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Kramer, Marc M.

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Financial literacy, confidence and financial advice seeking

Marc M. Kramer¹

University of Groningen, the Netherlands

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ABSTRACT

We find that people with higher confidence in their own financial literacy are less likely to seek financial advice, but no relation between objective measures of literacy and advice seeking. The negative association between confidence and advice seeking is more pronounced among wealthy households. We base these findings on the analysis of two rich data sources from the Netherlands: the DNB Household survey and a sample of investors from a large Dutch retail bank. Our results imply that policy makers should be careful to put financial advice forward as a mechanism to curb the ill effects of low financial literacy and that steering people towards more accurate self-assessments seems a more promising route.

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1. Introduction

Understanding the demand for and impact of financial advice is an important but as yet understudied topic of research. Recent studies indicate that the demand for financial advice may be related to financial literacy (Calcagno and Monticone, 2015). This is an important finding, given that financial illiteracy is widespread and adversely affects the quality of financial decision making (Lusardi and Mitchell, 2011). The use of a financial expert who offers unbiased advice may in principle ameliorate the negative effects of financial illiteracy.

Our study forms part of a large body of literature that documents the relationship between financial literacy and financial behaviors. A typical finding is that more knowledgeable people behave in a more optimal fashion, such as holding stocks, planning and saving for retirement, diversifying a portfolio, and paying low fees (e.g. Lusardi and Mitchell, 2007; Van Rooij et al., 2012).

A key issue that distinguishes financial advice seeking from other financial behaviors is the difficulty to ascertain what is normatively correct. It is unclear whether advisors deliver a valuable service to their clients. The advice of an advisors may be

E-mail address: m.m.kramer@rug.nl

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biased because the typical advisor's incentive structure creates a conflict of interest. Some studies have indeed established that advisors do more harm than good (Mullainathan et al., 2012; Hackethal et al., 2012), whereas other research has found positive effects (Kramer, 2012; Hung and Yoong, 2010). So, it is not a priori clear how, or even whether, financial literacy relates to advice seeking.

In addition, the few empirical studies in this domain provide conflicting evidence. Calcagno and Monticone (2015) and Collins (2012) find that financial literacy and financial advice are complements rather than substitutes. Bucher-Koenen and Koenen (2011) show that more literate investors induce advisors to provide better information. In addition, more sophisticated investors may have higher advice-seeking propensities because of their higher opportunity costs of time. In line with this view, Van Rooij et al. (2011a) find that people who are less financially literate rely more on informal sources of financial advice, such as friends and family, a finding that also resonates in the psychological literature. Less knowledgeable people lack the ability to recognize their illiteracy, leading them to overestimate their ability and not seek advice (Kruger and Dunning, 1999).

Others however, have found a negative relationship between professional financial advice seeking and financial literacy. Low literates have a higher barrier to gather and process information, and may thus want to save more on information and search costs by hiring an advisor (Hackethal et al., 2012; Hung et al., 2009; Hung and Yoong's, 2010). In addition, less financially literate households may be less aware of potential conflicts of interest and therefore less hesitant to consult an advisor (Hackethal et al., 2012; Inderst et al., 2009).

These conflicting findings may partly be attributable to the way in which financial literacy is determined. Financial literacy is typically established using a quiz of financial knowledge questions. Alternatively, people can be asked to self-assess their knowledge. If people are accurate in their self-assessment, one expects similar results when using self-assessed or measured financial literacy. Many found, however, that the correlation between objective and subjective knowledge is rather weak (Parker et al., 2012).

Recently, scholars have argued that both approaches to measuring financial literacy have their merits. Allgood and Wallstad (2012) show that a combined measure of self-assessed and measured financial literacy provides a greater understanding of the link between literacy and financial behaviors. Perceived literacy may more likely be a reflection of a person's self-image and confidence than a true indication of actual knowledge. Individuals rely on what they think they know, suggesting a relationship between perceived rather than actual financial knowledge and financial behavior. We expect this relation to apply especially to the decision to ask for expert help, given that it is hard to establish what is normatively correct. See et al. (2011) argue that as the confidence in one's judgement rises, the perceived need to incorporate advice will typically fall. Interestingly, studies that use measured financial literacy typically find a positive (or no) relationship, while studies based on self-assessed financial literacy observe a negative relationship. Our study therefore relates the choice to ask for expert financial help to both measured and perceived financial literacy.

Combined measures of financial literacy may also increase our understanding of overconfidence. High perceived combined with low actual knowledge may be a reflection of overconfidence. Overconfidence is associated with a higher propensity to engage in risky financial behaviors (Barber and Odean, 2000). Investing on one's own, that is without the help of a financial expert, is likely perceived as more risky, and hence an attractive option for overconfident individuals. In their analysis of advice-seeking behavior, Guiso and Jappelli (2006) argue that overconfident investors are less willing to rely on information provided by financial advisors. Von Gaudecker (2015) has documented that most losses from insufficient diversification are suffered by non-advised investors with low financial literacy. Our study therefore also includes various proxies for overconfidence.

An additional issue is the question why so many people lack financial knowledge. Lusardi, Michaud, and Mitchell (2013) state that some degree of financial ignorance may be optimal. Households may rationally decide not to invest in costly financial knowledge acquisition if the expected benefits probably are low. This applies, for example, to households with very simple financial needs. Such households neither need to become financially literate nor have to compensate their ignorance by hiring an expert. In investigating the relationship between self-assessed literacy and advice seeking we therefore compare behavior of wealthy and less wealthy households.

We use two data sources. The first is based on the Dutch DNB Household Survey (DHS), which is a large representative sample of Dutch households that provides information on a broad range of financial and socio-demographic characteristics.² In 2005, a special financial literacy module was added to this survey, which was completed by 1508 households (see: Van Rooij et al., 2011a). The second source is based on a survey of a randomly selected, representative sample of retail investors at one of the largest Dutch banks. This survey was filled out by 467 investors in 2011. We were able to combine this survey with client data registered by the bank.

Our main findings are as follows. We found a strong and significantly negative association between self-assessed financial literacy and the propensity to ask for expert help, while no such relationship was observed between measured financial literacy and seeking expert assistance. This negative relationship applies specifically to more wealthy households. Our findings on overconfidence are less straightforward. We did not identify a consistent pattern between our overconfidence

² DHS shares many characteristics with the National Financial Capability study by FINRA in the US. See Collins (2012) or Asaad (2012) for more detail.

proxies and advice seeking. Our results imply that the self-perception of one's financial literacy [whether right or wrong] is key in understanding ones' propensity to seek expert help.

Our study distinguishes itself in four ways from related research. First, we used both separate and combined measures of self-perceived and actual financial literacy in relation to for advice seeking behavior, which also allows us to investigate the role of (over)confidence. Second, we focused on both general households and investors. Financial literacy may have different effects on the behavior of those who participate in financial markets and those who do not. This approach made the comparison of our two datasets more straightforward. Third, our retail bank dataset combined survey data and client data from the bank, which allowed us to observe the actual choices made by investors (e.g. expert advice seeking), and perform various checks on other self-reported variables (e.g. portfolio allocations). Fourth, we checked for multiple controls in order to limit the possibility that our findings were actually the result of omitted variables. Apart from the usual socio-economic characteristics, we used data on investors' preferences, trust, and cognitive abilities.

The rest of this paper is organized as follows. In section 2 we discuss the datasets and the construction of our key variables. Section 3 starts with an univariate and multivariate analysis of advice seeking, and continues with additional analyses on heterogeneous wealth effects, overconfidence and endogeneity. Finally, section 4 concludes, discussing implications of this paper for policymakers, financial educators, financial institutions, and researchers.

2. Data and methods

2.1. The DNB household sample

We used data from a special financial literacy module that was added to De Nederlandsche Bank (DNB) Household Survey (DHS) in 2005. DHS is a representative panel of more than 2000 Dutch households. It provides detailed information on financial and demographic characteristics. In 2005, an extra module was included in the survey containing a set of financial knowledge questions. Interested readers may refer to [Van Rooij et al. \(2011a,b\)](#) who discuss this dataset extensively. In size and scope this dataset is best comparable to the National Financial Capability study (NFCS) by FINRA in the US.

Our final sample consists of 1276 households for which both financial literacy and professional advice seeking behavior was available. To be better able to compare the DHS sample with our second sample (discussed in the next section), we have also included statistics and analyses of the subset of households that hold risky assets (stocks, bonds and/or mutual funds). We refer to this subset as investors. This procedure dramatically reduced the sample size to 354 households.

2.2. The retail bank sample

The bank that provided the data is one of the largest retail banks in the Netherlands. Many of its services are sold through account managers, private bankers, retail advisors, or the internet. Its services and products include checking accounts, savings, mortgages, insurance, business loans, investments, private equity, leasing, and pensions. All investors can open an execution-only account. The execution-only channel implies that investors do not receive any advice and that they can have their trades executed by means of internet or telephone after filling in a legally required questionnaire on investment knowledge and experience. The advisory relationship always starts with an initial intake meeting, in which an advisor assesses the investor's investment goals, preferences, knowledge, and experience. From this first meeting advisors develop a client and risk profile, which constitutes the main input for the recommended strategic asset allocation. After the initial meeting, some advice is given in face-to-face meetings, but most recommendations occur over the telephone.

