Personal Values and Stock Market Participation - Evidence from Finnish University Students

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PURPOSE OF THE STUDY

The objective of this study is to find out whether personal values affect the decision of an individual to invest in the stock market. The main motivation is to shed further light on the phenomenon of limited stock market participation, which has been shown to have significant economic impacts, both micro and macro. By investigating the influence of personal values on the probability of participation and on the different reasons for non-participation, the study fills a gap in the existing behavioral finance literature.

As the topic has not been researched before, generally accepted methodologies do not exist. Thus my paper also contributes by introducing a method to connect personal values to investment decisions. The approach I choose is to combine the theory of personal values of Schwartz (1992) to stock market participation. This method provides measures of both personal values and investment behavior that are easy to quantify.

DATA

My data consist of information gathered using a tailored questionnaire about the demographics, characteristics, investment experience, and personal values of a respondent. The sample includes 320 university students from the Helsinki area in Finland. According to the university attended, the respondents can be grouped into students of business, technology, and natural or social science.

RESULTS

I find that personal values significantly affect the probability of stock market participation. The respondents who emphasize the Self-Enhancement values of power and achievement are more likely to have invested in the stock market than the others. The influence of value orientation is stronger than that of several previously suggested determinants of participation, which shows that differences in personal values are partly causing the limited participation phenomenon. When studying the reasons for non-participation reported by the respondents, I also find evidence of the effect of values. Emphasis of the Conservation values of tradition, conformity, and security increases the probability of reporting non-interest in stocks and equity funds as the reason for not investing.

KEYWORDS

Stock market participation, personal values

HENKILÖKOHTAISET ARVOT JA OSAKEMARKKINOILLE OSALLISTUMINEN – HAVAINTOAINEISTOA SUOMALAISISTA YLIOPISTO-OPISKELIJOISTA

TUTKIELMAN TAVOITE

Tutkielman tavoitteena on selvittää onko henkilökohtaisilla arvoilla merkitystä yksilön päätöksessä sijoittaa osakemarkkinoille. Päällimmäisenä motiivina on alhaisen osakemarkkinoille osallistumisen ilmiö, jonka vaikutukset ulottuvat laajalti sekä mikro- että makrotalouteen. Tutkimalla henkilökohtaisten arvojen vaikutusta osallistumispäätökseen, tutkielma täyttää aukon tähänastisessa sijoittajakäyttäytymistä käsittelevässä kirjallisuudessa.

Koska aihetta ei ole aiemmin tutkittu, yleisesti hyväksyttyjä menetelmiäkään ei ole olemassa. Tutkimukseni esittelee menetelmän henkilökohtaisten arvojen ja sijoituspäätösten yhdistämiseen, mikä lisää sen hyödyllisyyttä. Yhdistäminen toteutetaan liittämällä Schwartzin (1992) teoria henkilökohtaisista arvoista osakemarkkinoille osallistumiseen. Tällä menetelmällä voidaan helposti määrittää sekä henkilökohtaiset arvot että sijoituskäyttäytyminen.

AINEISTO

Aineistoni koostuu tutkimusta varten suunnitellulla kyselylomakkeella kerätyistä tiedoista, joista ilmenevät vastaajien taustat ja ominaispiirteet, sijoituskokemus, sekä henkilökohtaiset arvot. Otokseen kuuluu 320 yliopisto-opiskelijaa Helsingin seudulta, ja heidät on jaoteltu kauppatieteiden, tekniikan sekä luonnon- tai yhteiskuntatieteiden opiskelijoiksi oppilaitoksensa mukaan.

TULOKSET

Henkilökohtaisilla arvoilla on merkittävä rooli osakemarkkinoille osallistumisessa. Vastaajat, joille ovat tärkeitä ns. Self-Enhancement –arvot power ja achievement, ovat sijoittaneet osakemarkkinoille todennäköisemmin kuin muut. Arvojen vaikutus on vahvempi kuin useiden aiemmassa kirjallisuudessa osallistumiseen liitettyjen tekijöiden, mikä kertoo henkilökohtaisten arvojen osuudesta alhaisen osakemarkkinoille osallistumisen ilmiössä. Arvot näyttävät vaikuttavan myös osallistumatta jättämisen syihin. Ei-sijoittajista ne, jotka pitävät tärkeinä ns. Conservation-arvoja, ilmoittavat sijoittamattomuuden syyksi kiinnostuksen puutteen todennäköisemmin kuin muut.

ASIASANAT

Osakemarkkinoille osallistuminen, henkilökohtaiset arvot

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1. Introduction

Even though the large majority of people do not participate in the stock market, there are hundreds of thousands of individuals who own stocks in Finland alone[1]. These individuals range from rally drivers to finance professors, and from pop musicians to corporate executives. But if all of these seemingly different people can be categorized as equity investors, then could there be some additional features combining them as well?

Wealth is easily the first thing that comes to mind when thinking about connecting factors among investors.[2] Income often closely follows, along with being past adolescence and well educated. Furthermore, men might be perceived as more likely to invest than women. However, it has proven difficult to separate investors from non-investors according to demographic characteristics only. For example, Vissing-Jørgensen (2004) reports that there are actually a large number of wealthy individuals choosing not to participate in the stock market. In addition, it has been found that many highly educated people do not invest in stocks, not only because of a lack of information and interest, but also due to vague senses of prejudice against the stock market (Shiller, 1984). It thus seems reasonable to ask whether personal characteristics might also play a role in investment decisions. And if so, which of these characteristics are actually the most relevant?

The question has aroused the interest of several researchers in the field of behavioral finance, and consequently, a range of suggestions has been made. Relatively low risk aversion, for example, has frequently been shown to predict participation in different models (e.g. Haliassos and Bertaut, 1995). Compared to the people not participating in the stock market, investors have also been found to be more aware of different financial assets, more socially active, and more trusting towards other people (Guiso and Jappelli, 2005; Hong et al., 2004; Guiso et al., 2008). Additionally, it has been shown that the likelihood of participating in the stock market increases if an individual has an education in economics, possesses a high level of social capital, or is politically right-wing oriented (Christiansen et al., 2008; Guiso et al., 2004; Kaustia and Torstila, 2008). However, even after offering all of these explanations, the researchers tend to agree that further barriers exist, making stock market participation undesirable for a significant fraction of the population.

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[1] According to the Finnish Foundation for Share Promotion, 24% of Finnish households held stocks in 2009.

[2] In my paper, I define investors as the people who participate in the stock market. Thus the words investor, equity investor, stock investor, and stock market participant are used as synonyms in the text.

Investigating the typical features of an investor has meaningful purposes beyond the one of satisfying our curiosity about human behavior. Considering the excessively large premium on past equity returns compared to the returns of risk-free investment instruments, the extent of stock market participation is almost inconceivably low. This is not only a problem of brokerage companies. In fact, the limited participation phenomenon has been found to have far-reaching economic implications, on both the micro and the macro level. On the micro level, significant differences have been discovered between the consumption patterns of investors and non-investors, indicating that the aggregate consumption of stockholders is more volatile and more highly correlated with the stock market than that of non-stockholders (Mankiw and Zeldes, 1991). Non-participation in the stock market has also been found to result in a loss of welfare, as it can decrease the non-investors' annual consumption by up to two percent, at least if the investing would be done efficiently (Calvet et al., 2006; Cocco et al., 2005; Haliassos and Bertaut, 1995).

While the above implications mainly concern the non-investing individuals themselves, the macro level impacts carry on to societies and economies at large. First of all, if more people in a given country would participate in the stock market, regulation in the market would likely be enhanced, improving the level of shareholder protection in the country (Giannetti and Koskinen, 2008; Pagano and Volpin, 2006). Secondly, limited stock market participation has been suggested to lead to market incompleteness, which affects the behavior of asset prices in general (Guvenen and Kuruscu, 2006). Finally, the fact that only a small fraction of potential investors actually participate in the stock market could be one of the keys in solving the equity premium puzzle. This puzzle originates from the finding that in order to justify the large historical premium of equity investments, the level of risk aversion in the market would have to be unnaturally high (Mankiw and Zeldes, 1991; Mehra and Prescott, 1985).

In this paper, I shed further light on the phenomenon of limited participation. Going deeper into the personality of a potential investor, I study the effect of personal values on stock market participation. Research in the field of social psychology finds that personal values are linked to many of the characteristics affecting stock market participation, such as the above mentioned social capital, political orientation, and general trust (Verkasalo et al., 2009; Davidov et al., 2008; Caprara et al., 2006; Schwartz et al., 2001; Agnihorty, 1986). Furthermore, values are a factor affecting most human behavior, and they are particularly important in actions that require careful weighing of different alternatives (Bardi and Schwartz, 2003; McClelland, 1985). Thus it seems reasonable to hypothesize that value orientation could actually be an underlying factor shaping our investment

decisions, while also influencing the determinants of stock market participation suggested in previous studies.

The potential significance of personal values in investment decisions is tentatively brought forward in several studies (e.g. Hong and Kostovetsky, 2008; Kaustia and Torstila, 2008). However, actual research barely exists. The reason for this can partly be the limited availability of relevant data, often limiting the opportunities in the area of behavioral finance. My solution to the problem is to use a tailored questionnaire that provides me with the necessary information about a respondent's characteristics, investment experience, and personal values. My sample consists of 320 students from three different universities in the Helsinki area. According to the university attended, the respondents are divided into students of business, technology, and natural or social science. For measuring personal values I use variables based on the value theory of Schwartz (1992). Stock market participation can be either direct or indirect, as individuals investing in equity funds are also treated as participants.

I find that the respondents who emphasize the Self-Enhancement values of power and achievement are more likely to have participated in the stock market than the others. This effect is stronger in groups where investing is relatively rare, suggesting that in these groups participation is seen as more controversial. For individuals whose peers are likely to invest, habituation and group norms might lead to a decreasing importance of value orientation. At the same time, the respondents emphasizing the Conservation values of tradition, conformity, and security are more likely to report non-interest as the reason for non-participation than the other non-investors. This might reflect their willingness to maintain the status quo and stability in life.

Naturally, values are only one among a range of factors affecting the investment behavior of students. Demographics should be expected to play a significant role, and indeed characteristics such as wealth, age, year of study, and the investment experience of parents prove to be essential. The positive influence of being male on the probability of stock market participation is surprisingly large, however. Additionally, women are far more likely not to invest due to lack of awareness about equity assets. This could reflect the men's larger interest in financial matters and corporations already at a young age, potentially leading to consequences in the professional life.

Compared to many personal characteristics covered in previous literature, value orientation shows larger explanatory power and better consistency in predicting stock market participation. While political orientation remains low in statistical significance, general trust and social activeness are

actually found to negatively predict participation. These deviations compared to existing research can mainly be caused by differences in sample characteristics. However, especially for general trust, the existing findings of the value literature and the financial literature would seem to contradict. This leaves room for more theoretical interpretations as well.

Admittedly, my results can not be applied very widely due to the limited extensiveness of the data both geographically and demographically. In addition, my questionnaire is relatively short, which may arguably hurt its reliability. However, by presenting a valid way of combining personal values to investment behavior, I introduce a method for future scholars to cover the topic more thoroughly. This contribution will not be burdened by the mentioned limitations. Furthermore, as indicated by the results being mainly as predicted, the reliability problems seem to have been alleviated to an adequate extent.

The rest of the paper is structured as follows. In Chapter 2, I build a theoretical framework for the study, explaining the main attributes of the value theory and going through the existing literature related to my topic. In Chapter 3, I formulate my null hypothesis. In Chapter 4, I describe my data and methods by elaborating the gathering process, the questionnaire, the variables used, and the responses received. Chapter 5 presents the results of the statistical analyses. In Chapter 6, I discuss and interpret the results in more detail. Chapter 7 briefly concludes.

2. Theoretical framework

In this chapter, the theoretical basis for my study is constructed. I begin by giving a brief overview of the theory on personal values, and continue with the previous literature on stock market participation and personal values. In the end of the chapter, I also present results from authors who have directly combined values and investing, which will be my purpose as well.

2.1 An overview of the value theory

The theory on the content and structure of values has taken large leaps forward as recently as in the 1990s. It has been notably advanced by Shalom Schwartz, a social psychologist who along with his colleagues has studied the values of individuals and groups in a number of different countries and cultures, thus coming up with a theory of a close to universal set of values with an invariable content and structure. The current version was first presented in Schwartz (1992), and because it

plays such a key role in my study, I will here go through the elements that are essential for the reader to understand.

At first, a definition of personal values is needed. According to Schwartz (1992), they are desirable, transsituational goals that vary in their importance as guiding principles in people's lives. Further, the primary content aspect that distinguishes between different values is the type of motivational goal that they express (Schwartz and Bilsky, 1987, 1990). A concept that is quite close to a value by definition is a trait, and therefore it is important to see the difference between the two. Schwartz et al. (2001) highlight it well by stating that people who value a goal do not necessarily exhibit the corresponding trait, and vice versa. For example, some people may value creativity as a guiding principle in life but may not be creative, while others who actually are creative may attribute little importance to creativity as a value that guides them.

The Schwartz (1992) theory postulates that values represent, in the form of conscious goals, three universal requirements of human existence to which all individuals and societies must be responsive: (1) needs of individuals as biological organisms, (2) requisites of coordinated social interaction, and (3) survival and welfare needs of groups. Starting from these universal human requirements, a typology of the different contents of values was derived; for example, a *conformity* value type was derived from the prerequisites of smooth interaction and of group survival, meaning that individuals expressing conformity restrain impulses and inhibit actions that might hurt others (Schwartz, 1996). With some modifications that were made to the original typology after empirical tests in 20 countries, the current version of the theory contains ten distinct motivational types of values: benevolence, tradition, conformity, security, power, achievement, hedonism, stimulation, self-direction and universalism. Their contents are understood similarly regardless of nationality or cultural background, and each of the value types is represented by a number of more specific, single values. According to Schwartz (1996), a single value represents a certain value type when actions that express the value or lead to its attainment promote the central goal of the value type. Table 1 lists the ten value types, defines them in terms of their central goals, and presents the single values primarily representing each type.

Table 1. Definitions of the ten value types in the Schwartz (1992) value theory
This table first lists the ten value types: power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity, and security. Then, the central goal of each value type is defined, meaning that the value type combines single values whose pursuit promotes this goal. Finally, on the right, the primary single values representing each value type are listed. The table was adapted from Schwartz (1992).

Value type	Central goal	Primary single values
POWER	Social status and prestige, control or dominance over people and resources.	Social Power, Authority, Wealth
ACHIEVEMENT	Personal success through demonstrating competence according to social standards.	Successful, Capable, Ambitious, Influential
HEDONISM	Pleasure and sensuous gratification for oneself.	Pleasure, Enjoying Life
STIMULATION	Excitement, novelty, and challenge in life.	Daring, a Varied Life, an Exciting Life
SELF-DIRECTION	Independent thought and action-choosing, creating, exploring.	Creativity, Freedom, Independent, Curious, Choosing own Goals
UNIVERSALISM	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature.	Broadminded, Wisdom, Social Justice, Equality, a World at Peace, a World of Beauty, Unity with Nature, Protecting the Environment
BENEVOLENCE	Preservation and enhancement of the welfare of people with whom one is in frequent personal contact.	Helpful, Honest, Forgiving, Loyal, Responsible
TRADITION	Respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self.	Humble, Accepting my Portion in Life, Devout, Respect for Tradition, Moderate
CONFORMITY	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms.	Politeness, Obedient, Self-Discipline, Honoring Parents and Elders
SECURITY	Safety, harmony and stability of society, of relationships, and of self.	Family Security, National Security, Social Order, Clean, Reciprocation of Favors

Besides the propositions regarding the contents of the value types, the theory specifies dynamic relations among values. This stems from the conception that actions taken in pursuit of each type of values have psychological, practical, and social consequences that may either be compatible with or conflict with the pursuit of other value types. Schwartz (1992) specifies nine emphases that, being assumed to be shared by pairs of value types, are likely to enable people to pursue two different values simultaneously:

1. Power and achievement both emphasize social superiority and esteem.

2. Achievement and hedonism both express self-centeredness.

3. Hedonism and stimulation both entail a desire for affectively pleasant arousal.

4. Stimulation and self-direction both involve intrinsic motivation for mastery and openness to change.

5. Self-direction and universalism both express reliance upon one's own judgment and comfort with the diversity of existence.

6. Universalism and benevolence both entail concern for enhancement of others and transcendence of selfish interests.

7. Benevolence and tradition/conformity[3] all promote devotion to one's in-group.

8. Tradition/conformity and security all emphasize conservation of order and harmony in relations.

9. Security and power both stress avoiding or overcoming the threat of uncertainties by controlling relationships and resources.

In contrast to the compatibilities between these pairs of value types, the motivational goals of any other two different value types cannot easily be pursued at the same time, and conflicts arise. For example, the pursuit of achievement values may conflict with the pursuit of benevolence values, because seeking personal success for oneself is likely to obstruct actions aimed at enhancing the welfare of others who need one's help. (Schwartz, 1996) After empirical studies in 41 countries, two major value conflicts were found in over 95% of the samples (Schwartz, 1994). Combining these conflicts with the nine compatibilities described above, it is possible to conceptualize the total structure of value systems as organized on two basic dimensions. Each dimension is a polar opposition between two *higher order value types*.

The compatibilities and conflicts between value types also make it possible to graphically present the value structure that was derived from the empirical studies. The result is a quasi-circumplex model, where the ten value types are located inside a circle, each having its own restricted region. The value types are then further categorized according to the higher order value types, which divide the circumplex into four broader sections that form the two basic dimensions. This theoretical model of the value structure, developed by Schwartz (1992), is presented in Figure 1 below.

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[3] The reason for tradition and conformity being grouped here is that according to the theory, they share the same motivational goal. This will be discussed in more detail below.

SELF-TRANSCENDENCE

Universalism   Benevolence

Tradition

Self-
Direction   Conformity

OPENNESS   CONSER-
TO   VATION
CHANGE

Stimulation   Security

Hedonism

Power
Achievement

SELF-ENHANCEMENT
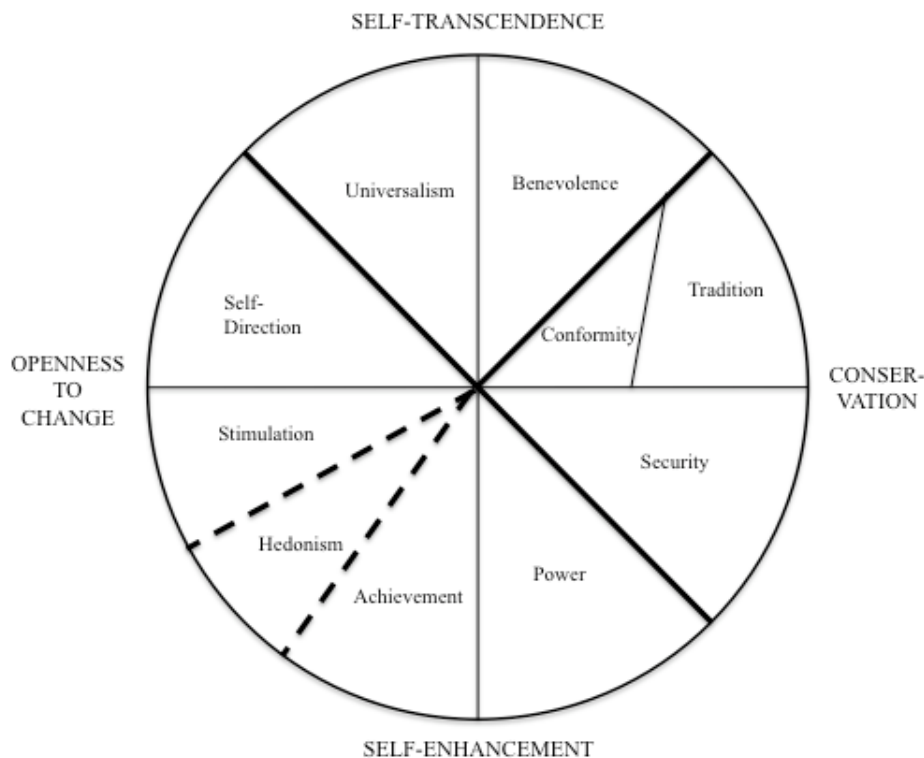
Figure 1. The quasi-circumplex model of relations between values
This figure illustrates the relationships between the different value types as postulated by the theory of Schwartz (1992). In the figure, two value types with mutually compatible motivational goals are located next to each other. From any value type, the further one moves around the circle, the smaller the compatibility gets. Thus value types with conflicting motivational goals are located opposite to each other. Due to these compatibilities and conflicts, the circle can be divided into two broader dimensions: Conservation vs. Openness to Change, and Self-Enhancement vs. Self-Transcendence. The former reflects a conflict where emphases on own independent thought and action and favoring change go against submissive self-restriction, preservation of traditional practices, and protection of stability. The latter reflects a conflict where acceptance of others as equals and concern for their welfare go against the pursuit of one's own relative success and dominance over others. Hedonism shares some elements of both Openness to Change and Self-Enhancement, and is thus not restricted to either dimension. The figure was adapted from Verkasalo et al. (2009).

As can be seen in Figure 1, one dimension opposes Openness to Change (a higher order value type combining the self-direction and stimulation value types) to Conservation (combining security, conformity, and tradition). This dimension reflects a conflict where emphases on own independent thought and action and favoring change go against submissive self-restriction, preservation of traditional practices, and protection of stability. The second dimension opposes Self-Transcendence (combining benevolence and universalism) to Self-Enhancement (combining power and achievement). This dimension reflects a conflict where acceptance of others as equals and concern for their welfare go against the pursuit of one's own relative success and dominance over others. Hedonism shares some elements of both Openness to Change and Self-Enhancement, and is thus not restricted to either one of these higher order value types.

In the graphical presentation of the theory, the idea is that value types with compatible motivational goals are next to each other in the circle (cf. the nine compatibilities above). Thus the further around the circle one moves from a given value, the smaller this compatibility gets. It then follows that the value types whose motivational goals are in conflict with each other are located on opposite sides of the circle. As proposed by Schwartz (1996), this view of value systems as integrated structures facilitates the generation of systematic, coherent hypotheses regarding the relations of the full set of value priorities to other variables. It also facilitates the interpretation of the observed relations of sets of values to other variables in a comprehensive manner. The implications of the interrelatedness of value priorities for generating hypotheses and interpreting findings can be summarized in two statements (cf. Schwartz, 1992):

1. Any outside variable tends to be associated similarly with value types that are located side by side in the value structure.

2. Associations with any outside variable decrease monotonically as one moves around the circular structure of value types in both directions from the most positively associated value type to the least positively associated value type.

As implied by statement one, there may not be significant differences between the associations of an external variable with two adjacent value types in the structure, unless the sample size is large. Thus quite similar correlations can be expected to emerge between stock market participation and both power and achievement, for example. Statement two, on the other hand, implies that the order of these associations is can still be predicted. However, Schwartz (1996) notes that although the order of the value types is set by the theory, it is not necessarily the case that that the types most and least positively associated with an outside variable are those in exact opposing positions in Figure 1. This is because the specific characteristics of the behavior studied make particular motivational goals more or less relevant to a decision. For example, tradition values are likely to be more relevant in the context of religious habits than investment behavior.

