Do Seemingly Smarter Consumers Get Better Advice?

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Abstract

In this paper, we study the interaction between financial advisors and customers with a potential conflict of interest. We show in a simple analytical framework that advisors have an incentive to provide better advice to consumers who *appear* to be better informed. From this, we derive an identification strategy to infer the quality of advice received from variables observed in a representative survey of German consumers. Our identification strategy makes use of the fact that we observe both a generally observable signal of a customer's financial literacy as well as an objective measure, which is not observed by the advisor. We apply this strategy to three different empirical settings. In each of these settings, we find consistent evidence that consumers with worse signals of financial literacy on average receive worse financial advice. In particular, both women and individuals without tertiary education are negatively affected.

1 Introduction

Around the world, given straining public pension funds and record-low interest rates, individuals bear increasing responsibility for financial decision making in general, and in particular for their investments. At the same time, financial products are becoming more and more complex. As a result, sound financial knowledge is a necessity for consumers. Choices with regard to investment portfolios and life-cycle savings are among the most momentous and complex decisions for households. Unfortunately, recent international research on the financial literacy of individuals has shown that a large share of households does not have the necessary expertise to make informed decisions (see, e.g., Lusardi and Mitchell, 2011, 2014, for overviews). To name just a few important categories, households seem to be ill prepared to plan for retirement, invest in stocks, diversify their portfolios or to borrow and service their debt wisely. The behavioral finance literature has shown that households systematically commit investment mistakes in managing their portfolios. They, for example, tend to chase past returns, are overconfident, trade too much, and apply overly simple heuristics (see, Campbell, 2006; Barberis and Thaler, 2003, for reviews of this literature).

In a perfect world, the solution to limited financial literacy would be to consult an independent, well-meaning and knowledgable financial advisor. Having specialized professionals provide advice should yield significant advantages for investors. Advisors can realize economies of scale by providing the information they have acquired to many clients, therefore they should be more able to avoid and correct investment biases and mistakes. In return, they are compensated through fees or commissions. Unfortunately, the world is not perfect and research on financial advice reveals that reliance on (financial) advisors raises a different set of problems: Conflicts of interest can arise if the objectives of the advisor and the customer are not aligned. This issue is exacerbated, if the customer is unaware of the conflict of interest or cannot judge the quality of the advice received (see Mehran and Stulz, 2007, for a review of the earlier literature on conflicts of interest in financial institutions and Inderst and Ottaviani, 2009, 2012a,c, for more recent contributions). The ensuing moral hazard problems negatively affect the relationship between client and advisor, creating the need for regulatory intervention (see Campbell, Jackson, Madrian, and Tufano, 2011; Inderst and Ottaviani, 2012b).[1]

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[1] See Guiso and Sodini (2013) for an overview of the recent literature on household finance.

In this paper, we take the conflict of interest between an advisor and his customer as a starting point to study who, in fact, will be most likely to suffer the consequences of these misaligned incentives. We set up a simple theoretical framework that is driven by the fact that more knowledgeable consumers have a better outside option vis-a-vis the advisor, since they will be able to obtain a better alternative on their own. Taking this into account, the advisor has an incentive to provide better advice to consumers who are smarter. If the advisor cannot perfectly observe the consumer's skills, but a signal which is on average informative, then he will give better advice to consumers who *appear* to be smarter. We take this finding to a large dataset which is representative for German households, an important developed financial market.[2] In our identification strategy, we make use of the fact that an objective measure of financial literacy is available to us, the researchers, but not to the advisor. Using this information together with measures on whether the customer adhered to the received advice and different signals regarding the advisee's financial literacy, we provide evidence for a very striking result: Individuals with "bad" signals of financial literacy do receive worse advice – we demonstrate that this is the case for individuals without tertiary education and for women. Note that the basic mechanism is not limited to financial matters and should hold in general, therefore individuals who appear more intimate with the subject of cars should receive better advice from their mechanics, for instance, and other relevant applications include healthcare (doctors) or legal matters (lawyers).

The central contribution of our paper therefore is an (indirect) identification strategy for the quality of (financial) advice that consumers receive, using a representative survey of households. This is an important complement to the existing literature, which up until now, due to the difficulty of observing interactions between advisors and customers, has mainly relied on field experiments, using relatively specific contexts (such as holders of brokerage accounts) or settings with actors impersonating mystery shoppers. The results of these studies are somewhat mixed: Kramer (2012) and Hackethal, Haliassos, and Jappelli (2012) find that brokerage accounts that are supervised by agents are associated with higher costs and lower returns on average, while Shapira and Venezia (2001) and Kramer (2012) show that professionally managed portfolios are better diversified. Shapira and Venezia (2001) even find a slightly better performance of professionally managed brokerage accounts. Mullainathan, Noeth, and Schoar (2012) perform an au-

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[2]We introduce and describe the SAVE survey in detail in the data section below.

dit study of professional advisors in the US using mystery shoppers and find that on average advisors even tend to reinforce existing biases of their clients. In a field experiment in India which is conceptually very close to our approach, Anagol, Cole, and Sarkar (2012) find that briefed actors indicating financial expertise (e.g., asking sophisticated questions) receive better advice from insurance sellers.

