Qual Quant (2016) 50:1949–1967
DOI 10.1007/s11135-015-0245-6

Trust in others: does it affect investment decisions?

Galit Klein[1,2] · **Ze'ev Shtudiner**[1]

Published online: 10 July 2015

Abstract In recent years, we have witnessed a fundamental change in the way laypeople approach economic issues—from a complete reliance on the financial system as the major source of investment wisdom to self-reliance and self-investments. The current paper examines how personality traits affect novice investors' decisions regarding the scope and amount of risk they take when making investments. The results indicate that general subjective risk attitudes and social trust influence investment patterns, but not in the same manner. While risk and trust influence the individual's willingness to take financial risks and invest in risky instruments, trust also affects investment diversification. In contrast to former studies, in this paper we define the term "trust" using two separate measurements—trust in the world versus self-trust. We made this differentiation by applying Schwartz's value model. We found that subjects who had faith in others took more financial risks, tending to concentrate their funds in these instruments. The opposite pattern was revealed in the behavior of self-trusting investors. These subjects not only invested in less risky instruments, they also divided their capital among several assets. The results suggest that psychological traits influence investment patterns in different manners, which requires a closer examination.

Keywords Social trust · Investment decisions · Risk aversion

1 Introduction

In recent years, we have witnessed a fundamental change in the way the public approaches monetary issues, especially issues that affect people's financial future. While traditionally people have preferred to consult with experts, today many choose to "get rid of the

✉ Ze'ev Shtudiner
zeevs@ariel.ac.il

[1] Department of Economics and Business Administration, Ariel University, Ariel, Israel

[2] Department of Business Administration, Kinneret College on the Sea of the Galilee, Kinneret, Israel

middleman" and rely on their own self-knowledge when investing. Furthermore, studies have demonstrated that although experts have better information-processing skills, they only infrequently outperform laymens' investment decisions (Andersson 2004; Camerer and Johnson 1991). The purpose of this paper is to inquire into what influences novices' investment decision patterns. More specifically, we wondered whether personality traits, i.e. risk attitude and social trust (trust in others), impact the scope and the amount of risk laymen investors take. In contrast to previous studies, we applied a general risk attitude questionnaire, rather than a financial risk attitude scale. We also used Schwartz's value model to assess the connection between trusting others and oneself, and investment portfolios. We argue that in order to invest in risky instruments people must have confidence and faith that the companies' management will not abuse or misuse their capital. Therefore, the more people believe in self-transcendent values, such as 'universalism' and 'benevolence', the higher their willingness to invest in risky instruments will be. On the other hand, people who are self-directed and rely on themselves find it difficult to trust others, whose actions cannot be controlled; therefore, they prefer to avoid risky instruments.

In addition to personality traits, we also examined the influence of other elements, such as the investment sum, the consulted person, and other demographic attributes. The results indicate that while general risk attitude has an impact on the risk people take when making investments, trust had an even greater effect on both risk investment level and diversification of assets. Moreover, demographic characteristics also had a significant influence on portfolio diversification patterns, suggesting that investment advisers must become familiar with clients' characteristics and personality traits before advising them.

Over the years, economic psychologists have conducted numerous studies in an attempt to better understand how various demographic, socioeconomic, and psychological traits influence decisions related to saving money (McCarthy 2004; Nyhus and Webley 2001; Schooley and Worden 1996). From among these many elements, *risk tolerance* was found to be highly connected to monetary behaviors, as well as the amount of risk taken when making investments (Lahav et al. 2011). According to Veld and Veld-Merkoulova (2008), subjects with a high tendency to take risks will prefer to invest in riskier instruments such as stocks; alternatively, clients with a high level of risk-aversion will tend to invest in safer tools such as short-term deposit. As a result, financial institutions throughout the world use standard questionnaires to evaluate clients' risk profile before advising them on the investment portfolio that suits them best. The same result was found in a survey conducted among 1000 discount brokers (e.g. no investment advice is given). In this study, the scholars followed the investment portfolios for over a 6-month period (Dorn and Sengmueller 2009). The results indicate a strong connection between the tendency to take risks and investment decisions. Subjects who say they "enjoy a risky proposition" had more concentrated equity portfolios characterized as riskier securities than subjects who said they prefer to avoid taking risks. Half of the subjects who said they enjoy risky propositions traded in options during the time of the survey, compared to 20 % of the subjects who described themselves as having a high level of risk-aversion. Finally, controlling for objective investors' attributes, the first group also traded more aggressively than the other groups. Nosic and Weber (2010) argue that *attitude toward risk* is an even better predictor of the investor's portfolio, compared to objective measurements. They found that investors' risk-taking behavior is affected by their self-perception as individuals who enjoy taking risks, which they referred to as "subjective risk attitude". The scholars demonstrate that this tendency along with other subjective return expectations are significantly better predictors of risk-taking behavior, compared to objective historical returns and stock volatility.

Although tolerance towards risk-taking has a significant influence on the willingness to invest in riskier instruments, this tendency was found to be stronger in novice investors, compared to experts (Lambert et al. 2012). Lambert et al. (2012) found that while risk aversion had no affect on loan officers, this tendency had a significant effect on students' financial investment decisions. Therefore, while inspecting the role of personality traits on novice investors, we argue that general risk tolerance will have a significant impact on one's capital allocation pattern. In other words, subjects who take risks in their everyday activities will also demonstrate the same pattern concerning financial decisions. Conversely, risk-averse people will choose to invest more funds in safer instruments, such as short-term deposit or even their bank account.

By the same token, we argue that attitude toward risk affects investment scope. In their article, Benartzi and Thaler (2001) demonstrated that naïve investors often diversify their funds among financial assets according to 1/n heuristics, which may suggest a low-risk portfolio. Accordingly, we ask whether diversification pattern is influenced by the subjects' risk attitude. Former studies found mixed, and even contradicting, results. While Hariharan et al. (2000) found that risk-aversion had no effect on investment diversification scope, Coleman (Coleman 2003) indicates that males, who were more risk-tolerant, engaged in various types of savings and investments, compared to women. On the contrary, Dorn and Sengmueller (2009) found that risk-averse subjects tend to diversify their assets more than risk-tolerant investors. Going back to Dorn and Sengmueller (2009), we assume that risk-averse subjects would like to reduce their risk; therefore, they diversify their assets among several options. On the other hand, people with a high tendency to take risks will concentrate their assets on few, but riskier, instruments. Therefore, our first hypothesis is as follows:

Ha1 Subjects with positive risk attitudes will prefer to invest more funds in riskier instruments, such as stocks and bonds, compared to risk-averse subjects.