Another implication of statement two is that the expected associations between value priorities and an outside variable can be presented graphically with a sinusoid curve, meaning a curve monotonously decreasing from the most positively associated value type to the least positively associated value type, and vice versa (Schwartz, 1992). To draw such a curve, the value types are first arrayed on the horizontal axis according to their order around the circular value structure. Then, the expected strength of the association with the outside variable of interest is plotted on the

vertical axis. Correlation is often used as the measure here. Due to statement two, the result should be a sinusoid curve. Figure 2 shows an example of a curve depicting the correlations between an imaginary outside variable and each of the ten value types.
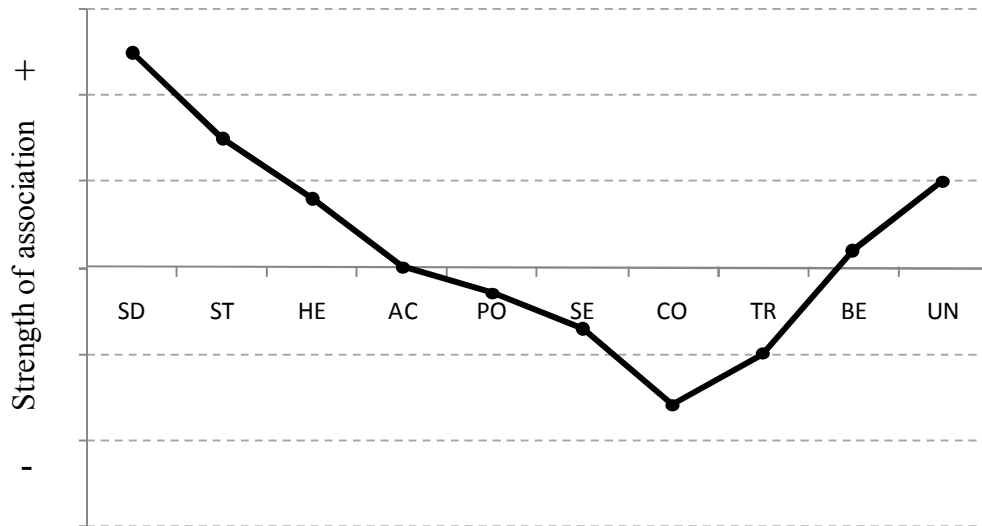
Figure 2. Hypothetical curve representing the associations between the value types and an outside variable
This figure presents an example of how hypotheses can be made about the relationship of an outside variable to the value types. According to the theory, the curve should decrease and increase monotonously between the most positively and most negatively associated value types, resulting in a so-called sinusoid curve. Thus even zero associations can be interpreted in a meaningful manner. On the horizontal axis, the names of the value types have been abbreviated, and the explanations are as follows: PO=power, SE=security, CO=conformity, TR=tradition, BE=benevolence, UN=universalism, SD=self-direction, ST=stimulation, HE=hedonism, AC=achievement.

Presenting hypotheses with this kind of a curve adds to the theory when value systems are conceived as integrated structures. In addition to the usual case where hypotheses predict strong positive or negative correlations, small and zero correlations now give valuable information as well. It is the monotonous form of the curve that confirms the theory. However, when plotting empirical data, deviations from the sinusoid pattern naturally occur, and this should not necessarily be considered a setback. On the contrary, deviations can be especially interesting because they focus attention on special circumstances, and they should also be tried to predict when constructing hypotheses. Schwartz (1992) gives an example where attributing importance to tradition values would decrease with age, which is contrary to usual findings. At the same time the associations between age and all the other value types would remain as predicted, which would cause a deviation in the curve. This would suggest that in the sample studied, a cohort effect related particularly to tradition is at work, for example a return to religion among youth.

2.1.1 How the quasi-circumplex model got its form

Now that the theory and logic behind the value structure has been elaborated, I will briefly go through the empirical tests that eventually gave the quasi-circumplex model its form. In the study that first validated the model, data was collected from 20 countries (Schwartz 1992), and today the model has been confirmed by more than 200 samples in more than 60 countries. In the vast majority of the samples, both the distinctiveness of the ten different value types and the structure of their relations have been verified. (Roccas et al., 2002)

The Schwartz (1992) study is based on a questionnaire that lists 56 single values that were, as described above, presumed to represent the different value types. For the meaning of each single value, a short specification was given in the list. When filling in the questionnaire, the respondents were asked to rate each of the single values "as a guiding principle in my life", using the following nine-point scale: *of supreme importance* (7), *very important* (6), (unlabeled; 5, 4), *important* (3), (unlabeled; 2, 1), *not important* (0), *opposed to my values* (-1). It was thus found out which values the respondents considered important and unimportant, and how the importance ratings were related to each other. The procedure, as well as a large proportion of the single values listed, was adopted from Rokeach (1973). The questionnaire was later named the Schwartz Value Survey, and it was the only tool used for testing the value theory until 2001, when an alternative method was developed (Schwartz et al., 2001).

We then get to the point where the actual structure was discovered for the model. In each sample, the intercorrelation matrix of Pearson correlations between the importance ratings of the single values was analyzed with a technique called the Guttman-Lingoes Smallest Space Analysis (SSA) (see e.g. Canter, 1985; Guttman, 1968). This technique presents the values as points in a multidimensional space, the distances between the points reflecting the empirical relations among values as measured by the correlations between their importance ratings. As a result, single values that are conceptually alike are located close to each other in the multidimensional space, whereas conceptually different or opposite values are distant from one another. Only two dimensions are required when applying SSA to the value theory, so the distances between the single values are easy to perceive.

After the SSA results had been plotted on the two dimensions, it was checked whether the single values were situated in the predicted manner. For example, single values postulated to primarily represent the achievement value type, such as capable and successful, should be found close to each

other on the graph.[4] Borders were drawn to separate the groups of single values representing a certain value type from each other, and the wedge-like regions starting from a common origin emerged. Naturally, not all of the single values hypothesized to lie in a given wedge actually did so in all the samples, so certain criteria was established to define whether it was feasible to say that a universal value type containing these single values truly exists. In fact, an eleventh value type called spirituality was also hypothesized to exist at first, but no justification for this was found in the SSA results, so the final model ended up consisting of the ten motivational value types described above. The order of the value types around the resulting circle was mainly as predicted in all the different samples, which means that regardless of culture or nationality, the compatibilities and conflicts between different value types corresponded to expectations. One notable deviation from the expected circumplex form was the location of both tradition and conformity in the same wedge, making the model a quasi-circumplex. The reason for this deviation will now be looked into.

2.1.2 The locations of tradition and conformity in the circumplex

In Schwartz's (1992) model of the structure of motivational value types, the only departure from the circumplex form, consisting of wedges emerging from a common origin to form a circle, is the location of tradition and conformity in the same wedge but at different distances from the origin. This may seem confusing, so the pattern will now be explained in a little more detail.

As explained above, the SSA technique was used to see whether the single values presumed to represent the different value types actually did appear in distinct regions on the two-dimensional space. With the tradition and conformity value types, distinct regions did indeed emerge, but rather than tradition being located between conformity and benevolence as originally hypothesized, tradition was usually found toward the rim of the circle, outside conformity.

The order of the regions around the circle represents variation in the motivational goals of the value types. Thus the location of tradition and conformity in the same wedge suggests that these two value types actually share the same motivational goal. As presented in Table 1, the central motivational goal of conformity values proposed in the theory is "restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms". The goal of tradition values is "respect, commitment, and acceptance of the customs and ideas that traditional culture or religion provide the self". Combining the substances of the two, Schwartz (1992)

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[4] See also Table 1.

suggests that the broader, shared goal might be stated as "subordination of self in favor of socially imposed expectations".

Even though they seem to share the same motivational goal, Schwartz (1992) takes note that the tradition and conformity value types were empirically distinguishable. The reason for their distinctness is attributed to a difference in the objects to which one subordinates the self. Conformity values entail subordination to persons with whom one is in frequent interaction, such as parents, teachers, and bosses. Tradition values, on the other hand, entail subordination to more abstract objects, such as religious and cultural customs and ideas. As a result, conformity values call for responsiveness to current, possibly changing expectations, while tradition values demand responsiveness to immutable expectations set down in the past.

The location of tradition and conformity in the same wedge has implications on the hypothesized relationships between the different value types as well. As the distance of the two is essentially the same to the neighboring value types in the model, the correlations between tradition and security, for example, should be quite similar to those found between conformity and security. However, relative to the opposing value types in the circle, the distance is greater for tradition than for conformity, suggesting that the correlation will be less positive between tradition and self-direction than between conformity and self-direction, for example. This makes intuitive sense as well, because subordination to religious expectations set down in the past is likely to decrease stimulation and self-direction more than subordination to, say, a boss.

2.2 Literature review

Now that the main features of the value theory have been presented, one should be ready to conceptually understand the results of the previous value research, and those of the current paper. Before going that far, however, I will first introduce the reader to the existing literature on stock market participation and the factors separating investors from the rest of the population. Thereafter I will present the findings related to these factors from the value literature, thus establishing a connection between values and stock market participation. Finally, I will go through the research that has already studied the linkage between values and investing.

2.2.1 The determinants of stock market participation – empirical evidence

A recent paper closely related to mine is the one by Kaustia and Torstila (2008). They investigate the relationship between political preferences and stock market participation in Finland, and show

that the political dimension of left versus right is a strong predictor of whether an individual participates in the stock market. Using a unique data set of zip-code-level election results and stock ownership information, the authors display that right-wing voters have a significantly larger probability of holding stocks than those who vote left. This result applies after controlling for the relevant factors such as income, wealth and education. Kaustia and Torstila (2008) also state that variation in risk aversion, social capital, or trust is not likely to explain the results, and that "personal values may figure importantly in major investment decisions" (p. 35).

Another recent study on stock market participation was conducted in Denmark, where Christiansen et al. (2008) were able to use a register-based panel data set covering the period 1997-2001. Their data contain more than 1.87 million observations on investors' background characteristics assumed to affect investment decisions. Using these data, they examine whether economists are more likely to hold stocks than others. In the paper, economists are defined as individuals who have a university degree in economics, a short-cycle higher education in economics, or a relevant apprenticeship education in the financial services industry. Comparing these individuals to people with other kinds of educational backgrounds, they document that economists do have a higher probability of holding stocks than the reference group, and also that completing an economics degree significantly increases the probability of an individual to participate in the stock market. On the other hand, becoming a teacher, for example, significantly decreases this probability. The interpretation that Christiansen et al. (2008) provide for their finding is that economists hold more stocks because they know more about economics, stock markets, and investment opportunities in general. This knowledge, in turn, decreases their cost of participating in the stock market.

Guiso et al. (2008) approach the stock market participation puzzle by investigating the effect of generalized trust, suggesting that trusting individuals are significantly more likely to invest in stocks and risky assets. Additionally, conditional on investing in stock, trusting individuals invest a larger share of their wealth in it. Their data consist of Dutch households participating in the annual Dutch National Bank Household Survey, and of Italian households participating in a survey of a large bank. With the data, they test a model they constructed to assess the impact of trust on portfolio decisions. To measure whether an individual is trusting or not, they use the following question asked from the Dutch respondents: "Generally speaking, would you say that most people can be trusted or that you have to be very careful in dealing with people?" The same question is used in an established cross-country survey called the World Values Questionnaire to measure generalized trust. To show that it is indeed generalized trust that predicts stock ownership, Guiso et

al. (2008) use questions asked from the Italian respondents about their confidence towards the bank as a broker. This controls for mistrust against the specific institutions involved in investing. After these measures, they are able to conclude that general trust does predict stock market participation. The results apply even after controlling for various other determinants found in previous studies such as ambiguity aversion (Knox, 2003), loss aversion (Barberis et al., 2006; Ang et al., 2005), and optimism (Puri and Robinson, 2005).

An interesting theory is put forward by Hong et al. (2004), who propose that socially active households are substantially more likely to invest in the stock market than non-social ones. Their data come from a survey conducted on US households, whom they are able to categorize into "socials" and "non-socials" by comparing the frequencies at which the different households interacted with their neighbors and attended church. After modeling the participation decision for both socials and non-socials and testing the model with their data, they conclude that social households do have a larger probability of being stock market participants, and that there are at least two different explanations for this finding, both of which decrease the fixed costs of participation. First, it may be that potential investors learn from each other about the high returns that the market has historically offered, or about how to execute trades. Second, a stock market participant may simply get pleasure from talking about market developments with fellow participants, just like he might enjoy similar conversations about other shared interests. These two explanations indicate that it is not the socially active personality as such that increases the probability of participation, but rather the side-effects of interacting with individuals who invest. This is further demonstrated by the authors through showing that the impact of sociability on participation is significantly stronger in states with high stock market participation rates.

Guiso and Jappelli (2005) contribute with the finding that stock market participation increases with awareness of financial assets. This statement is consistent both with the finding that participation increases with an economics education (Christiansen et al., 2008) and with Hong et al.'s (2004) proposition about social interaction. The study was done with data on Italian households received from the 1995 and 1998 Bank of Italy Surveys of Household Income and Wealth, and the households were sorted into aware and unaware ones by providing them with a list of different financial assets, and asking them to mark the ones somebody in the household is familiar with, even if only by hearsay. Indeed, after studying the awareness levels and stock market participation rates, Guiso and Jappelli (2005) state that should all investors be aware of stocks, the level of stock ownership could even double from its current level. However, their data also reveal that there are a

lot of people who are aware of stocks but who do not participate in the stock market, suggesting that factors related to personality might also be an important factor in the participation decision.

But how exactly do personal values fit into the picture when talking about stock market participation? To make the link visible between the two, I will next go through the research relating values to the determinants of participation discussed above.

2.2.2 Personal values and the determinants of stock market participation

Political orientation has been found to associate strongly with the Schwartz (1992) model of personal values (e.g. Caprara et al., 2006; Schwartz, 1996). As the political scenes in different countries can vary drastically due to the abundance of factors affecting citizens' lives such as the levels of democracy, income inequality, or national security, it is natural, however, that different values are emphasized in different environments. Barnea (2003) studies political preferences and personal values in 14 countries, and finds two main patterns that explain the relationship between personal values and political preferences. Where political competition revolves around issues of national security versus equal rights and freedoms for all, the key values that structure voters' preferences are security and conformity versus universalism and self-direction. Where the focus of political competition revolves around the distribution of material resources, the key values are universalism and benevolence versus power and achievement. (Davidov et al., 2008) Finland is one of the so-called Western welfare states where the distribution of material resources is significantly more present in political debates than the issue of equal rights among citizens. It can thus be expected that the values affecting the Finns' voting behavior will be universalism and benevolence versus power and achievement. Using the higher order value types, the relevant dimension would be Self-Enhancement versus Self-Transcendence (cf. Figure 1). According to Barnea (2003), Self-Enhancement values are emphasized more by right-wing voters, whereas left-wing voters consider Self-Transcendence values more important.

The link between educational orientation and personal values is examined by Verkasalo (1996), who finds that business students emphasize Self-Enhancement values, such as power and achievement, more than students of technology or humanities/social sciences. On the other hand, humanities/social science students score highest on universalism values according to the study, and lowest on conformity and security values. The sample of Verkasalo (1996) consists of Finnish, Swedish, and Estonian students, and from all these countries there are representatives of all three educational orientations. Schwartz et al. (2001) find similar evidence, stating that according to their

sample of Israeli students, economics majors score significantly higher on power and achievement values than humanities majors. This kind of a hypothesis is also suggested by the results of Roccas (1997) and Sagiv (1997), for example. Sjöberg and Engelberg (2009) use a slightly different methodology also based on Schwartz (1992). They choose finance students as their target group, and state that students of finance are high in sensation seeking and success orientation compared to the control group, but low in altruistic values. This result seems compatible with the other research, indicating that students of economics, of which finance students are a subgroup, should score high on Self-Enhancement values compared to other students.

Verkasalo et al. (2009) study the relationship between Schwartz's (1992) value system and interpersonal trust, and find predicted associations for both the individual value types and the broader value dimensions. In their international sample of approximately 30,000 participants, the strongest negative association is found for security, and the strongest positive one for benevolence. The results remain similar when the two value dimensions are investigated instead of the individual value types, with Conservation correlating negatively with interpersonal trust, and Self-Transcendence positively. In the study, interpersonal trust is assessed with the following three items, each of which has a response scale from zero to ten: "Most people can be trusted, or you can't be too careful?", "Most people try to take advantage of you, or try to be fair?", and "Most of the time people are helpful, or mostly looking out for themselves?". These questions are essentially similar to the one mentioned above in the context of Guiso et al. (2008), and were directly taken from another cross-country questionnaire called the European Social Survey. A similar method is used by Schwartz (2007), whose sample shows interpersonal trust to be most negatively associated with security and most positively with universalism values. He also demonstrates that interpersonal trust increases with income and education. In the above studies, the type of trust measured is very general, which is the case in my own study as well. Roccas et al. (2002), on the other hand, find similar results although they examine trust conceptualized as a personality trait.

Personal values have also been proven to be associated with social involvement, as measured by the extent of engaging in social activities and meeting socially with friends, relatives, and colleagues (Schwartz, 2007). Interestingly, two conceptually different values that are important to different types of people, hedonism and benevolence, are both found to predict social involvement in the Europe-wide study. The interpretation provided by Schwartz (2007) is that the motivation for social involvement can be related to either pleasure and excitement (hedonism) or to interest in others

close to you (benevolence). According to him, social involvement also increases with the level of education.

Values are connected to various demographic variables as well. For example, Openness to Change and Self-Transcendence values have been shown to become more important as the level of education gets higher. At the same time, the emphasis on Conservation and Self-Transcendence values tends to increase with age. (e.g. Schwartz et al., 2001) The influence of gender has also been studied, and women have been found to score higher on both Self-Transcendence and Conservation than men (e.g. Verkasalo, 2009). Another demographic variable that is interesting in the context of my study is income, which, in turn, seems to associate negatively with Self-Transcendence and Conservation (Schwartz, 2007).

As demonstrated through the findings above, several, if not all of the characteristics that have been related to stock market participation also seem to be influenced by personal values. This gives a solid reason for combining the two different but interdependent fields. However, even though a person with a certain value orientation would be more likely to exhibit a given characteristic, it remains unclear how value orientation influences actual behavior. More specifically, can it be expected that the act of investing in stocks would be affected by personal values? In the next section, a connection will be established between values and behavior in different contexts.

2.2.3 Links between personal values and behavior

Even if a person emphasizes certain values more than others, it seems reasonable to ask whether these values are visible in actual behavior. Rokeach (1973) studies the reason that makes people act according to their values, and suggests one possibility to be a need for consistency between one's beliefs and actions. A similar proposition is made by Feather (1995). He studies the relation of values and behavioral intentions in hypothetical situations, and states that actions that are value-consistent are found more rewarding than others. However, Bardi and Schwartz (2003) question the relevance of these hypothetical behaviors, stating that "in real-life situations, values are but one of many factors that may influence behavior" (p. 3). They suggest that actual behavior should be measured to estimate the strength of relations between values and behavior.

It has indeed been argued that in real-life behavior, the influence of personal values is more limited than in hypothetical intentions. In particular, McClelland (1985) postulates that values are likely to affect behavior only in the context of conscious decisions. When decisions like this are made,

people tend to choose carefully after weighing the pros and cons of different alternatives. The finding of McClelland (1985) has been confirmed in conjunction with choosing a university course and with voting for political parties, for example (Feather, 1988; Schwartz, 1996).

In the footsteps of these studies, Bardi and Schwartz (2003) carefully examine the effect of personal values in behavior. After gathering a range of suggestions from students and consulting a number of other value researchers, they list 80 different behaviors, each representing the motivational goal of one of the ten value types. Six to ten behavior items are thus assigned to each value type. Then, the value orientations for their student respondents are charted, after which the respondents report the frequency at which they have performed each behavior in the past year. Due to differences in living circumstances among respondents, the frequencies are reported relative to possibilities. To control for response biases, the same procedure is repeated for two other samples so that the behavior of a respondent is assessed by (1) the respondent's intimate partner living with the respondent in a long-standing relationship, and (2) the respondent's peers.

Bardi and Schwartz (2003) discover several results that have intriguing implications for my paper. The results also contradict McClelland's (1985) suggestion that values would only rarely be related to behavior, as substantial correlations are found between most values and their corresponding behaviors. Firstly, the authors suggest that the stronger the situational pressure to act in a particular way, the weaker the influence of personal values. This situational pressure can be related to the norms of behavior in a relevant group, for example. Secondly, they state that the less important a certain value is in a group, the stronger the relation between the personal importance of the value and the frequency of behaviors that express it. Thirdly, they find that certain value types are better predictors of actual behavior than others. They propose that tradition and stimulation values are most highly linked with the behaviors that express them. At the same time, hedonism, self-direction, universalism, and power values show reasonable associations with such behaviors. Finally, security, conformity, benevolence, and achievement values tend to relate only weakly to common behaviors that express them.

While the behaviors studied by Bardi and Schwartz (2003) were not related to investing, it has also been shown, in a slightly different context, that investment behavior and values do go hand in hand. In fact, Hong and Kostovetsky (2008) find strong evidence that political values influence the investment decisions of US mutual fund managers. This is indicated by the fact that in their portfolios, fund managers who make donations to the Democrats under-weight stocks that are

considered socially irresponsible or politically sensitive (e.g. tobacco, guns and defense, natural resources) when compared to non-donors or Republican donors. The results become even more significant in practice when considering that their sample consists of professional managers of large funds who are important marginal price setters in financial markets. They note that prior to their study, "the role of values, in general, and especially political values in shaping investments has not been explored" (p. 1).

Others have also recognized the role of personal values in investing. Statman (2000) states that some socially responsible investors want "portfolios that are consistent with their beliefs" (p. 34), even if their investment decisions would be trivial on a larger scale. He further says that it is natural for people to express their values in choosing the companies to invest in, just as it is natural that values are involved when people buy the products of different companies, such as automobiles or wine. Bollen (2007) suggests that investors in socially responsible funds derive utility from owning the securities of companies that are consistent with a set of personal values or societal concerns. This also makes them more loyal, meaning that compared to investors in other funds, the socially responsible investors are less likely to withdraw their allocations even after poor financial performance. Continuing on a similar front, Hong and Kacperczyk (2009) hypothesize that norm-constrained institutions, such as pension plans, pay a financial cost in abstaining from unethical stocks, including alcohol, tobacco, and gaming companies. They find that institutions subject to norms hold less of unethical stocks than hedge funds, for example, and that unethical stocks receive less coverage from analysts than do stocks of otherwise comparable characteristics.

3. Formulating the hypothesis

By going through the results of the previous research, the basis for formulating hypotheses for the current study has been established. As mentioned, the purpose is to investigate the role of personal values in the decision to invest in the stock market, and the framework I use is the Schwartz (1992) value theory presented above.

Even if the suggestion of McClelland (1985) about values only rarely being related to behavior is considered realistic, hypotheses considering the effect of personal values on stock market participation seem justified. The decision of an individual to invest in the stock market for the first time is arguably one that is considered with care. It takes effort to find out about the different

companies or funds that can be targeted, and the consequences on the personal finances of an individual can be significant. Thus it is likely that the pros and cons of participation compared to other alternatives are carefully weighed before the decision is finalized. As mentioned above, at least these kinds of conscious decisions should be influenced by value orientation (Schwartz, 1996; Feather, 1988; McClelland, 1985). Supported by this, I move on to reasoning about the role that value orientation might have in the specific context of stock market participation.

First, I will concentrate on the value dimension opposing Self-Enhancement to Self-Transcendence values. We have seen that right-wing political orientation increases the probability of investing in the stock market (Kaustia and Torstila, 2008), and is positively related to power and achievement, or Self-Enhancement values (Barnea, 2003). This suggests that investors, being more right-wing than the rest of the population, would rather emphasize Self-Enhancement values than the Self-Transcendence values, universalism and benevolence. Furthermore, people with an economics education are more likely to hold stocks than others (Christiansen et al., 2008), and students of economics and finance emphasize Self-Enhancement values more than other students (Verkasalo, 1996; Scwartz, 2001; Sjöberg and Engelberg, 2009). This also points to the direction that investors, who more often have an education in economics than the rest of the population, will emphasize Self-Transcendence less than their non-investing counterparts.

Income and wealth significantly increase the probability of owning stocks according to numerous studies and common logic. Income has also been shown to be positively associated with power and achievement values (Schwartz, 2007), and as presented in Table 1, wealth is even by definition connected to power values. From this angle as well, it seems feasible to believe that Self-Enhancement values are more important to investors than Self-Transcendence values.

However, not all of the previous literature indicates that the people participating in the stock market would be more Self-Enhancement oriented than others. Firstly, Hong et al. (2004) find that participation is predicted by social activeness, which in turn is suggested to be associated with benevolence values by Schwartz (2007). A combined interpretation for these findings could be that investors, being more socially active than non-investors, would score higher on Self-Transcendence values. However, one has to remember that Hong et al.'s (2004) finding was based on the fact that the socializing is done with investors, so that stocks become a topic of common interest. As the respondents in my sample are mainly students who have not yet entered the working life, it is not likely that the discussions they have with their friends would often have to do with savings and

investing, especially for the ones not studying business. Thus I do not expect that social activeness will be a good predictor for stock market participation in the current study.