To construct our retail bank sample, we combined two data sources. First, we obtained detailed information on a randomly selected sample of retail investors from the bank, such as the type of investment service chosen (execution only, investment advice, or delegated portfolio management) and the composition of financial assets. Second, we surveyed these investors via an e-mailed questionnaire, sent in October 2011. Two weeks after we sent the questionnaire, we again mailed the investors who had not responded. Investors who had no e-mail address listed were sent an invitation to participate through postal mail³ on the same day as the e-mail invitation but without a reminder. Of the 4586 randomly selected investors, 251 could not be reached due to e-mail bounces. We received completed surveys from 467 investors, which yielded a net response rate of 10.8%. Our retail bank dataset is comparable to the Unicredit Customers' Survey (UCS) from Italy, that has recently been used by [Calcagno and Monticone \(2015\)](#).

Because we obtained data from only one retail bank, we took great caution to ensure that our sample of respondents was both internally and externally valid. Although, we did observe some significant differences in the investor and portfolio characteristics of respondents and non-respondents, we are not concerned that our primary results suffered from any form of sample selection bias for two reasons. First, our main results are consistent for all our samples, and the DHS sample has been designed as to provide an accurate representation of the Dutch population. Second, as a robustness test for the retail

³ For both the e-mail and postal invitations, the participants answered the questions in a web-based environment. [Stanton and Rogelberg \(2001\)](#) warn that web-based surveys may suffer from the so-called digital divide, in that some groups have less Internet access. Since the Netherlands has one of the highest Internet access rates in the world, this issue is unlikely to have played a role

Table 1

Descriptive statistics. This table presents an overview of statistics of the 3 samples. Unless indicated otherwise, the figures represent the distribution of the sample.

	DHS		Retail Bank
	All Households	Investors Only	
Sample size (# respondents)	1276	354	467
Advise seeking propensity (% that seeks advice)	29.4	30.9	68.5
Financial Literacy			
Measured financial literacy [% correct answers]	55.5	67.8	70.6
Self Assessed Financial Literacy [Scale: DHS: 4; Retail: 7]	2.2	2.3	4.1
Education			
Primary/Preparatory intermediate vocational	27.0	20.7	15.4
Intermediate vocational	33.8	29.3	17.3
Higher secondary education/Secondary pre- university	26.0	32.4	7.1
Higher vocational/University	13.2	17.6	58.0
Other	0.0	0.0	2.1
Occupation			
Retired	18.2	27.4	35.3
Self-employed	4.5	4.0	19.1
Employee	48.8	54.2	35.8
Other	28.4	14.4	9.9
Male	55.8	69.5	76.9
Age			
20–29	11.3	5.9	0.6
30–39	20.2	14.4	3.6
40–49	22.2	22.0	10.9
50–59	21.3	24.3	30.8
60–69	14.1	16.4	51.2
older than 70	10.9	16.9	2.8
Household characteristics			
Married	62.6	71.2	78.4
With kids	41.2	29.7	34.7
Gross Annual Household Income			
Below modal (<€33,000)			13.5
1x- > 1.5 x modal (€33,000- <€50,000)			34.7
1.5- < 3 x modal (€50,000- <€100,000)			29.3
> 3 x modal (>€100,000)			11.8
Don't know/no answer			10.7
Net Annual Household Income			
€0 – €22.000	14.9	6.0	
€22.000 – €40.000	24.0	17.8	
€40.001 – €75.000	45.9	50.5	
>€ 75.0001	14.5	23.5	
Don't know/no answer	0.8	2.2	
Average portfolio value (€)	12,494	42,457	71,382
Preferences, Trust and Cognitive Abilities			
Risk tolerance (Scale 1–7)			3.6
Regret aversion (Scale 1–7)			3.0
Trust in people (Scale 1–7)			4.0
Trust in advisers (Scale 1–7)			4.1
Time preference (% impatient)			3.2
Cognitive ability (DHS: % correct answers basic literacy; Retail: # correct answers CRT)	80.1	86.9	1.5

bank sample we estimated all our models using post stratification weighting on age, gender and portfolio value. Also after this test, all reported findings in this study remained intact.

Table 1 provides an overview of some key statistics for all samples. The retail bank sample is more highly educated than the other samples: 58% report an higher vocational or university degree, compared to only 13–18% in the DHS samples. The largest group consist of employees (36–54%), while also the group of retirees is fairly large (18–35%). The average age in the DHS sample is almost 51 years, while the investors are a little older (54 years), which is also the case in the retail bank sample. A little more than half of the respondents in the DHS and almost 70% of the subset of investors are male. In the retail bank sample, males comprise an even larger fraction (77%). Most of the respondents are married (63–78%). The characteristics of the respondents in our DHS sample are rather similar to the respondents in the NFCS survey by the FINRA (see: [Asaad, 2012](#)); those in our retail bank sample are very similar to those in the Italian Unicredit Customers' Survey (Calcagno and Monticone, 2014).

Table 2

Distribution of Financial Literacy Scores. This table reports the distribution of the number of correct answers for the 11 (DHS) and 8 (Retail Bank sample) financial literacy questions in Panel A. Panel B reports the distribution of self-assessed financial literacy based on a 4 point (DHS) or a 7-point scale (Retail Bank). Panel C reports the distribution over 4 combinations of self-assessed and measured financial literacy. In the DHS sample “Investors Only” relates to the subset of households that own stocks, bonds, and/or mutual funds.

	DHS		Retail Bank
	All Households	Investors Only	
Panel A: Measured financial literacy			
None Correct	6.2	2.0	3.6
1 Correct	4.0	0.6	3.4
2 Correct	4.8	0.9	4.1
3 Correct	5.4	3.2	7.7
4 Correct	6.8	2.3	6.2
5 Correct	9.0	6.7	12.2
6 Correct	12.5	13.1	16.9
7 Correct	14.1	14.6	24.0
8 Correct	13.3	17.5	.
9 Correct	13.2	19.2	.
10 Correct	8.7	15.7	.
All (11 or 8) Correct	2.0	4.1	21.8
Mean # correct	6.10	7.51	5.65
Mean% correct	55.4%	68.3%	70.6%
Panel B: Self-Assessed financial literacy			
1 (Low)	13.9	8.5	34.5
2	60.8	64.2	26.8
3	22.9	24.5	24.0
4 (High)	2.4	2.8	14.7
Mean score	2.14	2.22	3.95
N	1276	343	467
Panel C: Combined Self-Assessed and Measured Literacy			
Hi perceived – Hi actual	18.3	24.6	28.5
Low perceived – Low actual	40.7	38.1	36.6
Low perceived – Hi actual	33.2	24.0	22.1
Hi perceived – Low actual	7.8	10.2	12.8

2.3. Construction of the key variables

2.3.1. Financial expert advice seeking

Our main dependent variable is whether or not households seek out professional financial advice. For our DHS sample we created a dummy variable based on a respondent's most important source of financial advice. We assigned a [1] to those who answered “*Professional financial advisors*”, and [0] to all other answers.

Clients at the retail bank can choose between execution-only and some sort of financial expert assistance: either by means of financial advice or via delegated portfolio management. This choice is registered by the bank, and clients can only trade through the respective departments. We constructed our advice seeking dummy from this information: we assigned a [1] to investors who opted for some sort of expert assistance, and [0] to those in the execution-only channel. Some execution-only investors in our sample indicated to receive professional financial advice from another retail bank. We added those to the expert advice seeking group, rather than to the execution-only group. Please refer to [Appendix A](#) for an exact description of our variable construction.

2.3.2. Financial literacy

2.3.2.1. Measured financial literacy. We use the same literacy questions as in [Van Rooij et al. \(2011a,b\)](#). These questions have been validated as having a good internal consistency and test–retest reliability ([Hung et al., 2009](#)). Please refer to [Appendix A](#) for the exact wording of the literacy questions. In [Table 2](#) (Panel A) we provide an overview of the distribution of correct answers. The average respondent answered approximately 6 questions correctly (55% of all questions). Not surprisingly, the subsample of investors performed much better, with on average about 7.5 correct answers (68% of all questions).

To obtain scores on financial literacy for each respondent, we performed a factor analysis similar to [Van Rooij et al. \(2011a\)](#) on both our datasets. We also used the information contained in the difference between incorrect answers and “don't know” answers. [Lusardi and Mitchell \(2007\)](#) show that those who answer “don't know” are different from other respondents. We therefore constructed two dummies for each of the questions. The first one indicated whether the question was answered correctly, while the second referred to “don't know” responses. From a factor analysis of these dummies, we retained one key factor underlying the level of financial literacy. The Kaiser–Meyer–Olkin test of sampling adequacy ([Kaiser, 1970](#)) returned a value of 0.923 for the DHS sample and 0.823 for our retail bank sample, which indicates that the factor analysis was appropriate. The use of a single factor to indicate literacy was accompanied by a scree plot, which displayed a point of inflexion after one factor for both samples ([Field, 2005](#)). Finally, we used the [Bartlett \(1937\)](#) method to determine factor scores for each respondent in our sample, which indicated their measured financial literacy.