The wider empirical literature on financial advice, which is still limited in scope, underlines the relevance of our subject: The majority of households rely on professional advice when investing. A survey by Hung, Clancy, Dominitz, Talley, Berrebi, and Suvankulov (2008) among US retail investors shows that 73% consult advisors when investing in stocks or bonds. Parallel results hold for Europe, where 80% of the households who recently bought investment products interacted with a personal advisor and 58% followed the advice (Chater, Huck, and Inderst, 2010). Moreover, in Germany around 80% of individual investors rely on professional advice when making investment decisions (Bluethgen, Meyer, and Hackethal, 2008) and in the Netherlands more than half of the investors with an investment portfolio rely on financial advice (Kramer, 2012). At the same time, clients seem to be unaware of advisors' conflicts of interest. For example, Chater, Huck, and Inderst (2010)) report that more than half of the respondents in their survey believed that the advice received was completely independent. On the other hand, it may be in doubt that consumers are able to identify and value truly independent advice in quasi-experimental settings: Bhattacharya, Hackethal, Kaesler, Loos, and Meyer (2012) find that only 5% out of about 8,000 retail clients of an online broker solicited advertised free and unbiased advice and even fewer followed the advice given. Empirical investigations of who consults with an advisor reveal that mainly household with higher levels of education, income and wealth and older, more experienced and better informed investors consult professionals (see, Bi, Montalto, and Fox, 2002; Hackethal, Haliassos, and Jappelli, 2012; Van Rooij, Lusardi, and Alessie, 2011; Kramer, 2012). These observations point to a complementary relationship between financial literacy and financial advice rather than a substitutive one. Hackethal, Haliassos, and Jappelli (2012) argue that it is higher opportunity costs of time that lead wealthier and older clients to make use of financial planners, even though they would be relatively better suited to perform the task themselves.

Recent papers theoretically modeling financial advice have also recognized that customers differ according to their levels of financial sophistication (see Gabaix and Laib-

son, 2006; Inderst and Ottaviani, 2012c), similar to our model. Georgarakos and Inderst (2011) combine a formal approach and and an empirical study of individual investment behavior in relation to financial advice. They construct a "cheap talk"-game, in which an advisor recommends one of two potential investment alternatives to a client. While uninformed investors must decide whether or not to trust the advice, an informed investor may prefer to disregard advice completely—in this sense, investor information and advice are substitutes. The authors then provide empirical evidence that "trust" only plays a role for less sophisticated investors. Note that in our framework, there are limits to what the advisor knows about the customer's financial skills, and he will have to rely on the available imperfect signals.[3] As a result, individuals who appear smarter actually receive better advice—a complementary relationship.

To summarize: This paper contributes a simple analytical framework for analyzing the interaction between a professional advisor and a client, in which the advisor is imperfectly informed regarding the client's expertise. As a result, clients who appear better informed receive better advice in expectation. Using the hypotheses generated by this model, we empirically tease out the quality of advice that groups of consumers receive in a representative household survey. Our findings have important welfare implications: Individuals who appear unsophisticated are more likely to receive bad advice – if they objectively are financially illiterate, then this will induce them to adhere to it and to make bad decisions. As the central result of this paper, we provide evidence that a large group of advisees, i.e., women, receives lower quality advice due to the mis-alignment of the advisor's and the customer's incentives. In line with Inderst and Ottaviani (2009), therefore, this indicates a justification for policy interventions to regulate compensation schemes. We discuss this issue in more detail in our conclusion. Finally, as opposed to the existing empirical literature, which often relies on hypothetical choice scenarios or highly selected samples of owners of brokerage accounts, our study is based on a representative sample of German households faced with a complex financial decision setting.

The article is organized as follows: In the next section we present a theoretical framework and derive empirically testable hypotheses (Section 2). This is followed by

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[3]According to the European Markets in Financial Instruments Directive (MiFID) advisors are required to collect information on clients' risk attitudes, current portfolios and previous investment experience. Advisors have to recommend investment alternatives that fit with their client's characteristics and background financial situation and the process has to be documented.

the empirical analysis in Section 3. To emphasize the robustness of our results, we analyze two different decision contexts: First, we study general financial/investment advice and a household's propensity to follow to it (Section 3.2), after that we zoom in on the specific context of private pension choice and provide additional evidence (Section 3.3). We conclude in Section 4.