Secondly, general trust has been found to predict participation by Guiso et al. (2008), and to increase with universalism values by Schwartz (2007). Again, this could indicate that investors, being more trusting than non-investors, would score higher on Self-Transcendence values. As shown by Guiso et al. (2006), however, the level of trust is also strongly determined by ethnic background, and Schwartz (2007) further states that education is an important factor. The people who responded to my questionnaire were all Finnish nationals, or at least Finnish speaking, and their level of education was essentially the same. Therefore the level of general trust should actually be quite stable throughout the sample, and I do not presume that investors and non-investors will be effectively separated by their trust levels. Furthermore, the less trusting people have been found to be more conservative (Verkasalo et al., 2009; Schwartz, 2007). Traditionally, they would thus be more right-wing politically than the trusting ones. This would indicate even a negative association between trust and stock market participation, which would coincide with a hypothesis that investors are more Self-Enhancement oriented than non-investors.

Concerning the other value dimension, Conservation versus Openness to Change, there are also some findings in the previous literature that could justify initial propositions about stock market participation. For example, awareness of financial assets was shown to predict participation by Guiso and Jappelli (2005). This awareness can arguably be stated to increase with the level of education, which in turn has been shown to associate positively with self-direction and stimulation values. Consequently, it could be professed that investors, being more educated than non-investors, will score higher on Openness to Change values. However, as the education level is now the same throughout the sample, the respondents should score relatively similarly on this dimension, rather close to the Openness to Change –end of the scale. Additionally, the sample is relatively homogenous in terms of other variables found to influence the scores on the dimension, such as age (Schwartz et al., 2001) and religiosity (Roccas and Schwartz, 1997). Thus I expect that the variation between respondents on the Conservation versus Openness to Change dimension will be small, and that the investors' and non-investors' scores will not be significantly different from each other.

As a conclusion, my null hypothesis becomes that stock market participation will be predicted by the score on the Self-Enhancement versus Self-Transcendence dimension, but not by the score on the Conservation versus Openness to Change dimension. I expect that participation will be

positively predicted by an emphasis of power and achievement values, meaning a location close to the Self-Enhancement-end of the scale. The non-investors are expected to be more leaned towards the Self-Transcendence values of universalism and benevolence.

Remembering the findings of Bardi and Schwartz (2003), universalism and power values should be reasonably strong predictors of behavior that is compatible with the motivational goals they express. At the same time, the predictive power of achievement and benevolence should be weak. Furthermore, when looking at the descriptions provided in Table 1, power and universalism seem intuitively more relevant for stock market participation than achievement and benevolence. Thus, as a specifying addition to the null hypothesis, I expect that participation will be most positively predicted by power values, and most negatively by universalism values.

4. Data and methodology

This chapter elaborates on the material and the measures that I utilized for investigating my null hypothesis. First, I tell about the actual gathering process, the respondents, and the circumstances under which the questionnaires were filled in. After that the variables received from the questionnaire will be explained. Then, I present some descriptive tables and graphs about the data, which already gives some indications about the results to come. Finally, I will introduce the statistical methods that I chose for examining the information more closely.

4.1 The data gathering process

Responses were gathered from the following universities: Helsinki School of Economics (HSE), Helsinki University of Technology (HUT), and the University of Helsinki (UH). All three universities are located in the Helsinki area, but have notably different orientations in their curricula. HSE mainly focuses on business studies, HUT on technological studies, and UH on studies in more traditional sciences, such as humanities, social sciences, and natural sciences. Thus a student that has selected one of the three universities should generally have at least some areas of interest that are different from those of the students in the two others. In the text, the terms business student, technical student, and natural/social science student will be used when referring to the people attending HSE, HUT, and UH, respectively.

The respondents answered the questionnaires during lecture time. In order to get permission for this type of data gathering, I approached the lecturers in advance and gave an overview about the

questionnaire and the purpose of the study. As my main goal was simply to get a fair amount of responses from each university, I suggested the procedure to several lecturers, without putting too much emphasis on the specific subject of the class. Thus I did not target the questionnaire to any particular, especially interesting subgroup of students in any of the universities, except for the fact that I managed to mainly interview students that had been studying for at least a couple of years already. While this lack of targeting can be considered a factor reducing the contrasts between the students of the different universities, it can also be thought of as a positive thing, as the results should now give a more representative view about the average students in the respective educational institutions.

All in all I visited nine lectures during the data collection process, which spanned about six months from late March to early October 2009. [5] Three lectures were covered at HSE, with 123 people initially answering the questionnaire (mainly students of accounting, finance, or marketing). At HUT, data was gathered from two lectures, and there were 95 initial responses altogether (mainly students of information technology or machine technology). At UH, the number of lectures was five, and 102 responses were received (mainly students of behavioral, social, or natural sciences). On a marketing class at HSE, there were three participants who actually studied at UH, but were taking part in this particular class as visiting students. These respondents were handled as UH students in the analysis. Finally, I was left with 320 responses; 120 business students, 95 technical students, and 105 natural/social science students.

The actual execution of the enquiry varied slightly from one lecture to another. On both of the HUT lectures and one of the UH lectures, the questionnaires were dealt out in the beginning of the class, and collected at the end of the class. Thus the students filled in the questionnaire during the lecture. As this can take away concentration from the actual topic, the most common way of execution, used to some extent on all of the other lectures, was to deal out the question sheets at some point of the lecture, and then let the respondents answer them without any other distractions. On one occasion this was done at the end, while on the others the enquiry took place at the beginning of the class. The introduction given to the respondents was essentially the same every time; I briefly explained that the questionnaire is related to a master's thesis that I am preparing at HSE, that the aim is to study the relationship between personal values and investor behavior, and that students from three different universities, HSE, HUT, and UH, will be interviewed.

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[5] Only one lecture was visited in the spring (26.3.2009), while the other eight were visited during one month's time in the fall (9.9. – 8.10.2009).

Naturally, it was easier to monitor the respondents when they were allowed to only concentrate on the question sheets, and in most of these cases, all of the students attending the class participated in the questionnaire, even though a few of them left some items unanswered. The biggest problem with giving time for the students in the beginning of a class was that almost every time, there were people coming in late. Therefore the late-comers started the answering process later than the others, and as individual students often arrived with intervals of one or two minutes during the first ten minutes of the lectures, the time needed for the whole class to be finished started nearing a quarter of an hour. As this was in most cases significantly longer than what the lecturer had had in mind, the process had to be interrupted at some point, which led to some respondents not making it through the whole questionnaire.[6] I was able to minimize the problem by staying in until the end of the lectures and offering to collect the missing question sheets afterwards, but undoubtedly it still caused some students to drop out of the sample. On the one class where the questionnaire was executed at the end, there was a significant amount of students who did not participate due to leaving before or at the end of the actual lecture. However, I estimate the response rate to be approximately 80% for this lecture as well.

In the situations where the questionnaires were filled in during the actual teaching, it was more difficult to control the process. Students could come in late and not even receive the questionnaire, leave early and give their paper to a friend for returning, or take their paper with them when leaving the class, for example. It was practically impossible for me to know whether some of these scenarios took place, as at the end of the lecture individual students delivered several papers, most often for the whole row. On two out of the three lectures where this method of execution was used, however, I know that I got answers from practically all of the attendants due to relatively small class sizes and the efforts of the lecturers. A couple of unobserved exceptions may naturally have occurred. On the third, the class size was quite large with an estimated number of 70-80 participants, and the question sheets were given out for circulation in the beginning of the lecture instead of separately distributing them to each row or individual. This makes it hard to tell how many students simply passed on the papers without taking one for themselves, or how many took the sheets but didn't return them. The number of answers received from this class is 57, so the estimated response rate still remains quite high at around 70-80%. For students showing up late to

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[6] The time needed for an individual respondent to answer all the questions is approximately five minutes, and this was reported to the lecturers in advance.

the lectures, I always offered the chance to fill in the sheets at the end, which also led to some increase in the sample size.

Based on the information above, I estimate the average response rate for the entire sample to be at least 80%, including answered sheets with missing individual items. As I was unable to rigorously supervise all of the potential participants, this figure can admittedly be claimed to be inaccurate. Still, the response rate will be considerably higher than that of a typical mail survey, for example, which is as low as 10-20% (Kaustia and Torstila, 2008). Further, the level of selection bias is arguably lower, as the non-responses were mostly caused by timing problems rather than negative or indifferent attitudes toward the study. Unwillingness to answer was most visible at HSE, where there were nine people refusing to report their wealth, one refusing to report income, and one who did not report political orientation. Apart from this, the reason behind most of the missing items seems to be the misunderstanding of one or several questions.

In all my analyses, I take advantage of all the data available. Thus the sample size slightly varies across different tests and calculations, as some answers are unnecessary for one test, but necessary for another. At any rate, the exact number of available responses is around 300 for all of my analyses, and it is reported in conjunction with each one.

4.2 The variables used – definitions and justifications

The questionnaire I constructed for the study consists of two parts that are fitted on one page each. Thus a two-sided sheet of paper, which I considered to be about the maximum in order to get permission to collect data during lectures, is adequate. The survey was done in Finnish, and the questions from the first part of the questionnaire presented here are translations, the accuracy of which can naturally be argued. Therefore, to avoid ambiguity, the Finnish version of part one, along with both Finnish and English versions of part two, can be seen in Appendix A.

First, I will explain the variables received from part one, which concentrates on the known determinants of stock market participation and the investment experience of the respondents. Then, I will elaborate on the variables received from part two, which aims to find out the value orientations of the respondents using a value questionnaire developed by Schwartz et al. (2001).

4.2.1 Control variables and investment experience – part one of the questionnaire

The determinants of stock market participation covered in previous literature were presented above. In addition to the demographic variables such as age, gender, place of birth, occupation, income,

and wealth, some personal characteristics had been shown to influence the decision of investing in stocks. To be able to properly control for the factors potentially affecting participation, and to thus find out the true effect of personal values, the first part of the questionnaire attempts to chart these factors as extensively as possible.

Most of the control variables are straightforward to find out with simple questions that do not require any weighing of different answers from the respondent. These include age, sex, place of birth, university, major, and year of study. The approximate amounts of wealth and debt are also easy for most people to remember, and they are inquired after as number estimates, dividing wealth into real estate and other, and debt into student loans, mortgage, and other.

Getting information about the investment experience of a respondent is also relatively simple. To make the information suit my purposes, I do it in the following manner. First, the respondent is asked to mark the assets in which he had ever possessed wealth, choosing from the following list: stocks, equity funds, other investment funds, and fixed term deposits. Then, she is asked to mark the ones in the same list in which she had invested with her own money, either earned or borrowed. After that, the potential reason for not investing in the equity products is enquired, presenting the following three options: lack of awareness, lack of capital, or lack of interest. Finally, to get more insight on the potential sources of awareness and assets, it is asked whether the respondent's parents have holdings in stocks or equity funds. With these measures, a relatively broad picture of a respondent's relationship to investing can be formed. The respondents who are classified as stock market participants in my study are the ones who report having invested in either stocks or equity funds with their own money. Thus both direct and indirect participation are included.

Some of the control variables are not as easy to measure reliably, however, which makes the process of choosing the right question formats more challenging. First of all, income has been found to be one of the main predictors of stock market participation. For students, income often varies a lot during the year and comes from a range of different sources, such as the government, employers, and parents. This can make it very difficult to report an average monthly income, and when asked about it, students often only report the "official" income such as government subsidies, while in fact they might be getting significant financial support from their parents in the form of rent payments, clothing, or school books, for example. This limits the effectiveness of the typical way of asking for

income levels, providing different brackets where each respondent marks the appropriate one. [7] As a result, I decide to use another technique I have seen in student surveys by posing the following question: "Compared to students on average and based on your own estimate, how much money do you have at your disposal per month?" The answer possibilities were (1) significantly less, (2) slightly less, (3) as much as the others, (4) slightly more, and (5) significantly more. In this manner, I expect to get a wider and more realistic income distribution for my sample.

Another known determinant of stock market participation that can be measured in various ways is generalized trust. I decide to follow in the footsteps of Guiso et al. (2008) and Kaustia and Torstila (2008), who both use the following question from a well-established cross country survey called the World Values Survey: "Generally speaking, do you feel other people can be trusted, or that you can never be too careful?" The three answer possibilities provided for this item in my questionnaire are (1) yes, (2) no, and (3) I can't say.

For the three remaining variables that are used as controls in the study, that is risk preferences, level of social interaction, and political orientation, a scale from zero to ten is provided, preceded by a short description about the measured item. For risk preferences, the question reads as follows: "How do you see your attitude towards risk? On a scale from zero to ten, do you try to avoid risk, or are you completely willing to take on risk?" The same formulation is used in Halko and Kaustia (2008), for example. For measuring the level of social interaction, the following question is posed: "Do you have a social character? For example, do you mostly spend time with friends and other people, or rather alone or with your potential family/co-habiting partner?" The question is structured so that it would capture especially the sociability that goes beyond one's own household, as that kind of social interaction was shown to predict stock market participation by Hong et al. (2004). The third of these scale questions, then, concerns political preferences, and it goes as follows: "Political orientation is often depicted with the so-called left – right axis. Where would you place yourself on this axis in the context of the Finnish political scene, when zero means left and ten means right?" This formulation originally comes from the European Social Survey, and is also used by Verkasalo et al. (2009). The reason for mentioning the "Finnish political scene" is that the differences between the political programs of the main "leftist" and "rightist" parties in Finland are not as extreme as in some other countries, so the variation in the responses might grow a bit wider when this clarifying addition is made.

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[7] This shortcoming was proven in practice when the bracket technique was used with the first sample of students who responded to the survey.

4.2.2 Variables measuring personal value orientation – part two of the questionnaire

To measure the value orientation of the respondents, I use the 21-item version of a validated tool called the Portrait Values Questionnaire (PVQ; Schwartz et al., 2001) as the second part of the survey. I now give a brief description about how and why the questionnaire was developed, and explain its suitability for my study.

The PVQ was developed as an alternative for the Schwartz Value Survey (SVS), described above in Section 2.1.1. The criticism for the SVS was that it demands a lot of abstract thought and presents value concepts outside of any specific context. Furthermore, people rarely evaluate and quantify the guiding principles of their lives, which makes this task novel and difficult. (Schwartz et al., 2001) Therefore the SVS had been found too time consuming and intellectually demanding for certain research purposes, and the need emerged for another type of questionnaire that would be more concrete and easier to relate to. However, the responses should still be applicable to the ten value types of the quasi-circumplex model of personal values.

The approach chosen for the PVQ was to give short portraits of different people, each one describing goals, aspirations, or wishes that implicitly point to the importance of a value. For example, "It's important to him to show his abilities. He wants people to admire what he does." portrays a person who considers achievement values important. On the other hand, "It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them." describes a person who thinks that universalism values are important. In the original version of the PVQ, there are 40 of these portraits. For each one, the respondent answers the question "How much like you is this person?" by checking one of the six boxes labeled as follows: (1) not like me at all, (2) not like me, (3) a little like me, (4) somewhat like me, (5) like me, (6) very much like me. The number of portraits representing each of the ten value types is between two and six, depending on the breadth of the conceptual definition of the value type (cf. Schwartz, 1992). Compared to the SVS, the respondents find the PVQ simple and straightforward, and most importantly, Schwartz et al. (2001) show that the two questionnaires provide similar measurements of the ten value types. Their study also demonstrates that value priorities obtained with the PVQ associate in a theoretically meaningful and predictable manner with background variables, attitudes, personality, and behavior.

The shorter, 21-item version of the PVQ was developed for the first, 2002 round of the European Social Survey, a biennial multi-country survey covering over 30 nations. A tool for measuring

personal values was needed, but there was not enough space for the original PVQ. Thus some items were dropped, and in the shorter version there are only two portraits representing each value type, except universalism, for which there are three. This naturally results in lower reliability for the ten value types, because the conceptually broad value constructs are covered with only a couple of items (Verkasalo et al., 2009). Consequently the calculated associations between the value types and external variables might become less trustworthy, decreasing the robustness of the research method.

To overcome the reliability problems caused by the shorter questionnaire, I use a method developed by Verkasalo et al. (2009), concentrating only on the Self-Transcendence – Self-Enhancement and Conservation – Openness to Change value dimensions instead of all of the ten value types. As explained in Section 2.1 and depicted in Figure 1, these two dimensions reflect the two major conflicts that organize the whole value structure in Schwartz's (1992) theory. Verkasalo et al. (2009) state that their method "should be especially useful in conjunction with short questionnaires, which may suffer from low reliability" (p. 2).

The solution provided by Verkasalo et al. (2009) is to calculate two variables, called Conservation and Self-Transcendence, for each respondent. A high Conservation score indicates the relative importance of Conservation values over Openness to Change values, whereas a high Self-Transcendence score indicates that Self-Transcendence values are considered more important than Self-Enhancement values. The calculation of the variables is done by using the equations they present for both of the two variables, including a constant and 21 different multipliers, one for each portrait. For example, the Conservation variable is the result of the following calculation:

90.5531 + (-1.1031)*(response to portrait no. 1) + 0.5736*(resp. to portrait no. 2) + ...

+ (-0.7511)*(resp. to portrait no. 21).[8]

Verkasalo et al. (2009) constructed the equations using a sample consisting of about 30,000 respondents from 15 different European countries, thus creating "European norms" for the two-dimensional presentation of personal values.[9] The least-square regression weights obtained in a factor analysis were scaled so that the means became 100 and the standard deviations 10 for the

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[8] A table containing the complete equations is presented in Appendix B.

[9] These norms should fit my Finnish sample well, as Schwartz (2007) shows that according to his research in 20 European countries, the value structure of the Finnish population has no deviations from the Europe-wide one.

Conservation and Self-Transcendence scores, allowing an easy and explicable presentation on a two-dimensional graph.

In the context of the 21-item PVQ, Verkasalo et al. (2009) mention three important benefits that can be gained by using the two value dimensions instead of the ten narrower value types. First, the reliabilities of the two value dimensions are significantly higher than those of the value types. Second, using their method to compute the two value dimensions controls for response bias, for example in the case where a respondent only uses the higher end of the answer scale. Third, presenting the data on two dimensions makes it very easy to graphically present the relationships between values and outside variables. However, the method also has its drawbacks, the major one being the loss of information compared to the situation where all ten value types are presented. Verkasalo et al. (2009) admit that the ten value types can be expected to predict somewhat more of the variance of external variables than the two value dimensions. Furthermore, even though statistically rare, some respondents may score high on both ends of a value dimension, thus ending up with an average score on this dimension. As an example of a group of respondents that may not be adequately described by two value dimensions Verkasalo et al. (2009) refer to military cadets, who have been found to emphasize both stimulation and security values (see Lönnqvist et al., 2009).

For the sake of reliability, I mainly concentrate on the two value dimensions in my research. However, I additionally conduct the most central analyses using the ten value types to account for the potential loss of information. This way the benefits of both methods can be utilized, while still controlling for their drawbacks by comparing the results between each other.

4.3 Description of the data

A wide range of information was received from each respondent. As described above, the first part of the questionnaire provides me with demographic variables, personal attitudes and characteristics, and investment experience, while the second part allows me to calculate value orientations. Besides the large quantity of the information, there are also at least two intriguing groupings in which it can be presented. The first one is to arrange the information according to different groups of investors and non-investors, and the second one to group the respondents into students of the different fields. In this section, I will show several tables and graphs, using both grouping methods. First, information on the characteristics and value orientations of the respondents will be given, and then,

to tentatively describe how the different variables respond to each other, correlation tables will be looked at. More detailed analysis will follow in Chapter 5.

4.3.1 Variables received from part one of the questionnaire

From part one of the questionnaire, the data are partly quantitative, which allows the comparison of average and median figures, for example. On the other hand, the information is partly qualitative, which allows the categorization of the respondents into different groups. Due to the amount of space required for presenting all the relevant data, I have divided it into two different tables by separating the quantitative and qualitative statistics.

Table 2. Descriptive statistics 1 – Quantitative data
This table presents the answers given by the respondents as number values. In the upper part of the table, the respondents have been grouped according to their field of study. In the lower part of the table, the grouping is according to investment experience. In the group Stocks, the respondents have directly invested in stocks. In the group Stocks or equity fund, the respondents have invested either in stocks or an equity fund. In the group Not aware, the respondents have not invested in stocks or equity funds due to lack of awareness about these assets. In the group Not interested, the respondents have not invested in stocks or equity funds due to lack of interest. In the group All non-investors, all the respondents who have not invested in stocks or equity funds are included, regardless of the reason. At the bottom of the table, the figures for the entire sample are presented. Age was reported as a number value by the respondents. Year of study was calculated using the year reported as the first year of study by the respondents. Risk attitude, social activeness, right-wing political orientation, and income were reported by the respondents using the scales shown. Net wealth was calculated as the difference between total assets and liabilities, as reported by the respondents.

	N	Age (years)	Year of study	Risk attitude (0-10)	Social activeness (0-10)	Right-wing orientation (0-10)	Income (1-5)	Net wealth (€)
Field of study:								
Business	120							
Average		24,52	4,38	5,31	6,70	7,01	3,47	39 420,72
Median		24	4	6	7	7	4	7 000,00
Standard deviation		4,12	3,02	2,09	2,05	1,77	0,96	130 591,74
Technology	95							
Average		23,49	4,20	5,03	6,04	6,13	3,63	19 225,53
Median		22	4	5	6	7	4	5 000,00
Standard deviation		3,46	3,00	2,21	2,31	2,15	0,85	38 310,68
Natural/social science	105							
Average		25,29	3,34	4,93	6,00	4,70	3,32	46 744,65
Median		23	3	5	6	5	3	3 150,00
Standard deviation		6,58	2,12	1,92	2,27	2,18	0,90	141 770,08
Investors and non-investors:								
Stocks	77							
Average		26,45	5,58	6,05	6,29	6,94	3,84	87 756,52
Median		24	5	6	6	8	4	20 000,00
Standard deviation		6,53	4,31	1,90	2,33	2,15	0,83	174 701,79
Stocks or equity fund	109							
Average		25,59	5,17	5,72	6,05	6,77	3,75	66 336,73
Median		24	4	6	6	7	4	15 000,00
Standard deviation		5,88	3,95	2,04	2,27	2,22	0,90	150 717,80
Not aware	86							
Average		22,71	2,92	4,55	6,65	5,13	3,17	8 257,79
Median		22	3	4	7	5	3	2 000,00
Standard deviation		2,67	1,42	2,13	2,20	2,12	0,71	25 260,34
Not interested	47							
Average		25,79	3,40	4,70	5,87	5,11	3,83	69 286,68
Median		23	4	4	6	5	4	10 000,00
Standard deviation		6,94	1,73	1,80	2,13	2,12	0,82	182 868,74
All non-investors	199							
Average		23,86	3,34	4,81	6,37	5,51	3,29	21 132,38
Median		23	3	5	7	5	3	2 500,00
Standard deviation		4,28	1,60	2,02	2,19	2,15	0,89	94 470,05
Total sample	320							
Average		24,47	3,98	5,10	6,28	5,98	3,47	35 742,21
Median		23	4	5	7	7	4	5 000,00
Standard deviation		4,95	2,78	2,08	2,22	2,24	0,92	115 690,55

Table 2 presents the information from the first part of the questionnaire that was given by the respondents in non-restricted number values, or as a number chosen from a scale. In the upper part of the table, a grouping according to field of study is made, while in the lower part of the table, the data are grouped according to investment experience. There is a group for those who have directly invested in stocks ("Stocks"), those who have invested in stocks or an equity fund ("Stocks or equity fund"), those who have not invested in either of the two because they are not familiar with these asset classes ("Not aware"), and those who have not invested because they are not interested in these asset classes ("Not interested"). The respondents who have not invested because they lack the required capital for it have not been assigned into a group of their own, because they are only expected to differ from the other respondents on wealth-related factors. Thus they are not particularly interesting as a subgroup, and their responses have simply been included to those covering all non-investors. The figures for the total sample are reported at the bottom of the table.

The average age of the natural/social science students is increased by a small number of individuals who are already in their 40s or 50s, and overlooking this it can be seen that the business students are slightly older and further in their studies than the other students. Concerning the previously found determinants for stock market participation, the business students are above the others on all the scales, scoring highest on risk preference, social activeness, and right-wing political orientation. The technical and natural/social science students are close to each other on the first two of these determinants, but not so much on the third, as the natural/social science students are clearly the most left-wing oriented group.