Ha2 Subjects with positive risk attitudes will prefer to concentrate their investments, compared to risk-averse subjects who will prefer to diversify their investments among multiple instruments.

Investments require not only financial knowledge, but also faith in the financial system (e.g. the belief that the financial system or institution will act in the investors' favor) (Guiso et al. 2008). This is more prominent in regard to instruments where the investors' control over the results is minimal/negligent or even completely irrelevant, such as in the case of stocks and corporate bonds. The price of stocks or the firm's ability to return revenues is in the hands of the companies' managers and directors. The investors themselves have no effect on the stocks' performance. They put their trust in the hands of the firms' leaders and hope they will not misuse their capital. Therefore, according to Guiso et al. (2008), investors—especially naïve ones—will not engage in the stock market if they do not trust in the fairness of the game and its operators. In their research, they found that subjects who believe "people can be trusted" tend to buy more stocks and invest in riskier assets. In fact, the scholars argue that the effect of trusting others increases the probability of buying stocks by 50 % and enlarges the share invested in stocks by 3.4 %. They also found that customers who declared they had confidence in the bank as a fair broker, tended to invest in the stock market.

The connection between trust and investments can explain why people prefer to invest in stocks belonging to firms they are familiar with (Cohen 2009; Huberman 2001). In today's incomplete information system, the ability to invest in a familiar, and hence more

reliable, company reduces the risk and increases the investors' sense of assurance (Guiso et al. 2008). This connection is so strong that even the norms of trust associated with the investors' geographical region can influence the amount of risk taken by the investors. In a study conducted by Georgarakos and Pasini (2011), the two researchers explored the connection between the geographical area's trust level and the willingness of the people living in this region to invest in stocks. The researchers examined subjects in 11 European countries, measuring *trust* as the proportion of people in a defined area who stated they trust others. They also asked individuals explicitly whether they trust the advice provided by financial institutions. The scholars found that living in a region where a higher proportion of subjects trust others was directly connected to an increase in the probability to own stocks. They also found that generalized trust and specific faith in financial institutions is not necessarily correlated. People can believe in the good nature of others and still have a low regard for and little trust in financial systems and institutions. Georgarakos and Pasini (2011) argue that generalized trust is the result of the norms, history, and tradition of the people living in a certain region. Therefore, while Austrian subjects share a sense of generalized trust with other Catholic countries but not with Germany, the opposite occurs with regard to trusting in financial institutions.

Following the line of thought presented in Georgarakos and Pasini's (2011) study, we believe that the ability to put one's trust in the company's actions is connected to the values people hold. Since self-reported trust measurements have raised some concern (Fehr 2009), we chose to measure the ability of trusting others versus self-trust by measuring the values that people hold, and relying on Schwartz's values model (Schwartz et al. 2001).

Shalom Schwartz, one of the leading researchers in the social-psychology field, defined *values* as 'desirable, trans-situational goals, varying in importance, that serve as guiding principles in peoples' life' (Schwartz 1996, p. 521). In other words, values are elements embedded in people's identity, which guide and instruct the persons who hold them. These elements stem from people's beliefs or assumptions, describe the individual's "desirable

Table 1 Definition of the value constructs and examples of the PVQ items that represent them (male version) (Schwartz et al. 2001, p. 521)

Power	Social status and prestige, control or dominance over people and resources ("He likes to be in charge and tell others what to do.")
Achievement	Personal success through demonstrating competence according to social standards ("Being very successful is important to him.")
Hedonism	Pleasure and sensuous gratification for oneself ("He really wants to enjoy life.")
Stimulation	Excitement, novelty and challenges in life ("He looks for adventure and likes to take risks.")
Self-direction	Independent thought and action—choosing, creating, exploring ("He thinks it's important to be interested in things.")
Universalism	Understanding, appreciation, tolerance, and protection of the welfare of humanity and nature ("He thinks it is important that every person in the world will be treated equally.")
Benevolence	Preservation and enhancement of the welfare of the people with whom one is in frequent personal contact ("He always wants to help the people who are close to him.")
Tradition	Respect, commitment, and acceptance of the customs and ideas provided by traditional culture or religion ("He thinks it is important to do things the way he learned them from his family.")
Conformity	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms ("He believes that people should do what they're told.")
Security	Safety, harmony, and stability of society, relationships, and the self ("The safety of this country is very important to him.")

outcome", and direct people about who and what is appropriate regarding behavior, perceptions, people's choices, and social circumstances. Values differ from attitudes, since they are more general, abstract, and can be arranged according to a hierarchy of importance (Rokeach 1973; Schwartz 1992).

Schwartz (1992) argues that the main content of values is the goal or motivation they express. He believed that human values evolved from three universal needs, enabling our existence as individuals in society: the needs of humans as biological organisms, the need to coordinate social interaction, and the need to maintain the welfare and security of society. In other words, *values* are evolutionary developments that motivate us to participate in our society as individual and biological entities, while continuing to maintain our society as a whole.

According to Schwartz's value theory (1992), ten basic general values serve as *core values*, and are common to multiple cultures and nations. Table 1 provides definitions for each of these values and a list of sample items from a questionnaire (PVQ), whose aim is to examine the importance of certain values to the subject.

