

Investment Competence and Advice Seeking

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Abstract

This paper evaluates individuals' ability to avoid investment mistakes and analyzes how investment competence is related to the propensity to seek or rely on professional advice. To address these issues, we use novel survey data collected from a representative sample of Swiss households. We find that investment competence is characterized by significant age and gender gaps, and that individuals who rely less on price movements as a source of information about investments are more likely to show above-the-average investment competence. We also find that individuals with relatively extensive investment experience and those who rely relatively strongly on their own judgment in making investment decisions are more likely to make investment decisions autonomously. In addition, we find that investment competence is positively related to the demand for financial advice. Thus, it appears that the individuals who most need financial advice are those who are least likely to seek such advice and rely on it.

Keywords: investment mistakes, behavioral biases, demand for financial advice, household finance

JEL classification: D14, D83, G11, G23

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1 Introduction

A compelling body of research documents that households make serious investment mistakes. Among the various pieces of evidence are findings that households hold under-diversified portfolios (Blume and Friend, 1975; Kelly, 1995; Goetzmann and Kumar, 2008) and exhibit a strong preference for local and home country stocks (Huberman, 2001; Calvet et al., 2007). In addition, households trade too much (Odean, 1999), sell winners too early and hold losers too long (Shefrin and Statman, 1985; Odean, 1998), and they tend to buy a stock simply because it catches their attention (Barber and Odean, 2008). As a result, the average retail investor tends to underperform the market (Barber et al., 2009).

One might argue that an inability to avoid investment mistakes will not necessarily generate poor financial outcomes for households. At least in principle, households with low investment competence could seek help from qualified financial advisors. In fact, the regulation of financial advisors relies, to a large extent, on the assumption that these advisors are mainly consulted by unsophisticated investors in need of help. However, regulatory protective measures can be effective only if households with limited investment competence seek the support of professional advisors. Otherwise, financial advice cannot serve as a substitute for investment competence, and regulatory measures will not benefit those who need them the most.

In this paper, we analyze whether individuals in Switzerland are at risk of making investment mistakes and whether they are inclined to seek help from professional advisors. To assess individuals' competence in avoiding investment mistakes, we conducted an online survey that consisted of questions that address common errors documented in the empirical literature on behavioral and household finance. We analyze the determinants of investment mistakes and assess how an individual's degree of investment competence affects whether he or she makes investment decisions autonomously, consults a professional advisor or delegates investment decisions to a potential advisor. We obtain several interesting findings. We find that respondents differ in their investment competence significantly by their age and gender: younger, female respondents show significantly lower investment competence than the other respondents. We also find that a greater reliance on price movements as a source of information about investments increases the probability that a person shows below-the-average investment competence. We find that individuals with substantial investment experience, who rely strongly on their own judgment, are more likely to make investment decisions autonomously than to seek and rely on advice. However, we also observe that the demand for financial advice is positively related to investment competence: investors who are less able to avoid investment errors are more likely to make investment decisions autonomously, whereas investors with higher investment competence are more likely to delegate decisions to an advisor. Overall, our results suggest that advisory services are not a substitute for the ability to avoid investment mistakes and that supply-side solutions imposed by regulators to protect financial customers may not benefit those who need them the most.

Our results contribute to the discussion of the drivers of investment mistakes and the role of financial advice as a potential remedy for such errors. They also generate suggestions regarding potentially helpful educational initiatives. Although we use hypothetical questions to assess individuals' decision behavior, we find that some often-cited errors, such as under-diversification and mistakes arising from the disposition effect, are influenced by the same factors as those identified in studies based on transaction data. Additionally, by providing hypothetical choices, we can address the reasoning used in investment decisions: reasoning that is not directly observable in research based on transaction data. By extending the definition of investment competence, we confirm the positive relationship between investment competence and the propensity to delegate decisions, as suggested by studies focused primarily on the importance of financial knowledge. On this basis, we suggest that educational initiatives may indeed be beneficial but that such initiatives should educate retail investors about how to avoid behavioral traps in addition to teaching them basic financial knowledge.

This paper is organized as follows. In Section 2, we provide an overview of the literature related to our research questions. In Section 3, we describe the data, provide descriptive statistics, explain how we assess investment competence and describe the motivation for our choice of control variables. Section 4 presents and elaborates the results and discusses endogeneity issues. The results of robustness tests are discussed in Section 5. Section 6 summarizes our findings and concludes the paper.

2 Related Literature

Many households make decisions that are hard to reconcile with rational decision-making (see, e.g., Bondt, 1998, Campbell, 2006 or Barber and Odean, 2011 for comprehensive reviews), and a growing body of empirical literature identifies a cross-sectional correlation between particular investment mistakes and individual characteristics. For example, Goetzmann and Kumar (2008) and Calvet et al. (2007) find that richer, better-educated households tend to be better diversified. Dhar and Zhu (2006) document that trading experience reduces the disposition effect, i.e., the tendency to hold losing stocks and sell winning stocks. Similarly, Feng and Seasholes (2005) find that investment experience eliminates reluctance to realize losses. Examining under-diversification, inertia in risk taking and the disposition effect, Calvet et al. (2009) build an index of financial sophistication and find that the latter increases with financial wealth, household size, education and proxies for financial experience. These and other related individual characteristics are often used as proxies for investor sophistication.

Decisions that violate the concept of rational decision-making are costly. Empirical studies suggest that the magnitude of negative abnormal returns ranges from 0.7% (French, 2008) to 3.7% per year (Barber and Odean, 2000). Consequently, a number of potential remedies have been proposed as a means to lessen such investment errors. For example, Thaler and Bernarzi (2004) show that participation in retirement plans as a default option has a substantial positive effect on retirement savings. Collins (2010) suggests that financial counseling can help individuals develop better financial practices, thus improving

their long-term financial security. The question of whether expert financial advice truly benefits retail investors is still under debate, but there is a consensus that financial advice may improve retail investors' portfolio decisions when conflicts of interests are minimized (Bhattacharya et al., 2012). There is evidence that professionally managed portfolios are better diversified (Gerhardt and Hackethal, 2009) and show a weaker disposition effect than portfolios of retail investors (Shapira and Venezia, 2001).

To date, the question of whether financial advice is a sufficient remedy for inferior decision-making has focused mainly on widespread financial illiteracy as a source of adverse decisions.¹ One strand of the literature documents a negative relationship between financial literacy and advice seeking, suggesting that those with lower levels of financial literacy are more inclined to make use of financial advice. For example, Hackethal et al. (2010) study the behavior of German retail investors and conclude that customers with less interest in and knowledge about financial matters are more likely than others to rely on advice. In a portfolio-choice experiment, Hung and Yoong (2010) find that individuals with low financial literacy (both self-assessed and measured) choose to take advice more often than others do. Frederick (2005) shows that individuals with lower levels of cognitive skills are more risk-averse, and both Bluethgen et al. (2008) and Gerhardt and Hackethal (2009) find that greater risk aversion increases the demand for financial advice. Kramer (2012) finds that banking clients who view themselves as less financially literate than others are more likely to ask for expert financial assistance. Additionally, Hackethal et al. (2010) find that less sophisticated customers are less aware of the problem of conflicts of interest among financial advisors and therefore are more inclined to consult and follow the advice of advisors. Hence, financial advice can serve as a substitute for a perceived or measured lack of financial sophistication.

Other studies, however, suggest exactly the opposite relationship between investment competence and the demand for financial advice, arguing that more sophisticated individuals are more likely to seek advice. One possible reason for this variation may be the incentives of advisors to reveal information to investors with different levels of sophistication. For example, Collins (2010), Calcagno and Monticone (2011) and Bucher-Koenen and Koenen (2011) suggest that advisors reveal information only to more knowledgeable clients, anticipating that such clients are more likely to consult advisors. Another possible reason for a positive relationship between financial sophistication and advice seeking may be the marginal costs of information acquisition and processing. If time spent with an advisor is perceived as a fixed cost, then highly sophisticated investors will face lower marginal costs of information processing than will investors with less sophistication, which will motivate the sophisticated investors to consume more advisory services (Bluethgen et al., 2008).

Various studies have confirmed the marginal benefits argument using different measures of investor sophistication. Lusardi and Mitchell (2006) find that people with higher scores on financial literacy questions are more likely than less sophisticated investors to rely on financial experts when planning their

¹ Kramer (2012), in addition, considers cognitive ability but fails to find a significant effect on advice seeking.

retirement. Using past portfolio performance as a proxy for financial sophistication, Bluethgen et al. (2008) find that wealthier, more sophisticated and more experienced clients are more likely to seek advice. Hackethal et al. (2012) confirm the effect of investment experience and wealth on the propensity to seek advice and suggest that the effect could also be related to the higher opportunity costs associated with time among wealthier, more experienced investors. Further support for the conjecture that less sophisticated individuals rely less on expert financial advice than others can be found in the psychology literature. Kruger and Dunning (1999), for example, observe that incompetence robs people of awareness of their own incompetence because such individuals lack the capacity to distinguish appropriate decisions from errors. As a result, such individuals fail to seek better information.

