a financial expert (1.13.6)
□ What type of expert? (1.13.7)

1.14 If you delegate your investment decisions to a financial expert-advisor, how much do you trust his or her abilities?
□ I do not delegate my investment decisions to an expert/advisor
□ A little
□ As much as needed
□ A lot

1.15 Have you received any bids for financial products/services in the last 12 months?
□ Yes
□ No
□ I don't remember

Questionnaire B
Presentation of financial products information

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1.28 Which of the following statements best describes your decision to invest in... (please refer to one of the products indicated in the "Use" column in the table above)?
- ☐ I considered a number of ... (product) of different companies before making a decision
- ☐ I considered a number of ... (product) of the same company
- ☐ I did not consider any other ... (product)

1.29 How did the sovereign debt crisis change your investment decisions?
- ☐ I bought undervalued stocks and/or bonds
- ☐ I sold only a percentage of my stocks and/or bonds
- ☐ I sold a large share of my stocks and/or bonds
- ☐ I didn't change my investment position

1.30 Please consider the following products and rate their market risk, credit risk and liquidity risk on a 1 (low risk) to 5 (high risk) scale (if your answer is "I don't know", do not fill in the corresponding item):

basso — alto

Market risk
- Current account (1.30.1.1)
- Multi-annual government bonds (BTP) (1.30.2.1)
- Stocks (1.30.3.1)
- Plain vanilla corporate bonds (maturity > 2.5 yrs) (1.30.4.1)
- Structured bonds (1.30.5.1)

Credit risk
- Current account (1.30.1.2)
- Multi-annual government bonds (BTP) (1.30.2.2)
- Stocks (1.30.3.2)
- Plain vanilla corporate bonds (maturity > 2.5 yrs) (1.30.4.2)
- Structured bonds (1.30.5.2)

Liquidity risk
- Current account (1.30.1.3)
- Multi-annual government bonds (BTP) (1.30.2.3)
- Stocks (1.30.3.3)
- Plain vanilla corporate bonds (maturity > 2.5 yrs) (1.30.4.3)
- Structured bonds (1.30.5.3)

1.31 What is the lowest percentage of investment loss that worries you?
0.1% 1% 5% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

1.32 Have you ever obtained a loan from your relatives, friends, colleagues, etc.?
- ☐ Yes: I preferred to
- ☐ Yes: I was obliged to
- ☐ No

1.33 Has your trust in financial advisors changed in recent years?
- ☐ I do not delegate investment decisions to financial advisors
- ☐ It has worsened
- ☐ It has remained stable
- ☐ It has improved

1.34 How much time do you spend reading information useful to your financial decisions?

	About 30 minutes	Some hours	Some days	I do not make financial decisions	
Investments	☐	☐	☐	☐	(1.34.1)
Loans/Mortgages	☐	☐	☐	☐	(1.34.2)

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1.23 Which of the following two investment options would you prefer?

	Investment 1	Investment 2
Your average expected yield is equal to:	+100 euros	+100 euros
Your yield might record a variation of:	± 25%	± 40%

- ☐ Investment 1
- ☐ Investment 2
- ☐ I don't know

1.24 Why?

1.25 Do you have insurance coverage? If yes, what kind of policy did you take out? (please do not consider car insurance; multiple answers allowed)
- ☐ None
- ☐ Life insurance (index/unit linked)
- ☐ Health or disability insurance
- ☐ Insurance against damage (casualty insurance)
- ☐ Liability insurance (professional indemnity insurance)
- ☐ Retirement trust or reinvestment plan

1.26 Which of the following are true? (multiple answers allowed)
- ☐ Net investment yield = Interest rate due − Taxes − Commissions
- ☐ Nominal yield rate = Real yield rate − Inflation rate
- ☐ Investment value = Invested capital − Taxes − Commissions + Interest due
- ☐ None of the above
- ☐ I don't know

1.27 Do you know and have you ever made use of the following products? (Please mark only if your answer is "yes"):

	Knowledge	Use (now or in the past)	Share of financial wealth currently held in this product
Current account	☐ (1.27.1.1)	☐ (1.27.1.2)	(1.27.1.3)
Bank deposit	☐ (1.27.2.1)	☐ (1.27.2.2)	(1.27.2.3)
Certificate of deposit	☐ (1.27.3.1)	☐ (1.27.3.2)	(1.27.3.3)
Repurchase agreements	☐ (1.27.4.1)	☐ (1.27.4.2)	(1.27.4.3)
Post deposit	☐ (1.27.5.1)	☐ (1.27.5.2)	(1.27.5.3)
Annual government bonds (BOT)	☐ (1.27.6.1)	☐ (1.27.6.2)	(1.27.6.3)
Multiannual government bonds (BTP)	☐ (1.27.7.1)	☐ (1.27.7.2)	(1.27.7.3)
Stocks	☐ (1.27.8.1)	☐ (1.27.8.2)	(1.27.8.3)
Plain vanilla corporate bonds	☐ (1.27.9.1)	☐ (1.27.9.2)	(1.27.9.3)
Investment funds	☐ (1.27.10.1)	☐ (1.27.10.2)	(1.27.10.3)
Exchange traded funds (ETF)	☐ (1.27.11.1)	☐ (1.27.11.2)	(1.27.11.3)
Assets management	☐ (1.27.12.1)	☐ (1.27.12.2)	(1.27.12.3)
Hedge funds	☐ (1.27.13.1)	☐ (1.27.13.2)	(1.27.13.3)
Structured bonds	☐ (1.27.14.1)	☐ (1.27.14.2)	(1.27.14.3)
Derivatives	☐ (1.27.15.1)	☐ (1.27.15.2)	(1.27.15.3)
Insurance policy (index and unit linked)	☐ (1.27.16.1)	☐ (1.27.16.2)	(1.27.16.3)

Financial knowledge and logical-mathematical attitudes

2.1 What kind of relationship exists between investment risk and return?
☐ Direct: the higher the risk, the higher the return
☐ Indirect: the higher the risk, the lower the return
☐ None
☐ I don't know

2.2 What does it mean to diversify your investments?
☐ To invest in a large number of stocks
☐ To have a long investment horizon
☐ To invest in non-correlated assets
☐ To mix investments as long as they are characterized by the same type of risk
☐ I don't know

2.3 If the inflation rate is equal to 1.5%, does a 0.5%-yield current account allow you to protect the purchasing power of your capital?
☐ Yes
☐ No
☐ I don't know

2.4 What is the "market risk" connected with a financial product?
☐ The risk stemming from the lack of marketability of an investment that cannot be sold quickly enough to prevent or minimize a loss.
☐ The risk that a borrower will fail to make required payments (capital and/or coupons).
☐ The risk stemming from the indirect relationship between the prices of two stocks listed on the same exchange (the higher the price of the first stock, the lower the price of the second)
☐ The risk of losses stemming from price variations due to factors that affect the overall performance of the financial markets.
☐ I don't know

2.5 Which of the following investment strategies is the most effective at minimizing investment risks?
☐ Not to invest in risky products, but only in corporate and government bonds
☐ To invest in as many financial products as possible
☐ To invest in a number of non-correlated financial products
☐ To have a short investment horizon
☐ I don't know

2.6 If Stock X offers an expected yield of 3% while Stock Y's expected yield is 7%, which of the two stocks is the riskiest?
☐ X
☐ Y
☐ I don't know

2.7 What is the "liquidity risk" connected with a financial product?
☐ The risk stemming from the lack of marketability of an investment that cannot be sold quickly enough to prevent or minimize a loss.
☐ The risk that a borrower will fail to make required payments (capital and/or coupons).
☐ The risk stemming from the indirect relationship between the prices of two stocks listed on the same exchange (the higher the price of the first stock, the lower the price of the second)
☐ The risk of losses stemming from price variations due to factors that affect the overall performance of the financial markets.
☐ I don't know

1.35 How often do you read newspapers and economic/financial magazines?
☐ More than once a day, on line
☐ Once a day
☐ Once a week
☐ Once a month
☐ Never

