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The role of behavioral factors in shaping asset allocation decisions: an empirical investigation

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INTRODUCTION

Born from the combination between the two disciplines of psychology and finance, behavioral finance tries to explain the dynamics and mental mechanisms which lie behind investment decision-making. Real individuals do not coincide with the rational beings depicted by traditional models and theories of finance, but they are subject to a number of heuristics and biases which influence their behavior. These factors play a relevant role in determining portfolio choices, as do other variables like sociodemographic characteristics, personality traits and individual attitudes towards risk.

Acknowledging the potential impacts that all these aspects can have on investment decisions is the starting point of this work, which has the aim to investigate *if* and *how* they actually shape asset allocation choices. Building on important insights from personality psychology and the behavioral finance literature, this research explores the possible links between investors' characteristics, decision-making biases and portfolio decisions.

The analysis is based on empirical data provided by CentroMarca Banca, a local Cooperative Credit Bank. The available information comprises the sociodemographic and behavioral profile of a sample of retail investors and the characteristics of their investment portfolios, which consist of model portfolios built for them by their financial advisors. In addition to that, the risk profile assigned to each individual in accordance with the European Union's Markets in Financial Instruments Directive (MiFID) is also provided. Indeed, the aforementioned Bank is subject to the European regulations governing financial markets and, like all financial institutions, it must go through a customer profiling process designed to make sure that clients undertake only the investments which are appropriate and suitable for them in terms of risk.

Relying on these valuable pieces of information, it is possible to analyze the many different facets of investors' profiles in relation to their portfolio choices, so as to understand which aspects seem to have a greater impact on investment decisions.

The first chapter starts with a general overview on the foundations of behavioral finance, followed by a review of the existing literature on the sociodemographic and behavioral determinants of portfolio choice. The body of research on the relationship between sociodemographics and asset allocation decisions is very extensive, with most contributions focusing on gender, age, profession, economic situation and knowledge in the financial field. Regarding behavioral factors, many studies have been performed in

recent times whose objective is to investigate whether and how investment decisions are influenced by the most widely recognized behavioral biases: overconfidence, loss aversion, herding and regret aversion are just a few examples. Pompian (2012) stresses how the degree of susceptibility to various biases may also depend on individuals' personality traits, which can influence investors' preferences and attitudes towards risk. In this respect, the psychological sphere emerges as a very interesting aspect of analysis, since patterns may arise which link a person's character and dispositions to his or her decision-making processes and outcomes, as well as to how he or she behaves in situations of risk and uncertainty.

Information on the underlying personality of investors has been collected through a questionnaire developed by a global asset management company, Schroders, that was submitted by the Bank to a group of selected clients. Chapter 2 is devoted to the description of this tool, which has proved to be exceptionally useful to profile investors: not only it permits to understand their demographic and psychological profile, but it also provides valuable information on their susceptibility to a wide range of behavioral biases. More precisely, it allows to develop individual scores on nine important dimensions: ambiguity aversion, anxiety, confidence, herd influence, impulsivity, loss aversion, optimism, projection and regret aversion. To conclude the chapter, the literature on each of these traits is briefly reviewed.

Finally, chapter 3 deals with the empirical investigation and illustrates the main research findings. In the first part, a descriptive analysis is performed which provides a general overview of the dataset, including descriptive statistics on the main portfolio indicators. After having developed a basic understanding of the structure of the sample, some potential patterns in the data are identified, allowing to make a few initial considerations.

The second part includes the inferential analysis, aimed at investigating or confirming whether and how the variables of interest are actually associated to each other by means of bivariate and multivariate analyses. This section starts with the study of the links between different aspects of investors' profiles (sociodemographic characteristics, behavioral and personality traits, MiFID risk classes), and then continues with the assessment of the relationship between investors' characteristics and the features of their portfolios. In this way, a deeper understanding of how different facets of an investor profile are interlinked is developed before addressing the key question of the study: how individual sociodemographic and behavioral attributes impact portfolio choices.

In general, results point to a weak association between portfolio characteristics and behavioral dimensions: personality traits and biases do not seem to influence asset allocations and portfolio risk indexes. The relationships between the latter and sociodemographic factors are a bit stronger, but they do not go beyond moderate intensity and are not always consistent with the literature.

Correlation analyses suggest that the most significant variable explaining portfolio characteristics is represented by the MiFID risk profile, a result which is also confirmed by multivariate regression models: a positive relationship with the standard deviation measure is observed, suggesting that investors in high-risk classes hold riskier portfolios, which include more stocks. However, no significant associations are found between MiFID risk profiles and individuals' personality and behavioral predispositions, which are not actually included among the information that the European Directive requires to be assessed for the purpose of client profiling.

In light of recent behavioral finance evidence stressing the important role of psychological factors in the investment domain, it is fundamental that each individual is guided in making the investments which are suitable for him both from a financial and a behavioral perspective, since investors may struggle if they hold portfolios which are not in line with their attitudes and dispositions. For this reason, other than relying on financial advisors' experience and competence in helping clients deal with their investments under an emotional point of view, it is argued that incorporating the results of the Schroders questionnaires in the process of providing financial advisory could generate a considerable added value, by fostering a systematic approach to client profiling and portfolio construction under a behavioral viewpoint.

CHAPTER 1
THE IMPACT OF SOCIODEMOGRAPHIC AND BEHAVIORAL FACTORS ON INVESTMENT DECISIONS

1.1 INTRODUCTION TO INVESTMENT PORTFOLIO CHOICE: TRADITIONAL FINANCE VS BEHAVIORAL FINANCE

The study of the dynamics of investment decision-making and portfolio choice has received a lot of attention in the past few years, as households' participation in the stock market has been steadily increasing. Indeed, the psychological mechanisms and evaluation processes adopted by individuals when making financial decisions represent an extensively investigated topic that blends together psychological and finance-related insights and perspectives. It has been largely documented that investment choices are influenced by a variety of factors: different types of variables need to be considered in order to explain and predict individual investors' decisions, among which demographic, social, biological and psychological characteristics. Over time, a gradual shift from traditional finance towards a behavioral finance perspective has made it possible to uncover a wide array of determinants of portfolio choice.

Traditional or standard finance refers to the conventional theories and models constituting the foundations of finance, among which the Efficient Market Hypothesis, Markovitz's Mean-Variance Modern Portfolio Theory, and the Capital Asset Pricing Model (CAPM). On the whole, standard finance is based on a set of assumptions, one of the most important of which is the *homo economicus*[1] concept, representing a perfectly rational economic man who possesses perfect information, aims at maximizing his utility, and always makes optimal economic decisions. Moreover, the Efficient Market Hypothesis first introduced by Fama (1970) assumed that, in a perfectly efficient market, investors possess complete information and securities' market prices match their respective intrinsic values. In the 1970s, this was the most commonly accepted theory by scholars and professionals. However, later on they come to realize that these assumptions are quite strong and tend to "*oversimplify reality*" (Pompian, 2012): in fact, persistent market anomalies have been

[1] The expression *homo economicus* literally means "economic man" and has its roots in classical decision theory. According to Pompian (2006), it describes a "*simple model of human behavior*" where individuals are perfectly rational and act based on a specific utility function with the goal of maximizing their economic well-being. The notion of *homo economicus* is based on three underlying assumptions: perfect information, perfect rationality and perfect self-interest.

observed which are largely inconsistent with them. Traditional theories of finance ignore human psychology and reasoning, focusing all their attention on mathematical models of economic behavior. This is the point where the new paradigm of behavioral finance comes into play: it "*provides several explanations for these anomalies and […] explain the inefficiency of markets and the apparent irrationality of investors*" (Frijins, Koellen and Lehnert, 2008).

Behavioral finance is commonly defined as the application of psychology to financial decision making (Pompian, 2006). It has indeed a multidisciplinary nature, blending together different perspectives from many fields, including finance, economics, psychology, sociology and, in general, the social sciences.

Although insights on the link between economics and psychology date back to as early as the mid-eighteenth Century, behavioral finance began to emerge as a distinct discipline around the 1980s, and it has been gaining a lot of attention in recent years.

Some of the major contributions to the field of behavioral finance are the Prospect theory (1979) formulated by Kahneman and Tversky, who explore how individuals evaluate gains and losses (a more detailed review about this theory will be provided in following sections) and Shefrin and Statman's Behavioral Portfolio Theory (2000), that incorporates behavioral insights into portfolio selection.

Behavioral finance challenges the standard finance perspective arguing that the underlying assumption of perfect rationality and perfect information are not realistic. In the words of Pompian (2012), "*behavioral finance attempts to understand and explain actual investor and market behaviors versus theories of investor behavior*". While traditional finance theories indicate how individuals *should* ideally behave, behavioral finance attempts to describe how individuals *actually* behave and make decisions, learning from human psychology. As a matter of fact, human beings are affected by bounded rationality[2] and are predisposed to using certain rules of thumb and taking mental shortcuts, called heuristics, to optimize mental processes and speed up decision-making. Moreover, the existence of certain behavioral biases affecting investors' decision-making processes has been documented, leading scholars to acknowledge the occurrence of behaviors that deviate from the complete rationality assumed by standard finance models. Behavioral biases are irrational beliefs or tendencies "*caused by faulty cognitive reasoning or reasoning influenced by emotions*" (Pompian, 2012), that can lead to investment errors and, in turn, to suboptimal asset

[2] The concept of bounded rationality was first introduced by Simon (1978) and it posits that individuals attempt to make rational choices, but they are limited by cognitive capacity and informational constraints.

allocation choices. Investors may be not aware of being subject to a bias if it influences decision making processes at an unconscious level, as is often the case. A large number of biases have been identified in the literature which are relevant to investors' portfolio decisions, among which overconfidence, herding, loss aversion, regret aversion and many others which are described later on in this chapter.

According to Antony A. (2019), behavioral finance is a complement, not a substitute, to standard finance theories which "*applies behavioral concepts to portfolio investment*". Frijins, Koellen and Lehnert (2008) indeed find that, by extending Markovitz conventional portfolio model and adding some behavioral variables, the fit of the model considerably improves.

Many subjective and cognitive factors are found to influence investors' portfolio choices, including sociodemographics, psychographics, personality traits and emotional biases. Retail investors can certainly benefit from the application of the principles of behavioral finance to improve their investment decisions and outcomes. By paying attention to individuals' personal characteristics and behavioral dispositions, it would be possible to devise customized investment strategies and programs that better fit the investor profile.

Recently, an increase in stock market participation on the part of the general public has been experienced. In the past, the stock market was a prerogative reserved to institutional investors and the wealthy, but nowadays the continuous evolution of societies and markets has contributed to higher participation rates by ordinary individuals and households as well as to increases in the share of risky assets held. At the same time, average financial literacy and knowledge has been improving as people reach higher educational levels. All these developments have posed the need for a deeper understanding of individual investors' behaviors, prompting additional research on the field.

The focus of this work will be to investigate how individual investors' characteristics, in particular behavioral and sociodemographic factors, affect their asset allocation choices and portfolio composition dynamics.

1.2 SOCIODEMOGRAPHIC FACTORS AND PORTFOLIO CHARACTERISTICS

In this section, the role of sociodemographic factors in investors' decision making is investigated. Indeed, there is a large body of literature which identifies sociodemographics as relevant variables in explaining portfolio choice.

Mazzoli and Marinelli (2014) found that various individual characteristics including demographics, which are not included in the MiFID suitability questionnaires[3] normally used by financial institutions to determine clients' risk profiles, indeed play a role in determining both risk-holding decisions (regarding the ownership of risky assets) and risk-allocation decisions (regarding the share of risky assets). Their analysis of risk-suitable portfolios revealed that some "*background variables*" linked to the individual's capability to psychologically bear risk influence the risk-holding decision, while a set of "*foreground variables*" referring to economic strength and risk capacity predict the risk-allocation decisions.

A large number of studies (Grable, 2000; Hallahan et al., 2003; Grable and Joo, 2004) investigate the relationship between sociodemographics and individuals' financial risk tolerance[4], which represents one of the most important determinants of investment strategies, asset allocation decisions and the resulting portfolio risk composition. Grable (2000) mentions demographic, socioeconomic and attitudinal characteristics, considered either individually or jointly, as decisive predictors of risk tolerance in financial matters. The outcome of his analysis confirmed the existence of a significant relationship linking individuals' risk tolerance to a number of variables, among which gender, age, marital or civil status, occupation, income level, education and financial knowledge. Many of these factors are also considered by Grable and Joo (2004), who study their ultimate impact on risk-tolerance attitudes, which in turn contribute to the creation of individual financial objectives and strategies. The authors classify the determinants of financial risk tolerance into two categories: biopsychosocial characteristics (for instance age, gender and personality traits) and environmental factors (for instance income, education and financial knowledge). Variables from both groups are found to have a significant influence on financial risk tolerance, highlighting the multidisciplinary nature of this field of research.

[3] In the European Union, the Markets in Financial Instruments Directive II or MiFID II (Directive 2014/65/EU, which replaced Directive 2004/39/EC or MiFID I) regulates the provision of investment services for the purpose of increasing transparency in financial markets and strengthening investor protection. This Directive introduced the suitability rule, requiring financial intermediaries to recommend financial products that are suitable to clients' characteristics and risk profiles. To this end, it made mandatory for financial institutions to administer suitability questionnaires aimed at profiling retail clients. In year 2018, the original MiFID was replaced by MiFID II, which introduced additional requirements in light of the 2008 financial crisis.

[4] Grable (2000) defines financial risk tolerance as "*the maximum amount of uncertainty that someone is willing to accept when making a financial decision*". Another well-known definition of financial risk tolerance is provided by Irwin (1993), who regards it as "*the willingness to engage in behaviors in which the outcomes remain uncertain with the possibility of an identifiable negative outcome*".

Muktadir-Al-Mukit (2020) focuses on a developing country's perspective, analyzing data from Bangladesh, where weaker regulatory and enforcement systems as well as a lower average level of financial literacy can be expected. The results of the study confirm that some sociodemographic variables also have an impact on investors' tolerance for risk in emerging economies, and the role they play may be even more important considering the economic, institutional, and political conditions of developing countries.

Summing up, the relationship between sociodemographic characteristics, financial risk tolerance and investment decisions has been a recurring subject of analysis in research. Nevertheless, studies sometimes display conflicting or inconsistent results, as can be understood by reading the following subsections dedicated to reviewing the most relevant sociodemographics investigated in the literature.

1.2.1 Gender

Gender represents one of the most common criteria for categorizing investors and individuals in general. Evidence from psychology suggests that men are inherently different to women in a number of ways and across various contexts. Most of the existing literature agrees that women tend to be more risk averse than men, and consequently to prefer less risky portfolios and to display a relatively more conservative investment behavior. In line with this strand of research, Bertocchi, Brunetti and Torricelli (2008) found that gender has an impact on Italian households' portfolio decisions: male individuals are more inclined to invest in risky assets than females, and this result holds also when controlling for risk aversion. Empirical findings by Fisher and Yao (2017) suggest that gender differences in financial risk tolerance do not derive from gender in and of itself, but they can be explained by certain moderating variables (for example, income uncertainty and net worth) which model the relationship between gender and risk tolerance.

It has been demonstrated that men and women also have different predispositions to the development of some behavioral biases, like overconfidence or excessive optimism. Jacobsen et al. (2014) focus on the level of optimism and perceived risk of financial markets as possible explanations of gender differences in risk aversion and resulting asset allocations. Their findings show that males exhibit higher levels of optimism about future stock market performance compared to females, and this may explain why they are inclined to hold riskier portfolios. The work by Barber and Odean (2001) investigates

gender differences in overconfidence, defined as "*an unwarranted faith in one's intuitive reasoning, judgements and cognitive abilities*" (Pompian, 2012). Overconfident investors are known to trade excessively and consequently obtain lower portfolio returns compared to other individuals who don't display this bias. Evidence from psychology research suggesting that men are generally more overconfident than women is confirmed by looking at the respective portfolio turnover and performance: male investors engage in trading more frequently and perform worse than female investors.

1.2.2 Age

The existing literature on the relationship between age and investment portfolio decisions is very extensive and displays quite variegated results. However, the majority of evidence points to a negative relationship between age and risk tolerance, so it is a common belief that the younger segments of the population have a higher propensity to make risky investments. Consistent with this theory, Zhanga et al. (2018) show that older investors are less inclined to invest in shares and property, and they prefer to maintain lower levels of portfolio risks by holding higher proportions of cash and bonds. Brooks et al. (2018), studied the relationship between age and financial risk tolerance. The results of their analysis show that financial risk tolerance declines at increasing rate with age, suggesting that older people are less inclined to take risks compared to younger individuals. This work is part of the strand of literature arguing that the relationship between age and risk tolerance is negative and displays a non-linear pattern.

Other research papers point to a concave age-profile following a hump-shaped curve, implying that ownership of risky assets[5] is low in early life and then increases up to a certain point (usually around middle age), after which it starts to fall towards retirement, indicating again a non-linear trend. For instance, Guiso and Jappelli (2000) examined the structure and composition of the portfolios held by a sample of Italian households and found "*a concave age-profile of participation and a flat profile of the conditional share*" (Guiso and Jappelli, 2000). This result also suggests that age affects portfolio decisions at the stage where the decision whether to invest in risky assets is taken, and has less influence on the choice of the share of risky assets, conditional on participation.

[5] In this context, risky assets include risky financial assets (stocks, long-term government bonds, other bonds, mutual funds, managed investment accounts, and defined-contribution pension plans) and risky real assets (investment real estate and business wealth), based on the definition adopted by Guiso and Jappelli (2000).

Korniotis and Kumar (2011) restrict their analysis to investment decisions made by older investors. The investment strategies of old age groups mirror two opposite effects: on the one hand, old people have more investment experience and knowledge; on the other hand, they have worse investment skills as a consequence of cognitive aging[6]. By studying these trade-off dynamics, the authors found that the second effect prevails, therefore cognitive aging is expected to worsen investment decisions by older investors.

All in all, most of the literature conveys that older investors have lower tolerance for risk. However, there is no universal consensus on the relationship between age and risk-taking behavior, as many research contributions reached different, and sometimes even conflicting, results.

1.2.3 Marital status and family structure

The existing literature on the role of marital status in portfolio decisions suggests that married individuals tend to hold riskier portfolios compared to single individuals.

The results of a regression analysis performed by Bertocchi, Brunetti and Torricelli (2008) show that male and married investors tend to undertake riskier investments than female and single ones. The most common explanation lies with the possibility for the partners to pool their incomes and resources and share investment risks. Muktadir-Al-Mukit (2020) also finds that individuals who are married and have a small household have higher risk tolerance levels. According to Love (2008), "*marital-status transitions and children can have important effects on optimal household decisions*". The author argues that asset allocation is affected by so-called "family shocks", life course changes which usually imply considerable alterations to an individual's financial situation. His model predicts that widowhood induces reductions in stockholdings, leading especially women and individuals with children to choose less risky allocations. Following a divorce, instead, men are expected to increase their stockholdings while women to reduce them. In recent times, an increase in divorce rates and female labor force participation have been witnessed. As the structure of contemporary families evolves, financial decision making is also likely to change accordingly.

[6] Cognitive aging refers to the gradual decline or deterioration of cognitive abilities (for instance memory, reasoning and learning processes) that normally occurs as an individual gets older.

1.2.4 Occupation

The relationship between investment decisions and occupation has not been explored as deeply as other demographics. In general, evidence suggests that people employed in higher-level, professional occupations higher levels of risk tolerance (Grable, 2000).
Quite broad professional categorizations have been used in research: for instance, Temel Nalin (2013) identifies employment status as one of the determinants of portfolio choice, distinguishing between wage and salary earners, self-employed and employers. Findings indicate that the latter category is more prone to invest in risky assets. Vaarmets et al. (2019) conducts a more detailed analysis, finding that people working in sectors that show to some extent a connection or tie with the investment or financial domain are more likely to be familiar with, and participate in, the stock market. Moreover, individuals in positions requiring leadership, risk-taking and ambition (like entrepreneurs, managers, and professionals) tend to hold more shares.