3 Data Description

3.1 The Sample

Our dataset comes from an online survey that was conducted in December 2010 with 1,016 individuals from the German-, Italian-, and French-speaking regions of Switzerland. Switzerland is a particularly suitable country for studies of investment competence for several reasons. First, Swiss households are better endowed with resources that allow them to engage in investment activities than are households in other countries. According to OECD data, Swiss households have the highest net saving rate as a percent of disposable income (12% compared to 4% in the US),² and in terms of per capita assets, Swiss households are the richest in the world.³ Second, compared to households in other European countries, households in Switzerland exhibit more independence in planning and managing the financial components of their retirement. Hence, the social costs of investment mistakes in such households' attempts to manage their savings for retirement may be high. Third, the multicultural character of Switzerland makes it possible to examine a magnitude of cultural effects on households' investment decision behavior, advice seeking and delegation.

The participants in our survey were recruited from a pool of individuals provided by a professional market research agency in Switzerland. The agency has experience conducting surveys on financial topics. The participants were informed of the purpose of the study and of the affiliation of the authors. Additionally, in exchange for their participation, the individuals answering most of the questions took part in a raffle in which an iPad was awarded to the winner.⁴ The questions were originally written in German. We used professional interpreters who were provided by the market research agency to translate the questions into French and Italian.

² See OECD (2012), Annex Table 23, p. 255.

³ See Allianz (2011), Appendix B, p. 90.

⁴ Compensation type did not have a significant impact on the respondents' answers. In particular, we found that a fixed payment (10 Swiss francs) did not motivate students to answer the questions differently than a chance of winning an iPad with a market value of approximately 800 Swiss francs that was raffled off among 100 participants.

The sample is representative of the underlying population in terms of age, gender and geographic location. As Table 1 shows, the respondents were 48 years old on average. 54% were male, 30% had degrees from schools of applied sciences (“Hochschule”) and 18% had university degrees. Overall, 43% of the respondents stated that their annual disposable income was between 50,000 and 100,000 Swiss francs (USD 48,500 and USD 97,000 as of December 2010),⁵ only 9% stated their annual income as less than 50,000 Swiss francs. Notably, 37% estimated the value of their wealth (including savings and financial investments) to be above 100,000 Swiss francs.

Table 1: Descriptive Statistics

	mean	st. dev.	min.	max.
Demographic and Socio-Economic Characteristics				
female	46%	0.50		
income:				
<50'000 Swiss francs	9%	0.29		
50'000-100'000 Swiss francs	44%	0.50		
100'000-150'000 Swiss francs	44%	0.50		
>150'000	2%	0.15		
wealth				
<100'00 Swiss francs	59%	0.49		
100'000-200'000 Swiss francs	18%	0.39		
200'000-300'000 Swiss francs	7%	0.25		
>300'000 Swiss francs	3%	0.18		
self-employment	10%	0.30		
education level:				
primary school	7%	0.25		
secondary school	34%	0.48		
grammar school	10%	0.30		
school of applied sciences	31%	0.46		
university	18%	0.38		
residence:				
German-speaking	70%	0.46		
French-speaking	20%	0.40		
Italian-speaking	10%	0.30		
age	48	0.12	25	69
<=30 years	7%	0.26		
31-40 years	21%	0.41		
41-50 years	30%	0.46		
51-60 years	22%	0.41		
61-69 years	20%	0.40		
household size	2.6	1.31	1	5
Investment Experience and Importance of Information Sources				
investment experience:				
Swiss bonds	2.03	0.96	1	4
bonds world	1.59	0.82	1	4
Swiss equity	2.09	1.00	1	4
equity world	1.70	0.89	1	4
alternative investments	1.76	0.91	1	4
perceived importance of information sources:				
price movements	2.04	0.79	1	3
media news	1.90	0.65	1	3
friend's opinion	1.79	0.66	1	3
own judgment	2.33	0.64	1	3
advisor's opinion	2.05	0.68	1	3
opinion of several advisors	1.80	0.70	1	3

3.2 Assessing Investment Competence

The main body of the survey contains questions that aim to evaluate individuals' ability to avoid investment mistakes. An investment mistake is a decision that is not recommended or wise based on

⁵ The average annual disposable income per household in 2010 was 81,900 Swiss francs (USD 78,600 as of Dec. 2010). Source: <http://www.bfs.admin.ch/bfs/portal/de/index/themen/20/02/blank/key/einkommen0/niveau.html>

theoretical or empirical considerations. We refer to the ability to avoid investment mistakes as investment competence.

Generally, investment mistakes can result from a lack of specific knowledge or an inability to apply such knowledge effectively. For example, Dhar and Zhu (2006) find that individuals with better financial literacy are more likely to avoid suboptimal portfolio decisions, such as those associated with the disposition effect. The inability to apply knowledge effectively can be driven by emotions or cognitive errors in the selection and processing of information, as suggested by the vast body of research on behavioral biases (see, for example, the surveys cited above).

To evaluate the investment competence of the respondents, we invited them to answer a set of multiple-choice questions whose potential answers were designed to illustrate biased decision behavior. Because we provided multiple answers, the respondents were able to compare them and choose the best alternative. The participants could also skip questions or choose the “don’t know” option. The appendix provides an English version of the investment competence questions and their motivation.

Table 2 shows how the participants answered our investment competence questions, the percentage of participants who answered the questions incorrectly and the distribution of the incorrect answers.

Table 2: Investment Mistakes

The table shows the distribution of answers to the investment competence questions. The marked cells show the percentage of individuals that we consider as able to avoid mistakes. The lower part of the table shows the number of investment mistakes and its probability distribution. The questions and the possible answers are included in the appendix.

	a)	b)	c)	d)	e)	f)	g)	h)	NA	Participants with investment mistakes		
Q1: past returns	2%	29%	12%	26%	24%	3%	2%	1%	1%		75%	
Q2: past risks	3%	2%	3%	5%	42%	7%	33%	3%	2%		56%	
Q3: performance drivers	76%	6%	17%						1%		23%	
Q4: diversification	17%	52%	29%						2%		69%	
Q5: risk for losses in the long-term	10%	59%	29%						2%		10%	
Q6: investing on a random walk	40%	57%							3%		57%	
Q7: reasons for continuing investing	14%	20%	34%	31%					1%		34%	
Q8: attractiveness of large unlikely payoffs	70%	8%	20%						2%		8%	
Q9: risk-taking after losses	1%	4%	36%	37%	22%				1%		5%	
Q10: behavior after losses	11%	3%	39%	46%					1%		53%	
Q11: behavior after gains	58%	9%	31%						2%		67%	
Number of mistakes	0	1	2	3	4	5	6	7	8	9	10	11
Frequency	4	17	47	136	219	221	178	78	18	8	0	0
Cumulative Prob. Distribution	0.4%	2.3%	7.3%	22.0%	45.7%	69.5%	88.7%	97.2%	99.1%	100%		

The respondents made the most errors in recalling and comparing the past returns of asset classes (Q1), deciding how many assets are needed for diversification (Q4) and assessing the attractiveness of assets with large but unlikely payoffs (Q8). Participants made the fewest mistakes in deciding whether to take risks after losses (Q9), judging the probability of losses from long-term investments (Q5) and comparing the importance of different performance drivers (Q3). Overall, 50% of the participants answered between

four and five questions incorrectly, 0.4% (4 individuals) made no mistakes and 0.9% (8 individuals) answered 9 of 11 questions incorrectly, providing the highest number of incorrect answers in the group. Notably, 9% failed to answer at least one question.

Investment mistakes themselves are only weakly correlated across individuals (see Table 3). The only exception is indicated by the answers to the last two questions, which were designed to assess the disposition effect, i.e., the propensity to hold losers too long (Q10) and sell winners too early (Q11).