1.36 Do you know how your investments performed last year?
☐ No
☐ Yes
☐ Yes, but not exactly
☐ I did not invest

1.37 How confidently do you make financial decisions?
☐ Not at all
☐ Sufficiently
☐ Very
☐ Completely

1.38 Do you believe about the future?
☐ No
☐ Yes
☐ I don't know

1.39 Which of these categories best describes your total family monthly income (before taxes)?
☐ < 500 euros
☐ 500 to 1,000 euros
☐ 1,000 to 2,000 euros
☐ 2,000 to 3,000 euros
☐ 3,000 to 4,000 euros
☐ 4,000 to 5,000 euros
☐ 5,000 to 6,000 euros
☐ 6,000 euros or more

1.40 Which of these categories best describes your total financial wealth?
☐ I don't have any wealth
☐ < 50,000 euros
☐ 50,000 to 100,000 euros
☐ 100,000 to 200,000 euros
☐ 200,000 to 500,000 euros
☐ 500,000 euros or more

2.8 What is the "credit risk" connected with a financial product?
- ☐ The risk stemming from the lack of marketability of an investment that cannot be sold quickly enough to prevent or minimize a loss.
- ☐ The risk that a borrower will fail to make required payments (capital and/or coupons).
- ☐ The risk stemming from the indirect relationship between the prices of two stocks listed on the same exchange (the higher the price of the first stock, the lower the price of the second)
- ☐ The risk of losses stemming from price variations due to factors that affect the overall performance of the financial markets.
- ☐ I don't know

2.9 Imagine you have 100 euros in a current account that offers a 2% annual rate (zero costs). Imagine you will make neither withdrawals nor deposits during the coming year. How many euros will be in your current account at the end of the year after interest is paid?
- ☐ _____ euros
- ☐ I can't answer given the available information
- ☐ I don't know

2.10 Concerning the same current account. Imagine you will make neither withdrawals nor deposits during the next 5 years. How many euros will be in your current account at the end of the fifth year after interest is paid?
- ☐ More than 110 euros
- ☐ 110 euros
- ☐ Less than 110 euros
- ☐ I can't answer given the available information
- ☐ I don't know

2.11 What is the internal rate of return of an investment? (multiple answers allowed)
- ☐ It is the yield offered by the government bonds of one's country   (2.11.1)
- ☐ It is the actual value of future cash flows   (2.11.2)
- ☐ It is a rate of return used to measure and compare the profitability of investments   (2.11.3)
- ☐ It is the discount rate that makes the net present value of all cash flows from a particular investment equal to zero   (2.11.4)

2.12 Which of the two following investment options would you prefer?

Investment 1

	possible gain	probability
1st hypothesis	7 euros	0.25
2nd hypothesis	4 euros	0.25
3rd hypothesis	3 euros	0.25
4th hypothesis	2 euros	0.25

Investment 2

	possible gain	probability
1st hypothesis	3 euros	0.25
2nd hypothesis	8 euros	0.25
3rd hypothesis	4 euros	0.25
4th hypothesis	5 euros	0.25

- ☐ Investment 1
- ☐ Investment 2
- ☐ I can't answer given the available information
- ☐ I don't know

Financial Risk Tolerance Elicitation (Grable & Lytton, 2003)

The situations provided in this section are absolutely hypothetical and are not connected to the current financial situation; moreover, some questions ask you to make decisions based on limited information.

3.1 In general, how would your best friend describe you as a risk taker?
- ☐ A real gambler
- ☐ Willing to take risks after completing adequate research
- ☐ Cautious
- ☐ A real risk avoider

3.2 You are on a TV game show and can choose one of the following. Which would you take?
- ☐ euros 1,000 in cash
- ☐ 50% chance at winning euros 5,000
- ☐ A 25% chance at winning euros 10,000
- ☐ A 5% chance at winning euros 100,000

3.3 You have just finished saving for a "once-in-a-lifetime" vacation. Three weeks before you plan to leave, you lose your job. You would:
- ☐ Cancel the vacation
- ☐ Take a much more modest vacation
- ☐ Go as scheduled, reasoning that you need the time to prepare for a job search
- ☐ Extend your vacation, because this might be your last chance to go first-class

3.4 If you unexpectedly received 20,000 euros to invest, what would you do?
- ☐ Deposit it in a bank account, money market account, or an insured CD
- ☐ Invest it in safe high quality bonds or bond mutual funds
- ☐ Invest it in stocks or stock mutual funds

3.5 In terms of experience, how comfortable are you investing in stocks or stock mutual funds?
- ☐ Not at all comfortable
- ☐ Somewhat comfortable
- ☐ Very comfortable

3.6 When you think of the word "risk" which of the following words comes to mind first?
- ☐ Loss
- ☐ Uncertainty
- ☐ Opportunity
- ☐ Thrill

3.7 Some experts are predicting prices of assets such as gold, jewels, collectibles, and real estate (hard assets) to increase in value; bond prices may fall, however, experts tend to agree that government bonds are relatively safe. Most of your investment assets are now in high interest government bonds. What would you do?
- ☐ Hold the bonds
- ☐ Sell the bonds, put half the proceeds into money market accounts, and the other half into hard assets
- ☐ Sell the bonds and put the total proceeds into hard assets
- ☐ Sell the bonds, put all the money into hard assets, and borrow additional money to buy more

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3.8 Given the best and worst case returns of the four investment choices below, which would you prefer?

☐ euros 200 gain best case; euros 0 gain/loss worst case
☐ euros 800 gain best case; euros 200 loss worst case
☐ euros 2,600 gain best case; euros 800 loss worst case
☐ euros 4,800 gain best case; euros 2,400 loss worst case

3.9 In addition to whatever you own, you have been given euros 1,000. You are now asked to choose between:

☐ A sure gain of euros 500
☐ A 50% chance to gain euros 1,000 and a 50% chance to gain nothing

3.10 In addition to whatever you own, you have been given euros 2,000. You are now asked to choose between:

☐ A sure loss of euros 500
☐ A 50% chance to lose euros 1,000 and a 50% chance to lose nothing

3.11 Suppose a relative left you an inheritance of euros 100,000, stipulating in the will that you invest ALL the money in ONE of the following choices. Which one would you select?

☐ A savings account or money market mutual fund
☐ A mutual fund that owns stocks and bonds
☐ A portfolio of 15 common stocks
☐ Commodities like gold, silver, and oil

3.12 If you had to invest euros 20,000, which of the following investment choices would you find most appealing?

☐ euros 12,000 in low-risk investments, euros 6,000 in medium-risk investments, euros 2,000 in high-risk investments
☐ euros 6,000 in low-risk investments, euros 8,000 in medium-risk investments, euros 6,000 in high-risk investments
☐ euros 2,000 in low-risk investments, euros 8,000 in medium-risk investments, euros 10,000 in high-risk investments

3.13 Your trusted friend and neighbour, an experienced geologist, is putting together a group of investors to fund an exploratory gold mining venture. The venture could pay back 50 to 100 times the investment if successful. If the mine is a bust, the entire investment is worthless. Your friend estimates the chance of success is only 20%. If you had the money, how much would you invest?

☐ Nothing
☐ One month's salary
☐ Three month's salary
☐ Six month's salary

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Section 4

Impulsivity test

In this section you find a list of situations that people usually face during their life. For each situation you are supposed to choose the answer that fits you best. You are kindly requested to answer to all of the questions based on your opinion and without the help of others. There is not right or wrong answer, just fill in the answers to the questions using your personal feelings.