2 Analytical Framework and Hypotheses

2.1 Setup and Timing

Consider a model with two rational, utility maximizing agents, a consumer/client and a financial advisor. The consumer faces the task of choosing a pension contract or investment from a set $Q = \{q_1, ..., q_z\}$ of potential alternatives. She derives utility $u(q_j)$ from alternative q_j, while she receives a utility normalized to 0 if no alternative is chosen. Consumers differ in their levels of financial literacy or aptitude θ_i, with $\theta \in [0, 1]$. A higher θ signifies better ability. For the following, it is necessary to define our understanding of the concept "financial literacy". Matching the way we measure it in the empirical part, we prefer a wide interpretation: Financial literacy is an individual's level of understanding regarding financial matters and financial products, in particular with respect to their risk, returns and cost structure as well as further benefits and relevant features.

Ex ante, the consumer does not know the potential alternatives. She can engage in random search in the spirit of Stigler (1961) to uncover them on her own, which determines her outside option in the "advice game" described below. We assume that the expected utility from random search is $Eu(q_S|\theta_j)$.[4] As, e.g., Rothschild (1974) demonstrates, this expected utility should be increasing as the consumer's search costs decrease.[5] We assume that consumers' search costs are decreasing in their level of financial literacy, therefore $Eu(q_S|\theta_i)$ is strictly increasing in θ.[6] This assumption seems natural: Higher aptitude could be associated with a better grasp of technical terms and

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[4] For a micro foundation, one may think of the optimal number of searches, or equivalently the reservation value of the consumer depending on θ.

[5] In particular, this holds even if the consumer does not know the distribution of qualities or prices.

[6] We provide evidence supporting this assumption in the empirical section below. It should be noted that Hackethal, Haliassos, and Jappelli (2012) argue for the opposite relationship due to potentially higher opportunity costs of time spent on research for people with higher aptitude.

concepts such as compound interest, so that less effort is required to study each offer. It could also decrease the time necessary to recognize and dismiss unsuitable offers.

Given this outside option for the consumer, we model the interactions with the advisor as a reduced form game of asymmetric information with the following timing and information structure:[7]

1. The consumer observes her level of financial literacy θ_i. The advisor receives a signal of the consumer's financial literacy s_i (but not the actual θ_i). From this signal, he infers a subjective distribution of financial literacy $F(\theta|s_i)$, conditional on the consumer having solicited advice. Based on this, he suggests an investment alternative q_a from the set of alternatives available to him, Q, to the consumer.

2. The consumer decides whether to accept or reject the offer. If the consumer accepts the offer, she receives the utility $u(q_a)$ and the advisor receives the utility $\nu(q_a)$. If she rejects the offer, the advisor receives utility $-\lambda_i$. Following this, the consumer can decide whether or not to search independently (with the expected utility defined above) or to stay out.

2.2   The Consumer's Problem

Consider the decision problem of the consumer who has been offered investment alternative q_a by the advisor. The consumer should follow advice and pick alternative q_a only if the following holds:

$$u(q_a) \geq \max\{Eu(q_s|\theta_i), 0\} \tag{1}$$

The utility derived from the suggested alternative must exceed the expected utility from both independent search (which we refer to as the consumer's outside option) and from choosing none of the alternatives. This immediately yields the first hypothesis:

Hypothesis 1: *For a given suggested alternative q_a, the probability that a consumer will accept is (weakly) decreasing in her financial literacy θ_i.*

More financially literate consumers are more selective regarding advice, due to their more valuable outside option from independent search.

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[7]In the appendix, we discuss an extension in which the consumer decides whether or not to solicit advice in period "0".

2.3 The Advisor's Problem

The advisor observes a signal s_i and updates the (subjective) distribution of the consumer's financial literacy to $F(\theta|s_i)$, with the associated densities $f(\theta|s_i)$. We assume the following very general signal structure: If s' is a signal of higher expertise than s, we assume that $F(\theta|s_i') < F(\theta|s_i) \, \forall \theta \in (0,1)$. That is, higher signals lead to first order stochastic dominance of the subjective distribution contingent on the received signal. The advisor's task is to pick an alternative $q_a \in Q$ to suggest to the consumer.