Income was not given as a euro amount, but as an individual estimate of how much disposable income the respondent has per month compared to the average student. On the one to five scale, three means equal to average. The technical students seem to think that they are best off compared to their peers, while the natural/social science students think the least of their earnings, but still rate them around the average. The order changes when looking at the net wealth, though, which is calculated using the euro estimates of assets and liabilities provided by the respondents. Looking at the average values, the natural/social science students are the wealthiest of the three groups. However, this is again explained by the middle-aged respondents in the sample, many of whom have gathered wealth in the €300.000 to €500.000 range. Thus the median values give a better picture of the actual situation, showing that business students are somewhat wealthier than their counterparts from the two other universities.

Moving on to the investor groupings, it seems that the people who have invested are already relatively far in their studies compared to the non-investors, especially the ones who are not aware of stocks or equity funds. The investors' risk preference is also higher than that of the non-investors, which, together with their more right-wing political orientation, is in accordance with previous research. Interestingly, social activeness is highest among the respondents who are not familiar with stocks or equity funds, which seems to go against the suggestion of Hong et al. (2004) discussed above.

In income and net wealth, the figures for the group not aware of stocks or equity funds are clearly below those of the others. For the respondents who have stated lack of interest as the reason for their non-investing, the income and wealth figures are not much different from the corresponding figures reported by the investors, which seems to confirm that the grouping is reasonable. The members of this group could well become investors, but choose not to because of ideological or other personal reasons.

Table 3. Descriptive statistics 2 – Qualitative data

This table presents the answers to the questions that only provided the answer possibilities yes and no, or otherwise had only one potential answer possibility for each respondent. The respondents are horizontally grouped into different categories. On the left side of the table, the grouping is made according to field of study. In the middle, the active investors, who have invested with their own money, have been divided into the ones who have directly invested in stocks, and the ones who have either invested in stocks or an equity fund. On the right, the respondents who have not invested in stocks or equity funds have been divided into the ones who have not invested due to lack of awareness about the assets, the ones who have not invested due to lack of interest, and the ones who have not invested, regardless of the reason. In the right end of the table, figures for the total sample are presented. "Helsinki area" means that the respondent is born in the Helsinki area. "Trusting" means that the respondent has indicated being generally trusting towards other people. Passive investors own or have owned some of the assets listed, but have not invested in them themselves, with their own money. Active investors have independently invested their own money in the assets listed. "Investing parents" means that the respondent's parents have invested in stocks or an equity fund.

	Field of study:			Active investors:		Non-investors:			Total sample
	Business	Technology	Natural/social science	Stocks	Stocks or equity fund	Not aware	Not interested	All	
Male	50,0 %	90,5 %	28,6 %	80,5 %	75,2 %	34,9 %	48,9 %	44,2 %	55,0 %
Helsinki area	62,5 %	56,8 %	53,3 %	63,6 %	62,4 %	53,5 %	55,3 %	54,8 %	57,8 %
Business	100,0 %	0,0 %	0,0 %	53,2 %	49,5 %	14,0 %	25,5 %	28,1 %	37,5 %
Technology	0,0 %	100,0 %	0,0 %	29,9 %	32,1 %	34,9 %	25,5 %	29,1 %	29,7 %
Natural/social science	0,0 %	0,0 %	100,0 %	16,9 %	18,3 %	51,2 %	48,9 %	42,7 %	32,8 %
Trusting	65,8 %	58,9 %	75,2 %	51,9 %	57,8 %	70,9 %	74,5 %	71,4 %	66,9 %
Passive investors in:									
Stocks	44,1 %	36,8 %	23,8 %	100,0 %	74,8 %	18,6 %	21,3 %	14,6 %	35,2 %
Equity fund	35,6 %	27,4 %	17,1 %	60,0 %	72,0 %	3,5 %	6,4 %	4,0 %	27,0 %
Other fund	30,5 %	24,2 %	19,0 %	38,7 %	41,1 %	8,1 %	31,9 %	14,6 %	24,8 %
Term deposit	36,4 %	28,4 %	27,6 %	45,3 %	47,7 %	16,3 %	29,8 %	21,6 %	31,1 %
Active investors in:									
Stocks	33,1 %	24,2 %	12,4 %	100,0 %	70,1 %	0,0 %	0,0 %	0,0 %	23,6 %
Equity fund	26,3 %	21,1 %	12,4 %	42,7 %	59,8 %	0,0 %	0,0 %	0,0 %	20,1 %
Other fund	26,3 %	20,0 %	13,3 %	33,3 %	37,4 %	7,0 %	21,3 %	9,0 %	20,1 %
Term deposit	30,5 %	27,4 %	18,1 %	38,7 %	43,0 %	11,6 %	23,4 %	15,6 %	25,5 %
Non-investors because:									
Not aware	11,1 %	32,3 %	41,9 %	0,0 %	0,0 %	100,0 %	0,0 %	43,2 %	28,1 %
Not interested	11,1 %	12,9 %	21,9 %	0,0 %	0,0 %	0,0 %	100,0 %	23,6 %	15,4 %
Investing parents	62,2 %	53,7 %	49,5 %	80,3 %	71,3 %	46,5 %	53,2 %	47,7 %	55,5 %

The answers to the "multiple choice" questions are presented in Table 3, where it can be seen how the groups of students, investors, and non-investors are distributed according to different characteristics. The groupings are the same as in the previous table, but here the division is horizontal, starting with the different fields of study on the left. In the lower half of the table, the investment experience of the respondents is reported. The passive investors have not necessarily acquired their holdings themselves, while the active investors specifically stated that they had used their personal capital, either earned or borrowed, for the investments. As the criterion for being a passive investor is simply the possession of the assets, all active investors are also passive investors, but not vice versa. The asset classes "other fund", meaning mutual funds that invest in other targets than pure equity, and "term deposit", meaning a bank deposit made for a fixed period of time, were inquired after mainly to broaden the view into the investment behavior of the students, and will not be analyzed further.

The proportion of males among the students of different fields seems to vary drastically, and the cut is very clear among the investors and non-investors as well. In the sample of technology students, nine out of ten respondents were men, and the corresponding figure for stock investors is eight out of ten. On the other hand, women are the large majority with more than 70% among the natural/social science students, and with 65% among the non-aware. The business students, interestingly, have a precise 50:50 gender distribution. In all of the different subgroups, about 55-65% of the respondents are born in the Helsinki area.

Roughly half of all the investors in the sample are business students, while the technology students represent one third and the natural/social science students less than a fifth of the investors. The pattern is reversed in the non-investor categories, as the natural/social science students dominate the non-aware and non-interested subgroups. People who are not interested in investing in stocks or equity funds are found evenly among business and technology students. In the entire sample, the number of students from each of the three fields is relatively equal, business students being the slight majority.

General trust is an interesting variable, as it has been shown to predict stock market participation by Guiso et al. (2008). Contrary to their finding, however, the stock investors are the least trusting subgroup of all in my sample. The people who seem most trusting toward other people are actually the ones not interested in investing in the stock market. On the university level, the natural/social

science students come forward as the most trusting group, while the technology students have the smallest amount of trusting individuals among their sample.

Looking at the investor categories, it can be seen that a relatively large share of the respondents in each field of study has at least some kind of investment experience, but that business students are still the dominant subgroup in all the investor categories. An interesting finding is that out of the people reporting themselves as not aware of stocks or equity funds, almost 20% actually own stocks that have most likely been inherited or received as a gift. This indicates that the classification of Guiso and Jappelli (2005), saying that the households who know an asset class even by hearsay can be categorized as aware of it, might not be very informative. On the contrary, some people may even have their own holdings in an asset class, but still not consider themselves capable enough for independently investing in it.

It can also be seen that a very large proportion of the respondents, especially the business students and the investors, have parents who have invested in stocks or equity funds. The percentage is close to 50 even for the non-aware, whose parents appear least probable to invest. According to The Finnish Foundation for Share Promotion, the aggregate share of Finnish households holding stocks in 2009 was only 24%. Even though the households with shares in equity funds are not included in this figure, it seems that investing households are overly represented in my sample. According to Karhunen and Keloharju (2001) the ratio of investor-inhabitants is larger in the Helsinki area compared to the rest of the country, but as they state that the ratio was only 29,8% in 2000, this is not likely to be the entire explanation. It could be argued that the children of parents who invest are more likely to study in a university than other children, potentially also reflecting a higher education level of the parents themselves.

Finally it should be pointed out that the share of people not aware of stocks or equity funds is quite large in the sample. Among the natural/social science students, more than 40% of all respondents say that they have not invested in these assets because they lack the required knowledge about them. Even in the group of business students there is one person in ten who does not know how to invest in these assets, or what kind of possibilities they offer. Thus it looks like the proportion of respondents who have a negative attitude against the stock market due to personal ideologies or the features of the current financial crisis, for example, is relatively low. This might indicate that the amount of stock market participants could be significantly increased through education and marketing.

4.3.2 Variables received from part two of the questionnaire – the ten value types

Next we come to the answers that were given to the second part of the form, consisting of the Portrait Values Questionnaire (PVQ) and aiming to find out the value orientations of the respondents. The main idea of the PVQ is that there are 21 short descriptions of different people, each portraying one of the ten value types, which the respondent rates on a scale from one to six according to the level of similarity he feels with each person described. Based on these ratings, an average can be calculated for each value type. Before comparing the value scores of different respondents between one another, I subtract the arithmetical average of all the 21 ratings given by a respondent from each individual rating of the respondent. This procedure is called ipsatization, and it makes the ratings of the various respondents comparable even if the ends of the scale have been used differently, because the answers become relative. It has been recommended to use ipsatized figures in the context of the PVQ by Verkasalo et al. (2009), for example.

Figure 3. The average scores of the respondents on the ten value types, grouped according to field of study
This figure shows the average value scores, as reported in the Portrait Values Questionnaire (PVQ), for the students of different fields. The answers have been ipsatized, meaning that from each answer on the PVQ, the average of all answers has been subtracted for each respondent. This makes the answers comparable across individuals. On the horizontal axis, the names of the value types have been abbreviated, and the explanations are as follows: SD=self-direction, ST=stimulation, HE=hedonism, AC=achievement PO=power, SE=security, CO=conformity, TR=tradition, BE=benevolence, UN=universalism.

Figure 3 presents the average scores for each value type as received by the respondents, here grouped according to field of study. The figure shows that the importance of almost all of the values is considered quite similarly by the different groups of students. Stimulation is the only value considered more important than average by the business students, but less important than average by the other students. As expected, natural/social science students consider power and achievement values less important than the other students, and benevolence and universalism values more important. For benevolence and universalism, it was also expected that the business students would score lowest, as suggested by Verkasalo (1996). Surprisingly, however, the lowest scores on these values, as well as the highest ones on security, conformity, and tradition, were received by the technical students in my sample. The explanation for the technical students' low scores on benevolence and universalism is probably the large majority of males among them, as men have been found to emphasize Self-Enhancement more than women (e.g. Verkasalo, 2009). The business students stand out as having the lowest score on security values, potentially reflecting their higher-than-average willingness to take risks and high regard for stimulation.
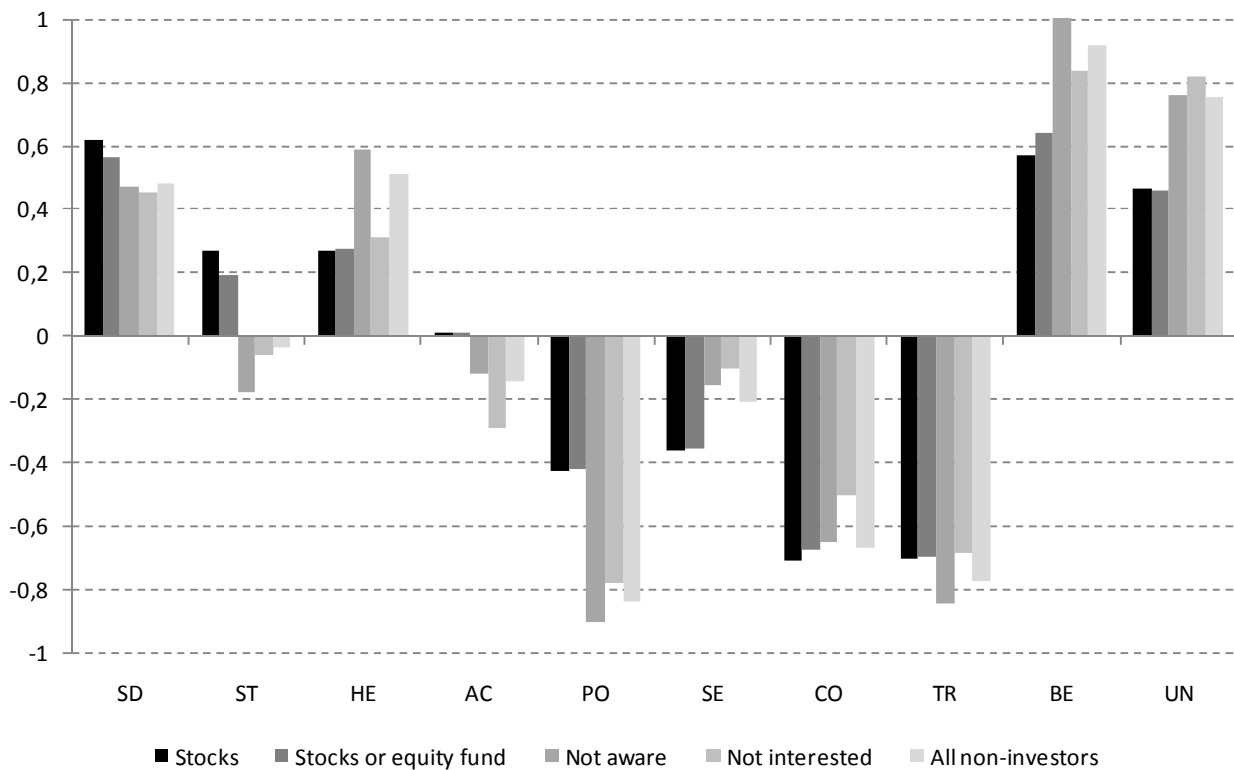
Figure 4. The average scores of the respondents on the ten value types, grouped according to investment experience
This figure shows the average value scores, as reported in the Portrait Values Questionnaire (PVQ), for the respondents with different relationships to investing. The answers have been ipsatized, meaning that from each answer on the PVQ, the average of all answers has been subtracted for each respondent. This makes the answers comparable across individuals. In the group Stocks, the respondents have directly invested in stocks. In the group Stocks or equity fund, the respondents have invested either in stocks or an equity fund. In the group Not aware, the respondents have not invested in stocks or equity funds due to lack of awareness about these assets. In the group Not interested, the respondents have not invested in stocks or equity funds due to lack of interest. In the group All non-investors, all the respondents who have not invested in stocks or equity funds are included, regardless of the reason. On the horizontal axis, the names of the value types have been abbreviated, and the explanations are as follows: SD=self-direction, ST=stimulation, HE=hedonism, AC=achievement PO=power, SE=security, CO=conformity, TR=tradition, BE=benevolence, UN=universalism.

In Figure 4, the average value scores are divided into the different groups of investors and non-investors. Like the business students above, the two groups of investors also consider stimulation values more important than average, while the non-investors, especially the ones not aware of investing, consider stimulation less important than their average rating. The investors score highest on self-direction, which emphasizes independence and setting one's own goals. They are also clearly above the others on achievement and power, and below the others in benevolence and universalism, which corresponds to what I hypothesized. The investors' low score on security values seems to stem from their relatively high willingness to take on risk, shown in Table 2 above.

Interestingly, the non-investors who are not interested in investing differ quite notably from the investors when looking at the value preferences, even though the differences were quite small regarding income and wealth, for example. The non-interested non-investors score highest on security and conformity, indicating that they do not appreciate risks and excitement as much as order and stability. They also find achievement values to be of little importance compared to the other subgroups.

The non-investors not aware of investing also stand out in several value types. For example, they score highest on hedonism and benevolence. As mentioned above, Schwartz (2007) found that hedonism and benevolence both predict social involvement, and as the non-aware were also the most socially active according to Table 2, the pattern found in my sample is consistent with previous value research. It could also be suggested that the non-aware, being the most hedonistic subgroup, spend their free time looking for present-day pleasures rather than thinking about their future savings, which leads to their non-awareness of financial assets. A more surprising observation that can be made from Figure 4 is that the non-aware are lowest on stimulation values, which express daringness and the pursuit of a varied life. It seems that their seeking of comfort in life goes beyond their desire for excitement.

4.3.3 Variables received from part two of the questionnaire – the two value dimensions

In spite of the mainly expected and justifiable results, it must be taken into account that, as pointed out by Verkasalo et al. (2009), the 21-item PVQ may be unreliable if used to calculate scores for all the ten value types. This is because conceptually large constructs are covered with only a couple of items in the questionnaire. The solution they provide is to calculate the two variables called Conservation and Self-Transcendence, which represent the two broader value dimensions. Next, the value orientations will thus be portrayed on a two-dimensional scale, where the locations of the different subgroups have been calculated using the equations provided in Appendix B.
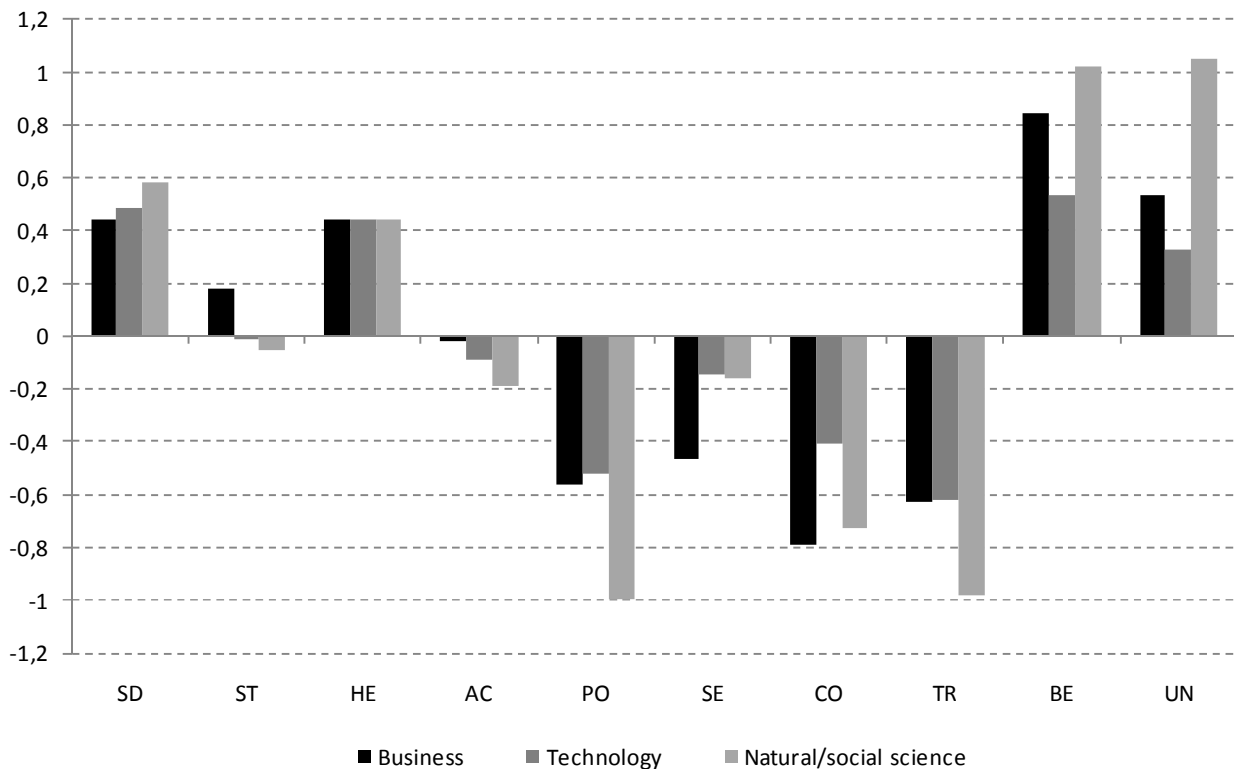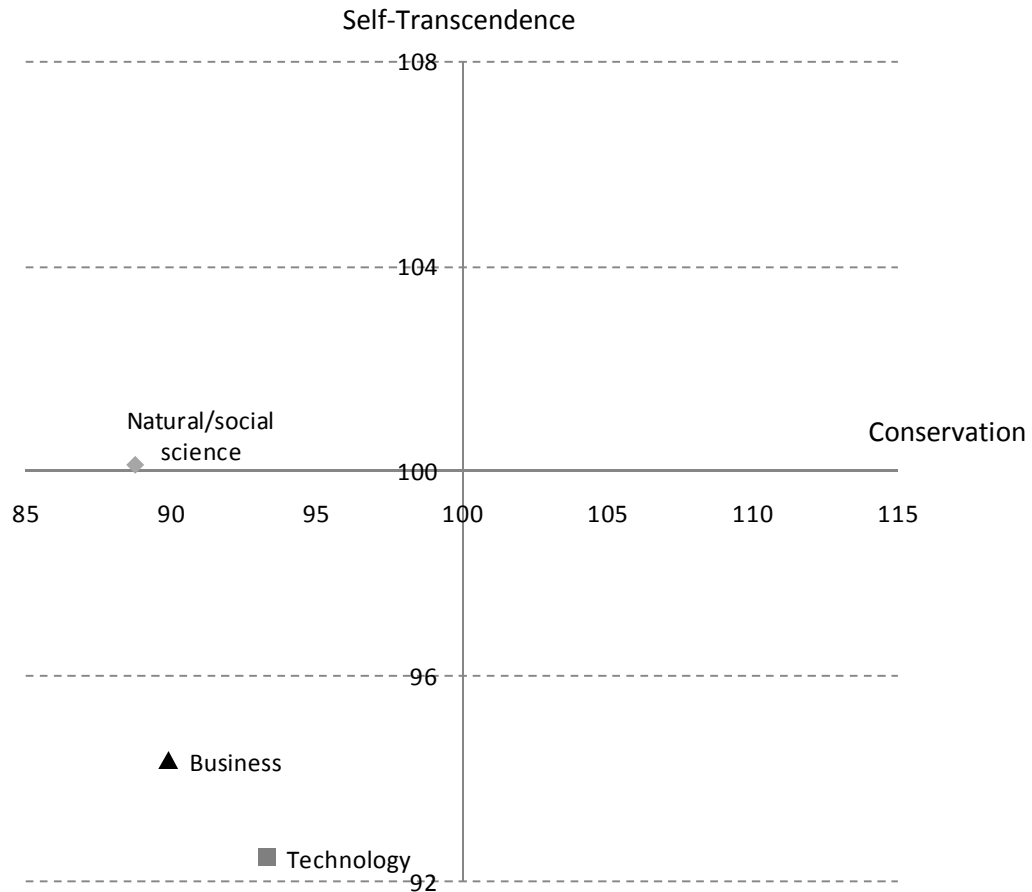
Figure 5. The average scores of the respondents on the two value dimensions, grouped according to field of study
This figure shows the average scores received for the two value variables, Conservation and Self-Transcendence, by the students of the different fields. The scores were calculated from the responses given to the Portrait Values Questionnaire using the equations provided by Verkasalo et al. (2009). The variables are based on the value theory of Schwartz (1992). A low Self-Transcendence score means that the respondent emphasizes Self-Enhancement values more than Self-Transcendence values. A low Conservation score means that the respondent emphasizes Openness to Change values more than Conservation values.

In Figure 5, the value orientations of the students of different fields are presented. The surprising order of the business and technology students in benevolence and universalism values, mentioned in the context of Figure 3 above, is also seen here as the technology students' lower Self-Transcendence score. This indicates that the technology students in my sample are more concerned about their own relative success than the other students, while in Verkasalo's (1996) sample the locations of the business and technology students were reversed. A reason for my unexpected finding could be the high proportion of men among the technical students, as mentioned above. As expected, the natural/social science students score highest on Self-Transcendence, suggesting they put most emphasis on the welfare of others, for example family and friends.