1.2.5 Economic and financial situation

Income and wealth level are the two most common indicators used to outline an individual's economic and financial position. Evidence of the relationship between wealth and portfolio choice is quite mixed. A research work on Italian households' portfolios by Guiso and Jappelli (2000) suggests that the ownership of risky assets is an increasing function of wealth: the share of stocks in households' portfolios increases as their wealth level rises. Mazzoli and Marinelli (2014) instead found that wealth is not a significant determinant of the share of risky assets. However, they found that the risk-allocation decision is affected by the economic capacity and financial situation of an individual, in particular by the income level: people with higher amounts of income tend to invest more in risky assets. Many papers, like the one by Grable and Joo (2004), reach the conclusion that both net worth and household income are significantly and positively related to financial risk tolerance, being its two most important determinants. Income fluctuations and uncertainty could also diminish the economic capacity of an individual. Angerer and Lam (2009) explore the relationship between income risk and portfolio decisions: empirical findings suggest that the share invested in risky assets is negatively affected by permanent income risk, while transitory income risk[7] has little impact on asset allocation.

[7] According to Angerer and Lam (2009) definitions, permanent income risk refers to "*variability of shocks to income that have permanent effect*", while transitory income risk refers to "*variability of shocks with no lasting effect*".

1.2.6 Financial literacy

Financial literacy refers to the degree of knowledge and experience in the financial market field, however various methods have been used to measure this construct in research. Most literature on the topic generally suggests that financial literacy stimulates individuals' participation in the stock market. Empirical results by Mazzoli and Marinelli (2014) suggest that financial knowledge and experience encourages the holding of risky assets, and Von Gaudecker (2015) argues that those who don't have good numerical skills (nor rely on financial advice) incur the largest losses in terms of under-diversification. Li et al. (2020) investigate the impact of financial literacy on households' investment decisions in China. The results of their analysis also point to a positive relationship between financial literacy and the propensity to invest in risky assets, since knowledgeable individuals are expected to be able to better understand and compare financial products. As for investment performance, financial literacy is found to improve returns only for the better educated and younger demographic segments. Given major evidence pointing to a positive role of financial knowledge and skills, it could be useful to offer more financial education to the public, providing them with the means to take more appropriate financial decisions.
Contrary to the main strand of literature, Bodnaruk and Simonov (2012) find no evidence of a positive effect of financial expertise on investment decisions and outcomes.

1.3 BEHAVIORAL FACTORS AND PORTFOLIO CHARACTERISTICS

Individuals are characterized by diverse personality traits[8] and subject to a range of different behavioral biases, all of which have an influence on their investment behavior and, in turn, on the characteristics of the preferred portfolio. Extensive evidence indicates that portfolio choice is not driven only by standard mean-variance analyses and utility function maximization, but also by behavioral factors which considerably influence an individual's decision-making processes.
In an experimental setting, Frijins, Koellen and Lehnert (2008) extend Markovitz traditional portfolio choice model (centered on the risk-return trade off) by adding and incorporating some behavioral factors, such as herding or market sentiment and

[8] In psychology, personality traits are defined as "*people's characteristic patterns of thoughts, feelings, and behaviors*" which persist over time and across situations (Diener E., Lucas R.E & Cummings J.A., 2018). However, some authors instead argue that personality traits may not be totally stable across situations.

overconfidence. The inclusion of these additional variables is found to significantly improve the fit of Markovitz model, suggesting that behavioral attributes are relevant determinants of individual investors' portfolio choice. Hence, the authors conclude that both traditional factors (e.g. market conditions) and individual behavioral attributes play a significant role in investment decisions.

All investors are subject to some degree to behavioral biases and, as a consequence, engage in irrational behaviors, which make it more likely that their investment decisions and performance result suboptimal. A contribution by Jain, Walia and Gupta (2020) is devoted to the study of the impacts of eight psychological biases on individual equity investors' decision making. The outcome of the analysis confirms the significant influence of all the biases taken into consideration. Furthermore, it makes possible to rank them by the strength of their effect: findings reveal that herding, loss aversion and overconfidence are the most important biases, followed by regret aversion, mental accounting, availability bias, anchoring and representative bias.

The extent to which an individual may be subject to certain biases or display irrational behaviors in the financial domain ought to depend also on the characteristics of his or her personality. Research in the psychology field offered important insights into the domain of personality traits: evidence suggests that the latter influence individuals' behavior in a variety of domains, among which the financial sphere. In fact, it has been observed that personality traits can have important impacts on investors' preferences, attitudes towards risk and uncertainty and, ultimately, investment decisions and performance. Carducci and Wong (1998) distinguish individuals into two categories based on their underlying personality, namely Type A and Type B, to understand their respective approach to risk-taking in financial matters. Type A subjects display a specific behavioral pattern characterized by strong competitiveness, ambition, aggressiveness and impatience; they aim at personal achievement and success and are willing to take high risks to reach their goals. On the contrary, people with Type B personality are even-tempered and patient, they are less competitive and display a more relaxed and easygoing attitude (Dasgupta and Klein, 2014). Therefore, Type A individuals are expected to be more inclined to take financial risks than Type B subjects, due to personality factors. In another paper Wong and Carducci (2013) analyzed how specific personality dimensions taken from the so-called

"Big Five" taxonomy[9] may affect financial risk tolerance, finding a positive relationship with extraversion and openness to experience, and a negative one with conscientiousness and agreeableness. Brown and Taylor (2014) also take the "Big Five" personality traits as reference point for their research on financial decision-making at the individual and household level. Their empirical results confirm that personality exerts an influence on the amount and structure of household finances, namely it is a determinant of both unsecured debt and financial assets holdings. Specifically, the finding of a positive relationship between openness to experience and the probability to hold stocks and shares is somewhat consistent with the results by Wong and Carducci (2013). However, Brown and Taylor (2014) conclude pointing out that economic variables like income still play a fundamental role in determining household finances. A related work by Bucciol and Zarri (2017) investigates individual portfolio decisions by relating financial risk taking to a wide range of personality traits, including the Big Five framework and, additionally, cynical hostility[10], anxiety and anger. Among all the attributes considered, cynical hostility, agreeableness and anxiety are found to be significantly and negatively associated to the propensity to take financial risk, as measured by the holding and the portfolio share of stock assets. The authors take it a step further by decomposing single traits into multiple facets, many of which also result to be correlated with portfolio choice, reinforcing and extending previous results at the aggregate trait level. Finally, it is stressed that both cognitive factors such as memory skills and non-cognitive factors such as personality attributes are significant determinants of portfolio allocation and risk taking in the financial domain.

An analysis devoted to some of the more common behavioral factors that can potentially influence investors' decision-making follows. After that, a few considerations on the link between personality traits and behavioral biases are presented.

1.3.1 Overconfidence bias

Overconfidence is one of the most common and extensively studied behavioral biases affecting investors. Overconfident individuals overestimate their own predictive abilities

[9] The "Big Five" personality traits are five broad trait dimensions (Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism) which together constitute the Five-Factor Model, one of the most widely used frameworks for assessing personality. The "Big Five" model provides a comprehensive taxonomy that can be further subdivided into more narrowly defined facets, allowing a more detailed analysis of an individuals' personality attributes.

[10] According to Bucciol and Zarri (2017), cynical hostility is a personality trait associated with a "*cynical worldview of the social environment*": people who display this trait tend to be mistrustful and suspicious about others, viewing them as a potential threat. Usually, they exhibit high levels of risk aversion.

and the precision of their knowledge, as well as the accuracy of their judgements (Pompian, 2006). Individuals can display overconfidence in many contexts, including the investment domain. In this latter area, the consequences of the discussed bias can be quite harmful, leading to investment mistakes and poor portfolio performance. Pompian (2006) identifies the key detrimental effects in excessive trading, underestimation of downside risk and portfolio under-diversification. Barber and Odean (2001) focus on the first one, namely trading behavior. They argue that overconfident investors trade too much, thereby lowering portfolio returns, because they overestimate their own ability to predict returns as well as the expected returns from trading. Based on evidence from psychology suggesting that men are more overconfident than women, the authors analyze the differences in turnover rate and performance across genders. Consistent with the predictions that overconfident investors trade excessively to the detriment of their portfolio performance, it is observed that males trade more and obtain lower returns than females. In their paper *The Courage of Misguided Convictions*, Barber and Odean (1999) get into the details of overconfidence and trading dynamics, asserting that "*overconfidence increases trading activity because it causes investors to be too certain about their own opinions and to not consider sufficiently the opinions of others. This increases the heterogeneity of investors beliefs -- the source of most trading*". Because they believe they are able to select good investments or evaluate companies better than other people, and are too optimistic about future prospects, people displaying overconfidence will more than often buy securities that underperform the ones they sell, thereby reducing net returns. Graham, Harvey and Huang (2009) offer another explanation regarding the link between trading behavior and overconfidence: "*overconfident investors tend to perceive themselves to be more competent, and thus are more willing to act on their beliefs, leading to higher trading frequency*". The authors refer to this psychological mechanism as the "*better-than-average overconfidence*" or "*competence effect*", according to which people who feel more skillful or knowledgeable in the financial domain are more willing to bet and act on their own judgements. Surprisingly, there is evidence that financial professionals are also often subject to overconfidence, which can influence their risk-taking behavior "*both in the general and the financial domains*" (Broihanne, Merli and Roger, 2014). Recent works by Ahmad and Shah (2020) and Ahmad (2020) focus on the overconfidence bias from a developing market perspective. Findings by Ahmad and Shah (2020) suggest that overconfidence has an adverse impact on investment decisions and performance of

Pakistani stock market investors. In addition, they find that risk perception[11] and financial literacy can act respectively as mediator and moderator, alleviating the negative effects of the bias and improving the quality of decision-making.

1.3.2 Loss aversion bias and the disposition effect

The concept of loss aversion was introduced in the context of the Prospect Theory formulated by Kahneman and Tversky (1979), who devised an S-shaped value function representing how people evaluate potential gains and losses. According to this model, the latter are considered and assessed in relation to a reference point (usually a security's purchase price), and individuals are risk-averse in the domain of gains, while displaying risk-seeking behaviors in the domain of losses. Indeed, research from psychology demonstrated that people perceive losses as having a stronger impact than gains: to compensate for a loss, a greater amount of gain is required.

The most important finance-related implication of this theory is the so-called *disposition effect*, defined as "*the desire to hold losing investments too long and to sell winning investments too quickly*" (Pompian, 2006). In practice, it has been observed that investors are reluctant to sell a losing investment and realize a loss because they hope for a rebound in the future, in order to eventually recover the losses. Conversely, investors usually want to sell profitable investments too early due to the fear they will deteriorate in the future, giving up the possibility of obtaining further gains. The combination of these behaviors has detrimental effects as it can lead to increased portfolio risk and lower returns.

1.3.3 Herding, regret aversion and projection bias

By nature, humans are oriented towards social interaction and developing connections with others: they are social beings. In most everyday life contexts, individuals work together or are in contact with other people, and this very fact may influence their personal choices and actions. Everyone cares about others' opinions and wants to be accepted and viewed as a good person: this is the essence of sociality and group belonging in nowadays' society. Social factors play a role also in the finance-related field. Herd behavior, or simply herding, is the tendency for an investor to follow other people's actions and opinions, getting influenced by the choices of the crowd "*without thinking independently whether those*

[11] Ahmad and Shah (2020) refer to the concept of risk perception as the way in which "*investors view the risk of financial assets based on their concerns and experience*".

actions are rational or not" (Jain, Walia and Gupta, 2020). Several studies document that herd instinct bias is very common among individual stock market investors. Empirical findings by Ramalakshmi et al. (2019) and Jain, Walia and Gupta (2020) suggest that herd instinct is one of the most influential biases having a significant impact on investors' behavior and investment decision-making processes.

Most people also experience feelings of regret when they come to know that they have made wrong or poor decisions. These uncomfortable emotions usually cause repentance, guilt and psychological pain, and this is the reason why individuals wish to avoid them whenever possible. Regret aversion is a behavioral bias displayed by people who "*avoid taking decisive actions because they fear that, in hindsight, whatever course they select will prove less than optimal*" (Pompian, 2006). Evidence from experimental psychology and behavioral finance shows that regret can have an impact on decision making, as individuals modify their choices based on the fear of future remorse. Hence, regret aversion, like any other bias, can be expected to lead to a number of adverse effects in the financial and investment domain.

Lastly, many individuals are subject to the projection bias, defined as "*the tendency to project current events into the future*" (Grable, Lytton and O'Neill, 2004). According to Kliger and Levy (2008), people may mis-predict future preferences, erroneously projecting current preferences into future attitudes and behaviors. As a matter of fact, other than occurring in many everyday life situations (for instance, purchasing decisions regarding durable goods and changing tastes), this psychological mechanism has also been observed in the context of investors' decision-making processes. Based on empirical evidence, the above-mentioned authors were able to confirm the existence of the projection bias among investors in the US stock market, finding that decision makers are often irrational when forecasting their own future preferences.

1.3.4 Personality traits and the predisposition towards specific behavioral biases

Individuals may have different predispositions towards the development of specific behavioral biases: depending on their demographic characteristics, personality and character traits, they usually are more prone to adopt particular behaviors.

In the domain of investment decisions, the analysis of these links can help identify the more appropriate asset allocation for each investor, which is inevitably linked to psychological factors. Hence, the analysis of personality could prove very useful, allowing

to exploit the predictive capability of personality traits for the purpose of improving or correcting suboptimal investment decisions. As a matter of fact, knowing more about individual psychological predispositions and character traits allows the investor (or the agent advising him) to become aware of the possibility of being subject to certain biases, recognize the potential mistakes they could entail, and refine investment strategies and objectives in light of this acknowledgment.

Making use of the Myers-Briggs Type Indicator personality test[12], Pompian and Longo (2004) were able to successfully correlate behavioral biases to specific personality profiles. The underlying idea of their work is that "*personality types and genders are differentially susceptible to numerous investor biases*", so investment programs should be designed and adjusted to cope with the specific investment mistakes to which the targeted investor types are prone. In this way it would be possible to mitigate the adverse effects of behavioral biases and ultimately improve investment outcomes.

A number of other research papers identified correlations between biases and investors' characteristics. For instance, it was discussed in previous sections that males are more prone to overconfidence than women (Barber and Odean, 2001). Rzeszutek, Szyszka and Czerwonka (2015) found that the degree of susceptibility to certain behavioral biases (namely, certainty effect, sunk cost fallacy and mental accounting) depends on the level of expertise in investing activities as well as on certain personality traits. Surprisingly, experts or professional investors seem to more likely display these biases. As for the link with personality, venturesome[13] individuals are found to be more rational decision-makers, and therefore more resistant to biases. The fact that experts themselves can also make irrational investment decisions proves the difficulty of recognizing and controlling these biases, which often are very deep-rooted and prevent individuals from becoming aware of them. The process of correcting biases can indeed be extremely difficult, especially for certain investor profiles.

[12] The Myers-Briggs Type Indicator (MBTI) personality test is a "*psychometric questionnaire designed to measure psychological preferences in how people perceive the world and make decisions*" (Walinga J., 2018). It takes its name from its original developers, K.C. Briggs and her daughter I. Briggs-Myers and its first publication dates back to 1962. Based on the theory of personality types elaborated by Jung (1921), the MBTI "*measures personality along four bipolar scales: introversion-extroversion, sensing-intuition, thinking-feeling, and judging-perceiving*" (Pompian, 2012) and results in the identification of 16 different personality types.

[13] Together with Impulsivity and Empathy, Venturesomeness is one of the three personality traits measured in Eysenck's IVE questionnaire. Venturesome individuals seek out new challenges and are ready to take risks; they are self-confident and persistent in goal pursuit (Rzeszutek, Szyszka and Czerwonka, 2015).

Some researchers developed actual behavioral classification schemes to group investors according to their personality and behavioral predispositions. In his book *Behavioral Finance and Investor Types*, Pompian (2012) presents a general framework comprising four so-called Behavioral Investor Types (or BITs): The Preserver, the Follower, the Independent and the Accumulator. BITs represent models for different types of investors, categorized based on their underlying behavioral orientations and dominant personality traits. Each BIT is associated to both positive and negative aspects (e.g. behavioral biases). In line with previous considerations, the proposed solution would be to design a personalized asset allocation program suited to each BIT, aimed at coping with the key irrational behaviors displayed more frequently by each investor category, as well as taking advantage of the respective favorable traits. From the advisor's point of view, identifying beforehand a client basic orientations and behaviors can help recommending the more appropriate investment plan, leading to trustful advisor-client relationships. However, the author argues that sometimes it is more convenient to "*adapt*" an asset allocation to an individual's biases rather than try to "*moderate*" them, because it can be very hard, or almost impossible, to effectively correct them in certain circumstances.

The existing literature has provided substantial evidence that portfolio decisions and attitudes towards risk are influenced by sociodemographic characteristics, as well as psychological factors, personality attributes and behavioral biases. Conventional finance theories should therefore be complemented by insights from personality psychology research, allowing a deeper understanding of individuals' decision-making processes and the reasons for their choices. In the context of portfolio decisions and asset allocation, profiling investors according to their personality probably represents the most effective solution to devise optimal investment programs. Following strategies which are capable to alleviate the negative impacts of behavioral biases that typically affect personality types can surely benefit investors. From the perspective of investment advisors, a thorough client profiling approach would also allow to develop better relationships with individual investors. All these considerations represent important arguments in favor of profiling techniques that take into account the psychological aspects and personality traits of subjects, other than basic sociodemographic characteristics.

1.4 ADVISED VS SELF-DIRECTED INVESTORS: THE INTERPLAY OF FINANCIAL ADVICE

Based on previous discussion concerning behavioral biases, it can be inferred that it is very common for retail investors who make decisions autonomously to run into investment mistakes, choosing the wrong investment strategies and ending up with suboptimal portfolio allocations. As a matter of fact, many individual investors or households are used to making financial decisions on their own, without relying on any external professional advice. One of the main reasons for poor financial outcomes stands in the interference of an array of irrational beliefs and behaviors which may influence individuals' decision-making processes. A possible solution to overcome this problem could be relying on the help of a qualified financial advisor, a professional figure having the investment skills and knowledge required to support and guide investors in making better investment choices and achieving their financial objectives.

A large body of literature is available concerning the market for financial advice: in particular, the analysis of the effects of financial advisory practices on asset allocation and portfolio performance has received a lot of attention in recent years. However, no universal consensus has been reached on the added value of financial advice, with different contributions often arriving at inconsistent results.

A first strand of research argues that financial advice has negative effects on investment outcomes. Using data from a large brokerage and a major bank, Hacketal, Haliassos and Jappelli (2012) compare advised accounts to self-managed ones and explore respective differences in portfolio characteristics and performance. Their findings show that advised accounts are associated with lower net returns, inferior Sharpe ratios[14] and higher turnover than self-run ones. The most intuitive explanation for these results is attributable to higher advisory fees and costs, combined to the conflictive sales incentive schemes which characterize advisors' common compensation structures[15]: the risk is that unsuitable

[14] The Sharpe ratio, introduced by Nobel Prize in Economics W.F. Sharpe, measures the risk-adjusted return of an investment or portfolio. It is calculated by taking the difference between the average rate of return of the investment (or portfolio) and the risk-free rate, and dividing it by the standard deviation of the investment's (or portfolio's) excess return. The higher the value of the Sharpe ratio, the more attractive the returns considering the attached risk.