The ten values are constructed in a circular structure, which represents a motivational continuum. Values that are closer to each other are congruent, while opposite values represent conflicted values. Figure 1 illustrates the pattern of relation among the ten values. This circular structure is constructed along two orthogonal dimensions: *Self-enhancement* versus *Self-transcendence,* which compares power, achievement, and hedonism-related values to benevolence and universalism-oriented values. The first two values, power and achievement, represent focusing on one's self-interest, while the last two values, benevolence and universalism, represent an interest in others and concern for their well-being. Another dimension represents *Openness to change* versus *Conservatism,* which opposes self-direction and stimulation-related values such as security, tradition and conformity. The

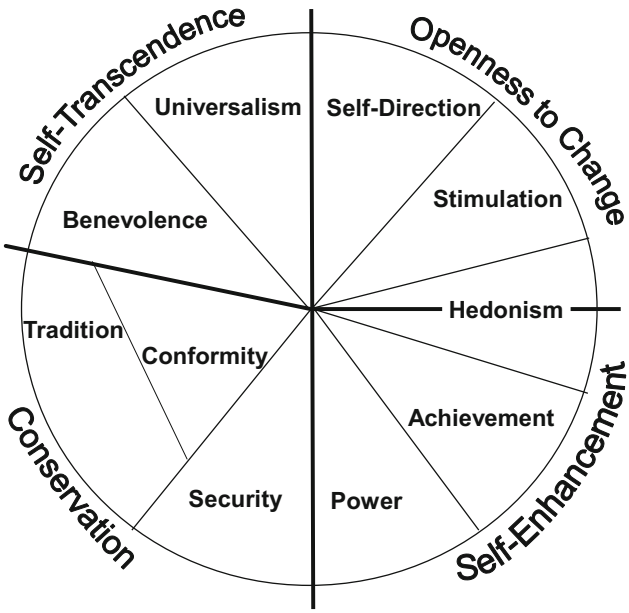

Fig. 1 Theoretical model of relational structure among 10 value constructs. *Source* Schwartz et al. 2001, p. 522)

first values emphasize independent action and thought, while the last values accentuate resistance to change, self-restriction, and the need for structure and order (Schwartz 1992).

Previous studies have demonstrated that values affect the amount of risk people take when engaging in certain behaviors, i.e. driving, eating disorders, sexual behaviors, and others (Chernoff and Davison 1999; Hains 1984; Goodwin et al. 2002; Schwartz and Inbar-Saban 1988; Schwartz et al. 2001). We assume that the same pattern will be found when we examine financial behavior and the amount of risk people take when making investments. Consequently, we assume that risky financial decisions will be more prominent in people who believe in the goodness of other individuals. Specifically, there will be a positive connection between subjects who believe in values supporting 'self-transcendence' and the proportion of investments made in stocks and bonds. In contrast, we also believe we will find a negative connection between investing in highly risky assets and 'openness to change', e.g. people who rely mainly on their self-intentions and self-direction when making decisions. As for diversification, the picture may be more complicated. Since previous studies hardly exist, we speculate that people with high levels of self-transcendence have faith in financial systems and institutions. Therefore, they will prefer to concentrate their investments in few options, believing these instrument will prove to be honest and beneficial to them. However, self-directed persons have less faith in the system; hence, they will choose to diversify their assets among several options, hoping at least one option will prove beneficial. Therefore, our second hypothesis proposes the following:

Hb1 A positive connection will be found between 'self-transcendence' and the willingness to invest in riskier instruments, such as stocks and bonds.

Hb2 A negative connection will be found between 'openness to change' and the willingness to invest in riskier instruments, such as stocks and bonds.

Hb3 A positive connection will be found between 'self-transcendence' and the concentration of investment instruments.

Hb4 A negative connection will be found between 'openness to change' and the concentration of investment instruments.

2 Method

2.1 Sampling design

The context of this study aims to follow the attributes that influence financial decisions made by novice investors, lacking comprehensive knowledge in economics. A total of 101 subjects participated in the study, all between the ages of 20–70 (mean = 26, SD = 6.484). A total of 70 % of the participants were female and 30 % were male. The majority of the subjects participated in a working students program; therefore, 62 % of the subjects were employees, 9 % were self-employed, 28 % were unemployed, and the rest were retired. However, when asked about their income, 81 % declared their income was below average (equal to $2,631[1] USD), 7 % reported an average income, and the rest declared a higher-than-average income.

[1] Based on the average salary and the dollar exchange in June 2014 in Israel.

2.2 Economic specification

We estimate the amount of risk taken by the subjects as follows:

$$IR = \beta_0 + \beta_i X_i + \gamma_1 Risk + \gamma_2 Self\_Transcendence + \gamma_3 Openness\_to\_Change + u_i$$

where *IR* represents an index that we calculated for the amount of financial risk taken by the investors. We include, under *Xi,* a rich array of demographic and financial characteristics that will be discussed in detail in the following section. *Risk* was measured by a subjective risk attitude measurement. As for social trust, we divided this measure into two variables, influenced by the amount of risk taken by the subjects (in opposite directions).

We also estimated the way in which the subjects diversified their assets according to the following choice model:

$$ID = \beta_0 + \beta_i X_i + \gamma_1 Risk + \gamma_2 Self\_Transcendence + \gamma_3 Openness\_to\_Change + u_i$$

The variable *ID* represents the degree of diversification of financial assets taken by the investors according to two indexes, which will be discussed in more detail later on in the paper. The personality trait 'risk' was measured by a subjective risk attitude measurement.

2.3 Measurement of variables

Data was gathered through several questionnaires. The first dependent variable was 'investment risk behavior' (*IR*), which measured the amount of risk participants agreed to take when making investments. The second dependent variable was 'diversification' (*ID*), which measured how subjects divided their capital among the available financial assets. Independent variables included: amount of available capital, the consulted person, subjective risk attitude, trust, and demographic characteristics. In order to gather the data, we used a semi-experimental questionnaire, which was divided into five parts. In the first part, we measured the values the subjects held according to the PVQ measurement. The second stage measured the general subjective risk attitude, e.g. whether the participant engaged in risky behaviors such as hitchhiking, drinking, stealing, etc. Parts 3 and 4 measured investment risk behavior. In both parts, subjects had to decide how to invest three different amounts of available money: NIS 10,000, NIS 50,000, and NIS 100,000. The difference between Parts 3 and 4 related to whose money was being invested. In Part 3, we asked the subjects to make a self-decision about investing their own money, while in Part 4 subjects had to advise a relative about making an investment. This led to a 2×3 experimental condition model. In the last part (Part 5), we measured personal variables such as income, gender, and other demographic variables. Table 2 summarizes the variables used in the study and presents the methods we applied to measure the different variables.