Table 3: Correlation Between Investment Mistakes

The table reports the tetrachoric correlations between the bivariate variables evaluating the answers to the investment competence questions.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Q2	-0.327									
Q3	0.126	-0.095								
Q4	0.190	-0.044	0.053							
Q5	0.167	-0.121	0.043	-0.126						
Q6	0.105	-0.030	-0.027	-0.035	-0.034					
Q7	0.050	-0.109	0.063	0.087	-0.054	0.074				
Q8	0.176	0.008	0.063	0.103	0.056	-0.028	0.226			
Q9	0.005	0.096	0.079	0.097	0.099	-0.050	0.252	0.293		
Q10	0.114	-0.094	-0.059	0.122	0.092	-0.068	0.223	0.119	0.282	
Q11	0.080	-0.124	0.024	0.109	-0.007	0.184	0.199	0.013	0.012	0.526

One method of measuring an individual's overall ability to avoid investment mistakes involves computing the fraction of incorrect answers. However, the disadvantage of this approach is that each question receives the same weight even though the degree of discrepancy between the incorrect and correct answers differs from question to question (see Table 2). Essentially, the questions may differ in their difficulty levels and in their degree of precision. For this reason, we developed a measure based on a weighting scheme that considers both issues.⁶

We define the index of investment competence for individual i as a weighted sum of investment mistakes, i.e.

$$I^i = -(w_1 Q_1 + w_2 Q_2 + \dots + w_k Q_k)$$

where

$$Q_k^i = \begin{cases} 1 & \text{if } Q^i \text{ is an inferior answer}^7 \\ 0 & \text{otherwise} \end{cases}$$

and $0 \leq w_k \leq 1$ is a weight that reflects the difficulty respectively the precision of question k . The weight of question k is defined as

$$w_k = 1 - \mu(Q_k)$$

⁶ The weighting scheme is the first step of the PRIDIT scoring method devised by Brockett et al. (2002), who use it to assess insurance fraud based on several indicator variables. In the second step, a principle component analysis is used to analyze the rescaled responses. Lusardi et al. (2012) used this method to assess financial literacy among the elderly in the U.S. We do not employ the second step because the responses to our investment competence questions show little correlation (see Table 3).

⁷ "Don't know" answers are treated as no mistakes.

where $\mu(\cdot)$ is the mean or the percentage of participants who answer question k incorrectly. The weight w_k applies a higher (lower) penalty to a question when a larger proportion of the participants answered the question correctly (incorrectly).

3.3 Investment Competence Drivers

The literature on the cross-sectional relationship between investment mistakes and household characteristics suggests that households with greater financial wealth, better education and more investment experience tend to make fewer investment errors (Goetzmann and Kumar, 2008; Calvet et al., 2007; Calvet et al., 2007; Dhar and Zhu, 2006; Feng and Seasholes, 2005; Calvet et al., 2009). Our proxy for financial experience is self-assessed investment experience. We asked the participants to evaluate their own investment experience in five asset classes (Swiss bonds, Swiss equities, international equities, international bonds and alternative investments) on a scale with four levels. Table 1 provides the summary statistics. The participants in our sample show the most experience with Swiss equities and Swiss bonds and the least experience with non-Swiss bonds and non-Swiss equities.

In Table 4, we report the polychoric correlations between the participants' levels of experience in different asset classes.⁸ We observe a high correlation between experience with Swiss bonds and international bonds and between experience with Swiss equities and international equities. Participants who indicate high (low) levels of experience with international equities are also more likely to have high (low) levels of experience with alternative investments.

Table 4: Correlation Between Statements on Investment Experience

The table reports polychoric correlations between experience statements across asset classes. The experience statements are ordinal variables taking values between 1 (no experience) and 4 (a lot of experience).

	Swiss bonds	bonds world	Swiss equity	equity world
bonds world	0.77			
Swiss equity	0.67	0.70		
equity world	0.54	0.75	0.81	
alternative investments	0.43	0.48	0.51	0.53

To determine the correlations between investment experience and different asset classes, we use principle component analysis to build an index of investment experience.⁹ The standardized loadings of the variables based on their correlation matrix are provided in Table 5.¹⁰ With the first principle component used to measure investment experience, we can explain 70% of the variance in the variables. The Cronbach's Alpha is 0.89, which indicates the high reliability of the variables used.

⁸ The polychoric correlations estimate what the correlation between households would be if ratings were made on a continuous scale. Theoretically, these correlations are invariant to changes in the number of rating categories.

⁹ Our main results are not sensitive to alternative measures, such as a simple sum of experience statements (from 1 to 4) regarding equities (Swiss and international) and bonds (Swiss and international).

¹⁰ The standardized loadings are based on the polychoric correlations reported in Table 4.

Table 5: Standartized Loadings

The table reports results of principal component analysis applied on the experience statements with different asset classes based upon the polychoric correlations. The standardized loadings of the first component are used to form an index of investment experience.

	1. component	2. component	3. component
Explained variance	0.704	0.128	0.094
	standardized loadings	explained variance	reliability by dropping
Swiss bonds	0.82	0.67	0.87
Bonds world	0.90	0.80	0.85
Swiss equity	0.89	0.80	0.85
Equity world	0.88	0.77	0.85
Alternative investments	0.68	0.46	0.91
Cronbach's Alpha	0.89		

Furthermore, we hypothesize relationships between an individual's views about the importance of specific sources of information and the probability of two decision types: making certain types of investment mistakes and seeking financial advice. To assess these relationships, we ask the participants to judge the importance of the following information sources on a three-point scale that includes the categories "not important," "important" and "very important": price movements, news in the media, own judgment, opinions of friends, opinions of one's advisor and opinions of many advisors. For the participants in our sample, the most important source of information was one's own opinions, followed by price movements and the opinions of one's advisor (see Table 1). The correlation between the perceived importance of various information sources is low (0.01) to mediocre (0.55) (see Table 6). For this reason, we do not apply further transformations to these data.

Table 6: Correlation Between Information Sources

The table reports polychoric correlations between statements on the perceived importance of information sources. The statements are ordinal variables taking values between 1 (not important) and 3 (very important).

	price movements	news in media	friends' opinion	own judgment	opinion own advisor
price movements					
news in media	0.468				
friends' opinion	-0.051	0.165			
own judgment	0.391	0.326	0.269		
opinion own advisor	0.079	0.094	0.132	0.022	
opinion many advisors	0.229	0.140	0.207	0.011	0.554

3.4 Demand for Financial Advice

Financial advisors can be endowed with decision-making authority or can play a purely advisory role. Swiss banks offer both options only to wealthy individuals¹¹, but some independent advisors offer advisory services to less wealthy individuals as well. Because participants may not have an advisor, we ask that they consider a *potential* financial advisor (at a bank or not) and then choose the option that best

¹¹ Banks differ in their definition of a wealthy client, but on the website www.assetinum.com, Swiss private clients with at least 50,000 Swiss francs can contact one or many advisors from different banks. For a choice of up to five advisors, the contact service is free.

describes their current attitude toward acquiring and relying on advice from such an advisor. The distribution of answers is summarized in Table 7.

Table 7: Demand for Financial Advice

Which of the following statements describes best your willingness to delegate financial decisions to a potential advisor?	
d ₁ : I prefer to decide autonomously, the advisor should only execute my decisions	23%
d ₂ : I prefer to tell my advisor how I would decide and would ask for his opinion	25%
d ₃ : I prefer to get several opinions before I decide	35%
d ₄ : I would trust my advisor in most decisions	14%
d ₅ : I would let my advisor decide everything	1%
Non participation	2%

22% of the participants state that they prefer to make investment decisions autonomously, 60% would consult one or several advisors before they decide, and 15% would rely largely or completely on an advisor. Calcagno and Monticone (2011) asked a similar question of banking clients in Italy in 2007. Of the clients who participated in the survey, 12% indicated that they make their decisions autonomously. The higher percentage of self-directed individuals in our sample (22%) could be a function of the participants' age. In our sample, 56% of the participants are less than 50 years old, whereas the percentage of banking clients under 50 in the sample of Calcagno and Monticone (2011) is 38%. Some studies provide evidence that younger individuals are more likely to make investment decisions autonomously (Bluethgen et al., 2008; Hackethal et al., 2010; Kelly, 1995; Bhattacharya et al., 2012). The results that we report in Section 4.2 support this finding.

To avoid estimation difficulties that can result from the use of too few observations in a given category, we pool participants who are willing to delegate all decisions (d₅) with those who are willing to delegate most decisions (d₄). As a result, we obtain a dependent variable with four categories (d₁, d₂, d₃ and d₄).

3.5 Advice Seeking and Individuals' Characteristics

Most studies on advice seeking find that the demand for advisory services increases with wealth (Bluethgen et al., 2008; Guiso and Jappelli, 2006; Calcagno and Monticone, 2011; Bluethgen et al., 2008; Bhattacharya et al., 2012). Some studies also find that older individuals are also significantly more likely to seek advice than are younger individuals (Bluethgen et al., 2008; Hackethal et al., 2010; Kelly, 1995; Bhattacharya et al., 2012). The effect of gender and those of experience, self-employment and education

as proxies for the opportunity cost of time, are ambiguous.¹² Based on these findings, we include the following variables as controls in the multivariate analysis: age, gender, education level, income, wealth, investment experience, and self-employment status. Additionally, we control for cultural differences based on the linguistic regions of the participants.

4 Results

4.1 Drivers of Investment Mistakes

In this section, we analyze whether the probability of certain investment mistakes and a person's level of investment competence are related to the perceived importance of specific information sources, stated investment experience and various demographic and socio-economic variables. Table 8 reports the marginal effects of logistic regressions on the probability of observing specific investment errors where investment errors are represented by the binomial variables Q_k for $k = 1, \dots, 11$.