Let $\theta^c(q_j)$ signify the critical level of financial literacy, for which a consumer would be indifferent between accepting the offer of q_j and searching independently, i.e., $u(q_j) \geq Eu(q_s|\theta^c(q_j))$ and $u(q_j) < Eu(q_s|\theta')$ if $\theta' > \theta^c(q_j)$. The advisor, upon observing signal s_i, expects the consumer to follow advice q_j with probability:

$$p^+(q_j|s_i) = F(\theta^c(q_j)|s_i) \tag{2}$$

The advisor receives the utility $\nu(q_a)$ if the consumer picks the suggested alternative, while he suffers expected (dis)utility $-\lambda_i$ if the consumer refuses the offered advice, the size of which may depend on the consumer's characteristics. This captures the possibility of losing future business if the consumer is dissatisfied or the possibility of complaints being handed in to the advisor's employer or the regulator.[8] For expositional purposes, we decompose λ_i into two components: $\lambda_i = \ell_i + \epsilon$.

ℓ_i is the component based on the observable characteristics of the consumer, while ϵ is a normally distributed random variable.[9]. The advisor facing consumer i therefore picks the alternative which solves the following maximization problem:

$$\max_{q_a \in Q} p^+(q_a|s_i)\nu(q_a) - (1 - p^+(q_a|s_i))\lambda_i \tag{3}$$

Assume that alternatives can be ordered such that a higher index represents a better alternative from the perspective of the consumer. The advisor will prefer to suggest alternative $j+1$ over alternative j, that is, he will offer better advice for the consumer,

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[8]For example, Inderst and Ottaviani (2009) make use of the consumer's opportunity to raise costly complaints.

[9]As possible interpretations for this random component, the advisor's assessment of the probability with which a dissatisfied consumer raises a complaint later on is imperfect or the eventual loss suffered by the advisor could partially depend on personal (lack of) sympathy

if the following condition holds:

$$\frac{p^+(q_{j+1}|s_i)}{p^+(q_j|s_i)} > \frac{(\nu(q_j) + \lambda_i)}{(\nu(q_{j+1}) + \lambda_i)} \tag{4}$$

The inequality is trivially satisfied whenever $\nu(q_{i+1}) \geq \nu(q_i)$. In this case, the interests of the advisor and the consumer are aligned and alternative q_j is dominated – the advisor will never suggest a dominated alternative, because he can either increase his own payoff or the probability of acceptance by picking the dominant alternative. We can construct a set of non-dominated alternatives $A \subset Q$ by eliminating the dominated alternatives. Note that within A, if there is more than one alternative remaining, there must be a conflict of interest between the advisor and his customer, with the advisor preferring alternatives with lower indices and vice-versa.

Considering only alternatives from A, inequality (4) shows that the advisor trades off the additional likelihood of the better suggestion being accepted versus the foregone private benefit from lower compensation. The righthand-side of the inequality is decreasing in the value of λ_j: As the disutility from failing to convince the consumer grows larger, the necessary increase in the likelihood of acceptance from offering better advice shrinks.[10]

2.3.1 Conflict of Interest and Kickbacks

Next, we focus on the structure of ν, i.e., the advisor's compensation. Typically, financial advisors in the market that we study are incentivized through kickbacks or bonus payments if they sell certain products. Assume that the advisor receives a base utility of v as well as a kickback of $b > 0$ if he successfully suggests an alternative from the set $Q_b \subset Q$ to the consumer, while he does not receive a kickback if he suggests an alternative outside of this set. It is immediately clear that all alternatives within Q_b must be (weakly) dominated, except for one: The one the consumer is most likely to accept. Analogously, all but one of the alternatives for which no kickback is granted must be (weakly) dominated: The one that conveys the maximal utility to the consumer among

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[10]In the extreme (as $\lambda_i \to \infty$), the ratio on the right-hand side approaches 1: If a certain consumer is very important or valuable, the advisor will have an incentive to maximize the probability of her accepting his advice, by making the best available suggestion. For this reason and since we allow λ_i to depend on the consumer's characteristics, in the empirical part of this paper we have to control for the consumer's importance to the bank, e.g., using wealth and (or) earnings of consumers as proxies.

this set. If the overall optimal (from the perspective of the consumer) alternative is not within Q_b,[11] then the advisor's problem is reduced to suggesting either an alternative for which he receives a kickback, which we denote as a_1, or the best overall option, which we denote as a_2, with $u(a_2) > u(a_1)$, while $\nu(a_1) > \nu(a_2)$. From this, we derive the following Lemma:

Lemma 1: *If the advisor receives a kickback $b > 0$ for successfully suggesting an alternative from the set $Q_b \subset Q$, by elimination of (weakly) dominated alternatives his problem is reduced to suggesting one of (at most) two alternatives a_1 and a_2.*

This result is based on the assumption that there are no additional costs (of effort, for example) attached to certain alternatives for the advisor.[12]

2.3.2 Financial Literacy and the Quality of Advice

An advisor incentivized by kickbacks would prefer to convince the consumer to pick alternative a_1, while he knows that the consumer would be better served by a different option. Given the findings above, we can derive the following central result, which will guide our empirical study:

Hypothesis 2: *Assume that an advisor receives $b > 0$ if he successfully suggests an alternative from $Q_b \subset Q$ to the consumer. Further assume that an alternative a_Z exists, with $u(a_Z) > u(q_b) \forall q_b \in Q_b$ and $u(a_Z) \geq u(q_i) \forall q_i \in Q$. For two signals $s' > s$, the probability of the advisor suggesting a_Z is greater if he observes signal s' than if he observes signal s.*

Proof: If an alternative a_Z with the properties described above exists, then $p^+(a_Z|s_j) = 1 \forall s_j$ and a_Z must be one of the two alternatives that the adviser considers. Denote the alternative in Q_b that maximizes the acceptance probability by the consumer as a_1. By Lemma 1, we know that the advisor only considers these two alternatives. Denote the distribution function of ϵ as $\mathcal{N}$. Plugging into (4), we can explicitly derive the probability

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[11]If the optimal alternative is within Q_b, then no conflict of interest exists.

[12]Lemma 1 is of particular interest, because it shows how any incentive structure with kickbacks to the advisor can result in a "binary problem". Such binary problems have been studied in the literature: Whether or not to advise purchase of a certain asset, whether or not to sell a certain product to an individual, or whether to convey or not convey the true state of the world. In these cases, therefore, our arguments with regard to the effects of consumer expertise on the quality of advice, which we derive in the following section, should also apply.

of the advisor suggesting a_Z over alternative a_1 as $1 - \mathcal{N}\left(\frac{p^+(a_1|s_j)}{1-p^+(a_1|s_j)}b - v - \ell_j\right)$. By first order stochastic dominance, $p^+(a_1|s') < p^+(a_1|s)$ if $s' > s$ which yields Hypothesis 2.

A higher signal of financial literacy is more likely to induce the advisor to forego his kickbacks and offer better advice to the consumer, which is the central mechanism we are interested in.[13] To paraphrase: Consumers who *appear to be smarter* are more likely to receive better advice from advisors. In the empirical part of this paper, we observe a measure of the objective financial literacy[14] of consumers as well as proxies for their signalled financial literacy. Since we do not directly observe the quality of advice, but only consumers' reactions to the advice received, the following two Corollaries will allow us to identify this central mechanism. The first follows immediately from Hypothesis 2:

Corollary 1: *Consider two signals $s' > s$ and the probability of a consumer rejecting $a^*(s)$, $r(a^*(s); \theta_j)$. Then $r(a^*(s); \theta_j) \geq r(a^*(s'); \theta_j)$, i.e., the consumer with the worse signal is (at least weakly) more likely to reject advice.*

Denote the advisor's choice of advice upon observing signal s as $a^*(s)$ and the probability that an individual with signal s and financial literacy θ_i will reject the offer she receives as $r(a^*(s); \theta_i)$. Applying Hypothesis 2, the reaction of consumers to the advice they receive should depend on their *signaled* as well as their *true* financial literacy: Intuitively, consumers whose signal is high should be generally more willing to accept the advice they receive (all else given), since they are more likely to receive good advice. In Corrolary 1, we are only able to posit a weak inequality, which will affect our identification strategy in the empirical section. The following intuition both makes this clearer and suggests a way forward: For customers with particularly low levels of financial literacy, the preferred option of the advisor a_A (the alternative for which he receives the kickback) can still be preferable to the outside option of independent search, if $u(a_A) > Eu(q_s|\theta_i^0)$. Individuals for whom this inequality holds will follow the advice received no matter whether it is good (alternative a_Z) or less good (a_A). On the other hand, individuals with higher financial literacy for whom $u(a_A) < Eu(q_s|\theta_i^1) < u(a_Z)$ will only follow good advice.[15] Then, if a customer's actual financial literacy is low, she

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[13]Note that the conflict of interest is reduced by the fixed wage-component, while it is exacerbated by the magnitude of the kickbacks.

[14]Measured by scores on a financial literacy quiz.

[15]We discuss the model's insights into different motivations for consulting advisors in the appendix.

is still relatively likely to accept less good advice, due to her bad outside option. But the more sophisticated the consumer whose signal is low, the more likely she is to detect bad advice and understand she could do better on her own, and thereby the more likely she is to reject the offer. Formally:

Corollary 2: *Assume that $0 \leq \theta^0 < \theta^1 < 1$ and $Eu(q_s|\theta^0) < u(a_A) < Eu(q_s|\theta_i^1) \leq u(a_Z)$. Then the probability of a consumer rejecting $a^*(s)$, $r(a^*(s); \theta_j)$ is increasing in financial literacy θ more quickly for lower than for higher signals.*

Proof: The assumptions ensure that less financially literate consumers exist for whom it is optimal to follow less good advice on the one hand, while the optimal advice should be followed by any consumer. For $\theta_i \leq \theta^0$ it is optimal to follow advice irrespective of the signal. For $\theta_j \geq \theta^1$ consumers only follow good advice, which is more likely obtained by consumers with high signals (Hypothesis 2).