Regarding the other variable, Conservation, the differences are smaller. The natural/social science students' score on the horizontal dimension is slightly lower than that of the other students, which

means that according to the figure, they give the most weight to independent thought and variation in life. The technology students, on the other hand, are closest to the Conservation end of the dimension, meaning that traditions, security, and stability are somewhat more important to them than to the others. However, as all the subgroups are located on the left side of the scale, they all seem to be tilted towards Openness to Change rather than Conservation.
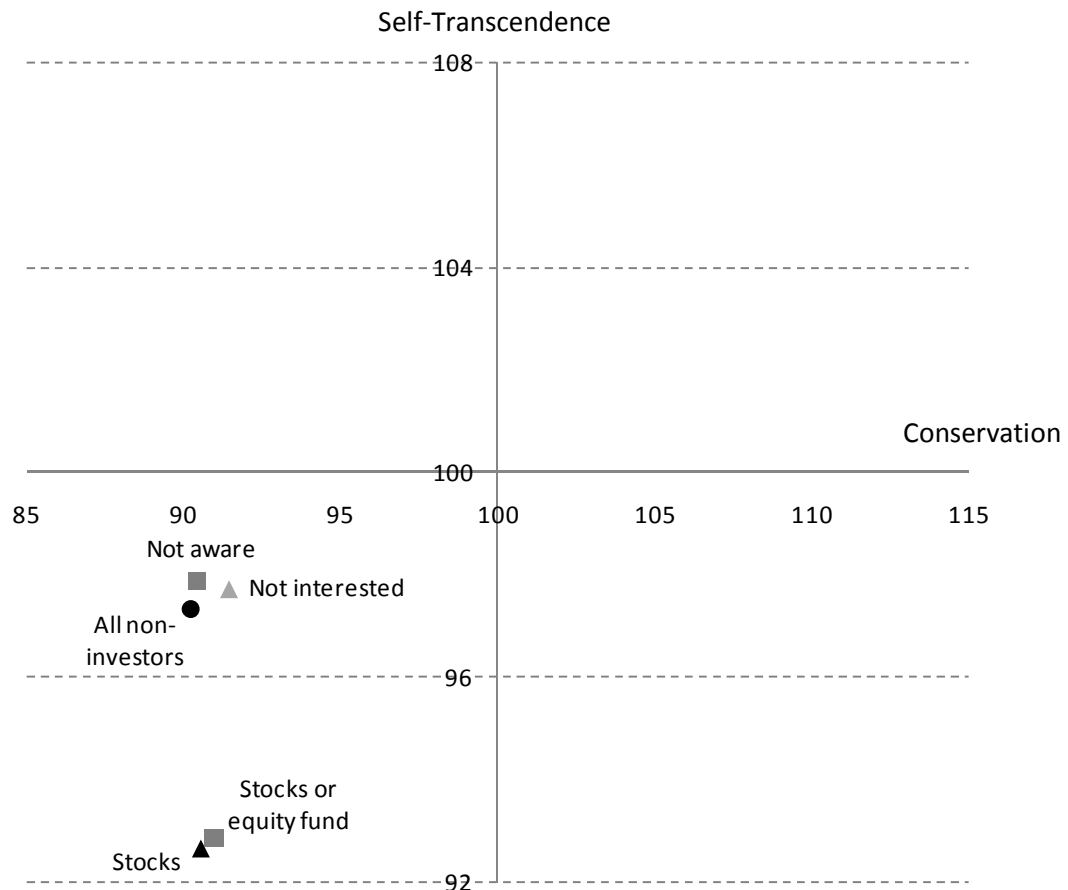
Figure 6. The average scores of the respondents on the two value dimensions, grouped according to investment experience
This figure shows the average scores received for the two value variables, Conservation and Self-Transcendence, by the respondents with different relationships to investing. The scores were calculated from the responses given to the Portrait Values Questionnaire using the equations provided by Verkasalo et al. (2009). The variables are based on the value theory of Schwartz (1992). In the group Stocks, the respondents have directly invested in stocks. In the group Stocks or equity fund, the respondents have invested either in stocks or an equity fund. In the group Not aware, the respondents have not invested in stocks or equity funds due to lack of awareness about these assets. In the group Not interested, the respondents have not invested in stocks or equity funds due to lack of interest. In the group All non-investors, all the respondents who have not invested in stocks or equity funds are included, regardless of the reason. A low Self-Transcendence score means that the respondent emphasizes Self-Enhancement values more than Self-Transcendence values. A low Conservation score means that the respondent emphasizes Openness to Change values more than Conservation values.

When the respondents are grouped according to their investment experience, as in Figure 6, it can be seen that there is practically no variance on the Conservation scale, while on the Self-Transcendence scale the investors are located clearly below the non-investors. This corresponds to my null hypothesis. When it comes to investing, the Self-Transcendence dimension seems more relevant, and the stock market participants should arguably score lower on this scale. For example, stock prices are particularly dependent on the performance of the companies relative to their peers, so it might be feasible to believe that the stock investors apply this mentality on some other areas in life as well.

4.3.4 Preliminary examinations about associations between variables

To provide a better understanding about how the ten value types and the broader value variables relate to investing and the explanatory variables, I next present a table showing the correlation coefficients between the value scores and the other variables received from the questionnaire. This gives a good overview of the factors covered in the study that are be influenced by value orientation. Furthermore, it can be seen whether the associations are similar to those found in previous literature.

Table 4. Correlations of the value variables with investment experience and the hypothesized determinants of stock market participation
This table presents the correlation coefficients between the different value variables, including both the individual value types and the variables related to the broader value dimensions, and the other variables obtained from the questionnaire. The Stocks or equity fund –dummy expresses whether a respondent has invested either in stocks or an equity fund. The Not aware and Not interested –dummies express whether a respondent has not invested in stocks or equity funds due to lack of awareness or due to lack of interest, respectively. The Helsinki area –dummy expresses whether a respondent was born in the Helsinki area. The Business, Technology, and Natural/social science – dummies express field of study. For risk attitude, social activeness, right-wing political orientation, and income, the scales shown were used in the responses. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. *, **, and *** mean that the correlation coefficients are statistically significant on the 5%, 1%, and 0,1% levels, respectively.

| | Individual value types: | | | | | | | | | | Value dimensions: | |
	SD	ST	HE	AC	PO	SE	CO	TR	BE	UN	Conser-vation	Self-Transcendence
Stocks or equity fund (dummy)	0,046	0,087	**-0,134***	0,066	**0,230***	-0,036	0,023	0,036	**-0,190***	**-0,186**	0,061	**-0,215***
Not aware (dummy)	-0,032	**-0,141***	**0,122***	-0,009	**-0,153**	0,053	-0,001	-0,069	**0,196***	0,086	-0,017	**0,135***
Not interested (dummy)	-0,033	-0,038	-0,067	-0,093	-0,040	0,064	0,064	0,034	0,007	0,094	0,034	0,071
Age	**0,152**	0,098	**-0,169**	**-0,132***	-0,059	0,104	-0,053	-0,058	0,010	**0,130***	-0,060	**0,122***
Male (dummy)	0,024	0,046	-0,050	0,072	**0,266***	-0,052	-0,005	**0,156**	**-0,348***	**-0,187**	0,072	**-0,290***
Helsinki area (dummy)	-0,050	-0,022	0,078	0,037	0,023	0,032	-0,036	-0,073	-0,011	0,025	-0,025	-0,040
Business (dummy)	-0,053	**0,114***	-0,008	0,026	**0,114***	**-0,140***	-0,089	0,101	0,030	-0,088	-0,044	-0,079
Technology (dummy)	-0,003	-0,031	0,007	0,029	**0,157**	0,064	**0,134***	0,092	**-0,257***	**-0,289***	**0,169**	**-0,22***
Natural/social science (dummy)	0,055	-0,083	0,001	-0,054	**-0,266***	0,077	-0,042	**-0,188**	**0,219***	**0,367***	**-0,120***	**0,294***
Year of study	0,056	**0,123***	-0,034	-0,031	0,054	0,014	-0,061	-0,045	-0,069	-0,011	-0,063	-0,057
Risk attitude (0-10)	**0,136***	**0,469***	0,047	0,050	0,019	**-0,346***	**-0,195***	-0,058	-0,033	-0,053	**-0,334***	-0,081
Social activeness (0-10)	-0,014	**0,382***	**0,315***	-0,020	-0,058	**-0,220***	**-0,224***	**-0,119***	**0,136***	**-0,116***	**-0,294***	-0,011
Right-wing orientation (0-10)	-0,045	0,094	0,022	0,084	**0,346***	**-0,119***	0,030	**0,120***	**-0,270***	**-0,347***	0,071	**-0,366***
General trust (dummy)	-0,062	**0,129***	0,105	0,001	-0,047	**-0,131***	**-0,115***	**-0,190**	**0,248***	**0,140***	**-0,199***	**0,119***
Income (1-5)	0,007	0,022	-0,066	-0,028	**0,163**	0,052	-0,012	0,056	**-0,193***	-0,043	0,045	**-0,118***
Log (assets)	0,082	0,073	0,007	**-0,144***	-0,005	-0,036	0,048	0,075	-0,100	-0,013	-0,022	0,010
Log (liabilities)	0,004	**0,143***	0,039	-0,039	-0,036	-0,080	-0,096	0,004	0,082	0,012	**-0,120***	0,036
Parents (dummy)	0,056	0,018	-0,031	-0,082	-0,022	-0,013	0,047	0,036	-0,020	0,008	0,006	0,028

The correlation coefficients in Table 4 confirm what was already suggested by the graphs above; Self-Transcendence is highly negatively correlated with investing in stocks or an equity fund. At the same time, the correlations between not being aware of stocks and the value types are basically the opposite. The correlations for being male are quite similar to those for being an investor, which makes sense, as 75% of the respondents who had invested in stocks or equity funds were men. It also looks like the men in the sample favour tradition values more than the women. For the groups of students, the correlations could also be expected from the graphs, as being a technical student correlates very negatively with Self-Transcendence, and being a natural/social science student positively.

The correlations between values and the previously found determinants of stock market participation are an interesting sight. Willingness to take risk correlates highly positively with stimulation values, and highly negatively with security and conformity values. Thus the risk takers seem to prefer Openness to Change rather than Conservation. Similar associations are seen for social activeness, except for the fact that it also correlates positively with hedonism, indicating that the respondents seek personal pleasure in socializing. For right-wing political orientation, the correlations are very similar to those of being an investor, which goes hand in hand with my null hypothesis and the results of previous research. Finally, it appears that general trust is positively influenced by benevolence and universalism, and negatively by security, conformity, and tradition. This supports the value literature and my hypothesis, but goes against the suggestion of Guiso et al. (2008), assuming that the equity investors are more Self-Transcendence oriented, which seems to be the case in my sample.

Income and wealth seem to be relatively independent of value orientation in my sample. One exception is seen in benevolence, which correlates negatively with income. Here we must remember, however, that income was given as an estimate relative to other students instead of an exact number. Thus it could be reasoned that the people who consider it important to be well off relative to others, indicated by a low benevolence score, at least want to believe that their disposable income is higher than average. This would make them more likely to mark their income in the upper end of the scale.

Finally, as the last table of the chapter, I include a correlation matrix showing how the different explanatory variables relate to one another. This is also useful for the analysis to come, and provides further detail about the sample characteristics.

Table 5. Mutual correlations between the variables received from part one of the questionnaire
This table shows the correlation coefficients of all the variables received from part one of the questionnaire with each other. The Stocks or equity fund –dummy expresses whether a respondent has invested either in stocks or an equity fund. The Not aware and Not interested –dummies express whether a respondent has not invested in stocks or equity funds due to lack of awareness or due to lack of interest, respectively. The Helsinki area –dummy expresses whether a respondent was born in the Helsinki area. The Business, Technology, and Natural/social science –dummies express field of study. For risk attitude, social activeness, right-wing political orientation, and income, the scales shown were used in the responses. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. *, **, and *** mean that the correlation coefficients are statistically significant on the 5%, 1%, and 0,1% levels, respectively.

	Stocks or equity fund (dummy)	Not aware (dummy)	Not interested (dummy)	Age	Male (dummy)	Helsinki area (dummy)	Business (dummy)	Techno-logy (dummy)	Natural/ soc. science (dummy)	Year of study	Risk attitude (0-10)	Social activeness (0-10)	Right-wing orientation (0-10)	General trust (dummy)	Income (1-5)	Log (assets)	Log (liabilities)	Parents (dummy)
Stocks or equity fund (dummy)	1																	
Not aware (dummy)	-0,448***	1																
Not interested (dummy)	-0,304***	-0,276***	1															
Age	0,181**	-0,227***	0,110	1														
Male (dummy)	0,325***	-0,265***	-0,057	-0,046	1													
Helsinki area (dummy)	0,071	-0,048	-0,017	-0,119*	0,035	1												
Business (dummy)	0,166**	-0,266***	-0,074	0,030	-0,065	0,040	1											
Technology (dummy)	0,066	0,049	-0,054	-0,150**	0,472***	0,011	-0,481***	1										
Natural/soc. science (dummy)	-0,229***	0,216***	0,126*	0,116*	-0,394***	-0,050	-0,523***	-0,495***	1									
Year of study	0,322***	-0,239***	-0,088	0,520***	0,128*	0,065	0,125*	0,038	-0,162**	1								
Risk attitude (0-10)	0,215***	-0,178**	-0,088	0,117*	0,107	0,073	0,101	-0,021	-0,080	0,010	1							
Social activeness (0-10)	-0,065	0,109	-0,077	-0,008	-0,105	-0,073	0,138**	-0,062	-0,076	0,051	0,333***	1						
Right-wing orientation (0-10)	0,227***	-0,212***	-0,148*	0,027	0,132*	0,004	0,342***	0,065	-0,403***	0,153**	0,216***	0,079	1					
General trust (dummy)	-0,141*	0,057	0,071	-0,014	-0,086	-0,019	-0,010	-0,123*	0,129*	-0,103	0,002	0,182**	-0,112	1				
Income (1-5)	0,236***	-0,187**	0,181**	0,316***	0,115*	0,003	-0,011	0,123*	-0,109	0,148*	0,033	-0,068	0,125*	-3,22E-18	1			
Log (assets)	0,346***	-0,212***	0,067	0,241***	0,096	0,059	0,077	0,032	-0,107	0,212***	0,135*	-0,057	0,203***	-0,021	0,341***	1		
Log (liabilities)	0,067	-0,191***	-0,049	0,292***	-0,020	-0,059	0,250***	-0,182**	-0,070	0,254***	0,224***	0,123*	0,174**	-0,010	-0,030	0,130*	1	
Parents (dummy)	0,243***	-0,125*	-0,026	-0,081	0,112	0,170**	0,125*	-0,033	-0,092	0,026	0,123*	0,024	0,115*	-0,062	0,079	0,217***	-0,039	1

Starting with the age variable in Table 5, it looks like the older respondents invest in stocks significantly more often, and are less often unaware of them. However, age is actually highly correlated with the year of study, which seems to associate to the same variables even more strongly. It also seems that the males in the sample, who show a high tendency of being investors or at least aware of stocks and equity funds, are a bit further in their studies than the females. As expected based on the statistics presented above, being a business student shows a high positive correlation with being an investor and a negative one with being unaware of stocks, while the effect is reversed for the natural/social science students.

Some of the literature-based predictors of stock market participation also show expected correlations with being an investor, as well as with each other. High willingness to take risk correlates positively with the Stocks or equity fund –dummy, and negatively with the Not aware – dummy. Furthermore, risk attitude shows strong positive correlations with both social activeness and right-wing political orientation. While social activeness gets few other significant correlation coefficients, the right-wing variable shows the expected associations with the investment dummies, and also seems to increase with the year of studies. This is probably related to the fact that the business students, who on average had studied a bit longer than the other students, seem to be markedly more right-wing oriented than the others. The correlations experienced by general trust are quite weak, and the direction is in most cases not the one suggested by previous research on stock market participation.

For income and wealth, the correlations are mainly as expected, and the most interesting associations are found for the liabilities. It seems that the business students are significantly more likely to have debt than the technical students, who were more fond of security according to their value orientation as well. Further, the people who are right-wing oriented and willing to take risk, both characteristics typical to business students, appear to have more debt than the others. One reason for this could be the higher level of knowledge that the business students arguably should have about financial products. This could make it less ambiguous for them to take debt. Alternatively, when considering that the business students are most likely to invest, one could hypothesize that they have taken some loans to be able to finance their investments.

The last variable in the table, expressing whether the parents of the respondent have invested in stocks or equity funds, is also worth examining. Having parents who invest correlates positively with being an investor and negatively with being unaware of investing. The correlation with assets

is also highly positive, suggesting that the respondents whose parents invest are wealthier than the others. Interestingly, the variable also shows a positive association with being born in the Helsinki area, which means that the parents of the respondents born in the Helsinki area are more likely to own stocks than the parents of the people coming from other areas in Finland. This is not so surprising when one remembers the words of Karhunen and Keloharju (2001), who report that the proportion of households holding stocks is larger in the Helsinki area than elsewhere in the country.

4.4 The statistical tools used for the main analysis

So far in this chapter, I have described my sample by showing some general trends and tendencies. In Chapter 5, I will move on to more specific analyses about the determinants of the value variables, the determinants of stock market participation, and the reasons behind non-investing. Here, I provide a brief elaboration on the statistical methods used, because knowing the logic behind them is key for understanding my results.

4.4.1 Mean similarity tests

To find potential differences between investors and non-investors, I conduct mean similarity tests. A mean similarity test can be used to tell whether two samples differ on a given variable or characteristic. For example, this kind of a test would be useful if one would like to know whether an average investor is wealthier than an average non-investor.

Mathematically, the idea of a mean similarity test is simply to compare the averages of two groups between each other on a given variable. Based on the sample size and the standard deviation of the variable in each group, the test will then reveal whether one of the averages is statistically significantly different from the other. Statistical significance is determined based on t-statistics, which are reported in conjunction with the difference in means.

4.4.2 Regression analyses

Most of my results are obtained through regression analysis. I conduct regressions to find the determinants for the value variables and stock market participation, and to find the factors that contribute to not being interested in stocks or equity funds. Through regression analysis, the impact of outside variables on a variable of interest can be assessed. For example, the effect of income on stock market participation could be examined.

Regression analysis is based on a linear equation, where the dependent variable is explained by other variables. The dependent variable will be the phenomenon studied, such as stock market participation. The other, explanatory variables will be factors thought to have an impact on this phenomenon, such as age, wealth, and political orientation. Each of the explanatory variables will get an estimated coefficient depicting the magnitude of its impact on the dependent variable.

For studying the factors that influence the Conservation and Self-Transcendence variables, I use ordinary least squares (OLS) regressions. The OLS method is now appropriate, because the dependent variables are continuous, freely getting any values based on the Verkasalo et al. (2009) equations. For example, age could be used as one of the explanatory variables for Conservation. If the coefficient for age turns out to be positive, it means that the older the respondent, the higher he or she tends to score on Conservation. This effect must not be very significant, however. To tell between the statistically significant and insignificant coefficients, t-statistics are provided for each coefficient. The t-statistics in my tables have been corrected for heteroskedasticity using the so-called White-test. To assess the significance of the entire regression equation, a coefficient of determination called R^2 can be used. The maximum value for R^2 is one, which means that the equation perfectly explains the phenomenon of interest. The minimum value is zero, meaning that the equation has no explanatory power whatsoever.

For studying the determinants of stock market participation and not being interested in stocks or equity funds, I use binary choice regressions. This is necessary because the dependent variables are now dummies, getting either the value of zero or one. Thus the name binary choice. For instance, the not interested –dummy gets the value of one if a respondent has not invested in stocks or equity funds due to lack of interest, and zero otherwise. Wealth, for example, could be used as an explanatory variable for non-interest. If the coefficient for wealth is negative, the interpretation is that the wealthier the respondent, the smaller the probability that he or she has not invested in stocks or equity funds due to lack of interest. In general, a negative coefficient indicates a decreasing probability of the dependent variable taking the value of one.

There are several binary choice models, such as logit, probit, and tobit. However, they all yield relatively similar results. The one I choose to utilize is the probit model, which has previously been used to investigate the factors influencing stock market participation by Kaustia and Torstila (2008), for example. Similarly as the t-statistics and R^2's for the OLS coefficients, I provide

heteroskedasticity corrected z-statistics and McFadden R^2's for the probit results. The McFadden R^2 is a so-called pseudo-R^2, and it is better suited for a binary choice model than the regular R^2.

5. Results

The results have been divided into four sections. In the first one, I test the value theory with my data to confirm that the PVQ has measured the correct things in my sample. The second section compares investors to non-investors using mean similarity tests. In the third section, I finally test my null hypothesis by examining whether the value variables predict stock market participation. The fourth section concentrates on the reasons for non-participation by searching for differences between the non-interested and the other groups of non-investors.

5.1 Testing the value theory

In this section, I first present the determinants of the Conservation and Self-Transcendence variables, thus making sure that they capture the relevant characteristics and not something else. Then, I look into the sinusoid-hypothesis of Schwartz (1992), presented above in Section 2.1, to see how well stock market participation fits into the value theory.

5.1.1 Determinants of value orientation – the current sample versus previous literature

To further test the validity of the 21-item PVQ and the Self-Transcendence and Conservation variables of Verkasalo et al. (2009), I run OLS regressions with each of the two variables as the dependent variable and the demographic variables received from the questionnaire as explanatory variables. This way it can be seen whether the variables I am using now are consistent with the value theory and previous findings. If not, setting hypotheses based on these variables can hardly be justified.

Table 6. Explaining the Conservation and Self-Transcendence variables with demographics
This table explains the Conservation and Self-Transcendence variables, as calculated from the responses to the Portrait Values Questionnaire, by means of OLS regression. The Year of study –variable is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected t-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable:	
	Conservation	Self-Transcendence
Male (dummy)	0,15	-4,24***
	(-0,13)	(-3,38)
Age	-0,01	0,37***
	(-0,09)	(2,70)
Year of study (cap at 6)	-0,82*	-0,12
	(-1,84)	(-0,25)
Year of study > 6 (dummy)	4,77**	-4,38*
	(1,99)	(-1,77)
Income (1-5)	0,28	-1,49**
	(0,42)	(-2,14)
Log (assets)	-0,12	0,48
	(-0,39)	(1,35)
Log (liabilities)	-0,14	0,12
	(-0,46)	(0,37)
Technology (dummy)	1,35	0,37
	(0,93)	(0,22)
Nat./soc. science (dummy)	-2,30*	2,96**
	(-1,73)	(2,11)
Risk attitude (0-10)	-1,35***	-0,28
	(-4,51)	(-0,94)
Parents (dummy)	0,81	2,33*
	(0,72)	(1,92)
Social activeness (0-10)	-0,79***	-0,03
	(-2,69)	(-0,12)
Right-wing (dummy)	0,70	-3,62***
	(0,56)	(-2,73)
General trust (dummy)	-3,15***	1,44
	(-2,83)	(1,15)
Constant	106,93	92,54***
	(29,36)	(22,76)
R^2	0,23	0,20
N	309	309

Table 6 does not add much to the information already seen in the correlations of Table 4, but it does give an idea about how well the value scores can be explained by demographics. The R^2 values for Conservation and Self-Transcendence are now 0,23 and 0,20, respectively. This means that the demographic variables included explain about one fifth of the variation in the value variables. The coefficients are not extremely high, but it is clear that the variables work relatively well in measuring an ambiguous concept like value orientation.

Further robustness is brought by the fact that the factors explaining the Conservation and Self-Transcendence variables are largely the ones expected based on the findings of Verkasalo (2009), Barnea (2003), and Schwartz (2001), for example. An interesting finding is the joint effect of age and year of study, which are now both included in the equations. As found by Schwartz (2001), Conservation and Self-Transcendence tend to increase with age, and Openness to Change and Self-Transcendence with level of education. The age variable seems to capture the increase in Self-Transcendence, while the age effect on Conservation seems to be captured by the dummy expressing that a respondent has studied more than six years. Then again, controlling for age, it seems that having studied more than six years decreases Self-Transcendence, even though the effect is not as strong as the positive one of age. Perhaps many of the respondents who have studied especially long could be taking multiple degrees, which might indicate that they are very success and achievement oriented and thus more inclined to Self-Enhancement values. In general, however, Openness to Change and Self-Transcendence should decrease with education, and this is at least reflected by the negative coefficient that the capped year of studies variable gets when explaining Conservation.