2.3.2.2. Self-Assessed financial literacy. To measure self-assessed literacy, we asked respondents to rate their financial knowledge on a scale from 1 to 4 (or 7). For more detail, please refer to [Appendix A. Table 2](#) (Panel B) shows that a majority of respondents opts for the middle categories (51–89%), while only a small group [2–15%] perceives his or her literacy as high.

2.3.2.3. A combined measure of self-Assessed and measured financial literacy. For the combined literacy measure, we follow [Allgood and Walstad \(2012\)](#) and create the following 4 groups: “Self-Hi/Measured-Hi”, “Self-Low/Measured-Low”, “Self-High/Measured-Low”, and “Self-Low/Measured-High”. We first split the respondents into a group with above and one with below median measured financial literacy. Each group was then divided into a group with high and a group with low self-assessed literacy.

In panel C of [Table 2](#) we provide the percentage of respondents in each of the groups. The largest group in all samples (between 37–41%) is the “Self-Low/Measured-Low” group, while the smallest group (between 8% and 13%) is “Self-High/Measured-Low”. These numbers imply that approximately 60% of our sample had a reasonably accurate self-assessment of their own financial literacy, while only a small fraction overrated their financial knowledge compared to the average respondent. Comparing these figures to the FINRA survey used by [Asaad \(2012\)](#), we observe a very similar distribution. In line with previous studies (e.g. Hung and Yuoong, 2010), we find that although measured financial literacy relates significantly and positively to self-assessed financial literacy, the correlation coefficient is rather weak [$\rho = 0.2$].

2.3.3. Control variables

[Guiso and Jappelli \(2006\)](#) indicate that men are less willing to delegate their portfolio decisions, which may relate to their higher level of confidence in financial matters ([Barber and Odean, 2000](#)), their generally higher level of financial literacy ([Van Rooij et al., 2011b](#)) and their lower degree of risk aversion ([Halko et al., 2012](#)). [Hackethal et al. \(2012\)](#) indicate that age correlates positively and being married negatively to advice seeking. Older investors may opt for financial advice to compensate for their cognitive aging ([Korniotis and Kumar, 2013](#)) while married couples have their spouse as a sounding board in financial matters. [Hung and Yoong \(2010\)](#) however, find that being married increases the propensity to seek advice. [Hackethal et al. \(2012\)](#) argue that investment experience relates positively to advice seeking. [Elmerick et al. \(2002\)](#) indicate that the likelihood of using a financial planner relates positively to income and wealth. High income households may have higher opportunity costs of time, which induces them to ask for assistance, while high wealth households have the means to pay for professional assistance. The authors also observe that the likelihood of using a financial planner relates positively to educational achievement, arguably because education increases the awareness of the complexity of financial products.

We also consider that heterogeneity in risk and time preferences, trust, and cognitive abilities may have effects on choice behavior ([Christellis et al., 2010](#)). It is especially relevant to note that advised investors tend to be more risk averse than non-advised investors ([Bluethgen et al., 2008](#); [Gerhardt and Hackethal, 2009](#)). Time preference may also influence the extent of advice-seeking in different ways. On the one hand, impatient people may be more inclined to opt for an execution-only platform. Here the barriers to directly executing one's investment decisions are lower compared to contacting a financial advisor first, discussing the proposed trade, and then having it executed. On the other hand, an advisor may serve as a self-control mechanism for the impatient investor ([Gathergood and Weber, 2014](#)). [Guiso, Sapienza and Zingales \(2008\)](#) show that economic decisions are generally influenced by the level of trust. [Georgarakos and Inderst \(2011\)](#) specifically indicate that trust in financial advice affects stock market participation, especially for less literate investors. Trust may therefore directly influence the decision to ask for help. In this respect, [Guiso and Jappelli \(2006\)](#) find that trust is positively associated with portfolio delegation. [Simonson \(1992\)](#) indicates a strong correlation between regret and responsibility. We consider advice seeking a responsibility-shifting mechanism that helps protect the investor against feelings of regret. [Shefrin \(2002\)](#) argues that handholding is one of the most important services provided by an advisor; if the investment decision turns out poorly, investors may blame the advisor. Cognitive ability relates to various cognitive domains, such as numerical and verbal skills and memory functioning ([Christellis et al., 2010](#)). On the one hand, those with a better mental ability incur lower search costs, and may thus be less in need of assistance. On the other hand, evidence from the psychological literature indicates that individuals with lower cognitive abilities are less aware of their limitations, and may thus believe that they do not need expert help ([Kruger and Dunning, 1999](#)). Please refer to [Appendix A](#) for an exact wording of the questions that underlie our control variables.

Based on the short discussion above, we decided to include the following variables as controls in our multivariate analysis: gender, age, educational achievement, occupation, household composition, income, wealth, investment experience, risk tolerance, time preference, regret aversion, trust in general, trust in advisors and cognitive abilities.

3. Results

3.1. Financial literacy and financial advice seeking: univariate results

We provide a first glance on our main relationships in [Figs. 1 and 2](#). [Fig. 1](#) shows that the advice seeking propensity for people with high and low measured financial literacy is remarkably similar. Approximately 30% of households and investors in the DHS sample, irrespective of their level of measured literacy, indicate professional financial advice as their main advice source. This number is almost equal to the NFCS-FINRA survey in the US, where 29.6% indicated the use of an advisor in investment decisions ([Allgood and Walstad, 2012](#)). In our retail bank sample 70% of the investors, both high and low literate,

Fig. 1. Advice seeking over Measured Financial Literacy (MFL).

Fig. 2. Advice seeking over Self-Assessed Financial Literacy (SAFL).

opts for advice, a number approximately similar to the 68.5% of the Italian UCS (Calcagno and Monticone, 2014). Fig. 2, however, exhibits a remarkable difference when splitting the sample in low and high self-assessed literacy groups. Advice seeking is substantially higher (almost 10 percentage points) for those with low perceived financial literacy, and even more so in the two investor samples, where the differences increase to almost 20 percentage points.

Table 3 provides an overview of the propensity to seek professional financial advice for various measures and levels of financial literacy, and for a selection of socio-economic variables. On the one hand, the differences in advice seeking are only small when our samples are divided into quartiles based on measured financial literacy (see panel A of Table 3). The quartile of the most literate households in the DHS sample has an insignificant 1.6% higher propensity to seek advice compared to the quartile of the lowest literacy (column 1), while the subset of highly literate investors shows a 2.4% lower propensity than the group of low literate investors (column 2). A similar pattern is visible in our retail bank sample, although it is interesting to observe that advice seeking is much more prevalent here. This is mainly attributable to our variable construction. In the DHS sample the advice seeking measure is based on households that indicate professional financial advice as their *main* source of advice, which by no means implies that other households do not make use of a financial advisor. In the retail bank sample, the advice seeking measure is based on investors who actually choose to consult an advisor to assist them in their investment decisions.

On the other hand, when we split our sample into groups based on self-assessed financial literacy, we see that households and investors who rate their financial literacy as high, exhibit a dramatically lower propensity to seek out advice. In the DHS sample, those households (investors) are 9.1 (17.5) percentage point less inclined to seek advice than those who rate their literacy as low, an impressive difference given the average advice seeking propensity of 30%. In the retail bank sample those investors that rate their financial knowledge as high, demand advice 22.0 percentage points less, equally impressive given a mean advice seeking propensity of 70%. These findings are a first indication that confidence in one's own knowledge matters more than actual knowledge.

We observe a similar pattern for our combined literacy measure (see: panel C of Table 3). The group of “Self-High/Measured-Low” exhibits the lowest advice seeking propensity (25% in the DHS samples and 60% in the Retail Bank sample), which is 6 and 18 percentage points less than those in the “Self-Low/Measured High” group, respectively. The two groups with a low self-rating (both “Measured- High” and “Measured- Low”) again exhibit the highest need for advice in all 3 samples.

Wealth appears to be a crucial factor in advice seeking (see: panel D, Table 3). Households in the highest wealth quartile exhibit a much higher advice seeking propensity than those in the lowest quartile (40% vs 17%). A similar, even more pronounced, pattern is visible for investors (42% vs 17% in the DHS sample, and 85% vs 54% in the retail bank sample).

The rest of Table 3 (Panels E to H) present the advice seeking behavior of various other socio-economic groups. Panel E shows that male investors are less inclined to consult an advisor consistent with Guiso and Jappelli (2006), while Panel F provides evidence that the lower educated seek out advice less. Panel G partitions the respondents based on household income. For general households (Column 1), those with high incomes seek out expert advice more often than the low income

Table 3

Univariate analysis on financial advice seeking over financial literacy levels and socio- demographics. This table presents the advice seeking propensity over various financial literacy measures, and several socio-economic variables. In the DHS sample “Investors Only” relates to the subset of households that own stocks, bonds, and/or mutuals funds.

