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A Behavioral Perspective on Sustainable Finance: Exploratory Research on the Drivers of Sustainable Investing

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Abstract

This thesis seeks to investigate the financial and non-financial drivers of sustainable investing. As a starting point, the study proposes that the traditional financial view of investors' behavior, with its focus on risk-return tradeoff between to explain investment choices, fails to fully explain sustainable investing. Taking a behavioral finance approach, the study acknowledges the role of personal characteristics, socio-cultural factors, and possible irrationalities in driving sustainable investing. Therefore, exploratory research is performed on primary data to identify the drivers of sustainable investing.

The analysis unfolds at the experimental and empirical level. At the experimental level, conjoint analysis is applied to the data from a choice survey to identify the relative importance of financial (risk, expected returns) and non-financial (ESG rating, fund objective) attributes for the investment choice. Results from this analysis reveal that non-financial attributes carry a relative importance of 38% in the investment decision. At the empirical level, first factor analysis is applied to data on investor motives to extrapolate overarching drivers of sustainable investing; then, multiple regression analysis tests the relationship between the drivers and the proportion of sustainable assets in investors' portfolios. Four main drivers are identified - self-expression, financial, social-context, and opportunistic – with the first three displaying a positive and statistically significant relationship with the dependent variable.

Thanks to the perspective of behavioral finance and the versatility of exploratory research, this study uncovers the multifaceted drivers behind sustainable investing.

Table of Contents

List of Tables

List of Figures

1 Introduction

Recent years have witnessed rising pressure on the financial system to step in to address social and environmental challenges. This resulted not only from mounting scientific evidence and governmental action regarding these phenomena, but also from increasing interest by financial market participants, ever more aware of the link between their investments and social, environmental and governance aspects.

The intensification of this shared conscience in what is universally knowns as ESG factors (environmental, social, governance) has particularly manifested itself in the dramatic growth of sustainable investing over the last decades (as reported, among others, by the Global Sustainable Investment Alliance and Morningstar). Sustainable investing is here considered as any investment approach that integrates ESG consideration in the analysis and selection process of securities (GSIA, 2021). While some have welcomed this shift as a sign that investors "do care" about more than financial returns, and that it is possible to "do well while doing good", others are more skeptical of the effects that sustainable investing can have on social and environmental issues, focusing rather on its impact on investors' portfolios. In fact, despite its growth and positive perception, sustainable finance has not been conclusively assessed from the perspective of traditional financial models. Mainstream financial theories point to the fact that sustainable investing strategies automatically entail an under-diversification of the portfolio and potentially lead to lower risk-adjusted returns, whether by excluding certain securities or industries, or by over-including asset that follow a specific theme. According to traditional financial models, this behavior is irrational on the side of return-maximizer investors. However, these theoretical assumptions are not definitively supported by empirical evidence, which shows sustained growth in sustainable investing and mixed results on financial performance.

This study posits that traditional financial models cannot fully account for sustainable investing, as their focus on risk-return maximization misses out on other relevant components that do affect investors' choices. Thus, behavioral finance is proposed as a framework to better account for the multifaceted aspects that come into play when investors engage in sustainable investing – i.e., personal motivations, social context, irrationalities, etc.

Recognizing the lack of a single theoretical model fully applicable to sustainable investing and consistent with the behavioral finance approach, this study undertakes an exploratory research to investigate what are the financial and non-financial drivers of sustainable investing.

In particular, the research proposes two levels at which sustainability considerations come into play in investments: at the general level, by shaping investors' motives and attitudes towards sustainable investing; and at the specific moment of the investment choice, i.e., when investors evaluate possible investment options.

To fully analyze how financial and non-financial factors interplay at the general and specific levels of investments process, the research involves both experimental and empirical analysis. The experimental part, carried out via a conjoint choice experiment, sheds light on how people make multidimensional choices and evaluate objects when faced with a hypothetical investment decision. The empirical part investigates the reasons leading people to choose sustainable investments, in terms of their attitudes toward sustainable investing, their investment strategies, and general behavioral characteristics.

The analysis unfolds in two main parts. First, a choice survey is designed to obtain primary data on investor choices, behavior, and attitudes toward sustainable investing. The target population are retail and professional investors based in Europe, who are reached via purposive and snowball sampling techniques to ensure a diverse while and high-quality sample. Then, a set of analytical techniques is applied to the different type of data. Conjoint Analysis is applied to the results from the conjoint experiment, to investigate the relative importance of non-financial attributes for the investment choice. Factor Analysis and a Multiple Regression Model are applied to empirical survey data: the former is used to extrapolate the main drivers behind sustainable investing, highlighting the latent tendencies behind investors' motives; the latter tests the relationship between the drivers and the proportion of sustainable assets in investors' portfolio.

The results of the research provide an informative picture of the different levels at which sustainability considerations come into play in the investment process. At the specific level of the investment choice, conjoint analysis shows that non-financial attributes (ESG rating and Fund objective) carry a relative importance of 38% for the investment decision. This proportion is the same between retail and professional investors, and is not affected by cognitive tendencies or other behavioral aspects (e.g., the order in which the choice experiment appears in the survey). This result proves that sustainability attributes do enter in investors' investment choices and carry a relevant weight for the final investment decision.

At the general level of investment motives, Factor analysis extrapolates four factors that summarize different tendencies at play for investors to engage in sustainable investing: a self-expression driver, a financial driver, a social context driver, and an opportunistic driver. These findings are consistent with prior studies in behavioral finance on the importance of expressive tendencies in shaping investors behavior, and they are coherent with the strong social nature of sustainable investing, strictly related to regulatory and social pressure. The opportunistic factor shows that there are also possible biases, irrational tendencies, or misaligned incentives for investors to engage in sustainable investing. Finally, the existence of a financial factor reflects the acceptance of ESG information as a strategic parameter to include in investment decisions, not at odds with other characteristics of the investment object. This last driver is visible in industry's surveys and reports, which highlight how ESG considerations are now generally included by investors, portfolio managers, advisors, and clients alike in their investment processes (e.g., Bloomberg, 2021).

Lastly, the results from the multivariate regression confirm that there is a positive and statistically significant relationship between the financial driver and sustainable investing, while this is only partly true for the self-expression and social context drivers (e.g., the self-expression factor is positively and significantly related to sustainable investing only when other behavioral variables are considered). The opportunistic factor never seems to have a statistically significant relationship with the dependent variable. These relationships are robust under different model specifications and with a relatively small sample size, pointing to a consistent tendency in the data.

Overall, the study furthers the understanding of the dynamics at play in sustainable investing, contributing to a growing literature body that aims to challenge traditional financial theories. A key contribution of this research is the identification of four underlying tendencies behind sustainable investing, suggesting new layers to analyze the phenomenon that go beyond the usual focus on financial performance of sustainable investing, or the impact-return tradeoff. Moreover, the results from the multiple regression analysis point to consistent tendencies in data. The results offer actionable insights for further academic research and for financial practitioners. From a methodological point of view, this study demonstrates the usefulness of different statistical methods to investigate a timely issue. In particular, it highlights the use of experimental analysis to gauge the relative importance of investment characteristics. It also shows the potentiality of behavioral finance to reconcile theoretical assumption with empirical evidence.

The rest of this thesis is organized as follows. The second chapter offers an overview of sustainable investing and assesses its place under the frameworks of traditional and behavioral finance. The third chapter outlines the exploratory research, focusing on the design of the choice survey and the analytical methods implemented. The results of the analyses are presented in chapter four, and they are discussed from a practical and academic perspective in chapter five. Finally, chapter six concludes.

2 Literature Review

This section introduces sustainable investing and presents its characteristics in terms of historical development and current size. The topic is then assessed from the perspectives of traditional and behavioral finance. It emerges that the latter is better positioned to account for the multifaceted aspects that are at play in sustainable investing. By applying the perspective of behavioral finance, this study seeks to understand and reconcile the contradiction between traditional financial theory and the empirical reality of sustainable investing.

2.1 Background: Sustainable Investing

Sustainable Finance encompasses a large and rapidly growing set of products, strategies and actors that seek to integrate non-financial issues - mostly in the form of ESG factors, but also ethical or religious concerns - into the otherwise strictly financial-driven processes of capital markets (Sandberg et al., 2009, pag 1). Within sustainable finance, Sustainable Investing (SI) is defined as a long-term oriented investment approach that integrates ESG factors in the research, analysis and selection process of securities within an investment portfolio (GSIA, 2021). This definition aims to capture different practices and terminologies through which sustainable investing is declined in practical terms, often reflecting geographical and historical developments. Consolidating a general understanding on what sustainable investing entails, the Global Sustainable Investing Alliance (GSIA) identifies seven sustainable investing practices that are commonly accepted and used in the investment industry: ESG integration, Corporate Engagement and Shareholder Action, Norm-based Screening, Negative/Exclusionary Screening, Positive/Best-in-class screening, Sustainability or Thematic investing, Impact Investing (detailed in Table A1, Appendix). All these strategies integrate ESG considerations to various degrees and with different financial and non-financial aims. For example, ESG integration can be seen as a traditional financial analysis with the inclusion of ESG factors in the risk assessment, whereas Impact Investments explicitly pursue a positive social and environmental impact, alongside financial returns (Trelstad, 2016).

The heterogeneity of SI strategies reflects underlying historical evolution, spanning from the investment of religious communities in North America, who shunned the so-called “sin-stocks” for ethical reasons, to the awareness of the concept of Corporate Social Responsibility in the late 1960s (Trelstad, 2016). Over the decades, the effects that ESG management had on companies’ financial results started to be noticed and investigated academically (Dunn et al., 2018). The role of financial markets on global issues started to

be questioned, especially after the Global Financial Crisis of 2008; this led to the creation of principles and coalitions to promote a more responsible approach to finance, such as the creation of the Principle of Responsible Investing in 2006 and the Global Impact Investing Network in 2009. The rise of sustainable finance was accompanied by a lively debate in academic circles and financial institutions over the role of sustainability in financial matters (Knoll, 2002; Sandberg et al., 2009).

Even though the conceptual and practical debate over the "doing well while doing good" is far from being resolved, there is nowadays widespread awareness and implementation of ESG considerations in financial markets. The current size of sustainable investing is exemplified by some key measures: the asset under management in sustainable investing and the inflow of capital in sustainable assets.

2.1.1. Key figures of Sustainable Investing

According to the latest global review[1] by the GSIA, assets in sustainable investing[2] reached USD 35.3 trillion at end of 2019, equivalent to 35.9% of total professionally managed Assets Under Management (AUM) (GSIA, 2021, pag 9). They represent a growth of 15% over the period 2018-20, and of 55% over the period 2016-20 (*ibid*). The trend shows that SI is growing in 4 of the 5 world regions investigated by GSIA (United States, Canada, Australia and New Zealand, and Japan), with the exception of Europe, in which the AUM in sustainable assets fell due to change in definition and methodology under EU legislation. Based on data from GSIA and projection by Bloomberg, sustainable assets are on track to reach, and exceed, USD 50 tn by 2025 (Bloomberg Intelligence, 2021).

A consistent growth of sustainable investing is also recorded by the increase of the signatories to the Principle of Responsible Investments (PRI), an investor initiative launched by UNEP FI in partnership with UN Global Compact in 2006. The PRI is the largest independent organization grouping proponents and practitioners of responsible investments. Starting with 63 signatories in 2006, the number grew to 3,826 in 2021, including both investment managers and asset owners that represent USD 121 tn in total AUM (PRI Annual Report, 2021). This is evidence of the institutional acceptance and widespread outreach of responsible investment practices.

[1] The GSIA focuses on five geographical markets - EU, USA, Canada, Australasia (AUS and NZ), and Japan – which are the main regions where sustainable investing is developed and consistently reported upon.

[2] GSIA includes as "Sustainable Investing Assets" all assets managed through one of the seven SI strategies, accounting for double-counting where more than one strategy is applied to the same assets

The size of capital inflows into sustainable funds exemplifies the strong and dynamic growth of sustainable investing. Morningstar's quarterly data shows that assets in global sustainable funds[3] reached USD 2.24 trillion at the end of the second quarter of 2021, benefitting from net inflows of USD 139.2 billion over the period (Morningstar, 2021a). Over the previous quarter, sustainable funds received an all-time high of USD 184 bn inflows (*ibid*). In terms of products, the increased demand from investors was met by the launch of new sustainability funds issued by providers (177 new products launched in Q2 2021 alone) or by traditional funds repurposed into sustainable ones, which brought the global number of sustainable funds to 4,929 (*ibid*).

Data from Morningstar also helps to display the resilience of sustainable assets over the pandemic. In 2020, around USD 350 bn flew into ESG funds, bringing total ESG assets to USD 1.65 tn at end of the year (Morningstar, 2021b). During the sell-off as the start of the pandemic, ESG assets proved incredibly resilient: investors poured $45.7 bn into sustainable funds compared with global outflows of USD 384.7 bn from overall fun universe (*ibid*). While it represented a 12% dip from the previous quarter, it was a better performance than the 18% decline registered by the overall fund universe (*ibid*).

2.2 Theoretical frameworks

While the evidence just presented confirms the growth of sustainable investing, the trend is difficult to reconcile with the traditional paradigm of financial markets for two main reasons. First, from the theoretical perspective, sustainable investing implies the creation of sub-optimal portfolios according to two core theories of modern finance: Modern Portfolio Theory (Markowiz, 1952) and Capital Asset Pricing Model (Sharpe, 1964). Second, empirical data reveal that there is no conclusive evidence about the financial performance of sustainable assets (among others, Yu et al., 2020). Some analysts recently suggested that the positive performance over recent years and during the outburst of the COVID-19 pandemic is due to the net inflows of capital into sustainable assets, rather than underlying asset fundamentals (Dillian, 2020; Beer, 2021). They question the financial sustainability of ESG assets and SI strategies, introducing the possibility that their grow stems from financial speculation and may give rise to a financial bubble. This raises a conceptual and practical puzzle, opening an opportunity for behavioral finance to assess SI.

[3] Sustainable funds considered in the assessment are open-end funds and exchange-traded funds claiming to have a sustainability objective and/or using binding ESG criteria for the investment selection (Morningstar, 2021a, pag 1)

2.2.1 Traditional perspective: risk-return tradeoff, diversification, and empirical assessment of SI

Traditional financial theory is based on neoclassical economic models, according to which human beings are rational decision-makers who seek to maximize their utility according to constraints and available information. The behavior of rational, utility-maximizer agents in uncertain situations is modeled by Expected Utility Theory (EUT), whereby rational agents are able to rank alternatives and choose the option that brings them highest expected utility, i.e., the probability-weighted value of possible outcomes (Von Neumann and Morgensten, 1944). EUT also shows that individuals are risk-averse, but they are willing to assume risks if adequately compensated.

According to traditional financial theories, investment decisions are driven by the tradeoff between an asset's level of risk and its expected return (Markowitz, 1952). The goal of investors is to obtain the highest expected returns while bearing the least possible risks, and they expect to be compensated with larger expected returns as the level of risk of the asset increases. The risk in financial markets is of two types: specific risk, related to the volatility of each asset; and systemic, inherent to the volatility of the whole market (Barnett and Salomon, 2006). According to Modern Portfolio Theory, investors can form optimal portfolios thanks to diversification, i.e. by combining securities with low level of covariances among themselves, so to diversify away specific risks (Markowitz, 1952). As specific risks can be managed by picking a diversified portfolio, the market prices the risk that cannot be eliminated, i.e., systematic risk. Therefore, investors may obtain a higher expected return rate only by incurring in additional risk, as the Capital Asset Pricing Model demonstrates (Sharpe, 1964). Conversely, investors will not be compensated for taking on diversifiable risk unrelated to market movements.

Following the traditional paradigm, these conditions are not realized in Sustainable Investing. By construction, SI strategies entail a reduction of the potential investment universe, whether by applying screens (positive or negative), or by selecting assets belonging to the same categories (e.g., thematic investing). Theoretically, then, the inclusion of ESG aspects would lead sustainable investors to form under-diversified portfolios, exposing themselves to more specific risks and generating a lower level of expected returns compared to a traditional, fully diversified portfolio (Kurtz, 1997).

Therefore, traditional financial theory maintains that sustainable investing leads to sub-optimal portfolios that rational, return-maximizer investors would not want to hold. Empirically, the performance of sustainable assets and portfolios has not been conclusively assessed. Various scholars have investigated the topic, reporting findings that support both sides of the sustainable investing argument.

Detractors argue that sustainable investors bear losses due to the under-diversification of their portfolio (Kurtz, 1997), increased portfolio costs (Geczy et al., 2003), and by excluding asset classes that generate positive returns (e.g., as proven by Hong et al. in the cases of investments in the so-called "sin-stocks", 2009). Proponents of sustainable investing highlight instead improved financial returns thanks to the integration of material ESG factors that are informative of relevant risks for the assets (Dunn et al., 2018). Additionally, studies fund that including sustainability considerations contributes positively to returns under stakeholder theory (Orlitzky et al., 2003) and creates value for investors over the longer term (Starks et al., 2017). Recently, academics have set to summarize prior research, showing that there is overall evidence of a non-negative relation between sustainable investing and financial performance. In general, they found proof that while sustainable funds are less exposed to some type of risk, they do not show evidence of superior financial returns (Friede et al., 2015; Yue et al., 2020)

While elements of risk management and financial performance do play a role in existence of sustainable investing, neither theory nor empirical studies related to traditional financial models seem to properly account for SI in an exhaustive manner.

2.2.2 Behavioral perspective: exploring a multi-faceted paradigm

Behavioral finance is an approach to the study of financial markets and actors that emerged following the difficulty to reconcile traditional theory with empirical evidence (Barberis et al., 2002). By applying theoretical concepts and empirical evidence from psychology, cognitive-neurology, and social sciences to finance, behavioral finance seeks to understand how and why people make decisions, and how they deviate from the rational behavior expected under traditional financial model (Pompian et al, 2006).