After seeing that the variables correctly measure the relevant characteristics of the respondents, it seems justified to hypothesize about the effects of Conservation and Self-Transcendence on investing. As explained in Chapter 3, my null hypothesis is that a high Self-Transcendence score will decrease the probability of a respondent being an equity investor, while the Conservation score is expected not to have an impact. Before moving on to study whether values actually predict participation in the stock market, however, I next examine the sinusoid curve –hypothesis of personal values and outside variables by plotting down the correlations between the ten value types and participation.

5.2.1 Investigating the sinusoid curve suggested by the Schwartz (1992) value theory

As elaborated in Section 2.1, the value theory predicts that the correlation curve between the ten value types and an outside variable would theoretically have a sinusoid form. This would mean that the curve is monotonous between the most positively and most negatively correlated values.
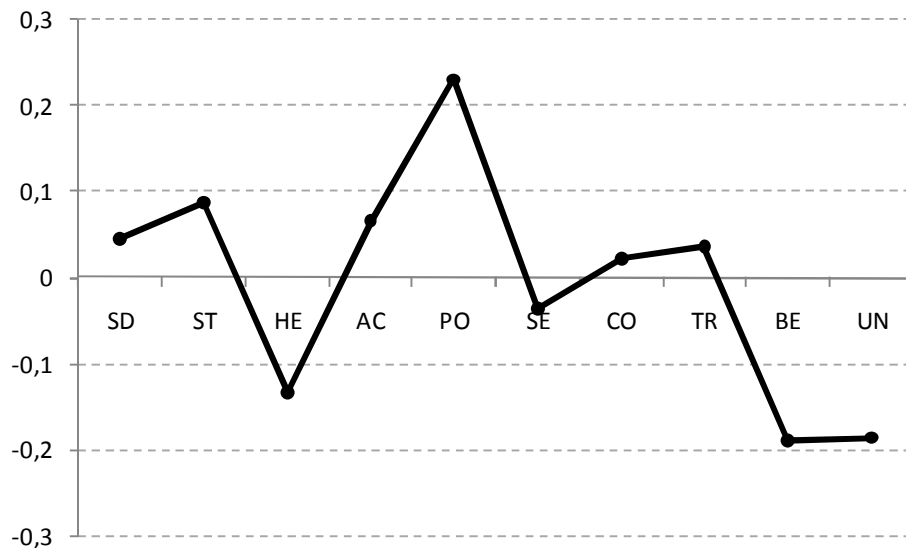
Figure 7. The curve of correlations between stock market participation and the ten value types
This figure tests whether the theory-suggested sinusoid form of the correlations between stock market participation and each of the ten value types applies in practice. From the axis on the left-hand side, the strength of the correlations can be seen. On the horizontal axis, the names of the value types have been abbreviated, and the explanations are as follows: SD=self-direction, ST=stimulation, HE=hedonism, AC=achievement PO=power, SE=security, CO=conformity, TR=tradition, BE=benevolence, UN=universalism.

Figure 7 shows that the value type correlating the most positively with stock market participation is clearly power. The most negatively correlated values are benevolence and universalism. This was already seen from the correlations in Table 4. Now, the sinusoid curve would require that from power to both left and right, the line would monotonically decrease, but this is not the case. The most notable deviations from the hypothesized form are the hedonism, achievement, and security value types.

The central goal of the hedonism value type, as presented in Table 1, is "pleasure and sensuous gratification for oneself". The reason why these goals might be less appreciated by the investors than what the theory predicts could be that in order to have money for investing as a student, one may have to give up some pleasures. If money is saved through, for example, living in a cheap apartment and eating simple food, a student may be able to invest, but might not consider life as pleasurable as otherwise.

"Personal success through demonstrating competence according to social standards" reads the central goal of the achievement value type in Table 1. Achievement, along with power, was hypothesized to associate positively with stock market participation, but for some reason it did not capture the effect as strongly as power, benevolence, and universalism. In the 21-item PVQ, the questions regarding achievement are about success, and the questions about power are about wealth and prestige. The central goal of the power value type is defined as "social status and prestige, control or dominance over people and resources". Apparently this goal more distinctly tells investors apart from the other students, while success and competence is more common to all the students in my sample.

Finally, security values' central goal is stated as "safety, harmony and stability of society, of relationships, and of self". This value type quite understandably correlates negatively with stock market participation, which is usually favored by people willing to take on some risk.

5.2 Comparing investors to non-investors

In this section, I compare the respondents who have participated in the stock market to the ones who have not. By conducting mean similarity tests, I am able to show the characteristics on which the investors are different from the non-investors.

Table 7. Mean similarity tests between investors and non-investors
In this table, it is tested whether the average investor differs from the average non-investor on the characteristics received from the questionnaire. In the group Stocks or equity fund, the respondents have invested either in stocks or an equity fund. In the group All non-investors, all the respondents who have not invested in stocks or equity funds are included, regardless of the reason. Standard deviations are presented for the quantifiable characteristics. Conservation and Self-Transcendence have been calculated from the Portrait Values Questionnaire. The Helsinki area –dummy expresses whether a respondent was born in the Helsinki area. The Business, Technology, and Natural/social science – dummies express field of study. For risk attitude, social activeness right-wing orientation, and income the scales shown were used in the responses. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. For the differences in means, t-statistics are presented below the actual figures in parentheses. *, **, and *** represent significance on the 5%, 1%, and 0,1% levels, respectively.

	Stocks or equity fund		All non-investors		Difference in means
	Mean	Standard deviation	Mean	Standard deviation	
Conservation	90,96	9,83	90,24	10,14	0,72 (0,61)
Self-Transcendence	92,87	10,39	97,32	10,15	-4,45*** (-3,65)
Age (years)	25,59	5,88	23,86	4,28	1,73** (2,70)
Male (dummy)	0,75		0,44		0,31*** (5,69)
Helsinki area (dummy)	0,62		0,55		0,08 (1,30)
Business (dummy)	0,50		0,28		0,21*** (3,71)
Technology (dummy)	0,33		0,29		0,04 (0,64)
Nat./soc. science (dummy)	0,19		0,43		-0,24*** (-4,65)
Year of study	5,19	3,95	3,34	1,60	1,85*** (4,60)
Risk attitude (0-10)	5,72	2,04	4,81	2,02	0,92*** (3,78)
Social activeness (0-10)	6,05	2,27	6,37	2,19	-0,33 (-1,22)
Right-wing orientation (0-10)	6,77	2,22	5,51	2,15	1,26*** (4,81)
General trust (dummy)	0,58		0,71		-0,14* (-2,36)
Income (1-5)	3,75	0,90	3,29	0,89	0,46*** (4,30)
Assets (€)	85 022	166 122	32 331	102 768	52 692*** (3,41)
Liabilities (€)	17 114	41 267	10 861	31 697	6 253 (1,42)
Parents (dummy)	0,72		0,48		0,24*** (4,31)

Table 7 presents the tests of similarity made for the average responses given by the two groups. The results for the tests largely follow the pattern that was seen in Section 4.3, being mainly as predicted, but also contradicting previous literature on some accounts.

As suggested by Figure 6, the investors and investors score similarly on the Conservation variable, but the investors score significantly lower on Self-Transcendence than the non-investors, meaning that on average, the investors are more concerned about their own relative success than the non-investors. The investors also seem to be slightly older, and the proportion of males among the investors is distinctively higher than among the non-investors. Place of birth seems not to be a relevant factor separating investors from non-investors, whereas the field of study has a high significance. There is a higher share of business students among the investors than the non-investors, whereas the situation is the opposite for the natural/social science students. Furthermore, the average investor is almost two years further in his studies than the average non-investor, indicating that investing is not topical for students during their first years of university.

Some of the personal characteristics found to affect stock market participation seem to be able to separate between investors and non-investors as well. For instance, risk attitude and right-wing political orientation are significantly higher for the investors, as expected. However, the social activeness of the two groups seems to be equal, and the general trust variable shows a difference that is only slightly significant and contradicts the previous research of Guiso et al. (2008).

Quite predictably, the disposable income and wealth of the investors are significantly higher than those of the non-investors. As shown earlier in Table 5, the respondents' wealth was highly correlated with their parents being investors, and accordingly, the proportion of respondents with investing parents is also higher among the investors. The fact that the investors and non-investors have similar amounts of debt is somewhat surprising, however. One could expect that the investors, being more willing to take risk and more aware about financial assets, would also have more debt, but apparently this is not the case in my sample.

5.3 Determinants of stock market participation

This section focuses on finding the factors that actually determine stock market participation in my sample. In other words, my null hypothesis will be either accepted or rejected based on the results in this section. First, I investigate the effect of the broad value dimensions by using the Conservation and Self-Transcendence variables. After that I look at the effect of the more specific

value types. Finally, I divide the respondents into smaller subsamples to see whether the factors determining participation differ from one group of people to the next.

5.3.1 Participation and the broad value dimensions

I now present probit regression models using the value dimensions as a part of the set of explanatory variables. After seeing the accounts on which the investors and non-investors significantly differ, it will be interesting to find out whether the same factors actually increase the probability of stock market participation.

Table 8. Explaining stock market participation using the broad value dimensions and controls

This table examines the determinants of stock market participation using Self-Transcendence as one of the explanatory variables. Specifications one through six are probits where the dependent variable takes the value of one if the respondent has invested in stocks or an equity fund, and zero otherwise. Self-Transcendence has been calculated from the answers given to the Portrait Values Questionnaire. The Year of study –variable is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable: Stocks or equity fund (dummy)					
	(1)	(2)	(3)	(4)	(5)	(6)
Self-Transcendence	-0,02**	-0,02*	-0,01	-0,02*	-0,01	
	(-2,00)	(-1,72)	(-1,48)	(-1,84)	(-1,57)	
Male (dummy)	0,82***	0,92***	0,89***	0,84***	0,82***	0,87***
	(4,40)	(4,56)	(4,37)	(4,15)	(3,86)	(4,16)
Year of study (cap at 6)	0,19***	0,15**	0,14**	0,13*	0,13**	0,13*
	(3,13)	(2,41)	(2,25)	(1,91)	(2,01)	(1,90)
Year of study > 6 (dummy)	0,59	0,78**	0,82**	0,89**	0,86**	0,92**
	(1,63)	(1,98)	(2,07)	(2,26)	(2,31)	(2,51)
Income (1-5)	0,08	0,09	0,09	0,10	0,10	0,11
	(0,72)	(0,81)	(0,90)	(0,92)	(0,88)	(1,00)
Log (assets)	0,32***	0,31***	0,29***	0,26***	0,25***	0,24***
	(3,82)	(3,63)	(3,46)	(3,20)	(3,08)	(2,91)
Technology (dummy)		-0,42*	-0,39*	-0,37	-0,39*	-0,39*
		(-1,90)	(-1,74)	(-1,62)	(-1,74)	(-1,76)
Nat./soc. science (dummy)		-0,30	-0,27	-0,23	-0,19	-0,25
		(-1,32)	(-1,19)	(-0,99)	(-0,77)	(-1,02)
Risk attitude (0-10)			0,10**	0,09**	0,11**	0,12**
			(2,18)	(2,07)	(2,33)	(2,47)
Parents (dummy)				0,47**	0,45**	0,40**
				(2,57)	(2,38)	(2,11)
Social activeness (0-10)					-0,06	-0,06
					(-1,46)	(-1,48)
Right-wing (dummy)					0,24	0,28
					(1,21)	(1,49)
General trust (dummy)					-0,30*	-0,31*
					(-1,69)	(-1,70)
Constant	-1,55	-1,38	-2,01*	-1,84*	-1,58	-2,99***
	(-1,56)	(-1,33)	(-1,87)	(-1,69)	(-1,38)	(-4,80)
McFadden R^2	0,25	0,26	0,28	0,29	0,31	0,30
N	308	308	308	308	308	308

Table 8 presents the results of probit regressions where the dependent variable takes the value of one if the respondent in question has invested in stocks or equity funds, and the value of zero otherwise. The Conservation and Self-Transcendence variables were both used to explain participation, but Conservation had no significant effect, as hypothesized. The specifications with Conservation as an explanatory variable are thus not included here, but they can be seen in Appendix C. Table 8 is therefore fully dedicated to exploring the effect of Self-Transcendence, which is my main variable of interest. In the first five specifications Self-Transcendence is always included, and the control variables differ. In the sixth one, Self-Transcendence is removed from the equation to see whether some of the other coefficients would notably react. Control variables are added when moving from one equation to the next, starting with the demographics, and later including the literature-based determinants of stock market participation.

The Self-Transcendence variable gets some explanatory power, but it can be seen that it is not the most essential component of any of the equations. The coefficients it gets are also small compared to the other variables, but this is explained by the fact that the coefficients depend on the scales of the explanatory variables. A coefficient reflects the effect that a one-point increase in an explanatory variable has on the probability of the dependent variable changing from zero to one. The Self-Transcendence variable gets values from approximately 65 to 120 in my sample. Thus it is natural that a one-point increase will have a small effect on the probability of a respondent being an investor compared to the other variables, which are often dummies or scaled from zero to ten.

A further look at the table reveals that the factors that most increase the probability of a respondent being an investor are being male, being relatively far in one's studies, being willing to take risks, being relatively wealthy, and having parents who have invested in stocks or equity funds. The strength of the male dummy is surprising, as it stands out as the variable with clearly the largest explanatory power in all five specifications. This means that in my sample, the men are highly more likely to invest than women, even when controlling for the other factors.

Year of studies is used and age left out of the equation, because the two are highly correlated, and with year of studies in the equation age has no statistical significance. Two variables are used to cover the year of studies. The first one is capped at six years, so that all observations above six are made equal to six. The second one is a dummy that equals one for the values greater than six, and zero otherwise. This alleviates the problem caused by potential outliers. It can be seen that when control variables are added, the dummy variable for older students gains in significance, while the

variable expressing the years of study from one to six loses significance. An interpretation would be that the older students differ from the younger ones on the characteristics that are added to the equation later, such as political orientation or their parents being investors. When these factors are controlled for, the respondents who have studied longer are more likely to invest than the others.

It is also unexpected that income has no effect on investing. When assets are left out of the equation, income becomes statistically significant, but when wealth is controlled for, income seems to be irrelevant. Now, it must be remembered that I ask about the disposable amount of money that the respondent has per month, not actual income. As the income for a student is unlikely to be very high even from a relatively well-paid job, it is probable that the people who have extra money for investing are the ones who have a lot of wealth instead of the ones with monthly earnings. This could explain that it is the wealth, not monthly income, that explains stock market participation in my sample. Liabilities were also included in unreported regressions, but as already suggested by the mean similarity tests in Table 7, they had no statistical significance, and were thus left out of the final specifications.

The effect of field of study is interesting as well. Compared to business students, the natural/social science students are not significantly less likely to participate in the stock market, other things being equal. However, being a technical student gets a statistically significant negative coefficient in nearly all specifications. Thus, even though the natural/social science students had the least investors among them, it is as probable for them to invest in stocks or equity funds as for the business students, provided that they are similar on the other characteristics that are controlled for.

As mentioned, risk attitude is an element clearly affecting the investment behavior of the students in my sample. However, the other personality-related determinants do not give the results suggested by previous research. Here, right-wing political orientation is portrayed by a dummy that gets the value one if the respondent has marked eight or higher on the zero to ten scale provided in the questionnaire. Similar dummies were created for risk attitude and social activeness as well, both for the high and low ends of the scale, but there was no effect on the final results. The Right-wing – dummy and the Social activeness –variable remain insignificant, and instead of the positive coefficients expected for social activeness, they are actually negative.

The General trust –dummy is the biggest deviation from previous research, however, as it gets a statistically significant negative coefficient in the equation. The previous chapters predicted this as well. It seems that being generally trusting towards other people has a negative effect on the

probability of being an investor, meaning that a typical investor in my sample is rather of the skeptical type.

The fact that a respondent's parents are investors seems to have a relatively large positive effect on the chances of the respondent being an investor. This could be explained by the correlation of wealth and the Parents-dummy, saying that the people whose parents are investors tend to be wealthier than the others. However, as wealth is also controlled for, it seems that these people just get familiar with stocks more easily. Potentially they first receive stocks from their parents as a gift, for example, and then start to take care of their portfolios themselves later on.

5.3.2 Participation and the more specific value types

After reporting the results concerning the explanatory power of the two value dimensions, I now show how well the more specific value types predict stock market participation. As mentioned above, both concepts have their benefits, and while the value dimensions are more reliable in conjunction with short questionnaires, valuable information can be left unfound if the more specific value types are disregarded.

According to Bardi and Schwartz (2003), power and universalism are reasonably strong predictors of behavior that is compatible with the motivational goals that they express. On the other hand, they state that achievement and benevolence are weak predictors of actual behavior. Thus, in Chapter 3, I hypothesized that even though all of these value types should in principle predict participation, power and universalism would be better predictors than achievement and benevolence. Indeed, the regressions I run support this hypothesis. In Table 9, I therefore concentrate on the specifications including power and universalism as explanatory variables. Specifications including the weaker predictors, achievement and benevolence, can be found in Appendix C.

Table 9. Explaining stock market participation using the ten value types and controls

This table examines the determinants of stock market participation using the power and universalism value types as part of the equations. Specifications one through six are probits where the dependent variable takes the value of one if the respondent has invested in stocks or an equity fund, and zero otherwise. Power and universalism have been calculated from the answers given to the Portrait Values Questionnaire. The Year of study –variable is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable: Stocks or equity fund (dummy)					
	(1)	(2)	(3)	(4)	(5)	(6)
Power	0,30***	0,27**	0,29**			
	(2,84)	(2,51)	(2,51)			
Universalism				-0,27**	-0,29**	-0,29**
				(-2,47)	(-2,35)	(-2,23)
Male (dummy)	0,82***	0,93***	0,84***	0,86***	1,02***	0,91***
	(4,39)	(4,68)	(3,98)	(4,66)	(5,07)	(4,34)
Year of study (cap at 6)	0,19***	0,15**	0,12*	0,19***	0,15**	0,13*
	(2,97)	(2,25)	(1,82)	(3,04)	(2,29)	(1,89)
Year of study > 6 (dummy)	0,75**	0,98**	1,07***	0,81**	1,07***	1,13***
	(1,98)	(2,47)	(2,78)	(2,13)	(2,67)	(2,98)
Income (1-5)	0,05	0,07	0,08	0,10	0,12	0,13
	(0,49)	(0,63)	(0,70)	(0,99)	(1,12)	(1,20)
Log (assets)	0,32***	0,31***	0,26***	0,30***	0,29***	0,23***
	(3,85)	(3,64)	(3,15)	(3,80)	(3,59)	(3,00)
Technology (dummy)		-0,46**	-0,44*		-0,54**	-0,50**
		(-2,10)	(-1,94)		(-2,45)	(-2,22)
Nat./soc. science (dummy)		-0,32	-0,20		-0,27	-0,16
		(-1,38)	(-0,83)		(-1,16)	(-0,65)
Risk attitude (0-10)			0,13***			0,13***
			(2,65)			(2,59)
Parents (dummy)			0,45**			0,43**
			(2,65)			(2,26)
Social activeness (0-10)			-0,04			-0,06
			(-1,05)			(-1,48)
Right-wing (dummy)			0,12			0,19
			(0,61)			(0,95)
General trust (dummy)			-0,33*			-0,26
			(-1,80)			(-1,39)
Constant	-2,90***	-2,61***	-2,87***	-3,06***	-2,75***	-2,94***
	(5,68)	(-4,98)	(-4,50)	(-6,11)	(-5,36)	(-4,65)
McFadden R^2	0,27	0,28	0,33	0,26	0,28	0,33
N	308	308	308	308	308	308

The results seen in Table 9 are otherwise similar as in the context of the two value dimensions, but the significance levels received by the power and universalism value types are notably higher than the one achieved by the Self-Transcendence variable. As the coefficients are significant at the five percent level even with all of the controls included, my null hypothesis is confirmed. The explanatory power of the value types is far stronger than that of educational orientation, for example, and only slightly behind that of risk attitude or having parents who invest.

The reason for the stronger results with the individual value types compared to the value dimensions is the loss of information that is suffered in conjunction with the Conservation and Self-Transcendence variables, as described by Verkasalo et al. (2009). The value types are more specific and informative, but might be burdened by a lack of accuracy when using only the 21-item PVQ. However, the results are very much in line with the initial hypothesis I formulated based on existing literature, and they can also be intuitively justified. It can therefore be reasonably assumed that this problem is not too severe in my sample, and that the results are reliable.

5.3.3 Subsample analyses

In this section, I divide the respondents into different subsamples to see whether the same factors determine participation for seemingly different people. Specifically, I focus on Self-Transcendence, social activeness, political orientation, and general trust, because these variables have substantial relevance to the study, but lack power or behave unexpectedly in the full-sample regressions. The subsamples I investigate are (1) the students of each field, (2) men and women, (3) the respondents who have studied longer than median and the rest, (4) the ones with higher than median wealth and the rest, and (5) the ones whose parents had invested in stocks or equity funds and the rest. These groupings are chosen as intuitively meaningful, and also because these five criteria for division all have substantial significance for stock market participation. Even though the sample sizes get small, some interesting patterns can be seen. For ease of presentation, I now summarize the results, only reporting the coefficients of specific interest for each equation. However, all of the control variables listed in Table 8 are included in each equation.

Table 10. Summarized results of subsample regressions with only variables of interest reported
This table provides a summary of the determinants of stock market participation in different subsamples, only partly reporting the equations. All specifications are probits where the dependent variable takes the value of one if the respondent has invested in stocks or an equity fund, and zero otherwise. Self-Transcendence has been calculated from the answers given to the Portrait Values Questionnaire. For social activeness the scale shown was used in the responses. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Other factors controlled for in each equation are gender, year of study, income, wealth, field of study, risk attitude, and the investment experience of a respondent's parents. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable: Stocks or equity fund (dummy)				
	Self-Transcendence	Social activeness (1-10)	Right-wing (dummy)	General trust (dummy)	N
Field of study:					
Business	-0,01	0,01	0,12	-0,30	110
	(-0,65)	(0,08)	(0,37)	(-0,87)	
Technology	-0,01	-0,11	0,80**	-0,59**	94
	(-0,42)	(-1,44)	(2,19)	(-2,00)	
Natural/social science	-0,06**	-0,11	-1,38**	0,31	104
	(-2,11)	(-1,30)	(-2,42)	(0,51)	
Gender:					
Female	-0,04**	-0,08	-0,73*	0,70*	139
	(-2,20)	(-0,87)	(-1,79)	(1,74)	
Male	-0,004	-0,08	0,71***	-0,70***	169
	(-0,34)	(-1,59)	(2,85)	(-3,14)	
Year of study:					
Median or below	-0,02	-0,06	0,17	-0,26	223
	(-1,48)	(-1,27)	(0,74)	(-1,21)	
Above median	-0,01	-0,14	0,68*	-0,58	85
	(-0,33)	(-1,46)	(1,67)	(-1,52)	
Wealth:					
Median or below	-0,02	-0,11*	0,08	-0,66**	163
	(-1,13)	(-1,77)	(0,27)	(-2,34)	
Above median	-0,02	-0,04	0,28	0,07	145
	(-1,38)	(-0,66)	(0,94)	(0,26)	
Investing parents:					
No	-0,03**	-0,04	0,75**	-0,18	136
	(-2,05)	(-0,57)	(2,18)	(-0,62)	
Yes	-0,01	-0,06	-0,05	-0,33	172
	(-0,63)	(-1,12)	(-0,22)	(-1,45)	

When read from left to right, it can be seen from Table 10 how each of the four variables chosen predicts stock market participation in a given subsample. The equations are again probit regressions with the stocks or equity fund –dummy as the dependent variable, taking the value of one if a respondent has invested in stocks or equity funds, and zero otherwise.

According to Table 10, it seems that the influence of value orientation is most significant for the natural/social science students, the women, and the respondents whose parents do not invest. In other words, in the groups where investing is not very common, personal values seem to play a bigger role. This result is strongly supported by the findings of Bardi and Schwartz (2003), who study the effect of personal values in behavior. As mentioned in Section 2.2.3, they find that the stronger the peer pressure to act in a particular way, the weaker the influence of personal values. Therefore among groups where investing is popular, such as business students and men, an individual might feel like an outsider if not participating in the stock market due to ideological reasons. In addition, Bardi and Schwartz (2003) state that the less important a certain value is in a group, the stronger the relation between the personal importance of the value and the frequency of behaviors that express it. As non-investors are more Self-Transcendence oriented, power and achievement values are less important in groups where investing is not common. Thus in these groups, the personal emphasis of power and achievement values becomes more relevant in the context of participation.