Intuitively, two things must coincide for an offer to be rejected: 1) The advice received by the advisor must be suboptimal and 2) the consumer must be able to do better by herself. In the extreme, if a good signal ensures receiving the best offer from the advisor, consumers with good signals would never have reason to reject an offer. On the other hand, consumers with bad signals should receive objectively bad offers with a higher probability. The more financially literate they are, the higher the probability that they expect to outperform this bad offer on their own and therefore reject it. In the remainder of the paper, we demonstrate that these predicted patterns are reflected by what we empirically observe in representative survey data.

3 Empirical Application

3.1 Data

We use SAVE, a panel of German households that contains detailed information on households' financial situations and socio-economic as well as psychological characteristics to test our hypotheses.[16] Our analysis is primarily based on data from SAVE 2008

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[16]SAVE was first conducted in 2001 by the Mannheim Research Institute (now Munich Center) for the Economics of Aging (MEA). Consecutive waves were in the field in 2003/2004, and every year since 2005. A detailed description of the scientific background, design and results of the survey can be found in Börsch-Supan, Coppola, Essig, Eymann, and Schunk (2009).

and 2009. There are 2,608 (2,222) observations in the sample in 2008 (2009). Our main variables of interest are whether financial advice was solicited, whether the households followed the financial advice they received and the level of financial literacy as measured by a standard quiz-like test. We measure financial advice and following advice in two different contexts. First we use self-reported information from SAVE 2009 on financial advice in general. Second we use a special module of questions regarding search for information with respect to subsidized private pensions which were added to the questionnaire in 2008. We describe the variables in detail in the following sections. We drop observations for which information on our dependent variables or the central explanatory variable financial literacy is missing. Thus, the sample for our analyses varies depending on the variables examined. We explain this in more detail in the respective subsections. We also drop observations with unspecified educational status.[17]

3.2 Taking and Following Financial Advice

3.2.1 Variables

We use a dual strategy to test our hypotheses, with measures of behavior regarding financial advice in general and behavior regarding the private pension choice in particular. We start out with general financial advice in this section followed by financial advice in the context of private pensions in section 3.3. The socio-demographic characteristics of the 1,958 respondents from SAVE 2009 which we included in the analyses regarding general financial advice in this subsection are provided in Table A1.

Financial Advice. In the questionnaire section on saving behavior, respondents are asked with whom they talk about financial issues. The exact wording of the question is *"Do you talk about financial topics with: relatives, who do not live in the same household / friends / colleagues / neighbors / financial advisors of banks, insurance companies or financial service providers. / I do not talk with any of these persons about financial topics."* Respondents were able to give multiple responses. The focus of our study is professional financial advice. Thus we construct a dummy variable equal to one if individuals consulted a professional from a bank, insurance company or financial service

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[17]Other control variables are provided with imputations (see Schunk, 2008; Ziegelmeyer, 2013, for details). This increases the efficiency of estimates due to a larger number of observations and reduces the item non-response bias that occurs if observations with and without missing values differ systematically. We use five multiply imputed data sets which are provided. The coefficients and standard errors are derived using Rubin's method (Rubin, 1987, 1996).

provider. In 2009, 660—which is a little more than one third—of the respondents in the sample talked to professional financial advisors (33.7%).[18] Table A1 in the appendix also provides descriptive statistics conditional on consulting an advisor. Results are in line with previous empirical findings: those talking to financial advisors tend to be wealthier, with higher income, have higher levels of education and are slightly older.

Following Financial Advice. As a follow-up question respondents who consult professional advisors were asked how closely they follow their advice. The question included was *"How closely do you follow the advice obtained? Please evaluate your behavior on a scale from 0–"I /We do not follow the advice at all" to 10–"I/We follow the advice given entirely"*. We label this variable *Following Financial Advice*. Answers to this question are depicted in the histogram in Figure 1. On average respondents tend to follow advice—only around 15.8% indicate values below 5 which is the center of the scale. Almost one quarter of the respondents reply with the middle category 5, and around 60% of the respondents tend to follow advice, i.e. they indicate values larger than 5.[19]

Figure 1: Following Financial Advice

This figure shows the relative frequency of responses regarding the following of professional advisors recommendations among the SAVE respondents in 2009. N=660.