[15] Advisors' compensation structure is generally characterized by commissions received from third parties (for instance, banks or financial institutions) based on the amount of sales of specific products and fees generated. As a consequence, advisors are incentivized to encourage clients to undertake investment strategies that entail higher fees, going against investors' best interest and causing potential conflicts of interests.

products are recommended or excessive trading is encouraged by intermediaries in order to earn higher commissions, but to the detriment of clients (especially if they are unsophisticated or uniformed). On the other hand, it is acknowledged that advised accounts are better diversified than self-managed ones, reflecting higher investment in mutual funds. However, self-interest could still play a role as advisors have an incentive to encourage the purchasing of funds for which they earn greater amounts of sales commissions. In their audit study, Mullainathan, Noeth and Schoar (2012) document that advisors "*fail to de-bias their clients and often reinforce biases that are in their interests*", stressing the occurrence of self-interested behaviors also in this case, since the goals of advisor and client are not aligned. Instead of actively attempting to correct or reduce the investment mistakes commonly exhibited by retail investors, professionals may end up exploiting or exacerbating them by promoting returns-chasing behaviors or actively managed funds entailing higher fees, ultimately damaging clients and going against their best interests. Once again, self-serving practices encouraged by sales incentives and aimed at generating higher commissions are considered to be the major cause of instances of bad-quality advice. Therefore, based on these research findings, individuals would be better off investing on their own instead of turning to intermediaries for help.

Conversely, other contributions support the argument that financial advice entails an added value and can lead to some improvements in investment decisions and performance. In his research paper, Kramer (2012) compares portfolios of advised and self-directed individual investors: although no evident differences in risk-adjusted performance are identified, it is observed that advised portfolios display a higher degree of diversification and lower idiosyncratic risk than self-managed ones. By analyzing the behavior of self-directed investors who switched to advice-seeking, it is possible to reinforce these results confirming that financial advisors do not produce higher risk-adjusted returns, but add value to individual investors' portfolios by lowering avoidable portfolio risk, achieving higher diversification through more investments in mutual funds, a larger number of asset classes, and a lower focus on domestic equity. In line with these findings, an empirical analysis by Von Gaudecker (2015) shows that the worst outcomes in terms of under-diversification are experienced by those individuals who do not seek any form of advice and have a low level of financial-numerical skills. In her book *Investor decision-making and the role of the financial advisor: a behavioral finance approach*, Cruciani (2017) argues that, even though the goal of improving financial returns may not be successfully achieved by

advisors, "*the premium that advisors bring to the relationship with their clients can be found in the support they provide at emotional level*". These are intangible, non-monetary benefits that improve the advisor-client relationship and most likely push individuals to seek advice even if no superior financial performance is achieved. The very fact of relying on an advisor alleviates the stress and anxiety that often accompany investment decision-making, and trust plays a crucial role for keeping the advisory relationship going. Therefore, according to this second strand of contributions, it can be beneficial for investors to rely on financial advisors instead of making decisions independently, the main advantages being better portfolio diversification and support at the emotional level.

Taken together, research studies suggest that the added value of financial advice possibly resides in informational advantages beneficial for trading, in economies of scales in portfolio management and information gathering, in advisors' better financial knowledge, experience and investment skills, or in advisors' ability to recognize and reduce harmful behavioral biases displayed by clients. Nevertheless, it is often argued that advisors may be willing to correct investment mistakes and give beneficial advice to clients only if this has advantageous effects for them as well (as seen before with the mutual funds purchases example), and sometimes they may even exacerbate clients' behavioral biases for their own benefit. Moreover, as Rigoni and Gardenal (2016) also suggest, the possibility that financial professionals are also affected by certain behavioral biases and heuristics themselves cannot be totally excluded. At this time, the literature remains inconclusive and it is still not completely clear whether financial advice actually improves or worsens portfolio decisions and performance.

A related group of studies addresses another important question: it would be interesting to know what categories of investors are most likely to seek professional advice. Bachmann and Hens (2015) find that the propensity to rely on financial advice is positively linked to investment competence, which refers to the ability to avoid biases in the selection and processing of information and, consequently, limit investment mistakes. This means that those investors who are more likely to run into investment mistakes tend to make decisions autonomously, while more competent individuals are more prone to delegating decisions. Demand for advisory services is also found to increases with wealth and age and to decrease with self-assessed experience. These empirical findings are consistent with those by Hacketal, Haliassos and Jappelli (2012), who show that wealthier, older, more experienced, single and female investors are more likely to delegate decisions to a financial advisor. Hence, according to these studies, investors who are less prone to seeking advisory

services actually coincide with those who would be in greater need of guidance and would benefit from it the most.

All these contributions to the literature regarding financial advice have important implications. First of all, clearer information and greater transparency on the role of financial services and on financial advisors' practices and incentives is crucial, not only to inexperienced investors but also to more competent and knowledgeable ones. Some advisors may display self-interested behaviors to the detriment of retail investors, and it can be quite difficult for the latter to distinguish "bad advisors" from good ones who act in favor of the client. Regulations aimed at protecting investors' interests play an important role in this context: in the European Union, the previously-mentioned Markets in Financial Instruments Directive (MiFID) requires advisors to make recommendations that fit clients' characteristics and financial and economic conditions. It could also be useful to take steps to improve individuals' financial literacy and investment competence, so that they are better able to watch for bad advice and unfair practices.

In sum, it always goas back to balancing benefits and costs of financial advisory services: whether advisors are able to generate net benefits for clients still remains an open question in the finance-related literature. All in all, the demand and uptake of financial advice will most likely evolve over time, following market trends and changes in regulative frameworks.

CHAPTER 2
INVESTOR PROFILING:
THE SCHRODERS QUESTIONNAIRE

2.1 INVESTOR PROFILING: OVERVIEW AND REGULATORY FRAMEWORK

Individuals often rely on financial intermediaries and advisors to manage their own finances since, most of the time, they lack the necessary competences and knowledge or simply the time to do it themselves. In this regard, financial institutions offer private wealth management services designed to advise individuals and families (in particular, high-net-worth subjects owning substantial sums of money) on the best way to reach their financial goals. Finance professionals use their expertise to suggest appropriate investment plans and strategies, and are specialized in providing a wide range of financial services, including portfolio management and financial planning. The source of attractiveness for customers stems from the application of a highly customized approach to wealth management: this means that the kind of solutions proposed will vary according to the specific needs and characteristics of the client. In order for this method to work, it is fundamental for financial institutions to get to know in depth their clients, including their future goals and tolerance for risk. Taking the clients' perspective, individuals want to be reassured that the advice they are to receive is "good for them" and, above all, is in their best interest. In order for any subject to allow a third party to manage and control his own financial resources, guarantees of fair and suitable practices as well as a good amount of trust are required. Financial regulators around the world have established several laws and regulations over time in an effort to protect investors and guarantee fairness and efficiency in the financial services industry, especially after experiencing instances of misconduct and deceptive practices connected to the 2008 financial crisis. For many years now, financial institutions are required to gather specific information about their clients before making recommendations on financial products and investment strategies: this process takes the name of "customer profiling" or "investor profiling", and essentially consists in collecting data and information to gain an insight into each client's main characteristics and preferences, in order to ultimately build personal "profiles" on which to base financial recommendations. This practice had been carried out since before specific regulations on

the matter made it compulsory, precisely because it is a good way for intermediaries to develop best-suited plans for every single individual and, in turn, establish trustworthy relationships with clients and build a loyal customer base. Additionally, carrying out a profiling process serves "*to protect the intermediary against any complaint the client could make with reference to a loss that* [..] *is physiological according to the level of risk that characterizes the investment*" (Marinelli and Mazzoli, 2011). Marinelli and Mazzoli (2011) also argue that, from a customer segmentation perspective, having a good knowledge of customers' characteristics enables financial firms to create and market products and services which meet the needs and preferences of specific categories of customers. This is beneficial from an economic point of view, as it can contribute to increasing sales and enhancing customer satisfaction. Hence, customer profiling is essential for the success of the financial services business and represents one of its core sources of value.

2.1.1 Regulatory framework

After this first introduction to the topic, it is useful to provide a short overview of the main legislative frameworks regulating financial services and investor profiling, so as to grasp their key rationale and takeaways and to understand why they are important. Regulations on financial markets and services have been put in place in the majority of developed countries, however a stronger focus is put on the European legislation for the purpose of this study. In general, legislations aim at ensuring the efficient functioning of financial markets in compliance with the core principles of fairness and transparency, as well as at safeguarding investors. In that respect, they establish suitability rules to be observed by financial intermediaries and discipline profiling processes in a more systematic and comprehensive way, while providing useful guidance to practitioners.

In the European Union, Directive 2014/65/EU on Markets in Financial Instruments (MiFID II) and Regulation on Markets in Financial Instruments (MiFIR)[16] currently govern financial markets. They entered into force on January 3rd, 2018, replacing former Directive 2004/39/EC on Markets in Financial Instruments (MiFID), and are now applicable in all Member States. These legislative acts seek to create a single and harmonized European market for financial services in order to promote competitiveness

[16] The Regulation on Markets in Financial Instruments (MiFIR) is directly applicable in EU Member States. It is less focused on financial advice and contains rules on transparency and organized trading facilities.

and investor protection (European Securities and Markets Authority[17]). The most important provisions regarding investor protection are included in Articles 24 and 25 of MiFID II. While the former lays down some general principles and informative requirements to be observed by investment firms in order to safeguard investors' interests, the latter Article sets out important rules which are strictly related to investor profiling, among which the "*assessment of suitability*". In particular, Article 25(2) of MiFID II states that "*the investment firm shall obtain the necessary information regarding the client […] to recommend the investment services and financial instruments that are suitable for him*". In this way, the regulator aims to make sure that the client has the necessary knowledge, experience and financial capacity to properly understand the features and risks of the recommended financial products, as well as compatible financial objectives. To that end, a previous collection and record of information about each client, that is a profiling process, is necessary. The regulator also specifies which items need to be taken into account, referring to three broad categories: the client's knowledge and experience in the investment field, financial situation and investment objectives, including his risk tolerance (Gortsos, 2018). In the US, financial services regulation also provides for suitability obligations: FINRA[18] Rule 2111 dictates that investment firms "*must have a reasonable basis to believe that a recommended transaction or investment strategy […] is suitable for the customer, based on the […] customer's investment profile*" and lists some information that firms can use to profile clients. Even if some differences as for the interpretation and the scope of application remain, these normative frameworks are based on the same broad principles for efficient markets and investor protection, and establish similar requirements as far as suitability is concerned. Altogether, the main goals of suitability rules are safeguarding retail investors, who are faced with increasingly complex and sophisticated financial products, and providing practical guidance to investment firms with reference to suitability and profiling processes (Mazzoli and Marinelli, 2011).

[17] The European Securities and Markets Authority (ESMA) is an independent European Union Authority responsible for regulating and supervising the Union's financial markets. Its main objectives are included in his mission, which is "*to enhance investor protection and promote stable and orderly financial market"* (ESMA, 2021). In addition, it promotes supervisory convergence across EU Member States.

[18] The Financial Industry Regulatory Authority (FINRA) is an independent "*government-authorized not-for-profit organization that oversees U.S. broker-dealers*" (FINRA, 2021). Its responsibilities include establishing specific rules aimed at protecting investors and ensuring financial market integrity. It is considered a self-regulatory agency and operates under the supervision of the Securities and Markets Commission.

2.1.2 Profiling methods: suitability questionnaires

Besides highlighting the fundamental importance that profiling and suitability practices hold for the purpose of investor protection, current regulations should be straightforward enough for firms to implement. Nevertheless, they do not clearly specify which methods are to be used to profile investors and assess suitability, leaving the choice of related tools and techniques to financial institutions. As a consequence, many different approaches are adopted by financial intermediaries around the world, making client profiling a quite complex and debated issue. In 2018, the European Securities and Markets Authority (ESMA) published the *Guidelines on certain aspects of the MiFID II suitability requirements* to give further details and clarifications on their application. In particular, the Authority cites questionnaires as a means to collect information from clients and gives some guidance on how to design them correctly, detailing examples of both financial and non-financial elements to be taken into account in defining investment profiles. Indeed, questionnaires are the most common tool used by financial intermediaries to get to know their clients, and represent an efficient method to gain an insight on individuals' basic characteristics (for instance, sociodemographics, economic situation, financial goals) and easily build customer profiles for the purpose of assessing suitability. Additionally, they can also be administered in digital format, improving user-friendliness as well as data collection times. Metzger and Fehr (2018) develop and test the effectiveness of a questionnaire which fulfills a series of both regulatory and scientific standards, finding that it is a valid instrument to elicit clients' attitudes towards risks and a reasonable basis for making suitable financial recommendations.

Questionnaires are likely to be very different in their structure and design which are entirely up to practitioners' choice. In fact, each investment firm usually develops its own questionnaire (whose features and effectiveness will depend on the level of expertise of the staff involved and on the specific business model of the firm) and can devise a specific process to carry out customer profiling and suitability assessment operations. Klement (2018) outlines a standard process for assessing investors' risk profile. He considers an investment suitable if its risks are compatible with the individual's risk capacity and risk aversion, and this definition is indeed consistent with MiFID requirements. The typical risk-profiling procedure presented in this study consists in five consecutive steps: (1) defining the goals the investor wants to achieve; (2) administering a risk-profiling questionnaire to elicit his risk aversion and risk capacity; (3) scoring the questionnaire

answers; (4) determining a coherent asset allocation; and (5) implementing it. As a matter of fact, questionnaires are at the core of the process and represent the standard tool used to work out clients' risk profiles.

The most important element of a suitability questionnaire is the content, namely the questions included in it, and the information they are designed to obtain or elicit. According to the literature reviewed in the previous chapter, a variety of factors can influence investors' preferences, risk aversion and consequent portfolio decisions. Hence, it is necessary to take into account a broad range of characteristics (for instance, sociodemographics, financial knowledge and experience, risk aversion) in order to profile the client in an effective manner, so as to develop financial recommendations that fit his needs and preferences. Evidence from psychology and behavioral finance suggests that individual personality and psychological traits, behavioral biases and emotional predispositions should be taken into consideration when devising suitable asset allocations and investment plans. This point is also stressed by Davies (2017), who argues that an investor profile incorporates many aspects, from financial circumstances and goals, to emotions and behaviors. The large number of relevant variables contributes to the inherent complexity of the issue, making it challenging for financial intermediaries to design effective and complete questionnaires which, while complying with regulations, "*combine the suggestions from classic economic literature with the indications of behavioral finance and of psychometrics*" (Linciano and Soccorso, 2012).

2.1.3 Suitability questionnaires limitations

Given the high relevance of the MiFID, it is interesting to see how European investment firms have applied suitability assessment processes in practice and whether compliance with regulatory requirements has led to satisfactory results in terms of client profiling. A discussion paper by CONSOB[19] members Linciano and Soccorso (2012) is dedicated to the analysis of the suitability questionnaires administered by a sample of Italian financial firms. Empirical findings suggest that several shortcomings affect both their content and their structural and textual aspects: some answers may not be reliable as they are based on respondents' self-evaluation or affected by biases which are not controlled for; wording is vague, unclear or includes too sophisticated micro-language expressions; answer options

[19] CONSOB stands for *Commissione Nazionale per le Società e la Borsa* (in English, Italian Companies and Stock Exchange Commission). It is a supervisory Authority in charge of regulating financial markets in Italy and ensuring investors' protection.

are limited or poor, leading to flawed responses. Moreover, different questionnaires depict and classify the same person in different ways, showing up considerable inconsistency. Mazzoli and Marinelli (2011) explore the same issue by examining the content of 14 MiFID questionnaires administered by major Italian financial intermediaries. They also find evidence of unreliability, with different questionnaires leading to different profiling outcomes for the same individual. Besides substantial divergence in questions and scoring methods, inconsistencies may be due to the fact that the assessment of the subjective risk profile[20] of the client is found to be often overlooked. After having identified through an empirical investigation the most relevant factors that need to be taken into consideration to properly perform the risk profiling process, Mazzoli and Marinelli (2014) show in another related paper that important variables like age, employment status and attitudes towards risk are often not included in suitability questionnaires. As a result, information about clients is likely to be incomplete or inaccurate, leading to unreliable profiles and unsuitable recommendations. Klement (2018) even argues that, most of the time, questionnaire-based risk profiling "*explains less than 15% of the variation in risky assets between investors*". Many of these drawbacks have been also noticed by supervisory Authorities in the financial services field: in 2011 the British Authority, at the time named Financial Service Authority[21] (FSA), showed concern for the extremely high rate of unsuitable investment advice (50%) caused by poor risk-profiling tools or approaches which failed to correctly assess the risk a customer is willing and able to take. In order to try and solve the problem, it published a guidance consultation on the matter (Financial Service Authority, 2011). The European Securities and Markets Authority (ESMA) did the same after becoming aware of widespread inadequacy and unreliability of risk-profiling tools (European Securities and Markets Authority, 2012).

Based on this large amount of evidence, it appears that although the use of suitability questionnaires is commonly considered a practical and efficient method to gather information about customers, a number of shortcomings have been identified with regards to this tool. The major weakness probably regards the assessment of clients' risk tolerance, a complex concept that, most of the times, is not elicited in the correct way. The huge

[20] According to Mazzoli and Marinelli (2011) the subjective risk profile of a client indicates "*the attitude of the client towards a situation of riskiness and uncertainty*". It can be difficult to measure since it represents a psychological concept.

[21] The Financial Service Authority (FSA) was the agency responsible for regulating the financial services industry in the United Kingdom. It operated until year 2013, when it was replaced by two distinct bodies: Financial Conduct Authority and the Prudential Regulation Authority of the Bank of England.

diversity observed among questionnaires also represents a problem, since inconsistent profiles for the same individual are developed by different intermediaries. These issues should not be overlooked because poor-quality questionnaires will most likely lead to incorrect client profiles and, in turn, to unsuitable or suboptimal financial recommendations. There may be several reasons behind the ineffectiveness of these questionnaires. Besides incorrect design probably caused by unskilled or unspecialized staff, part of the problem could reside in the underlying legislative framework, which does not give much details on which clients' characteristics should be known (only referring to broad and vague categories), nor specifies how to elicit and measure that information (Cruciani, 2017). The majority of suitability questionnaires analyzed in the previously mentioned studies were generally compliant with MiFID II requirements, nevertheless they did not constitute a reliable basis for profiling clients: regulatory compliance is not automatically associated with the design of effective questionnaires (Cruciani, 2017). Most likely, this is due to the fact that they lack or do not correctly assess some of the variables considered relevant by the psychological and behavioral finance literature, with which regulatory requirements may not be fully aligned. Some research studies try to look into this issue: by comparing the items regarded as relevant by the MiFID II regulation with those regarded as relevant by the behavioral finance literature, Linciano and Soccorso (2012) found that the former are a subset of the latter. For example, many sociodemographic characteristics like gender and age are not mentioned by the Directive, nor are background risk, subjective risk (that is, emotional capacity to bear risk) and recurring behavioral biases like loss aversion, overconfidence and optimism.

Even if they formally comply with regulatory requirements, suitability questionnaires may lack scientific validity, failing to build in important psychometric and behavioral factors that would be useful to properly assess clients' risk profiles but are not yet clearly or explicitly specified in legislations. In light of the recent findings of the behavioral finance literature, the questionnaire which is used for the purpose of the present study is intended to accurately get to know a client under many aspects. It also includes questions designed to uncover potential biases to which respondents may be subject, with the goal to ultimately build reliable investor profiles reflecting individual personality traits and behavioral predispositions.