		Rarely/ Never	Occasionally	Often	Almost always/ Always
4.1	I plan tasks carefully.	☐	☐	☐	☐
4.2	I do things without thinking.	☐	☐	☐	☐
4.3	I make-up my mind quickly.	☐	☐	☐	☐
4.4	I am happy-go-lucky.	☐	☐	☐	☐
4.5	I don't "pay attention."	☐	☐	☐	☐
4.6	I have "racing" thoughts.	☐	☐	☐	☐
4.7	I plan trips well ahead of time.	☐	☐	☐	☐
4.8	I am self controlled.	☐	☐	☐	☐
4.9	I concentrate easily.	☐	☐	☐	☐
4.10	I save regularly.	☐	☐	☐	☐
4.11	I "squirm" at plays or lectures.	☐	☐	☐	☐
4.12	I am a careful thinker.	☐	☐	☐	☐
4.13	I plan for job security.	☐	☐	☐	☐
4.14	I say things without thinking.	☐	☐	☐	☐
4.15	I like to think about complex problems.	☐	☐	☐	☐
4.16	I change jobs.	☐	☐	☐	☐
4.17	I act "on impulse."	☐	☐	☐	☐
4.18	I get easily bored when solving thought problems.	☐	☐	☐	☐
4.19	I act on the spur of the moment.	☐	☐	☐	☐
4.20	I am a steady thinker.	☐	☐	☐	☐
4.21	I change residences.	☐	☐	☐	☐
4.22	I buy things on impulse.	☐	☐	☐	☐
4.23	I can only think about one thing at a time.	☐	☐	☐	☐
4.24	I change hobbies.	☐	☐	☐	☐
4.25	I spend or change more than I earn.	☐	☐	☐	☐
4.26	I often have extraneous thoughts when thinking.	☐	☐	☐	☐
4.27	I am more interested in the present than the future.	☐	☐	☐	☐
4.28	I am restless at the theatre or lectures.	☐	☐	☐	☐
4.29	I like puzzles.	☐	☐	☐	☐
4.30	I am future oriented.	☐	☐	☐	☐

The information pills

Slide 1 (Liquidity risk):

Liquidity risk

… the risk that a given security cannot be traded quickly enough, when necessary, or the risk of loosing a relevant amount of the invested principal

… it can be measured considering the number and frequency of tradings on a specified security (turn-over)

typically the higher the turn-over …

… the lower the liquidity risk

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Slide 2 (Credit risk):

Credit risk

… the risk that the issuer shall not pay interests and principal because experiencing financial hardship or because he has failed

… credit risk can be measured by means of:
- the issuer default probability
- the rating assigned by rating agencies tipically expressed by a letter of the alphabet

if the probability of default

credit risk

if the rating

| AAA |
| BBB |
| BB |
| C |

the credit risk

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Internal Rate of Return (IRR)

… is an indicator of invested capital profitability

At a given level of risk, the investment with a higher IRR is preferred

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The market risk

… the risk of losses arising from movements in the market prices and from factors thet affect the overall performance of the market

… it can be measured by means of volatility and value at risk (VaR)

if volatility

market risk

if VaR

market risk

Appendix   V

Two-steps sampling procedure

1 First step: selection of cities by geographical area

In order to ensure that the overall sample was statistically significantly representative of the Italian population of bank customers, and assuming as a budget constraint the overall target of 300 interviews, we distributed the number of expected participants among the three main Italian geographical areas: Northern, Central and Southern Italy.

We selected from each area three representative cities and assigned a target-number of CTs to each day-city (e.g., 2 days in Bologna, 2 days in Milano, 1 day in Genova; see Table a.3). Each day was assumed to allow a target of 20 interviews.

Table a.3 – Step 1: Selection of cities/days by each geographical area

area	city	days	no. expected participants
North	Bologna	D1	20
		D2	20
	Milan	D3	20
		D4	20
	Genova	D5	20
Central	Rome	D6	20
		D7	20
	Florence	D8	20
		D9	20
	Fano	D10	20
South	Naple	D11	20
		D12	20
	Palerm	D13	20
		D14	20
	Bari	D15	20

Each day-city was offered to the Italian Financial Institutions (Banks) that agreed to participate in the research project, into a sort of call auction: Intesa San Paolo, Unicredit, Monte Paschi Siena, Banca Nazionale del Lavoro, Banca Sella, Banca Fideuram, and Banca di Credito Cooperativo di Fano. After a multilateral negotiation of availabilities and constraints, the final allocation of days/cities by Financial Institution was determined and is described in Table a.4.

Financial disclosure, risk perception
and investment choices
Evidence from a consumer testing exercise

Table a.4 – Financial institutions by city

Fano	Bcc Fano
Milano	Banca Fideuram
Milano	Banca Sella
Genova	Carige
Bologna	Intesa San Paolo
Bologna	Unicredit
Firenze	Monte Paschi Siena
Firenze	Monte Paschi Siena
Roma	Banca Nazionale del Lavoro
Napoli	Monte Paschi Siena
Napoli	Intesa San Paolo
Roma	Banca Sella
Palermo	Unicredit
Palermo	Unicredit
Bari	Intesa San Paolo

Note: Cities and financial institutions are ordered according to the agenda of the interviews.

We assigned each city to a specific bank, and identified the branch unit most appropriate for conducting the CT. Consequently, we asked banks to build a database containing the branch customers who fulfilled our recruitment conditions (owner of securities, with a positive portfolio turnover, in the last year, younger than 70, with a privacy statement compliant with the CT).

For each branch i, where i represents cities 1 to 15 as listed in Table 2, we received a database containing the population of Ni customers of the selected branch. Each bank customers was designated with a bank code, and further details (names excluded) were provided such as gender, income, wealth under management, Mifid profile and so forth. These details were used to control for any potential selection bias that might distinguish those who were invited to the CT from those who either refused to participate or who were not extracted.

2 Second step: random selection of branch customers

We randomly extracted a sample of customers using a selection step ki, where:

ki= Ni/ni

Ni: population of bank codes (i.e., customers) of the branch i,

ni: width of the sample selected for the branch i.

Organisational constraints induced us to assume that each day allowed a target of 20 interviews. Given an experienced redemption rate of roughly 80%, we set

a prudential sampling target of 24 individuals, for each day/branch/city. Therefore, our ni was fixed for each branch, and equal to 24.

As an example, let's assume a branch 'X' that offers a dataset of bank codes (customers) containing 1,080 items (Nx=1.080), and that is assigned one day (nx= 24). The selection step is kx= Nx/nx= 1,080/24=45. Therefore, we randomly extracted the initialisation number, included in the 1-1,080 range. Let's assume that this number is 5; therefore, we sampled the bank codes (customers) 5; 5+45=50; 50+45=95; 95+45=140; up to the 24th extraction.

This sample indicates the list of 24 customers to invite, first. Being aware that the redemption rate for individuals agreeing to take part in such interviewees is low, we selected 29 back-up samples (overall 30 lists of 24 bank codes): for each back-up, we repeated the random selection of the initialisation number, and starting from that number we extracted the next 23, following the selection step that is feasible given the original width of the population Ni. An example of samples back-ups used in the research is shown in Table a.5.

Table a.5 – Random samples and back–ups (up to 30)

Research ID	Sample back up										
	1	2	3	4	5	6	7	8	9	...	30
1	G010101	345195171	415199677	325176669	415199505	385199567	385199180	405199833	345192121	315191835	...	345191937
2	G010102	335128648	385197734	385599585	345197523	335129163	385199551	395199877	365192641	385199750	...	375198541
3	G010103	345192517	375599702	345198591	315195525	345599895	335599240	355192893	345599665	325599924	...	335128929
4	G010104	355599650	445599949	325176816	355192811	375199678	375599692	375198873	475199974	355192435	...	365192726
5	G010105	325176708	445199898	325176717	315197973	325299988	475599988	385198031	425199814	325177116	...	325177220
6	G010106	345195024	345191972	395199636	415199671	335599153	355192450	325176871	315193001	335128833	...	375199167
7	G010107	355192491	385599470	355192529	345192156	355599235	425199469	325599584	445199689	335129838	...	315196143
8	G010108	355193771	315599325	425599675	465599953	365199492	415199439	425199766	375198979	355192406	...	425199725
9	G010109	465199942	325195701	435199975	325176773	375599615	425199547	335128668	375599579	365192603	...	325177181
10	G010110	405199903	415199518	415199747	325176724	335129250	445199647	405599894	385299974	385199537	...	335194581
11	G010111	355193115	315199306	375198663	325177492	465199864	335599151	325176703	425199479	355192494	...	425199634
12	G010112	415599736	315198809	395199734	325176828	375198700	345194287	345192024	405199801	395198816	...	375199831
13	G010113	405199848	325177017	325176883	365193279	345191946	425199625	335129174	445199921	425199489	...	385199451
14	G010114	395199794	345192153	425199476	375198895	375198952	375599180	425199440	325176881	425599601	...	325177015
15	G010115	355192445	345192795	365599692	345192874	435199776	345192974	345195171	385199343	345192539	...	375198469
16	G010116	475599974	345598932	425199434	425199564	445599811	345193766	335128648	425199546	415599723	...	315192761
17	G010117	335129122	335128761	335129513	385599715	315191871	345192676	345192517	435199766	355599236	...	355599566
18	G010118	325176720	315193808	345192026	415199960	435199762	355198714	355599650	335199002	445199938	...	415199677
19	G010119	355192626	465599925	375199333	335128770	335128949	355193419	325176708	445599817	465199872	...	385197734
20	G010120	385199339	395199761	395199914	335129463	415199961	345192326	345195024	345193784	315192106	...	375599702
21	G010121	325176884	375199307	345192314	445599897	345193397	335129599	355192491	325177339	375198461	...	445599949
22	G010122	445199677	365193069	425199635	395199644	345197559	325598347	355193771	345192204	465199836	...	445199898
23	G010123	445199672	415199557	375199892	465199887	345192053	385599744	465199942	355192870	315192095	...	345191972
24	G010124	475599980	405199776	395199944	345192058	385198357	335599814	405199903	325177058	325176849	...	385599470

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Each branch unit was assigned the task of inviting the customer corresponding to the bank code resulting from the sampling procedure and, if the customer accepted, allocating him or her to the Day Time Schedule that was assigned for that day (see Table a.6). This way a correspondence of the bank code with the research ID was generated, with the bank being (uniquely) responsible for the de-codifying key connecting the bank code- research ID and name of the customer.