In particular, Behavioral Finance argues that there are cases in which agents make choices that are incompatible with Expected Utility Theory, displaying bounded rather than perfect rationality. (Barberis et al., 2002). The concept of bounded rationality contrasts the idea that individuals are rational, utility-maximizers agent. According to this notion, individuals have limited, rather than perfect information, and they display a satisficing behavior: rather than optimizing according to known constraints, they choose the best course of action based on the limited set of information and resources at hand (Simon, 1987). Under bounded rationality, optimal decision making is hampered by cognitive constraints and information availability, which opens opportunity for heuristics, emotions, and biases to steer decisions and behaviors. In fact, Behavioral Finance recognizes that individuals are characterized by persistent biases when making decisions, often driven by emotions and heuristics (i.e., simplified decision-making processes) (Baker et al., 2014). This is clearly outlined under Prospect Theory, a model of decision-making under risk developed by Thaler and Kahneman (1973) which

recognizes that when individuals make decisions in situation of uncertainty, their process is affected by simplified decision-making processes and are susceptible to cognitive biases and emotions. Biases are irrational assumptions or beliefs that affect the ability to make decisions based on facts and evidence (Hayes et al,. n.d.). Some of the most common biases in investing are related to the concept of Representativeness, which leads to a probability judgement error where one outcome is estimated more (or less) likely than it is.

These concepts are relevant when assessing sustainable investing behavior, as investors tend to display bounded rationality when faced with imperfect ESG information that is often complex, unclear and non-standardized. When it comes to sustainability, and its integration in financial analysis, the lack of a clear definition and solid data negatively affect investors decision-making, increasing reliance on heuristics and emotions to guide the choice.

Additionally, biases such as Representativeness, Saliency, and Availability are particularly relevant for SI, as environmental and social issues are highly featured in public discourses and across the media. Catastrophic events related to environmental damages and/or human rights violations generate strong images which attract attention and remain readily available in the mind; similarly, instances of positive performance of ESG investments reverberate strongly in the media, keeping SI in the spotlight. This promote the relevance of ESG aspects in investment decisions, and may increase the importance given to sustainability considerations in the investment choice.

Finally, ESG issues tend to be emotionally charged, which may lead investors to disproportionally account for them in their investments. In fact, a relevant aspect at play in sustainable investing is affect, which happens when positive or negative perceptions steer the investment choice. Affect is a relevant theme in investing and enters often in studies of financial markets under the term of *sentiment* (e.g., Baker and Wurgler, 2007). Its effect in the case of SI were studied by Brøgger and Kronies (2020), who found evidence of a positive sustainability sentiment leading to abnormal returns in ESG assets and related growth of the sustainable investing space.

The role of affect is integrated in a structured approach to portfolio creation in the Behavioral Asset Pricing Model (BAPM) (Shefrin and Statman, 2010). In this model, the authors recognize the effect of non-traditional factors in impacting expected returns, such as the role of emotions and personal evaluation of an asset. In particular, they use the case of Socially Responsible Investing (another term for SI) to show how the positive affect associated to these investments has an immediate effect of an increase asset prices through the expectations that investors form about the quality of the asset (Statman et al, 2008).

To summarize, by accounting for more aspects than the risk-return tradeoff to impact the investment decision, behavioral finance is able to better contextualize and make sense of sustainable investing. In particular, given the characteristics of ESG factors, sustainable investing appears as a fertile ground for bounded rationality, cognitive processes, emotions, and biases to affect the investment decision. The next section outlines empirical evidence of such tendencies in investor behavior.

2.3 Why investors invest?

Various studies have investigated the reasons leading investors to invest in general, and in sustainable investing in particular. At the general level, Statman suggest that investors invest for three main reasons: utilitarian, expressive, and emotional (Statman, 2004; Statman, 2010). He argues that investors do not only seek utilitarian benefits in the form of low risk and high expected returns; they also seek expressive benefits that allow them to identify and convey values, both to themselves and others, as role of expressive benefits add meaning to the products and affect the decisions of financial participants (Statman, 2004).

This is the case particularly for sustainable investing, as multiple authors found evidence of financial and non-financial motives to influence SI decisions. Beal et al. (2015) point to a mix of financial returns, psychic benefits, and the contribution to social change as motives for investors to engage in SI. Similarly, Selicikova (2020) stresses the role of cognitive, psychic and emotional factors in affecting the decisions to hold sustainable assets. These overarching tendencies are also explored at more focused level – for example, Mak & Ip (2017) performed an exploratory study in of investors' behavior and found statistically significant results of the effect of psychological, demographic and sociological attributes on the investment strategy on Chinese individual Investors. Finally, the social pressure, the impact of regulation, and demand by clients is also identified as a driver of sustainable investing (Cao et al, 2019).

To summarize, scholars find multiple and varied factors that have a relation with investor behavior in sustainable investing, such as motivational, social, psychological, and cognitive aspects. Considering SI under the lenses of behavioral finance allows to account for such factors and explain empirical evidence, thus overcoming the traditional view of sustainable investing as an "irrational" strategy.

Yet, even if behavioral finance allows for non-traditional financial factors to potentially play a role in sustainable investing, there is no conclusive research over the characteristics of such factors, how they interplay with traditional financial characteristics, and their possible relationship with realized sustainable investing strategy.

There are two level of analysis that emerge when considering SI from behavioral perspective: first, the way investors interact with the information – studied via cognitive models of investor-decision making (e.g., Gonzales, 2005; Lowellen al., 2007); second, the set of different tendencies and motives that lead investors to SI (e.g., expressive, social, emotional). This suggest that an analysis of SI drivers should account for both the levels in order to comprehensively understand possible financial and non-financial drivers behind the phenomenon. Therefore, this analysis seeks to contribute to the dynamic debate by applying exploratory research to identify possible drivers of sustainable investing at the specific and general levels.

3 Methodology

This thesis adopts the perspective of behavioral finance to explore why investors invest sustainably. In particular, the research question focuses on what are the financial and non-financial drivers in sustainable investing. This chapter outlines the research question and related hypotheses, and it presents the exploratory research carried out to answer them. A choice survey is identified as the best method to gather primary data, and its construction is presented alongside the distribution method. Finally, the chapter presents the analytical methods that will be performed: conjoint analysis, factor analysis, and multiple regression analysis.

3.1 Research question, hypotheses, research method

The research question seeks to **identify what are the financial and non-financial drivers in sustainable investing**. A driver is a key factor that has an influence on the outcome of interest – in this case, sustainable investing (Hayes, 2020). The term "financial" refers to elements of traditional financial theory such as risk, return, portfolio diversification, etc.; while the term "non-financial" refers to those elements not included in traditional financial theory, such as personal values, social pressure, clients' demand. In particular, the following hypotheses will be tested:

- *Hp1. When faced with an investment choice between different investments, both financial and non-financial attributes are relevant for the investment decision.*
- *Hp2. There is a set on non-financial drivers leading investors to engage in sustainable investing, alongside a traditional financial driver. In particular:*
    - *Hp2.1. A self-expression driver has a positive relation with SI*
    - *Hp2.2. A Social context driver has a positive relation with SI*
    - *H3.3. A behavioral-biases driver has a positive relation with SI*

This first hypothesis refers to the specific moment of the investment decision, proposing that both financial and non-financial attributes carry a weight for the investment decision, and it seeks to uncover their relative importance for the choice. The second hypothesis refers to the general level of investor motives and it posits that a set of non-financial drivers is identifiable for sustainable investing. The sub-hypotheses specify that such drivers have a positive relation with a measure of realized sustainable investing, which in this case is the percentage of the investor's portfolio managed via SI strategies.

Exploratory research is implemented to answer the research question and related hypotheses. In the social sciences, exploratory research is intended as a "broad-ranging, purposive, systematic undertaking" which aims to extend the knowledge and understanding of a field of research in light of complex real-world cases (Stebbins, 2001, pag 3). This research method is particularly well-suited to investigate an area of social or psychological life that has evolved over time, with the aim to discover something new and interesting (Swedberg, 2018). Exploratory research is often used in behavioral finance (e.g., Sahi et al., 2013; Mak & Ip, 2017) to identify tendencies in investor behavior without imposing a pre-determined structure, reason why it is considered appropriate for this study.

In practical terms, the exploratory research is carried out via two main steps: first, a choice survey is designed to gather primary data from the population of interest; second, the data is analyzed via a set of statistical methods. The target population are European retail and professional investors, i.e., any individual who invests her money, or invests on behalf of clients, in the financial market, whether on her own or within an institutional setting. The rest of the chapter presents each step, outlining the survey design and the analytical techniques applied to the data.

3.2 Research design

3.2.1 Data gathering: a survey with choice experiment

As the data needed to answer the research question and test the hypotheses is not available through existing sources, a survey is designed to collect primary data from the population of interest. Surveys are useful in social sciences to measure attitudes, opinion, and behaviors because they ask direct questions to respondents, rather than inferring them from statistical associations between proxy variables (Dichev et al., 2013). Surveys have been extensively used to investigate drivers of investor behavior in sustainable finance, both by academic researchers (among others, Lewellen et al., 1977; Beal et al., 2005; Amel-Zadeh & Serafeim, 2018) and industry participants alike (recent investors survey on SI by BNP Paribas, 2021; Natixis Asset Management, 2020).

The survey designed for this study includes two main parts: a choice experiment, and a standard questionnaire with qualitative and quantitative questions in different formats (multiple and single choice, Likert-scale questions, etc.). Choice experiments, or stated preference experiments (Hainmueller et al., 2015), present respondents with a choice between two or more hypothetical alternative scenarios described in terms of a bundle of attributes. Respondents are asked to state their preference over the scenarios by ranking the various options or by selecting the option they prefer over the other(s) (Adamowicz et al., 1998). Usually, respondents are presented with the choice task

multiple time, with different scenarios varying along different levels of the attributes. Choice experiments closely resemble real-world decisions and allow to elicit preferences for complex multidimensional objects, from which information on how individuals value different attributes can be inferred (Hall et al., 2004). Individual preferences for attributes, and the relative importance of attributes for the specific choice or rating, are estimated via conjoint analysis (presented in section 3.3.1 below).

Including a choice experiment in the survey allows to record how investors choose when considering investment options that vary along both financial and sustainability parameters. It also grounds the analysis for two main reasons: first, it is consistent with the theoretical field of analysis within which this study takes place (i.e., behavioral finance); second, it allows to overcome some of the limitations of using only post-hoc methods - such as questionnaires and interviews - in analyzing human behaviors and investor decision-making.

The first point reflects the fact that studies of human behavior in the social sciences are often carried out via laboratory experiments, as they allow to scrutinize behavior and decision-making processes by controlling the environment in which respondents act, focusing the attention on key variables of interest (Smith, 1976). The exogenous variation of variables in an experimental setting provides researchers a reliable way to make predictive inferences about respondents' behavior that can be tested and verified in subsequent experiments, overall enhancing knowledge about human behavior (Fehr et al., 2003). As this analysis assumes a behavioral approach and investigates investors' decision making, it is deemed suitable to include an experiment as part of the research.

The second point argues that, while post-hoc methods allow to examine motives, attitudes, and past behaviors, they are self-reported accounts of decisions made in the past (Shepherd & Zacharakis, 1999). The problem with retrospective data is that respondents may lack information on the event of interest, and they may suffer from cognitive and perceptual limitation in retrieving it (Krosnick, 1991). Additionally, in the case of sustainability information, respondents have a higher likelihood to suffer from social desirability bias, which leads them to report untruthfully on their actions and motivations to fulfil some expectations or reflect a desired behavior (Krosnick, 1999). Finally, respondents are likely to lack sufficient insights into their own decision-making process to report correctly on it (Bertrand & Mullainathan, 2001). Overall, this may lead to satisficing behavior, whereby respondents adopt shortcuts to limit cognitive demands when answering questionnaires, such as selecting an answer depending on its position on the paper or screen, agreeing with the status quo, or providing motivations that are not reflective of their real attitudes (Krosnick, 1991). This lowers the quality of the data and hinders the analytical power of the study.

Contrary to the above, choice experiments are concurrent techniques that collect data in the moment in which the decision is made, decreasing respondents' cognitive efforts to retrieve past information or motivations and overcoming some of the limitations of post-hoc methods (Shepherd & Zacharakis, 1999). Hence, by directly assessing participant's underlying preferences, choice experiments increase internal validity and robustness of the results (Hainmueller et al., 2014). Additionally, adding the experimental portion enables to compare the extent to which reported attitudes (e.g., positive predisposition toward sustainable investing) are reflected, first, in the actual relevance of attributes for the investment decision (i.e., relevance of sustainability characteristics vs financial ones); second, it allows to evaluate any possible gap between intention of sustainable investing, and its actual realization in investors' portfolios.

3.2.2 Survey design

The survey is composed of three blocks:

- Block 1: Choice experiment
- Block 2: Investment strategy and motives
- Block 3: Behavioral and demographic data

The survey is constructed on Qualtrics, an online software specialized in questionnaire constructions, and administered to respondents online. One advantage of online administration is the possibility to randomly mix the order in which the blocks, questions, and answers appear to respondents, thus mitigating potential order-of-presentation effects (Dichev et al., 2013). The order in which Block 1 and Block 2 appear to respondents is randomized, to test whether answers to the choice experiment differ depending on the moment in the survey in which investors take it. Block 3 is the final one for all respondents.

The survey questions and the attributes of the choice experiments are based on a thorough literature review and tested with industry participants. While this is recommendable for any kind of empirical research, it is an important step to appropriately define the choice experiment (Kløjgaard et al., 2012). Before distributing the survey, the final draft was tested with a group of investors to ensure the tone and questions were relevant for the target population.

Block 1: choice experiment

OBJECT OF THE CHOICE

The object of the choice experiment is an equity fund described by four attributes: Financial Performance, Risk, Fund Objective, and ESG Rating. The attributes and the values they assume in the experiment, called "levels", are presented in Table 1. The choice of attributes and levels is based on academic literature and empirical evidence,

referring in particular to a study by Bassen, Godket, Ludeke-Freund and Oll (2019), who devised a choice experiment to evaluate the relevance of climate labels in investors decisions. In their study, they tested the relative importance of five parameters for the investment decision (fund provider, financial performance, risk class, fund cost, and climate performance indicator). This study follows their approach, but with a different set of attributes.

Attribute	Levels	Description
Fund Objective	Generic Fund Sustainability-specific Fund	Whether the fund aims only to maximize investment returns (Generic), or if it has an additional sustainable goal alongside financial returns
Financial Performance	9.5% 7.5% 4.5%	Based on the fund's historical annual return (in percentage of invested capital) over the past three years
Risk Class	7 (high risk) 4 (medium) 1 (low)	Volatility of the fund returns over the past three years. It is measured by the historical standard deviation of the fund's returns
MSCI ESG Rating	AAA - leader BBB - average B - laggard	The MSCI ESG Rating measure the resilience of mutual funds and ETFs to long-term risks and opportunities arising from ESG issues

Table 1 - Attributes and levels of the choice experiment

Equity funds are one of the most used investment vehicles, especially in sustainable investing: according to research by Morningstar, nearly 70% of all the inflows into sustainable assets go into equity funds (Morningstar, 2021a). An equity fund contains primarily equity or stocks of different kinds, comprising multiple underlying companies. It offers general or specific investment strategies, usually targeting a geography, an industry, an index, a theme, or other parameters. As a comprehensive financial product, it is widely used by investors to access a broad and diversified range of underlying stocks.

By using an equity fund as the object of the investment, the study strives to abstract away from characteristics of specific stocks that may affect respondents' choice beyond of the four attributes of interest. In the study, and also specified to respondents in the survey, all other characteristics of the investment objects are assumed to be the same between the two proposed choices. It is a simplification of a real-world investment choice, but a necessary one given the experimental nature of the study and the intention to focus on the four key financial and non-financial attributes.

Financial performance and Risk are conventional elements of a fund's description, commonly used to describe funds such as in the Key Investor Information Document. Additionally, as outlined in the previous chapter, they are traditionally assumed as the most relevant determinants of the investment choice. Fund objective and ESG rating are the sustainability-specific attributes and are explained in greater detail below.

DESCRIPTION OF SUSTAINABILITY ATTRIBUTES

- **FUND OBJECTIVE: Generic or Sustainability specific fund.** The main objective, for any kind of fund, is to maximize the returns on the investment. Yet, equity funds can be thematic and propose a theme in parallel to return maximization[4]. This attribute allows to test whether investors do take into account the sustainable aim of the fund in investment decisions.

  The decision to add a Sustainability-focused goal is related to the coming into force of the European Union Sustainable Finance Disclosure Regulation (EU SFDR) on March 10th, 2021 (EU Official Journal, 2019). The SFDR is a part of an EU-wide strategy to harmonize the growing space of sustainable finance, under the EU Commission's Sustainable Finance Action Plan. The SFDR applies to financial market participants and financial advisors operating in the EU; its goal is to provide investors with more information on sustainable investments. In fact, by requiring asset managers to provide punctual information on the sustainable characteristics of their products, it ensures EU investors have the disclosure they need to make investment choices in line with their goals (Doyle, 2021). In particular, the Regulation asks fund providers to classify funds in 3 distinct categories, based on the fund's investment objectives:
  - **Article 6 – Non-sustainable**: funds that are not promoted as having ESG factors or objectives. In this study, this is the "Generic" fund objective.
  - **Article 8 - Environmental and socially promoting products**: the asset promotes environmental or social characteristics, or a combination of those, and ensures the companies in which investments are made follow good governance practices.
  - **Article 9 - Products targeting sustainable investment**: funds with an explicit sustainable objective (e.g., investments in economic activities that contribute to an environmental or social goal) and to which an index has been assigned as a reference benchmark. The "Sustainability-focused" fund in the choice experiment corresponds to this kind of product.

[4] An example of the Sustainability-focused funds provided by BlackRock is available at the following link: https://www.blackrock.com/us/individual/investment-ideas/sustainable-investing/sustainable-solutions

- **ESG ratings from MSCI: AAA, BBB, B.** ESG ratings are a widely used and immediate source of information on the ESG characteristics of financial assets. They are designed to provide greater transparency and understanding to investors, helping them to discriminate investment opportunities according to ESG characteristics. MSCI ratings are used in this study due to their broad coverage and popularity among investors (Wong et al, 2020). The overall MSCI ESG ratings aggregate information from the fund's companies and provide a summary measure of the resilience of the fund to long-terms ESG risks and opportunities (MSCI, 2021). MSCI provides comprehensive explanation behind its ratings, including: an overall ESG Fund Rating represented by letters going from C (laggard) to AAA (leader); a global ESG quality score and single E, S and G scores, each measured on a scale from 1 to 10; and a percentile rank, which shows how the fund performs in general in the fund's universe, and relative to a peer group.