¹² Whereas Guiso and Jappelli (2006), Calcagno and Monticone (2011), Bluethgen et al. (2008), Hackethal et al. (2012) and Kelly (1995) find that males have a lower propensity to delegate, Bhattacharya et al. (2012) find that males are more likely to obtain advice, and Hackethal et al. (2010) find that males and females do not differ significantly in their willingness to rely on advice. Additionally, Hackethal et al. (2012) find that advised clients are more likely to be self-employed and tend to be more experienced. However, Calcagno and Monticone (2011) find that experience does not significantly influence advice seeking, and Kramer (2012) does not find any significant effect of self-employment on the demand for financial advice among Dutch retail clients. Elmerick et al. (2002) find that for US households, self-employment is negatively related to the likelihood of using a financial planner in saving and investment decisions. They also find that this likelihood increases with educational achievement. However, Calcagno and Monticone (2011) and Hackethal et al. (2010) find that better-educated investors are less likely to delegate and are more likely to make investment decisions on their own.

Table 8: Drivers of Single Investment Mistakes

The table reports marginal effects on the probability to make investment mistakes in answering investment competence questions after estimating logistic regressions. The dependent variables in the logistic regressions are bivariate variables taking the value of 1 if the choice is inferior. The explanatory variables are described in the appendix. Robust standard errors are reported in parenthesis. Significance levels are denoted with stars: *** $p \leq 0.01$ ** $p \leq 0.05$, * $p \leq 0.1$.

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	disposition effect
price movements	-0.034 (0.022)	-0.033 (0.027)	0.02 (0.022)	-0.032 (0.025)	-0.022 (0.016)	0.059** (0.027)	0.038 (0.026)	0.002 (0.014)	-0.008 (0.01)	0.062** (0.027)	0.038 (0.025)	0.05** (0.024)
news in media	-0.041* (0.024)	0.017 (0.03)	-0.008 (0.024)	-0.039 (0.027)	-0.001 (0.018)	0.078*** (0.03)	0.013 (0.028)	-0.019 (0.016)	0.005 (0.011)	0.017 (0.03)	0.052* (0.028)	-0.004 (0.027)
friends' opinion	0.077*** (0.024)	-0.023 (0.029)	0.023 (0.024)	0.072*** (0.027)	0.016 (0.017)	-0.036 (0.029)	-0.019 (0.027)	-0.009 (0.015)	-0.003 (0.011)	-0.049* (0.029)	-0.028 (0.027)	0.023 (0.026)
own judgment	-0.001 (0.026)	0.032 (0.03)	-0.035 (0.025)	-0.082*** (0.028)	0.021 (0.018)	0.059* (0.03)	0.013 (0.029)	-0.017 (0.015)	0.018 (0.011)	0.028 (0.03)	0.023 (0.028)	-0.009 (0.027)
advisor's opinion	-0.018 (0.024)	-0.066** (0.029)	0.003 (0.024)	-0.046* (0.027)	-0.031* (0.018)	-0.013 (0.029)	0.04 (0.028)	-0.008 (0.015)	-0.011 (0.011)	0.065** (0.029)	0.036 (0.027)	0.051* (0.026)
opinion many advisors	0.012 (0.023)	0.026 (0.029)	-0.013 (0.024)	-0.006 (0.026)	0.015 (0.018)	-0.005 (0.028)	-0.001 (0.027)	0.008 (0.015)	-0.001 (0.011)	-0.038 (0.029)	-0.035 (0.027)	-0.024 (0.026)
investment experience	-0.069*** (0.019)	0.023 (0.024)	-0.018 (0.02)	-0.06*** (0.022)	-0.009 (0.015)	-0.041* (0.024)	0.072*** (0.023)	0.023* (0.012)	0.007 (0.008)	-0.005 (0.024)	-0.047** (0.022)	-0.042* (0.022)
age	0.003** (0.001)	0.004** (0.002)	-0.003* (0.001)	0.003** (0.001)	0.000 (0.001)	-0.004*** (0.002)	-0.001 (0.002)	0.000 (0.001)	-0.001** (0.001)	-0.005*** (0.002)	-0.002 (0.002)	-0.004*** (0.001)
female	0.11*** (0.031)	-0.094** (0.037)	-0.022 (0.031)	0.051 (0.034)	-0.006 (0.023)	0.089** (0.037)	0.073** (0.036)	0.000 (0.019)	-0.011 (0.014)	0.067* (0.037)	0.084** (0.035)	0.139*** (0.034)
high education	0.044 (0.032)	0.045 (0.038)	-0.048 (0.032)	-0.012 (0.035)	0.007 (0.023)	0.023 (0.038)	-0.069* (0.036)	0.005 (0.02)	0.000 (0.014)	-0.010 (0.038)	-0.001 (0.036)	0.056 (0.034)
income2	-0.08 (0.065)	-0.015 (0.064)	-0.031 (0.05)	0.136** (0.058)	0.005 (0.038)	-0.028 (0.065)	0.146** (0.065)	-0.014 (0.03)	-0.005 (0.023)	0.026 (0.064)	-0.044 (0.062)	0.051 (0.061)
income3	-0.184*** (0.066)	0.023 (0.067)	-0.026 (0.053)	0.011 (0.062)	-0.009 (0.04)	-0.002 (0.068)	0.133* (0.068)	-0.048 (0.032)	-0.002 (0.024)	-0.025 (0.067)	-0.068 (0.064)	0.064 (0.063)
income4	-0.414*** (0.142)	0.122 (0.124)	-0.067 (0.093)	-0.103 (0.128)	-0.004 (0.08)	0.091 (0.124)	-0.044 (0.123)	-0.056* (0.029)	0.02 (0.056)	-0.110 (0.128)	-0.226* (0.133)	-0.023 (0.121)
wealth2	0.037 (0.035)	0.019 (0.046)	-0.078** (0.034)	-0.009 (0.042)	0.007 (0.029)	-0.007 (0.047)	0.032 (0.044)	-0.023 (0.021)	-0.021 (0.014)	0.009 (0.046)	0.033 (0.042)	0.076* (0.044)
wealth3	-0.012 (0.057)	0.016 (0.07)	-0.072 (0.051)	0.003 (0.063)	-0.009 (0.043)	-0.097 (0.073)	-0.014 (0.067)	-0.037 (0.027)	0.005 (0.027)	0.077 (0.069)	0.108* (0.057)	0.006 (0.066)
wealth4	-0.04 (0.085)	0.167* (0.095)	-0.059 (0.077)	-0.029 (0.094)	-0.059 (0.046)	-0.044 (0.105)	0.085 (0.102)	-0.052* (0.029)	0.017 (0.042)	-0.012 (0.104)	0.044 (0.089)	0.157 (0.107)
French-speaking	0.06* (0.034)	0.092** (0.044)	-0.038 (0.036)	0.064 (0.039)	0.042 (0.03)	-0.022 (0.045)	-0.02 (0.043)	-0.037* (0.02)	0.017 (0.02)	0.095** (0.044)	-0.01 (0.042)	0.1** (0.043)
Italian-speaking	0.089** (0.041)	-0.066 (0.061)	0.058 (0.053)	0.05 (0.051)	-0.015 (0.036)	0.133** (0.056)	0.218*** (0.061)	0.023 (0.034)	0.069* (0.037)	0.057 (0.059)	0.127*** (0.049)	0.108* (0.06)

As expected, reliance on certain information sources significantly influences the risk of certain investment mistakes. We find that individuals who strongly rely on price movements as a source of information are more likely than others to trade on a random walk and to fall victim to the disposition effect. Individuals who follow media news are more likely to be informed about the past long-term returns of different asset classes. However, they are also at a greater risk of trading actively on a random walk. Individuals who rely on their friends' opinions are more likely to hold only a few assets, whereas for individuals who rely on their own judgment, the opposite is the case. Individuals who strongly weight the opinion of their own advisors are more likely to be aware of the risks of assets in the short term and of the advantages of portfolio and time diversification. However, they are also more vulnerable to the

disposition effect. Hence, it is possible that individuals who rely on advisors learn to avoid some mistakes related to asset allocation but do not learn how to avoid mistakes in shifting their asset allocations over time.

Individuals with higher self-reported levels of investment experience are indeed better than others at avoiding investment mistakes. More experienced individuals appear to be more familiar with the past returns of asset classes, show better knowledge about diversification, seem to avoid active trading in the presence of a random walk and show a better ability to avoid the disposition effect. However, they are also more likely to maintain investments for the wrong reasons and to bet on large but unlikely outcomes. The effects of demographic and socio-economic characteristics on the probability of specific investment errors are also worth noting, as some of these characteristics are often used as proxies for investor sophistication. We find that older individuals make more mistakes in answering questions about the risk-return profiles of asset classes and diversification but that they are better informed than other respondents about potential performance drivers. The former group of respondents is also less likely to trade actively in the presence of a random walk, less likely to take risks after losses to try to break even and better able to avoid the disposition effect. Females are generally better than males at assessing the short-term risks associated with specific asset classes. However, they are also more likely to trade actively in the presence of a random walk, to maintain investments for the wrong reasons and to fall victim to the disposition effect. Individuals with higher education levels are less likely to maintain investments for the wrong reasons, but otherwise, higher education does not influence the probability of specific investment errors. The impact of income and wealth on the ability to avoid specific mistakes is limited. Interestingly, we observe significant regional differences; e.g., in answering many questions, French- and Italian-speaking individuals are more likely to make mistakes than are German-speaking individuals.