	Professional Financial Advice seeking propensity				Professional Financial Advice seeking propensity		
	DHS		Retail Bank N = 467		DHS		Retail Bank N = 467
	All Households N = 1276	Investors Only N = 343			All Households N = 1276	Investors Only N = 343	
	(1)	(2)	(3)		(1)	(2)	(3)
Panel A: Measured Financial Literacy Quartiles				Panel E: Gender			
1 (Low)	27.6%	32.1%	70.1%	Female	28.8%	33.7%	75.9%
2	28.0%	34.5%	61.5%	Male	29.8%	29.7%	66.3%
3	32.7%		71.8%				
4 (High)	29.1%	29.8%	70.6%	Panel F: Education			
Difference 4-1	1.6%	−2.4%	0.5%	Primary/Preparatory	24.6%	31.0%	54.2%
				intermediate vocational			
				Intermediate vocational	32.5%	30.3%	77.8%
				Higher secondary	31.4%	31.3%	66.7%
				education/Secondary pre-			
				university			
				Higher vocational/University	29.1%	32.2%	68.6%
Panel B: Self-Assessed Financial Literacy Groups				Panel G: Annual Household Income			
1 (Low)	29.1%	33.3%	76.6%	Q1	20.6%	38.9%	73.0%
2	29.8%	35.2%	67.2%	Q2	26.5%	29.1%	67.3%
3	29.9%	25.0%	72.1%	Q3	31.9%	29.7%	66.4%
4 (High)	20.0%	15.8%	54.6%	Q4	38.0%	36.7%	70.5%
Difference 4-1	−9.1%	−17.5%	−22.0%				
Panel C: Self Assessed vs Measured Literacy				Panel H: Age			
Self-Hi/Measured-Hi	30.0%	23.0%	66.7%	<40	29.1%	32.3%	52.9%
Self-Hi/Measured-Low	25.0%	25.0%	60.3%	40–49	32.1%	31.8%	62.7%
Self-Low/Measured-Hi	31.4%	34.1%	78.0%	50–59	28.8%	27.6%	61.8%
Self-Low/Measured-Low	28.3%	35.6%	68.7%	>60	28.1%	32.0%	74.6%
Panel D: Wealth							
Q1	17.1%	16.9%	53.8%				
Q2	22.5%	29.9%	65.3%				
Q3	34.9%	34.1%	70.7%				
Q4	39.8%	42.4%	84.5%				

group (38% vs 21%). A similar distribution is reported by [Collins \(2012\)](#) where high income groups demand advice twice as much as low income groups. For the two investor samples (Column 2 and 3), income is much less related to advice seeking. In Panel H the samples are divided into age groups. Only in the retail bank sample can a significant effect be observed: 75% of the investors above 60 years old consult an advisor, compared to 53% of those aged 40 or below, a finding consistent with [Hackethal et al. \(2012\)](#).

3.2. Financial literacy and financial advice seeking: multivariate results

To determine whether financial literacy is related to the propensity to seek expert help conditional upon a number of other characteristics, we present estimations from various linear probability models⁴ in [Table 4](#). We confirm the most important finding from our univariate analysis: *measured* financial literacy is unrelated to advice-seeking, while *self-assessed* financial literacy is strongly negatively related (see: estimations 1, 4, and 7). How much people think they know thus matters more than how much people actually know. More specifically, moving from the lowest to the highest self-assessed level of literacy relates to a 15 (36) percentage point lower propensity to seek advice in the DHS (retail bank) sample. These results, in conjunction with the average advice seeking propensity of 30% (DHS sample), and 70% (retail bank sample), show that the degree of self-assessed literacy is an important aspect in clarifying the demand for financial advice. Our results are partly in line with [Calcagno and Monticone \(2015\)](#) who find that the propensity to delegate investment decisions reduces with approximately 20 percentage points when moving from the highest to the lowest degree of self-assessed literacy.

We confirm some of the results from prior studies on other determinants of advice seeking ([Bhattacharya et al., 2012](#); [Bluethgen et al., 2008](#); [Hackethal et al., 2012](#)). Most remarkably, wealth relates positively and strongly to advice seeking in all our specifications. Compared to the quartile of low wealth individuals, high wealth individuals have a 23–38 percentage point higher propensity to seek advice. Other significant control variables include education and age. In the retail bank sample less educated investors have a significantly lower propensity to seek advice, while investors older than 60 years seek advice more often (see estimation 7).

Risk tolerance is significantly and negatively associated with advice-seeking behavior, but only so in the retail bank sample (estimations 8–9). Time preference shows a positive association, although the relationship is only significant in the specification that includes cognitive abilities (column 9). Trust in general bears no relation to the propensity to ask for help, whereas trust in advisors indicates a significant positive association, as expected. Causality may run in both directions: people who place more trust in advisors may be more inclined to hire one, and having an advisor may increase trust.

In none of our specifications (estimations 3, 6 and 9) cognitive ability is significant despite other studies that show that cognitive abilities do affect choice behavior in many domains [Christellis et al., \(2010\)](#). We tested whether this may have resulted from a multicollinearity problem. The variance inflation factor of approximately 1.3 after all our estimations using cognitive ability does not seem problematic, however. Alternatively, our DHS cognitive ability measure may be more a reflection of financial literacy as indicated by [Van Rooij et al. \(2011a,b\)](#). Insofar this is the case, an insignificant coefficient of cognitive ability supports our finding on the insignificance of measured financial literacy. The Cognitive Reflection Test applied in the retail bank sample may not capture the relevant aspects of cognitive abilities when it comes to advice seeking. [Frederick \(2005\)](#) for example finds that within a group of highly educated and supposedly smart fund managers CRT-scores still showed significant variation. Most importantly, after the inclusion of many controls, our main findings remained unaltered: measured financial literacy is unrelated to professional advice seeking, while higher self-assessment of one's own financial knowledge relates to a lower propensity to ask for expert assistance.

We repeat our estimations using our combined measures of self-assessed and measured financial literacy in [Table 5](#). For each of the four groups defined in Section 2.3.2 (“Self-Hi/Measured-Hi”, “Self-Low/Measured-Low”, “Self-High/Measured-Low”, and “Self-Low/Measured-High”), we created a dummy variable where [1] corresponded to belonging to that group and [0] to otherwise. We used the “Self-Low/Measured-Low” as our base group, to which we compared the advice-seeking propensity rates of the other 3 groups. Households with high self-assessments are associated with a 7 percentage point lower advice seeking, although not significantly at the conventional levels (estimation 1). For investors (estimations 2 and 3), we document a similar pattern. Both groups of high self-assessed literacy are significantly associated with lower advice-seeking, especially so in for the group “Self-Hi/Measured-Low”. The coefficient of “Self-Low/Measured High” is not significant in any estimation. Because we omitted group IV (“Self-Low/Measured-Low”), this implies that while keeping self-assessed financial literacy fixed at “low”, measured financial literacy had no effect, in line with our previous findings. Our findings are broadly in line with findings by [Allgood and Walstad \(2012\)](#), but only so in the domain of debt counselling.

In the two investor samples the size of the coefficient of “Self-Hi/Measured-Low” is more negative than that of “Self-Hi/Measured-Hi”. This may imply a role for overconfidence. We therefore compared the coefficients of both groups with high self-assessed literacy. The Chi-squared statistic of a Wald test is insignificant in all 3 estimations, however, which implies that keeping self-assessed literacy fixed at “high”, changing measured literacy from low to high does not have any

⁴ A probit model is generally to be preferred to a bivariate dependent variable. We re-estimated all equations using a probit model, obtaining similar results both qualitatively and quantitatively. The use of linear probability models is advocated with the aid of an instrumental variables technique employed later on in this paper (Freedman and Sekhon, 2010). However, the error term of a linear probability may suffer from heteroskedasticity. Therefore, we used heteroskedastic-robust standard errors in all reported estimations.

Table 4

Multivariate analysis of financial literacy on financial advice seeking. This table presents coefficient estimates of financial literacy measures on financial advice seeking using linear probability models. The dependent variable in the DHS sample is a dummy where 1 corresponds to households that indicated "professional financial advice" as their main source of advice when making financial decisions; for the retail bank sample 1 corresponds to investors that make use of a financial advisor at the retail bank of our sample or at any other bank, and 0 otherwise. Please refer to [Appendix A](#) for the exact definition of all variables. ***, **, * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively. P-values based on robust standard errors in parentheses.