2.3.1 Dependent variables

In order to measure the amount of financial risk novice investors take, we asked participants to imagine they have an available amount of money, which they would like to invest. Nyhus and Webley (2001) argue that when measuring the effect of personality dimensions related to financial decisions, scholars should ask the participant to choose from among different options, since aggregate measures of savings have a high correlation with personality dimensions as opposed to a single instrument. Therefore, we told the participants they could either invest the entire sum in one option or divide the capital among different

Table 2 Summary of variables and measurements

Variable	Variable named in the analysis	Measurement
Dependent		
Investment risk behavior	IR	Likert scale questionnaire
Independent		
External variables		
1. Amount of money	Amount	Choose between NIS 10/50/100 K
2. Consulted person	Consult	0—Self-investment/1—advise relative
Psychological variables and values:		
1. A subjective risk attitude	SR	Likert scale questionnaire
2. A subjective risk attitude	Values	PVQ questionnaire
Demographic variables		
1. Age	AGE	Years
2. Gender	GEN	0—Man/1—woman
3. Religion	REL	0—Non-religious/1—orthodox or traditional
4. Education	EDU	1—Elementary school/2—high school/3—student (first degree)/4—university graduate
5. Employee status	EMP	0—Unemployed/1—employed
6. Income	INC	1—Very much below average/2—below average/3—average/4—above average/ 5—very much above average

instrument tools. If they chose the latter option, they were asked to write down the percentages they would invest in each instrument. The options were divided according to the amount of risk embedded in the different instruments. The choices were: *Short deposit, Stocks, Long-term savings account* (over a year), *Corporate bond, Government bond* or *Bank account/At home*. Questionnaire sample items are displayed in Appendix.

To calculate the amount of risk, we used a risk index developed by "Kedem", one of the leading investment groups in Israel. According to their risk factor index, 'Stocks' are defined as high-risk and receive a score of 100 % risk; 'Corporate bonds' are defined as high-medium-risk and are calculated as having a 70 % risk factor; 'Government bonds' are defined as medium–low-risk and scored 30 %; all other items are defined as low-risk, with a 0 % risk factor. For each subject, we calculated the amount of risk that s/he took under each of the conditions, according to the percentage that s/he applied in each of the instruments and its risk factor:

$$IR = (Stocks \times 1 + concern\,bonds \times 0.7 + government\,bonds \times 0.3 + short\,deposit \times 0 + long\,term\,saving\,account \times 0 + current\,account \times 0)/100$$

The risk factor ranged between 0 to 1; 1 represented individuals with high risk levels, while 0 represented risk-averse subjects.

In order to measure investment diversity, we used two measurements. In the first index (*ID)*, we calculated a new variable for the number of instruments the subject invested in, by transforming each option into a dummy variable and then summing them together. For each instrument, '0' was given if there were no investments and '1' if the subject invested in this option, regardless of the amount of capital invested. Then, we calculated the overall values of the six instruments. Diversification ranged from 1, which represented full concentration, to 6, which represented full diversification.

In the second measurement, we applied the Herfindahl Index to estimate the amount of diversification (HHI), similar to Dorn and Sengmueller's (2009) method. The Herfindahl Index (also known as the Herfindahl–Hirschman Index) measures the amount of market control concentration held by the largest firms in the industry (Hannan 1997; Rhoades 1993). The HH Index is calculated by the sum of the squares of market shares, expressed in fractions, of the largest firms within the field. Correspondingly, we estimated the amount of investment diversification, according to the following model:

$$HHI = \sum_{i=1}^{N} s_i^2$$

In this model, S_i represents the investment portion people allocate among the different alternative instruments. N is the number of instruments that people invested in. In this index, the portions are crucial. For example, investing 80 % in one instrument and 20 % in the other instruments will result in a higher index than dividing the sum equally. Therefore, we calculated not only the number of instruments, but also the investment portions/percentages. The numbers range from 1 to .167, where 1 represents full concentration and .167 represents maximum diversification among the various instruments.

2.3.2 *Independent variables*

2.3.2.1 Subjective risk attitude (SR) Previous studies have usually measured investors' risk attitudes by inspecting their willingness to take financial risks (e.g. Nosic and Weber, 2010). In the current study, we chose not to use a financial risk questionnaire, in order to eliminate the possibility of mutual influence on the amount of risk the subject takes when making an investment, i.e. influencing the decisions the subject makes in Parts 3 and 4. Therefore, the subjective risk attitude questionnaire was based on two measures developed by Shapiro et al. (1998) and Siegel et al. (1994), who inquired into general risk behaviors such as driving, alcohol use, and sexual behaviors. Since many of the subjects were religious, we made some revisions and eliminated any questions we thought might be offensive and irrelevant to the subjects (e.g. sexual behaviors). Ultimately, participants were asked to rate their willingness to take risks in regard to 7 behaviors, using a likert-type scale ranging from 1 to 5 with the endpoints "1 = not at all" and "5 = once a day or more". We also asked general questions about subjects' self-perceptions as "risk-taking individuals". After measuring the reliability of the question ($\alpha = .649$), we calculated a new variable: *subjective risk attitude* (SR).

2.3.2.2 Trusting the world versus trusting oneself In order to discover whether the participants were willing to trust others, we measured the subjects' values according to the portrait values questionnaire (PVQ) (Schwartz et al. 2001). The PVQ contains short verbal portraits of both men and women: subjects receive a questionnaire according to their gender. Each portrait describes a person's goals, desires or wishes, according to the values

this sentence represents. The respondents were asked to describe the extent to which the portrait resembles him/her on a scale ranging between "1 = not like me at all" to "6 = very much like me".

For each subject, we calculated the average score for the ten values, and then the four higher values. "Trusting others" was measured by the value of *'Self-transcendence'*, which was calculated according to the score of the values for universalism and benevolence. "Trusting oneself" was measured by calculating the variable *'openness to change'* by summing the variables of self-direction and stimulation.

We also measured two other values: '*Conservation',* which was measured by the score achieved for the values of conformity, tradition and security, while *'Self-enhancement'* was measured by the score achieved for the values of hedonism, achievement and power.