Although we do not know whether individuals would truly behave as they indicated in their answers to our hypothetical questions, there are some similarities between our observations and the results of other studies of individuals' actual trading behavior. Most often, these studies focus on the disposition effect and under-diversification. Regarding the disposition effect, we observe that younger, less experienced, female individuals, who rely strongly on price movements as a source of information, are more likely than others to fall victim to the disposition effect. Our findings regarding the effects of age and gender are consistent with the results of Cheng et al. (2013), who used data on investors in the Taiwan Futures Exchange. Our findings on the relevance of investment experience are consistent with the results of Dhar and Zhu (2006). Those researchers observe that investors who gain more investment experience through frequent trading are less vulnerable to the disposition effect. In comparing experienced investors and undergraduates students, Costa et al. (2013) find that both groups are subject to the disposition effect but that the experienced investors are less so. The relevance of price movements is indirectly observed by Weber and Camerer (1998). In an experimental study, Weber and Camerer find that individuals who make portfolio decisions that conform to the disposition effect ask for information about past price movements even though they have been told that price changes are independent over time.

In investigating the drivers of under-diversification, we find that older individuals are more likely to state that fewer than ten securities are sufficient to minimize portfolio risk. To the extent that a lack of knowledge drives under-diversification, we expect older individuals to hold less diversified portfolios. Calvet et al. (2009) study the portfolios of the entire Swedish population and find that older households are more likely to hold under-diversified portfolios. Furthermore, we observe that individuals who self-identify as having more extensive investment experience are more likely than others to know that well-diversified portfolios consist of more than ten stocks. In applying this knowledge, experienced investors should develop better-diversified portfolios than less experienced investors. This conjecture is consistent with the results of Goetzmann and Kumar (2008), who find that more sophisticated investors, i.e., more experienced investors, are better diversified.

To consolidate our results on the drivers of investment mistakes, we use the index of investment competence as a dependent variable and estimate whether its value is related to the perceived importance of information sources, investment experience and certain demographic and socio-economic characteristics. The results are summarized in Table 9.

Table 9: Drivers of Investment Competence

Panel A reports the mean value of variables in a sample with individuals with an investment competence below the average and in another sample with individuals with investment competence above the average. It includes p-values on one-side t-tests on the reported differences in the means. Panel B reports estimated marginal effects of three regressions. The first column of Panel B reports the marginal effects of a logistic regression on the probability to show high investment competence (investment competence that is above the average). The second and third columns report the marginal effects of OLS regressions on the index of investment mistakes using the whole sample respectively a subsample with one-person households. The explanatory variables are described in the appendix. Robust standard errors are given in parenthesis. Significance levels are denoted with stars: *** $p \leq 0.01$ ** $p \leq 0.05$, * $p \leq 0.1$.

	Panel A			Panel B		
	Investment competence			Investment competence		
	below average	above average	one-sided t-test (p-value)	1: above average 0: below average		subsample: 1-person-households
price movements	2.10	2.03	0.096	-0.054** (0.028)	-0.042 (0.043)	-0.092 (0.103)
news in media	1.88	1.91	0.253	0.038 (0.031)	0.005 (0.051)	0.046 (0.130)
friends' opinion	1.81	1.76	0.098	-0.029 (0.029)	0.026 (0.047)	0.123 (0.122)
own judgment	2.34	2.34	0.495	0.01 (0.031)	-0.035 (0.050)	0.050 (0.112)
own advisor's opinion	2.07	2.04	0.248	-0.007 (0.030)	0.046 (0.048)	0.068 (0.109)
many advisors' opinion	1.81	1.80	0.366	0.029 (0.029)	0.001 (0.049)	0.055 (0.105)
investment experience	2.19	2.23	0.259	-0.022 (0.025)	0.003 (0.043)	0.007 (0.106)
age	47	49	0.002	0.005*** (0.002)	0.007** (0.003)	0.020*** (0.006)
female	47%	41%	0.028	-0.069* (0.039)	-0.130** (0.063)	-0.116 (0.156)
high education	47%	52%	0.076	0.058 (0.039)	0.027 (0.065)	0.080 (0.170)
income 1	10%	7%	0.072			
income 2	44%	44%	0.471	0.043 (0.068)	0.016 (0.110)	0.153 (0.245)
income 3	44%	46%	0.219	0.040 (0.071)	0.105 (0.112)	0.192 (0.254)
income 4	2%	2%	0.419	0.002 (0.136)	0.220 (0.248)	0.047 (1.032)
wealth 1	61%	56%	0.067			
wealth 2	18%	18%	0.499	-0.012 (0.048)	0.016 (0.080)	-0.084 (0.180)
wealth 3	6%	7%	0.272	0.034 (0.073)	0.011 (0.132)	0.029 (0.327)
wealth 4	3%	4%	0.130	0.079 (0.103)	0.048 (0.162)	0.312 (0.322)
German-speaking	65%	74%	0.001			
French-speaking	22%	18%	0.047	-0.062 (0.046)	-0.090 (0.081)	-0.046 (0.180)
Italian-speaking	13%	8%	0.010	-0.151** (0.061)	-0.355*** (0.110)	-0.234 (0.217)
c					2.243*** (0.248)	-3.629*** (0.621)
N				794	794	172

In Panel A, we present the differences between individuals with high and low investment competence in terms of how they weight the importance of different information sources, their indicated investment experience and some demographic and socio-economic characteristics. One-tailed two-sample t-tests are used to estimate the significance of the observed differences in the means. We find that individuals with lower investment competence consider price movements and friends' recommendations to be significantly more important, on average, than do other individuals. These individuals are also likely to be young, French- or Italian-speaking and female and tend to have less education, income and wealth than other individuals.

To estimate the impact of these variables on investment competence, we first conduct a logistic regression with a binomial variable that takes a value of 1 if investment competence is above average and a value of 0 otherwise. The marginal effects on the probability of above- average investment competence as reported in the first column of Panel B show that older, male individuals and individuals who give relatively less weight to price movements are more likely than others to avoid making many investment mistakes.

We also find that investment competence is characterized by significant age and gender gaps. The OLS regression estimates reported in the third column of Panel B suggest that younger, female individuals have significantly lower investment competence than others.

The gender gap may be a function of the traditional division of household labor, in which women are less involved than men are in investment decision-making. To test this conjecture, we replicate the OLS analysis for a subsample of participants, those with only one person in the household. The results, which are reported in the last column of Panel B, show that in one-person households, men and women do not differ significantly in their ability to avoid investment errors. Hence, the low involvement of women in investment decision-making may indeed be responsible for the observed difference in investment competence.

4.2 Investment Competence and Advice-Seeking

In this section, while controlling for other relevant variables, we analyze the relationship between individuals' investment competence and their propensity to make investment decisions autonomously, consult advisors and delegate decisions. Panel A of Table 10 shows the differences in the characteristics of individuals with differing degrees of willingness to delegate decisions. Panel B reports the marginal effects of partially proportional odds estimates on the probability of a person's choosing one of the four delegation options.¹³

¹³ The estimation procedure is described in the appendix.

Table 10: Drivers of the Demand for Financial Advice

Panel A reports the mean value of variables in four subsamples of individuals according to their propensity to delegate decisions. Panel B reports estimated marginal effects of a generalized ordered logit on the probabilities to choose one of the four options regarding delegation. The explanatory variables are described in the appendix. Robust standard errors are given in parenthesis. Significance levels are denoted with stars: *** $p \leq 0.01$ ** $p \leq 0.05$, * $p \leq 0.1$.