	DHS						Retail Bank Sample		
	All households			Investors only					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Measured Financial Literacy	−0.00 (0.97)	−0.01 (0.66)	−0.00 (0.80)	−0.05 (0.34)	−0.05 (0.36)	−0.07 (0.23)	0.00 (0.90)	0.01 (0.75)	0.00 (0.92)
Self-Assessed Financial Literacy	−0.05** (0.03)	−0.06** (0.01)	−0.06** (0.01)	−0.11*** (0.01)	−0.11** (0.01)	−0.11*** (0.01)	−0.06*** (0.00)	−0.04** (0.04)	−0.04** (0.04)
Education (base group: higher vocational or University)									
Primary or preparatory intermediate vocational	−0.04 (0.50)	−0.02 (0.72)	−0.02 (0.68)	0.00 (0.97)	0.00 (0.98)	0.01 (0.92)	−0.22*** (0.00)	−0.22*** (0.00)	−0.27*** (0.00)
Higher secondary education or secondary pre- university	0.02 (0.66)	0.05 (0.34)	0.05 (0.36)	0.01 (0.92)	0.03 (0.72)	0.03 (0.69)	−0.03 (0.74)	0.01 (0.90)	0.01 (0.94)
Intermediate vocational	0.02 (0.76)	0.03 (0.49)	0.03 (0.50)	−0.00 (0.99)	0.02 (0.82)	0.02 (0.82)	0.09* (0.09)	0.09 (0.14)	0.05 (0.49)
Age (Base group: age < 40)									
Age 40–49	−0.00 (0.99)	−0.00 (0.93)	−0.00 (0.94)	−0.16* (0.08)	−0.15* (0.09)	−0.16* (0.07)	0.07 (0.60)	0.06 (0.63)	−0.05 (0.74)
Age 50–59	−0.02 (0.60)	−0.04 (0.43)	−0.03 (0.44)	−0.17* (0.06)	−0.17* (0.07)	−0.17* (0.06)	0.08 (0.50)	0.07 (0.53)	−0.01 (0.96)
Age > = 60	−0.01 (0.93)	−0.01 (0.80)	−0.02 (0.79)	−0.15 (0.16)	−0.15 (0.18)	−0.15 (0.18)	0.23** (0.05)	0.18 (0.13)	0.08 (0.56)
Income (base group: Q1)									
Income (Q2)	0.03 (0.51)	0.04 (0.48)	0.04 (0.48)	−0.07 (0.59)	0.13 (0.41)	0.13 (0.42)	−0.10 (0.16)	−0.07 (0.34)	−0.07 (0.39)
Income (Q3)	0.01 (0.83)	0.02 (0.73)	0.02 (0.71)	−0.09 (0.51)	0.11 (0.47)	0.11 (0.49)	−0.09 (0.24)	−0.05 (0.53)	−0.14 (0.16)
Income (Q4)	0.02 (0.78)	0.03 (0.65)	0.03 (0.64)	−0.02 (0.89)	0.19 (0.29)	0.19 (0.29)	−0.03 (0.73)	0.03 (0.71)	−0.04 (0.71)
Wealth (base group: Q1)									
Wealth (Q2)	0.05 (0.20)	0.03 (0.55)	0.03 (0.54)	0.21*** (0.00)	0.20*** (0.01)	0.19*** (0.01)	0.10 (0.13)	0.10 (0.13)	0.20** (0.03)
Wealth (Q3)	0.19*** (0.00)	0.18*** (0.00)	0.18*** (0.00)	0.26*** (0.00)	0.26*** (0.00)	0.25*** (0.00)	0.12* (0.07)	0.13** (0.05)	0.24*** (0.00)
Wealth (Q4)	0.25*** (0.00)	0.23*** (0.00)	0.23*** (0.00)	0.36*** (0.00)	0.36*** (0.00)	0.35*** (0.00)	0.27*** (0.00)	0.27*** (0.00)	0.38*** (0.00)
Retired	−0.03 (0.59)	−0.03 (0.54)	−0.04 (0.54)	0.04 (0.70)	0.02 (0.82)	0.02 (0.83)	−0.10 (0.15)	−0.10 (0.21)	−0.21** (0.03)
Self-employed	0.14* (0.08)	0.16* (0.07)	0.16* (0.07)	−0.01 (0.93)	−0.01 (0.97)	0.00 (0.99)	−0.11 (0.20)	−0.08 (0.41)	−0.11 (0.29)
Employee	0.03 (0.50)	0.02 (0.63)	0.02 (0.63)	0.00 (0.99)	−0.01 (0.89)	−0.01 (0.87)	−0.00 (0.97)	−0.01 (0.90)	−0.07 (0.51)
Kids	−0.01 (0.78)	−0.02 (0.63)	−0.02 (0.63)	0.00 (0.95)	0.01 (0.86)	0.02 (0.83)	−0.04 (0.47)	−0.03 (0.56)	−0.06 (0.30)
Married	0.06* (0.07)	0.07* (0.06)	0.07* (0.06)	−0.05 (0.49)	−0.07 (0.38)	−0.06 (0.41)	0.05 (0.36)	0.02 (0.69)	0.00 (0.96)
Male	−0.01 (0.81)	−0.01 (0.78)	−0.01 (0.80)	−0.00 (0.99)	0.03 (0.69)	0.03 (0.73)	−0.05 (0.34)	−0.01 (0.83)	0.05 (0.52)
Experienced							0.03 (0.60)	0.05 (0.41)	0.03 (0.64)
Risk Tolerance		0.01 (0.48)	0.01 (0.50)		−0.03 (0.39)	−0.03 (0.42)		−0.05*** (0.00)	−0.05** (0.03)
Time Preference								0.13 (0.14)	0.20** (0.02)
Regret Aversion								−0.01 (0.42)	−0.00 (0.91)
Trust General								−0.00 (0.98)	−0.01 (0.80)
Trust Advice								0.04** (0.04)	0.04* (0.07)
Cognitive Abilities			−0.01 (0.61)			0.05 (0.40)			0.02 (0.53)
Constant	0.22*** (0.00)	0.23*** (0.00)	0.23*** (0.00)	0.59*** (0.00)	0.39** (0.05)	0.40** (0.04)	0.78*** (0.00)	0.70*** (0.00)	0.79*** (0.00)
Number of observations	1095	1018	1018	308	299	299	453	422	296
R ²	0.058	0.060	0.060	0.090	0.096	0.098	0.140	0.173	0.206

Table 5

Multivariate analysis of a combined measure of self-assessed and measured financial literacy on financial advice seeking. This table presents coefficient estimates of financial literacy using dummies that are based on combinations of measured and self-assessed financial literacy on financial advice seeking. *Self-Hi/Measured-Hi* refers to respondents that score above the median for measured financial literacy, and self-assess their financial literacy as high; *Self-Hi/Measured-Low* refers to respondents that score below the median for measured financial literacy, and self-assess their financial literacy as high; *Self-Low/Measured-Hi* refers to respondents that score above the median for measured financial literacy, and self-assess their financial literacy as low. The base group *Self-Low/Measured-Low* that refers to respondents that score below the median for measured financial literacy, and self-assess their financial literacy as low. Please refer to [Appendix A](#) for the exact definition of all variables. ***, **, * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively. P-values based on robust standard errors in parentheses.

	DHS		Retail Bank Sample
	All households (1)	Investors only (2)	(3)
Measured vs Self-Assessed Financial Literacy groups (Base group: Self-Low/Measured-Low)			
Self-Hi/Measured-Hi [I]	−0.07 (0.14)	−0.19** (0.03)	−0.05 (0.43)
Self-Hi/Measured-Low [II]	−0.07 (0.19)	−0.30** (0.02)	−0.16** (0.04)
Self-Low/Measured-Hi [III]	−0.02 (0.60)	−0.03 (0.70)	0.06 (0.29)
Number of observations	1018	299	422
R ²	0.057	0.101	0.133
Other controls (see Table 4)	yes	yes	yes
Wald test [I vs II]	0.00	0.85	2.28
P-value Wald test [I vs II]	0.990	0.358	0.132

effect. So, based on this comparison, there appears no significant role for overconfidence. Again, these results confirm the insignificant role for measured, and the prominent role for self-assessed financial literacy.

3.3. Heterogeneous wealth effects

Our univariate analysis already revealed a strong association between advice seeking and wealth. The quartile of most wealthy households reported an expert advice seeking propensity rate two times larger than that of the least wealthy quartile.

The decision to invest in financial literacy has costs and benefits. The model of [Jappelli and Padula \(2013\)](#) predicts that less wealthy people have less incentive to invest in financial literacy. Investing in financial literacy increases the net returns on saving, but requires money, time and effort. Also [Lusardi, Michaud and Mitchel \(2013\)](#) argue that some financial ignorance may be optimal. Since it is costly to become financially knowledgeable, and not everyone benefits to the same extent from higher literacy, some individuals will rationally refrain from investing in knowledge acquisition. It thus seems plausible that more wealthy people are more motivated to invest in financial literacy or have their ignorance compensated by a financial expert, given that have more at stake. We therefore expect that the negative relationship between self-assessed literacy and seeking financial advice is more prominent for more wealthy individuals.

To test for this hypothesis, we split our samples into two groups based on median wealth. A first impression of this analysis is obtained from [Figs. 3–5](#). Comparing the right and left hand panels of these figures, we observe that the negative association between self-assessed literacy and advice seeking is only present for more wealthy people. For less wealthy households the relationship between advice seeking and self-assessed literacy is almost flat. A remarkably different pattern is observable for our retail bank investors ([Fig. 5](#)). Here the negative association between perceived knowledge and asking for expert help is observable in both wealth subsamples. We attribute this different finding to the fact that our retail bank sample consists of more wealthy individuals in general. To illustrate: the median portfolio value in the low wealth retail bank sample is €9,000, not so different from the €13,000 of the high wealth DHS investor-only sample.

In [Table 6](#) we present the results of a more formal test on the impact of wealth on our relationships by re-running our main estimations for each wealth subsample. This analysis confirms the impression that was obtained from the graphs. The negative association between self-assessed literacy and advice seeking is only observable in the subsample of wealthy households (estimation 2 and 4). Wealthy households with the highest self-assessed literacy rating, exhibit a 21 percentage point lower advice seeking propensity than equally wealthy households with the lowest self-assessed rating, a considerable effect given the average advice seeking propensity in this sample of 30%. We find no relationship for less wealthy households. Consistent with [Fig. 5](#), our retail bank investors seek advice less if they rate their financial literacy as higher, irrespective of their wealth level (estimation 5–6).