  In the choice experiment, 3 levels of the overall fund ESG Rating are proposed:

  - **AAA - leader**: The companies the fund invests in tend to show strong and/or improving management of financially relevant ESGe issues. These companies may be more resilient to disruptions arising from ESG events.
  - **BBB – average**: The fund invests in companies that tend to show average management of ESG issues, or in a mix of companies with both above-average and below-average ESG risk management.
  - **B – laggard**: The fund is mostly exposed to companies that do not demonstrate adequate management of ESG risks, or show worsening management of these issues. These companies may be more vulnerable to disruptions arising from ESG events.

To make the choice as close as possible to reality, the real labels from MSCI ESG Ratings are provided in the choice experiment (Figure 1).

Figure 1 - MSCI ESG Ratings presented in the choice experiment

EXPERIMENTAL DESIGN

To examinate participants' hypothetical investment choices, a fractional factorial experimental design is used. As the full factorial set of bundles (i.e., the attribute-level combinations) cannot be feasibly assessed by each participant, this experimental design presents just a fraction of all possible combinations to each respondent. The Qualtrics Conjoint software automatically selects a reduced set of combinations according to randomized balance design, which aims to maximize the number of data points and the coverage across potential packages, while minimizing the number of profiles exposed to the respondents (Qualtrics Conjoint White paper, n. d.). In practice, this means that respondents are presented with different packages that have proper representation of the various attribute levels, ensuring an orthogonal design with no multicollinearity between the attributes. In this way, the displayed set of bundles are designed to capture the main effects for each attribute level, and the overlap between levels of one attribute with levels of another attribute are assumed to be negligible (Qualtrics Conjoint White Paper, n.d.).

The format of the choice experiment as it appears to participants is a **forced pair profile conjoint choice.** Respondents are presented with two different profiles of the equity funds, out of which they are asked to select the one they would like to invest in (based on Hainmueller, 2014). Forced pair profile is one of the most widely used type of conjoint experiments as it closely approximates real-world decision making. To have investors consider the tradeoff between different attributes levels, the "none" option is not provided.

Respondents are given instruction at the beginning of survey on the choice task they are going to perform, including a detailed description of the four attributes and their levels. Then, they are provided with 8 different choice sets, one at a time, each including two equity funds based on random attribute-level combination from the fractional factorial design.

An example of the investment choice is displayed in Figure 2. The levels of the attributes are independently randomized by the software in each choice, so that all combinations are displayed an even number of times to participants. No restrictions are imposed on the possible attribute-level combination, so to make the attributes mutually independent and avoid imposing any a-priori structure on the possible results[5].

[5] It was originally thought to excluded 2 attribute-level pairings from the possible combination of attributes: the highest possible financial performance (9,5%) with the lowest level of risk (1); and the lowest financial performance (4,5%) with the highest risk level (7). However, this assumed that the other sustainability parameters would not be relevant in assessing the tradeoff. Hence, no restrictions were imposed, and all combinations were displayed evenly to respondents.

As mentioned, the order in which the choice experiment appears in the survey is randomized. Respondents are assigned either to a control or a treatment group, depending on the moment in which they take the choice experiment within the survey. The control group answers the choice experiment first, and then moves on to the rest of the survey. The treatment group completes first Block 2 of the survey (on investor motives and strategy), and then is presented the choice experiment. This allows to evaluate possible differences in results from the choice experiment that arise due to the moment in which they choice experiment is taken, and not to the relevance of the choice attributes.

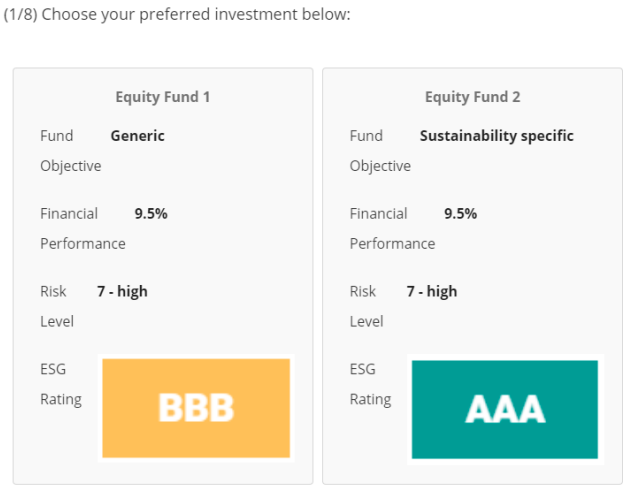

Figure 2 - Example of the choice question in the survey

Block 2: Investment strategy and motives

INVESTMENT STRATEGY

First, respondents are asked about their type (retail or professional), investment experience, and investment strategy, defined in terms of amount of capital invested or managed, asset classes used, and investment horizon. Then, respondents' approach to sustainable investing is investigated by gauging whether they integrate ESG factors in the investment decision, when they started to do so, and which ESG strategy they apply among the seven suggested by the Global Sustainable Investment Alliance (GSIA)[6]. Respondents are also asked which percentage of their portfolio is managed with ESG considerations and, in a separate question, which percentage can be classified as "Sustainable assets", i.e., financial products that fall within the Article 9 definition (as per

[6] As presented in Chapter 1, the seven sustainable investing strategy are: Negative/exclusionary screening, Positive/best-in-class screening, Norms-based screening, ESG integration, Sustainability themed investing, Impact investing, and Corporate engagement and shareholder action (GSIA, 2021).

EU SFDR, 2020). For both questions, investors are asked about the kind of assets they hold under ESG consideration and in Sustainable Assets. The questions included in this section are of different types, to keep the survey dynamic and avoid respondent fatigue.

SUSTAINABLE INVESTING MOTIVES

Possible motives to engage in sustainable investing are measured via 7-point Likert-scale questions. First, respondents are asked about the reason behind the integration of ESG aspects in the investment decision: financial (risk management, returns, materiality, portfolio diversification), personal (alignment with values, creating real-world environmental or social impact), social (client demand, regulatory pressure). Then, a second set of statements adds more nuances to the possible motives by proposing some views on sustainable investing in general and asking respondents to which extent they agree or disagree with them. This set aimed to explore the role of possible biases and behavioral tendencies, in the form of:

- Representativeness: "Assets with high ESG scores represent good investment opportunities"
- Overconfidence: "I know more about ESG than average investors"
- Reputation: "Sustainable investing improves my reputation or my company's reputation"
- Trend: "Investing in ESG is a trend to follow on the market"
- Feeling: "I feel good when I invest in sustainable assets"
- Alluring: "Having an ESG strategy attracts clients"

The choice of a 7-point Likert scale to record this question us chosen by its property of reliability and validity (Krosnick 99; O'Muircheartaigh et al., 1999). The order in which the various questions appear to respondents is also randomized, to avoid any possible carryover effect and satisficing behavior, which may happen when answering Likert-sale questions. The suitability of the responses for our analysis is assessed prior to engage in Data analysis part by two measures of sampling adequacy (KMO test and Bartlett's test of sphericity) – more details in section 4.2.

Block 3: Behavioral and demographic questions

Finally, the last section gauges some behavioral characteristics of respondents. There are a set of personal tendencies that are demonstrated to play a role in investment decisions, namely: cognitive reflection abilities (i.e., whether the reasoning process is more impulsive or reflective) (Bassen et al., 2019); risk attitudes (Boffo and Palatano, 2019); investment horizon (Starks et al., 2017). Alongside demographic characteristics, these tendencies can assist in defining investors' profiles and evaluate whether certain tendencies tend to be associated with specific sustainable investing attitudes.

COGNITIVE CHARACTERISTICS

According to the dual process theory, there are two distinct modes of cognitive functioning to human decision making: intuition (system 1) and reasoning (system 2) (Stanovich, 1999, Kahneman, 2003) The two systems are a continuum, rather than a discrete process, and have been featured extensively in behavioral studies and financial decision making (Toplak et al., 2014). In particular, inadequate or immediate information processes may have important consequences in Sustainable Investing, where insufficient or complex information may encourage the use of heuristics and intuitive processes instead of more rational, deliberate analysis. For example, Bassen et al. (2019) explored the effectiveness of climate labelling for investment choices and found that intuitive decision makers were more likely to engage in climate-friendly investing. According to their study, investors more prone to intuitive (system 1) cognitive processes tend to place significant more importance on the fund's climate performance compared to its financial performance or risk class (Bassen et al, 2019, pag 14). Their finding is consistent with the "dual nature" of sustainable investing, which posits that investors aspire both to financial and non-wealth returns (Beal et al., 2005).

To measure the cognitive tendencies of respondents, the Cognitive Reflection Test (CRT) is included in the survey. The CRT was developed by Frederik (2005) to measures the intuitive versus reflective tendencies of individual cognitive process. It is composed of 3 questions that attract respondents toward an intuitive answer, while more careful reflection reveals the correct one. The CRT can assume values from 0 (markedly intuitive system 1 decision maker) to 3 (markedly reflective system-2 decision maker). The CRT is related to important decision-making characteristics such as risk and time preferences, cognitive abilities, and other rational thinking tasks (Frederik, 2005). The standard version of the CRT has become widely known and therefore less reliable as an accurate indicator of cognitive tendencies. Some scholars suggest controlling whether respondents have been previously exposed to the three problems (Haigh, 2016), while others have started to develop alternative measure of cognitive reflections (Thomson & Oppenheimer, 2016; Toplak et al., 2014). To mask the obviousness of the CTR questions, the original wording is altered to be more aligned with the tone of the survey[7]. Additionally, to ease the survey compilation process, the format of the questions is changed from open-ended to multiple-choice, which was proven to maintain the same number of correct responses, intuitive response, and correlation patterns of the open-ended questions (Sirota & Juanchich, 2017).

[7] The original CRT questions and the adapted ones for my survey are present in the Appendix.

RISK ATTITUDES

Risk attitudes play a determinant role in any kind of decision, even more so in financial investments. To measure risk preferences, social scientists have developed two main approaches: incentivizing tasks or games, where respondents make choices between risky alternatives; and self-reported survey measures, in which subjects report their perception of their own risk tolerance (Eckel, 2019). In this questionnaire, risk preferences are measured by a single question asking respondents to self-asses their general willingness to take risks. The question is worded as it appears in a study by Dohmen et al. (2011)[8], who proved the behavioral validity of this measure compared to other questions on risk attitudes. The authors empirically test different measures of risk preferences (general self-assessment question, multiple self-assessment questions, and lottery-type elicitation of risk attitudes) and subsequent risk behavior in real-stakes lottery experiments, concluding that the simple, self-assessed survey measure emerges as the best all-round explanatory variable of actual risk behavior (Dohmen et al., 2011). Additionally, other authors find supporting evidence for the self-reported measure of risk aversion as a valid proxy of actual risk preferences (Tasoff & Zhang, 2018), also when compared to other risk attitude-eliciting questions such as lottery-based games and multi-item questions (Coppola, 2014).

INVESTMENT HORIZON

Investment horizon refers to the length of time securities are held by investors, and it is an important parameter to identify investors prone to hold sustainability assets. In general, responsible investors promote ESG practices because they believe in the value they can generate over the long term, both in terms of financial return and risk mitigation (Dunn et al, 2018; Hoepner et al., 2021).

The importance of investment horizon in sustainable investing was empirically investigated by Starks et al. (2017): using different measures of investment horizon (e.g., portfolio turnover and churn ratio), the authors showed that investors with longer horizon have preferences for high-ESG firms. Additionally, their findings corroborate theories of investors myopia: as long-term investors believe that high-ESG firms deliver value in the long run, they will be more "patient" and will stick to their stocks even in times of underperformance (Starks et al., 2017). This has implication for the wider market and would counter claim of speculative nature of SI. Therefore, alongside non-pecuniary preferences and beliefs on ESG's effect on firms' value, investment horizon is a significant determinant of investors' choice to hold ESG stocks.

[8] Their question appeared as: "*How do you see yourself: are you generally a person who is fully prepared to take risks or do you try to avoid taking risks? Please tick a box on the scale, where the value 0 means: 'not at all willing to take risks' and the value 10 means: 'very willing to take risks'" (Dohmen et al, 2011)*

GENERAL DEMOGRAPHIC QUESTIONS

Lastly, a set of demographic questions is asked to understand the characteristics of the sample and control for possible aspects of investors that may affect the investment attitudes (Lowellen et al., 1977). These variables included respondents' gender, age class, country of residence, income level, and socioeconomic class.

3.2.3 Distribution strategy and sample size

The survey is created on Qualtrics and administered online in anonymous format. As an incentive for respondents to complete the survey, they were given the opportunity to voluntarily leave their email address to receive the main findings of the study. No other personal or sensitive data was recorded.

TARGET POPULATION

The survey was circulated among European investors. To avoid possible biases in the sample selection, the survey was open to all investor types – retail, professional, with or without prior experience or familiarity with sustainable investing. The inclusion of both private and professional investors in the sample was done to ensure quality in the response and improve the statistical validity of the results. Yet, there are concerns that these two categories have different traits that make inter-groups comparison difficult. This argument is contested on the following grounds.

1. **Sample Quality.** Circulating the survey among various investor types ensures respondents are familiar with investing concepts and respond "truthfully" to the questions, based on their real-life experience, thus enhancing the quality of the data collected. This is relevant as the survey includes a choice experiment, where it is essential to match the characteristics of survey sample to the target population as closely as possible to generate externally valid results (Hainmueller et al., 2015). Focusing on the quality of the sample to match the target population also allows to overcome some criticism raised against behavioral studies that employ student samples, which make generalization difficult. This study being of an exploratory kind, there is no claim of result generalization beyond the scope of the analysis. Still, it aims to provide a rigorous exploratory analysis into the drivers of sustainable investing, supposing a role for behavioral variables. The choice of a high-quality sample ensures that the results will prove insightful and suggest areas to explore with further research.
2. **Study Constraints**. The sampling takes into account the resource and time constraint of the analysis. Accessing both investor types help ensuring the sample is both adequately large to enable inferential analysis, and also composed of respondents with real-life investment experience that provide quality data. Restricting the sample only to professional investors would have hampered the

collection of a sufficient number of cases, given the limited resources and difficulty to access to such investor types – usually, studies of professional investor are run by financial institution themselves or by researchers in collaboration with investment firms (e.g., the research by Amel-Zadeh and Serafeim, done in collaboration with BNY Mellon in 2017). Conversely, including only retail investors would have lacked the more structured experience and perspective that professional investors could contribute to the study.

3. **Behavioral Focus**. The focus of this analysis presumes a role for psychological and behavioral factors to affect investment decisions, to which both retail and institutional investors are subject to. Their behavior is confirmed by evidence about institutional investors' trading behaviors that highlight numerous anomalies (Jaiyeoba et al., 2019) and biases recorded in both novice and expert professionals alike (Dargham, 2009). As Schiller (2015) points out, "the susceptibility of investors to psychological biases is likely invariant across investor types: professional investors are not foreign to the several psychological factors that influence investment decisions observed in retail investors; additionally, retail investors routinely sourced advice from institutional ones. From a behavioral perspective, there may not be a clear distinction between these types of investors, as the psychological biases that influence investment decision are a fundamental part of human nature (Jayieoba, 2019).

To acknowledge for possible differences between investor types, the sample analysis provides per-group details when accessible.

SAMPLING METHOD

To identify and reach respondents from the target population, a mix of purposive and snowball sampling methods is applied. The former is based on a selection of participants based on certain traits according to the researcher's judgement – in this case, the discriminant variable was being an investor. The latter involves asking the first participants to nominate more respondents with similar traits to participate in the research (Naderifar et al., 2017), so to enlarge the sample size while retaining the focus on the category of interest. These types of non-probability sampling techniques are adequate for exploratory research, where selection is driven by criteria of interest, rather than randomization. Additionally, the goal of the study is to develop an understanding about the specific category (i.e., investors), rather than on the general population. These sampling techniques are also suitable when it is rather hard to collect primary data sources from the population of interest (Kohler et al., 2019).

DISTRIBUTION METHOD

The survey was distributed virtually via multiple channels – emails to financial institutions, financial associations (e.g., Dansif), university alumni communities, direct personal contacts, post on social media (LinkedIn). The data collection period lasted 7 weeks, from September 13th to October 24th. This period allowed enough time to reach an extensive number of respondents.

SAMPLE SIZE

Overall, more than 300 respondents were reached with request to participate to the study, of which 186 commenced the survey and 115 reported sufficient data for the study (completion rate of 63%, response rate of nearly 30%). In some cases, respondents finalized just one part of the overall survey - either the choice experiment or the investment strategy and motives – depending on the section that appeared first in the survey randomization. In the case of missing data on respondents' investment strategy and ESG attitudes (8 instances), the cases were excluded from the total analysis. In the case of complete response but missing conjoint experiments due to software malfunctioning (3 cases), the cases were kept as to identify latent tendencies in data. Additionally, some missing answers were identified throughout the dataset, and were dealt with on a variable-by-variable basis.

The final sample size of 107 respondents is adequate for the parameter of conjoint analysis as estimated by the following formula:

$$\text{Number of respondents} = (\text{multiplier}^* c)/(t^* a)$$

Where c is largest number of levels across all features (3), t is number of tasks or questions (8), and a is number of alternatives or choices per question (2). The multiplier is set at different levels depending on the type of study, from a minimum of 300 to over 1000 (Qualtrics Conjoint white paper, n.d.). In my study, a multiplier of 500 is chosen given the targeted population of analysis, making 94 the minimum number of respondents required. This threshold is required to generate informative summaries about the attributes, despite the software recording individual-level utility scores that are informative on an individual basis. This is related to the fact that just a subset of all possible attribute-level combinations is shown to respondents; therefore, a minimum threshold is identified to ensure that a sufficient number of combinations has been tested with respondents.

3.3 Analytical methods

Three analytical techniques are applied to the data to answer the research question holistically: Conjoint Analysis, Exploratory Factor Analysis, and Multiple Regression Analysis. These techniques reflect the experimental and empirical level of the study. Conjoint Analysis is applied to the data of the choice experiment, allowing to determine the relative importance of the four fund attributes for the investment choice. Exploratory Factor Analysis is applied to the motivational data, to identify the drivers of sustainable investing. Finally, the multiple regression in the form of an OLS model is applied to test the relationship between the drivers and the percentage of ESG assets in investors' portfolio.