	Panel A				Panel B				
	d ₁	d ₂	d ₃	d ₄	d ₁	d ₂	d ₃	d ₄	
investment competence	-2.09	-1.98	-1.92	-1.87	-0.030** (0.013)	-0.013** (0.006)	0.021** (0.010)	0.022** (0.010)	
price movements	2.05	2.16	2.06	1.85	0.008 (0.017)	0.004 (0.007)	-0.006 (0.012)	-0.006 (0.012)	
news in media	1.92	1.90	1.93	1.78	0.021 (0.018)	0.01 (0.008)	-0.015 (0.013)	-0.016 (0.013)	
friends' opinion	1.69	1.73	1.93	1.70	-0.072*** (0.023)	-0.048* (0.025)	0.137*** (0.027)	-0.017 (0.018)	
own judgment	2.43	2.36	2.38	2.01	0.089*** (0.024)	0.009 (0.026)	-0.012 (0.026)	-0.085*** (0.019)	
own advisor's opinion	1.71	2.19	1.98	2.48	-0.165*** (0.023)	0.081*** (0.022)	-0.061** (0.025)	0.145*** (0.018)	
many advisors' opinion	1.56	1.85	1.89	1.86	-0.015 (0.018)	-0.007 (0.008)	0.011 (0.013)	0.011 (0.013)	
investment experience	2.27	2.24	2.12	2.08	0.027* (0.015)	0.012* (0.007)	-0.019* (0.011)	-0.020* (0.011)	
age	46	50	48	50	-0.003*** (0.001)	-0.001** (0.000)	0.002** (0.001)	0.002*** (0.001)	
female	45%	44%	45%	49%	0.010 (0.024)	0.004 (0.010)	-0.007 (0.017)	-0.007 (0.017)	
higher education	48%	46%	51%	48%	0.000 (0.024)	0.000 (0.011)	0.000 (0.017)	0.000 (0.017)	
self-employment	9%	12%	8%	13%	-0.017 (0.034)	-0.008 (0.017)	0.012 (0.024)	0.013 (0.028)	
income 2	43%	51%	42%	46%	-0.019 (0.041)	-0.009 (0.019)	0.013 (0.029)	0.014 (0.030)	
income 3	33%	27%	33%	32%	-0.054 (0.042)	-0.025 (0.020)	0.038 (0.029)	0.041 (0.032)	
income 4	13%	14%	15%	12%	-0.009 (0.080)	-0.004 (0.039)	0.006 (0.056)	0.007 (0.063)	
wealth 2	17%	19%	18%	20%	0.004 (0.029)	0.002 (0.013)	-0.003 (0.021)	-0.003 (0.021)	
wealth 3	12%	15%	14%	19%	-0.012 (0.042)	-0.006 (0.021)	0.008 (0.030)	0.009 (0.034)	
wealth 4	3%	8%	5%	7%	-0.015 (0.061)	-0.007 (0.031)	0.011 (0.042)	0.012 (0.050)	
French-speaking	19%	17%	22%	23%	-0.02 (0.027)	-0.009 (0.014)	0.014 (0.019)	0.015 (0.022)	
Italian-speaking	12%	14%	8%	8%	0.066 (0.043)	0.023** (0.011)	-0.048 (0.032)	-0.041* (0.022)	
N									784
Pseudo R ²									0.1002

We observe that on average, self-directed individuals have the lowest investment competence, whereas individuals who delegate decisions have the highest investment competence. The estimation results confirm this observation. The results show that investment competence positively influences the demand for financial advice. When investment competence increases, the probability of consulting several advisors and of delegating decisions increases, and the probability of making investment decisions autonomously and of consulting an advisor before making a final decision decreases.¹⁴

Other interesting observations emerge from a comparison of the effects of different information sources. Individuals who rely strongly on the opinions of friends are more likely to consult several advisors, and those who rely less on their friends' opinions are more likely to make investment decisions autonomously or to consult an advisor before making a decision. One's own judgment as a source of information is important only with respect to whether one makes investment decisions autonomously or delegates such decisions. The greater (weaker) one's reliance on one's own judgment, the higher (lower) the probability that one will make one's investment decisions autonomously (delegate decisions). Greater reliance on the opinions of one's advisor increases the probability of a person's consulting an advisor and delegating decisions and decreases the probability of that person's making investment decisions autonomously and of seeking out many advisors. Investment experience increases the probability of a person's making

¹⁴ This result remains qualitatively the same if we apply a multinomial logistic model. The latter neglects the fact that the dependent variable is ordered and treats the delegation decisions as independent categories.

investment decisions autonomously and consulting an advisor before making investment decisions and decreases the probability of that person's consulting with several advisors and delegating decisions.

In summary, self-directed individuals are more likely to be younger, have lower levels of investment competence, have greater investment experience and rely more on their own judgment and less on the opinions of their advisors and friends. Individuals who rely more on the opinions of advisors are more likely to consult an advisor before making an investment decision. Older individuals rely more on the advice of their friends and less on that of a single advisor, and they tend to have high investment competence but low investment experience. They are also more likely to seek the advice of several advisors. The probability of delegating decisions increases with investment competence, reliance on one's own advisor and age. It decreases with stated investment experience and reliance on one's own judgment. Gender, higher education, self-employment status, income and financial wealth appear to be unrelated to decisions to seek financial advice or to delegate financial decisions.

Why, then, do some individuals with low investment competence make investment decisions autonomously? One reason may be their lack of self-awareness. As Kruger and Dunning (1999) suggest, less competent individuals are likely to lack the ability to recognize their own lack of competence. If awareness is reflected in reliance on one's own judgment, then it appears that individuals with low investment competence tend to be unaware of their incompetence, as individuals with high and low investment competence rely equally strongly on their own judgment (see Table 9).

An alternative explanation relates to regret aversion. For a regret-averse decision-maker, consulting an advisor or delegating decisions is risky because the advisor could reveal mistakes in the individual's previous decisions. Such regret tends to be stronger for individuals who are more involved in the decision-making process (Kahneman and Tversky, 1982). If we proxy involvement in the decision-making process using the perceived importance of one's own judgment as a source of information, we may conclude that self-directed individuals are most likely to feel regret because they rely most heavily on their own judgments (see Table 10).

The same arguments can explain why advice seeking increases with investment competence. Individuals with higher levels of investment competence may also lack awareness of their abilities but may be less prone to regret in delegating decision because they are less involved in their investment decisions than are self-directed individuals. Additionally, it is possible that more competent individuals anticipate advisors' incentives to reveal information, as suggested by Collins (2010), Calcagno and Monticone (2011) and Bucher-Koenen and Koenen (2011), or that they consume more advisory services because of their lower marginal costs of information processing (Bluethgen et al., 2008).

4.3 Learning from Advisors

The fact that individuals with higher investment competence are more likely to consult with advisors and delegate decisions does not necessarily indicate the direction of causality within that relationship.

Individuals with higher levels of investment competence may consult with advisors to learn from them rather than to rely on their advisors' recommendations.

To shed light on this issue, we focus on individuals who are likely to learn from their advisors. We consider two sub-samples: one that includes all individuals who do not make investment decisions autonomously (i.e., those who consult one or several advisors or who delegate decisions) and one that includes all individuals who consult one or several advisors. We then test whether investment competence is related to the perceived importance of advisors' recommendations given the assumption that individuals who learn from their advisors attach greater importance to their advisors' recommendations than do individuals who do not. The results are summarized in Table 11.

Table 11: Investment Competence and Learning

The table reports marginal effects of OLS-regressions on the level of investment competence with a subsample of individuals consulting one or several advisors and a subsample of individuals with individuals choosing to consult one or several advisors or delegate decisions. The explanatory variables are described in the appendix. The explanatory variables are described in the appendix. Robust standard errors are reported in parenthesis.

Significance levels are denoted with stars: *** $p \leq 0.01$, ** $p \leq 0.05$, * $p \leq 0.1$.

	Investment competence	
	Subsample: d2, d3	Subsample: d2, d3, d4
price movements	-0.042 (0.053)	-0.055 (0.045)
news in media	-0.007 (0.061)	-0.031 (0.054)
friends' opinion	-0.028 (0.059)	-0.029 (0.050)
own judgment	0.028 (0.064)	-0.001 (0.055)
own advisor's opinion	-0.021 (0.063)	0.011 (0.051)
many advisors' opinion	0.020 (0.063)	0.002 (0.052)
investment experience	-0.033 (0.055)	-0.022 (0.047)
age	0.003 (0.003)	0.004 (0.003)
female	-0.195** (0.082)	-0.210*** (0.069)
higher education	0.141* (0.084)	0.136* (0.070)
income 2	0.010 (0.147)	-0.035 (0.125)
income 3	0.070 (0.148)	0.002 (0.128)
income 4	0.392 (0.276)	0.281 (0.246)
wealth 2	-0.021 (0.107)	-0.021 (0.088)
wealth 3	0.138 (0.141)	0.073 (0.131)
wealth 4	-0.121 (0.229)	-0.076 (0.200)
French-speaking	-0.067 (0.103)	-0.101 (0.087)
Italian-speaking	-0.357** (0.154)	-0.348*** (0.125)
c	-1.919*** (0.32)	-1.767*** (0.276)
N	486	619
R ²	0.0600	0.0572

We do not find that individuals' investment competence is related to their reliance on their advisors in any of the subsamples. There is also no evidence that individuals learn from advisors but they tend to attribute the positive achievements resulting from this learning to their own ability. The relationship between the perceived importance of one's own opinion and one's level of investment competence is very weak and is statistically insignificant. We conclude that learning from advisors is most likely not related to the observed positive relationship between investment competence and delegation.

5 Robustness Tests

As discussed in Section 3.2, our index of investment competence is constructed using the weighted sums of investment mistakes. A higher (lower) penalty is assigned for an incorrect answer when a larger proportion of the respondents answer the question correctly (incorrectly).