Table a.6 – Day Time Schedule and de–codifying key

day time schedule

DAY: mm/gg/aaaa			Bank name:		Address:	
Room 1				**Room 2**		

Room 1:

	Research ID	Bank code
9.30		
10.00		
10.30		
11.00		
11.30		
12.00		
12.30		

	Research ID	Bank code
14.30		
15.00		
15.30		
16.00		
16.30		

Room 2:

	Research ID	Bank code
9.30		
10.00		
10.30		
11.00		
11.30		
12.00		
12.30		

	Research ID	Bank code
14.30		
15.00		
15.30		
16.00		
16.30		

de–codifying key (only for the bank!)

Prog: No. client to be called	ID: Research ID	Bank code:	Miss/Mr: Name	phone number:
1	G010101			
2	G010102			
3	G010103			
4	G010104			
5	G010105			
6	G010106			
7	G010107			
8	G010108			
9	G010109			
10	G010110			
11	G010111			

If a customer refused to participate in the experiment, the branch unit was asked to invite the client corresponding to the same position in the further back up samples, until an individual who agreed to participate was found. In Table 4, Participant 1 is identified with the first customer invited, who immediately accepted; Participant 2 corresponds to the client who holds position 2 in the second extraction (Sample 2), because the first one refused; and Participant 3 corresponds to the client who holds position 3 in the fourth extraction (Sample 4) because the previous three customers refused.

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Socio-demographic characteristics of the sample

Table a.7 – Socio-demographic characteristics of participants to the consumer testing

item	percentage/ mean	question number	item	percentage/ mean	question number
age (average)	56	1.1 QB	financial situation		1.39 QB
residence		1.2 QB	*monthly family income < 2,000 euros*	26%	
north	39%		*monthly family income in the range 2,000–5,000 euros*	51%	
center	33%		*monthly family income > 5,000 euros*	15%	
south	27%		expectation about family income		1.8 QB
gender		1.3 QB	*declining*	20%	
female	37%		*remaining stable*	63%	
male	63%		*increasing*	14%	
marital status		1.4 QB	family total financial wealth		1.40 QB
unmarried	18%		*< 50,000 euros*	22%	
married/cohabitee	67%		*in the range 50,000 to 500,000 euros*	46%	
separated or divorced	9%		*> 500,000 euros*	20%	
widow	3%		real estate properties		1.11 QB
family		1.5 QB	*0*	10%	
average no. of people	2.6		*1*	35%	
average no. of children	0.4		*2*	22%	
highest level of education completed		1.6 QB	*3*	13%	
less than high school	11%		*more than 3*	15%	
high school	41%				
bachelor's degree or completed masters or ph.d.	46%				
current employment status		1.7 QB			
fixed term contract employee	5%				
open-ended contract employee	20%				
bank employee or financial agent	3%				
retired	32%				
manager	4%				
self-employed	18%				
entrepreneur	8%				

Table a.8 – Investment habits and experience

item	percentage/ mean	question number	item	percentage/ mean	question number
saving		1.10 QB	use of financial information		
able to save something/sufficiently	57%		*time spent reading information useful to investment decisions*		1.34 QB
just balance expenses	26%		*30 min.*	38%	
not able to save	13%		*some hours*	32%	
got a loan from relatives/friends	9%	1.32 QB	*some day*	23%	
investment decision mode		1.13 QB	*frequency of reading financial magazines/newspaper*		1.35 QB
autonomous	33%		*once a day or more often*	35%	
together with family	22%		*once a week/month*	35%	
listening friends/colleagues	2%		*never*	30%	
listening to financial expert	43%		*frequency of updating financial decisions*		1.12 QB
delegating to a financial expert	16%		*more than once a year*	53%	
trust in financial advisor		1.14 and 1.33 QB	*once a year*	23%	
little	6%		*less*	16%	
as much as needed/a lot	72%		knowledge of past performance of one's investments	96%	1.36 QB
stable in last year	43%		well-known products		1.27 QB
worsened in last year	11%		*current account*	*81%*	
improved in last year	31%		*plain vanilla corporate bonds*	*60%*	
received bid in the previous year		1.15 and 1.16 QB	*stocks*	*55%*	
plain vanilla corporate bonds	32%		widespread products		1.27 QB
ucits	31%		*current account*	*72%*	
index and unit linked insurance products	25%		*plain vanilla corporate bonds*	*45%*	
offered by			*stocks*	*35%*	
personal advisor	51%		most widespread insurance coverage		1.25 QB
financial agent	9%		*life*	36%	
insurance company	9%		*health*	29%	
shopping around		1.28 QB	*against damage*	28%	
yes, for different product of different companies	45%		*liability insurance*	23%	
yes, for different product of the same company	24%		*retirement trust/reinvestment plan*	26%	
no	20%				

Table a.9 – Financial literacy and mathematical attitudes of participants to the consumer testing

item	percentage of correct answers	question number
portfolio diversification[1]	27%	2.2 and 2.5 QB
risk/return relation[1]	54%	2.1 and 2.6 QB
inflation	74%	2.3 QB
market risk	31%	2.4 QB
liquidity risk	50%	2.7 QB
credit risk	56%	2.8 QB
internal rate of return[1]	56%	2.11 QB
net investment yield/ nominal yield/investment value[1]	10%	1.26 QB
mathematical question	44%	2.12 QB
capitalization[1]	28%	2.9 and 2.10 QB

Note: [1] Figures refer to the percentage of respondents that answered correctly to all the questions concerning the specific item.

Table a.10 – Personal traits and behavioural biases of participants to the consumer testing

item	definition	percentage of participants	question number	value of the dummy used in the multivariate analysis
reflection effect[1]	the reversing of risk aversion/risk seeking in case of gains or losses	2%	1.21, 1.23 QB	n.a.
disposition effect	the attitude of investors to sell too quickly the securities with positive performance and hold for too long the securities with negative performance	62%	1.19, 1.20 QB	=1 if respondents choose the 3rd or the 4th alternative answer in 1.19 and the 1st, the 2nd or the 3rd in 1.20 QB
volatility aversion[1]	the attitude of investors to avoid variability of returns in the domain of both losses and gains	32%	1.21, 1.23 QB	=1 if respondents prefer ± 20% both in 1.21 and 1.23 QB
loss aversion	the maximum loss on a financial investment an individual would accept before deciding to sell	45%[2]	1.18	=1 if respondents answer 'I can't invest at a loss' or 'Even very little'
optimism	individuals believe that the outcomes of events are better for them than for others	54%	1.38 QB	=1 if respondents answer 'yes'
self representation	confidence in making financial decisions	9%	1.37 QB	=1 if respondents answer 'very' or 'completely'
gap between self-assessed and objective knowledge	mismatch among the declared and the actual knowledge			=1 if respondents answer 'Yes' to questions in QA and then choose the wrong answers in QB
market risk		*48%[3]*	*0.0.2 QA, 2.4 QB*	
liquidity risk		*25%[3]*	*0.0.3 QA, 2.7 QB*	
credit risk		*8%[3]*	*0.0.4 QA, 2.8 QB*	
IRR		*13%[3]*	*0.0.5 QA, 2.11 QB*	
volatility seeking[1]	the attitude of investors towards variability of returns in the domain of both losses and gains	9%	1.21, 1.23 QB	=1 if respondents prefer ± 40% both in 1.21 and 1.23 QB
thrill seeking	seeking well-being through thrill	9%	1.17 QB	=1 if respondents answer 'yes'
risk tolerance	willingness to take financial risk	52%[4]	section 3 QB	=1 if respondents' scores are higher than the median of the sample
impulsivity	predisposition towards rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these	52%[4]	section 4 QB	=1 if respondents' scores are higher than the median of the sample

Note: [1] About 30% of interviewees did not answer to questions 1.21 and 1.23. [2] Figure refers to question 1.18 QB; according to question 1.31 QB the percentage of loss averse individuals is equal to 48%. [3] Figures refer to the percentage of respondents who state to know what market risk, liquidity risk, credit risk and internal rate of return mean and then failed to correctly define them. [4] Figures refer to respondents whose scores are higher than the median of the sample.