3.3.1 Conjoint Analysis

Conjoint analysis is a statistical technique to examine how people make multidimensional choices and to elicit their underlying preferences for specific attributes of the object of the choice (Lohrke et al., 2009). The analysis derives participants' preferences depending on their choices between, or ranking of, hypothetically described objects, which are described along multiple attributes. The assumption at the basis of this analysis is the recognition that, in making multidimensional choices, people not only identify their preferences on each particular dimension, but they also make trade-offs across the dimensions (Bansak et al., 2019). Starting from the individual stated choice, conjoint analysis estimates the utility that respondents attach to each level of each attribute, from which the relative influence of each attribute value on the resulting choice is estimated. In short, this technique measures how respondents trade-off alternatives and their respective attribute levels, allowing to identify which attributes carry more relative importance for their final choice (Steiner & Meißner, n.d.).

Conjoint analysis developed from the theoretical work of Luce and Tukey in mathematical psychology, and it was first introduced in marketing by Green and Rao (Green & Rao, 1971) to estimate consumer preferences for multidimensional attributes in products. It is now a methodology increasingly used in social sciences, from Economics, to Political Science, to Psychology (Shepherd & Zacharakis, 1999). It is particularly suited when participants evaluate multiple attributes simultaneously and face trade-offs between various criteria, which is the case for investment decisions in capital markets (Block et al., 2019).

ANALYSIS SPECIFICITIES

Conjoint analysis is based on Hierarchical Bayes estimation technique to yield individual-based utility models – i.e., to estimate the utility that each respondent assigns to each level of the attributes. This technique uses Bayesian methods to probabilistically

derive the relative value of each variable being tested. HB estimation is an iterative process that encompasses a lower level and a higher-level model: the former estimates the individual's relative utilities for the tested attributes, the latter pinpoints the population's predictions for preference. The two models work together until the analysis convergences on the coefficients that represent the utility of each attribute for each individual. The model is hierarchical because it estimates the average preferences (higher-level model) and then gauges the difference of each respondent from the distribution, in order to derive specific utilities (lower-level model) (Qualtrics Conjoint White paper, n.d.). The outcome of this process are individual coefficients defined "part-worth utilities", representing the value that the individual attach to each level of the attributes. These scores are at the basis of summery metrics about the relative importance of attributes for the individual choice.

Conjoint analysis is applied to the data from the stated choice experiment to identify the utility that each respondent derives from attribute level, and to estimate the relative importance of each of the four attributes for the investment choice at individual and sample level. To ensure results of the conjoint analysis are robust, the following assumptions are made (following Hainmueller et al, 2014):

a. **Stability and no Carryover effects**: the potential outcomes always take the same value as long as all the profiles in the same choice task have identical sets of attributes, independent of the choice they have seen or would see in the rest of the experiment. If this assumption holds, having respondents do multiple tasks is beneficial (in this study respondents perform 8 choice tasks).

b. **No profile-order effects**: ordering profiles within a choice task does not affect respondents, i.e., the order in which profile are presented on the questionnaire does not alter the choice respondents would make. It enables researchers to ignore the order in which information is presented and pool information across profiles when estimating quantities of interest.

c**. Randomization of the profiles**: assume that when the attributes of each profile are randomly generated, the potential outcomes are statistically independent of all the profiles, i.e., the respondents' potential choice behavior can never be systematically related to what profiles they will see in the experiment, but it is related to the attribute combinations.

KEY CONTRIBUTION TO THE STUDY

Conjoint choice tasks have enhanced realism as they resemble real-world situations that respondents are likely to have faced previously, hence they allow to gauge a more truthful response (Hainmueller et al., 2014). Combined with the randomization of the choice sets and the exogenous change in the attribute levels, this enables conjoint

analysis to yield results that are highly predictive of real-life behavior (as demonstrated by Hainmueller et al. via a natural experiment in Switzerland, 2015). Furthermore, conjoint analysis is a well-suited technique for theory testing and for research questions that assume a different relative importance of a set of decision criteria for a particular judgement. It is therefore apt for this exploratory study.

3.3.2 Exploratory Factor Analysis

Factor analysis is a statistical technique used to explore the underlying pattern of relationships among multiple observed variables (Baglin, 2014). This data-reduction technique was introduced in 1904 by Spearman and it is now used widely in the social sciences. It rests on the assumption that there are some common, abstract dimensions – the factors - that influence a set of observable variables. Via Factor Analysis, it is possible to evaluate first, whether the observed variables (obtained via answers to a test or survey) reflect such broader underlying dimensions; then, it allows to individuate and measure such dimensions, based on the influence they have on the observed variables (Cattell, 1988).

Factor analysis can be of different kinds: Exploratory, Confirmatory, and integrated in other sophisticated statistical techniques such as Structural Equation Modelling. For the purpose of this research, Exploratory Factor Analysis (EFA) is applied, where Factor analysis techniques are used to uncover latent factors without any prior hypothesis on the relation between factors and variables (Verma, 2019). EFA is chosen when it is not possible to assume a-priori the structure of the variable's relationships, as it is the case for this exploratory study.

ANALYSIS SPECIFICITIES

EFA is based on a factor model, which assumes that a number of latent common factors exists and influences a set of manifest variables. Factors are formed based on similarity characteristics of the variables, which are evaluated via correlation among the variables and with the factors. Each factor has a different relation with each variable, measured by the correlation between factor and variable, defined "loading".

The goal of factor analysis is to estimate the loadings, from which the impact of the factor on each variable is measured by computing the squared loading. The loadings and squared loadings are at the basis of factor analysis, as the model assumes that a portion of the variability of each variable – the "communality" - can be explained by the common factors. The communality is the proportion of the variable's variance shared with other variables and explained by common factors. It is computed as the sum of the squared correlation that each variable has with the common factors. The higher the communality, the larger the proportion of variable's variance that is explained by the

factors. Each manifest variable then has also a portion of variance that does not depend on the factors, but rather it is specific to that variable alone - defined "specificity".

The linear factor model for a Z_j variable is reported below. This model assumes that each j variable (Z_j) can be defined as a linear combination of the q common factors (F_q), with weights given by the loadings (l), and the specific factor U_p, which is unique to each variable.

$$Z_j = \sum_{s=1}^{q} \ell_{js} \mathcal{F}_s + \mathcal{U}_j = \ell_{j1} \mathcal{F}_1 + \ell_{j2} \mathcal{F}_2 + \ldots + \ell_{jq} \mathcal{F}_q + \mathcal{U}_j$$

The common and specific factors are unobservable, therefore some assumptions are made on their characteristics in order to study their relationship with manifest variables:

- **Common Factors are:**
  - Standardized
  - Mutually uncorrelated
  - Uncorrelated with the specific factors
- **Specific Factors are:**
  - Centered, but have different variances ψ_{jj} that explains the proportion of variable's variance that is not recovered by the common factors
  - Mutually uncorrelated, as each refers to one variable alone

To estimate the loadings, the factor model starts with the variables' correlation matrix and decomposes it into the reduced correlation matrix, comprising the communalities on the main diagonal, and the matrix of specificities, whose diagonal elements are the specificities. As sample data is used, the loadings and communalities are extracted based on the sample correlation matrix, which generates differences between the observed and predicted correlations. Hence, the correlation matrix is decomposed to account for possible errors so to obtain: a reduced correlation matrix R*, a matrix of specificities, and a matrix of residual correlations E, which includes the difference between the observed correlation and those estimated based on the loadings. The goal of the analysis is to estimate the loadings so to reproduce the reduced correlation matrix R* at best, making the entries on E as small as possible. From there, the loadings are calculated and the structure of the latent factors is estimated.

The final results of EFA show the structure of the latent factors by highlighting their relationship with each variable. If there is a clear structure in the data, each variable will be more strongly related to one factor. This enables an evaluation and description of the factors, and the identification of the tendencies driving the links among variables.

KEY CONTRIBUTION TO THE ANALYSIS

EFA is a multivariate statistical technique that is particularly well-suited to analyze complex psychological and social data, where many parameters that influence behaviors can be better understood and managed if they are summarized in a manageable number of factors (Verma, 2019). EFA has often be applied to the study of human behavior, for example by Cattel in developing the personality traits (Cattel, 1965), and to evince investor attitudes (Nagy and Obenberger, 1994; Gutsche et al, 2020; Kocmanová, 2020).

3.3.3 Multiple Regression Analysis

To estimate the relationship between the identified factors and the realization of sustainable investing in investors' portfolio, a multiple linear regression is implemented. Multiple regression is a statistical technique that uses several explanatory variables to predict the outcome of a response variable. The specification of the Ordinary Least Square (OLS) model is as follows:

$$y_i = \beta_0 + \beta_1 x_i + \beta_2 K_i + \varepsilon_i$$

Where:

y_i = proportion of the investor's AUM managed via ESG strategies

x_i = a vector of the factors identified via Factor Analysis

k_i = a vector of control variables, including behavioral tendencies and demographic characteristics

ε_i = error term

In order to control for the issue of heteroskedasticity, each regression is computed using White-corrected standard errors. Heteroskedasticity may happen when the variance in residuals in not homogeneous, which violates one of the assumptions of OLS regressions. Statistically, this means substituting a robust variance matrix calculation for the conventional calculation of the errors.

This analysis is performed on STATA, using consolidated data from the questionnaire and the results from Factor Analysis.

KEY CONTRIBUTION TO THE ANALYSIS

This final step in the data analysis process is added to test the results obtained from the previous analysis. The goal is estimating whether the identified tendencies relate to self-reported sustainable investing behavior. In fact, while EFA allows to identify possible factors driving sustainable investing, it does not assess their relevance for actual ESG implementation in the investment previous two analyses, to investigate whether and how the overarching drivers are related to realized sustainable investing strategies.

4 Data analysis

This chapter presents the main results obtained from applying the statistical methods described in the previous chapter to the survey data. It starts with a description of the sample to identify the main behavioral traits and possible differences between investor types. It then reports the results from conjoint analysis, showing the relative importance of non-financial information for the investment choice. Following, the factors extracted via EFA are reported and described. To conclude, results from the regression model are presented. When not included in the main body of the chapter, tables, figures, and further details on the analyses are available in the Appendix.

4.1 Descriptive Analysis of the sample

4.1.1 Demographic characteristics

Out of the 107 complete cases in the sample, 63% are private investors (67 cases) and 37% are institutional ones (40 cases). Out of the latter group, 17 are asset managers, 14 are institutional investors, 6 are investment advisors, and 3 are another kind of financial professional. The sample is predominantly male (77%) and skewed toward the younger set of the population, as more than 75% of respondents are younger than 35 years-old, with nearly 60% of the respondents falling in the 25-34 age group (demographic information are reported in table AB in the Appendix). The correlation between age and the dummy variable representing professional investors is at 0.14, showing that professional investors tend to be older than the average observation, as there is a positive although modest correlation.

In terms of geographical distribution, the largest proportion of respondent is located in Italy (29%) and France (24%), followed by Central Europe (Germany, Netherlands and Luxemburg – 12%), Nordic countries (Denmark and Sweden, 10%), Switzerland (7%) and UK (6%) (Table A.3 in Appendix). Overall, all the respondents are based in Europe and, since there are not enough cases by country to justify a country fixed effect, the country of residence will not be used as control variable.

The sample is normally distributed with respect to the socioeconomic status, as most respondents tend to fall in the upper middle (38%) and middle (31%) categories, and distribution at the extreme is lower. Regarding income class, more than 70% if respondents report earning less than USD 100k, with the majority falling in the USD 45k-100k category, consistent with the fact that most respondents are relatively young.

The correlation between income class and the dummy measuring whether respondents are professional investors has a value of 0.16, meaning that the variables are slightly correlated. Lastly, regarding education, the majority of all respondents (78% across sample and also by investor group) holds a Masters' degree, with 7% of respondents holding a higher qualification (13% for Professional, 3% for retail), and 14% a lower qualification.

4.1.2 Behavioral characteristics

Investors' characteristics that could affect their attitude toward sustainable investing are investment experience, investment horizon, cognitive processes, and risk attitudes.

On average, investment experience tend to be of 5 years for professional investors, and 4 years for retail ones (statistically different between groups at the 2.5% level). For both types, the experience is skewed toward smaller values, consistent with a predominantly younger sample.

Both investor types tend to have a medium-to-long-term investment horizon: the median holding period is 2-5 years for retail investors, and 6-10 years for professional ones. In general, both types are skewed toward longer-time horizons and only retail investors look to hold assets for less than one year.

Other behavioral characteristics that may affect investment decision in sustainable assets relate to their Cognitive Reflection abilities (CRT) and the risk attitudes (in Figures 3 and 4). As explained earlier, the CRT assesses respondents' cognitive dual processes, measuring the tendency of individuals to rely on their intuitive thinking (low scores) or their reflective thinking (higher scores) (Frederik, 2005). On average, the CRT score is 2.13 for the sample, with different mean values for retail (2.40) and professional investors (1.68), showing contrary to expectations that financial professionals tend to display a more intuitive cognitive approach than retail ones. This difference is significant at the 1% level, computed by means of a t-test, a statistical test to compare the means of two groups and evaluate whether they are different from one another[9].

Risk attitudes, measured on a scale from 1 to 0, are normally distributed for both investor types, with an average value of 6.5 and 6.3 for retail and professionals, respectively. There is no statistically significant difference in risk tendencies between the two groups.

[9] The t-test statistics to compare the means of the two investor groups is calculated throughout the analysis and reported when relevant

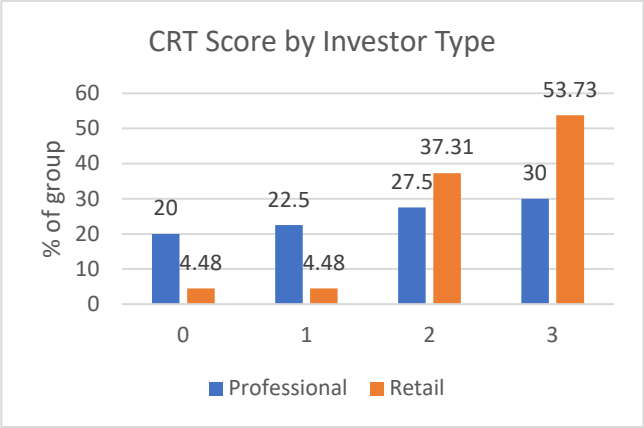

Figure 3 - CRT Score

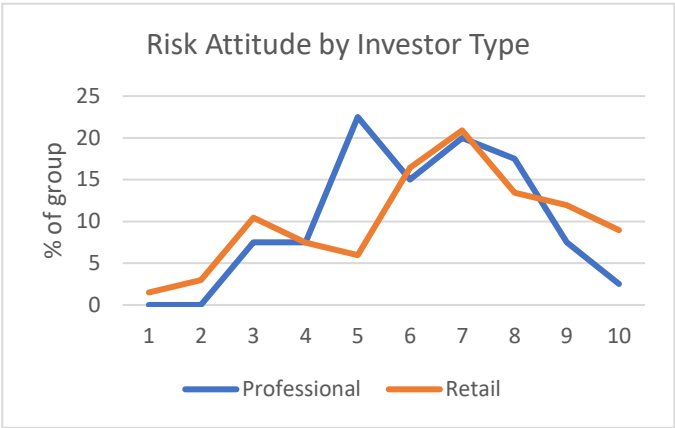

Figure 4 - Risk Attitude by Investor type

The descriptive analysis shows that there is no striking difference between the two investor types along most of demographic and behavioral variables, with the exception of the CRT score and the investment experience. Still, the sub-sample size of professional investors is rather limited, and this data may not be reflective of the wider investor population. Summary statistics of the main demographic and behavioral variables are presented in Table 2, with breakdown of the difference between two subgroups for the key behavioral variables in Table 3.

Summary Statistics					
Variable	***Obs***	***Mean***	***Std. dev.***	***Min***	***Max***
Demographic Variables					
Female	103	0.233	0.425	0	1
Professional Investor	107	0.374	0.486	0	1
Age class	107	2	0.813	0	5
Education Class	104	2.904	0.512	1	4
Income Level	92	2.022	1.099	1	5
Socioeconomic Background	96	3.365	1.1436	1	5
Behavioral Variables					
CRT Score	107	2.131	0.982	0	3
Risk Attitude	107	6.402	2.110	1	10
Investment Horizon	107	5.607	1.172	2	7

Table 2 – Summary Statistics of main demographic and behavioral variables

Comparison between institutional and retail investors – Behavioral variables								
Variable	***Retail***	***Prof.***	***Mean Retail***	***Mean Profess***	***dif***	***St Err***	***t value***	***p value***
Investment experience	66	39	4.136	5.231	-1.095	.48	-2.30	.025
Investment horizon	67	40	5.492	5.8	-.307	.234	-1.30	.191
CRT Score	67	40	2.403	1.675	.728	.184	3.95	.000
Risk Attitude	67	40	6.478	6.275	.203	.423	0.50	.633

Table 3 - T-test statistics between investor types along behavioral variables

4.1.3 Investment strategy

GENERAL INVESTMENT STRATEGY

Focusing on investment strategy, in terms of general investment characteristics the largest difference between the two groups lies in the size of the assets they manage or invest. 51% of retail investors tend to invest less than USD 10k, and the majority (75%) of them invest less than USD 50k. For institutional investors, the majority (50%) invests more than USD 500M, followed by USD 100-500M (23%).

Focusing on the type of assets investors invest in, stocks are the most common class across the sample (72%), followed by bonds (45%), Private Equity (35%), Cash and Cash Equivalents (35%), and Alternative Assets (31%). Most investors of both types tend to hold just one asset class (30%) and only professional investors hold more than 7 asset classes. Specifically, retail investors tend to hold an average of 2.4 number of different asset classes, whereas professionals tend to hold 3.2. Tables with strategy and asset breakdown by investor type is in Tables A.10- A.12 in Appendix.

SUSTAINABLE INVESTING - DEFINITION

In the Literature Review, it was outlined how Sustainable Investing is composed of different terminology and investment strategies. The broad definition of SI used in this study is GSIA's definition, whereby sustainable investments are any form of investment approaches that integrate ESG factors in in the "research, analysis and selection process of securities within an investment portfolio" (GSIA, 2021). In practical terms, ESG considerations can enter into the investment decision as a strategy or process, i.e. to screen securities and monitor their performance; and they can also be included for the final goal of the investments. Consequently, and as it's also reflected by the EU SDFR, it is possible to broadly define two types of sustainability-related assets: the ones that include ESG considerations, but do not explicitly pursue a sustainable objective (i.e., Article 8 assets per the EU SFDR), and the ones that include ESG aspects in the analysis and also seek a positive ESG return alongside financial performance (i.e., Article 9 assets as per the EU SDFR). Therefore, consistent with this understanding, the survey studies

how investors organize their portfolio with respect to both type of assets. For the purpose of this study, the former kind of assets are referred to as “ESG assets”, and any integration of ESG considerations will be generically defined “sustainable or ESG investing”. The latter kind will be labeled as “Impact assets” and “Impact investing”, with “impact” being the terms most widely used to refer to investments that seek to generate positive social and environmental returns, alongside financial ones.