2.2 THE SCHRODERS QUESTIONNAIRE: GOALS AND STRUCTURE

For the purpose of this empirical research, information regarding the characteristics of a sample of retail investors has been collected using a questionnaire developed by the widely-known asset management company Schroders[22] and administered by CentroMarca Banca to its clients. As part of its Wealth Management service offerings, Schroders gives to its clients the possibility to get to know their investment personality by taking the *investIQ test* (Schroders, 2021), a questionnaire developed by a team of behavioral scientists and experts available on an online digital platform. The company sums up the rationale behind this tool by stating that "*at Schroders we believe it's only by understanding your own mind that you can make truly informed investment decisions"* (Schroders, 2021): this short sentence conveys the significative value that psychology and behavioral finance insights can bring to the investment-related domain. The questionnaire used in the present study is indeed based on the *investIQ test*, and it is precisely its alignment with the behavioral finance findings that makes it so effective and functional to this research. Another of its major advantages is that, after having filled out a simple and user-friendly digital questionnaire form, each investor is automatically associated to a specific investor type, that is a profile outlining predominant personality traits and behavioral tendencies. This output is extremely useful because it allows each individual to know himself better and discover "what kind of investor he or she is", recognizing and understanding his or her own psychological profile with the related strengths and weaknesses. Other than benefiting the investor himself, using such a sophisticated tool to gain a thorough understanding of a client's characteristics brings along many benefits for the financial intermediary or advisor as well. First of all, it guides and facilitates the crafting of investment strategies that best suit the needs of each particular individual. Particularly, it is extremely important that the level of risk an investor is willing and able to bear is neither overestimated nor underestimated, otherwise problems of customer dissatisfaction or conflicts could arise (Marinelli and Mazzoli, 2014). By reliably assessing clients' risk profiles, an institution will be able to reduce customer complaints and attract more clients, enhancing its competitiveness on the market. Secondly, having accurate information about the client's risk attitudes and personality

[22] Schroders is a global asset management company headquartered in London that offers wealth management and financial planning services to individuals and institutions. Its purpose is "*creating a better future by investing responsibly for our clients*" (Schroders, 2021) and Wealth Management represents a core business segment as well as a strategic priority.

traits allows the intermediary to be more sensitive about the client's emotional needs, permitting to build a solid client-advisor relationship based on trust and transparency as well as to enhance customer experience (Klement, 2018). In this way, the advisor will have the capability of maintaining a climate of confidence and trust in difficult times, such as during economic downturns, and of keeping the client satisfied with his investment plans in the long-run.

After having stressed the goals and benefits of the profiling tool under consideration, a more detailed description of its design and structure is provided. The underlying questionnaire is composed by 7 initial questions asking for sociodemographic information, followed by 36 closed-ended questions designed to elicit clients' investment personality, directly taken from the *investIQ test*. At the beginning, respondents are asked to select their gender, date of birth, profession and level of knowledge in the investment field; after that, they are faced with a combination of multiple-choice, Likert scale and dichotomous questions aimed at revealing a person's basic psychological traits and behavioral attitudes. For example, the investor is asked:

- how he would act, or what decisions he would make, in a hypothetical scenario or in a particular context;
- to choose between a number of alternative investment options related to risk-and-return tradeoffs or intertemporal choices;
- whether he agrees with some statements regarding personal attitudes and beliefs;
- how he rates his own knowledge or abilities in certain activities with respect to others;
- how much he is confident about his answers being right.

These types of questions are designed to elicit if a person is prone to being subject to various behavioral biases that will be described in later sections, such as feeling regret, being impulsive, being overconfident about own abilities, following the herd (please see Appendix A for the complete list of questions and answer options included in the questionnaire).

It is worth pointing out that questions are formulated using clear and simple wording without overly sophisticated jargon, so as to be fully comprehensible also to people who are not familiar with the investment and financial field (Metzger and Fehr, 2018). Being in digital format, the layout is very user-friendly, linear and easy to read, and it includes pictures in order to be as straightforward as possible for the user, making it extremely easy to follow the flow of questions. Most importantly, the questionnaire contains questions

designed to elicit most of the variables that the literature considers relevant in shaping investment decisions. Other than easy-to-measure factors like sociodemographics and financial knowledge, it is designed to uncover more subjective but extremely valuable information such as personality traits, psychological attitudes and behavioral biases which are unique to each investor.

2.3 THE SCHRODERS QUESTIONNAIRE: OUTPUT AND BEHAVIORAL DIMENSIONS

After the completion of the Schroders questionnaire, each respondent obtains as output an elaborated four-page report describing the resulting investment personality and the most impactful behavioral traits to which it is associated, giving also some suggestions to deal with them. Each individual is identified with one of four different investor types: *the vigilant planner*, *the independent rider*, *the level-headed optimist* and *the opinion hunter*. For every category a detailed description is provided with regard to distinctive traits and tendencies, typical behaviors and attitudes, and specific strengths and weaknesses from the point of view of investing. Figure 1 summarizes the main characteristics of each investor type (please see Appendix B for more detailed information on each category).

The vigilant planner	**The independent rider**
✓ Conducts extensive research before making decisions	✓ Individualist
✓ Long-term oriented and cautious	✓ Realist and confident
✓ Not likely to be impulsive	✓ Makes decisions independently
✗ May get anxious about investing	✗ Likely to make rushed decisions
✗ Holds a pessimistic attitude	✗ May easily get nervous
✗ May get influenced by the herd	✗ Extremely fears losses
The level-headed optimist	**The opinion hunter**
✓ Calm and tolerant	✓ Copes well with uncertainty
✓ Holds an optimistic attitude	✓ Not likely to get anxious
✓ Less sensitive to losses	✓ Long-term oriented
✗ Tends to follow the crowd	✗ Very likely to follow the herd
✗ Prone to over-confidence	✗ May get over-optimistic
✗ Easily influenced by projection bias	✗ Lacks confidence

Figure 1. Investor types: main behavioral characteristics. Source: Schroders (2021).

This information is extremely important because it allows to acknowledge how one's personality impacts financial decisions, so that actions can be taken to counteract potential shortcomings, while taking advantage of the recognized strengths. Indeed, some tips and suggestions are also provided to help investors tackle adverse attitudes or tendencies and take informed investment decisions. The report concludes with a final section including a graphical representation of some numerical scores, indicating how much an investor is likely to be influenced by 9 different behavioral dimensions. The latter include personality traits and biases, and are precisely:

1. ambiguity aversion
2. anxiety
3. confidence
4. herd influence
5. impulsivity
6. loss aversion
7. optimism
8. projection
9. regret aversion.

The score for each variable ranges from 0 to 10 (the higher the score, the more influential the trait is) and can be compared with the average result, in order to better understand how an investor is positioned with respect to the others.

Recalling previous discussion about individuals' different predisposition towards the development of specific behavioral biases, the rationale behind the *investIQ* personality test is evidently linked to Pompian and Longo's idea that "*personality types* [..] *are differently susceptible to numerous investor biases*" (Pompian and Longo, 2004). There is also an apparent parallel between the Behavioral Investor Types (BITs) introduced by Pompian (2012) and the investor personalities suggested at the completion of the questionnaire: both of them are used to categorize investors based on their dominant traits and to investigate their susceptibility to various behavioral biases, allowing advisors to quickly grasp the basic characteristics of each client before making recommendations (Pompian, 2016). The Schroders profiling tool exploits these kinds of connections in order to learn more about individuals' preferences and orientations and facilitate the development of customized investment strategies based on the client's personality and behavioral traits. Taking into consideration insights from personality psychology and behavioral finance can be

extremely useful to get to know investors in a thorough way and can make a difference in the effectiveness and reliability of investor profiling.
In the following subsections, the behavioral dimensions included in *investIQ* final report as well as their potential impacts on investment decisions are explored.

2.3.1 Ambiguity aversion

Ambiguity aversion refers to "*the preference for choices where the probabilities of outcomes are known over those involving unknown probabilities*" (Schroders, 2021). Most people dislike uncertainty, so they tend to shy away from investments in securities with less predictable return distributions. For example, they favor familiar and local stocks over foreign investment (so-called home bias) since they consider the former less ambiguous and, consequently, more attractive (Pompian, 2006). These irrational behaviors may lead to problems of under-diversification and to the loss of profitable opportunities. Furthermore, the ambiguity aversion bias is closely linked to the *competence effect* described by Graham, Harvey and Huang (2009), who argue that investors who feel more competent in the investment domain are more likely to act on their judgement and accept higher risks, so they are less averse to ambiguity. The results of Ghosh and Ray's empirical analysis support these findings, suggesting that decision makers having more tolerance for ambiguity are more confident when making choices, and confirming that ambiguity aversion has an influence on choice behavior under uncertainty (Ghosh and Ray, 1997).
In order to reduce the adverse effects of the ambiguity aversion bias, it is important to educate investors on the inherent uncertainty involved in investing activities, and to provide them with information on the risks and benefits of all the alternative options available to them.

2.3.2 Anxiety

Anxiety is a personality trait characterized by "*an uncomfortable state of apprehension and worrying resulting from the anticipation of a threatening event or situation*" (Bucciol and Zarri, 2017). Anxious individuals tend to be influenced by short-term fluctuations in the market, and their emotional state may lead them to take rushed decisions to the detriment of long-term financial goals. Several studies have explored the relationship between anxiety and investment decisions. Using US data, Bucciol and Zarri (2017) document that it has a significant impact on individual propensity to take risk and resulting portfolio choice: in

fact, anxious investors tend to have lower shares of stock assets in their portfolio. In their empirical researches, Gambetti and Giusberti (2012) and Gambetti and Giusberti (2019) find that anxiety shapes real life investment decisions: it is associated with low stock trend predictability[23], stronger perception of risks and with the tendency to avoid risk-taking and make conservative financial choices (for instance, anxious people prefer not to invest savings but rather to hold interest-bearing accounts granting the possibility to withdraw money as needed). Given that anxiety leads to the desire to reduce uncertainty in order to increase the sense of control over situations, in the view of the authors individuals scoring high on this trait are likely to avoid risky investments in order to reduce their unpleasant feelings, even if this strategy is not optimal from an economic point of view.

Investors who are prone to anxiety can certainly benefit from relying on a professional advisor who can help them overcome negative mental states, guiding them towards taking the best financial decisions to reach their goals.

2.3.3 Confidence

Considering the level of confidence an investor has in his own abilities is of utmost importance since serious problems might arise when individuals either overestimate or underestimate it. As already mentioned in the previous chapter, overconfidence is one of the most commonly experienced biases when it comes to investing, and it usually results in excessive trading, under-diversified portfolios and lower portfolio returns. Ahmad (2020) claims that *under*-confidence also exerts a negative influence on investment decisions, so that neither too much nor too little confidence is optimal.

An interesting research study by Yao and Rabbani (2021) demonstrates that confidence moderates the relationship between investment risk tolerance and portfolio risk: people having a higher level of the former will also show a higher value of the latter, but a lower level of confidence will have the effect of lowering portfolio risk (Yao and Rabbani, 2021). Therefore, underconfident investors are expected to hold less risky portfolios compared to overconfident ones.

Most of the time, the self-esteem personality trait is closely related to an individual's self-confidence, so that the former drives the latter: very often, people with high self-esteem also are self-confident. Several studies exploring the biopsychosocial determinants of

[23] The stock trend predictability indicates "*how much a person believes the fluctuation in price of an investment to be predictable*" so it gives an insight of an individual's "*sense of control regarding the possibility to forecast the variation in trend of stocks*" (Gambetti and Giusberti, 2012).

financial risk tolerance (Kannadhasan et al., 2016; Grable and Joo, 2004) uncover a significant and positive association between self-esteem and financial risk tolerance, suggesting that investors with higher self-esteem are expected to be more risk-tolerant. On the other hand, it is worth pointing out that having disproportionately high self-esteem might lead to overconfidence: overestimating own investing abilities and knowledge could imply higher tolerance for risk but sub-optimal finance-related decisions.

Given the relevance of the adverse consequences caused by overconfidence, investors should carefully evaluate their investment options, being aware of the recurring presence of this bias and of the errors of judgement it entails. Increasing financial education and literacy may have beneficial effects and reduce overconfidence, however considering to rely on the help and guide of a competent advisor may represent the most appropriate solution in certain circumstances.

2.3.4 Herd influence

As was pointed out earlier in this study, people are easily affected by what others think or do and are prone to irrationally following the herd. Frijins, Koellen and Lehnert (2008) include in their behavioral portfolio choice model a significant herding variable, indicating that investors follow general market sentiment: they tend to invest in risky assets when the market is bullish; on the contrary, when the market is bearish, they are more oriented towards riskless assets. People subject to herding tend to seek investment advice from family members, friends and colleagues. Zhanga et al. (2018) investigate the relative importance of so-called nurture factors (household, workplace and neighborhood peer effects and financial advice) in influencing asset allocation decisions, finding that their overall explanatory power is even stronger than personal characteristics or nature variables. Regression results indicate that household peer effects, personal characteristics and workplace peer effects (in order) are the most important determinants of portfolio decisions.

Some argue that herd behavior won't lead to good investment outcomes: individuals who get conditioned too easily may excessively follow temporary trends and fashions and become vulnerable to irrational choices or bad strategies. Conversely, others think that following the crowd could be beneficial in certain circumstances, rather than taking decisions or acting in a vacuum. In any case, overcoming the potential negative consequences of this bias requires focusing on own financial goals and circumstances, and

sticking to a compatible long-term strategy. What others do is not necessarily what's best of a particular individual.

2.3.5 Impulsivity

Impulsive people prefer immediate or short-term rewards rather than long-term ones, as they focus their attention on the here-and-now (Schroders, 2021). Rzeszutek, Szyszka and Czerwonka (2015) define impulsivity as "*a very strong tendency to undertake risky, unplanned activities, to make quick decisions and to have rash reactions*". This behavioral inclination is displayed in a variety of contexts and can have important repercussions in everyday-life activities. In the worst cases, it could also have serious detrimental effects for people's health: for example, impulsivity has been found to be associated to pathological gambling (Alessi and Petry, 2003). In financial terms, the main risk of acting impulsively is that individuals could fail to accumulate enough savings for the future, jeopardizing long-term goals because of excessive short-term spending. The literature on this behavioral dimension is not very extensive, however some studies have explored it within the scope of personality assessment models. Gambetti and Giusberti (2019) acknowledge that measuring impulsivity is a complex task because different personality traits can be involved, such as lack of self-discipline or ability to defer urges. By making use of the 16PF model[24], the authors are able to demonstrate that low impulsivity (or high self-control) is associated to higher spending on investments and durables. Another tool that permits to measure the impulsivity trait is Eysenck's Impulsivity, Venturesomeness and Empathy (IVE) Questionnaire, which was used in a research by Rzeszutek, Szyszka and Czerwonka (2015) who studied the relationship between certain individual personality traits and the susceptibility to behavioral biases in decision making (in particular, mental accounting, the certainty effect and the sunk cost fallacy). Contrary to their expectations, empirical results suggest that impulsivity does not have a significant impact on individuals' proneness to exhibiting the considered biases. Relying on the same tool, Baddeley et al. (2010) instead found significant evidence that impulsive investors have a stronger propensity to follow the herd.

[24] The 16 Personality Factors (16PF) model is a personality test that permits to identify 16 primary traits, which can be grouped into 5 global personality factors (Extroversion, Anxiety, Tough-Mindedness, Independence and Self-Control). It was developed in 1970 by Cattel and colleagues and is still largely used nowadays. Gambetti and Giusberti (2019) use the 16PF model as it allows them to separately assess the anxiety and impulsivity traits, which are both considered facets of Neuroticism in the Big Five framework.

Given the complex nature of the impulsivity trait, more research is needed to gain a deeper understanding of its impacts on investment decisions.

2.3.6 Loss aversion

For loss averse individuals, the psychological pain caused by losses has a stronger impact than the pleasure stemming from winning. As anticipated in previous discussions, the disposition effect and loss aversion go hand in hand in affecting people's preferences as well as the resulting investment decisions. Shefrin and Statman (1985) were among the first to document the existence of the disposition effect. Research by Barber and Odean (1999) also supports this evidence, suggesting that "*a stock that is up in value is over 50 percent more likely to be sold from day to day than a stock that is down*", and findings by Jain, Walia and Gupta (2020) point to a strong influence of the loss aversion bias on investment decisions. Empirical evidence by Frino, Lepone and Wright (2015) suggest that women, older people, unsophisticated investors and investors with Chinese ethnic background tend to show higher degrees of loss aversion. Interestingly, it has also been documented that the disposition effect and overconfidence are not likely to occur together; this evidence is consistent with previous findings by Dhar and Zhu (2006), indicating that higher trading frequency helps to reduce the magnitude disposition effect. Hence, it is often possible to predict whether an individual is more susceptible to the loss aversion bias and the disposition effect by looking at his or her demographic and ethnic profile as well as trading behavior. In order to deal with this bias, investors must make an effort and try to reason with a clear mind before making financial decisions, taking a long-run view when choosing whether to sell or hold into an investment. Relying on external advice can often be useful as financial professionals can help the client better manage emotions and stick to pre-set long-term plans.

2.3.7 Optimism

Optimistic individuals normally hold positive expectations with regard to future events or outcomes (Jacobsen et al., 2014) which can influence their behavior in a multitude of contexts, for instance in the working environment and in many daily life situations, among which those that involve economic and financial choices. Optimism per se is not a negative trait, but it can be harmful if excessive. Pompian (2006) argues that investors are often overly optimistic about general market and economic trends and about the future

performance of their investments. As a consequence, they often underestimate the risks of potential adverse outcomes and may take irrational investment decisions. Overly-optimistic subjects also consider themselves above-average investors and are likely to be subject to the home bias. After documenting that individuals' level of optimism has an influence on many life choices, including portfolio allocation and savings decisions, Puri and Robinson (2007) make an important distinction between modest and extreme optimism[25]. Findings suggest that the former is associated with reasonable financial choices (more savings, long planning horizons), while the latter with imprudent and unwise decisions (less savings, short planning horizons, larger individual stock holdings). The key takeaway of this study is that, while extreme optimism is associated to irrational behaviors, a moderate amount of optimism can instead be beneficial. A research study by Bonaparte, Kumar and Page (2017) suggests that US investors are more optimistic towards financial markets and the general economic environment when their political party is in power, in fact during those periods they are more willing to invest in risky assets. Moreover, interesting evidence by Jacobsen et al. (2014) shows that, on average, men tend to be more optimistic than women with regard to future stock market performance and the economy in general.

In order to overcome the negative effects of over-optimism, it is important that investors form realistic expectations and forecasts, taking into account the possibility of downside risk which is intrinsic to any investment.

2.3.8 Projection

Although it is not usually the case, investors tend to believe that their current preferences and needs will not change in the future. As already mentioned in previous sections, this psychological bias is called projection and is often observed in the financial domain, as documented by several studies. Grable, Lytton and O'Neill (2004) and Grable et al. (2006) focus on the dynamics of financial risk tolerance in relation to the projection bias. The results of both empirical analyses suggest that individuals' risk tolerance is affected by recent stock market price changes (as measured by major market indexes such as NASDAQ, Dow Jones Industrial Average and S&P 500). By projecting previous week closing stock market data into the future, individual investors seem to "*extrapolate recent*

[25] For the purpose of their research, Puri and Robinson (2007) categorize as extreme optimism those belonging to the right-most 5% of optimists and who "*are approaching two standard deviations away from the mean*".

trends into attitudes toward taking investment risks" (Grable, Lytton and O'Neill, 2004). The authors arrive at the conclusion that risk perceptions and preferences related to investing reflect overall stock market trends: generally speaking, when the market is bullish the level of risk tolerance tends to increase, while when the market is bearish individuals usually become more risk averse. According to Grable et. al (2006), financial risk tolerance is not static but, on the contrary, it is a dynamic factor which should be periodically re-assessed as it may change over time. This has important implications for financial planners and advisors: ideally, asset allocation programs should be adjusted to these variations in risk attitudes, so that the probability that the client will be unsatisfied with the investment outcomes is reduced, and the client-advisor relationship does not risk being compromised. Taking the investor's perspective, the projection bias can be overcome by acknowledging that the future will probably be different from the present: circumstances change as do people, their needs and their attitudes.

2.3.9 Regret aversion

As pointed out earlier in this study, regret aversion is caused by the fear of taking wrong decisions, which impacts the way people reason when making a choice. Anticipating the possibility of feeling regret, investors may take irrational decisions or even avoid taking any action to the detriment of their investment performance. Jain, Walia and Gupta (2020) identify regret aversion as one of the strongest behavioral biases impacting investment decisions by individual equity investor. Ramalakshimi et al. (2019) also hypothesize that the financial decision-making process is significantly affected by the regret aversion bias, and empirical results once again confirm the expectations. According to Pompian (2006), this bias can lead to excessively conservative investment strategies or to shying away from depressed markets or relatively unknown companies, limiting returns and jeopardizing investment goals. Moreover, it can encourage herd behavior, due to the comfort of "not being the only one mistaken" if things should go wrong. Regret aversion bias can also cause investors to hold losing stocks for too long due to the reluctance to admit errors and realize losses.