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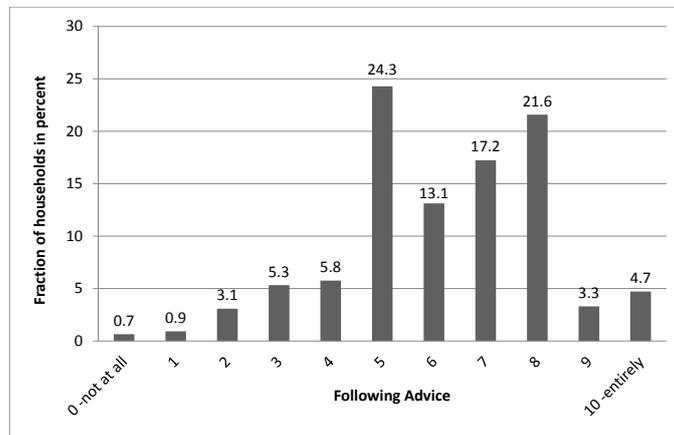
[18]The fraction of households consulting advisors is almost identical in the previous survey waves 2008 and 2007.

[19]There could be an issue with responses specifying the middle of the scale, category 5, as it can mean that respondents are equally likely to follow or reject advice. However, it could also imply that respondents pick a "neutral" option, if they do not care or do not have an answer to the question. We take account of this in the robustness checks.

Financial Literacy. We measure financial sophistication using objective measures of financial literacy which are based on financial literacy quizzes. The measures are very similar to the financial literacy questions developed and evaluated by Lusardi and Mitchell (2007) and Van Rooij, Lusardi, and Alessie (2011). In total, nine financial literacy questions were introduced into SAVE in 2009. For the purpose of our study we construct a measure composed of four—judging by the answering behavior of respondents—relatively difficult questions. Our measure contains four of the five questions labeled "advanced financial literacy" by Lusardi and Mitchell (2007) and Van Rooij, Lusardi, and Alessie (2011).[20] The questions are about the understanding of return fluctuations, stock markets, risk and diversification, as well as mutual funds. The detailed questions can be found in the Appendix (B). The percentage of correct answers ranges from 47.1% on the funds question to 73.0% on the return question (table 1 Panel A). We create an index that reflects the number of correct answers by the individual and can therefore assume the values 0 through 4 (see table 1 Panel B). Around 17% of the individuals in the 2009 survey were unable to give any correct answer and around 13% gave only one correct answer. Almost 15% were able to answer half of the questions correctly, 24% gave three correct answers and more than 31% were able to get all answers right.[21] As a central robustness check, we also introduce a dummy-variable that assumes the value of 1 if the respondents answered three or more questions correctly. This takes into account that the effects of financial literacy do not have to be linear, on the one hand. On the other hand, it addresses an interesting issue associated with potentially differing answering behavior: By guessing randomly, respondents would be expected to get 1 to 2 correct answers in the financial literacy survey. Bucher-Koenen, Alessie, Lusardi, and van Rooij (2015) show in a survey experiment that women and men are not equally likely to proffer guesses when the correct answer is unknown. The dummy ensures that individuals who guess at random are on average sorted into the same group with those who modestly admit their lack of knowledge.[22] Additionally, we also create a measure of basic financial literacy, comprised of four questions on more fundamental concepts,

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[20]Van Rooij, Lusardi, and Alessie (2011) and Bucher-Koenen (2011) conduct factor analyses to group financial literacy items into different constructs. The four questions used here all load on the same factor labeled "advanced financial literacy".

[21]For an analysis of the answering behavior across socio-demographic characteristics and a comparison with respondents in the US and the Netherlands see Bucher-Koenen (2011).

[22]As robustness checks to the robustness check, we also defined dummies with other cutoffs (2 and 4). The results (not reported) are qualitatively unchanged (except for the fact that there is not enough variation in the 2-measure for some of the subsamples).

like inflation and interest rates. We include this measure in robustness checks. The questions and the distribution of answers are included in the appendix (Table B6).

Table 1: Financial Literacy

This table shows the relative frequency of the answers to the advanced financial literacy questions among the SAVE respondents in 2009. N=1958.

Variable	all	men	women	no tertiary education	tertiary education
Panel A:					
risk question	66.0	72.9	59.3	63.2	78.7
return question	73.0	79.8	66.5	70.3	85.4
market question	53.5	61.6	45.9	50.4	67.1
funds question	47.1	55.6	39.0	43.8	62.1
Panel B:					
no. of correct answers					
0	17.1	11.03	23.0	19.5	6.2
1	12.7	10.72	14.6	13.4	9.8
2	14.9	13.53	16.3	15.4	12.6
3	24.0	26.74	21.3	23.2	27.3
4	31.3	37.98	24.9	28.5	44.1
N	1958	961	997	1602	356

Signal of financial literacy. Our identification strategy hinges on the fact that we, the researchers, observe an objective measure of the consumer's financial literacy, which is unavailable to the advisor, in addition to a signal which is generally observable. For the signal of the customers's expertise, we therefore require and want to focus on characteristics that are a) generally observable and b) on average indicative of a person's financial literacy. Note that the first requirement is there to make sure that the advisor can make use of the signal; the second requirement implies that this information is relevant and making use of it is valuable on average.