SUSTAINABLE INVESTING – ESG INTEGRATION

Concerning Sustainable Investing in general, 74% of all investors in the sample report including ESG considerations in their investment strategy, applying it to 58% of the assets in their portfolio. The difference between investor groups for ESG integration is statistically significant: 63% of retail and 93% of professional investors report integrating ESG considerations in their decision, which results in an average ESG-managed AUM of 48% for retail and 71% for professional investors. This shows how ESG considerations are more widespread among professional investors than private ones. At the sample level, the most common ESG asset classes held are stocks (60%), followed by Bonds (36%), and Private Equity (31%). Retail investors tend to hold mostly ESG stocks (63%) and, to a less extent, bonds (22%) and PE assets (22%). Professional investors hold mostly ESG bonds (60%), followed by Stocks (58%), PE (45%) (Table A13-A16 and related figures in Appendix).

Over the investment process, ESG integration happens at different stages. 46% of respondents use ESG factors for securities analysis, 51% for securities selection, and 47% for the management of the portfolio. Then, only 22% and 11% use ESG factors to evaluate the portfolio performance and the sales of security, respectively. The same difference between investor groups present at broad ESG level is present over the phases of the investment process, whereby professional investors tend to include ESG factors at a higher degree than private ones along all investment phases (Figure 5). Possible reason for this is that institutional investors have specific frameworks and structures in place to make and manage investments, where ESG may be formally integrated.

In terms of ESG strategy, thematic investing appears as the most widely used strategy as 55% of respondents report applying it, followed by negative screening (50%), ESG integration (44%) and positive screening (38%). This trend is confirmed also at sub-group level, with institutional investors using all the strategies to a larger extent than retail ones, and showing also a larger use of ESG integration (Figure 6). This last point may again be related to the existence of structured framework where ESG factors can be accounted automatically in the investment process.

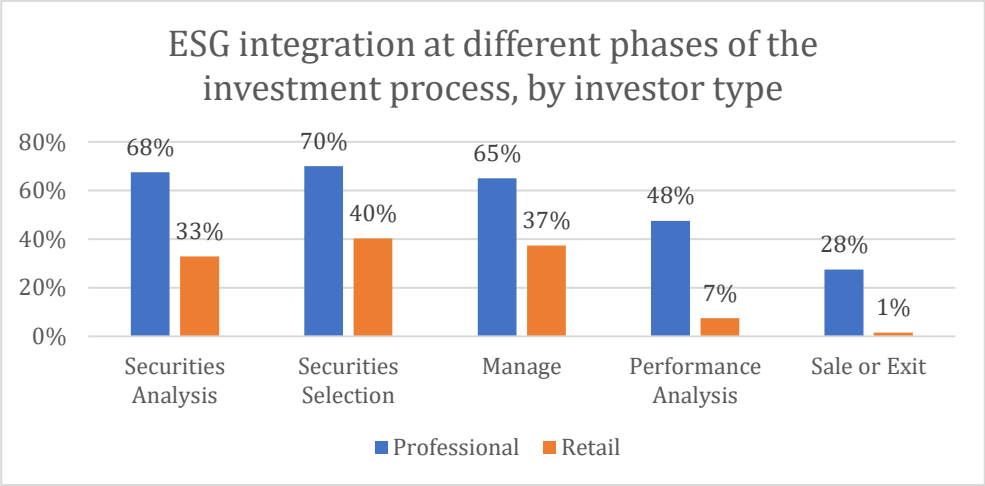

Figure 5 - ESG integration at different phases of the investment process

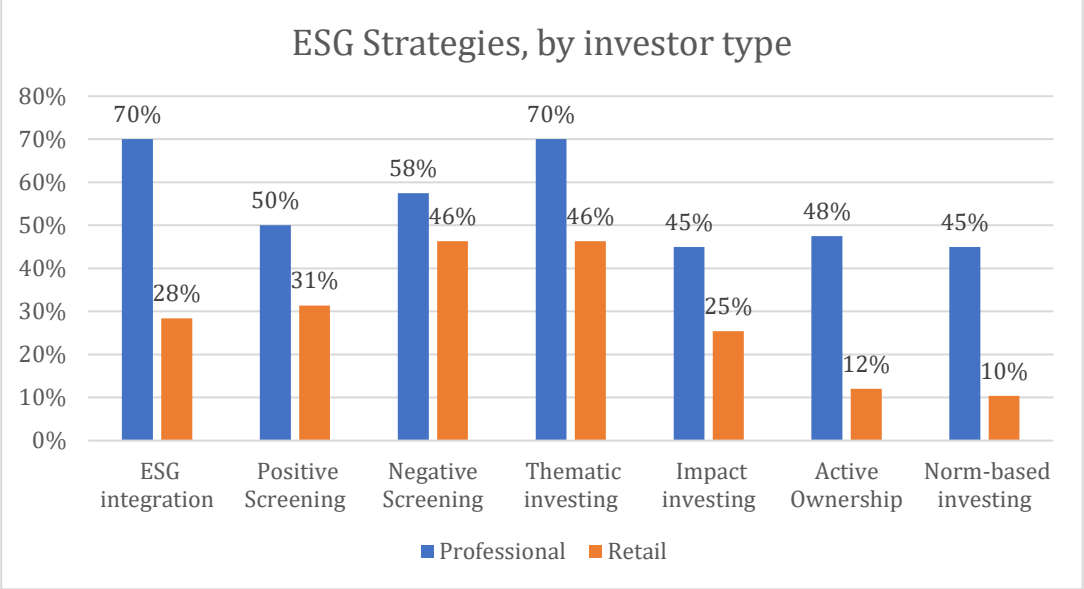

Figure 6 - ESG strategies applied, by investor type

SUSTAINABLE INVESTING – IMPACT ASSETS

Regarding impact investing, 39% of respondents say they hold impact assets, which on average occupy 20% of their investment portfolio. The greatest majority of these figures come from professional investors: 76% of them tend to own impact assets that occupy 28% of their investment portfolio, whereas just 16% of retail investors own such assets, which occupy 10% of their portfolio. Stocks, Private Equity, Bonds and Alternative Assets are the most used assets to realize impact investing, and are mostly held by professional investors (Table A.13-A.16, Appendix).

To summarize, the main difference between the investor types in the sample relates to the actual implementation of sustainable investing strategy, in terms of AUM, asset classes, phases of the investment in which ESG is integrated, and ESG strategy. Along some key behavioral and demographic aspects, instead, the two subgroups display similar tendencies.

4.2 Results from analytical methods

To determine what drives sustainable investing, the analysis involves: Conjoint Analysis to identify the relative importance of sustainable information in the investment decision; Exploratory Factor Analysis to extrapolate the main drivers in the form of latent factors; and multiple regression model to evaluate whether the identified factors and other possible behavioral tendencies (e.g., CRT score, risk attitude, investment horizon) relate to the ESG investment strategy, measured by the percentage AUM held in ESG assets.

4.2.1 Conjoint analysis: does ESG information matter for the investment decision?

Conjoint analysis allows to identify the relative importance of four attributes used to describe an equity fund – i.e., fund objective, financial performance, risk level, and ESG score. Starting from individual-level part-worth utilities for each attribute level, the relative importance of each attribute is calculated for individuals and then aggregated across the sample. The relative importance of the four attributes is displayed in Table 4, both at the global level and disaggregated by investor type.

The results show that, overall, sustainability attributes are relevant for the investment decision. At the sample level, risk has the highest relative importance of 32.86%, followed by financial performance (28.98%), ESG rating (26.22%), and fund objective (11.94%). The results give support to the hypothesis that non-financial factors are relevant in the investment decision, as ESG Score and fund objective (i.e., the sustainable attributes) have nearly 40% relative importance for investors' choices.

The results are consistent with the findings from Bassen et al. (2019), who identified risk as the relatively most important attribute for the investment choice, followed by fund providers and then financial performance. In their case, the relative importance of sustainable information differed across the treatment conditions, depending on how it was presented - from 11% when presented in a climate award format, to 18% in impact scale format, to 23% in star rating.

Fund Attribute	*Global Sample*			*Professional*			*Retail*		
	Obs	***Mean***	***Std. dev.***	***Obs***	***Mean***	***Std. dev.***	***Obs***	***Mean***	***Std. dev.***
Fund Objective	104	12.03	9.12	39	11.88	9.52	65	12.14	8.95
Financial Performance	104	28.95	10.24	39	29.23	12.55	65	28.78	8.67
Risk	104	32.72	14.53	39	33.02	14.71	65	32.54	14.53
ESG Rating	104	26.31	11.03	39	25.91	11.01	65	26.54	11.12

Table 4 - Relative importance of fund attributes, at sample level and by Investor Type

RELATIVE IMPORTANCE OF ATTRIBUTES BY INVESTORS TYPE

The trends identified at the sample level hold when disaggregated by investor types, as there is no statistically significant difference between the two groups (t-test statistics in table B.2. in Appendix and displayed in Figure 7). This result runs contrary to the expectation that institutional and retail investors place different importance to different investment attributes. For example, it would be plausible to assume that professional investors would place more importance to the level of risk than retail investors, having to manage investments on behalf of clients. Instead, no significant difference is found between the two investor categories.

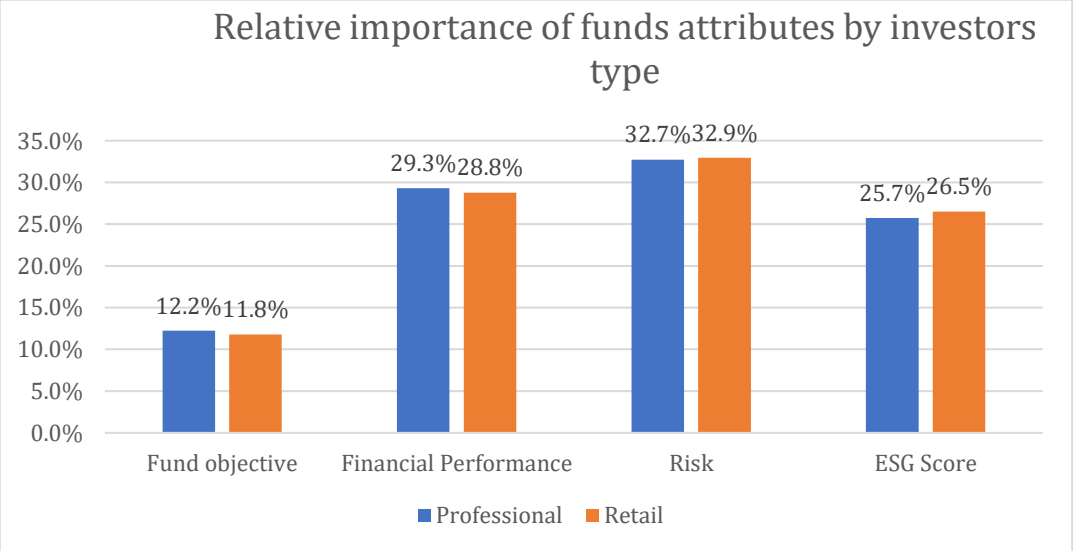

Figure 7 - Relative importance of fund's attributes by investor types

RELATIVE IMPORTANCE OF ATTIRBUTES BY INVESTORS' COGNITIVE ABILITIES

Results are then disaggregated depending on investors' Cognitive Reflection Score, to evaluate differences in the relative importance of ESG information due to different cognitive abilities. Figure 8 reveals heterogeneity in the observed relative importance values across participants with different CRT score, but the difference is not statistically significant and overall confirms the tendencies found at sample level.

Across respondents with different cognitive tendencies, the importance given to fund objective seems to be negatively associated with respondents' CRT score. In fact, respondents with intuitive tendencies (as measured by 0 and 1 values) tend to attribute larger relative importance to the fund objective than do respondents with higher CRT scores.

The relationship with the other attributes is more nuanced. With the exception of respondents with lowest CTR score, the relative importance of risk attributes increases with respondents' CRT score; while Financial performance and ESG have mixed results across different CRT scores.

Following Bassen et al. (2019), it was expected that investors with higher CRT score would weight financial attributes more than non-financial ones, but this claim is not supported by the results. Given the limited sample size, especially when disaggregating it along CRT score subgroups, the results point to some aspects to be further evaluated rather than to evidence of sure tendencies in the data.

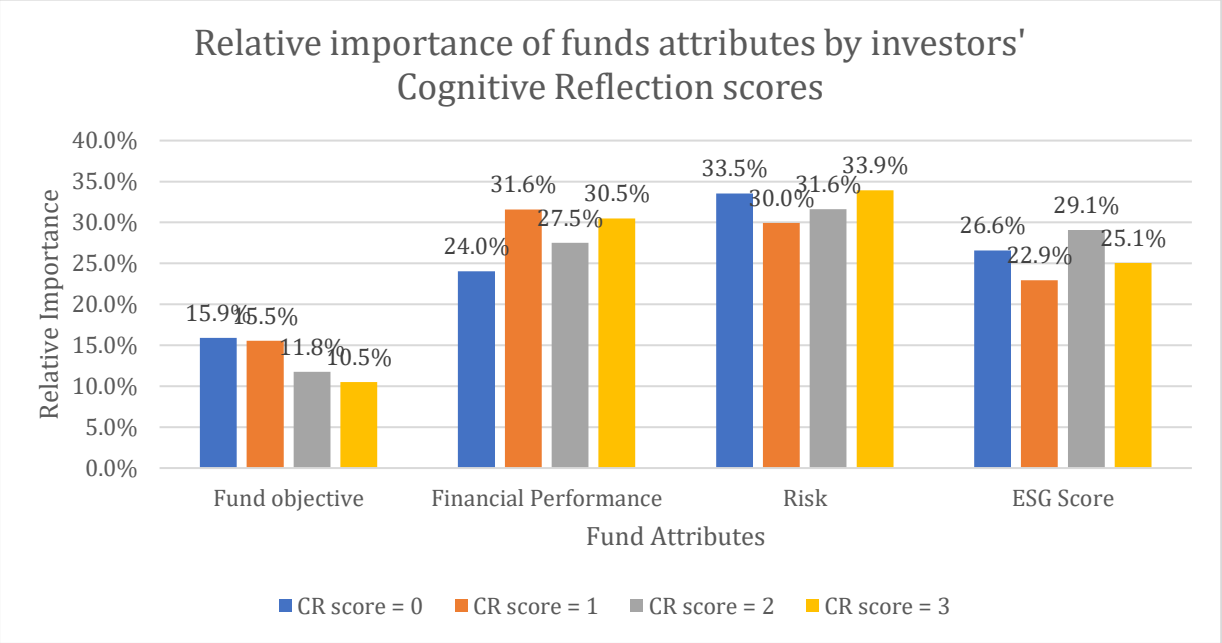

Figure 8 – Relative importance of Fund Attribute by Investors' CRT

RELATIVE IMPORTANCE OF ATTIRBUTES BY TREATMENT CONDITION

Finally, to ensure validity of the questionnaire, it is evaluated whether respondents placed different importance do the attributes depending on the moment in which they faced the choice experiment, i.e. before or after the attitudes and strategy section (Table B.3 in Appendix and Figure 9). No statistically significant difference is found between the two conditions for all attributes, especially not for the ESG rating (26.5% in control, 26.1% in treatment), showing that respondents were not affected by being exposed to SI investment questions beforehand.

The larger difference in relative importance between condition groups, but not at a statistically significant level, is about fund objective, which shows a slightly higher relevance for respondents in the treatment condition (relative importance of 12.75%) versus the control subsample (11.28%).

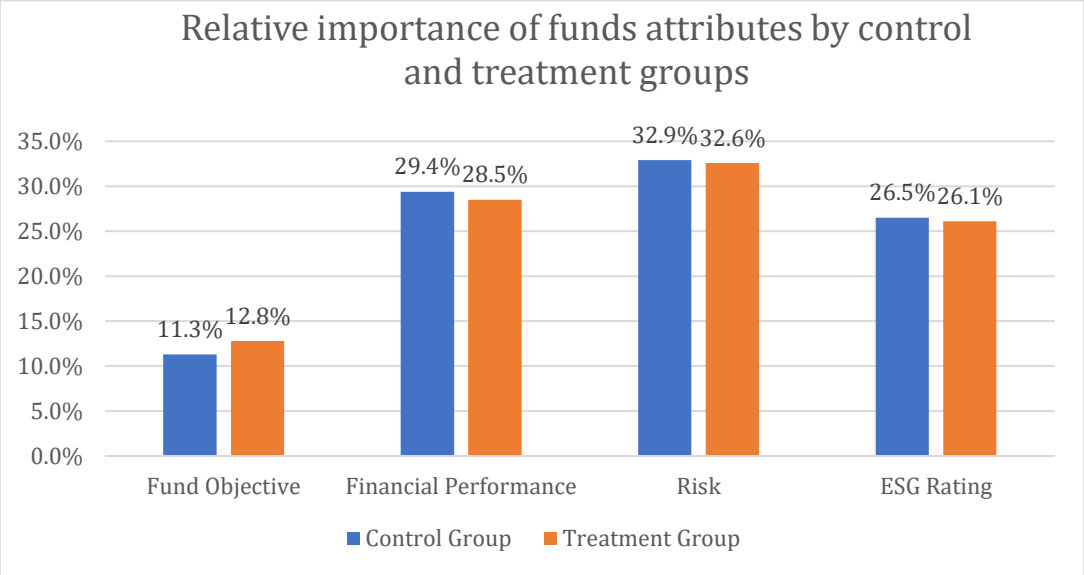

Figure 9 - Relative importance of Fund Attributes by experimental protocol

Overall, Conjoint analysis points to the relative importance of ESG information (26%). and fund objective (12%) in the investment choice at the sample level, with tendencies that are robust when analyzed in different sub-samples. The results confirm the first Hypothesis: non-financial attributes do matter in the investment choice.