Individuals should try to manage the negative feelings arising from regret and to avoid getting influenced from them, learning from their past mistakes with the goal of taking better-informed investment decisions.

CHAPTER 3
EMPIRICAL ANALYSIS

3.1 DESCRIPTIVE ANALYSIS

In light of the evidence emerged from the previously reviewed body of literature, the characteristics of a sample of retail investors elicited through the Schroders questionnaires are now analyzed in relation to their investment portfolios and asset allocation choices.

The data has been provided by CentroMarca Banca, a local Credit Cooperative Bank which submitted the questionnaire to a group of selected clients. In order to perform the empirical investigation, a database has been created containing the following information for each investor:

- the answers to the Schroders questionnaire, including basic sociodemographic information;
- the location of the credit agency or branch office of reference;
- the individual risk profile according to the MiFID regulation;
- the investor type and the individual's scores on nine behavioral and personality traits, taken from the final four-page report developed by the Schroders *investIQ* platform;
- selected data and risk indicators regarding the individual's investment portfolio.

The sample is composed by 84 retail investors owning a portfolio with a value above €50.000. In line with the behavioral finance literature, their profile comprises both sociodemographic characteristics and behavioral traits. The former include gender, age, profession, level of knowledge in the investment field (identified as "beginner", "intermediate" or "advanced") and the geographic location of the credit agency or bank office of reference. There is no direct measure to identify the economic situation of respondents, so the value of their financial portfolio is taken as proxy for the purpose of the analysis.

Behavioral characteristics coincide with the nine behavioral dimensions elicited through the Schroders personality test which were described in detail in the previous chapter; the scores on each attribute are measured by means of numerical scales ranging from a minimum of 0 to a maximum of 10. Based on the assessment of the relevance of these traits, each subject is identified with a specific investor type.

Another very important piece of information is the MiFID risk profile: according to the aforementioned European Union's Directive on Markets in Financial Instruments, financial intermediaries must classify investors into risk classes based on three main factors: knowledge and experience in the investment field, financial situation and investment objectives, including risk tolerance. In this regard, the Cooperative Bank providing the data categorizes clients into four risk classes: low, medium-low, medium-high and high.

With regards to individual investment portfolios, the reported risk indicators include the standard deviation for the last 3 years, the Sharpe ratio over the same 3-years period, the Maximum Drawdown (%), and the related Time to recover in days. Performance measures include the portfolio performance over the last 3 months, the performance Year-To-Date (registered over the period from 1/01/2021 to the date of this research), and the percentage portfolio variation, that is the 1-year performance in the observation period lasting from 31/01/2020 to 31/01/2021. The specific asset allocations at the end of the aforementioned period is also provided, breaking down the portfolio values into the respective percentage weights of stocks, fixed-income securities (bonds), cash and other securities. The latter category refers to investments in commodities, precious metals, real estate and equities in very specialized or innovative sectors like ecology, agribusiness, artificial intelligence or in emerging markets (Asia, India, China, Brazil). Therefore, this asset class can be considered particularly risky, generally speaking. The total value of the portfolio in Euro is also specified, being indicative of the size of the amount invested.

It is worth pointing out that investment portfolios consist of model portfolios which are pre-built by financial advisors for investors, so they are expected to be well-diversified and appropriately constructed based on investors' financial goals and risk appetite.

After having outlined which are the main data and information available, it is useful to provide a few summary statistics to get a first idea of the profile of investors, their main characteristics and the basic structure of the sample.

The majority of investors are males (65% of the total) and the mean age of the sample is 57, in fact 46% of respondents are between 50 and 65 years old and only 6% are under 34. Most individuals are either employees (35%) or they have reached retirement (29%), while fewer people work as entrepreneurs, self-employed or managers. Interestingly, all the entrepreneurs in the sample are represented by males, who prevail in self-employed positions as well.

The following pie charts show how investors are distributed according to their level of knowledge in the investment field and to the MiFID risk profile classification.

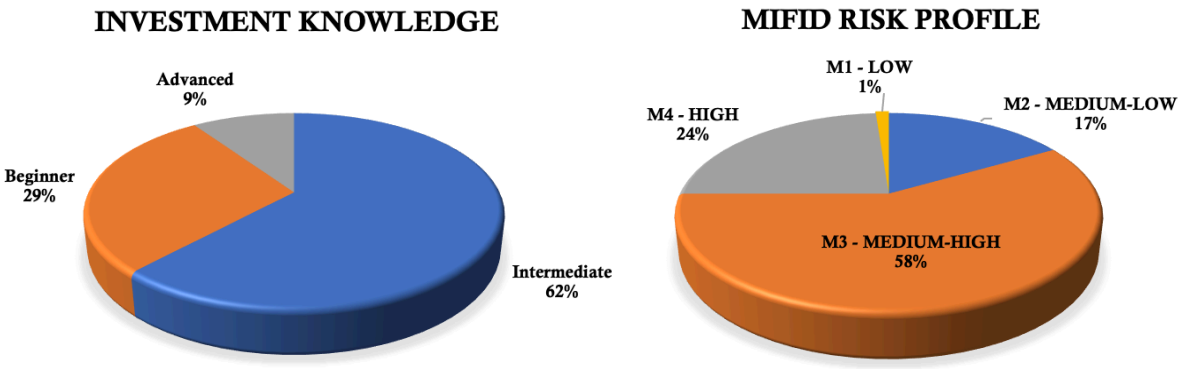


Figure 2. Sample distribution based on investment knowledge and MiFID risk profile.

At first glance, the two graphs seem to display a similar distribution. Indeed, the majority of respondents declares having an intermediate level of knowledge in the investment field and is positioned in the medium-high class of risk. On the contrary, the "beginner" and "advanced" categories account for smaller portions of the pie, as do the high and medium-low risk classes. By jointly considering these two variables, a potential link emerges: moving from lower to higher knowledge levels, the percentage of investors with high MiFID risk profiles increases from 4% to 50%. A correlation analysis will allow to understand whether the two measures are actually and significantly associated.

It has also been noticed that the "advanced" category is composed by a majority of males (87,5%), who appear to be more knowledgeable than women in the investment-related domain.

In order to get an insight of the economic situation of investors, the value of their portfolios (used as a proxy of wealth) has been divided into six intervals, as shown in Figure 3. It should be remembered that all investors in the sample own a portfolio of value above €50.000, and that is why the first interval starts at that amount. By looking at the graph, it can be immediately noticed how most investors (65% of the total) own a portfolio of value below €200.000. The number of individuals in each interval then gradually decreases for higher portfolio values. The "€500.000+" category includes a total of 6 individuals, all of which are men and 3 of which have invested over €700.000.

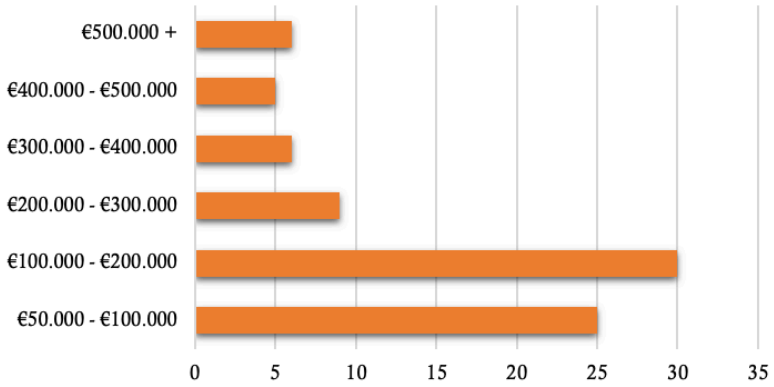


Figure 3. Distribution of investors in portfolio value intervals.

Considering now the profile of investors from a behavioral point of view, the categorization into the four investor types developed by the Schroders personality test is outlined in the Table below:

The vigilant planner	The level-headed optimist	The opinion hunter	The independent rider
35%	31%	20%	14%

Table 1. Schroders investor types: percentage distribution.

Most investors are identified with the vigilant planner and level-headed optimist investment personalities, suggesting that the majority of people either tends to be cautious and wary or has an optimistic attitude when confronted with investment activities. Only a minority of individuals (14%) seems confident enough to rely on their own abilities and judgement, rather than getting influenced by others.

Going into the details of investors' personality traits, respondents' average scores on the nine behavioral dimensions are reported in the following histogram:

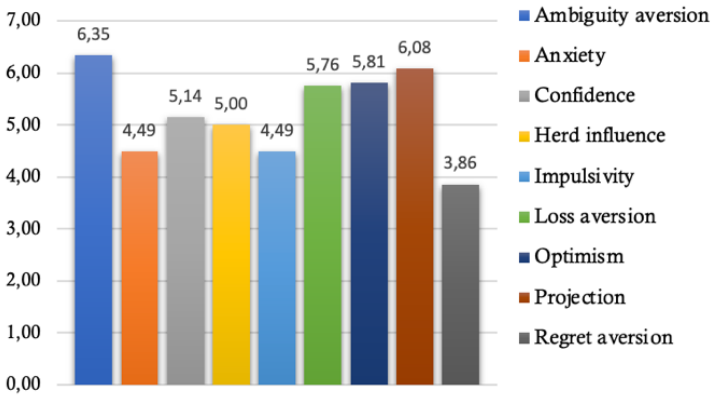


Figure 4. Average scores on behavioral dimensions.

Overall, the highest scores are registered for ambiguity aversion, projection, optimism and loss aversion, while the lowest ones for regret aversion, impulsivity and anxiety. Besides that, it is also interesting to see how many people have scored below or above average on each trait (Figure 5). For that purpose, generic average values provided by Schroders have been taken as a point of reference. Since they represent the mean scorings of a larger sample of the general population, these values slightly differ from the average scores reported in the previous graph.

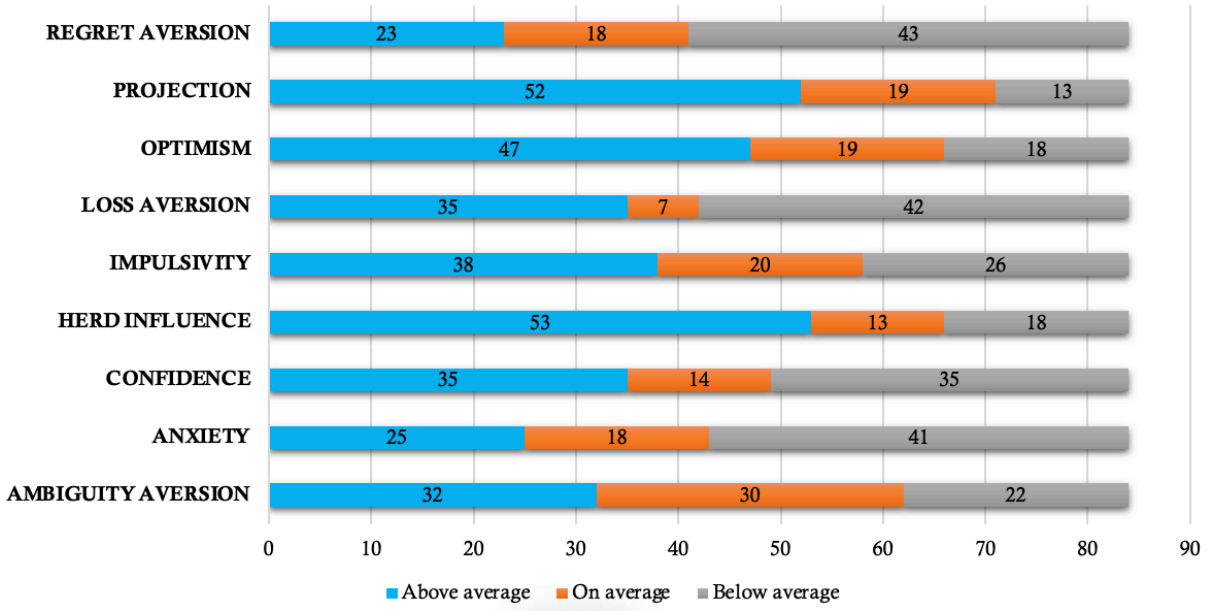


Figure 5. Behavioral dimensions: number of individuals above, below and on average.

The most relevant considerations to be made concern herd influence and projection: as a matter of fact, more than 60% of individuals scored above average on these biases, suggesting that they may be rather influential and widespread. Approximately half of the investors are instead positioned below average with regards to regret aversion, loss aversion and anxiety.

After having briefly traced the profile of investors, some descriptive statistics are provided with regards to the characteristics of their investment portfolios.

Figure 6 shows the average asset allocation of the sample.

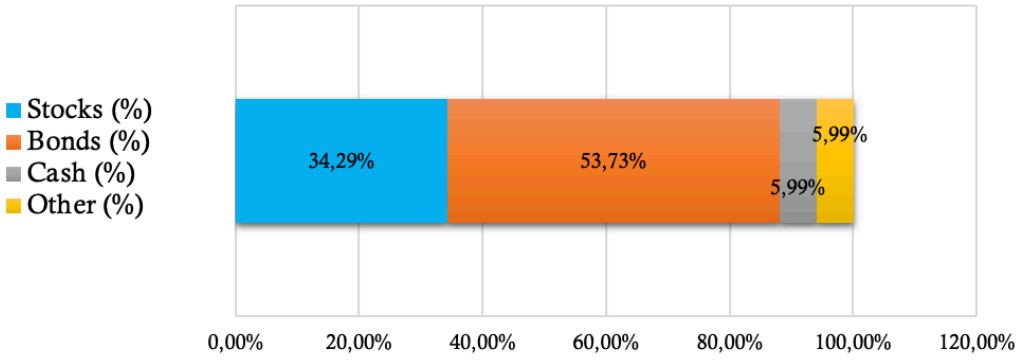


Figure 6. Average allocation (%) in asset classes.

The average portfolio composition is characterized by a predominance of the bonds asset class, which accounts for more than a half of the portfolio value. Stocks have a percentage weight of approximately 34% of the total, while cash and other securities equally share the remaining 12%.

The highest percentage proportion of stocks registered in the sample is 96,98%, but it is observed that only 20% of individuals have more than half of their portfolio invested in stocks. Fixed-income securities account for more than 50% of the portfolio for 54 investors out of 84, whereas the average percentage weight of liquidity is quite low: 46% of individuals hold less than 5% of cash and cash equivalents, which never exceed 17,5% of the portfolio value. On average, quite low amounts are registered for the asset class of other securities as well. It should also be noted that just two individuals invest in only one asset class, that is represented by bonds.

To complete the analysis, descriptive statistics of the main portfolio risk indexes and performance indicators are detailed in the following Table:

PORTFOLIO INDEX	MEAN	MEDIAN	MINIMUM	MAXIMUM	STANDARD DEVIATION
Standard Deviation 3Y	10,29	9,82	2,31	18,23	3,38
Sharpe 3Y	0,25	0,26	0,10	0,34	0,04
Maximum Drawdown (ABS)	17,12	17,16	1,64	26,26	5,31
Time To Recover	177	184	76	220	38
Portfolio Variation (%)	3,62	2,29	-5,78	19,07	5,17

Table 2. Portfolio risk and performance indicators: summary statistics.

It is worth pointing out that time to recover statistics have been calculated with reference to only 62 observations, because in some cases the measure was not available yet, and that Maximum Drawdown has been considered in absolute value. Moreover, portfolio

variation is positive in 81% of cases, so only 19% of portfolios register negative performances in the 1-year observation period.

Generally speaking, the literature suggests that asset allocation choices may change based on demographic or behavioral factors. In this regard, investor profiles and portfolios' characteristics are now jointly discussed in order to make some initial considerations on the data.

Considering the variable age (Table 3), it can be noticed that older investors hold larger portfolios in terms of value: the latter averages €196.000 for those between 18 and 34 years old, while it rises to a mean of €249.000 for investors over 65 years old. The individuals with more funds available for investing seem to be the oldest ones.

For what concerns knowledge in the investment field (Table 4), it is observed that the percentage proportion of stocks in portfolio is higher for highly knowledgeable individuals (corresponding to those in the "advanced" level) compared to those in the "beginner" and "intermediate" levels. In addition, the average portfolio variation increases from 3% to 4,3% moving from beginners to more expert individuals. Hence, the level of financial knowledge might have an impact on investment decisions and outcomes.

Age	Average portfolio value (€)
18-34	195.632,80 €
35-49	162.072,00 €
50-65	209.140,84 €
Over 65	248.719,00 €

Investment knowledge level	Average % Stocks	Average portfolio variation (%)
Beginner	33,55%	3,03
Intermediate	33,87%	3,78
Advanced	39,26%	4,34

Table 3. Age and portfolio value. Table 4. Investment knowledge, % stocks and portfolio variation.

The MiFID risk profile also seems to be related to portfolio choices: compared to people with low-risk profiles, investors in high-risk classes hold portfolios which are larger in terms of value, include greater amounts of stocks and lower proportions of bonds, and register higher standard deviations and portfolio variations (Table 5).

MiFID risk profile	Average portfolio value (€)	Average % Stocks	Average % Bonds	Average standard deviation 3Y	Average portfolio variation (%)
M1 - LOW	86.352,00 €	9,76%	76,66%	6,26	0,45
M2 - MEDIUM-LOW	126.225,93 €	25,94%	59,91%	9,28	1,19
M3 - MEDIUM-HIGH	169.287,70 €	34,21%	54,54%	10,30	2,94
M4 - HIGH	364.237,26 €	41,57%	46,29%	11,19	7,14

Table 5. MiFID risk profile and selected portfolio indicators.

The portfolio size may also play a role in shaping investment outcomes: in fact, Table 6 shows that portfolio variation is 2,4% for the investors positioned in the €50.000-€100.000 value interval, while it is substantially higher (7,4%) for those owning portfolios that are worth over €500.000. The Sharpe ratio follows the same trend, passing from 0,24 to 0,28.

Portfolio value (€)	Average portfolio variation (%)	Average Sharpe 3Y
€50.000 - €100.000	2,40	0,24
€100.000 - €200.000	2,56	0,25
€200.000 - €300.000	3,43	0,26
€300.000 - €400.000	5,70	0,25
€400.000 - €500.000	8,82	0,26
€500.000 +	7,40	0,28

Table 6. Portfolio value (€), portfolio variation and Sharpe.

Correlation analyses and statistical tests of differences are needed to confirm these relationships as well as to uncover any potential links between behavioral dimensions and portfolio characteristics. The inferential analysis that follows will allow to clarify the nature and significance of the associations that may exist among the different variables under consideration.

3.2 INFERENTIAL ANALYSIS

The main objective of this analysis is to assess the relationship between investors' sociodemographic and behavioral attributes on the one hand, and the characteristics of their investment portfolios on the other hand.

Due to the limited amount of data, a major focus has been put on bivariate analyses: in particular, statistical tests of differences of means and medians and correlation analyses have been performed in order to look for any patterns in the data.

The correlation analysis permits to study the relationships between numerical variables in order to uncover the potential links that may exist between them. When categorical variables were involved, investors have been divided into different groups according to objective characteristics, with the aim of studying the statistical differences between various categories. In this regard, two types of statistical tests have been carried out:

1. t Test of the difference between the means of two independent samples with normally distributed data;

2. non-parametric tests (Mann-Whitney U or Wilcoxon rank-sum Test) to study the difference between the medians of two independent, non-normally distributed samples.

In order to quickly get an idea of the strength of the associations between all the variables considered, it is useful to look at a heatmap plot of the correlation matrix (Figure 7). This is a simple tool which allows to immediately grasp which are the areas of stronger statistical associations and develop a first, general understanding of the data. Red squares indicate positive correlations and blue squares negative ones; the strength of the relationship is suggested by the color intensity: as correlation coefficients get closer to 0, the color fades and becomes lighter.