2.3.2.3 External investment variables: investment amount and whose money is being invested Two external variables were measured in order to examine whether the risk taken when making investments is influenced by external factors: (a) the amount of the investment and (b) whose money is being invested. In order to measure the possible influence of the *amount,* we gave the subjects three investment scenarios, divided according to the different fund amounts available for the investment: a small amount—NIS 10,000, medium amount—NIS 50,000, and large amount—NIS 100,000 (approximately \$2900, \$14,600 and \$29,000 USD, correspondingly[2]). For each condition, the subjects had to decide how they would invest and divide the given amount.

We thought that people might choose a different amount of risk when deciding for themselves and for others. In order to control for this affect, we measured the influence of the *consulted person* variable by asking respondents to imagine they (a) needed to invest their own money or that (b) they had been asked to help a relative invest his/her money. In both situations, subjects had to decide about the amounts of money described above (NIS 10,000/50,000/100,000), which leads to 2 × 3 experimental conditions.

2.3.2.4 Demographic variables Respondents were asked to answer several personal questions related to their: *age, gender (GEN), religion (REL), education (EDU), employee status (EMP),* and *income* (INC).

3 Results

3.1 Assets allocation

In the first part of the study, we measured the pattern of investments. Table 3 summarizes how participants distributed their available capital among the different financial instruments. As Table 3 demonstrates, most of the subjects can be defined as 'risk averse', since they prefer to invest in low-risk instruments such as short deposit, savings accounts, and their own bank accounts. It is interesting to note that participants preferred to invest in stocks more than in corporate bonds, although bonds are considered more secure assets. This may be due to recent scandals that occurred in Israel, where companies recruited capital from the public through corporate bonds, but failed to return the full debt back to

[2] Based on the dollar exchange in June 2014 in Israel.

Table 3 Allocations of financial assets according to whose money is being invested and the amount of available capital (in percentages)

	Me-NIS 10,000 M S.D	Me-NIS 50,000 M S.D	Me-NIS 100,000 M S.D	Other-NIS 10,000 M S.D	Other-NIS 50,000 M S.D	Other-NIS 100,000 M S.D
Short deposit	21.6 (29.75)	21.83 (28.31)	21.86 (28.76)	21.93 (29.68)	20.18 (27.21)	18.72 (26.43)
Stocks	9.75 (16.08)	10.72 (19.42)	9.02 (12.80)	6.83 (12.26)	8.49 (18.60)	9.45 (17.55)
Savings account	24.6 (28.18)	30.37 (21.86)	32.11 (31.32)	23.81 (29.75)	28.63 (21.21)	28.39 (32.09)
Corporate bonds	3.1 (6.99)	3.26 (6.64)	3.45 (7.92)	3.56 (11.32)	2.67 (6.87)	3.49 (8.41)
Government bonds	6.25 (15.06)	7.27 (15.59)	6.87 (16.12)	7.07 (16.69)	5.99 (13.80)	6.36 (13.75)
Own bank account	31.2 (33.32)	21.25 (25.97)	21.49 (28.32)	26.88 (32.32)	24.02 (28.14)	22.65 (27.70)

N = 101

the public. Therefore, the Israeli public might now feel that stocks are more secure than corporate bonds.

As for diversification, the *ID* index (M = 2.879, SD = 1.82) indicated that subjects had a tendency to lean towards the middle. Since the options range between 1 and 6, the results demonstrate a mid-range preference—neither full diversification nor full concentration. The HHL index (M = .512, SD = .307) indicated the same pattern. Since the Index ranged from 1 to .166, the result demonstrated medium-level diversification.

3.2 Investment risk behavior

In order to analyze what influences the amount of risk taken by the participants, we conducted a hierarchical ordinary least squares (OLS) regression in 4 steps. In the first step,

Table 4 Hierarchical regression results—investment risk behavior

	(1)	(2)	(3)	(4)
(Constant)	.750** (.141)	.821** (.144)	.545** (.151)	.601 ** (.151)
Age	.002 (.003)	.002 (.003)	.000 (.002)	.000 (.002)
Education	−.120** (.036)	−.122** (.036)	−.107** (.035)	−.109** (.035)
Income	−.019 (.015)	−.018 (.015)	−.017 (.014)	−.015 (.014)
D_status	.059 (.037)	.059 (.037)	.045 (.036)	.038 (.036)
D_ religion	.017 (.026)	.016 (.026)	.032 (.026)	.035 (.026)
D_employ	.025 (.028)	.024 (.028)	.014 (.028)	.015 (.028)
D_gender	−.070* (.030)	−.070* (.030)	−.022 (.031)	−.031 (.031)
D_consult		−.066 (.043)	−.067 (.043)	−.040 (.042)
Amount		−.124* (.000)	−.124* (.000)	−124* (.000)
Interaction		.102 (.000)	.103 (.000)	.103 (.000)
SR			.105** (.021)	.105** (.021)
Self-transcendence				.034* (.018)
Openness to change				−.082** (.028)
Conservation				−.062 (.048)
Self-enhancement				.005 (.022)
R^2 (%)	3.1**	3.5**	7.4**	8.5**
Chg. R^2 = .	.042**	.009	.040**	.016*
Std. error	.303	.303	.297	.295

Note Columns (1)–(4) report the results of OLS regressions between the score on risk investments and between demographic variables (1), external variables (2), subjective risk perspective (3) and trust (4)

Asterisks indicate that the coefficient estimates are significantly different from zero at the $*P < 0.05$ and $**P < 0.01$

we entered the demographic variables. In the second step, we entered the external variables: the amount of money, the consulted person, and the interaction between the two variables. The third step integrated the general subjective risk attitude variable, while the final step incorporated the trust measurements. The results appear in Table 4.