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Table a.11 – Correlation between some personal traits and socio-demographic characteristics of respondents

	delegating financial decisions to an expert	attitude towards disposition effect	gap between self-assessed and objective knowledge	thrill seeking	impulsivity	married or cohabitee	self-employed	age	wealth	real estate properties
financial knowledge		0.3036*								
being solicited to invest										
frequent investment decisions			0.2576*							
trust in advice	0.5838*									
thrill seeking										
risk tolerance		0.2655*	0.3376*							
residence in south					-0.4921*					
age				-0.2757*		-0.2880*				
income								0.3557*		
no. of children in the family							-0.4024*			
real estate properties								0.3360*	0.3185*	
income to savings ratio									0.2574*	-0.2978*

Note: blanks indicate that the correlation is not statistically significant.

Table a.12 – High financial knowledge, behavioral biases and risk tolerance

	high financial knowledge
disposition effect	+
volatility aversion	+
behavioural biased vs not biased	+
high risk tolerance	+

Note: high financial knowledge is a dummy variable equal to 1 if the percentage of correct answers to questions 2.1 – 2.8 and 2.11 of QB is above the sample median of correct answers. High risk tolerance is a dummy variable equal to 1 if the Grable and Lytton (2003) indicator is above the median of the sample distribution. The notation +/- indicates the sign of a 5% statistically significant difference (according to a two sample t-test on the means).

Disclosure appraisal, risk perception and investment decision: a descriptive analysis

Figure a.1 – Complexity average scoring per order selection
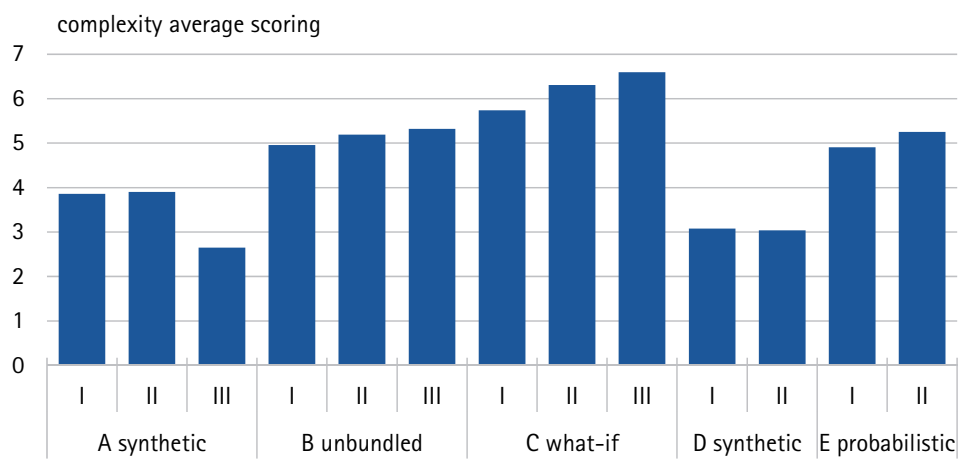
complexity average scoring

Note: Figure collects answers to the following: 'Please consider the [...] Information sheets one at a time and assess their simplicity [...] on a 0–10 scale', questions 1.1.1 and 1.2.1, QA.

Figure a.2 – Distribution of response by complexity
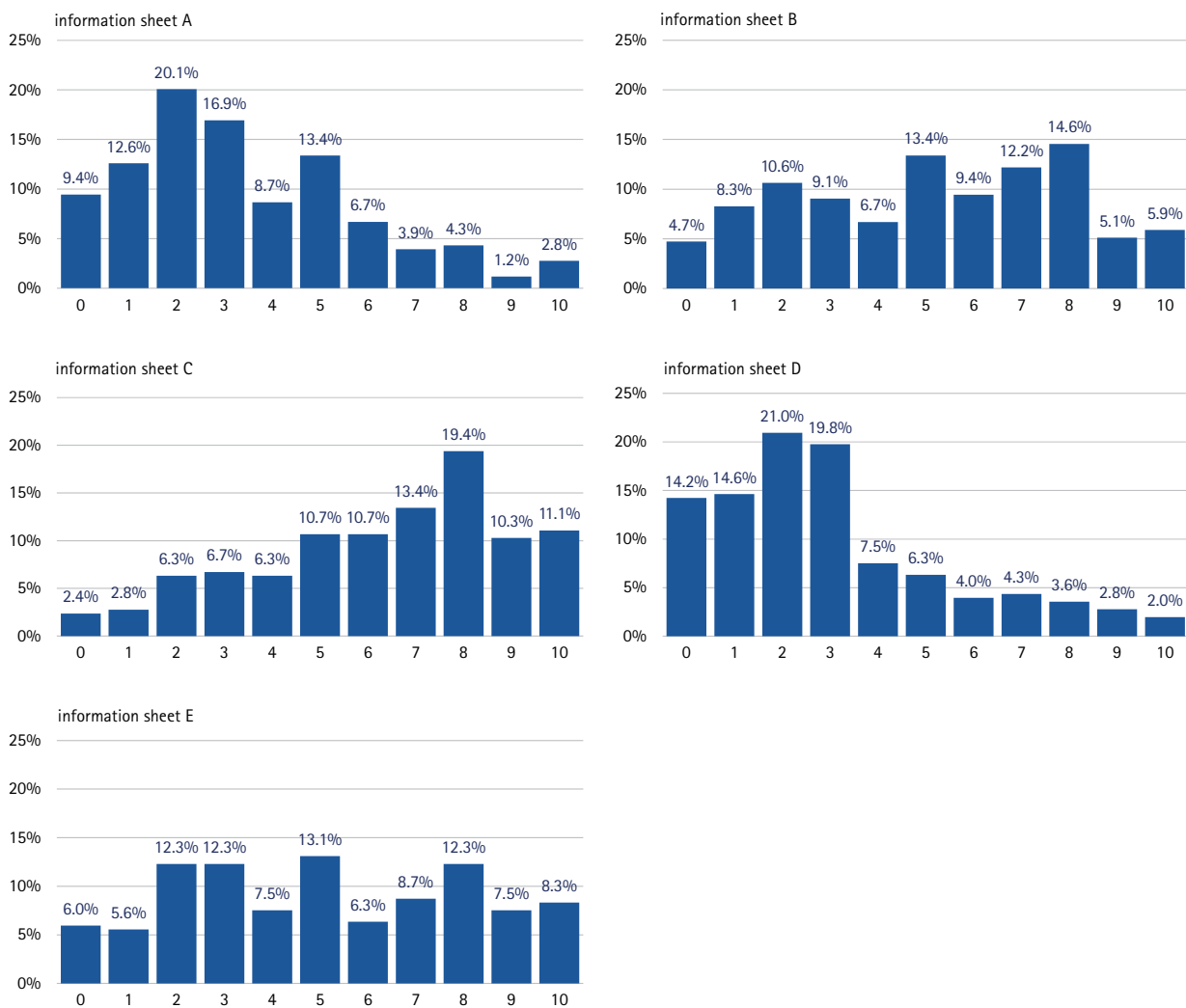
information sheet A

information sheet B

information sheet C

information sheet D

information sheet E

Note: Figure collects answers to the following: 'Please consider the [...] Information sheets one at a time and assess their simplicity [...] on a 0-10 scale', questions 1.1.1 and 1.2.1, QA.