4.2.2 Factor analysis: what drives sustainable investing?

Exploratory Factor Analysis is performed a set of 16 variables that requested respondents' attitude toward a series of statement associated with Sustainable Investing, as presented in section 3.2.2 in the previous chapter (Table of variables and their short code in Table C.1, Appendix). As outlined, this technique aims to identify latent tendencies in data, that are not directly measurable but that appear through their influence on observable variables. Each variable measures respondents' attitudes on a 7-point Likert scale, obtaining ordinal-type answers which may give rise to problems when performing statistical analysis based on correlation tables (Baglin, 2014). Therefore, the variables are ranked to preserve the information on the distance between their levels, they are standardized, and outliers are identified by applying Mahlanobis distance[10] to the standardized variables set. This process flags 6 outlier cases, which are excluded from the computation of the factors.

MEASURE OF SAMPLE VALIDITY AND RELIABILITY OF THE SAMPLE

Prior to extrapolating the factors, the quality of the survey data for the Factor Analysis is tested via two statistics: Kaiser-Meyer-Olkin measure of Sample Adequacy, and Bartlett's sphericity test. These tests measure the suitability of the survey data for structure detection.

1. **Kaiser-Meyer-Olkin (KMO) Measure of Sample Adequacy (KMO MSA):** this statistic measures the proportion of variance among variables that may be due to common factors, by measuring the sampling adequacy for each variable in the model and the complete model. The values of the KMO test range from 0 to 1, with higher values indicating higher proportion of common variance.
   The KMO test for this sample is 0.78, with no variable displaying a value below 0.71 (variable-level details in the Appendix). In the words of Kaiser, this value can be evaluated as "middling" (but close to 0.8 which is "Meritorius") and thus indicates that the data is suitable for EFA (Kaiser & Rice, 2016).
2. **Bartlett's test of sphericity**: This test measures the hypothesis that the correlation matrix is an identity matrix, which indicates that the variables are unrelated and unsuitable for structure detection. Significant values of the test indicate worthwhile correlations between the items and confirm that a factor analysis is useful with the data.
   The test reports a P-value smaller than the significance level (0.05), hence there is correlation between our variables and the data is suitable for EFA.

[10] Malhanobis distance is a multivariate distance metric to measure a distance between a point and the centroid, defined by all the variables taken in consideration

SELECTION AND EXTRACTION OF FACTORS

To evaluate the model that best allows to identify tendencies in the data, EFA is initially carried out via both Principal Component (PC) and Principal Factors (PF) extraction methods.

- **Principal Component extraction method** is based on Principal Component Analysis (PCA) and it estimates that the initial communalities among variables are all equal to 1, i.e., all variables are completely interconnected and their variance is fully captured by common factors. This method aims to recover the variance for all variables, even the ones that are less connected to the others, and risks to overestimate the strength of the relation between factors and variables.
- **Principal Factor extraction method** relies on prior communalities estimates based on a preliminary evaluation of the level of connection of each variable with the others. The model assumes that the portion of communality shared by the standardized variables is less than 1, accounting for specific factors to influence each variable beyond the estimated common factors. As such, it starts from lower level of prior estimated communalities and may risk underestimate the true level of communalities in the sample.

What follows is a summary of the analysis to justify the number of factors selected and their interpretation. A thorough breakdown of the whole EFA process is reported Section C of the Appendix.

Choice of number of factors. The PF and PC methods are initially tested at a global and variable-level to identify the best number of factors to retain. Initially, measures of total variance explained, parallel analysis, and global measures of errors are evaluated, which point to a set of 2 to 6 factors as possible factor solution. Then, a variable-level analysis highlights the level of communalities and corresponding error that each number-factor solution would generate. Overall, after evaluating the performance of different number of factors according to the amount of communality they recover, and the level of estimation error they generate, **a 4-factor solution is selected as the best model to capture the underlying tendencies**, while limiting over and under-estimation errors.

Choice of extraction method. Different extraction methods are applied to the data to extract the 4-Factor model: PC and PF methods, with and without iterations[11]. The analysis shows that all four methods perform similarly in identifying the factors and their relations with variables, as evaluated by global measures of variance and error, and by the level of communalities they recover for each variable. The level of

[11] The iterative versions of both models apply an iterative algorithm to consequently refine the estimates about prior communalities estimates, until a stopping rule is met

communalities is almost the same across the different models, showing the robustness of the underlying tendencies in data (Table C.2 in Appendix). **A PC iterative method** is eventually chosen as the final model to extrapolate the 4 factors, given its similar performance with other models and its ability to recover a clear factor structure. The iterative nature of the model limits the overestimation risk.

Detection of factors' structure. Based on the iterative PC model, factor loadings are extrapolated and factor scores are assigned to cases. Factor loadings are presented in Table 5, and the final Factor diagram is displayed in Figure 10.

Variables	***Factor 1: Self-Expression Driver***	***Factor 3: Social-context Driver***	***Factor 2: Financial Driver***	***Factor 4: Opportunistic Driver***
Align with Personal Values	**0.73**			
Have Social Impact	**0.70**	0.25		
Have Environmental Impact	**0.69**	0.29	0.23	
Feel good	**0.66**		0.27	0.31
Representativeness	**0.42**		0.35	0.37
Client Demand		**0.64**		0.27
Regulation		**0.57**		
Influence investee company behavior	0.42	**0.55**		
Improve Reputation		**0.55**		0.34
Overconfidence		**0.46**	0.44	
Materiality to investment		0.44	**0.65**	
Risk management		0.35	**0.56**	
Enhanced Returns			**0.56**	
Portfolio Diversification	0.24		**0.40**	
ESG as a Trend		0.29		**0.71**
Attract client		0.31		**0.62**
Model Statistics				
a. Squared Loadings	2.48	2.21	1.74	1.39
b. Proportion of Variance explained by Factor	0.15	0.14	0.11	0.09
c. Cumulative Variance	0.15	0.29	0.40	0.49

Table 5 – Four Factor model: factor loadings and model statistics from PC-iterative extraction method

Factors are automatically numbered according to the squared loadings, which represent the variance explained by each factor (statistic a). Larger absolute values indicate that the factor has stronger explanatory power, which are then evaluated in relative terms versus the overall sample variance (statistic c). Overall, the 4-factor model recovers 49% of the variable's variance, meaning that the identified factors can explain nearly half of the variability of investor motives toward SI.

The factor diagram exemplifies the relation of each factor with the observable variables, with the strength of the relation described by the factor loadings (i.e., the correlation of a variable with the factor). To interpret the tendencies described by the factors, the variables that display the highest loading on each factor are analyzed. To provide more context on how each factor interacts with the overall group of variables, Table 5 reports also the loadings that the factors have with other variables (only the loadings with an absolute value greater than 0.2 are reported).

Factors Diagram

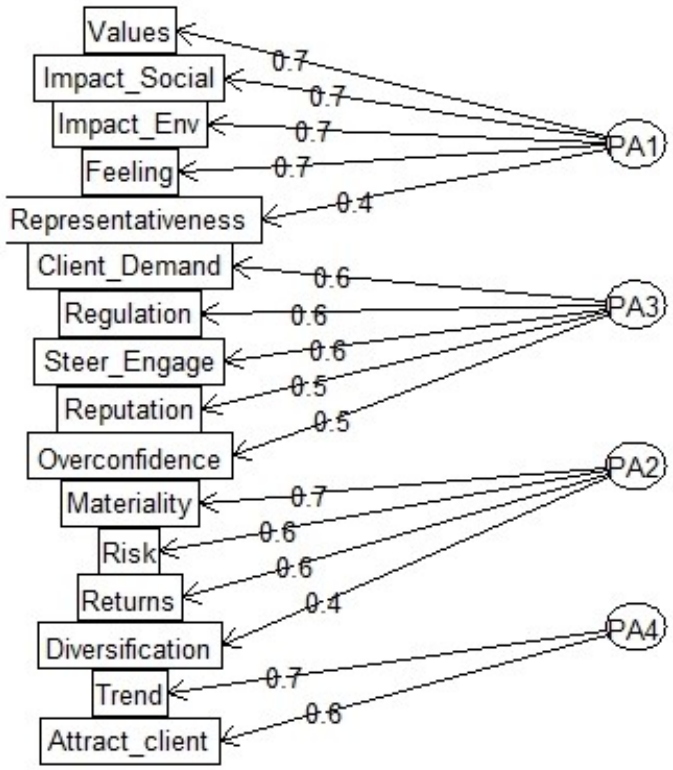

Figure 10- Factor diagram of the 4-factor model

INTERPRETATION OF THE 4-FACTOR SOLUTION

- **FACTOR 1 – SELF-EXPRESSION DRIVER**. This factor explains 15% of the variance of the sample and it is positively correlated with variables measuring personal expressions in the form of alignment to personal values, having positive environmental and social impact, feeling good when investing in sustainable assets, and the variable for representativeness (thinking assets with good ESG scores represent good investment opportunities). This factor shows that sustainable investing is associated with the desire of non-financial returns, of being consistent with personal values, and for the positive emotion it give rise to. Consistently, the representativeness variable loads positively on this factor, showing that when there is a tendency to invest sustainably for personal realization, sustainable assets are also perceived as being good financial opportunities.
    - Respondents with high scores on this factor tend to be motivated by desire for self-realization when engaging in SI, and by the positive feedback associated with it. Conversely, people with negative values along this would not aim to have a sustainable impact when investing in SI, and do not associate it with positive emotions or good investment opportunities. It is expected that professional investors would score lower on this factor, as they are more emotionally distant from the positive emotions or aims that sustainable investing may give to private investors. It is interesting to note that this factor explains the larger portion of variance among variables, grounding the claim that there is a role for self-expression and affect in sustainable investing behavior.
- **FACTOR 2 – FINANCIAL DRIVER**. Explaining 11% of variance, this factor encompasses standard financial motives for investors to engage in Sustainable Investing: the consideration of ESG issues as material to the investment, risk management, returns, and portfolio diversification. Additionally, the variable of overconfidence loads positively on this factor, despite being better captured by the Third Factor. This driver shows that there is a financial rationale for investors to include ESG considerations in their investment strategy, in particular related to the contribution of ESG factors to manage possible risks and construct a diversified portfolio.
    - Respondents with high scores along this tendency would include ESG factors as a regular variable in their assessment of the portfolio or investment assets, showing that sustainability characteristics are not at odds within a traditional framework for financial analysis. This factor shows a strategic tendency for investors to include ESG factors, e.g., a way to reduce risks or enhance returns. Respondents with lower values along

this factor, instead, would not consider ESG aspects as a lever for risk management and return-seeking behavior. Professional investors may tend to hold positive score along this factor, as they tend to have more structured frameworks in place to consider ESG aspects in their investment strategies; yet, it is also possible for professional investors to display negative values across this factor, as not all investors agree on the extent to which ESG aspects have a role in financial analysis.

- **FACTOR 3 – EXTERNAL CONTEXT or SOCIAL CONTEXT DRIVER**. It is the second larger factor, explaining 14% of the variance of the sample. It loads positively on variables related to client demand, compliance with regulation, improving reputation, influence company behavior (Engage/Steer), and Overconfidence. All the variables relate to the role of investors with **respect to the external context** in which they operate, both in terms of what investors "receive" from the outside – i.e., regulation, clients' expectations – and what they transmit externally – i.e., engagement with companies, reputation, knowledge. This factor highlights that Sustainable Investing is a social phenomenon, as it is interconnected to multiple external aspects.
    - Given the relevance of the external context, respondents with high scores along this factor tend to engage in sustainable investing with the aim, on one hand, to adapt to regulation and customer demand, and, on the other, to improve their reputation or their company's stance externally. As such, professional investors are expected to hold mostly positive value along this factor. Conversely, respondents with negative scores do not engage in SI due to the influence of the external context and do not seek to enhance their reputation, or prove their ESG knowledge, when investing sustainably.
- **FACTOR 4 – OPPORTUNISTIC DRIVER.** This factor explains 9% of variance and loads positively on variables related to ESG as a market trend, and its role to attract clients. It is also positively related, albeit with smaller values, to the variable of representativeness. As it comprises only variables that aim to measure possible behavioral or irrational tendencies in Sustainable Investing, it shows that is plausible to assume that part of the interest in SI is driven by an opportunistic driver. The term "opportunistic" is used to explain the interest in sustainable investing for reasons that are neither related to financial fundamentals, nor to personal expression; rather, respondents with high value along this factor would tend to engage in sustainable investing because they see the market following it, hence they do not want to miss on the opportunity. This driver is likely representing the perceived tendency that analysts point to when using the term "ESG bubble".

- Respondents with high score along this factor could be equally private or professional investors, who go into sustainable investing to follow the market and point to a possible herding behavior in SI. On the opposite end of the spectrum, respondents with negative score do not consider ESG as a trend, as a good investment opportunity, or as an occasion to attract clients.

Except for Factor 4, which is composed exclusively of behavioral variables, it is interesting to note many of the variables that measure more "behavioral" or irrationality-prone tendencies tend to appear alongside other variables in separate factors. It is also important to underline that the factors do not aim to identify whether a respondent will or will not invest sustainably depending on her higher or lower score along the factors. Rather, the four factors highlight different tendencies in the motives that may lead investors to engage in sustainable investing, overall suggesting four main drivers.

MEASURE OF INTERNAL CONSISTENCY OF THE FACTORS

The internal consistency of the factors is estimated via Cronbach's alpha for each factor and reported below. Cronbach's alpha is a measure of internal consistency reliability or item relatedness of a scale or questionnaire. It measures the extent to which items on the scale contribute to measuring the same construct. The test's values range from 0 to 1, with values closer to 1 indicating greater consistency of the variables on the scale (Tavakol & Dennick, 2011). The results of Cronbach's alpha the factors are reported below and show overall good levels of internal consistency for the identified factors, with the exception of Factor 2.

- Factor 1 – Self-expression driver: 0.807
- Factor 2 – Financial driver: 0.60
- Factor 3 – Social context driver: 0.723
- Factor 4 – Opportunistic driver: 0.72

This test reveals that the Financial driver has a value of 0.60, indicating low internal consistency of the variables included in the factor. This is accounted for by the fact that two variables – Returns, Diversification – displayed low communality estimates with the other variables (Table C.1 in Appendix). Furthermore, the value of tests is also affected by the sample size and variable formulation, which could have given rise to ambiguous interpretation by respondents For the purpose of this exploratory analysis, Factor 2 will be kept as identified with all variables for the regression analysis, but as an additional test, the model will test the effect of the various underlying variables when considered alone, to see if they display a difference relation with the dependent variable.

FACTORIAL MAPS

To understand how different investor types are distributed along the factors, factorial maps are used (Figures 11 and 12). Factorial maps display where the cases (i.e., the respondents) fall in the space spanned by the factor, according to their factor scores.

In the first factorial map, investors tend to display a slight clustering along the main diagonal of the quadrant, with a well-defined group of cases in the second quadrant occupying a marked negative position along Factor 1 (Self-expression Driver). With the exception of such group, most cases tend to be along neutral to positive values of the factor. On Factor 2 (Financial Driver), cases are more uniformly distributed across positive and negative values, with most cases falling within -1 and +1 values. Contrary to initial expectations, both private and professional investors have positive values along the Self-expression Factor, demonstrating that the expressive tendency appears for both investor types when engaging in SI. Likewise, the two types are distributed across values of Factor 2, showing that the financial or strategic tendency in not a prerogative of professional investors to invest sustainably.

The distribution of investors along Factor 3 and Factor 4 is more loosely clustered in a circular shape around the center. Consistent with expectations, the majority of retail investors displays negative values along Factor 3, signifying that they are less subject to the influence Social Context for investing sustainably. They also tend to span both positive and negative values of Factor 4, showing that they are not immune to opportunistic tendencies when it comes to SI. Professional investors tend to show positive values along the External Driver, as supposed given the variable underlying this factor. They overall display neutral to negative values along the Opportunistic Driver, with the exception of one case, meaning that opportunistic reasoning is less of a driver for them to opt for sustainable investing. Still, cases like the few outliers also show that "irrational" or opportunistic tendencies exist also for Professional investors.

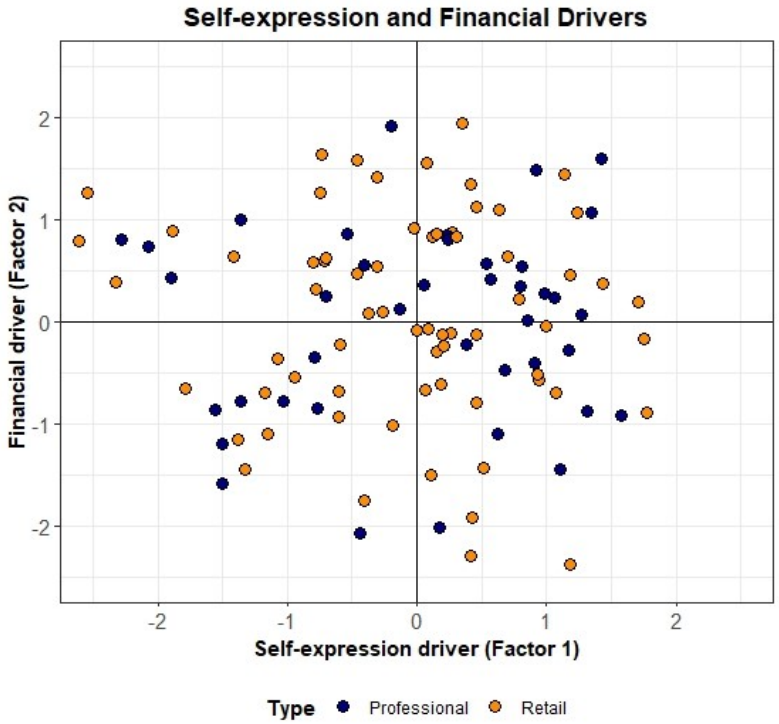

Figure 11 - Factorial Map: Self Expression and Financial Drivers

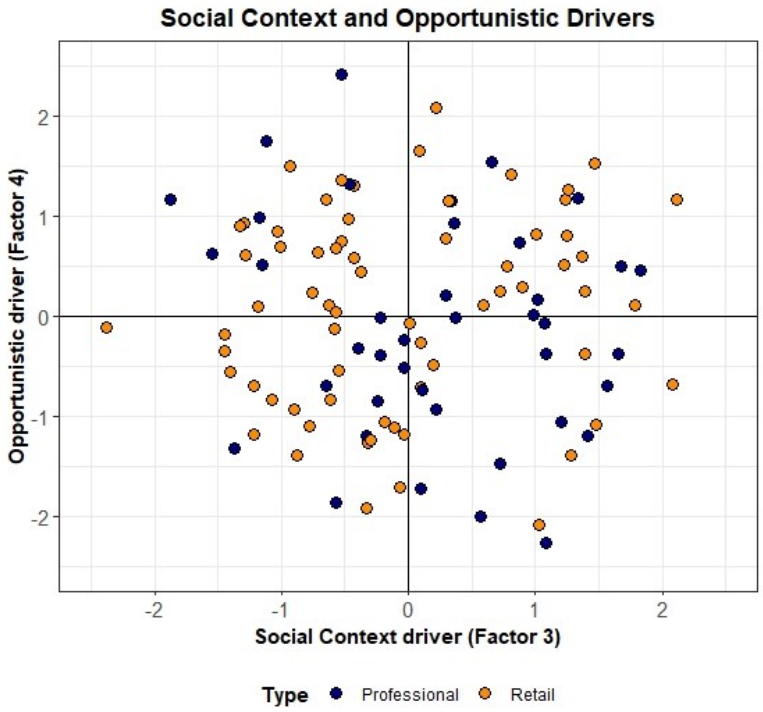

Figure 12 – Factorial Map: Social Context and Opportunistic Drivers

4.2.3. Multivariate analysis: how are factors relate to aspects of sustainable investing?

To conclude the analysis, an OLS regression is performed to test the relationship between the identified factors and one dependent variable representative of sustainable investing: the percentage of portfolio managed via ESG strategy. This variable is regressed against the four drivers and the set of control variables, whose summary statistics are reported in Table 2. The control variables are of two types: behavioral characteristics, comprising CRT score, risk attitude, investment horizon and investment experience; and demographic characteristics, related to investors' gender, type, age class, education level, income and socioeconomic background.