3.4. Overconfidence

[Allgood and Walstad \(2012\)](#) indicate that perceived literacy may relate to the confidence in one's own financial insight and the ability to handle financial matters, but also to a general feeling of optimism about life, a degree of trust in the

Fig. 3. Advice seeking over Self-Assessed Financial Literacy, split by median wealth (DHS sample of all households).

Fig. 4. Advice seeking over Self-Assessed Financial Literacy, split by median wealth (DHS sample of investors).

financial institutions, and an interest in personal finance. Guiso and Jappelli (2008) state that perceived literacy is more a manifestation of self-confidence or even overconfidence than of actual financial knowledge. Indeed, in section 3.2 we reported that the group which combined high self-assessed with low measured literacy, exhibited the lowest advice seeking propensity, a result consistent with an overconfidence based explanation. Overconfident individuals score below average on measured literacy, and mistakenly consider themselves to be expert investors. As a result, they may not recognize the need for investment advice. Gentile et al. (2016) indeed reports evidence of overconfident individuals having a lower demand for advice. Asaad (2012) additionally indicates that overconfident individuals are less aware of risks. Investing on one's own by means of execution-only platforms could be considered as a manifestation of excessive risk taking, and thus as related to overconfidence.

To test whether the differences in self-assessed literacy should be interpreted in terms of overconfidence, we took another look at our financial literacy questions and used some additional items that are available in the DHS survey to serve as proxies for various manifestations of overconfidence. Overconfidence has been used to indicate miscalibration (Lichtenstein et al., 1982), the 'better than average' effect (Svenson, 1981), and unrealistic optimism (Weinstein, 1980), which we all try to proxy for. Two questions ask about inflation expectations, and allow us to construct a confidence interval. Another question is on the likelihood that someone's inflation estimate is too high, and yet another on someone's life expectancy. Please refer to Appendix A for an exact wording of these additional questions. We created 5 dummy variables that proxy for overconfidence

Fig. 5. Advice seeking over Self-Assessed Financial Literacy, split by median wealth (Retail Bank Sample).

Table 6

Multivariate analysis of financial literacy on financial advice seeking, sample split on median wealth. This table presents coefficient estimates of various linear probability models on measures of financial literacy split in subsamples based on median wealth. The odd numbered models [models 1, 3, and 5] refer to households with below median wealth, the even number models [models 2, 4, and 6] to households with above median wealth. Please refer to [Appendix A](#) for the exact definition of all variables. ***, **, * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively. P-values based on robust standard errors in parentheses.

	DHS				Retail Bank Sample	
	All households		Investors only			
	Low Wealth (1)	High Wealth (2)	Low Wealth (3)	High Wealth (4)	Low Wealth (5)	High Wealth (6)
Measured Financial Literacy	0.00 (0.92)	0.01 (0.84)	−0.07 (0.29)	0.01 (0.89)	0.02 (0.61)	0.02 (0.54)
Self-Assessed Financial Literacy	0.00 (0.95)	−0.07** (0.02)	−0.05 (0.38)	−0.15** (0.01)	−0.06*** (0.01)	−0.04** (0.04)
Number of observations	515	580	148	160	229	224
R ²	0.040	0.039	0.092	0.094	0.174	0.101
Other controls (see Table 4)	yes	yes	yes	yes	yes	yes
Wald Test Self-Assessed Financial Literacy Low Wealth = Self-Assessed Financial Literacy High Wealth	3.23		1.63		0.48	
P-value Wald Test	0.07		0.20		0.49	

assuming that overconfidence is likely going to be found among people who provided the more extreme answers. We then reestimated our main regressions from [Table 4](#) using our these overconfidence dummies and report our results in [Table 7](#). Sample sizes differ due to data availability.

Our first overconfidence proxy (*Overconfidence 1*) was created based on the combination of self-assessed and measured financial literacy. Unlike before, we now concentrated on the group of hyper confident individuals. Our variable *Overconfidence 1* was a dummy where [1] corresponded to respondents who considered their financial literacy as belonging to the highest possible category, whereas their score on measured financial literacy ranked below the median. This group of hyper confident individuals was rather small: depending on the sample it amounted to only 3–6% of the respondents. We used this variable in addition to our measured and self-assessed literacy variables and report our estimation results in [Table 7](#) (Panel A). Overconfidence individuals have a 19–27 percentage point lower demand for advice, although the effect is insignificant for our retail bank investors. Interestingly, self-assessed literacy is still negatively associated to advice seeking, which indicates that overconfidence is an additional factor in advice seeking. Stated differently, the negative association observed between advice seeking and self-assessed literacy is not predominantly determined by the subset of highly confident individuals.

Our second overconfidence proxy (*Overconfidence 2*) related to the notion that more confident individuals are less likely to answer “don’t know” on the financial literacy questions. It makes intuitively sense that people who lack self-confidence are more inclined to admit that they “don’t know”. We used this information to create our second overconfidence measure.

Table 7

Multivariate analysis of overconfidence on financial advice seeking. This table presents coefficient estimates of various linear probability models of proxies for overconfidence on financial advice seeking. In panel A, *Overconfidence 1* is a dummy where [1] corresponds to respondents that self-assess their financial literacy in the highest possible category, while ranking below the median for the measured financial literacy score. In Panel B, *Overconfidence 2* is a dummy where [1] corresponds to respondents that never answered “Don’t know” to any of the measured financial literacy questions, and [0] otherwise. In Panel C, *Overconfidence 3* is a dummy where [1] corresponds to respondents whose inflation interval equalled 0 based on the difference between the following two questions: “What is the maximum percentage prices will increase over the next twelve months, do you think?” [=max] and “What is the minimum percentage prices will increase over the next twelve months, do you think?” [=min]. In Panel D, *Overconfidence 4* is a dummy where [1] corresponds to respondents who answered “90%” or more to the following question: “How likely do you think that it is that the increase in prices in the next twelve months will be less than $[\min + (\max - \min) \cdot 4] / 10$?”, and [0] otherwise. In Panel E, *Overconfidence 5* is a dummy where [1] corresponds to respondents who answered “Absolutely certain” to the following question: “How likely is it that you will attain (at least) the age of 80?”, and [0] otherwise. All estimations include the control variables of Table 4. Please refer to Appendix A for the exact definition of all variables. ***, **, * denote significance at the 1 percent, 5 percent, and 10 percent levels, respectively. P-values based on robust standard errors in parentheses.

	DHS		Retail Bank Sample
	All households (1)	Investors only (2)	(3)
Panel A: Hyper Confident dummy Overconfidence 1	–0.25*** (0.00)	–0.27** (0.05)	–0.19 (0.11)
Measured Financial Literacy	–0.01 (0.57)	–0.05 (0.33)	–0.00 (0.95)
Self-Assessed Financial Literacy	–0.05** (0.04)	–0.11** (0.01)	–0.02 (0.16)
Constant	0.23*** (0.01)	0.59*** (0.00)	0.67*** (0.00)
Number of observations	1018	299	422
R ²	0.062	0.091	0.179
Panel B: Never “Don’t know” dummy Overconfidence 2	–0.06* (0.10)	–0.07 (0.40)	0.03 (0.61)
Measured Financial Literacy	0.01 (0.45)	–0.04 (0.58)	–0.01 (0.71)
Constant	0.15** (0.02)	0.20 (0.29)	0.59*** (0.00)
Number of observations	1018	299	430
R ²	0.056	0.078	0.167
Panel C: Zero inflation range dummy Overconfidence 3	–0.00 (0.98)	–0.36*** (0.00)	
Constant	0.12* (0.10)	0.31 (0.17)	
Number of observations	929	279	
R ²	0.058	0.081	
Panel D: >90% probability dummy Overconfidence 4	–0.25*** (0.00)	–0.30*** (0.00)	
Constant	0.15 (0.11)	0.06 (0.78)	
Number of observations	613	180	
R ²	0.074	0.109	
Panel E: Age > 80 “Absolutely certain” dummy Overconfidence 5	0.03 (0.74)	0.20 (0.37)	
Constant	0.06 (0.38)	–0.02 (0.91)	
Number of observations	804	220	
R ²	0.059	0.073	
Other controls (see Table 4)	yes, in all above estimations		

More specifically, we created a dummy where [1] corresponded to respondents who *never* answered “Don’t know” to the measured financial literacy questions, and [0] otherwise. Of course, we needed to control for actual financial knowledge in this specification, given that people that do not answer “don’t know” may just know the right answer. This alternative measure of overconfidence (Panel B) shows a negative relationship with advice seeking that is barely significant for all households (estimation 1), but no effect for investors (estimation 2 and 3).

Our third overconfidence proxy (*overconfidence 3*) made use of the inflation expectation confidence interval. In the calibration literature, respondents are typically asked to state confidence intervals for several uncertain quantities, which are then used to assess the number of estimates outside the interval (Glaser et al., 2007). Unfortunately, we did not possess a list

of such confidence intervals, so we could only focus on the inflation range. Menkhoff et al., (2013) however define the mis-calibration type of overconfidence in terms of the size of one confidence interval, whereby the smallest interval corresponds to overconfidence. We followed a similar approach. A smaller confidence interval could, of course, also reflect more precise knowledge. Atkeson and Ohanian (2001), however, provide evidence that as regards the accurate prediction of inflation rate changes, the various methods available are no better than flipping a coin. We therefore rather attribute smaller confidence intervals to more self-confidence rather than to possessing precise knowledge in this field. Someone who is absolutely certain of his/her inflation forecast will provide an inflation range equal to 0%. Our *overconfidence 3* variable contained a dummy where [1] corresponded to respondents whose inflation interval equaled 0, and [0] otherwise. A zero interval applied to just 3% of the people in our samples. Using this overconfidence measure, we find that only overconfidence investors demand advice much less, but no effect for all households (Panel C).