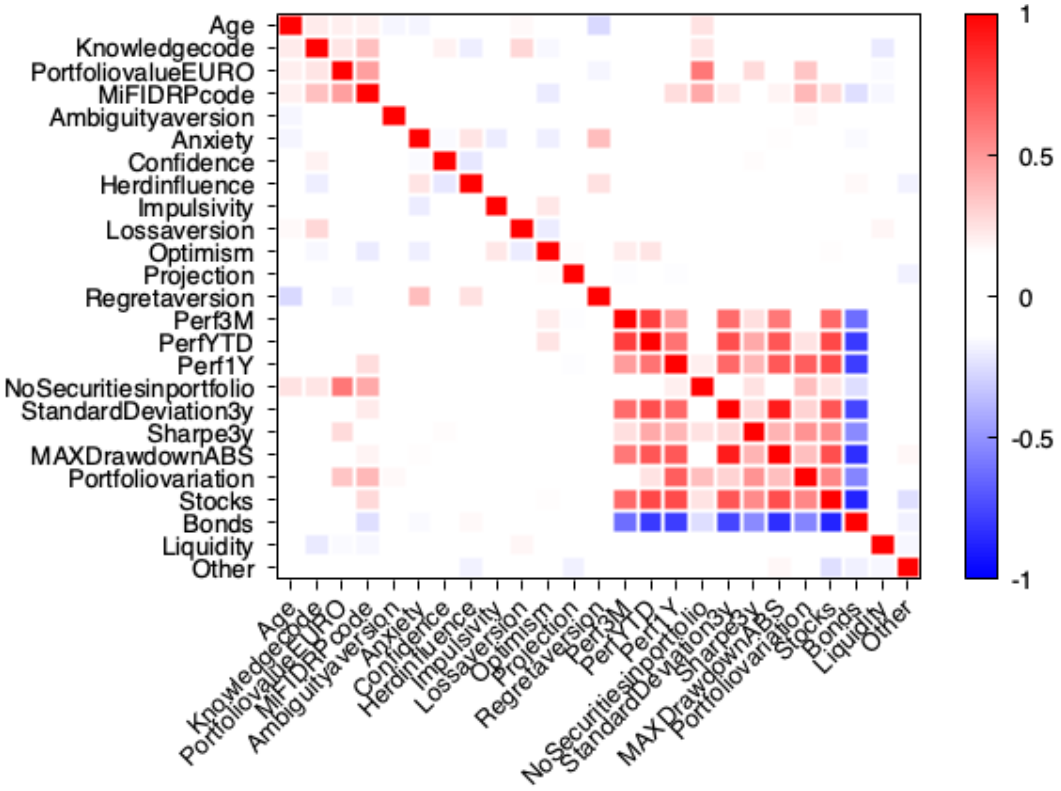


Figure 7. Correlation heatmap (built with the software Gretl).

The strongest correlations are concentrated in the bottom-right corner of the map and involve the relationships between different portfolio characteristics. Clearly, risk indexes are directly related to one another, and the variables describing the asset allocation strongly influence other portfolio indicators: by nature, a larger percentage of stocks causes portfolio risk and performance to increase, while the opposite happens for larger percentages of bonds.

The plot shows various correlations of medium intensity between sociodemographic variables and portfolio characteristics (displayed in the left-hand side or upper part of the graph), while portfolio indicators appear to be less correlated to behavioral dimensions. The graph also reveals some weak links among the different behavioral traits taken into consideration.

By getting into the details of the aforementioned bivariate analyses, it is possible to study the specific links between the variables and to develop a deeper understanding of the data which, in turn, will allow to establish whether the results are consistent with or diverge from the existing body of literature. The empirical findings are described in detail in the following paragraphs.

3.2.1 Relationships between sociodemographic and behavioral characteristics

The available information on the sample of retail investors allows to capture their profile under many aspects: their sociodemographic characteristics, their behavioral and personality traits, and their MiFID risk categorization. The different facets of an investor profile could be somewhat linked to one another, so it is interesting to explore the relationships between different investor characteristics, in particular between sociodemographic and behavioral attributes.

Various contributions to the literature have suggested the possibility that investors belonging to certain sociodemographic segments may be more susceptible to certain behavioral traits or biases. Hence, statistical tests of differences and correlation analyses have been performed to see if there is evidence of this kind of links in the data.

Table 7 shows a summary of the correlation coefficients with regards to the numerical or ordinal behavioral dimensions and MiFID-related variables. The level of significance of correlations is denoted by the star signs: 1 star (*) corresponds to 5% significance level, 2 stars (**) to 1% significance level, and 3 stars to 0.1% significant level. All statistically significant correlation coefficients are highlighted in orange and the color intensity increases for lower levels of significance.

	Ambiguity aversion	Anxiety	Confidence	Herd influence	Impulsivity	Loss aversion	Optimism	Projection	Regret aversion
Age	-0.1744	-0.1786	0.0364	-0.0533	-0.1306	0.1628	-0.0194	-0.1074	-0.2724*
Investment knowledge	0.0184	-0.0340	0.1886	-0.2007	-0.0406	0.2798**	-0.1674	0.0175	0.0209
Portfolio value (€)	-0.1191	-0.1455	0.0484	0.0110	0.0476	0.0409	-0.0990	-0.0203	-0.1738
MiFID risk profile	0.0805	-0.0834	0.0327	-0.0753	-0.1220	0.0529	-0.2096	-0.1417	-0.0579

Table 7. Correlation coefficients: demographic characteristics and behavioral dimensions.

With reference to age, the correlation analysis suggests that only one association with the behavioral sphere is significant: older investors are less subject to regret aversion. No evidence of a similar pattern has been found in the literature, however a possible explanation could be that older individuals have gained more experience in investing and become familiar with its dynamics and with the ups-and-downs of the market over time, so that they are better able to handle uncomfortable feelings of repentance and guilt. The positive correlation observed between age and investment knowledge (r = 0.21) could be supportive of this line of reasoning, but it cannot definitely confirm it since the association is weak and lacks statistical significance.

The same results hold when the groups of retired versus working individuals are compared: retired investors (who are mostly over 65 years old) are found to score lower on regret aversion compared to workers, confirming that older people are more likely to cope well with the fear of regret.

Knowledge in the investment field is assigned numerical values ranging from 1 (corresponding to the "beginner" level) to 3 (coinciding with the "advanced" level). This variable seems to be unrelated to most behavioral traits: only the relationship with loss aversion is significant, but its direction, suggested by the sign, doesn't seem to have logical sense. Other than the three-point scale from "beginner" to "advanced", another measure of investment knowledge has been used to analyze potential links with behavioral dimensions: the answers to question 19 of the questionnaire. Respondents were asked to rate themselves against the population in their country for the skill of "investing" by means of indicating the percentile in which they believed themselves to be positioned (see Appendix A for the complete question and answer options). It is worth pointing out that both of these measures consist in respondents' self-evaluations, so they may not always be reliable. For comparison purposes, the correlation coefficients for the two knowledge variables are detailed in the following Table:

	Ambiguity aversion	Anxiety	Confidence	Herd influence	Impulsivity	Loss aversion	Optimism	Projection	Regret aversion
Investment knowledge	0.0184	-0.0340	0.1886	-0.2007	-0.0406	0.2798**	-0.1674	0.0175	0.0209
D19 answers	0.1442	-0.0495	0.3933***	-0.2238*	0.0429	-0.1130	-0.0173	0.2171*	-0.2046

Table 8. Correlation coefficients: investment knowledge and behavioral dimensions.

Taking into consideration the second measure, the correlation between knowledge and confidence displays a positive sign and is statistically significant at 0.1% level. It is

understandable that people who consider themselves more knowledgeable are likely to display higher self-confidence. At the same time, a higher self-assessed knowledge in the investment field is also associated to reduced herding behavior and increased susceptibility to the projection bias. It is possible that expert individuals' higher self-confidence is also reflected in a lower tendency to get influenced by other people's actions, and in a strong belief that personal opinions and preferences won't change in the future. As can be noticed from Table 8, the two measures show inconsistency with regards to the loss aversion variable: intuitively, unsophisticated investors should be expected to be more averse to losses, as also Frino, Lepone and Wright (2015) suggest. However, the possibility that some behavioral biases may be independent from the level of investment knowledge should be considered, as they involve deep, intrinsic aspects of the self which may be only partially influenced by financial literacy.

The value of the portfolio in Euro has been included among the demographic characteristics as it represents a proxy for investors' wealth: intuitively, the larger the amount of their portfolio, the better their economic situation. Table 7 shows no significant correlations between the behavioral dimensions and portfolio value, which does not seem to depend on personality traits.

For what concerns the categorical variables of gender, profession and bank office of reference, the results of the statistical tests of differences are summarized below:

Behavioral trait	**Gender** (females VS males)		**Profession** (self-employed, managers & entrepreneurs VS employees		**Area of reference** (Venice VS Treviso)	
	U test statistic	p-value	U test statistic	p-value	U test statistic	p-value
Ambiguity aversion	-0.15	0.88	-1.43	0.15	0.36	0.72
Anxiety	-1.02	0.30	-1.53	0.13	-1.44	0.15
Confidence	-0.55	0.58	0.26	0.79	3.54	0.00
Herd influence	-0.17	0.86	0.11	0.91	-0.33	0.74
Impulsivity	-0.87	0.38	-0.71	0.48	1.44	0.15
Loss aversion	-0.22	0.82	0.16	0.87	-1.36	0.17
Optimism	0.35	0.72	-0.02	0.98	2.54	0.01
Projection	-0.42	0.67	-0.62	0.54	3.19	0.001
Regret aversion	0.64	0.52	0.44	0.66	-0.91	0.36

Table 9. U tests of statistical differences based on gender, profession and area of reference.

Considering gender, there is not enough evidence to say that women score differently than men on any behavioral or personality trait, as the U Tests do not lead to statistically significant results. Contributions from the literature reach different conclusions: for

instance, Barber and Odean (2001) find that males are more prone to displaying overconfidence than women, and Jacobsen et al. (2014) suggest that they are also more optimistic. The divergence from the present empirical findings could be due to the limited number of observations. Interestingly, males are instead found to be more knowledgeable than females in the investment-related domain, confirming what was observed through the descriptive analysis. This is probably due to the fact that finance has traditionally been a male-dominated sector (although the trend seems to be gradually changing).

Investors in the sample have also been divided into two categories according to their profession: the first group is composed by employees (working in both public and private sectors), while the second one is composed by self-employed workers, entrepreneurs, and directors or managers. The tests of differences based on occupation did not lead to statistically significant results, however the signs of the U Test statistics may reasonably suggest that managers, self-employed and entrepreneurs display lower anxiety and ambiguity aversion compared to employees. Some differences may actually be present between the two groups under the behavioral point of view, but these considerations are only based on the signs of the U Test statistics: findings would need to be validated with more data.

Based on the geographic location of the credit agency or bank office of reference, investors have been divided into two groups: those from Venice and those from the Treviso area. Even if some differences in behavioral traits have emerged between them, these are probably linked to sampling considerations. Another interesting finding is that individuals from the Venice area register lower MiFID risk profiles, on average, with respect to those from Treviso.

Every investor is also profiled according to the guidelines of the European directive on financial markets, leading to the development of MiFID risk profiles. In order to analyze how the latter relate to behavioral characteristics, each classification level is assigned a number, going from 1 for low-risk to 4 for high-risk positions. Contrary to the expectations, no significant association has been found between the MiFID risk profile and the scores on the nine behavioral dimensions. Apparently, the risk profile assigned according to normative requirements is independent from behavioral aspects and does not take into account the personality traits of investors. As mentioned in previous discussion, MiFID suitability rules may still not be aligned with the behavioral finance literature, leading to the development of risk profiles which do not incorporate important behavioral factors.

On the other hand, the risk profile is positively correlated with the level of financial knowledge and with the portfolio value, as can be noticed by looking at Table 10. In fact, the client's knowledge and experience in the investment field and his financial situation are among the macro-categories of information that the European directive requires to consider in order to build appropriate investor profiles and select suitable portfolios. The sign of the correlation between MiFID risk profile and age is positive as well, but the association does not reach statistical significance.

Based on the available data, it can be said that the Bank has taken into account the information required by the MiFID regulatory requirements in order to categorize investors into risk classes: individuals with high-risk profiles have a higher financial capability and knowledge, which should allow them to bear higher levels of volatility in their investments.

	Age	Investment knowledge	Portfolio value (€)
MiFID risk profile	0.1949	0.3555***	0.4654***

Table 10. Correlation coefficients: MiFID risk profile and sociodemographic characteristics.

3.2.2 Links between different behavioral dimensions

Many research studies have also found evidence of associations between different personality traits and behavioral biases. Generally speaking, individuals who have certain behavioral predispositions may be more or less likely to display other ones, or vice versa. In this regard, a specific analysis is performed to find out whether the nine behavioral dimensions are correlated with each other; results are shown in Table 11.

Ambiguity aversion	Anxiety	Confidence	Herd influence	Impulsivity	Loss aversion	Optimism	Projection	Regret aversion	
1	0.1296	0.0910	-0.0601	0.1239	0.0210	-0.0509	-0.0294	-0.0037	Ambiguity aversion
	1	-0.1608	0.2356*	-0.2080	0.0583	-0.1977	-0.0381	0.3639***	Anxiety
		1	-0.2234*	-0.0758	-0.0663	0.1109	0.1451	-0.0704	Confidence
			1	0.1022	0.0625	-0.0346	0.0545	0.2430*	Herd influence
				1	0.1178	0.2244*	0.1383	-0.0951	Impulsivity
					1	-0.2091	-0.1332	0.0219	Loss aversion
						1	0.1549	-0.1240	Optimism
							1	-0.0139	Projection
								1	Regret aversion

Table 11. Correlation coefficients: behavioral dimensions.

Overall, it can be noticed that most correlations are not significant. The strongest association observed is the one between regret aversion and anxiety, which are positively correlated: investors who fear regret tend to be anxious as well. These two unpleasant feelings are likely to reinforce each other, generating emotional strain. This is probably the reason why individuals subject to anxiety and regret aversion tend to follow the herd: they try to alleviate their psychological pain by following the crowd, since they take comfort in knowing that, in case of bad outcomes, they won't be the only ones making the wrong choices (Pompian, 2006). In fact, both anxiety and regret aversion are positively correlated with herd influence. On the contrary, self-confident investors are less subject to herding, as they are more likely to trust their own abilities and follow their judgement.

Another significant correlation is detected between optimism and impulsivity: those who are inherently more optimistic seem more likely to take rushed decisions. It may be that these individuals are more hopeful about the future, so they get more excited to take action. Previously discussed empirical evidence by Frino, Lepone and Wright (2015) and Dhar and Zhu (2006) also suggests that loss aversion and overconfidence are negatively correlated. In the present analysis, the association lacks statistical significance, although the sign of the coefficient is supportive of the inverse relationship. The same situation is observed with regards to the link between impulsivity and regret aversion: according to Pompian (2006), they should be negatively correlated since regret averse individuals can be extremely hesitant or even reluctant to take action.

Although they are not very strong, some connections are indeed present between certain behavioral traits, which may reinforce or weaken each other. If an individual scores high on a specific dimension, it might be possible to predict how he or she will score on some other ones. As a matter of fact, the identification of the most influential personality traits characterizing a person is at the very foundation of the categorization in investor types developed by means of the Schroders behavioral questionnaire. The analysis of statistical differences confirms that each investor type scores differently from the others in a set of specific traits, and results are in line with the descriptions reported in Figure 1 (Chapter 2). For example, the vigilant planner is found to display higher anxiety and lower optimism relative to the level-headed optimist, and the independent rider scores lower in herding and higher in confidence with respect to the opinion hunter.

In view of the correlations observed between different personality attributes, a principal component analysis (PCA) has been performed in order to see whether the nine behavioral variables could be reduced to a lower number of dimensions.

Table 12 details the proportion of the overall variation in the data which is explained by each principal component, as well as cumulative values. In order to explain an acceptably large percentage of variation, it is necessary to consider the first 6 principal components, which account for about 80%. Accordingly, the data on behavioral traits can be reduced from 9 to 6 dimensions to limit information loss.

Component	Eigenvalue	Proportion	Cumulative
1	1.8385	0.2043	0.2043
2	1.3236	0.1471	0.3513
3	1.2283	0.1365	0.4878
4	1.1207	0.1245	0.6123
5	0.9170	0.1019	0.7142
6	0.7850	0.0872	0.8015
7	0.6596	0.0733	0.8747
8	0.6455	0.0717	0.9465
9	0.4818	0.0535	1.0000

Table 12. Principal Component Analysis of the nine behavioral dimensions.

Even if some of the behavioral traits may be linked to one another, the results of the principal component analysis suggest that it is not possible to achieve a substantially large reduction of the number of dimensions. Therefore, it can be inferred that each behavioral dimension captures a different aspect of an investors' personality, proving the accuracy and effectiveness of the Schroders questionnaire in identifying in a precise way the most prominent behavioral predispositions of individuals and, in turn, in assigning the proper behavioral type to each investor.

3.2.3 Relationships between investor profile and portfolio characteristics

After having investigated the links between the three main aspects of investor profiles (sociodemographics, MiFID risk classification, and behavioral attributes), it is interesting to explore how the various characteristics of the investor may influence portfolio choices and investment decisions in general. Therefore, each dimension of investor profiles is now explored in relation to the characteristics of investment portfolios. It should be recalled that the latter consist of model portfolios which are expected to be inherently well-constructed and well-diversified, as they are built by the Bank's financial advisors based on appropriate asset allocation principles.

First of all, the relationships between sociodemographic characteristics and portfolio indicators are considered. Extensive research has been performed on these links, focusing in particular on gender, age, profession and investment knowledge.

The literature has highlighted various differences in risk attitudes and portfolio composition between males and females. With reference to our sample, no significant differences are detected with regards to the asset allocation, failing to confirm the findings of Bertocchi, Brunetti and Torricelli (2008), who suggest that men tend to hold riskier portfolios compared to women. Differences in the MiFID risk profile are also investigated as it constitutes a variable that should reasonably capture risk aversion, but it does not significantly vary across gender either.

The analysis suggests instead that females have a significantly lower portfolio variation (%), which corresponds to the 1-year performance in the observation period from 31/01/2020 to 31/01/2021. Therefore, women seem to experience worse investment outcomes than men. It is unclear whether this divergence is caused by a lower amount of portfolio risk (which could be linked to a higher risk aversion) or by other factors, since no differences in asset allocation could be observed between men and women.

With regards to profession, the occupations of managers, self-employed and entrepreneurs usually entail higher levels of latitude in decision-making, greater responsibilities and most likely involve leadership roles, so individuals in those positions are expected to be more risk tolerant and to hold more shares (Grable, 2000; Temel Nalin, 2013; Vaarmets et al., 2019). Contrary to the expectations, the analysis reveals no statistically significant differences among the two groups with reference to portfolio composition and risk, so the type of profession doesn't seem to impact investment choices in this case. The only statistically significant divergence detected with reference to the two profession-based groups regards age: employees are younger than non-employees, on average. As a matter of fact, people usually begin their working career as dependent employees, and then reach higher-level roles later in time.

Another distinguishing factor is whether the investor is retired or still working, which could also act as a proxy of age by roughly differentiating younger individuals from older ones (mostly over 65 years old). Empirical evidence suggests that investors who have reached retirement invest lower percentages of their portfolio in the asset class of other securities, probably because these are innovative, less traditional investments with which older people are less familiar. No other significant differences are observed.

Talking about the area of reference, individuals from Venice register a lower portfolio standard deviation compared to those from Treviso. This difference could be linked to the fact that individuals from the Venice area also register lower MiFID risk profiles, otherwise it may simply be due to sampling considerations.

Considering now how numerical and ordinal sociodemographic variables, including the MiFID risk profile, impact portfolio choices, Table 13 reports the related correlation coefficients.