The regression model is run with the following specifications: first, the relationship between the factors and the dependent variable is assessed alone; then, only the set of behavioral control is added; following, the set of demographic controls is added, without behavioral controls; and finally, both sets of controls are added.

For all regression models, a robust error is estimated and controls for multicollinearity are put in place. In particular, robust Huber-White standard errors are included to control for possible issues of heteroscedasticity, which accounts for unequal variance distribution across variables. To check for multicollinearity, a check for Variance Inflation Factors (VIF) is applied after each regression. This allows to verify that variables included in the regressions do not encounter severe multicollinearity, which would inflate the standard errors of the estimated regression coefficients.

OLS REGRESSION: PERCENTAGE OF AUM MANAGED WITH ESG STRATEGIES

The results from the OLS regression are displayed in table 6. The model shows that Self-expression, Financial, and Social Context drivers are significantly related to the dependent variable, although for Self-expression and Social Context the statistical significance depends on the model specification. The Opportunistic factor is not found to be statistically significant across any model specifications. The VIF remains under the required threshold in all models, confirming that regression coefficients are not inflated by multicollinearity.

Relationship between the Four Drivers and the percentage of portfolio in sustainable assets				
	(1)	**(2)**	**(3)**	**(4)**
Self-expression driver (F1)	5.898	7.638*	5.971	9.214*
	(1.76)	(2.10)	(1.75)	(2.27)
Financial driver (F2)	12.48***	11.75**	7.840*	9.107**
	(3.90)	(3.25)	(2.41)	(2.94)
Social Context driver (F3)	9.605**	9.577**	6.317	6.776
	(3.28)	(2.70)	(1.20)	(1.27)
Opportunistic driver (F4)	0.618	1.602	2.361	2.419
	(0.20)	(0.52)	(0.60)	(0.67)
CRT score		-1.213		2.392
		(-0.33)		(0.57)
Risk Attitude		0.335		1.191
		(0.24)		(0.76)
Investment Horizon		5.358*		6.280*
		(2.12)		(2.52)
Investment Experience		0.323		-1.297
		(0.24)		(-0.93)
Female			10.44	8.244
			(1.37)	(1.01)
Institutional Investor			10.93	14.22
			(0.97)	(1.23)
Age Class			-4.151	-3.561
			(-0.63)	(-0.53)
Education			10.06	9.001
			(1.76)	(1.51)
Socioeconomic Background			-2.047	-1.314
			(-0.80)	(-0.50)
Income level			-2.481	-3.115
			(-0.67)	(-0.80)
_cons	55.30***	25.08	38.65	-2.793
	(17.65)	(1.45)	(1.97)	(-0.11)
N	93	91	75	74
R^2	0.259	0.304	0.337	0.418

t statistics in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6 - Result from OLS regression

The Self-expression driver (Factor 1) assumes a positive and significance relation at the 5% level with the dependent variable when behavioral controls are added to the regression. This reveals that considering the behavioral tendencies of investors helps to unmask the relation of the expressive factor with the amount of assets held in ESG strategies. The positive relation shows that an increase in self-expression tendencies is positively related with an increase in up to 9.2% (when the full controls are included in the model) in assets managed under ESG strategies. In particular, investment horizon shows to be statistically significant (at the 5% level) and positively related to the dependent variable. This is consistent with expectations and with the core assumption of sustainable investing, which presume a long-term view of investments.

The Financial driver (Factor 2) is positively related at statistically significant levels across all model specifications (at the 0.1% level in the first two specifications, and at the 1% level once demographic controls are added). This result demonstrates that the tendency to include ESG factors from the perspective of traditional financial motives e.g., (risk management, return seeking) is positively related to investors holding a greater proportion of assets in ESG strategies. The regression coefficient of this factor is 9.1% when all controls are considered, showing that the more investors are driven by strategic reasons to engage in SI, the higher proportion of their portfolios will be in ESG assets.

The External context driver (Factor 3) displays a positive and statistically significant relation with the dependent variable when factors are regressed alone and with the behavioral controls (at the 1% level), but the significance is lost once demographic controls are added to the model. This shows that there is a relation between contextual factors and realized sustainable investing strategy, whether measured by the ad-hoc factor or by demographic variables.

In general, among the four factors, the Opportunistic one never appears to be significantly related with the outcome, while for the other three there are evidences of significant relationships. Additionally, the demographic variables are not found to be statistically significant in any specification of the model, which may be related to the drop in sample size as more variables are added (due to issues of missing responses in the data).

Overall, although the identified relationships are not constant across different model, the results appear to indicate that there might be a relationship worth exploring with further research. Moreover, although the number of observations is limited, and further reduced to 74 in the model with all the controls, the R2 increases across the specifications and in the fourth model is above 0.4, which support the validity of our approach

FURTHER TESTS

To test the stability of results, the regression is replicated disaggregating each driver into its underlying variables, to test whether some of the relationship identified could be attributable to a specific variable, rather than to the whole factors. Results from these regressions are reported in the Appendix, Tables D1-D5.

No evidence of a statistically significant relation between standalone variables and the dependent variable is found for Self-expression and Social context drivers, except for a slight positive value of overconfidence (at the 5% significance level) until controls are added.

For the Financial driver, materiality shows a positive and significant relationship at the 1% level with the dependent variable, until demographic controls are added. Materiality is indeed a strong property of ESG information, as the inclusion of ESG factors in financial analysis allows to account for issues that may directly affect the value of an asset.

For the Opportunistic driver, the variable of "Attracting clients" is found to be statistically significant at the 5% level in all model specifications, showing that the signaling is a relevant incentive driver for investors (mostly professional ones) to hold ESG assets. This is consistent with the belief and empirical evidence from investor surveys, where client demand is often cited as a source of the increase in ESG investing by professional investors.

The results from the additional tests confirm that the four drivers work better than the individual variables at capturing complex tendencies that are positively related to the realized sustainable investing. This is relevant especially for the Financial factor, which displayed lower measure of internal consistency as measured by Cronbach's alpha.

FINAL CONSIDERATIONS

The results from the various analysis point to a visible role played by non-financial drivers in sustainable investing. In particular, the study confirms the first hypothesis and partially confirms the second hypothesis.

The first hypothesis is accepted following the results from the conjoint analysis, which quantifies the relative importance of ESG information for the investment choice. The results confirmed that non-financial factors have a relative weight of 38% for the investment decisions.

The second hypothesis is confirmed by factor analysis, which identifies four overarching drivers leading investors to engage in sustainable investing. In particular, the regression model shows that the expressive factor and the social context factor have a positive and statistically significant relation with realized sustainable investing strategy, confirming

Hp 2.1 and Hp 2.2 respectively. The Opportunistic factor is identified as a fourth tendency, but its effect is not found to be statistically related to the variable of sustainable investing, thus rejecting Hp 2.3.

Overall, the three analyses bring evidence that sustainability considerations are integrated at different moments of the investment process – both at the specific moment of the investment choice, and at the general level of investment motives. Additionally, the identified tendencies are found to be robust when disaggregated across various respondent groups, and when estimated via different extraction models. The final results from the multiple regression analysis confirm the relevance of the four drivers for the realized measure of sustainable investing, i.e., the percentage of ESG assets held in investors' portfolios. While the relationships between drivers and dependent variable are statistically strong across model specification, they highlight the existence of a relationship which is present despite the limited sample size.

5 Discussion

This chapter assesses the results of the analysis in light of the research question, evaluating how sustainability considerations enter in the investment decision at the specific moment of the investment choice, and at the general level of investor motives. Results are first assessed with respect to theoretical and empirical evidence. Then, the identified factors are proposed as a solution to possible inconsistencies identified in investor behavior. Finally, actionable insights for academic research and industry participants are suggested.

5.1 Assessment of the drivers of sustainable investing

The results of the analysis allow to give a holistic answer to the research question, which sought to identify the drivers of sustainable investing. By performing an exploratory research with experimental and empirical methods, it is possible to analyze sustainable investing and its drivers at both the specific and general levels.

5.1.1 Specific level: inclusion of non-financial factors in the investment choice

As the definition of sustainable investing used in this research presumes the integration of ESG factors in the investment process, the first part of the analysis focused on evaluating whether, and how, sustainability attributes enter at the specific level of the investment choice.

This is done via conjoint analysis, which demonstrates the relative importance on non-financial attributes of the investment object in the moment of the investment decision. The analysis reveals that non-financial attributes have a relative weight of 38% for the investment choice, with ESG score carrying a relative importance of 26% and fund objective of 12%. The results confirm that ESG issues are included in the investment decisions, and they are important determinant of investor choices as their relative weight is comparable to that of standard financial aspects such as risk (33%) and financial performance (29%).

The results exemplify both the upsides and downsides of sustainable investing. On the upside, they confirm the increasingly important role that sustainability considerations have come to occupy for investments. What started as a "do-good" thing that many still regard as a passing trend, is now becoming a core aspect of financial analysis. Noting the relevance that ESG aspects are starting to occupy, BlackRock Investment Institute

(2020) suggested that SI represent a "tectonic shift" in the way investment work: ESG integration is not just a new investing strategy or analytical prerogative; rather, it is representative of a complete shift that is reshaping the way the whole investment process operates. The findings from CJA confirm this trend and highlight the important role played by sustainability information - and ESG rating in particular - in the investment decision.

On the downside, the increasing relevance of sustainability parameters for the investment choice should be approached with caution because, different than traditional and established measures of risk and returns, ESG issues do not have a standard unit of measure. One of the main problems of ESG data is the lack of a common definition, globally-accepted measures, and universal reporting systems by which all actors in the financial space (and beyond) refer to and integrate sustainability in their workings. Until clarity will be built, ESG data will be evaluated and interpreted differently by different actors, furthering concerns and challenges for a more widespread and effective adoption of SI. For example, it is not clear to what extent ESG scores overlap with, or complement measures of risk. Additionally, as the performance of sustainable investments is still being assessed, there is no certainty over the long-term effect of ESG integration in the long term, and on whether ESG issues may be over-included in investment evaluation to the point of unbalancing a thorough analysis of investment fundamentals. These are major barriers hampering wider and more consistent adoption of ESG in investments.

The data and definition challenges are to be overcome if, as suggested by BlackRock research, sustainability is now a core aspect of investments and financial markets. In this respect, the role of regulators is paramount in ensuring harmonization of definition and reporting in the system, as the EU is doing via multiple initiatives (e.g., the SFDR, the Task Force on Climate-related Financial disclosure, the Environmental and Social taxonomies, etc.). Work is also under way in Australia and New Zealand, where the regulators have tightened the standards of what constitutes sustainable investing (GSIA, 2021).

Another interesting aspect highlighted by conjoint analysis is the robustness of results when disaggregated across investor types, cognitive characteristics, and control-treatment groups. With respect to cognitive characteristics and experimental protocol, the results argue against possible cognitive abilities or irrationalities when investors decide to invest sustainably (e.g., herd behavior or availability biases). With regard to investor types, the relative importance of the investment attributes is not statistically different between the two groups, which display very close values. When compared to the descriptive analysis and combined with the characteristics of the SI drivers, a gap emerges between intention and realized sustainable investing by retail investors. This point is explored in detail in Section 5.2.

5.1.2 General level of investor motives: SI drivers and their relationship with realized sustainable investing

The factors extrapolated via EFA identify four overarching drivers behind sustainable investing: self-expression, financial, social context, and opportunistic. These drivers summarize different attitudes and motives investors display when they engage in SI.

The factors reveal the presence of both financial and non-financial reasons behind SI, confirming Hypothesis 2. Taken together, these drivers have an explanatory power of 49% with respect to the overall SI motives included in the study. To add validity to the results, the variables included in the analysis spanned different motives for investors to invest sustainably, and no advantage was given to financial, personal or irrational aspects by including more variables of such category in the questionnaire. Moreover, different factor extraction models pointed to the same factor structure in terms of their relations with the underlying variables (as detailed in the Factor Analysis report in part C.3 of the Appendix), confirming the robustness of the underlying structure and the relevance of the identified tendencies for sustainable investing.

Identifying these overarching drivers allows to recognize the **multifaceted nature of the SI phenomenon**, which cannot be explained by a single variable or tendency alone. This is consistent with the fact that sustainable investing is often called into question under different perspectives: e.g., for the performance-return tradeoff debate, for its ability to conjugate financial returns and personal values, for the role of sustainable investing in the global social context, etc. The results of EFA therefore consolidate the often-contrasting claims about SI, by showing four different tendencies along which the SI debate can unfold. Each driver can also be related to theoretical aspects of behavioral finance and empirical evidence.

SELF-EXPRESSION DRIVER

The emergence of Self-expression as the main driver behind sustainable investing, demonstrates the importance of a behavioral perspective to analyze sustainable investing. This driver confirms that investors seek personal expression when investing, and not just return-maximization or monetary utility (consistent with Statman, 2004). In fact, sustainable investing allows investors to express themselves by offering products aligned to investors' values, which give rise to positive feelings, and which enable investors to have social or environmental impact.

This factor clearly displays the role of affect in investments, i.e., the positive or negative feeling associated with the investment object. As investigated by Statman, Fisher, and Anginer (2008), affect is a relevant determinant of investment decision, often at the automatic and unconscious level. The role affect plays on asset prices and market equilibrium is at the basis of the Behavioral Asset Pricing Model (BAPM) (Shefrin and

Statman, 1994). The application of BAPM to different types of portfolios shows how affect, in the form of positive evaluation of an asset, translates into investors' expectations of lower risk and higher expected returns, increasing the demand of such asset but not being reflected in realized returns (Statman et al., 2008).

The predictions from the BAPM are confirmed in the results from the Multiple Regression Analysis, where the self-expression driver is found to be positively related to the percentage of ESG assets held by investors. This relationship is significant at 5% level when behavioral variables are included in the model. The positive relation between factor and dependent variable shows that, the more investors seek expressive, affective, or impact benefit, the higher the proportion of ESG assets will in their portfolio.

The role of affect and emotions in sustainable investing is increasingly noticed and studied, for example by Brøgger and Kronies, who sought to understand the role of investor sentiment in SI (2020). In further research, it would be interesting to integrate the self-expression driver - or a comparable indicator of investor affect - in the BAPM, so to evaluate the relationship between this variable, assets' prices, and overall market equilibrium. Such an investigation would be useful to assess the claims that the price and related performance of ESG assets is inflated due to affect, rather than to financial value or asset fundamentals.

FINANCIAL DRIVER

The Financial driver manifests the strategic rationale to include non-financial factors in the investment process. Coherent with the results of conjoint analysis, this factor confirms that investors do see the strategic advantage and informative content of ESG factors, highlighting in particular the inclusion of ESG from a risk-management perspective (e.g., materiality of ESG issues, portfolio diversification). This result is consistent with the claim and evidence that management of ESG issues is positively correlated with financial performance (Dunn et al., 2018). The tendency described by this factor proposes a reconciliation of the trade-off often implied in SI (i.e., impact versus return), as investors are motivated to integrate ESG in their investment strategy for the positive effect is has on traditional financial aspects of risk management, return optimization, and portfolio diversification. In this sense, ESG is not at odds with traditional financial theory, as it contributes to the overall investment strategy by optimizing risk and generating higher potential returns.

The realization of this driver is displayed in the systematic inclusion of ESG factors in the investment process, which finds both theoretical and practical application. From the theoretical perspective, an example of how sustainable factors are structurally included into traditional investment decision is proposed in the ESG Efficiency Frontier (Pedersen et al., 2020). This model acknowledges the role that ESG aspects have come to occupy in portfolio allocation, and it proposes an ESG-adjusted capital asset pricing model to

illustrate the investment opportunity set when investors care about risk, return, and ESG. Overall, the ESG Efficiency Frontier demonstrates that it is possible to include sustainable considerations as part of a structured investment strategy, with the resulting costs and benefits that such integration entails (Pedersen et al., 2020).

From a practical perspective, the widespread integration of ESG factors in financial analysis and portfolio strategies is visible in most financial institution and fund providers, as found by global investors survey (suggested in chapter 3, pag. 17). The research by BlackRock Investment Institute brought the relevance of sustainable investing to new prominence by depicting it as a "tectonic shift" that is transforming investing as a whole (Hildebrand et al., 2020). According to it, sustainability is a source of new return premia, and it will manifest its effects on asset prices over the long term, rewarding assets with high sustainability characteristics and making low-sustainability assets cheaper. In their perspective, viewing ESG integration from a financial or strategic tendency is only the starting point: they see the sustainability wave as the core of investment strategies, which should inform asset allocation and cause structural shift in investment patterns.