The results from Models 1 and 2 indicate that subjects who were less educated and male achieved a higher risk investment score, i.e. invested more capital in riskier instruments, compared to females or participants with a higher education. When the external variables were entered into the regression, the results revealed that participants were negatively influenced by the amount of money, but were not influenced by whether they were investing for themselves or advising a family member. According to the results, subjects agree to take more risk and invest a larger percentage of their capital in riskier instruments when the amount of money is smaller. Meaning, people are more likely to agree to

Table 5 Hierarchical regression results—investments' diversification—DI

	(1)	(2)	(3)	(4)
(Constant)	5.063** (.763)	5.144** (.778)	4.767** (.836)	4.568** (.844)
Age	.003 (.014)	.003 (.014)	.002 (.014)	.002 (.014)
Education	−.966** (.191)	−.966** (.191)	−.945** (.191)	−.932** (.192)
Income	−.338** (.080)	−.338** (.080)	−.340** (.080)	−.339** (.080)
D_status	.807** (.204)	.807** (.204)	.788** (.204)	.788** (.205)
D_ religion	−.977** (.143)	−.977** (.143)	−.955** (.144)	−.943** (.144)
D_employ	.333* (.155)	.333* (.155)	.319* (.156)	.300 (.156)
D_gender	−.365* (.165)	−.365* (.165)	−.300* (.173)	−.296 (.174)
D_consult		−.256 (.238)	−.256 (.238)	−.364 (.238)
Amount		−.013 (.000)	−.013 (.000)	−.011 (.000)
Interaction		.008 (.000)	.008 (.000)	.032 (.000)
SR			.142 (.115)	.153 (.115)
Self-transcendence				−.135 (.100)
Openness to change				.170 (.161)
Conservation				.387 (.269)
Self-enhancement				.201 (.125)
R^2 (%)	16.6 %**	16.6 %**	16.7 %**	16.7 %**
Chg. R^2 = .		.04	.002	.006
Std. error	1.66	1.66	.218	.393

Note Columns (1)–(4) report the results of OLS regressions between the score on risk investments and between demographic variables (1), external variables (2), subjective risk perspective (3) and trust (4)

Asterisks indicate that the coefficient estimates are significantly different from zero at the $*P < 0.05$ and $**P < 0.01$

jeopardize smaller amounts of money; however, as the amount rises they withdraw from this risky behavior and become more risk-averse.

Steps 3 and 4 were congruent with our hypothesis. Model 3 demonstrates that general subjective risk attitude has a significant impact on the amount of risk participants take when making investments. This variable was not only significant, but actually doubled the explained variance. The more individuals perceive themselves as enjoying participating in general risky behaviors, the more they will agree to invest a higher percentage of their capital in riskier instruments. Yet, if individuals perceive themselves as risk-averse in nature, they will avoid investing in risky instruments and prefer to invest in more common, milder assets, such as savings accounts. Our next hypothesis proposed that risk investment is influenced by the amount of trust people have toward others and themselves. Model 4 indicates that the two variables were significant, but in the opposite direction, as we

Table 6 Hierarchical regression results—investments' diversification—HHL

	(1)	(2)	(3)	(4)
(Constant)	1.041** (.132)	1.076** (.135)	1.093** (.145)	1.144** (.146)
Age	−.012** (.002)	−.012** (.002)	−.012** (.002)	−.012** (.002)
Education	.024 (.034)	.024 (.034)	.023 (.034)	.020 (.034)
Income	−.070** (.014)	−.070** (.014)	−.070** (.014)	−.069** (.014)
D_status	−.205** (.035)	−.205** (.035)	−.204** (.035)	−.208** (.035)
D_ religion	.158** (.024)	.158** (.024)	.158** (.025)	.158** (.025)
D_employ	−.058* (.027)	−.058* (.027)	−.057* (.027)	−.057* (.027)
D_gender	−.063* (.028)	−.064* (.028)	−.067* (.030)	−.073* (.030)
D_consult		−.023 (.041)	−.023 (.041)	−.364 (.238)
Amount		−.047 (.000)	−.047 (.000)	−.010 (.043)
Interaction		.000 (.000)	.000 (.000)	.000 (.000)
SR			−.007 (.020)	−.009 (.020)
Self-transcendence				.047** (.017)
Openness to change				−.049[1] (.027)
Conservation				−.034 (.046)
Self-enhancement				−.021 (.021)
R^2 (%)	13.9 %**	13.8 %**	13.7 %**	14.4 %**
Chg. R^2 = .		.04	.000	.012*
Std. error	.285	.285	.285	.284

Note Columns (1)–(4) report the results of OLS regressions between the score on risk investments and between demographic variables (1), external variables (2), subjective risk perspective (3) and trust (4)

Asterisks indicate that the coefficient estimates are significantly different from zero at the $*P < 0.05$, $**P < 0.01$ and $^{1}P < 0.08$

expected. In other words, the more subjects believed in 'self-transcendent' values—having faith in the goodness of others—the more they invested in riskier instruments. However, people who do not trust others, and hold the value 'openness to change', which relies on self-direction and stimulation, are more risk-averse and do not trust others to handle their finances. The more the subjects perceived this value as important, the more they withdrew from riskier instruments and invested in safer assets, such as their own bank accounts.

3.3 Diversification of assets

In order to better understand the investmentportfolios, we measured this variable using two methods. The results of the two regressions appear in Table 5 for the ID, and Table 6 for the HHL.

The results indicate that diversification was mainly connected to demographic elements and less to psychological traits. Subjects who were less educated, had a lower income, were single, secular, and employed tended to diversify their financial assets more than their peers. We also found that gender had a significant connection: men tend to diversify their investments more than women. These variables explained most of the variance in both measurements.

Attitude toward risk had an insignificant influence on explaining diversification as regardsboth the ID and the HHL; therefore, we did not confirm this hypothesis. In other words, people chose to allocate their financial assets regardless of their specific risk-taking attitudes. As for the ability to trust others, the picture was more complicated. In the first measurement, which counts the number of instruments, trust had no significant impact on diversification scope. However, in the second method, according to the Herfindahl–Hirschman Index, we found that the two trust variables were significantly connected, and in the opposite direction, as we expected. According to the results, people who trust in the benevolence of the world feel more secure to concentrate their investments in few instruments. The opposite pattern was indicated for people who value self-direction. People who feel more secure trusting themselves tend to diversify their capital, distributing it among several instruments. Therefore, this result also confirms our hypotheses.

4 Conclusions

Today, more than ever, governments make abundant efforts to persuade people to accumulate capital reserves. This tendency accelerated after the economic collapses of 2000 and 2008. More countries began to teach financial literacy and education in schools and universities, believing that people should take responsibility for their capital and financial decisions. As the population's general knowledge in finance expands, and with the aid of financial consultancy websites, people feel more secure about making decisions about their own finances and how to invest their capital. Accordingly, the current paper examined factors that influence novices' investment decisions and their allocation of assets.