As a robustness check, we estimate the relationship between investment competence and the propensity to seek and rely on advice under alternative specifications for the investment competence index. The first index of investment competence uses the sums of the respondents' investment mistakes. The next two indices introduce weights for some questions to account for their relatively high correlations with other questions. Table 12 reports these estimation results, which show that the effect of investment incompetence remains qualitatively unchanged.

Table 12: Robustness Tests on Index Construction

The table reports the marginal effect of alternative investment competence indices on the probability to choose one of the options regarding delegation in generalized logit regressions. The repressors (not reported here) are the same as in Table 10. Robust standard errors are included in parenthesis. Significance levels are denoted with stars: *** $p \leq 0.01$ ** $p \leq 0.05$, * $p \leq 0.1$.

The indices are specified as follows:

$$\text{Index (basis)} = -(w_1 Q_1 + \dots + w_{11} Q_{11});$$

$$\text{Index 1} = -(Q_1 + \dots + Q_{11});$$

$$\text{Index 2} = -\left[Q_1 + \dots + \frac{Q_{10} + Q_{11}}{2}\right];$$

$$\text{Index 3} = -\left[Q_1 - Q_2 + \dots + \frac{Q_{10} + Q_{11}}{2}\right].$$

	d ₁	d ₂	d ₃	d ₄
Investment competence index (basis)	-0.030** (0.013)	-0.013** (0.006)	0.021** (0.010)	0.022** (0.010)
Investment competence index 1	-0.014* (0.007)	-0.006* (0.003)	0.010* (0.005)	0.010* (0.005)
Investment competence index 2	-0.017** (0.008)	-0.008** (0.075)	0.013** (0.006)	0.013** (0.006)
Investment competence index 3	-0.016** (0.008)	-0.007** (0.003)	0.011** (0.005)	0.012** (0.006)

One might argue that for individuals with low investment competence, autonomous investment decisions are not costly because such individuals do not participate in the financial markets, and thus, their investment mistakes appear only “on paper.” To test this conjecture, we use stated investment experience as a proxy for participation in the financial markets and re-estimate the impact of investment competence on advice seeking by excluding all individuals without investment experience. Table 13 reports the marginal effects of investment competence on the probability of choosing one of the delegation options within this particular subsample. Clearly, the effects of investment competence and of the control variables on the probability of delegating decisions are qualitatively the same as in the full sample. We conclude that if individuals do not learn from their experience, the “paper mistakes” that they make when answering our questions are likely to materialize in the real world unless they delegate their decisions.

Table 13: Robustness Test on a Subsample with Investment Experience

The table reports marginal effects on the probability to choose one of the options regarding delegation in a generalized logit regression on a subsample excluding individuals stating no investment experience with any asset class. The explanatory variables are described in the appendix. Robust standards errors are included in parenthesis. Significance levels are denoted with stars: *** $p \leq 0.01$ ** $p \leq 0.05$, * $p \leq 0.1$.

	d1	d2	d3	d4
Investment competence	-0.029** (0.014)	-0.020** (0.009)	0.031** (0.014)	0.018** (0.009)
price movements	-0.002 (0.017)	-0.001 (0.012)	0.002 (0.018)	0.001 (0.011)
news in media	0.019 (0.019)	0.013 (0.013)	-0.02 (0.020)	-0.012 (0.012)
friends' opinion	-0.046** (0.023)	-0.075*** (0.027)	0.144*** (0.030)	-0.023 (0.017)
own judgment	0.083*** (0.002)	0.056*** (0.015)	-0.087*** (0.022)	-0.052*** (0.013)
own advisor's opinion	-0.165*** (0.023)	0.082*** (0.025)	-0.054* (0.029)	0.136*** (0.017)
many advisors' opinion	-0.013 (0.018)	-0.009 (0.012)	0.014 (0.019)	0.008 (0.011)
investment experience	0.033* (0.017)	0.022* (0.012)	-0.034* (0.018)	-0.02* (0.011)
age	-0.002** (0.001)	-0.001* (0.001)	0.002** (0.001)	0.001** (0.001)
female	0.032 (0.025)	0.021 (0.016)	-0.033 (0.026)	-0.019 (0.015)
higher education	0.009 (0.025)	0.006 (0.017)	-0.01 (0.026)	-0.006 (0.016)
self-employment	0.016 (0.037)	0.01 (0.022)	-0.017 (0.038)	-0.010 (0.020)
income 2	-0.003 (0.048)	-0.002 (0.033)	0.003 (0.051)	0.002 (0.030)
income 3	-0.025 (0.049)	-0.017 (0.034)	0.026 (0.052)	0.015 (0.031)
income 4	-0.012 (0.077)	-0.009 (0.058)	0.013 (0.082)	0.008 (0.054)
wealth 2	0.005 (0.029)	0.003 (0.019)	-0.005 (0.031)	-0.003 (0.018)
wealth 3	0.028 (0.046)	0.017 (0.024)	-0.029 (0.047)	-0.016 (0.023)
wealth 4	0.006 (0.062)	0.004 (0.039)	-0.006 (0.065)	-0.004 (0.037)
French-speaking	0.015 (0.033)	0.009 (0.020)	-0.015 (0.034)	-0.009 (0.019)
Italian-speaking	0.036 (0.043)	0.021 (0.021)	-0.037 (0.043)	-0.020 (0.021)
N				629
Pseudo R ²				0.1070

6 Conclusion

In this paper, we assess the extent to which individuals in Switzerland are at risk of making investment mistakes and the likelihood that investors will seek help from professional advisors. We find that younger, female individuals show significantly less ability to avoid investment mistakes than do other individuals and that individuals who rely less on price movements as a source of information about investments are more likely than others to avoid making many mistakes simultaneously. Regarding the demand for financial advice, we find that individuals with lower investment competence but a higher stated level of investment experience and a stronger reliance on their own judgment are more likely than others to make investments decisions autonomously. This result is robust to alternative specifications of investment competence and to the use of subsamples that exclude individuals who are unlikely to participate in financial markets. It thus appears that the individuals who are most in need of financial advice are those who are least likely to seek it out and rely on it.

This finding has important implications for initiatives that are intended to promote investment competence among retail investors. Our results suggest that, in Switzerland, younger, Italian-speaking and female individuals would benefit most from such programs. The gender gap with regard to investment competence appears to be a result of the low level of involvement of women in investment decision-making. Hence, specific measures should be used to promote investment competence among women. Our results also suggest that such programs need to clarify the relevance of information about

price movements, as we find that individuals who rely less on such information are more likely than others to avoid making many investment mistakes simultaneously.

Overall, this study indicates that it is difficult for financial advisors to reach the people who most need financial advice. On the other hand, letting self-directed individuals learn “by doing” may not be effective, as some mistakes are not easy to identify (Koestner et al., 2012). Learning by doing in this context is also irrational, as people tend to overweight their own experience relative to broader patterns of evidence. Hence, if the aim is to develop methods of correcting widespread investment mistakes among individuals, additional research should be undertaken to cultivate a better understanding of the conditions under which people learn from their mistakes, determine the limits of their abilities and thus seek professional help.

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Appendix

Description of Variables

Variable	Description
investment competence	Index of investment competence
investment experience	Index of investment experience based on experience statements with asset classes
female	dummy variable: 1: female
higher education	dummy variable: 1: school of applied sciences or university
self-employment	dummy variable: 1: status is self-employment
age	ordinal variable: number of years
bonds world	ordinal variable: experience with international bonds investments (1: no experience - 4: high)
Swiss bonds	ordinal variable: experience with Swiss bonds investments (1: no experience - 4: high)
equity world	ordinal variable: experience with international equity investments (1: no experience - 4: high)
Swiss equity	ordinal variable: experience with Swiss equity investments (1: no experience - 4: high)
alternative investments	ordinal variable: experience with alternative investments (1: no experience - 4: high)
price movements	ordinal variable: perceived importance of price movements (1: not important - 3: very important)
news in media	ordinal variable: perceived importance of media news (1: not important - 3: very important)
friends' opinion	ordinal variable: perceived importance of friends' opinion (1: not important - 3: very important)
own judgment	ordinal variable: perceived importance of own judgment (1: not important - 3: very important)
opinion own advisor	ordinal variable: perceived importance of the own advisor (1: not important - 3: very important)
opinion many advisors	ordinal variable: perceived importance of the opinion of many advisors (1: not important - 3: very important)
income 1	dummy variable: 1: net disposable income in the household $\leq 50'000$ Swiss francs
income 2	dummy variable: 1: net disposable income in the household between 50'000 and 100'000 Swiss francs
income 3	dummy variable: 1: net disposable income in the household between 100'000 and 150'000 Swiss francs
income 4	dummy variable: 1: net disposable income in the household above 150'000 Swiss francs
wealth 1	dummy variable: 1: financial wealth below 100'000 Swiss francs
wealth 2	dummy variable: 1: financial wealth between 100'000 and 200'000 Swiss francs
wealth 3	dummy variable: 1: financial wealth between 200'000 and 300'000 Swiss francs
wealth 4	dummy variable: 1: financial wealth above 300'000 Swiss francs
German-speaking	dummy variable: 1: residence in a German-speaking region
French-speaking	dummy variable: 1: residence in a French-speaking region
Italian-speaking	dummy variable: 1: residence in an Italian-speaking region
Q_k	dummy variables for k investment competence questions: 1: answer indicating an investment mistake
d_1	dummy variable: 1: "I prefer to decide autonomously, the advisor should only execute my decision"
d_2	dummy variable: 1: "I prefer to tell my advisor how I would decide and would ask for his opinion"
d_3	dummy variable: 1: "I prefer to get several opinions before I decide"
d_4	dummy variable: 1: "I would trust my advisor in most decisions"
d_5	dummy variable: 1: "I would let my advisor decide everything"