While not at a global or tectonic level, the results from the OLS regression confirm this trend, showing a positive and statistically significant relationship between the Financial driver and sustainable investing. The relationship is positive across all model specification, confirming that when investors see the strategic role of ESG integration, they are more likely to hold a larger proportion off their portfolio in ESG assets.

EXTERNAL CONTEXT AND OPPORTUNISTIC DRIVERS

The tendencies described by the last two drivers can be assessed in light of the social role that sustainability has come to play in both mainstream and financial discourses. On one hand, the increased attention toward sustainability topic has questioned the role of the financial factor with respect to global challenges, and has led some investors to align their principles and strategies with the direction proposed (and in some cases imposed) by general public and regulators. On the other, this interest has also given rise to a "sustainability trend", whereby financial products branded as "Green" or "Sustainable" are being increasingly offered by providers (as per Morningstar, 2021a), but the true sustainable underlying nature of such products remains unclear.

The Social Context and the Opportunistic drivers reflect these two tendencies. The former acknowledges a role for external context in motivating investors to engage in sustainable investing; the latter shows that the incentives to do so may be opportunistic in nature and may relate to possible herding behavior.

The relationship of the two drivers with the percentage of ESG assets in investors' portfolio is positive, although not conclusively assessed in terms of statistical significance. The relationship with social context factor is statistically significant when demographic factors are not included in the model, which otherwise mask the relationship between the variables. The opportunistic driver never appears to be significantly related with the outcome. While the results are not conclusive of the relations, they indicate that there might be a relationship worth exploring with further research.

Regarding these two drivers, it is interesting to mention the regulatory work brought forward by the European Union under the Sustainable Finance Initiative. This work aims to reflect both the importance of addressing global environmental and social challenges, and the necessity to limit fraudulent or irrational investing behavior, or "Greenwashing". The last instance of the EU effort is the European Union Sustainable Finance Disclosure Regulation, presented in the third chapter and used to inform the construction of the choice experiment. With more work planned to come into force, the European Union is striving to create a shared understanding among fund providers and client of what sustainable investing means in practice.

5.2 Sustainable investing puzzles by investor type

The results from the analysis show that the tendencies identified are consistent with broader theoretical and practical aspects of sustainable investing. The drivers also allow to illustrate how SI is realized by both professional and retail investors, especially as a discrepancy emerges between the results from descriptive analysis, where retail investors appear to engage in SI way less than professional ones; and the results from the other analysis, where retail investors demonstrate the same tendencies as professional ones.

The descriptive analysis of the sample highlights a consistent difference between professional and retail investors, as the former tend to engage in sustainable investing more and for a larger proportion of their assets, compared to the latter. In fact, nearly all professional respondents in the sample include ESG factors in their investments (93%), applying it to most stages of the investment process and using different SI strategies. A lower proportion of retail investors, instead, considers ESG factors in their investment strategies (63%), which is visible by the lower proportion of ESG inclusion throughout the investment process and in the application of various ESG strategies. The same difference is reflected in the proportion of portfolio that is in ESG assets (78% professional, 48% retail) and impact assets (29% professional, 10% retail).

While the descriptive analysis show a marked difference in the realization of Sustainable investing between investor types, the results from conjoint and factor analyses show that both type of investors display similar tendencies in the investment decision and in the SI drivers. In fact, conjoint analysis reveals that the relative importance of the asset's attributes for the investment choice is not statistically different between investor types, who display similar values. While it would be plausible to assume that professionals and retail investor weight attributes differently in their investment choices, the results show otherwise. Regarding the distribution of cases along the SI drivers, as visible in the factorial maps, there appears no specific clustering of either type along the four tendencies. This is interesting, considering for example that the strongest driver of sustainable investing was found to be personal realization or self-expression, to which professional investors are assumed to be less exposed to – or at least, less than retail investors. Finally, the dummy variable assigned to professional investors never appears to be statistically significance in the multiple regression model, arguing against the type of investor as a decisive variable for SI.

This raises questions around the behavior of the two investor types. For professional investors, the findings lead back to the initial puzzle about the existence of sustainable finance from a traditional perspective: why is sustainable investing so widespread in their strategy, considering the traditional theory and inconclusive evidence against it? For retail investors, why don't they engage in sustainable investing at the level that their experimental investment choices suggest? A proposed conciliation of these contrasting tendencies it resolved by considering the four drivers of SI.

5.2.1 Professional investors: reasons to engage in SI

From the perspective of traditional finance, the results from the descriptive analysis are surprising given the traditional view of finance whereby sustainable investing is an irrational strategy, as investors would accept lower expected returns to hold a portfolio that fits with their ESG standards (Hong and Kacperczyk, 2009; Pedersen et al., 2020). Consistent with this claim, the Expressive driver confirms that there is an expressive tendency at play in sustainable investing, suggesting that this kind of investments would be more expected from less-sophisticated, more self-driven retail investors.

Yet, the results are acceptable when considering the other drivers. Sustainable investing appears indeed consistent with the tendency identified by the Financial driver, whereby ESG aspects are included in the investment strategy for their strategic contribution to risk, return, and portfolio diversification. Under this perspective, it is plausible that professional investors engage in SI, and to a higher degree than retail ones, thanks to their sophisticated investment approach and reliance on frameworks to structurally include ESG variables in their strategies. The structured integration of ESG factors in professional investors' strategies is confirmed by the growth, among others, of

sustainability reporting standards and frameworks, and the number of ESG rating and agencies available to investors.

Moreover, this result is also coherent with the tendency represented by the Social Context driver, as professional investors face great pressure about their sustainability stance from regulators and the general public. Therefore, they may engage in sustainable investing to answer to regulatory request and to respond to the pressure coming from clients, two main tendencies identified in an industry survey by Natixis Asset management (2021).

5.2.2 Retail investors: gap between intention and realization of SI

The predictive power of the conjoint experiment is helpful to assess retail investors' behavior in sustainable investing. As outlined in chapter 3, the results form conjoint analysis have high external validity and identify patterns of behavior that are strong predictors of real-life behavior[12] (Hainmueller et al., 2015). Theoretically, then, the investor choices in the experiment should have high predictive power for the choices of investors in real-life.

Based on the results obtained from conjoint analysis, it is expected that both investor types would display similar investment choices in real life, given the fact that they attribute the same relative importance to attributes in the investment choices and display similar tendencies along the four drivers. In particular, retail investors seem to include sustainable information in their investment choices to the same level and with the same drivers of professional investors. Yet, this is not mirrored in the empirical data: the descriptive analysis of the sample shows that they are much less likely to include ESG information in their investment decisions (difference of 30% between the two types, significant at the 1% level). The same holds for the case of fund objective, whose relative importance for the investment choice is similar between investor types, despite a significantly lower proportion of retail investors reports holding Impact assets (difference of 61% vs Professional investors, significant at the 1% level).

[12] This analysis was performed on a sample composed only of investors that reflected the target population of analysis, and conjoint assumptions were implemented to make sure the experimental design was methodologically sound. While this gives confidence to the result of the analysis, it would not be possible to claim the results hold external predictive validity given the limitation of the sample size. Therefore, what follows is a theoretical argument to suggest a possible role of the identified factors in explaining the perceived realization gap by retail investors. More structured studies of this gap have already been acknowledged by other scholars in the context of sustainable investing (Falko and Bush, 2014).

From here, the question arises as why retail investors do not reflect similar sustainability investing tendencies in their portfolio as the experimental results would suggest, and given the strong nature of self-realization motives identified by the first driver.

Evaluating the gap from the perspective of the four drivers, this result is consistent with the lack of strong Financial and Social Context tendencies at play for retail investors. The Financial driver identifies strategic motives for investors to invest sustainably, which may simply not be there for retail investors due to a lower awareness of ESG information, and less knowledge and financial instruments to integrate them in their investments. Additionally, lack of availability of ESG investment products may further hamper the realization of SI. From the Social-context perspective, external motives and social pressure are less stringent on retail investors. Importantly, retail investors have reduced access to external inputs or guidance in their investments. The lack of structural ESG information and means was confirmed as a reason for the intention-realization gap in retail investors by Falko and Bush (2014), who applied the theory of Planned Behavior to explain the gap in sustainable investing attitudes and realization of retail investors. In particular, they found that the lack of proper sustainability information provided by fund advisor was one of the causes limiting the capacity of retail investors to invest in SI.

5.3 Applicable insight for academic research and industry participants

The analysis identified relevant aspects of sustainable investing that are often overlooked when the phenomenon is considered from the framework of traditional finance, opening implications for both academic research and financial practitioners.

From the academic perspective, the study proves the case for behavioral finance as a useful framework to assess empirical tendencies in sustainable investing. Using the behavioral finance perspective, it is in fact possible to identify how some non-financial drivers shape SI behavior, gauge their relative importance in the investment decision, and estimate their relationship with a measure of realized SI. This enlarges the perception of sustainable investing from a narrow impact-return debate to the consideration of how trade-offs happen along the four drivers, for example by considering self-expressive motives in investing, by evaluating the role of social pressure, and by looking for possible irrationalities at play.

Two points are particularly relevant form the perspective of behavioral finance: the importance of the expressive motives and irrationalities for sustainable investing, and role of cognitive evaluation of object for the decision. On one hand, behavioral finance acknowledges a role for feelings and biases when investors engage in financial markets, two tendencies identified by the Self-expression and Opportunistic drivers, respectively. Hence, theories of behavioral finance contribute to explaining the relationship between such tendencies and actual investment behavior in a more comprehensive way than mainstream financial paradigm. On the other hand, the evaluation of investment objects may be subject to biases related to cognitive characteristics and the framing of investment choices. Some behavioral theories that explore the way behavioral tendencies affect sustainable investing are the Behavioral Asset Pricing Model (Statman and Shefrin, 2008) and, in the case of cognitive evaluation, the Theory of Planned Behavior (Ajzen, 1991).

For industry participant, the study highlights a series of actionable insights.

First, the study shows that retail and private investors alike are affected by the same drivers when they engage in sustainable investing. Also, they tend to assign the same relative importance to attributes of a financial product in the investment decision. These findings suggest that these investor types are more similar than expected, especially in what drives their investment decision. However, the two investor types do differ along their realized sustainable investing strategy. Since both investor types are driven by the same tendencies, and evaluate attribute similarly in the investment decision, this discrepancy points to the presence of barriers retail investor face to invest sustainably. Such barriers are suggested in the form of lack of awareness of ESG information and difficulty to access ESG or impact products. More structured research on the intention and realization gap could be useful to assess the specific form of these barriers and help overcome them. These findings suggest that fund providers and investment advisors can play an important role to enable retail investors to access sustainable products and sustainability information.

Second, the study suggests that different motives are at play for investors to invest sustainably. This has important implication for asset providers, who can evince the different tendencies underlying investor choices and propose investment products that meet the desired characteristics. Related to this point, another important insight of the study is the use of conjoint analysis to identify the attributes of the investment choices that have highest relative importance for the investment decision. By applying this methodology, providers could understand the attribute(s) of their products that their clients find more relatively important, and use them to communicate accordingly on their products.

Finally, investors themselves can benefit by understanding whether their investment strategy is driven by one or more of the overarching drivers. By understanding whether they tend to be driven by one tendency rather than the other, they will be able to adjust their strategy and make more informed investment decision, avoiding possible irrational behaviors – or delusion. This point is particular important, as behavioral finance often find that irrationalities in the market are driven by noise traders who commit cognitive errors when they invest, affecting market efficiency and leading to distorted prices (Statman et al, 2008). By accounting for possible factors to impact sustainable investment decisions, investors can self-assess their tendencies and make sure their personal or contextual drivers do not lead them to an irrational investment strategy.

6 Conclusion

This study sought to investigate what drives sustainable investing at the specific and general level of investment process. By applying a set of statistical techniques to primary data, the study demonstrated that both financial and non-financial drivers interplay when investors engage in sustainable investing.

First, it is shown that sustainability attributes carry an important weight for investment decision, especially ESG score, which displays a relative importance of 26% on average. Conjoint analysis reveals that sustainability information (in the form of an ESG rating and fund objective) have a relative importance of 38% for the investment choice. This shows that, contrary to mainstream financial assumptions, ESG integration in now pervasive in investment evaluation. Yet, given the issue with data and definition, it is not clear whether SI is understood equally by all investors and properly accounted for in the investment process. This opens room for biases, irrationalities, and emotions to steer the investment choice, affecting the equilibrium in the market. In this respect, work by regulators is necessary to harmonize and standardize the sustainable investment space, to make sure all financial participants share the same understanding and have access to reliable and comparable sustainability information when investing.

Then, exploratory factor analysis identifies four overarching drivers behind SI: Self-expression, Financial, Social context, and Opportunistic. It is interesting to note how the strongest tendency in data is identified by the Self-expression driver, which summarizes variables of desire to have social and environmental impact, alignment with personal values, and positive feeling associated with sustainable investing. This is consistent with the behavioral framework in general, and the research on affect in particular: affect plays an important role when investors evaluate ESG information, and a Behavioral Asset Pricing Model could help to assess better the extent to which such tendencies relate to portfolio allocations and overall market dynamics (Statman et al., 2008). The Financial driver allows to see ESG information as a strategic variable in investment decisions, grounding the view that sustainable investing is not at odds with traditional financial aims, and rather it may become a core aspect for the whole investment industry (as per BlackRock research, 2020). The Social-context driver highlights the social nature of sustainable investing, as investors' interaction with their external context does reflect in sustainable investing decisions. Finally, the Opportunistic driver recognizes possible irrational tendencies at play in sustainable investing, whereby investors include ESG factors in their analysis to signal adherence to a perceived market trend and to attract clients.

Finally, three out of the four drivers are found to have a positive relationship with the proportion of sustainable assets in investors' portfolio, although the statistical significance varies across the factors and model specification. Additionally, the variable of investment horizon shows a positive relation to the measure of realized ESG investing, confirming that sustainable assets are associated with longer-term investment strategies (Starks et al, 2017).

Overall, this analysis uncovers aspects of sustainable investing that are not often accounted for in the literature. This is consistent with the broader perspective of behavioral finance, which allows for factors not included in traditional financial models to be investigated and included in the analysis of investment phenomena. Additionally, the use of exploratory research allows to perform a focused while flexible research, enabling the identification of tendencies that emerge from primary experimental and empirical data. This research could serve as starting point to investigate the SI drivers more in depth.

LIMITATIONS

The study was carried under rigorous methodological and analytical conditions; however, certain limitations remain.

The characteristics of the sample - in particular its limited size and mixed-investor composition - shaped the results and the statistical power of the analysis, visible especially in the low statistical significance of the of the multiple regression models. While the various models confirmed a robust underlying structure of the data, a larger sample would have enhanced the statistical significance of the results.

Regarding the statistical methods used, their diverse techniques allowed to holistically identify a set of financial and nonfinancial drivers in sustainable investing. Yet, what was gained in breadth was lost in focus, as the analysis did not allow to dive deeper in the identified tendencies. Had the analysis adopted a narrower focus, a richer examination would have ensued. Additionally, the analysis remained at the descriptive and inferential level, without adopting more sophisticated statistical technique to test the causal relationship between the drivers and the realization of sustainable investing. However, this research was exploratory in nature and aimed to identify aspects of SI to account for empirical irregularities, which could be investigated in greater details in subsequent analysis.

SUGGESTIONS FOR FURTHER RESEARCH

This study proposes multiple avenues to further the research in behavioral tendencies within sustainable investing. The starting point would be to replicate the analysis, or part of it, with a larger sample, to test the statistical validity of the identified tendencies. The sample composition should also be calibrated to either ensure a wholly heterogeneous group of investors, or to focus on one investor type alone, to evaluate the extent of similarities and differences between the groups.

In terms of the methodology, more sophisticated statistical methods such as structural equation modelling could be applied to investigate the causal relationship between SI drivers and various aspects of sustainable investing, for example the kind ESG strategy implemented, the type assets held, the choice of impact or regular assets, etc.

The analysis could also be performed with a specific experimental focus. In this study, a role for irrational tendency was initially assumed based on behavioral theory and general expectations. While such tendency was identified in the Opportunistic driver, it was not found to have a significant relation with the dependent variable in the regression model. Similarly, cognitive tendencies as measured by the CRT score were not found to affect the relative importance of financial versus non-financial attributes in the fund choice. This opens the possibility to replicate the study with a more attentive focus on behavioral aspects, possibly by implementing a dedicated experiment to evaluate whether any biases are found in sustainable investing behaviors. For example, following Bassen et al. (2019), the conjoint experiment could be replicated with a clearer treatment of the two respondent groups, for example by testing the effect that strong ESG information has on the investor choice.

Similarly, a conjoint analysis could be performed with the integration of more sustainability attributes – e.g., social impact, climate reduction, circular economy - to understand their relative importance for sustainable investors. This kind of studies would be particularly beneficial for funds providers, to understand which attributes of the financial products are relatively more relevant for investors' choices.

Another avenue for further research is linked to models of investors decision-making, and the gap between identified predisposition and realization of sustainable investments by retail investors. This was briefly presented by referring to the study of Falko and Bush about the Theory of Planned Behavior (2014), but there are more specific frameworks that study investor decision-making. Such models link evaluative criteria to the formation of an intention towards a specific behavior, coupled with the factors that limit the realization of that behavior (Kalafatis, Pollard, East, & Tsogas, 1999). In such studies, it would be useful to investigate the possible mediating role of the drivers in moving investors from intention to realized sustainable investing.

CONTRIBUTIONS

Despite the limitations given by the sample and the heterogeneous analysis implemented, this study proposed a thorough program of research to understand better the interplay between financial and non-financial drivers in sustainable investing.

The perspective of behavioral finance was determinant to identify how non-financial aspects play a role in sustainable investment motives. The use of exploratory research and the integration of different statistical techniques allowed to answer holistically the research question, even in the absence of a single framework to evaluate sustainable investing. This purposive research uncovered four drivers shaping SI, which can be used as a novel perspective to analyze the phenomenon in a broader light than the usual sustainability-return tradeoff.

Additionally, the integration of a choice experiment revealed important results about how investors trade-off investment characteristics and evaluate investment attributes when making decisions. This technique allows to better understand investor decision-making, and could be replicated with more or different attributes. In general, the analysis suggested practical insights for financial market participants and further academic research.

By applying the perspective of behavioral finance, this study proposed a new way to understand and reconcile the contradiction between traditional financial theory and the empirical reality of sustainable investing**.** The results obtained are consistent with the literature and empirical evidence, and multiple avenues of further research are proposed to deepen the understanding of sustainable investing.

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