The results of this study indicate that psychological traits have a significant influence on financial decisions. We found that *general subjective risk attitudes*, which was defined as the amount of risk people take in their overall behaviors, have a significant influence on active behaviors such as demonstrating and making independent investment decision. Similar to former studies (Barberis et al. 2006; Lambert et al. 2012; Shavit et al. 2013, 2014; Veld and Veld-Merkoulova 2008), participants who perceive themselves as risk-

takers tend to invest a greater proportion of their capital in risky instruments, compared to risk-averse subjects. This tendency is so embedded that it did not change, even when the investor was an external person, i.e. subjects made similar assumptions for both themselves and their relatives. Therefore, we can conclude that risk-averse people invested a smaller proportion of capital in risky tools, regardless of whether they owned the capital or not, and vice versa. As for diversification of assets, this tendency did not affect the pattern of investment allocation. Similar to Hariharan et al. (2000) results, we did not find a connection between asset diversification and risk attitude. This lack of connection implies that while taking financials risks is in some ways part of a general tendency, the willingness to diversify one's capital is not a result of that trait. The findings suggested that subjects prefer to operate in "safe" mode and not diversify too much or too little. The tendency to reduce risk was demonstrated in Benartzi and Thaler's (2001) article. In their multiple experiments, the two scholars illustrated that novice investors prefer not to make sophisticated diversifications, but prefer to rely on simple heuristics, such as 1/n (Benartzi and Thaler 2001). The researchers argue that this tendency is not the best option for gaining revenues; however, naïve investors tend to ignore the costs incurred by their choices. Since this tendency is so embedded in human behavior, it is not surprising that the subjects in our study prefered mid-range diversification—neither full diversification nor full concentration. We speculate that laymen investors don't necessarily have full knowledge about how to accurately calculate the amounts of profit and loss, when diversifying their funds. Therefore, they utilize heuristics, such as 1/n, in order to simplify their cognitive elaboration technique. This tendency is so intensive, it has a greater effect on allocation of financial assets than on the tendency to take risks. The results also indicated that while general risk attitude had an impact on investment decisions, the ability to trust others made a greater contribution. This result is in line with a growing number of studies indicating the importance of trusting the financial system, especially in regard to high-risk investments (e.g. Guiso et al. 2008; Georgarakos and Pasini 2011; Veld and Veld-Merkoulova, 2008). We argue that investing in stocks and bonds revealed the ability to trust others, since naive investors cannot have an effect on the results of the company, its ability to return its debts or on enlarging the value of the stocks. Consequently, one will not invest in risky instruments if s/he does not have faith in others' intentions. Applying a new operationalized method to the term "social trust", we found that participants who believe in the benevolence of others invested more funds in risky instruments, compared to subjects who rely on their self-direction. The latter had a negative connection to taking financial risks. This pattern repeated itself when we inquired into how subjects diversified their investments. Subjects who had faith in others not only took financial risks, they also concentrated on these instruments and made them their main investment tools. The opposite is true for people who hold more self-trusting values. These subjects not only invested in less risky instruments, they also avoided concentrating their investments. Since they have less faith in the financial system, they may find it wiser to allocate their assets by distributing them among several options, hoping one of them will reap benefits. Again, we found no connection between diversification and risk-taking attitudes. Therefore, we can say that trust and risk attitudes are not only dissimilar traits, they also affect different financial behaviors.

Diversification of assets was also connected to the subjects' characteristics. Male subjects were willing to divide their capital among several options more than women. In addition, subjects who were less educated, had a lower income, were single, secular, and employed tended to diversify their financial assets more than their peers. These variables explained most of the variance in both measurements, suggesting it should be taken into

account, especially when brokers adjust the appropriate portfolio of investments to naïve clients.

Another variable found in connection with pattern of investments was the amount of available money the participant had. The results indicate that when dealing with smaller amounts of capital, people prefer to take more risk, compared to larger amounts. This result can be attributed to the "loss aversion" tendency (Kahneman and Tversky 1984): people desire more strongly to avoid loss than to gain profit. Since the investments were preannounced in percentages, losing was less damaging when the invested amount was smaller. Thus, people could bear the idea of loss in relation to the smaller amount, but avoid financial risk when the stakes were higher.

The current paper provides both theoretical and practical information that may be of value to monetary institutions. We found that financial decision is influenced by general risk attitude and the ability to trust others, but not necessarily for the same procedures. Understanding the connections between these tendencies and investment types can aid bankers and investment advisors to better adjust the financial instruments they recommend, reducing clients' anger resulting from misinterpretation. Bankers should also realize that 'where to invest' and 'how to divide your capital' are two different dilemmas, influenced by different traits and considerations. Today, many financial institutions understand the importance of risk attitude; however, few are also aware of the impact of trust on monetary behaviors. We suggest that financiers inquire into the amount of trust clients have in their institution before advising them. If the financial system desires to encourage the public to invest in the stock market, it should take steps to reduce the mistrust people have developed toward it. This can encourage the public to invest more in stocks and bonds and help the system prevent the financial collapse we are currently facing.

Finally, since the influence of values has received very little research attention, we believe that more studies should be conducted in the future to better understand the role of the values held by both novice and expert investors, and their influence on the decisions they make concerning investments. For example, since we concentrated on young subjects in this research, a possible extension includes recruiting older subjects. Understanding how these fundamental attributes direct monetary behaviors will also aid financial advisors to better understand their clients and create more appropriate instruments tailored to clients' specific needs.