	Stocks %	Bonds %	Cash %	Other %	Portfolio value (€)	No. securities in portfolio
Age	-0.0369	0.0219	-0.0626	0.0588	0.1966	0.2408*
Investment knowledge	0.0572	-0.0016	-0.2135*	-0.0315	0.2303*	0.2321*
Portfolio value (€)	0.0769	-0.0778	-0.1616	0.0634	1	0.6002***
MiFID risk profile	0.2716*	-0.2513*	-0.1704	0.0131	0.4654***	0.4328***

	Standard deviation 3y	Sharpe 3y	Max Drawdown	Time to recover	Portfolio variation (%)
Age	-0.0377	-0.1026	-0.0060	-0.0349	-0.0866
Investment knowledge	0.0004	0.0674	0.0367	-0.0125	0.0788
Portfolio value (€)	-0.0397	0.2647*	-0.0094	-0.3705**	0.3380**
MiFID risk profile	0.2123*	0.0697	0.1803	-0.3651**	0.3831***

Table 13. Correlation coefficients: sociodemographic variables, MiFID risk profile and portfolio characteristics.

No significant correlations are detected between age and asset allocation, nor between age and portfolio risk and performance indicators. These unclear results may mirror the lack of consistency in the literature of reference, which displays conflicting views on the link between age and investment decisions. The variable is instead found to positively correlate with the number of securities held in portfolio: older individuals seem to invest in a large number of different securities and funds. This may be the result of a greater experience and familiarity with investing, which leads to a gradual enrichment of the portfolio over time, or simply of more funds available.

As for the level of knowledge in the investment field, a negative correlation with the percentage of cash held in portfolio is displayed, meaning that the more knowledgeable individuals hold lower amounts of cash and cash equivalents, and consequently they devote a larger part of their portfolio to fixed-income or risky assets. Even though the relationship between knowledge and portfolio risk remains unclear, the variable positively relates to the measures of portfolio size (portfolio value in Euro and number of securities held in portfolio). The reasons may be linked to economic considerations or it might be

that more knowledgeable investors are able to properly understand the characteristics of a wider range of financial products, as Li et al. (2020) also point out, so that they hold larger portfolios both in terms of value and number of diverse securities.

Considering the value of portfolios in Euro as a proxy of investors' wealth, results suggest that individuals owning a larger amount of money available for investing obtain better portfolio performance: both the Sharpe ratio and the portfolio variation are positively related to the value of the portfolio. The means by which the superior investment outcomes are achieved remain unclear, since no significant associations are detected between portfolio value and asset allocation or risk indexes.

The MiFID risk profile constitutes another very important dimension to define investors. The variable under consideration significantly correlates with the main portfolio risk and performance indicators, as well as with the allocation in asset classes. The assigned MiFID risk profile is positively associated to the standard deviation, the portfolio variation, and the portfolio percentage invested in stocks, and negatively correlated with the percentage held in bonds. In addition, individuals with high risk profiles own larger portfolios in terms of values and number of securities. These findings meet the expectations, confirming that investors in high-risk classes are assigned model portfolios which entail higher levels of risk.

All in all, the present results suggest that the risk profile measure has been taken into account by the Bank when building and selecting the suitable portfolio for each client, as European regulatory requirements mandate. Even if correlations are not very strong and not all of them reach a very low significance level, it can be reasonably inferred that the MiFID risk classification explains to some extent the characteristics and risk positions of investment portfolios. It is worth recalling, however, that previous findings suggested it may not adequately capture the behavioral traits of investors, but only the sociodemographic and Directive-related aspects. Hence, if investment portfolios and asset allocation strategies were based exclusively on the MiFID risk profile, relevant behavioral predispositions and personality factors would be overlooked.

The analysis that follows aims at investigating whether the nine behavioral dimensions indicated by Schroders also have some impact on portfolio characteristics.

Correlations between behavioral traits and the percentage weights of the four asset classes are reported in Table 14. The highest coefficient in each column is written in bold.

	Stocks %	Bonds %	Cash %	Other %
Ambiguity aversion	0.0105	-0.0268	-0.0616	0.0583
Anxiety	0.1044	-0.1610	-0.0538	0.1339
Confidence	-0.0013	0.0038	-0.0091	-0.0014
Herd influence	-0.0857	**0.1624**	0.0811	-0.1878
Impulsivity	-0.0203	0.0323	0.0021	-0.0248
Loss aversion	-0.1294	0.0631	**0.1735**	0.0738
Optimism	**0.1499**	-0.1135	-0.0585	-0.0597
Projection	-0.0460	0.1245	0.0767	**-0.1919**
Regret aversion	0.0440	-0.0363	0.0043	-0.0202

Table 14. Correlation coefficients: behavioral dimensions and asset allocation.

It can immediately be noticed that correlations are very weak, and none of them reaches statistical significance. At first glance, asset allocation strategies seem independent from investors' behavioral and personality traits. In some instances, the signs of the coefficients are also inconsistent with the literature: considering for example anxiety, individuals who score higher on this trait seem to have a larger percentage portion of stocks in portfolio.

Correlations between portfolio risk indexes and performance indicators also result very weak, as Table 15 shows.

Like before, almost all results are not statistically significant and signs do not always confirm expectations (for instance, anxiety was expected to negatively correlate with standard deviation). The only significant relationship is the one between optimism and performance Year-To-Date, a measure of short-term performance corresponding to a period lasting from the beginning of the year to the present date. This finding may be consistent with Puri and Robinson's (2007) view that a modest level of optimism can be beneficial, but it may not be reliable since the relationship with medium-term performance remains unclear.

	Standard deviation 3y	Sharpe 3y	Max Drawdown	Time to recover
Ambiguity aversion	0.0075	-0.1101	0.0099	**-0.1679**
Anxiety	0.1246	0.0459	**0.1504**	0.0499
Confidence	-0.0517	**0.1550**	-0.0021	0.0570
Herd influence	-0.1337	-0.0460	-0.1257	0.0238
Impulsivity	-0.1320	-0.0024	-0.0218	-0.0578
Loss aversion	-0.1342	-0.0328	-0.0473	-0.0557
Optimism	**0.1388**	0.0465	0.1334	0.1389
Projection	-0.0757	0.0357	-0.0124	0.0909
Regret aversion	0.0564	-0.0484	0.0199	0.0323
	Portfolio variation (%)	**Performance 3M**	**Performance YTD**	**Performance 1Y**
Ambiguity aversion	**0.1643**	-0.1179	-0.0470	0.1301
Anxiety	0.0808	0.0198	0.1357	0.1446
Confidence	-0.0248	-0.0973	-0.0252	-0.0780
Herd influence	-0.0579	-0.0344	-0.0384	-0.0443
Impulsivity	0.0252	-0.0539	-0.0665	-0.0475
Loss aversion	-0.0352	-0.1055	-0.1194	-0.1365
Optimism	-0.0137	**0.2058**	**0.2331***	0.0071
Projection	-0.0089	-0.1513	-0.1186	**-0.1506**
Regret aversion	0.0425	-0.0679	-0.0308	0.0276

Table 15. Correlation coefficients: behavioral dimensions and portfolio risk and performance indicators.

At present, no significant links have been observed between behavioral dimensions and portfolio characteristics, which seem to depend to a greater extent on the MiFID risk profile classification. As the correlation analysis shows, the risk class is assigned based on specific investor characteristics indicated by the European Directive, like the level of knowledge in the financial field and the economic situation, and does not consider the behavioral and psychological characteristics of the subject.

On the whole, the results of the bivariate analyses indicate that the primary factor taken into consideration by advisors for the purpose of assigning model portfolios to clients is the MiFID risk profile. Nonetheless, correlations between MiFID risk profiles and the characteristics of investment portfolios are not very strong, so it would be necessary to perform a multivariate analysis with more data in order to better understand the various drivers of portfolio choice.

Based on recent behavioral finance evidence and extensive research studies on the matter, incorporating behavioral considerations into the financial advisory practice can bring substantial benefits to both institutions and their clients. Relying on the output of the Schroders questionnaires could represent an efficient way for financial advisors to systematically consider the psychological traits of clients when constructing their portfolios. As such, the tool would act as a clear reference point by providing a

comprehensive picture of investors' personality with reference to nine fundamental dimensions, supporting advisors also in the task of helping clients manage negative emotions.

It would be also interesting to know whether the clients who have a portfolio which is not aligned with their underlying personality coincide with those who show major discomfort and dissatisfaction with their advisors. For example, this could be the case of very anxious individuals who are positioned in high-risk classes based on MiFID: their portfolio could be inadequate for them from a psychological point of view, so they could have difficulties in bearing a high level of risk and may welcome changes in their asset allocation. If this is the case, a measure indicating the quality of advisors' relationships with their clients could be used in order to identify potentially problematic investors who may benefit from this kind of adjustments.

By acknowledging the important role played by the psychological and behavioral sphere in the investment domain, the quality of the client-advisor relationship could be substantially improved, benefiting both investors (who would feel more comfortable with their investments) and advisors (who would deal with more pleasant and satisfied clients).

3.2.4 Multivariate regression analysis

The correlation analysis has shown that the MiFID risk profile and the sociodemographic variables that drive it (such as investment knowledge and portfolio value as a proxy of wealth) are associated to some extent to the characteristics of investment portfolios. In light of these findings, a multivariate regression analysis is performed in order to understand which of these variables actually explain and have a greater influence on portfolio choices.

The first regression model is aimed at exploring the impact of investors' MiFID-related characteristics on the portfolio's level of risk: it includes the standard deviation of the portfolio for the last 3-years period as dependent variable and the following variables as regressors:

- the MiFID risk profile, identified with a numerical scale from 1 (low-risk) to 4 (high-risk);
- the level of knowledge in the investment field, which has also been assigned increasing numerical values from 1 ("beginner") to 3 ("advanced");
- the portfolio value in Euro;
- the age of investors;

- a dummy variable identifying gender (1=male, 0=female).

The linear regression can be described by the following equation:

$$Standarddeviation_i = c + \beta_1 MiFIDriskprofile_i + \beta_2 Investmentknowledge_i + \beta_3 Portfoliovalue_i + \beta_4 Age_i + \beta_5 Dummy\_gender_i + \varepsilon_i$$

The standard deviation of the portfolio should positively correlate with the MiFID risk profile, as well as with investment knowledge and portfolio value. By definition, investors positioned in high risk classes are expected to hold riskier model portfolios, and people who are more knowledgeable and have more funds available should be able to bear a greater amount of risk in their investments. In this regard, the regression model wants to confirm what was already observed in the bivariate analysis.

The literature displays quite conflicting views on the relationship between age and risk-taking behavior: most authors (Zhanga et al., 2018; Brooks et al., 2018) argue that younger investors are more willing to hold risky assets than older ones, but other contributions are suggestive of non-linear patterns (Guiso and Jappelli, 2000). With regards to gender, women are generally thought to be more risk averse than men, so it is expected that males' portfolios will exhibit a higher standard deviation.

Table 16 reports the regression coefficients, the associated t-ratios and p-values, as well as the R-squared and adjusted R-squared of the estimated model. The number of observations is 81 since there were three missing values in the data regarding portfolio value (€).

Variable	Coefficient	t-ratio	p-value
MiFID risk profile	1.491	2.247	0.0276
Investment knowledge	-0.162	-0.221	0.8254
Portfolio value	-3.09E-06	-1.222	0.2254
Age	-0.012	-0.395	0.6941
Dummy_gender	-0.298	-0.354	0.7245
Constant	7.518	3.094	0.0028
R-squared	**0.074**		No. Observations
Adjusted R-squared	**0.012**		81

Table 16. Regression model 1: MiFID-related characteristics and portfolio risk.

The results confirm the positive correlation with the MiFID risk profile: investors in high risk classes are indeed assigned riskier portfolios in terms of standard deviation, so the bank is taking into account the MiFID categorization when selecting suitable investments for its clients, as prescribed by European regulations. Contrary to the expectations, the other

variables are not significant, so the MiFID risk profile seems to be the only factor explaining investment decisions under the point of view of risk.

The value of R-squared suggests that the model is able to explain approximately 7% of the variation in portfolio standard deviation. If the adjusted R-squared (which factors in the number of explanatory variables included in the model and the sample size) is instead considered, only 1% of the variation can be predicted by the regressors. Therefore, other factors are probably involved in explaining portfolio risk choices.

The second regression analysis investigates the relationship between the independent variables and risk-adjusted portfolio returns, which are measured by the Sharpe ratio registered over the last 3 years:

$$Sharpe_i = c + \beta_1 MiFIDriskprofile_i + \beta_2 Investmentknowledge_i + \beta_3 Portfoliovalue_i + \beta_4 Age_i + \beta_5 Dummy\_gender_i + \varepsilon_i$$

Being more focused on risk and asset allocation choices, the existing literature includes fewer contributions regarding the relationship between sociodemographic factors and risk-adjusted performance. Therefore, the links between the investors characteristics and the Sharpe ratio are less clearly understood.

Variable	Coefficient	t-ratio	p-value
MiFID risk profile	-0.004	-0.545	0.5873
Investment knowledge	0.007	0.856	0.3949
Portfolio value	6.85E-08	2.430	0.0175
Age	-0.0004	-1.248	0.2161
Dummy_gender	-0.004	-0.444	0.6582
Constant	0.261	9.611	1.03E-14
R-squared	**0.097**		No. Observations
Adjusted R-squared	**0.037**		81

Table 17. Regression model 2: MiFID-related characteristics and risk-adjusted returns.

Table 17 shows that the MiFID risk profile is not significant in this case, so it has no impact over the level of risk-adjusted returns. Investment knowledge, age and gender don't have any influence on the value of the Sharpe ratio either. The only significant variable is represented by the value of the portfolio in Euro: larger portfolios seem to achieve slightly higher risk-adjusted performance (the related coefficient, however, is very low).

Overall, the model has a rather poor predictive power: it explains less than 10% of the variation in the Sharpe ratio, and less than 4% considering the adjusted R-squared.

The last model intends to analyze how MiFID-related investor characteristics may influence portfolio performance in the observation period (31/01/2020 – 31/01/2021). In this case, returns are not adjusted for risk but they are considered in absolute terms.
The regression model includes the portfolio variation (%), that is the 1-year performance in the observation period, as dependent variable and can be summarized by the following equation:

$$Portfoliovariation_i = c + \beta_1 MiFIDriskprofile_i + \beta_2 Investmentknowledge_i + \beta_3 Portfoliovalue_i + \beta_4 Age_i + \beta_5 Dummy\_gender_i + \varepsilon_i$$

The relationship between MiFID-related characteristics and performance is quite unclear, as the latter could also be influenced by random and unpredictable market fluctuations which are independent from risk.
Table 18 details the coefficients and related p-values of the estimated model.

Variable	Coefficient	t-ratio	p-value
MiFID risk profile	2.787	2.968	0.0040
Investment knowledge	-0.824	-0.795	0.4290
Portfolio value	6.27E-06	1.754	0.0835
Age	-0.075	-1.695	0.0942
Dummy_gender	1.489	1.249	0.2154
Constant	-1.428	-0.415	0.6790
R-squared	**0.233**		No. Observations
Adjusted R-squared	**0.182**		81

Table 18. Regression model 3: MiFID-related characteristics and portfolio performance.

The regression model shows a significant and positive relationship between MiFID risk profile and portfolio variation (%): individuals in high-risk classes achieve a better portfolio performance over the 1-year observation period, if the associated amount of risk is not taken into account. However, the possibility that these investors were able to obtain superior returns simply thanks to better luck cannot be excluded.
Gender has no significant impact on portfolio variation, while the age and portfolio value variables reach a 10% significant level, although the values of the related coefficients are very low.
All things considered, it is possible that the results of this analysis may be biased by uncontrollable fluctuations in absolute performance.

In order to check whether behavioral biases and personality traits influence any of the considered portfolio characteristics (risk, risk-adjusted returns and performance),

additional regression analyses have been performed using the nine behavioral dimensions as independent variables. Confirming the outcomes of the bivariate analyses, the regressions didn't show any significant results, so they are not reported for reasons of space. In a model which includes exclusively behavioral variables, none of them results significant. However, it is interesting to see whether the results change when personality attributes are analyzed together with the most significant sociodemographic variable, represented by the MiFID risk profile.

The portfolio characteristic taken into consideration for the purpose of this analysis is the amount of risk, so the model includes the portfolio standard deviation (3 years) as dependent variable and is summarized by the following equation:

$$Standarddeviation_i = c + \beta_1 MiFIDriskprofile_i + \beta_2 Ambiguityaversion_i + \beta_3 Anxiety_i + \beta_4 Confidence_i + \beta_5 Herdinfluence_i + \beta_6 Impulsivity_i + \beta_7 Lossaversion_i + \beta_8 Optimism_i + \beta_9 Projection_i + \beta_{10} Regretaversion_i + \varepsilon_i$$

Regression results are presented in the following Table:

Variable	Coefficient	t-ratio	p-value
MiFID risk profile	1.320	2.358	0.0211
Ambiguity aversion	-0.032	-0.144	0.8860
Anxiety	0.329	1.508	0.1360
Confidence	-0.173	-0.842	0.4025
Herd influence	-0.269	-1.469	0.1461
Impulsivity	-0.168	-0.672	0.5039
Loss aversion	-0.146	-0.906	0.3678
Optimism	0.568	2.104	0.0388
Projection	-0.105	-0.434	0.6658
Regret aversion	0.127	0.538	0.5922
Constant	5.670	1.457	0.1495
R-squared	**0.172**		No. Observations
Adjusted R-squared	**0.059**		84

Table 19. Regression model 4: behavioral dimensions, MiFID risk profile and portfolio risk.

It is observed that the MiFID risk profile remains significant at 5% level, confirming previous findings. Among the behavioral variables, the optimism dimension becomes now significant: more optimistic individuals seem to hold portfolios with higher standard deviations. This positive relationship is consistent with the findings of the literature: in particular, Pompian (2006) and Kumar and Page (2017) argue that overly-optimistic individuals tend to take on more risk in their investments.

With respect to the first model regarding portfolio risk (Table 16), the present one registers a higher R-squared, which increases from 7% to about 17%. The value of adjusted R-squared also grows from 1% to approximately 6%, suggesting that this last model has a slightly higher explanatory power.

CONCLUSIONS

This research has analyzed various aspects of investors' profiles in relation to the characteristics of their portfolios, with the aim of identifying the most influential factors guiding investment decisions.

The bivariate analysis has highlighted how portfolio choices seem to be independent from investors' behavioral and personality traits: no significant correlations have been observed between behavioral dimensions and portfolio characteristics, as opposed to most contributions to the literature which found many important links.

Although they were not very strong, some significant relationships have been detected between sociodemographic variables and the features of portfolios. Anyway, a single variable has emerged as the most influential factor affecting portfolio characteristics: the MiFID risk profile. In fact, the latter has registered the highest correlations with both asset allocations and risk indexes. Also, the variable significantly correlates with investors' level of knowledge in the investment field and with portfolio value (considered as a proxy of their wealth), so it can be inferred that the Bank has taken into account the information prescribed by the European Directive in order to classify clients into risk classes. It is worth pointing out, however, that the MiFID risk profile is not found to relate to any of the nine behavioral dimensions.

Multivariate regression models have roughly confirmed what was uncovered through the bivariate analyses. Again, the MiFID risk profile has been shown to be the most significant variable explaining portfolio choices, in particular with regards to the amount of risk. Behavioral variables instead did not result significant in any of the proposed models, except for the last one which included both behavioral dimensions and the MiFID risk profile as independent variables. In this last regression, optimism has emerged as the only significant trait, registering a positive impact on the standard deviation of portfolios. Apart from this single exception, personality attributes have not been found to explain portfolio characteristics.

All in all, these results suggest that clients' MiFID risk categorizations have been used as the main criterium for deciding on the amount of portfolio risk and devising asset allocation strategies.