Figure a.3 – Usefulness average scoring per order selection

usefulness average scoring

Note: Figure collects answers to the following: 'Please consider the [...] Information sheets one at a time and assess their [...] usefulness on a 0-10 scale', questions 1.1.1 and 1.2.1, QA.

Figure a.4 – Distribution of response by usefulness

information sheet A

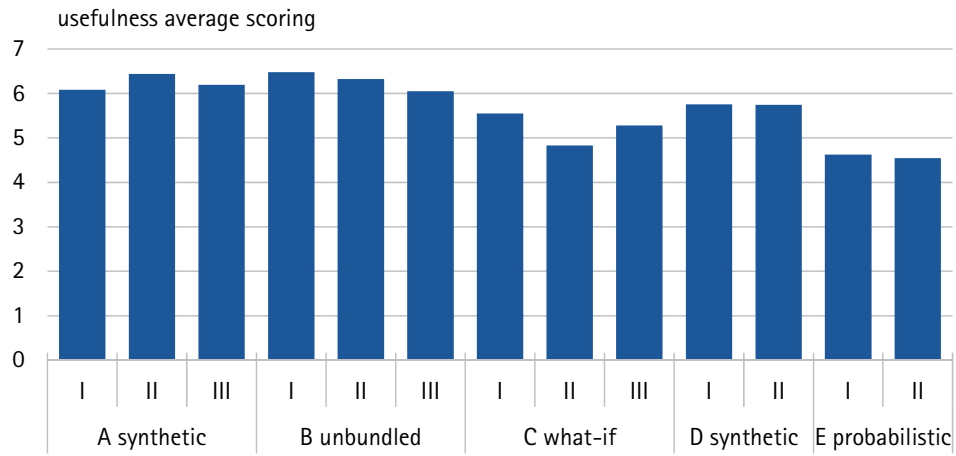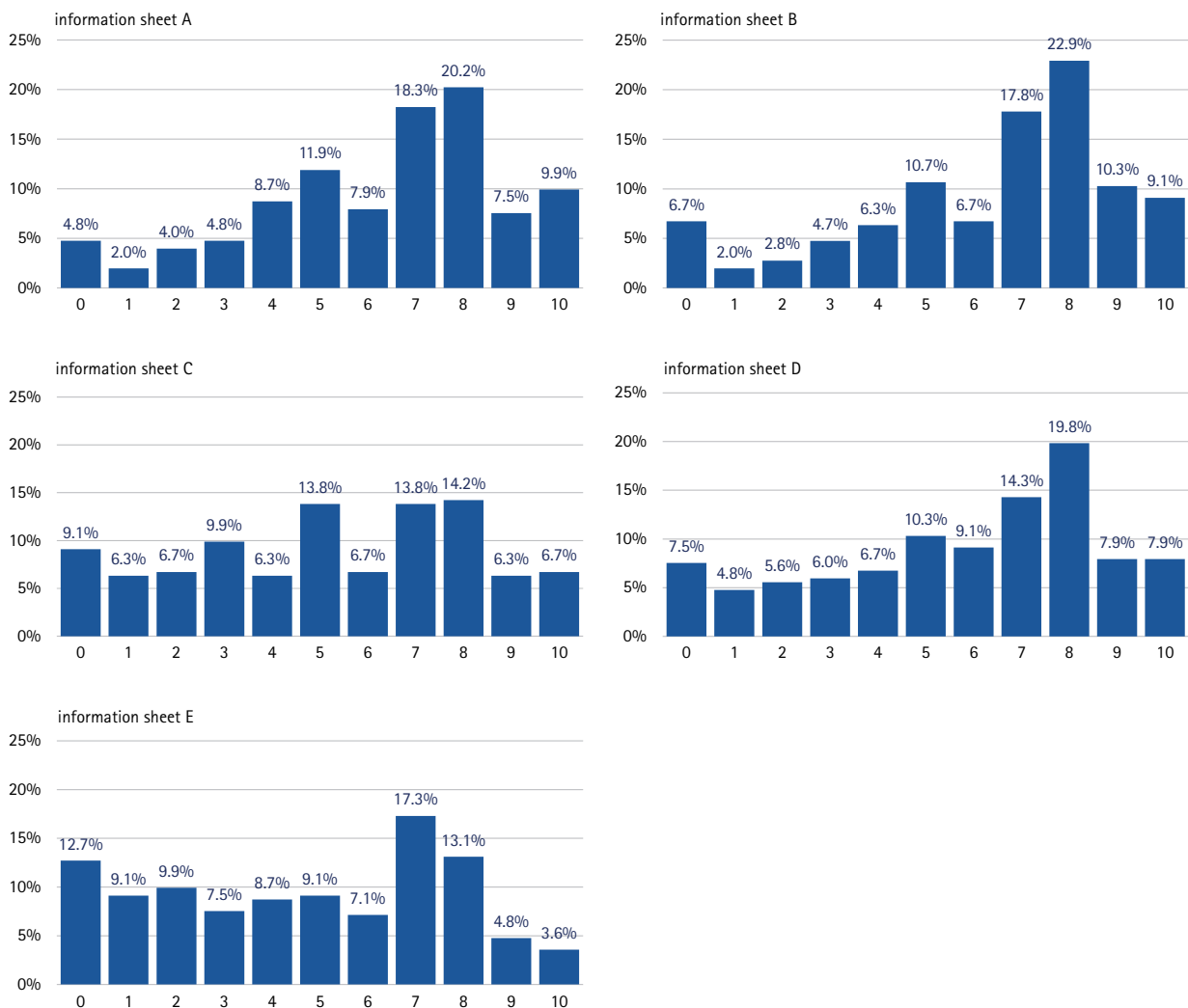information sheet B

information sheet C

information sheet D

information sheet E

Note: Figure collects answers to the following: 'Please consider the [...] Information sheets one at a time and assess their [...] usefulness on a 0-10 scale', questions 1.1.1 and 1.2.1, QA.

Table a.13 – Correlation between perceived risk and perceived complexity/comprehensibility of the Information sheets submitted to participants

Product	Information Sheet	risk and complexity	risk and comprehensibility
outstanding structured bond	A (synthetic)	0.07	
	B (unbundled)	0.09	
	C (what–if)	0.004	
newly issued structured bond	D (synthetic)	-0.06	
	E (probabilistic modelling)	0.01	
stock 1	F (synthetic)		-0.2**
stock 2	G (unbundled)		-0.2**

Note: ** indicates that the correlation coefficient is significant at 95%. We did not test the correlation between perceived complexity, usefulness and information content of Information Sheets F and G since for these Templates we did not ask respondents to assess complexity, usefulness and information content on a 0-10 scale, we asked only which of the two Documents was regarded as the most understandable and which as the most useful.

**Table a.14 – Inability to rank risk by socio–demographic and personal traits**

	Intra-product comparison (A- B-C)	Intra-product comparison (D-E)	Intra-product comparison (F-G)
high vs low financial literacy	–		
high vs low risk tolerance			
high vs low impulsiveness			
male vs female			
under 50 vs over 50			+
married or cohabitee vs single			
self–employed vs employee			
high income vs low income			
high property wealth vs property wealth	+	+	+
high financial wealth vs financial wealth			
south vs rest of Italy			

Note: High financial literacy is a dummy variable equal to 1 if the percentage of correct answers to questions 2.1 – 2.8 and 2.11 of QB is above the sample median of correct answers. High risk tolerance is a dummy variable equal to 1 if the Grable and Lytton score is above the sample third percentile. High impulsivity is a dummy variable equal to 1 if the Impulsivity test score is above the sample third percentile. The notation +/- indicates the sign of a 5% statistically significant difference (according to a two sample t-test on the means) between the inability to rank risk of the two groups selected by dividing the sample along the lines of the attributes of the dichotomous independent variables reported in the Table. As a way of example, in the intra-product comparison of A. B and C the inability to rank risk of high financial literates and low financial literates is significantly different, with the former assigning on average higher scores than the latter. Blanks indicate that the difference in the means is not statistically significant.