Self-Transcendence orientation is also the only one of the variables in Table 10 that consistently remains negative for all subgroups. Thus it seems to be a more consistent predictor for stock market participation, at least in my sample, than the three other personal characteristics shown. This should be expected as well, because 21 questions were utilized for the Self-Transcendence score, while the other variables were determined by individual questions.

Social activeness has a negative coefficient in all but one of the subsamples, but the coefficient is statistically significant only among the respondents with less than median wealth. Hypothesizing that they socialize with peers that have a similar financial standing, this could be an indication that social activeness can actually decrease the probability of stock market participation in certain cases. In addition, the only subgroup where the coefficient is positive is the business students. Even though the coefficient is only slightly positive and has almost zero statistical significance, it shows that among the business students, the effect is at least not significantly negative. This seems to

further strengthen the hypothesis that social activeness can work in both ways, depending on one's peers.

Interestingly, right-wing political orientation and general trust get both positive and negative, significant coefficients, depending on the subgroup. This makes it doubtful whether the questionnaire has been reliably measuring them. On the other hand, as the sample sizes are small in Table 10, it is natural that the results become less credible. For the Right-wing –dummy, some meaningful interpretations can still be made. For example, it gets a significantly positive coefficient for the respondents who have studied longer than the median of four years. This might indicate that politics are not an issue for the younger students, but gain in importance as an individual ideology starts to develop later on. However, as the coefficients vary so clearly among different subsamples, it mostly seems that among the respondents, political orientation is not a very good predictor of stock market participation. The same applies for general trust, for which interpretations are harder to generate in the first place.

5.4 Examining the reasons for non-participation

I now move on from studying the determinants of stock market participation to investigating the factors influencing non-participation. As mentioned above, the respondents who had not invested in stocks or equity funds were asked to report the reason for this in the questionnaire, and the three choices given were as follows: lack of awareness, lack of capital, or lack of interest. In Chapter 4, the non-aware and the non-interested were examined as separate subgroups, while the ones who lack capital were simply included in all non-investors. In the following, particular attention will be given to the non-interested by searching for the characteristics that separate them from the ones who lack awareness or capital. This approach is chosen because not being interested in stocks may reflect some attitudinal prejudice against the stock market, whereas a lack of awareness or capital merely indicates that the cost of participation is considered too high.

Table 11. Differences between the non-interested and the other groups of non-investors

This table examines the differences between different groups of non-investors. All specifications are probits where the dependent variable takes the value of one if a respondent has not invested in stocks or equity funds due to lack of interest, and zero otherwise. In Panel A, all non-investors are included. Panel B excludes the ones who have not invested due to lack of awareness, and Panel C the ones who have not invested due to lack of capital. Self-Transcendence and Conservation have been calculated from the answers given to the Portrait Values Questionnaire. Year of study is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable: Not interested (dummy)					
	PANEL A: Not interested vs. all other non-investors		PANEL B: Not interested vs. not enough capital		PANEL C: Not interested vs. not aware	
Self-Transcendence	-0,002		-0,01		0,004	
	(-0,18)		(-0,44)		(0,31)	
Conservation		0,02		0,02		0,03*
		(1,49)		(1,15)		(1,79)
Male (dummy)	0,49*	0,54*	-0,02	0,003	1,12***	1,22***
	(1,79)	(1,95)	(-0,05)	(0,01)	(2,74)	(2,97)
Age	0,05**	0,05**	0,02	0,02	0,08**	0,07**
	(2,29)	(2,22)	(0,84)	(0,80)	(2,45)	(2,40)
Year of study (cap at 6)	-0,02	0,004	-0,17*	-0,15	0,08	0,10
	(-0,22)	(0,05)	(-1,74)	(-1,57)	(0,78)	(0,95)
Year of study > 6 (dummy)	-0,67	-0,81	-0,38	-0,45	-0,93	-1,12
	(-1,01)	(-1,22)	(-0,61)	(-0,76)	(-1,04)	(-1,23)
Income (1-5)	0,62***	0,64***	0,72***	0,71***	0,61***	0,67***
	(4,07)	(4,18)	(3,44)	(3,45)	(3,15)	(3,43)
Log (assets)	0,10	0,11*	0,07	0,07	0,13*	0,14*
	(1,61)	(1,67)	(0,83)	(0,87)	(1,66)	(1,67)
Technology (dummy)	-0,44	-0,50	0,30	0,27	-1,33**	-1,53***
	(-1,32)	(-1,47)	(0,72)	(0,65)	(-2,47)	(-2,75)
Nat./soc. science (dummy)	0,13	0,17	0,53	0,53	-0,23	-0,20
	(0,48)	(0,60)	(1,48)	(1,50)	(-0,58)	(-0,51)
Risk attitude (0-10)	-0,03	0,01	-0,15*	-0,11	0,03	0,08
	(-0,53)	(0,08)	(-1,65)	(-1,18)	(0,34)	(0,98)
Parents (dummy)	0,29	0,29	0,30	0,30	0,40	0,42
	(1,28)	(1,29)	(0,98)	(0,97)	(1,49)	(1,57)
Social activeness (0-10)	-0,06	-0,05	-0,05	-0,04	-0,13*	-0,12
	(-1,04)	(-0,85)	(-0,69)	(-0,56)	(-1,81)	(-1,57)
Right-wing (dummy)	-0,84***	-0,89***	-0,93**	-0,96**	-0,75	-0,78*
	(-2,70)	(-2,74)	(-2,39)	(-2,42)	(-1,83)	(-1,82)
General trust (dummy)	0,09	0,18	0,12	0,22	0,16	0,30
	(0,37)	(0,71)	(0,36)	(0,64)	(0,54)	(0,99)
Constant	-3,90***	-6,23***	-1,59	-4,18**	-4,83***	-7,64***
	(-3,04)	(-3,86)	(-0,96)	(-2,16)	(-2,76)	(-3,73)
McFadden R^2	0,22	0,23	0,27	0,28	0,29	0,30
N	199	199	113	113	133	133

To find the differences that might separate the groups of non-investors from each other, I first exclude the investors from the sample. Then, choosing the non-interested as the group of interest, I run probit regressions with the Not interested –dummy as the dependent variable. The dummy takes the value of one if a respondent has not invested due to lack of interest, and zero otherwise. The results are shown in Table 11. In Panel A, all non-investors are included, which highlights the differences of the non-interested compared to all the other non-investors. Panel B underlines the differences between the non-interested and the ones who lack capital by excluding the non-aware from the sample of non-investors. Similarly, Panel C excludes the ones who lack capital, thus focusing on the differences between the non-interested and the non-aware. Even though Table 11 already presents the most important results, additional regressions examining the different reasons for non-participation can be found in Appendix C for a more detailed view.

Table 11 shows that a respondent's Self-Transcendence score seems to have no effect on the reason of non-participation, even though it had explanatory power in determining whether a respondent is an investor or not. In contrast, the Conservation score now appears to be higher for the non-interested than for the other non-investors, especially the ones not aware of stocks or equity funds. This indicates that the non-investors who have not participated due to lack of interest emphasize tradition, conformity, and security values more than the other non-investors. Risk attitude, which negatively predicts Conservation according to Table 6, is now controlled for. Still, as the people emphasizing Conservation values should like to keep things the way they are, it could be that the respondents with high Conservation scores are reluctant to move money from their regular bank account to a book-entry account, for example. Not only because of the risk included, but also because of the unnecessary change to the status quo.

While men and women are equally likely not to invest due to lack of capital or lack of interest, women seem highly more likely to not have invested due to lack of awareness. This is seen in Panel C. As field of study is controlled for, this can not be explained by the fact that most of the natural/social science students are women, for example. On the contrary, according to Panel C, technology students are clearly the most likely to have reported non-awareness as the reason for not investing. Natural/social science students seem not to be especially prone to any of the three reasons. The business students are again the omitted group of students, and thus reflected by the coefficients received by the other two groups. Even though the statistical significance in Panel B is not extremely high for the fields of study, the business students seem most likely to have reported lack of capital for the reason of non-investment.

In determining the reason for non-participation, age seems to be more relevant than year of studies. In particular, it seems that the older respondents are significantly more likely to have chosen lack of interest as the reason for not investing. This is no surprise, because the older respondents can be expected to have more knowledge about financial assets, and also a higher income and wealth. The result is not caused by a small number of middle-aged respondents either, as the coefficients remain similar even when the respondents over 30 years old are excluded. I also include the year of studies in Table 11 due to the significance it gets in Panel B. For students who have studied longer, it seems more probable to not have invested due to lack of capital. A potential explanation could be that after a few years studied, almost all students have at least moved to live on their own, and financial support from the parents might already be decreasing. Having to pay for rent and other living expenses on their own could then lead to a diminishing amount of money available for investing.

Controlling for wealth, monthly disposable income was not a significant determinant of stock market participation, as shown earlier in Table 8. However, income distinctively separates between the different categories of non-investors. Table 11 suggests that the respondents who have reported a relatively high disposable income are much less likely to not have invested due to lack of capital or knowledge, and much more likely to not have invested due to lack of interest. This is logical, because a high-income earner could probably afford to invest. Similarly, a high-income earner might be likely to find out about different alternatives for investing the cash that is not needed for monthly expenses, thus becoming aware of stocks and equity funds. The final alternative that remains for such a respondent to choose is lack of interest in stocks and equity funds. In fact, more than 40% of the respondents not interested in stocks and equity funds have invested in the other two asset classes available, namely non-equity funds and/or fixed-term deposits. This indicates that many of them prefer less risky assets.

The effect of wealth is similar to that of income, but notably milder. It looks like the relatively wealthy non-investors are more probably not interested than not aware, which seems reasonable. In contrast, one might expect that the wealthier respondents would be less likely to report lack of capital than lack of interest as the reason for non-investment. However, this seems not to be the case, even when controlling for liabilities. It may be that some of the respondents who have wealth in the form of an apartment, for example, do not consider it an option to sell the apartment and invest in something else. Thus they only think about their disposable income, which can be small especially if down payments have to be met for a loan.

Some of the personal characteristics found to predict stock market participation in previous literature also influence a respondent's reason of non-participation. The respondents willing to take on risk seem more likely not to invest due to lack of capital than due to the two other reasons. These people should be likely to find out about risk opportunities and interested in taking them. The respondents who are highly socially active, on the other hand, seem more probable not to have invested due to lack of awareness than due to lack of interest. This was already suggested by some of my previous findings. It indeed seems that socializing can decrease awareness of stocks and equity funds, at least among the students in my sample. Probably this result is conditional on the investing behavior of the peers of the group examined. Finally, the right-wing oriented respondents are significantly less likely to not have invested due to lack of interest in stocks and equity funds. It thus appears that the right-wing oriented have a positive attitude towards the stock market, and if they have not invested so far, it is because they lack the required capital or knowledge.

6. Discussion

The previous chapters have presented a wide range of findings related to the value theory, stock market participation, and the students of different fields included in my sample. To highlight the most important results, this chapter will bring them together in a discussion attempting to interpret the current findings and also to reflect them against those of previous authors. Additionally, it is crucial to remember that my study, like any other, is subject to limitations and challenges that have to be considered when assessing and interpreting the results. Because of this, my data and methodologies will also be critically scrutinized. Finally, I will give some suggestions for future research in the field of personal values and investing.

6.1 The current results – interpretations and implications

In this section, I will go through the most important findings of the paper in three parts. First, I discuss the role that personal values appear to have in the decision to participate in the stock market. Then, I talk about the other findings I made related to the investment behavior of university students. In the final part, I give potential explanations for the deviations that occur between my own results and those of the existing literature.

6.1.1 The influence of values on investor behavior

The main purpose my analyses was to investigate the effect of personal values in investment decisions. More specifically, the decision of directly or indirectly participating in the stock market was examined. There were two interrelated sets of value variables that were related to stock market participation. The Self-Transcendence and Conservation variables were used as the primary set, because their reliability remains high even when used with the relatively short, 21-item PVQ. The secondary set of variables, consisting of the ten value types, was also included because even though its reliability may slightly suffer when used in conjunction with the shorter questionnaire, the information captured by it is more specific. Personal values had not been connected to investment decisions in this manner in existing literature, but I suggest that as both investment experience and value orientation could now be explicably quantified, the current method is useful also for future research in the field.

In the paper, I find that among the sample of students, values do indeed predict stock market participation. The Self-Transcendence variable has, as hypothesized, a negative influence on the probability of a respondent being an investor. The explanatory power of the variable is small, but it is still a stronger predictor than social activeness, political orientation, and general trust, which have all been suggested to predict participation by previous authors. Self-Transcendence also remains a consistently negative predictor throughout the different subsamples examined. Furthermore, when using the more specific value types, the significance of value orientation notably increases. In fact, the influence of the value variables becomes comparable to that of risk attitude in this context. The ten value types associate largely as expected with other outside variables as well, and can thus be claimed to reliably measure value orientation. Therefore it seems justified to accept my null hypothesis, stating that investors emphasize power and achievement values more than non-investors, and universalism and benevolence values less.

As the companies listed in the stock market typically emphasize achieving ambitious goals and outperforming their peers, an implication of my finding could be that the people buying the stocks of these companies share this way of thinking. They might like to look for the winning characteristics in companies, and also in their own lives and careers try to apply the methods of action that are found to bring success in the market. On the other hand, people who are not interested in gathering wealth or fame, and are more concerned with securing a relatively equal welfare among all citizens, might be uncomfortable with this competition-oriented mindset. This

way investing in the stock market might feel distant to them. These fundamental differences in the way people think could be part of the solution to the non-participation puzzle, and they should also be taken into account by brokerage firms planning their marketing campaigns and fund portfolios.

The influence of personal values is particularly strong for subsamples where investing is not very common. This further indicates that for some people, investing in stocks is not a matter of much controversy, but rather a normal way of personal financial planning. In addition, in groups where investing is popular, the importance of group norms could outweigh that of value orientation, as indicated by the results of Bardi and Schwartz (2003). At the same time, for people not very familiar with investing, some ideological prejudice against the stock market could exist. Thus these individuals could consider the decision to participate in a way that is not necessarily financially rational, but compatible with their own way of thinking.

A value-based prejudice against the stock market is also indicated by the fact that a high Conservation score predicts non-interest in the stock market among the non-investors. This means that the respondents who find self-direction and stimulation values important are more probable to at least be interested in stocks or equity funds, even if they could not afford to invest at the moment. By definition, a person emphasizing Conservation does not appreciate change in life. Thus it could be that the people scoring high on Conservation values choose not to invest because it would break the status quo, where they have their money on a bank account, for example, and live an adequately comfortable life. As risk attitude is controlled for, the reason is not only a high level of risk aversion among these respondents.

A relatively similar prejudice is suggested by the negative influence of right-wing political orientation on lack of interest in stock market participation. The left-wing and center oriented non-investors are thus more likely to report lack of interest as the reason for not investing, which reflects the importance of political values in investment decisions. This is a clear, further indication of the other than financially rational components that are present when an individual is considering whether to participate in the stock market.

6.1.2 The importance of demographics

Even though the value variables have explanatory power in my sample, the strongest factors determining stock market participation and the potential reason for non-participation are related to demographics. The respondents who are most probable to have invested are men, relatively far in

their studies, relatively wealthy, and children of investing parents. In addition, technical students are slightly less likely to have invested than the others. On the other hand, the respondents most likely not to be aware of stocks are women, relatively young, and have relatively low income. Most of these findings are not surprising, as it seems clear that while personal characteristics play some role in the equation, a respondent's relationship to investing is also heavily influenced by things like family background, wealth, and work experience. This is especially true for students, many of whom have only lived on their own for a few years, and who often have an irregular financial income.

The impact of gender, however, is larger than anticipated. Even when controlling for factors such as income, risk aversion, and educational orientation, men are far more likely to have invested in the stock market than women. Further, among the non-investors, women are significantly more likely to be unaware of stocks and equity funds. Therefore it seems that already at a young age, men could be more interested in wealth accumulation and financial planning than women. Considering the public discussion that often occurs about men having higher salaries and more influential positions than women, this is an interesting finding. Even if a man and a woman from my sample would graduate with the same academic education, it seems likely that the man will have more knowledge about financial assets, and maybe about corporations and business in general. Thus the man might be more qualified for some jobs, or at least better able to assess his own value for a company. This, in turn, could lead to a gender gap in salaries already in the beginning of students' professional careers.

6.1.3 Findings contradicting existing literature

In contrast to the finding of Guiso et al. (2008), general trust is a negative predictor of being an investor in my sample. The reasoning of Guiso et al. (2008) is that when pondering upon the question of investing in stocks, an individual factors in the probability of being cheated in the market. A more trusting individual sees the risk as smaller, and is thus more likely to participate. However, I propose that the question of being cheated in the market is not relevant for a potential investor in Finland. The legislation for shareholder protection is strong, and it is closely monitored that individual investors are not hurt through the misuse of insider information, for example. The situation is arguably worse in Italy, for instance, where a part of Guiso et al.'s (2008) data was collected. The explanation I offer for the negative coefficient of general trust is rather based on the value literature. Verkasalo et al. (2009) and Schwartz (2007) have shown that interpersonal trust is

positively related to Self-Transcendence values. Thus a person whose level of general trust is low would on average emphasize power and achievement values, indicating a desire of success and control over other people. As especially power values strongly predict stock market participation in my sample, I conclude that people with low levels of trust could actually be more probable to be investors.

Another finding that contradicts previous literature is related to social activeness. Hong et al. (2004) suggest that socially active households are more likely to participate in the stock market, while I find the socially active students slightly less likely to have invested. Among the non-investors, the reason for the socially active not to invest is actually most likely to be lack of awareness. This goes completely against the theory of Hong et al. (2004), who propose that by being socially active, a household is more likely to become aware of stocks and investing. However, Hong et al. (2004) do suggest that the positive effect of social activeness is milder in states with lower overall participation rates, because it becomes less likely to socialize with investors.

The explanation I offer for the negative effect follows the same logic. In my sample of students, it is not highly probable that the discussions between the respondents and their peers would focus on savings or investing. Thus to learn about investing, a respondent is likely to use other sources of information, such as books, magazines, or the internet. Being socially active and spending a lot of time with friends could be away from the time when a student might look into investment opportunities, leading to a situation where the effect on participation is at least non-positive. Naturally, this would depend on the interests and financial situation of the individual respondents and their peers. Looking at the subsample analyses, the only subsample where the coefficient of social activeness is positive, even though insignificant, is the business students. The only subsample where the coefficient is significantly negative is the respondents with relatively low wealth. This seems to clearly support a theory where the effect of social activeness on stock market participation can be either positive or negative, depending on the context.

6.2 Limitations of the study

When considering the limitations of a study, the characteristics of the data tend to be essential. In my case, the availability of data is a key constraint due to the ad-hoc nature of the information required. Further, to avoid response bias, I chose to personally distribute paper versions of the questionnaires and monitor the respondents. This has its cost, as it limits the number of answers received compared to a web-based questionnaire, for example. However, there is arguably a notable

gain in the quality of the answers, and as I still managed to get a fair number of respondents as well, these problems should not be extremely severe in the context of my study. More attention should be given to the targeted respondents, who are all university students living in the Helsinki area. This group is very specific both geographically and demographically, which significantly hinders the possibility to generalize my findings to other kinds of populations.

An even more important factor for the credibility of the results is the methodology chosen for answering the research question. As my intention is to study the effect of personal values on stock market participation, I need to be able to reliably define and measure "personal values" and "stock market participation". For value orientation, I use the definitions and methods developed in previous literature, and the expected associations of values with other variables seem to confirm that the correct characteristics are measured in my questionnaire. For stock market participation, I use subjective information given by the respondents instead of an objective database available for some previous studies. Furthermore, I define both direct and indirect stock investors as stock market participants, whereas some studies have only concentrated on direct participation. However, no differences occur in my results when only direct stock investors are considered, which makes the question trivial in this case.

The subjectivity of the answers can also be seen as problematic, because it is not certain that the responses given will coincide with reality. It may be difficult to assess one's own personal characteristics, or to accurately know the amounts of income and wealth. In addition, answering to questions related to personal values can be found troublesome. When possible, these problems were taken into account in the design phase of the questionnaire. For example, income is asked as a relative amount compared to other students, and a value questionnaire specifically meant to be easy to grasp was chosen. For many factors, however, there are no particularly simple ways to pose the questions, and no matter how a question is framed, one can not be certain that all respondents will understand it correctly. The possibility also always exists that a respondent intentionally gives unrealistic answers. Still, as the information received from the questionnaire is mainly as expected, and the value variables associate according to theory with the other personal characteristics, it seems that the questions were well understood and the answers relatively truthful.

Due to limited resources, my questionnaire is also relatively short, which could hurt the reliability of any conclusions made. Characteristics such as general trust are measured with an individual question, while several questions are mostly used for broad concepts like this in other studies. I also

use the shortened, 21-item version of the PVQ. However, as mentioned above, the largely predicted, explicable results indicate that sufficient reliability is achieved.

Finally, my results do not tell whether it is the Self-Enhancement oriented individuals who decide to invest, or the investors who become Self-Enhancement oriented after becoming participants in the stock market. Schwartz (1992) describes values as transsituational goals that act as guiding principles in people's lives. As the same values are emphasized across different situations in life, it seems likely that value orientation does not tend to change easily once established. This would indicate that it is the Self-Enhancement oriented individuals who are prone to investing, and that an investor's values remain unchanged also after the decision to invest in stocks. However, this suggestion is difficult to prove empirically, and will thus remain unconfirmed in my study.

6.3 Suggestions for future research

As the relationship between personal values and investor behavior has so far been studied on very few occasions, a number of potential topics remain for future research. In relation to the current paper, a suggestion that naturally comes to mind is to conduct similar studies in different populations and with broader resources. Firstly, a longer questionnaire would help in making the results more reliable. Personal characteristics such as general trust, risk attitude, and social activeness could be charted with more than just one question each, and the longer, 40-item PVQ could be used for value orientation. Secondly, the number of respondents could be larger, increasing the credibility of the results. To make the findings more general, the respondents could also be gathered from a wider range of backgrounds. This way it would also be possible to divide the respondents into more and more specific subgroups, thus revealing some potential differences that exist between the various categories of investors and non-investors. As the large, cross-national studies that have been established relatively recently, such as the European Social Survey, are starting to include a lot of detailed information about huge numbers of people, they could be a very promising source of data for future studies concerning values and investing, for example.

The topic of investor behavior could also be approached from other angles. With respect to personal values, it could be investigated how the portfolios of investors with different value orientations deviate from each other, for example. Additionally, instead of stocks and equity funds, other asset classes such as options or futures could be chosen to separate between investors and non-investors. Furthermore, the trading volumes and investment returns could be compared between investors with

different value orientations. All this, of course, would require data of much detail, and these topics should probably be studied in co-operation with a bank or some other financial service provider.

While the characteristics of the non-aware could also be more carefully examined, a very interesting branch of future research would be to more closely look into the reasons of non-interest in equity investing. It seems that supporting right-wing political parties has a negative effect on non-interest, but other factors are sure to exist as well. Finding these factors would probably require individual interviews with people who choose not to invest in the stock market due to lack of interest. Revealing the sources of the negative feelings that these people might have towards the stock market could further contribute to the resolution of the limited participation puzzle.

7. Conclusion

In this paper, I present a method for studying the effect of personal values in investment decisions. By connecting the value theory of Schwartz (1992) to stock market participation, I show that value orientation is indeed a valid predictor of participation. In my sample consisting of university students of business, technology, and natural/social sciences, the individuals who emphasize the Self-Enhancement values of power and achievement are significantly more likely to have invested in stocks or equity funds than the others. This result holds even when factors such as wealth, year of study, and the equity holdings of parents are controlled for. Additionally, the predictive strength of the value variables goes beyond that of many previously suggested determinants of stock market participation. Value orientation thus seems to be a relevant personal characteristics connecting equity investors.