As a matter of fact, investment activities imply risk-taking, which may be a delicate matter for many people from a psychological point of view: every individual reacts differently to

uncertain situations and to the possibility of incurring financial losses, so portfolios should be tailored to accommodate different needs and preferences. By relying on the results of the Schroders questionnaires, financial advisors have the opportunity to devise in an efficient and structured manner the asset allocation strategies which are best aligned to investors' personality traits, so that each individual can hold a portfolio which is suitable for him or her both from a strictly regulatory perspective and from a behavioral point of view.

Other than providing extremely valuable information, the reliance on questionnaire results could support and promote a systematic approach to adjusting clients' investment portfolios to behavioral and psychological traits, bringing significant added value to financial advisory.

APPENDIX A. Full questionnaire

To begin with, few simple data are asked.

Date of birth *(specify DD/MM/YYY)*: __/___/_____

Age: □ Under 18 □ 18 - 34 □ 35 - 49 □ 50 - 65 □ Over 65

Gender: □ Male □ Female □ Prefer not to say □ Other

Profession:

- □ Private sector employee
- □ Public sector employee
- □ Private sector manager
- □ Public sector manager
- □ Self-employed
- □ Entrepreneur
- □ School teacher
- □ University teacher
- □ Retired
- □ Other

E-mail address: _____

How did you get to know our Bank?

- □ I'm already a client
- □ By chance
- □ By visiting your official website
- □ On social networks
- □ Through radio/television/social advertisements

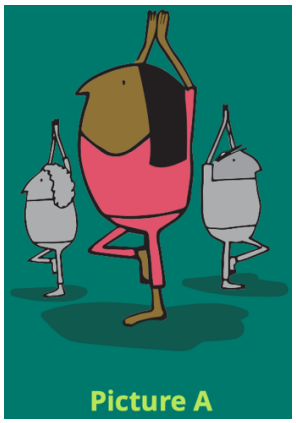
Select your investment knowledge: □ Beginner □ Intermediate □ Advanced

Personality test (*investIQ*)

1. Someone has left you a small pile of money in their will. You're going to invest it yourself. Which would you be most likely to do?
   - **Option A**: talk to friends, family, and other people to find out what they recommend and where they have invested.
   - **Option B**: carry out detailed research into your investment options using financial data and product factsheets.

   □ Only A □ Mostly A □ A mix of both □ Mostly B □ Only B

2. You're sitting in the airport, waiting for your delayed flight to Las Vegas with your friend John, who loves to gamble. To pass the time, you and John start to play a gambling game. He offers you this bet: ***heads you lose €3, tails you win €6***.
   Would you take it?
   □ Yes □ No
3. And what about this bet? ***Heads you lose €4, tails you win €6***. Would you take it?
   □ Yes □ No
4. And what about this bet? ***Heads you lose €5, tails you win €6***. Would you take it?
   □ Yes □ No
5. And what about this bet? ***Heads you lose €6, tails you win €6***. Would you take it?
   □ Yes □ No
6. And what about this bet? ***Heads you lose €7, tails you win €6***. Would you take it?
   □ Yes □ No
7. If a friend were describing you, would they say you were more like Picture A or Picture B?



   □ Definitely A □ Mostly A □ A mix of both □ Mostly B □ Definitely B
8. How strongly do you agree or disagree with the following statement?
   I fear for the worst
   □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree
9. How strongly do you agree or disagree with the following statement?
   I prefer to make my own decisions rather than with other people. I'm a bit of a lone wolf.
   □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree
10. How strongly do you agree or disagree with the following statement?
    I'm always optimistic about my future.
    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

11. How strongly do you agree or disagree with the following statement?

    I tend to buy things even when I can't really afford them.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

12. How strongly do you agree or disagree with the following statement?

    I think that the future will be much like the present.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

13. How strongly do you agree or disagree with the following statement?

    Once I make a decision, I don't look back.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

14. How strongly do you agree or disagree with the following statement?

    I feel relieved when an ambiguous situation suddenly becomes clear.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

15. You grab a jar of 90 jellybeans from the airport shop. The jar contains 30 red jellybeans and 60 other jellybeans, some of which are black, and the rest are white. You close your eyes and pick one jellybean at random from the jar. Which option do you prefer?

    - **Option A**: you win €10 if you pick a red or white jellybean
    - **Option B**: you win €10 if you pick a black or white jellybean

    □ Definitely A □ Slightly A □ Indifferent □ Slightly B □ Definitely B

16. Whilst in the airport shop you decide to buy a camera for your trip to Las Vegas and you're offered a cashback incentive. Which option would you prefer?

    - **Option A**: €100 in 12 months
    - **Option B**: €110 in 13 months

    □ Definitely A □ Slightly A □ Indifferent □ Slightly B □ Definitely B

17. You're still at the airport, and your airline has given you £6 for the first hour of delay. The airport staff have been watching you and John gambling and, just for fun, they tell you that they'll offer you a bet. Which choice would you make?

    - **Option A**: get an additional €3 for sure
    - **Option B**: Heads - you win nothing extra; Tails - you win an additional €6

    □ Definitely A □ Slightly A □ Indifferent □ Slightly B □ Definitely B

18. Think about the other people in your country. Be honest, how would you rate yourself against everyone else for the following skills?

Skill	Bottom 0 – 10%	Bottom 10 – 30%	Bottom 30 – 50%	Top 50 – 70%	Top 70 – 90%	Top 90 – 100%
Driving	□	□	□	□	□	□

19. Think about the other people in your country. Be honest, how would you rate yourself against everyone else for the following skills?

Skill	Bottom 0 – 10%	Bottom 10 – 30%	Bottom 30 – 50%	Top 50 – 70%	Top 70 – 90%	Top 90 – 100%
Investing	□	□	□	□	□	□

20. Think about the other people in your country. Be honest, how would you rate yourself against everyone else for the following skills?

Skill	Bottom 0 – 10%	Bottom 10 – 30%	Bottom 30 – 50%	Top 50 – 70%	Top 70 – 90%	Top 90 – 100%
Cooking	□	□	□	□	□	□

21. John asks you this true or false question. What do you think? No cheating! Tell us how confident you are about your answer, where 50% means you're just guessing, and 100% means you're certain.

    Sapphires and diamonds are both made of carbon.

    □ True □ False

    Confidence *(select)*: □ 50% □ 60% □ 70% □ 80% □ 90% □ 100%

22. John asks you another true or false question. What do you think? No cheating!

    There has been life on Earth for approximately 5 billion years.

    □ True □ False

    Confidence *(select)*: □ 50% □ 60% □ 70% □ 80% □ 90% □ 100%

23. John is enjoying this now and asks you one last true or false question. What do you think? No cheating!

    The ferrule connects the bristles to the handle on a paint brush.

    □ True □ False

    Confidence *(select)*: □ 50% □ 60% □ 70% □ 80% □ 90% □ 100%

24. Still in the departure lounge, John's bought a box of 100 wrapped sweets. All of the sweets look the same with their wrappers on, but inside, 50 of the sweets are red and 50 are yellow. He says you can take 10 sweets, and you'll win €1 for every red sweet you unwrap. How much money do you think you will win?

€0	€1	€2	€3	€4	€5	€6	€7	€8	€9	€10
□	□	□	□	□	□	□	□	□	□	□

25. You're starting to get bored waiting for your flight, so you decide to buy an MP3 player. You're offered another cashback incentive. Which option would you prefer?
    - **Option A**: €100 right now
    - **Option B**: €110 in 1 month

    □ Definitely A □ Slightly A □ Indifferent □ Slightly B □ Definitely B
26. John suggests you get some food together while waiting for your flight. What do you order?

    □ Pizza □ Pasta

    How confident are you that you'd make the same choice in a year's time?

    □ Not at all confident □ Not confident □ Neither □ Confident □ Very confident
27. You're still in departures and John whips a normal six-sided dice out of his pocket. You're starting to worry that his gambling is out of control, and that maybe Las Vegas was a bad idea, when John offers you one of two bets *(choose one)*:

    □ **Option A**: win €10 if the number is four or less

    □ **Option B**: Win €15 if the number is five or more

    You lost! How strongly do you now regret your choice?

    □ Not at all □ Slightly □ Moderately □ Very □ Extremely
28. How strongly do you agree or disagree with the following statement?

    I am not easily bothered by things.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree
29. How strongly do you agree or disagree with the following statement?

    I find other people's advice the most helpful source of information for solving my problems.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree
30. How strongly do you agree or disagree with the following statement?

    In uncertain times, I usually expect the best.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

31. How strongly do you agree or disagree with the following statement?

    I am prepared to spend now and let the future take care of itself.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

32. How strongly do you agree or disagree with the following statement?

    I sometimes buy too much food when grocery shopping while hungry.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

33. How strongly do you agree or disagree with the following statement?

    Whenever I make a choice, I'm curious about what would have happened if I had chosen differently.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

34. How strongly do you agree or disagree with the following statement?

    I find it hard to make a choice when the outcome is uncertain.

    □ Strongly Disagree □ Disagree □ Neither □ Agree □ Strongly Agree

35. You've eaten all your jellybeans! Despite feeling quite unwell, you get another jar with 30 red jellybeans and 60 other jellybeans, some of which are black, the rest are white. John says to close your eyes, and pick one jellybean at random from the jar. Which option do you prefer?

    - **Option A**: win €10 if you pick a red jellybean
    - **Option B**: win €10 if you pick a black jellybean

    □ Definitely A □ Slightly A □ Indifferent □ Slightly B □ Definitely B

36. You're still at the airport and finally the plane is boarding. You've been offered £12 this time for the second hour of delay. The airport staff offer you another bet before you get on the plane: You are given the £12, and they offer the choice below. Which choice would you make?

    - **Option A**: lose €3 for sure
    - **Option B**: Heads - you lose nothing; Tails - you lose £6.

    □ Definitely A □ Slightly A □ Indifferent □ Slightly B □ Definitely B

APPENDIX B. Schroders final report: investor types

Based on the results of the Schroders questionnaire and the assessment of each respondent's investment personality, individuals are classified into 4 categories of investors called investor types. The detailed description of each investor type included in Schroders final reports follows below.

The vigilant planner

Investment strength: Doing your homework

Most likely to: Excessively worry about making a decision

Defining Characteristic: Anxious about investing

Least likely to: Act impulsively

What is my investment character

When it comes to investing, care, consideration and caution drive your approach. You take your time and do as much research as possible so you have all the facts before making a decision. Your careful and cautious manner stems from the fact it's in your nature to feel anxious about investing. This leaves you prone to following the action of others as well as drawn towards what you perceive as safe and proven investments. You're also a bit of a pessimist. While this makes you less impulsive than most, your fear of making a poor decision can prevent you from taking any action. On the flipside, you have realistic expectations and are likely to be better at long-term planning than most people!

> **You take your time and do as much research as possible so you have all the facts before making a decision**

Pros

Considered
You are not impulsive and are better than most at balancing your long-term needs against your needs today. You consider the future when making decisions.

Thorough
You're unlikely to invest in anything you don't understand well. You'll do your homework on any investments.

Saver
Your pessimism means you're probably saving more in order to secure a comfortable future, so you're unlikely to be disappointed.

Cons

Procrastinator
You might take a long time to make a decision, and that delay can lead to you missing out on the upside of rising markets.

Nervous
Uncertainty can make you nervous and you may take investment decisions which make you feel more comfortable (e.g. less risky investments) rather than what is appropriate to reach your goals.

Follower
Because you worry about having regrets, you have the tendency to follow the actions of others and find relief in the fact that if things turn bad, you're not the only one who got it wrong!

Tips

Talk to an adviser

As you lack investment confidence and can be a touch pessimistic, getting a professional to guide you could help calm your nerves and assist you in taking the necessary steps to achieve your investment goals.

If you can't help yourself, remove temptation

Constantly checking your investments can make you anxious. In your case, that's not a good thing. Remove immediate temptation (such as deleting investment apps on your phone) and restrict yourself to checking your portfolio every six months.

Don't seek perfection

Rather than trying to find what you think is the optimal solution, learn to find an efficient solution that meets your requirements. Set yourself distinct and appropriate criteria that when satisfied, moves you to take action. Don't over analyse the solution once you've found it. Remember, more information and time spent will not necessarily leave you less anxious about your final decision.

Do what's right for you

Don't pick investments just because other people have. They may have completely different goals and circumstances. It's essential you independently weigh up each investment opportunity on its own merits and risks to ensure it fits with your overall objectives.

The Independent Rider

Investment strength: Individualist

Most likely to: Make snap decisions

Defining Characteristic: Belief in oneself

Least likely to: Take advice from friends

What is my investment character

When it comes to investing, you think you know what you're doing, so you're happy making your own decisions and following your own path without being swayed by others.

There is bit of a pessimist in you, which means you're good at balancing the risk with the benefits when investing. On the flipside, you tend to focus on the negative side of things and you also find losses hard to digest. Sometimes anxiety kicks in and makes you take decisions too quickly. For example, if markets fall, you tend to expect the worse and irrationally sell your investments for fear of losing everything, even if it undermines your long-term objectives.

You also have a tendency to assume that your needs, wants and preferences in the future will be similar to how they are now. This means your financial goals may not match up with your future circumstances.

> **"Sometimes anxiety kicks in and makes you take decisions too quickly"**

Pros

Independent

You're independent and don't follow the herd. You are not influenced by what other people are investing in, relying instead on your own knowledge.

Realist

Your realistic attitude is good and your pessimism can work for you, as you are able to weigh up the pros and cons of an investment better than most.

Balanced

You worry less about regrets than most people, which helps you take a balanced view of the risks involved when investing. Being governed by regret can mean you take on too little risk (for fear of incurring losses) or more risk than you should (for fear of losing out).

Cons

Nervous

Uncertainty can make you nervous and you may take investment decisions which make you feel more comfortable (e.g. less risky investments) rather than what is appropriate to reach your goals.

Impulsive

Your inclination to make quick decisions without thinking through all the options or consequences may jeopardise your long-term investment goals.

Over confident

Your confidence might lead you to overestimate your ability to pick winning investments. You may also make more changes to your portfolio than necessary as you feel you can conquer the market.

Tips

Try a cooling-off period

Your impulsive nature can mean you make quick decisions without necessarily taking enough time to consider all the options or conduct thorough research. Next time you feel the urge to take action in response to an unexpected event, try giving yourself a cooling-off period – give yourself 48 hours to think things over before making a final decision. Perhaps use the time to speak to a financial adviser to see if what you're thinking makes sense.

Listen to the experts

Your independent streak combined with your overconfidence might mean you do not readily seek advice. While it is not wise to blindly follow the advice of others, neither is it to ignore the expertise available to you. A financial adviser can help you stay focused on your long-term goals and provide insights that help inform your decisions.

Don't check investments too often

Set your calendar and only check your investments at 3 month intervals at most. Over-trading your portfolio based on short-term market rises or falls is a bad idea. Not only is it very difficult to do well consistently, over-trading may significantly stunt your potential profits due to, for example, transaction costs and timing the market incorrectly.

The level-headed optimist

Investment strength: Calm and tolerant

Most likely to: Assume that the future will be similar to the present

Defining Characteristic: Always see the bright side of things

Least likely to: Get anxious

What is my investment character

When it comes to investing, you're both optimistic and calm. You like to listen to the advice of your friends and peers and are likely to do what others are doing in order to minimise the likelihood of regret – you find relief in the fact that if things turn bad, you're not the only one who got it wrong!

You cope well with uncertainty compared to others and are good at tolerating the ups and downs of markets. Your confidence can lead you to make impulsive decisions which you will be quite happy with, even if you haven't given them due thought or conducted thorough research.

You have a tendency to assume that your needs, wants and preferences in the future will be similar to how they are now. This means your financial goals may not match up with your future circumstances. Combine this with your optimistic nature and you might be thinking that since things are good now, they will continue to be good.

> "You like to listen to the advice of your friends and peers and are likely to do what others are doing"

Pros

Composed
Your calm and composed nature means the ups and downs of the markets are unlikely to trigger you into taking unnecessary action.

Steady
You cope well with uncertain outcomes. This can put you in a good position as taking on higher return, higher risk investments is likely to involve a degree of uncertainty.

Rational
You are less sensitive to losses than most people. This is a desirable trait as you are likely to hold onto investments for rational reasons rather than emotional ones.

Cons

Over-confident
Your confidence might lead you to overestimate your ability to pick winning investments and underestimate the likelihood of things not going your way. You may also make more changes to your portfolio than necessary as you feel you could conquer the market.

Follower
Your tendency to follow the actions of others might cause you to forget what is good for you.

Impulsive
Your inclination to make quick decisions without thinking through all the options or consequences may jeopardise your long-term investment goals.

Tips

Try a cooling-off period
Your impulsive nature can mean you make quick decisions without necessarily taking enough time to consider all the options or conduct thorough research. Next time you feel the urge to take action in response to an unexpected event, try giving yourself a cooling-off period – give yourself 48 hours to think things over before making a final decision. Perhaps use the time to speak to a financial adviser to see if what you're thinking makes sense.

Consider the worst case scenario
Your confidence can lead you to jump to conclusions and rely on luck more than logic. Don't believe your previous successes will automatically lead to further success. Instead, ensure you evaluate every investment decision thoroughly. Explicitly asking yourself how you might be wrong - and write down your answers!

Be realistic about your future needs
It can be hard to project forward and imagine how circumstances can change in the future. Speak to a financial adviser to agree on a realistic assessment of your future needs. Setting these needs in a variety of personal and wider economic scenarios will help you set appropriate financial goals. Then, together you can come up with a plan as to how to achieve your goals, setting you on a course for the future.

The Opinion Hunter

Investment strength:
Good with uncertainty

Most likely to:
Be over-optimistic

Defining Characteristic:
Follows the crowd

Least likely to:
Panic about investments

What is my investment character

You don't think you're a good investor, so you believe the best approach is to stick with the crowd, following the actions of others. You're generally optimistic about markets, so aren't concerned about the possibility that following the herd could go against you. But if that happens, you'll take comfort in the fact that you weren't the only one who made the wrong decision. You're optimistic by nature so you cope well with uncertainty and are comfortable in tolerating the ups and downs of markets without becoming anxious about your investments. You're focused on the future and don't let short-term incentives impact your long-term goals.

> **"You believe the best approach is to stick with the crowd, following the actions of others"**

Pros

Steady
You cope well with uncertain outcomes. This puts you in a good position as taking on higher return, higher risk investments is likely to involve a degree of uncertainty.

Composed
Your low propensity to panic helps you consider the future and the long-term nature of your investments. It also means you're unlikely to sell winning investments too soon or panic when markets fall.

Balanced
You have a balanced view and are able to sacrifice short-term rewards in favour of harvesting the long-term benefits. Investing is for the long term so this is important.

Cons

Follower
Your lack of confidence leads you to follow the actions of others. When it comes to investing, this may lead you to think you'll have fewer regrets if you "stick with the herd". However, what the herd does may not be appropriate for your personal circumstances.

Over optimist
You are over-optimistic so you might not save enough to achieve your goals, or might overestimate the likelihood of investment success without fully considering the pitfalls.

Tentative
You are relaxed but you do worry about making the wrong choice. This could mean you're sometimes not motivated to take action at all and stick with the status quo.

Tips

Talk to an adviser
As you can be overly optimistic and lack investment confidence, getting a professional to guide you could provide more realistic expectations and assist you in taking the necessary steps to achieve your investment goals.

Do your research
Build your confidence by taking time to research where to invest your money and tapping into the expertise of a financial adviser. This will help you understand how investments are likely to perform in different circumstances and help you make choices that meet your financial goals and suit your appetite for risk. Then trust yourself enough to make a decision.

Do what's right for you
Do not pick investments simply because everyone else thinks it is a good idea. It may not be the right thing to do, particularly for your financial goals and circumstances. Weigh up each investment on its merits and risks, and ensure they fit with your overall objectives. Avoid simply investing in the latest "hot trends" just because others are doing so

Be realistic
Remind yourself what your financial goals are and make sure you've invested enough to potentially reach those goals. Base your assessment on realistic (rather than optimistic) expected returns.

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