Table a.15 – Investment decisions

Information Sheets	no. observations	mean	st. deviation	min.	max.
A (synthetic)	155	6235.48	2437.07	1000	10000
B (unbundled)	117	5581.2	2587.23	1000	10000
C (what–if)	87	5511.49	2666.52	1000	10000
D (synthetic)	95	5403.16	2684.57	1000	10000
E (probabilistic modelling)	100	5425	2522	1000	10000
F (synthetic)	177	5610.17	2689.52	1000	10000
G (unbundled)	127	4795.67	2631.77	1000	10000

Figure a.5 – Investment decisions after the disclosure about products' typology
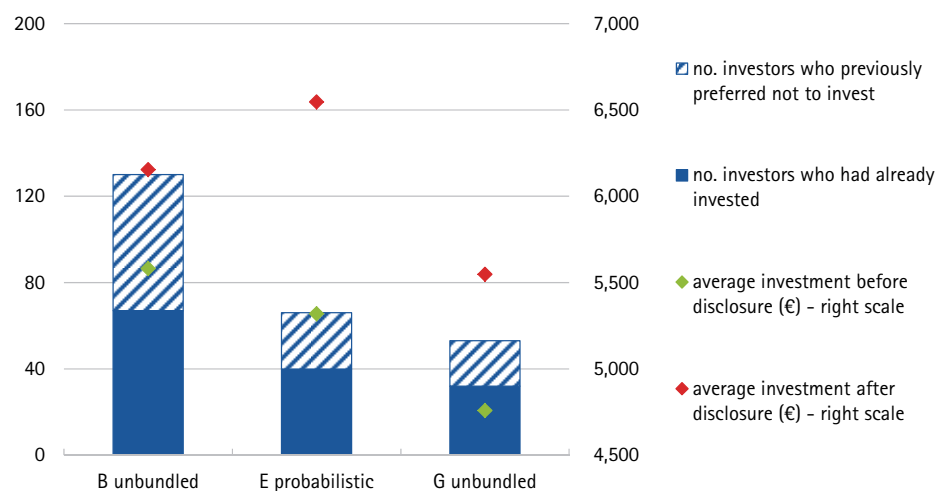
Note: Figure refers to the 'post-disclosure phase' (see questions 2.0.2 and 2.0.3, QA).

Figure a.6 – Distribution of response by invested amount

information sheet B

information sheet E

information sheet G

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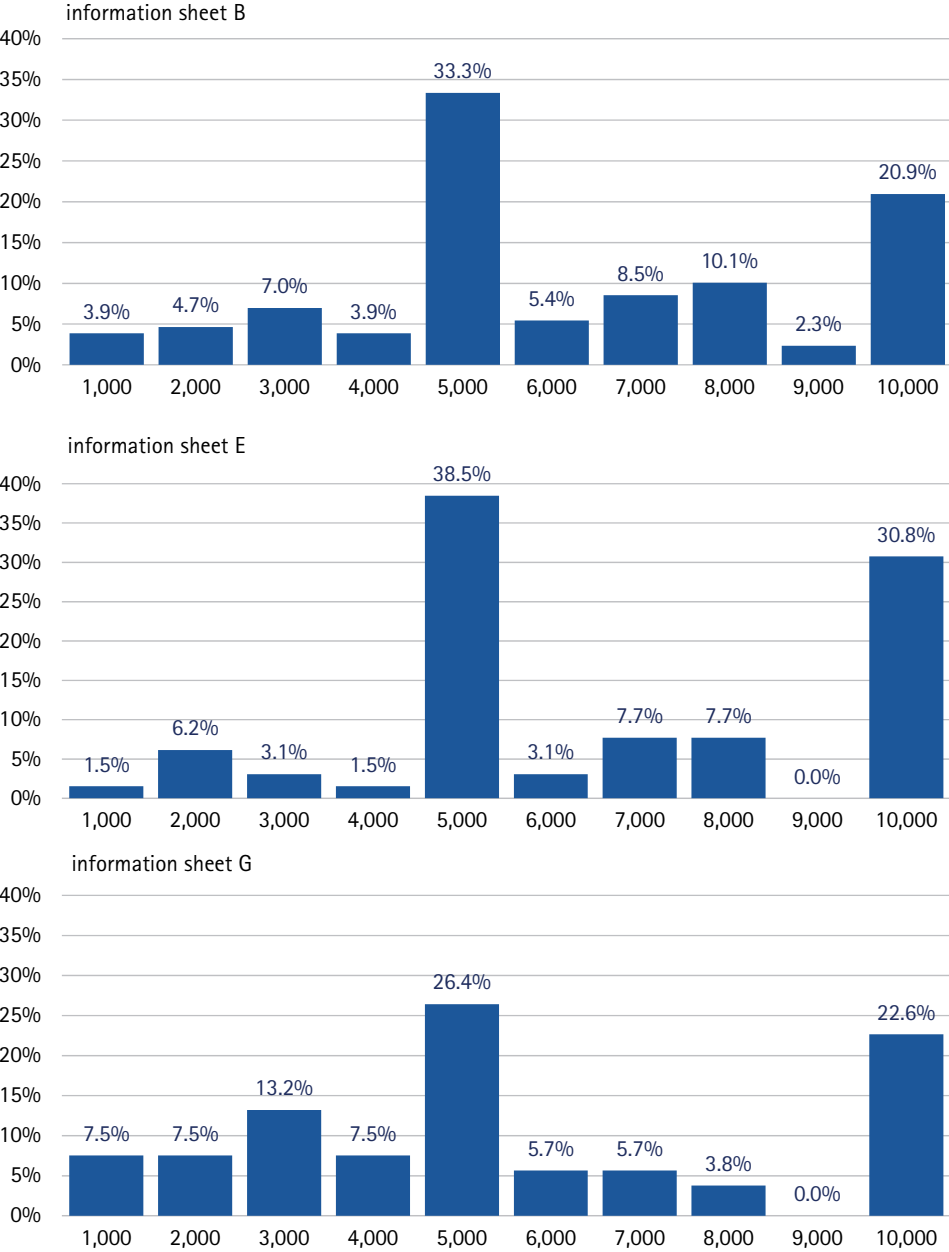
Estimation results

Table a.16– Perceived risk at a glance

variable	perceived risk				
	Mod.1	Mod.2	Mod.3	Mod.4	Mod.5
perceived complexity	positive for all but A and B				
sheet selection order			n.a.		
attention effect	n.a.	n.a.	n.a.	n.a.	+C, +E
personal traits					
disposition effect	n.a.	n.a.	n.a.	n.a.	-E, -G
volatility aversion	+E, +G	+E, +G	+E, +G	+E, +G	+E, +G, -F
loss aversion					-G
risk tolerance	-F; +G	-F	-F ; +G	-F ; +G	+G
individual characteristics					
optimism	+C	+C	+C		
impulsivity	-C	-C			
financial knowledge					
education					
knowledge	n.a.	n.a.	n.a.	n.a.	
gap between self-assessed and objective knowledge	+ E; -D	+ E; -D	+ E; -D	+E	+C, +E
interaction gap-man			n.a.		
frequency financial readings	n.a.				n.a.
investment habits					
frequent investment decisions					
being solicited to invest	+ E, +F; -G	-D, -G; +E	+ E; -G	+E	+C, +E, -D, -G
frequently delegated investment decisions					
trust in advice			n.a.		
socio-demo characteristics					
man	n.a.	n.a.	n.a.	n.a.	
age	+E	+E	+E	+E	
open ended contract employed	-E	+D; -E	-E	-E	-C, -E
being self-employed	+D; -E	+D; -E	+D; -E	-E	+D; -E
resident in the south	+C; -E				+C; -E
financial situation					
financial wealth	-D, -F	-D, -F	-D, -F	-F	-D, -F
income	-C	-C	-C	-C	+D
real estate	-C	-C	-C	-C	-C, -D
positive expectations on future income	-E, -G; +F	-E, -G; +F	-E, -G; +D, F	-E, -G; +F	-E, -G; +F
adverse events in the last 12 months					

Note: Blanks indicate that the coefficient is not statistically significant at 10% level of significance. The variable 'knowledge' indicates the percentage of correct answers to questions about basic notions.