Appendix: investment risk behavior questionnaire

Part 3—self-decision

Imagine you have NIS 10,000/50,000/100,000 available to invest. How would you invest this amount, in percentages? If you deicide to diversify, please note that the final invested amount should be 100 % of the total amount.
Short deposit_____
Stocks _____
Long-term savings account (over a year) _____
Corporate bonds _____
Government bonds _____
Bank account/At home _____

Part 4—advising a relative

Imagine a relative of yours has NIS 10,000/50,000/100,000 available to invest. How would you recommend investing this amount, in percentages? If you deicide to diversify, please note that the final invested amount should be 100 % of the total amount.
Short deposit_____
Stocks _____
Long-term savings account (over a year) _____
Corporate bonds _____
Government bonds _____
Bank account/At home _____

References

Andersson, P.: Does experience matter in lending? A process-tracing study on experienced loan officers' and novices' decision behavior. J. Econ. Psychol. **25**(4), 471–492 (2004)

Barberis, N., Huang, M., Thaler, R.H.: Individual preferences, monetary gambles, and stock market participation: a case for narrow framing. Am. Econ. Rev. **96**, 1069–1090 (2006)

Benartzi, S., Thaler, R.H.: Naive diversification strategies in defined contribution saving plans. Am. Econ. Rev. **91**, 79–98 (2001)

Camerer, C.F., Johnson, E.J.: The process-perform paradox in expert judgment: How can experts know so much and predict so badly? In: Ericsson, K.A., Smith, J. (eds.) Toward a General Theory of Expertise: Prospects and Limits, pp. 215–281. Cambridge University Press, New York (1991)

Chernoff, R.A., Davison, G.C.: Values and their relationship to HIV/AIDS risk behavior among late-adolescent and young adult college students. Cogn. Ther. Res. **23**(5), 453–468 (1999)

Coleman, S.: Women and risk: an analysis of attitudes and investment behavior. Acad. Account. Financ. Stud. J. **7**(2), 99–114 (2003)

Cohen, L.: Loyalty-based portfolio choice. Rev. Financ. Stud. **22**(3), 1213–1245 (2009)

Dorn, D., Sengmueller, P.: Trading as entertainment? Manag. Sci. **55**(4), 591–603 (2009)

Fehr, E.: On the economics and biology of trust. J. Eur. Econ. Assoc. **7**(2–3), 235–266 (2009)

Georgarakos, D., Pasini, G.: Trust, sociability, and stock market participation. Rev. Financ. **15**(4), 693–725 (2011)

Goodwin, R., Realo, A., Kwiatkowska, A., Kozlova, A., Luu, L.A.N., Nizharadze, G.: Values and sexual behavior in central and eastern Europe. J. Health Psychol. **7**, 45–56 (2002)

Guiso, L., Paola, S., Luigi, Z.: Trusting the stock market. J. Financ. **63**, 2557–2600 (2008)

Hains, A.A.: Variables in social cognitive development: Moral judgment, role taking, cognitive processes, and self-concept in delinquents and nondelinquents. J. Early Adolesc. **4**, 65–74 (1984)

Hannan, T.H.: Market share inequality, the number of competitors, and the HHI: an examination of bank pricing. Rev. Ind. Organ. **12**(1), 23–35 (1997)

Hariharan, G., Chapman, K.S., Domian, D.L.: Risk tolerance and asset allocation for investors nearing retirement. Financ. Serv. Rev. **9**(2), 159–170 (2000)

Huberman, G.: Familiarity breeds investment. Rev. Financ. Stud. **14**(3), 659–680 (2001)

Lahav, E., Benzion, U., Shavit, T.: The effect of military service on soldiers' time preference—evidence from Israel. Judgm. Decis. Mak. **6**(2), 130–138 (2011)

Lambert, J., Bessière, V., N'Goala, G.: Does expertise influence the impact of overconfidence on judgment, valuation and investment decision? J. Econ. Psychol. **33**(6), 1115–1128 (2012)

Kahneman, D., Tversky, A.: Choices, values and frames. Am. Psychol. **39**(4), 341–350 (1984)

McCarthy, D.: Household portfolio allocation: a review of the literature. In: Economic and Social Research Institute of the Japan Cabinet Office Conference on the International Collaboration Projects (2004).

Nosic, A., Weber, M.: How riskily do I invest? The role of risk attitudes, risk perceptions, and overconfidence. Decis. Anal. **7**(3), 282–301 (2010)

Nyhus, E.K., Webley, P.: The role of personality in household saving and borrowing behavior. Eur. J. Pers. **15**(S1), S85–S103 (2001)

Rhoades, S.A.: Herfindahl-Hirschman index, the. Fed. Res. Bull. **79**, 188 (1993)

Rokeach, M.: The Nature of Human Values, p. 438. Free Press, New York (1973)

Schooley, D.K., Worden, D.D.: Risk aversion measures: comparing attitudes and asset allocation. Financ. Serv. Rev. **5**(2), 87–99 (1996)
Schwartz, S.H.: Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries. Adv. Exp. Soc. Psychol. **25**(1), 1–65 (1992)
Schwartz, S.H: Value priorities and behavior: applying a theory of integrated value systems. In: Seligman, C., Olson, J.M., Zanna, M.P. (eds.) The Psychology of Values: The Ontario Symposium, vol. 8, pp. 1–24. Lawrence Erlbaum, Hillsdale (1996)
Schwartz, S.H., Inbar-Saban, N.: Value self-confrontation as a method to aid in weight loss. J. Personal. Soc. Psychol. **54**(3), 396 (1988)
Schwartz, S.H., Melech, G., Lehmann, A., Burgess, S., Harris, M., Owens, V.: Extending the cross-cultural validity of the theory of basic human values with a different method of measurement. J. Cross Cult. Psychol. **32**(5), 519–542 (2001)
Shavit, T., Lahav, E., Shahrabani, S.: What affects the decision to take an active part in social justice protests? The impacts of confidence in society, time preference and interest in politics. J. Behav. Exp. Econ. **52**, 52–63 (2014)
Shavit, T., Benzion, U., Shapir, O.M., Galil, K.: Are time preferences for risky outcomes, riskless outcomes and commodities really different? Econ. Lett. **118**(3), 512–514 (2013)
Shapiro, R., Siegel, A.W., Scovill, L.C., Hays, J.: Risk-taking patterns of female adolescents: what they do and why. J. Adolesc. **21**(2), 143–159 (1998)
Siegel, A.W., Cousins, J.H., Rubovits, D.S., Parsons, J.T., Lavery, B., Crowley, C.L.: Adolescents' perceptions of the benefits and risks of their own risk taking. J. Emot. Behav. Disord. **2**(2), 89–98 (1994)
Veld, C., Veld-Merkoulova, Y.V.: The risk perceptions of individual investors. J. Econ. Psychol. **29**(2), 226–252 (2008)