Our fourth overconfidence proxy (*overconfidence 4*) made use of a probability estimate using peoples own inflation interval. Self-confident individuals are more certain, and thus provide higher probability estimates. Overconfident individuals are very certain, or even sure of their estimate. Here, being sure implied answering '100%'. Given that only 1 respondent answered '100%' to this question, we broadened the range a bit. More specifically, we created a dummy where [1] corresponded to respondents who provided a probability estimate of 90% or higher, and [0] otherwise. Our estimations show that overconfident people ask advice significantly less. Being very certain reduces the advice seeking propensity to almost 0% (Panel D).

Our last overconfidence proxy (*overconfidence 5*) related to the life expectancy. To determine whether differences in life expectancy are merely a reflection of a general tendency of optimism, or a correct estimation, we made use of peoples Body Mass Index (BMI). BMI is considered as a rough approximation of someone's health, and may thus serve as a more objective proxy of life expectancy than someone's subjective assessment. Peeters et al. (2003) report that the probability of early death increases with a higher BMI. People who are very optimistic about their life expectancy were assumed to assign a high number to this question. The most optimistic individuals were expected to answer 10, which carried the label "absolutely certain" in the survey. We note that this question was only asked to respondents aged 16–70, so the outcome could not be influenced by people of 80 or older. We created a dummy where [1] corresponded to respondents who gave the answer '10' to this question, and [0] otherwise. There appears to be no relationship between the optimism type of overconfidence and advice seeking (see panel E).

Summarizing, we do find evidence of a negative relationship between overconfidence and the propensity to seek out financial advice. Some of our estimates even indicate a strong connection. However, we observe the relationship only some of our samples and for some of our proxies. Our results are clearly not robust. Therefore, we cannot provide an unambiguous answer to the role of overconfidence in the relationship between financial literacy and financial advice seeking.

3.5. Endogeneity of financial literacy

In estimating the relationship between advice seeking and financial literacy, we must consider the possibility that measured financial literacy is in fact endogenous. We should therefore be careful in interpreting our OLS estimates as a causal effect.

Many financial literacy researchers have tried to solve endogeneity problems using an instrumental variables approach. In an overview of various literacy studies, Lusardi and Mitchell (2014) report that IV estimates of financial literacy are larger than OLS estimates, which is true for local average treatment effects in general. Our coefficients of measured financial literacy may thus understate the true size of the effect on financial advice seeking.

Endogeneity problems may be caused by omitted variables. Although we tried to limit this possibility by controlling for demographics, preferences, trust and cognitive ability, omitted variables bias cannot be ruled out. Furthermore, our estimations may also have suffered from reversed causality. Namely, the choice to hire an advisor impacts the degree of financial literacy. The sign of such a relationship is, however, not clear a priori. Both advised and non-advised households may increase their literacy from interacting with financial markets, while this effect even may be greater for non-advised households. They deal with financial markets directly, find information themselves, and decide on their own which investments to pursue. Alternatively, advised households may learn from their interactions with their financial advisor, who teaches them about topics such as risk, return, and diversification.

Allgood and Walstad (2012), however, provide evidence that makes reversed causality an unlikely explanation of our results. Their high- and low-literate subjects did not consistently exhibit 'good' or 'bad' financial behavior, which makes reversed causality an unlikely determinant of their results. In addition, the absence of a normative judgment about financial advice seeking makes it unclear how or even if financial advice can produce high or low ratings of financial knowledge.

Still, we attempted to address the problem of endogeneity more formally. We gathered the additional information available in our retail bank survey to create an instrument. Finding suitable instruments is not easy, and we do not claim that our instrument irrefutably solved the endogeneity issues addressed above. We followed the approach of many other authors (see: Lusardi and Mitchell, 2007; Van Rooij et al., 2012; Kimball and Shumway, 2010), asking the respondents about their financial education in school before they entered the job market, which should have been before they started to invest. We assumed that economic education correlates positively with current financial literacy, but is not directly related to expert financial advice seeking. For children and young adults, making financial choices that require expert help lies in the very distant future. Please refer to Appendix A for more detail on the underlying survey questions.

A potential concern with this instrument was that advice seeking and becoming financially literate or being exposed to economics education are choice variables that depend on a commonly unobserved factor. Christiansen et al. (2008), however, argue that causation entails the path from economics education to financial behaviors, while also Yoong (2010) justifies our approach. She states that the institutional features particular to the Netherlands dictate the exogeneity of economics education, which means that there is virtually no access to financial education outside the formal schooling system.

The results of the first stage regression on measured financial literacy⁵ show that our instrument is significantly positively correlated with measured financial literacy. The estimates of our second stage regression show that the relationship between financial literacy and expert advice seeking remains insignificant. This result can be interpreted as a limited average treatment effect (LATE). Our IV estimate represents the average effect of financial literacy on advice seeking for those whose literacy has been changed by the amount of economics education.

Testing for over-identifying restrictions cannot be done by means of a single instrument. Therefore, to check the quality of our instrument, we re-ran the IV regressions using two dummies: one for respondents who indicated to have received some economic education and one for respondents who indicated to have received a lot of economic education. Those with little economic education constituted the benchmark group.

A Hansen J-test indicated no rejection of the over-identifying restrictions. Also the exogeneity test was not rejected. However, the F-statistic of the first stage regression (approximately 9) might not have been high enough to avoid the weak instrument problem. We therefore reran our regressions using the LIML estimator. Anderson (2005) indicates that this maximum likelihood method yields superior estimates in the case of weak instruments. Using the LIML estimator, however, provided almost identical results.

The analysis in this section provides no evidence of a causal relationship between measured financial literacy and advice seeking. However, we are careful to interpret this as evidence of the absence of such a relationship, given the possibility that our instrument is not truly exogenous.

4. Conclusions

The key result of this paper is that more self-confident individuals seek out advice less, while any relationship between measured financial literacy and financial advice seeking is absent. The most confident households demand advice roughly half as much as the least confident. This effect is most pronounced among more wealthy households. Advice and self-assessed financial literacy are thus substitutes, but mostly for those for whom prudent financial decision making matters the most. Measures of objective financial literacy used by many researchers are thus not very effective in capturing the relevant aspects of financial literacy in connection with the need for financial advice. This makes intuitively sense: in the decision to ask for expert financial help, one has to rely on what one thinks one knows, given that one's objective knowledge is largely unobservable. We also find some evidence of a negative relationship between overconfidence and advice seeking, but abstain from drawing any definite conclusions, given the lack of robustness in analyzing overconfidence.

We draw four main implication from our findings. First, policy makers should acknowledge at most a limited role for advice as a mechanism to counter the ill-effects of low financial literacy. Still, our findings in themselves do not imply that financial advice can be of no help. Those with low measured financial literacy capabilities who do seek assistance could still benefit if one is willing to assume a larger beneficiary advisory impact on the less knowledgeable. Interventions aimed at steering people to more accurate self-assessments seems a more promising route though. Although debiasing may be difficult, immediate, unambiguous, and accurate feedback has been shown effective in changing household's energy consumption (Schultz et al., 2007) and in influencing confidence (Arkes et al., 1987). Confronting financial consumers with the disparity between their self-assessment and test based results before being allowed to access execution-only financial services, may be an interesting option.

Second, financial institutions must be cautious in using self-assessed literacy to determine the suitability of their retail financial products. Questions in legally required client profiling surveys are typically based on people's own assessment of their financial knowledge. Our findings show that the answers to these questions should be treated with skepticism, given the weak correlation with the actual scope of people's financial knowledge. Third, researchers in the field of financial literacy should recognize that much additional insight can be obtained from combining measured and self-assessed measures of financial literacy. Incorporating both factual knowledge and peoples view of themselves will increase understanding of financial decision making of households. Fourth, financial educators should recognize that changes in financial behavior may stem more from changed self-perceptions, than from enhanced knowledge. Willis (2011) indeed indicated that personal finance courses increase confidence more than justified.