The influence of personal values is particularly strong in groups where investing in the stock market is relatively rare. This indicates that for people whose peers invest, stock market participation is not considered a very controversial decision, which decreases the effect of value orientation. In addition, in a group where investing is common, an individual might feel more pressed to buy stocks in order to conform to the group norms. For people whose peers are not likely to invest, the decision to participate in the stock market requires more personal reflection, increasing the importance of values.

Among the non-participants, non-interest in stocks and equity funds is also predicted by value orientation. The individuals who emphasize the Conservation values of tradition, conformity, and

security are more likely to report lack of interest as the reason for not investing. Non-interest appears not to be driven by risk aversion, for example, but rather by reluctance to cause unnecessary change to the status quo that would result from participating in the stock market.

In real-life behavior, personal values are only one influencing factor among a wide range of others. Thus it is natural that demographics strongly predict investment behavior among students. However, as values reach explanatory power comparable to that of risk attitude, they prove to be relevant for resolving the puzzle of limited stock market participation. Due to the broad economic impacts of the low levels of participation, my finding gains economic significance in addition to the purely academic one. Furthermore, recognizing the characteristics of a typical equity investor is highly beneficial to companies selling financial products, who could utilize my findings in their marketing processes, for example.

Many ways remain for future research to extend our understanding about the role of personal values in investment behavior. My results suffer from weaknesses such as limited potential of generalization and less than optimal reliability. Using larger resources, these problems could be alleviated, and more widely applicable results received. In addition, stock market participation is only one of the contexts of investing where the influence of personal values can be studied. Examples of possible alternatives include the portfolio compositions or trading habits of investors with different value orientations. Finally, even though personal values have now been shown to be one of the components causing irrational investment decisions, the more specific attributes of equity investing causing prejudice or non-interest remain on the level of speculation.

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APPENDIX A.

The questionnaire used in the study. For the Portrait Values Questionnaire, the English version is also included.

OSA 1: TAUSTATIEDOT JA SIJOITTAMINEN

1. Ikä: _____   **2.** Sukupuoli: M / N   **3.** Synnyinpaikka: ☐ pääkaupunkiseutu
                                                                        ☐ muu

4. Oppilaitos ja opintosuunta (esim. HSE/markkinointi): _____

5. Aloitusvuosi: _____   **6.** Arvioitu valmistumisvuosi: _____

7. Millaisena pidät omaa suhtautumistasi riskiin? Asteikolla nollasta kymmeneen, yritätkö karttaa riskiä, vai oletko täysin valmis riskinottoon?

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Riskin karttaja   Täysin valmis riskinottoon

8. Oletko luonteeltasi sosiaalinen? Vietätkö esimerkiksi enimmäkseen aikaasi ystävien ja muiden ihmisten seurassa, vai ennemminkin yksin tai mahdollisen perheesi/asuinkumppanisi kanssa?

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

En lainkaan sosiaalinen   Erittäin sosiaalinen

9. Poliittista suuntautumista kuvataan usein ns. vasemmisto-oikeistoakselilla. Mihin sijoittaisit itsesi tällä akselilla **Suomen poliittisen kentän mittakaavassa**, kun nolla tarkoittaa vasenta ja kymmenen oikeaa?

0	1	2	3	4	5	6	7	8	9	10
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Vasen   Oikea

10. Oletko yleisesti ottaen sitä mieltä, että useimpiin ihmisiin voi luottaa, vai että muiden suhteen ei koskaan voi olla liian varovainen?

☐ Useimpiin voi luottaa.   ☐ Koskaan ei voi olla liian varovainen.   ☐ En osaa sanoa.

11. Verrattuna opiskelijoihin keskimäärin, kuinka paljon sinulla on arviosi mukaan rahaa käytettävissäsi kuukausitasolla?

☐	☐	☐	☐	☐
Huomattavasti vähemmän	Hieman vähemmän	Yhtä paljon	Hieman enemmän	Huomattavasti enemmän

12. Arvio varallisuudestasi: a) Kiinteistövarallisuus (mahdollisen omistusasunnon arvo tms.): _____ €

b) Muu varallisuus (pankkitalletukset, sijoitukset, ym.): _____ €

13. Arvio veloistasi: a) Opintolaina: _____ € b) Asuntolaina: _____ € c) Muu velka: _____ €

14. Onko sinulla nyt, tai onko sinulla aiemmin ollut, varallisuutta
☐ osakkeissa   ☐ osakerahastossa   ☐ muussa sijoitusrahastossa   ☐ määräaikaistalletustilillä?

15. Oletko joskus **itse** sijoittanut ansaitsemiasi tai lainaamiasi varoja
☐ osakkeisiin   ☐ osakerahastoon   ☐ muuhun sijoitusrahastoon   ☐ määräaikaistalletustilille?

16. Mikäli **et ole itse sijoittanut** osakkeisiin tai osakerahastoon, mikä seuraavista vaihtoehdoista kuvaa parhaiten syytä tähän?
☐ En tunne näiden sijoituskohteiden ominaisuuksia tai niiden tarjoamia mahdollisuuksia.
☐ Tunnen sijoituskohteet ja olen kiinnostunut sijoittamaan niihin, mutta minulla ei ole ollut varaa siihen.
☐ Tunnen ainakin toisen näistä sijoituskohteista, mutta en ole kiinnostunut sijoittamaan niihin.

17. Onko vanhemmillasi varallisuutta osakkeissa tai osakerahastossa?
☐ Kyllä.   ☐ Ei.   ☐ En tiedä.

Seuraavassa on lyhyitä kuvauksia erilaisista ihmisistä. Lue jokainen kohta ja mieti, kuinka paljon kuvailtu henkilö muistuttaa sinua.
Vastaa käyttäen seuraavaa asteikkoa:

1. Ei lainkaan samanlainen kuin minä.	4. Jonkin verran samanlainen kuin minä.
2. Ei juuri lainkaan samanlainen kuin minä.	5. Melko samanlainen kuin minä.
3. Vain hieman samanlainen kuin minä.	6. Erittäin paljon samanlainen kuin minä.

		1	2	3	4	5	6
1.	Ideoiden tuottaminen ja luovuus ovat hänelle tärkeitä. Hän haluaa tehdä asiat omaperäisesti.	☐	☐	☐	☐	☐	☐
2.	Hänestä on tärkeää olla rikas. Hän haluaa, että hänellä on paljon rahaa ja kalliita tavaroita.	☐	☐	☐	☐	☐	☐
3.	Hänestä on tärkeää, että kaikkia maailman ihmisiä kohdellaan tasa-arvoisesti. Hän katsoo, että kaikilla pitäisi olla samat mahdollisuudet elämässä.	☐	☐	☐	☐	☐	☐
4.	Hänestä on tärkeää saada näyttää muille taitojaan. Hän haluaa, että hänen tekemisiään ihaillaan.	☐	☐	☐	☐	☐	☐
5.	Hänelle on tärkeää elää turvallisessa ympäristössä. Hän välttää kaikkea, mikä voisi uhata hänen turvallisuuttaan.	☐	☐	☐	☐	☐	☐
6.	Hän pitää yllätyksistä ja etsii uusia asioita, joita voisi tehdä. Hänestä on tärkeää tehdä erilaisia asioita elämässään.	☐	☐	☐	☐	☐	☐
7.	Hänen mielestään ihmisten pitää tehdä, kuten käsketään. Hänen mielestään sääntöjä pitää noudattaa aina, vaikka kukaan ei ole näkemässä.	☐	☐	☐	☐	☐	☐
8.	Hänestä on tärkeää kuunnella ihmisiä, jotka ovat erilaisia kuin hän itse. Vaikka hän olisi heidän kanssaan eri mieltä, hän haluaa silti ymmärtää heitä.	☐	☐	☐	☐	☐	☐
9.	Hänestä on tärkeää olla nöyrä ja vaatimaton.Hän ei pyri keräämään huomiota osakseen.	☐	☐	☐	☐	☐	☐
10.	Hänestä on tärkeää pitää hauskaa. Hän pitää itsensä hemmottelemisesta.	☐	☐	☐	☐	☐	☐
11.	Hänestä on tärkeää päättää itse omista asioistaan.Hän haluaa olla vapaa ja riippumaton toisista.	☐	☐	☐	☐	☐	☐
12.	Hänestä on tärkeää auttaa ympärillään olevia ihmisiä. Hän haluaa huolehtia heidän hyvinvoinnistaan.	☐	☐	☐	☐	☐	☐
13.	Menestyminen on hänelle tärkeää. Hän haluaa, että hänen saavutuksensa huomataan.	☐	☐	☐	☐	☐	☐
14.	Hänelle on tärkeää, että valtio takaa hänen turvallisuutensa kaikkia uhkia vastaan. Hän haluaa, että valtio on niin vahva, että se voi suojella kansalaisiaan.	☐	☐	☐	☐	☐	☐
15.	Hän etsii seikkailuja ja haluaa ottaa riskejä. Hän haluaa jännitystä elämäänsä.	☐	☐	☐	☐	☐	☐
16.	Hänestä on tärkeää käyttäytyä moitteettomasti. Hän haluaa välttää tekemästä mitään, mikä toisten mielestä on väärin.	☐	☐	☐	☐	☐	☐
17.	Hänestä on tärkeää nauttia toisten ihmisten kunnioitusta. Hän haluaa ihmisten tekevän kuten hän sanoo.	☐	☐	☐	☐	☐	☐
18.	Hänestä on tärkeää olla uskollinen ystävilleen. Hän haluaa omistautua läheisilleen.	☐	☐	☐	☐	☐	☐
19.	Hän on voimakkaasti sitä mieltä, että ihmisten pitäisi välittää luonnosta. Ympäristöstä huolehtiminen on hänelle tärkeää.	☐	☐	☐	☐	☐	☐
20.	Perinteet ovat hänelle tärkeitä. Hän pyrkii noudattamaan uskonnollisia sekä sukunsa tapoja.	☐	☐	☐	☐	☐	☐
21.	Hän etsii aktiivisesti mahdollisuuksia hauskanpitoon. Hänelle on tärkeää tehdä asioita, joista hän nauttii.	☐	☐	☐	☐	☐	☐

		1	2	3	4	5	6

#	Statement	1	2	3	4	5	6
1.	Thinking up new ideas and being creative is important to him. He likes to do things in his own original way.	☐	☐	☐	☐	☐	☐
2.	It is important to him to be rich. He wants to have a lot of money and expensive things.	☐	☐	☐	☐	☐	☐
3.	He thinks it is important that every person in the world should be treated equally. He believes everyone should have equal opportunities in life.	☐	☐	☐	☐	☐	☐
4.	It's important to him to show his abilities. He wants people to admire what he does.	☐	☐	☐	☐	☐	☐
5.	It is important to him to live in secure surroundings. He avoids anything that might endanger his safety.	☐	☐	☐	☐	☐	☐
6.	He likes surprises and is always looking for new things to do. He thinks it is important to do lots of different things in life.	☐	☐	☐	☐	☐	☐
7.	He believes that people should do what they're told. He thinks people should follow rules at all times, even when no-one is watching.	☐	☐	☐	☐	☐	☐
8.	It is important to him to listen to people who are different from him. Even when he disagrees with them, he still wants to understand them.	☐	☐	☐	☐	☐	☐
9.	It is important to him to be humble and modest. He tries not to draw attention to himself.	☐	☐	☐	☐	☐	☐
10.	Having a good time is important to him. He likes to "spoil" himself.	☐	☐	☐	☐	☐	☐
11.	It is important to him to make his own decisions about what he does. He likes to be free and not depend on others.	☐	☐	☐	☐	☐	☐
12.	It's very important to him to help the people around him. He wants to care for their well-being.	☐	☐	☐	☐	☐	☐
13.	Being very successful is important to him. He hopes people will recognise his achievements.	☐	☐	☐	☐	☐	☐
14.	It is important to him that the government ensures his safety against all threats. He wants the state to be strong so it can defend its citizens.	☐	☐	☐	☐	☐	☐
15.	He looks for adventures and likes to take risks. He wants to have an exciting life.	☐	☐	☐	☐	☐	☐
16.	It is important to him always to behave properly. He wants to avoid doing anything people would say is wrong.	☐	☐	☐	☐	☐	☐
17.	It is important to him to get respect from others. He wants people to do what he says.	☐	☐	☐	☐	☐	☐
18.	It is important to him to be loyal to his friends. He wants to devote himself to people close to him.	☐	☐	☐	☐	☐	☐
19.	He strongly believes that people should care for nature. Looking after the environment is important to him.	☐	☐	☐	☐	☐	☐
20.	Tradition is important to him. He tries to follow the customs handed down by his religion or his family.	☐	☐	☐	☐	☐	☐
21.	He seeks every chance he can to have fun. It is important to him to do things that give him pleasure.	☐	☐	☐	☐	☐	☐

APPENDIX B.
Coefficients for computing the Conservation and Self-Transcendence value variables from the 21 PVQ items measured on a 6-point scale ranging from 1 (not like me at all) to 6 (very much like me). The table has been adapted from Verkasalo et al. (2009).

	Conservation	Self-Transcendence
Constant	90,5531	67,3577
SD01	-1,1031	0,4871
PO02	0,5736	-2,0283
UN03	-0,3955	1,6101
AC04	0,3430	-1,5345
SE05	1,8516	0,0781
ST06	-1,3589	0,1803
CO07	1,4490	-0,0952
UN08	-0,9353	2,1805
TR09	0,8867	0,8088
HE10	-0,9702	-0,3864
SD11	-0,9665	0,6436
BE12	-0,3883	2,2422
AC13	0,3336	-1,8321
SE14	1,4640	0,2620
ST15	-1,3850	-0,8482
CO16	2,3203	0,1396
PO17	1,0024	-1,1128
BE18	-0,4133	1,9057
UN19	-0,3065	2,1328
TR20	1,1249	0,3330
HE21	-0,7511	-0,3541

APPENDIX C.
Results of additional regressions not included in the main text.

Explaining stock market participation using different value variables and controls
Specifications one through six are probits where the dependent variable takes the value of one if the respondent has invested in stocks or an equity fund, and zero otherwise. Self-Transcendence, Achievement, and Benevolence have been calculated from the answers given to the Portrait Values Questionnaire. The Year of study –variable is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable: Stocks or equity fund (dummy)					
	(1)	(2)	(3)	(4)	(5)	(6)
Conservation	0,01	0,01				
	(0,71)	(0,93)				
Achievement			0,19*	0,18*		
			(1,85)	(1,74)		
Benevolence					-0,11	-0,09
					(-0,84)	(-0,63)
Male (dummy)	0,89***	0,87***	0,92***	0,89***	0,86***	0,87***
	(4,92)	(4,16)	(5,02)	(4,27)	(4,50)	(3,98)
Year of study (cap at 6)	0,19***	0,13**	0,19***	0,12*	0,18***	0,11*
	(3,16)	(2,00)	(3,11)	(1,84)	(2,97)	(1,70)
Year of study > 6 (dummy)	0,61*	0,87**	0,74**	1,07***	0,80**	1,14***
	(1,67)	(2,35)	(1,97)	(2,82)	(2,06)	(2,96)
Income (1-5)	0,09	0,11	0,09	0,11	0,08	0,11
	(0,90)	(1,04)	(0,89)	(1,01)	(0,76)	(0,91)
Log (assets)	0,30***	0,24***	0,32***	0,25***	0,30***	0,23***
	(3,66)	(2,92)	(3,91)	(3,17)	(-5,64)	(2,85)
Technology (dummy)		-0,40*		-0,43*		-0,46**
		(-1,80)		(-1,93)		(-2,07)
Nat./soc. science (dummy)		-0,22		-0,29		-0,30
		(-0,91)		(-1,18)		(-1,22)
Risk attitude (0-10)		0,13**		0,12**		0,13***
		(2,56)		(2,44)		(2,63)
Parents (dummy)		0,40**		0,42**		0,39**
		(2,10)		(2,13)		(2,05)
Social activeness (0-10)		-0,05		-0,05		-0,05
		(-1,24)		(-1,28)		(-1,26)
Right-wing (dummy)		0,27		0,23		0,24
		(1,39)		(1,20)		(1,22)
General trust (dummy)		-0,29		-0,31*		-0,28
		(-1,59)		(-1,73)		(-1,48)
Constant	-3,75***	-3,97***	-3,27***	-3,08***	-3,02***	-2,90***
	(-4,19)	(-3,18)	(-6,69)	(-4,88)	(-5,64)	(-4,45)
McFadden R^2	0,24	0,31	0,26	0,32	0,25	0,31
N	308	308	308	308	308	308

Explaining non-participation due to lack of awareness using the broad value dimensions and controls

Specifications one through five are probits where the dependent variable takes the value of one if the respondent has not invested in stocks or equity funds due to not being aware of these assets, and zero otherwise. Self-Transcendence has been calculated from the answers given to the Portrait Values Questionnaire. The Year of study –variable is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable: Not aware (dummy)				
	(1)	(2)	(3)	(4)	(5)
Self-Transcendence	0,01	0,005	0,004	0,004	0,003
	(0,67)	(0,53)	(0,42)	(0,43)	(0,32)
Male (dummy)	-0,65***	-1,06***	-1,04***	-1,03***	-0,98***
	(-3,66)	(-4,36)	(-4,23)	(-4,15)	(-3,78)
Year of studies (cap at 6)	-0,21***	-0,14**	-0,13**	-0,13**	-0,16**
	(-3,21)	(-2,04)	(-2,01)	(-1,97)	(-2,34)
Year of studies > 6 (dummy)	-0,30	-0,79	-0,83	-0,82	-0,64
	(-0,50)	(-1,25)	(-1,36)	(-1,36)	(-1,12)
Income (1-5)	-0,09**	-0,23**	-0,24***	-0,24***	-0,23**
	(-2,34)	(-2,52)	(-2,60)	(-2,59)	(-2,40)
Log (assets)	-0,09*	-0,09*	-0,08	-0,08	-0,05
	(-1,77)	(-1,72)	(-1,55)	(-1,49)	(-0,95)
Log (liabilities)	-0,14***	-0,09*	-0,08	-0,08	-0,09
	(-2,91)	(-1,85)	(-1,45)	(1,45)	(-1,60)
Technology (dummy)		1,24***	1,24***	1,24***	1,31***
		(4,29)	(4,07)	(3,98)	(4,05)
Nat./soc. science (dummy)		0,68***	0,68***	0,68***	0,76***
		(2,75)	(2,73)	(2,69)	(2,86)
Risk attitude (0-10)			-0,07	-0,07	-0,14**
			(-1,50)	(-1,46)	(-2,50)
Parents (dummy)				-0,04	-0,07
				(-0,20)	(-0,38)
Social activeness (0-10)					0,15***
					(3,38)
Right-wing (dummy)					-0,07
					(-0,29)
General trust (dummy)					-0,01
					(-0,06)
Constant	1,15	0,54	0,94	0,94	0,27
	(1,22)	(0,56)	(0,97)	(0,96)	(0,27)
McFadden R^2	0,18	0,24	0,25	0,25	0,28
N	297	297	297	297	297

Explaining non-participation due to lack of interest using the broad value dimensions and controls
Specifications one through five are probits where the dependent variable takes the value of one if the respondent has not invested in stocks or equity funds due to not being interested in these assets, and zero otherwise. Self-Transcendence has been calculated from the answers given to the Portrait Values Questionnaire. The Year of study –variable is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Dependent variable: Not interested (dummy)				
	(1)	(2)	(3)	(4)	(5)
Self-Transcendence	0,01	0,01	0,01	0,01	0,001
	(1,37)	(0,87)	(0,71)	(0,73)	(0,14)
Male (dummy)	-0,15	-0,06	-0,03	-0,01	-0,04
	(-0,78)	(-0,27)	(-0,12)	(-0,05)	(-0,17)
Year of studies (cap at 6)	-0,06	-0,03	-0,03	-0,03	-0,03
	(-0,94)	(-0,40)	(-0,45)	(-0,37)	(-0,40)
Year of studies > 6 (dummy)	-0,80	-0,97*	-1,04**	-1,06**	-1,11**
	(-1,51)	(-1,81)	(-1,97)	(-2,04)	(-2,10)
Income (1-5)	0,42***	0,45***	0,46***	0,46***	0,48***
	(3,43)	(3,59)	(3,67)	(3,66)	(3,85)
Log (assets)	0,03	0,03	0,04	0,04	0,05
	(0,41)	(0,40)	(0,56)	(0,67)	(0,83)
Log (liabilities)	-0,03	-0,02	-0,001	-0,005	0,02
	(-0,54)	(-0,48)	(-0,02)	(-0,09)	(0,46)
Technology (dummy)		0,09	0,08	0,06	0,001
		(0,35)	(0,29)	(0,22)	(0,003)
Nat./soc. science (dummy)		0,47**	0,48**	0,47**	0,28
		(2,01)	(2,05)	(2,00)	(1,12)
Risk attitude (0-10)			-0,08*	-0,08*	-0,04
			(-1,95)	(-1,90)	(-0,94)
Parents (dummy)				-0,11	-0,04
				(-0,54)	(-0,22)
Social activeness (0-10)					-0,03
					(-0,58)
Right-wing (dummy)					-0,77***
					(-2,91)
General trust (dummy)					0,18
					(0,83)
Constant	-3,38***	-3,48***	-3,05***	-3,05***	-2,56**
	(-3,43)	(-3,43)	(-2,94)	(-2,95)	(-2,32)
McFadden R^2	0,08	0,10	0,11	0,11	0,14
N	297	297	297	297	297

Explaining non-participation due to lack of capital, awareness, and interest

All three specifications are probits where the dependent variable takes the value of one if the respondent has not invested in stocks or equity funds due to the reason mentioned, and zero otherwise. Self-Transcendence has been calculated from the answers given to the Portrait Values Questionnaire. The Year of study –variable is capped at six, making it six for all respondents who reported a year of study above 6. In addition, a dummy is included, taking the value one if a year of study above six was reported, and zero otherwise. For income, risk attitude, and social activeness the scales shown were used in the responses. The Technology and Natural/social science –dummies express field of study. Business-dummy is the omitted variable. The Parents –dummy expresses whether a respondent's parents have invested in stocks or equity funds. The Right-wing –dummy expresses whether a respondent has reported a right-wing political orientation of eight or higher on the scale from zero to ten provided. The General trust –dummy expresses whether a respondent has indicated being generally trusting towards other people. Heteroskedasticity corrected z-statistics are in parentheses below the coefficients. *, **, and *** represent significance on the 10%, 5%, and 1% levels, respectively.

	Panel A: Total sample included	Panel B: Excluding non-investors with not enough capital	
	Dependent variable:	Dependent variable:	
	Not enough capital	Not aware	Not interested
Self-Transcendence	0,01	0,01	0,005
	(0,82)	(0,72)	(0,45)
Male (dummy)	-0,01	-1,20***	-0,003
	(-0,04)	(-4,05)	(-0,01)
Year of studies (cap at 6)	0,10	-0,16*	-0,001
	(1,38)	(-1,95)	(-0,01)
Year of studies > 6 (dummy)	-0,53	-0,77	-1,38**
	(-1,35)	(-1,13)	(-2,52)
Income (1-5)	-0,27***	-0,44***	0,46***
	(-2,78)	(-3,59)	(3,41)
Log (assets)	-0,18***	-0,14*	0,05
	(-3,46)	(-1,94)	(0,72)
Log (liabilities)	0,11**	-0,04	0,07
	(2,31)	(-0,63)	(1,18)
Technology (dummy)	-0,22	1,37***	-0,04
	(-0,94)	(4,06)	(-0,13)
Nat./soc. science (dummy)	-0,48*	0,40	0,20
	(-1,94)	(1,25)	(0,71)
Risk attitude (0-10)	0,03	-0,14**	-0,05
	(0,69)	(-2,30)	(-0,94)
Parents (dummy)	-0,32*	-0,33	-0,14
	(-1,79)	(-1,47)	(-0,67)
Social activeness (0-10)	-0,05	0,18***	-0,03
	(-1,15)	(3,35)	(-0,51)
Right-wing (dummy)	0,19	-0,04	-0,81***
	(0,90)	(-0,15)	(-2,75)
General trust (dummy)	0,19	0,01	0,22
	(1,02)	(0,05)	(0,97)
Constant	-0,20	1,26	-2,70**
	(-0,18)	(1,01)	(-2,13)
McFadden R^2	0,15	0,36	0,14
N	297	231	231