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Table a.17– Perceived complexity at a glance

variable	perceived complexity				
	Mod.1	Mod.2	Mod.3	Mod.4	Mod.5
perceived complexity			n.a.		
sheet selection order			+ C, +E		
attention effect	n.a.	n.a.	n.a.	n.a.	-C, -D, -E, -G
personal traits					
disposition effect	n.a.	n.a.	+D; -G		+D
volatility aversion	-C, -D, -E	-D	-D		-D
loss aversion	+D, -G	+D, -G	+D, -G	-G	+D, -G
risk tolerance	-C, -D, -E, -G	-C, -D, -E	-D, -E	-E	-D, E
individual characteristics					
optimism			n.a.		
impulsivity			n.a.		
financial knowledge					
education			n.a.		
knowledge	+C, +D	+C, +D	+C	+C, +F	
gap between self-assessed and objective knowledge	+C; -E	+C	+C; -E	-E	n.a.
interaction gap-man	-C	-C	-C	-F	+D
frequency financial readings	n.a.				n.a.
investment habits					
frequent investment decisions	-D	-D	-D; +E	+E	-D
being solicited to invest			n.a.		
frequently delegated investment decisions			n.a.		
trust in advice	-C	-C, -G	-C, -G	-C	
socio–demo characteristics					
man	+C	+C	+C	+F; -G	n.a.
age	+D; -E	+D; -E	+D; -E	-E	+D
open ended contract employed	n.a.	n.a.	n.a.		n.a.
being self-employed		+C			+C
resident in the south	-C, -D; +F	-C, -D; +F	+F	-C; + F	-C
financial situation					
financial wealth	+C, +D, +F; -G	+C, +D, +F; -G	+C, +D,+F; -G	+C, +F; -G	+C, +D, +F; -G
income			n.a.		
real estate			n.a.		
positive expectations on future income			n.a.		
adverse events in the last 12 months	-C; +D, +E	-C; +D, +E	-C; +D, +E	-C; +E	-C; +D, +E

Note: Blanks indicate that the coefficient is not statistically significant at 10% level of significance. The variable 'knowledge' indicates the percentage of correct answers to the questions about basic notions in Models 1-2-5, whereas in Models 3-4 is the dummy identifying 'high financial literate' individuals (i.e. individuals with a percentage of correct answers above the median of the distribution).

Table a.18– Perceived risk in the multilogit econometric specification

variable	probability of indecision	probability of equal risk
perceived complexity	–D, +E, +F,+G	+F,+G
attention effect	–B,–E,–F,–G	
personal traits		
disposition effect	+E, –G	
volatility aversion	–F,–G	
loss tolerance	–A,–B–,–C	
risk tolerance	–A,–B,–C,–F,–G	–F,–G
individual characteristics		
optimism	–A,–B,–C,–F,–G	
impulsivity		
financial knowledge		
knowledge	–A,–B,–C	
gap between self-assessed and objective knowledge	–A,–B,–C,–G,–F	
investment habits		
frequent investment decisions		+D,+E
being solicited to invest		
frequently delegated investment decisions	–D,–E	+F,+G
socio–demo characteristics		
man		
age		
open ended contract employed	+F,+G	
being self-employed		
resident in the south		
financial situation		
financial wealth	+D,+E	
income	–D,–E,+A,+B,+C	+F,+G
real estate	+A,+B,+C	
positive expectations on future income		
adverse events in the last 12 months		

Note: Blanks indicate that the coefficient is not statistically significant at 10% level of significance.

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Table a.19– Correlation among financial literacy proxies

	bachelor's or post-graduate degree	frequency of financial readings	frequency of correct answers to financial education questions	principal component	frequency of financial decisions
bachelor's or post-graduate degree	1				
frequency of financial readings	0.2**	1			
frequency of correct answers to financial education questions	0.3**	0.3**	1		
principal component	0.5**	0.5**	0.9**	1	
frequency of financial decisions	0.1	0.1**	0.3**	0.3**	1

Note: *** indicates that the correlation coefficient is significant at 5%. The first principal component is estimated by taking into consideration simultaneously the frequency of correct answers to financial education questions, the frequency of financial readings and if interviewees have got a bachelor's or post-graduate degree.

Table a.20– Correlation among perceived risk, perceived complexity, investment choices and financial literacy

	complexity	comprehensibility	perceived risk	investment choice
frequency of correct answers to financial education questions				
A	-0.1	n.a.	-0.05	-0.2*
B	-0.04	n.a.	-0.1	-0.1
C	+0.04	n.a.	+0.2	-0.1
D	-0.06	n.a.	0.1	0.001
E	-0.05	n.a.	-0.1	0.004
F	n.a.	-0.1	+0.03	+0.2*
G	n.a.	+0.1	+0.06	0.1
earned a bachelor's or post-graduate degree				
A	-0.05	n.a.	-0.1	-0.2**
B	+0.02	n.a.	-0.1	-0.1
C	+0.05	n.a.	+0.1	-0.2**
D	-0.06	n.a.	+0.02	-0.1
E	+0.01	n.a.	-0.1	-0.1**
F	n.a.	-0.1	+0.1	+0.01
G	n.a.	+0.1**	-0.1	+0.1
frequency of financial readings				
A	-0.1**	n.a.		-0.02
B	+0.1	n.a.		-0.02
C	-0.04	n.a.		-0.04
D	-0.1	n.a.		-0.004
E	-0.1**	n.a.		+0.1
F	n.a.	-0.1		+0.3**
G	n.a.	+0.1		+0.3**

Note: ** indicates that the correlation coefficient is significant at 5%.

Table a.21– Investment choices at a glance

variable	Mod.1i	Mod.2i	Mod.3i	Mod.4i	Mod.5i	Mod.6i
perceived complexity	-B,-D,-E,-F,-G	-B,-D,-E,-F,-G	-B,-D,-E,-F,-G	-B,-D,-E,-F,-G	-B,-D,-E,-F,-G	-A,-B,-C,-D,-E,-F, -G
attention effect	+B,+C,+G	+B,+C,+G	+B,+C,+G	+B,+C,+G	+B,+C,+G	+B,+C,+G
personal traits						
disposition effect	+E	+E	+E	+E		+E
volatility aversion	-D	-D	-D	-D	-D	-D
loss aversion						-F
risk tolerance	+C,+D,+F	+C,+D,+F	+C,+D,+F	+C,+D,+F	+C,+D,+F	+C,+D,+F,+G
individual characteristics						
optimism	-A	-A	-A	-A	-A	-A,-B
impulsivity						-F
financial knowledge						
education	-A,-C,-E	-A,-C,-E	-A,-C,-E	-A,-C,-E	-C,-E	
high knowledge	-A,-C	-A,-C	-A,-C	-A,-C	-A,-C,-D	
synthetic indicator (first principal component)						-A,-C,-E
gap between self-assessed and objective	-E	-E	-E	-E	-E	+G
frequency financial readings	+F,+G	+F,+G	+F,+G	+F,+G	+F,+G	
investment habits						
frequent investment decisions	+C	+C	+C	+C	+C	+C
being solicited to invest	+A,+B	+A,+B	+A,+B	+A,+B	+A,+B	+A,+B
frequently delegated investment decisions						-C
socio–demo characteristics						
man						
age						+A
being married /cohabitant						
being self-employed	+C,+E	+C,+E	+C,+E	+C	+C,+E	
resident in the north		-A	-A	-A	-A	-A
resident in the south	-B,-G	-B,-G	-B	-B,-G	-B,-G	-B
financial situation						
financial wealth	-C,-F,-G	-C,-F,-G	-C,-F,-G	-C,-F,-G	-C,-F,-G	-C,-F
income	+E	+E	+E	+E	+E	-A,+E
real estate						-E
positive expectations on future income	+A,+E,+G	+A,+E,+G	+A,+E,+G	+A,+E,+G	+A,+E,+G	+A,+E,+G
adverse events in the last 12 months	-D	-D	-D	-D		
cover ratio between income and expenses	-A	-A	-A	-A	-A	-D
having a pension fund						

Note: Model 1i, Model 2i, Model 3i, Model 4i, Model 5i, specifications contain respectively Model 1, Model 2, Model 3, Model 4, Model 5 complexity equations (Table a.17). Model 6i specification contains Model 5 complexity equation. In the investment choice equation of Model 6i, financial knowledge is measured by first principal component (estimated on the answers to the questions about basic notions and on the variables education and frequency financial readings). The 'high knowledge' dummy variable is equal to 1, when the percentage of correct answers to questions about basic notions is above the sample median. Blanks indicate that the coefficient is not statistically significant at 10% level of significance.

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