Investment Competence Questions

Q1. Considering a long-term time period (e.g. 30 years), which assets normally give the highest return?

a) cash b) gold c) bonds d) real estate financial investments e) stocks f) hedge funds g) private equity

Q2. Normally, which assets display the highest risk in the short-term (e.g. 1-2 years)?

a) cash b) gold c) bonds d) real estate financial investments e) stocks f) hedge funds g) private equity

Q3. Investment success depends on several sources. Which of the following has the strongest contribution?

a) long-term allocation of wealth over several asset classes b) over- and underweighting of asset classes in the short-term c) security selection within asset classes

Q4. How many single stocks are needed to achieve a good dispersion of risk?

a) 1-5 stocks b) 5-10 stocks c) more than 10 stocks

Q5. If one assumes that the average return on the Swiss stock market is 5% per year, then the probability for a loss after one year is 40%. What is the probability for a loss after 5 years?

a) 40% or more b) less than 40% c) I cannot make such estimation

Q6. Suppose that the market price of a stock moves randomly and in more than half of the cases it goes up. Which strategy would you prefer?

a) I buy and hold the stock until I need the money b) I buy, wait until I made a certain gain, and then I sell and buy again at a lower price.

Q7. Suppose you bought a financial asset. Which of the following factors do you consider as most important for you to stay invested, i.e. keep the asset?

a) that I made a gain with asset b) that the asset follows a positive trend at the moment c) that the investment idea still holds true d) I cannot decide because I have no investment experience with financial assets.

Q8. Suppose you want to invest a large portion of your wealth for 1-2 years. Which of the following investments appear more attractive to you?

a) asset A offering a chance to win 10'000 Swiss francs in 50 out of 100 cases b) asset B offering a chance to win 50'000 Swiss francs in 10 out of 100 cases c) both assets are equally attractive

Q9. How do you assess the correctness of the following rule: "After large losses one should take more risks in order to compensate for the losses"

a) always true b) often true c) sometimes true d) never true e) I cannot decide

Q10. Suppose you bought a financial asset for 100 Swiss francs. The current market price of the asset is 80 Swiss francs. What would you do?

a) I would buy more because the asset costs less b) I would sell because I made a loss c) I would not sell because otherwise I have to realize a loss d) I would reconsider the investment idea.

Q11. Suppose you bought a financial asset at 100 Swiss francs. The current market price of the asset is 150 Swiss francs. What would you do?

a) I would realize the gain, i.e. I would sell the asset b) I would buy more because I made a gain c) I would reconsider the investment idea.

Questions' Background

The first two questions are designed to assess the risk-reward perceptions of households. These questions ask households to compare asset classes in terms of long-term returns and short-term risk. Incorrect answers to these questions may be linked to the availability heuristic (Tversky and Kahneman, 1973). Because recent returns and losses are easily remembered, these may dominate overall risk-reward perceptions, with adverse consequences for trading decisions. For example, observing assets that have appreciated in the recent past may suggest that such assets are good long-term investments. On the other

hand, investing in an asset with long-term return potential without awareness of its potential for short-term losses increases a person's risk of abandoning it too early.

The availability heuristic may also impact the perceived importance of performance drivers (Question 3). Because news media typically report the successes or failures of single securities and highlight shifts in the attractiveness of different asset classes, households may overweight such short-term phenomena in long-term asset allocation. However, Griffin and Xu (2009) suggest that even professional hedge fund managers may not exhibit superior skill at timing the market and selecting individual securities.

Question 4 is used to evaluate households' knowledge about the number of stocks that is necessary to achieve good portfolio diversification. A lack of such knowledge may explain why individuals hold under-diversified portfolios.

Question 5 is used to assess households' perception of the risk of long-term investments with returns following a random walk based on their knowledge of time diversification. If households know that the probability of loss decreases with the time horizon of an investment, then high turnover is most likely driven by other factors than knowledge (e.g., overconfidence).

Question 6 addresses a type of trading behavior that is known as probability matching (see Vulkan, 2000 for a review). The question assesses whether, given a random walk with positive drift, individuals prefer an active trading strategy to a passive buy-and-hold strategy.

Question 7 is used to evaluate reasons for maintaining an investment. From a portfolio perspective, holding a stock that has appreciated in market value or has followed a positive trend is equivalent to taking on more risk. Depending on the investment idea, such risk-taking behavior can be optimal. However, holding an asset because it has appreciated in value or because it has exhibited a positive trend can be suboptimal. For example, holding an asset because its value has increased can be linked to self-attribution bias (Kukla, 1972). Under this bias, past gains are perceived as evidence of the validity of one's decision to buy the asset, whereas past losses are seen as resulting from bad luck. Due to the representativeness heuristic (Kahneman and Tversky, 1973), households may follow trends. Although momentum investing is considered a legitimate strategy in the practitioner literature, evidence suggests that individual investors who buy equities that have recently outperformed the market and expect that this momentum will continue tend to obtain significantly inferior results (Pettengill et al., 2006).

Under the assumption that households are risk averse, Question 8 is used to evaluate whether households overweight small probabilities (Kahneman and Tversky, 1979), showing a preference for investing in assets with potentially high but unlikely gains over investing in other assets with the same expected returns.

Question 9 is used to assess households' awareness of their budget constraints in taking additional risks after losses in an effort to break even. The last two questions are used to assess households' tendency to sell winners and hold losers in accordance with the disposition effect.

Empirical Estimation Strategy

The delegation decisions are sorted into four levels j of increasing severity of delegation. The ordered nature of the delegation choice suggests the use of ordered regression techniques to explain it.

An ordered logit model is used to estimate the probability P that the delegation choice of individual will take the value $j = 1, \dots, M$ where M is the number of delegation choices,

$$P(d_i > j) = g(\delta_j - \beta X_i) = \frac{\exp(\delta_j - \beta X_i)}{1 + \exp(\delta_j - \beta X_i)}, j = 1, \dots, M - 1$$

where δ_j and β are the parameters to be estimated and where X_i is a vector of explanatory variables.

A critical assumption of the ordered model is that the slope coefficients do not vary across different choice categories except at the cut-off points δ_j . Hence, a change in a covariate is expected to have the same effect on all delegation choices.

This parallel-lines assumption can be violated in many cases. A generalized ordered logit model can be specified to relax the parallel-lines assumption for all variables (see Boes and Winkelmann, 2006). In the generalized ordered logit model, the probability of a particular delegation choice is given by

$$P(d_i > j) = g(\delta_j - \beta_j X_i) = \frac{\exp(\delta_j - \beta_j X_i)}{1 + \exp(\delta_j - \beta_j X_i)}, j = 1, \dots, M - 1$$

Hence, in the generalized logit model, the slope coefficients β_j may vary across equations, i.e., the relationship between the explanatory variables and the dependent variable may depend on the choice category j .

Given that the parallel-lines assumption may be violated by one variable or by multiple variables, we use the partial proportional odds model suggested by Peterson and Harrell (1990).¹⁵ The model is a special instance of the generalized ordered model in which one or more coefficients differ across equations and others can be the same for all equations. Relaxing the assumption for those variables that violate the parallel-lines assumption makes this model more efficient than the generalized ordered model.

Using Wald tests, we find that at a 5% level of significance, the parallel-lines assumption is violated for the statements regarding the importance of friends' and advisors' opinions and for statements regarding the importance of one's own judgment. For the rest of the variables, we assume that the estimated coefficients do not depend on the choice category j .

The probability that the delegation choice will take the value $j = 1, \dots, M$ is given as follows

$$\begin{aligned} P(d_i = 1) &= 1 - g(\delta_1 - \beta_1 X_i) \\ P(d_i = j) &= g(\delta_{j-1} - \beta_{j-1} X_i) - g(\delta_j - \beta_j X_i), j = 2, \dots, M - 1 \\ P(d_i = M) &= g(\delta_{M-1} - \beta_{M-1} X_i) \end{aligned}$$

¹⁵ To estimate the regression model, we apply the "gologit2" routine in the software package Stata.