⁵ The regression results underlying this section are available upon request

Appendix A. Wording of Survey Questions and Key Variable Construction

Financial Advice Seeking	<p>– DHS Sample: Dummy variable indicating [1] when household answered “Professional financial advisers” to the following question: “What is the most important source of advice when you have to make important financial decisions for the household?”, and [0] otherwise</p> <p>– Retail Bank Sample: Dummy variable indicating [1] when an investors is registered as client of the financial advisory or delegated portfolio management department at the bank that provided us the data, or if investors indicated using an financial adviser at another bank, and [0] otherwise.</p>
Measured Financial Literacy	<p>Score obtained from a factor analysis on the first 8 [Retail Bank Sample] or all 11 [DHS sample] of the following financial literacy questions: [All questions also included a “don’t know” and a “refusal” option].</p> <p>1) Which of the following statements describes the main function of the stock market? [The stock market helps to predict stock earnings; The stock market results in an increase in the price of stocks; The stock market brings people who want to buy stocks together with those who want to sell stocks; None of the above.]</p> <p>2) Which of the following statements is correct? [Once one invests in a mutual fund, one cannot withdraw the money in the first year; Mutual funds can invest in several assets, for example invest in both stocks and bonds; Mutual funds pay a guaranteed rate of return which depends on their past performance; None of the above.]</p> <p>3) If the interest rate falls, what should happen to bond prices? [Rise; Fall; Stay the same; None of the above.]</p> <p>4) True or false? Buying a company stock usually provides a safer return than a stock mutual fund. [True; False].</p> <p>5) True or false? Stocks are normally riskier than bonds. [True; False].</p> <p>6) Considering a long time period (for example 10 or 20 years), which asset normally gives the highest return? [Savings accounts; Bonds; Stocks].</p> <p>7) Normally, which asset displays the highest fluctuations over time? [Savings accounts; Bonds; Stocks].</p> <p>8) When an investor spreads his money among different assets, does the risk of losing money: [Increase; Decrease; Stay the same].</p> <p>9) Which of the following statements is correct? If someone buys the stock of firm B in the stock market: [He owns part of firm B; He has lent money to firm B; He is liable for firm 's debt, None of the above]</p> <p>10) Which of the following statements is correct? If someone buys a bond of firm B: [He owns part of firm B; He has lent money to firm B; He is liable for firm 's debt, None of the above]</p> <p>11) True or false? If you buy a 10-year bond, it means you cannot sell it after 5 years without incurring a major penalty.[True; False].</p>
Self-Assessed financial literacy	<p>– DHS Sample: A score ranging from [1] “not knowledgeable” to [4] “very knowledgeable” on the following question: “How knowledgeable do you consider yourself with respect to financial matters?”</p> <p>– Retail Bank Sample: A score ranging from [1] very low to [7] “very high” on the following question: “Financial knowledge varies from person to person. How would you assess your own financial knowledge?”</p>
Self-Hi/Measured-Hi	<p>– DHS Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 3 or 4, and ranked above the median in measured financial literacy, and [0] otherwise.</p> <p>– Retail Bank Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 5, 6 or 7, and ranked above the median in measured financial literacy, and [0] otherwise.</p>
Self-Hi/Measured-Low	<p>– DHS Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 3 or 4, and ranked below the median in measured financial literacy, and [0] otherwise.</p> <p>– Retail Bank Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 5, 6 or 7, and ranked below the median in measured financial literacy, and [0] otherwise.</p>
Self-Low/Measured-Hi	<p>– DHS Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 1 or 2, and ranked above the median in measured financial literacy, and [0] otherwise.</p> <p>– Retail Bank Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 1, 2, 3, or 4, and ranked above the median in measured financial literacy, and [0] otherwise.</p>
Self-Low/Measured-Low	<p>– DHS Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 1 or 2, and ranked below the median in measured financial literacy, and [0] otherwise.</p> <p>– Retail Bank Sample: Dummy indicating [1] if respondents indicated their self-assessed financial literacy as 1, 2, 3, or 4, and ranked below the median in measured financial literacy, and [0] otherwise.</p>
Overconfidence 1	Both samples: a dummy where [1] corresponds to respondents that self-assess their financial literacy in the highest possible category, while ranking below the median for the measured financial literacy score.
Overconfidence 2	Both samples: a dummy where [1] corresponds to respondents that never answered “Don’t know” to any of the measured financial literacy questions, and [0] otherwise.
Overconfidence 3	DHS Sample: a dummy where [1] corresponds to respondents whose inflation interval equalled 0. The inflation interval has been calculated as the difference between the following two questions: “What is the maximum percentage prices will increase over the next twelve months, do you think?” [=max] and “What is the minimum percentage prices will increase over the next twelve months, do you think?” [=min]).

Overconfidence 4	DHS Sample: s dummy where [1] corresponds to respondents who answered “90%” or more to the following question: How likely do you think that it is that the increase in prices in the next twelve months will be less than $[\min + (\max - \min) \cdot 4] / 10$?, and [0] otherwise. “minand “max have been defined in “Overconfidence 3.
Overconfidence 5	DHS Sample: a dummy where [1] corresponds to respondents who answered 10 to the following question: “How likely is it that you will attain (at least) the age of 80?” on a 10 points scale ranging from 1 (No chance at all) to 10 (“Absolutely certain”), and [0] otherwise.
Risk Tolerance	– Retail Bank Sample: Score based the following question: “How would you rate your willingness to take risks in financial matters?” based on Dohmen et al. (2011), [1 = “totally not prepared” to 7 = “totally prepared”] – DHS Sample: Factor score based on agreement (ranging from 1 (totally disagree) – 7 (totally agree)) on the following 6 questions: (1) I think it is more important to have safe investments and guaranteed returns, than to take a risk to have a chance to get the highest possible returns, (2) I would never consider investments in shares because I find this too risky, (3) If I think an investment will be profitable, I am prepared to borrow money to make this investment, (4) I want to be certain that my investments are safe, (5) I get more and more convinced that I should take greater financial risks to improve my financial position, (6) I am prepared to take the risk to lose money, when there is also a chance to gain money.
Time Preference	Retail Bank Sample: Dummy variable on impatience, indicated as 1 if people choose the first option in the following question: “Image you have to make a choice between the receiving €3400 right away, or €3800 in one month from now, which choice would you make?”, and 0 otherwise.
Regret Aversion	Retail Bank Sample: Based on “Suppose that your zip code wins a large price in the zip code lottery, how much regret would you feel if you had not purchased a lottery ticket?” using a seven-point scale [1 = “totally no regret to 7 = a lot of regret]. ¹ The Dutch Zip Code Lottery provides a unique platform to measure regret. Even if people do not buy a lottery ticket, they receive a lottery number (i.e., their zip code). Thus people know the outcome of their decision, even if they do not participate, which may induce feelings of regret.
Trust General	Retail Bank Sample: Based on the degree of agreement on the following statement using a seven-point scale [1 = “totally disagree” to 7 = “totally agree”]: “Most people can be trusted”.
Trust Advice	Retail Bank Sample: Based on the degree of agreement on the following statement using a seven-point scale [1 = “totally disagree” to 7 = “totally agree”]: “Most financial advisors can be trusted”.
Cognitive Abilities	– DHS Sample: score based on a factor analysis on the following 5 basic literacy questions: [All questions also included a “don’t know” and a “refusal” option]. 1) Suppose you had €100 in a savings account and the interest rate was 2% per year. After 5 years, how much do you think you would have in the account if you left the money to grow? [More than €102; Exactly €102; Less than €102] 2) Suppose you had €100 in a savings account and the interest rate is 20% per year and you never withdraw money or interest payments. After 5 years, how much would you have on this account in total? [More than €200; Exactly €200; Less than €200]. 3) Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? [More than today; Exactly the same; Less than today] 4) Assume a friend inherits €10,000 today and his sibling inherits €10,000 3 years from now. Who is richer because of the inheritance? [My friend; His sibling; They are equally Rich] 5) Suppose that in the year 2010, your income has doubled and prices of all goods have doubled too. In 2010, how much will you be able to buy with your income? [More than today; The same; Less than today] – Retail Bank Sample: Number of correct answers [ranging from 0 – 3] on the Cognitive Reflection Test [CRT] from Fredrick (2005). Specifically, the CRT ask the following 3 questions: 1) A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost? cents. 2) If it takes 5 machines 5 min to make 5 widgets, how long would it take 100 machines to make 100 widgets? minutes. 3) In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half of the lake? days. [n.b. The non-investment nature of the CRT questions deviated considerably from the rest of the survey, which could make the respondents suspicious. Therefore, we framed the CRT-questions as a contest, in which the participants could win one of two €50 prizes. A moderate proportion of 93 respondents (20%) chose not to participate in the contest. Therefore, our sample size dropped when we included cognitive ability in our analysis] Highest attained educational degree of respondent Age of the respondent – DHS Sample: Net annual household income – Retail Bank Sample: Gross annual household income DHS Sample: summ of savings accounts, amount invested in stocks, bonds and mutual funds, and house value Retail Bank Sample: portfolio value

Retired	Dummy indicating [1] if respondents are retired and [0] otherwise.
Self-employed	Dummy indicating [1] if respondents are self-employed and [0] otherwise.
Employee	Dummy indicating [1] if respondents work as an employee and [0] otherwise.
Kids	Dummy indicating [1] if respondents have kids and [0] otherwise.
Married	Dummy indicating [1] if respondents are married and [0] otherwise.
Male	Dummy indicating [1] if respondents are male and [0] for female.
Experienced	Retail Bank Sample: dummy indicating [1] if respondents have more than 5 year investment experience and [0] otherwise
Economics Education	Retail Bank Sample: Score used in our IV-estimation based the following question: “How much of your formal education was devoted to economics?”, using a seven-point scale ranging from [1] “very little” to [7] “very much”. To be able to test for over-identifying restrictions we created 3 dummies: one for those that received little economic education (score of 1–2), one for those with some economic education (score of 3–5), and one for those that received a lot of economic education (score of 6–7).

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