We identify two different characteristics which fulfill both requirements. The first is educational attainment, in particular whether or not the individual has completed tertiary education. Tertiary education in Germany confers a title to its holder, which is included in bank forms and protocols of advice sessions as standard procedure. University education is correlated with financial literacy (see table 1). It has even been used as a proxy for financial expertise in studies such as e.g. Georgarakos and Inderst (2011). Around 18% of our respondents have tertiary degrees (22% among those who consult financial advisors). Table 1 shows that 44% of the SAVE respondents with tertiary education were able to correctly answer all financial literacy questions, compared to less than 29% of those with lower education levels. The difference is highly significant.

Therefore, tertiary education can be employed as a signal of high financial literacy and no tertiary education as signal of low financial literacy. There are two drawbacks to this signal: First, the two groups differ substantially in size, such that the high-signal group is relatively small. Second, the selection into tertiary education is clearly non-random and generally associated with cognitive skills; controlling for the financial literacy score may not, in general, fully account for this.

The second characteristic solves both of these issues, as well as being clearly observable to the advisor: the gender of the person seeking advice. Various studies of financial literacy show that the financial literacy of women is on average significantly lower compared to men, even after controlling for factors such as education, age and income.[23] Therefore, at the population level, women display lower levels of financial literacy, which is a regularity that an advisor can make use of. As opposed to tertiary education, though, the selection into genders is exogenous with regard to financial and cognitive skills. Further note that in addition to the correlation at the population level, common stereotypes and traditional role perceptions towards men and women consider mathematical and financial skills as male instead of female traits. In line with this, we employ being female as a signal of low financial literacy and being male as a signal of high financial literacy in our empirical approach. This signal addresses the second issue, as the two groups are of almost identical size in our sample: Around 51% of our respondents are female (47% among those who consult advisors). The correlation with financial ability holds on average, as 25% of the women are able to answer all four financial literacy questions, while among men, 38% get all answers right (see table 1). Again, the difference is highly significant. One potential problem in this context is that couples make financial decisions jointly given the financial advice they have received; therefore we control for the relationship status of respondents.

3.2.2 Results: True and Apparent Financial Literacy and Following Financial Advice

Empirical strategy. First, we briefly outline our empirical strategy based on the analytical framework set out above. It relies on the fact that through the SAVE ques-

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[23]For a review of financial literacy and gender see Bucher-Koenen, Lusardi, Alessie, and van Rooij (2014). Bucher-Koenen and Lusardi (2011) provide results for the German population based on the SAVE survey.

tionnaire, we observe a measure of the individual customer's objective financial literacy which is unavailable to the financial advisor.

We estimate linear models of the following form:[24]

$$y_j = \beta_0 + \beta_1 x_j + \beta_2 z_j + \epsilon \tag{5}$$

Here, y is the (self-reported) measure of how closely the individual followed financial advice which it received. x is the measure of financial literacy, and z is a vector of controls. In our preferred specifications, we separate the sample into individuals with high signals of financial literacy (respectively, men and individuals with tertiary education) and low signals of financial literacy (women; individuals without tertiary education), thereby estimating a fully interacted model. In accordance with the hypotheses set out in our analytical framework, we would expect the following pattern with regard to following advice depending on financial literacy: Overall, we would expect individuals with higher skill levels to be less likely to follow advice, due to their better outside option (Hypothesis 1). Taking the (unobserved) quality of advice into account, this effect should be more pronounced given that the advice received is of low rather than high quality (Corollary). If, as our model predicts, a group of individuals with a signal of high financial literacy receives better advice than the group with the bad signal (Hypothesis 1), we should be able to infer this from the pattern of who does and does not follow the advice received. Applying this to the regressions, therefore, our hypothesis is that β_1 should be negative and significant for individuals with low signals as opposed to those with high signals. We present the detailed results of different models in Table 2 below.

Identification. Before discussing the results, we briefly address some empirical issues arising with our approach in advance. The first issue, which generally troubles studies making use of measures of financial literacy, is endogeneity due to reverse causality. For most financial decision making contexts, this tends to be a serious issue, as individuals gathering the necessary information for a decision, e.g. on stock purchases, may in the course of this acquire higher levels of financial literacy. Additionally, ability and interest can confound the effect of financial literacy. We believe that in our context, these issues are less relevant, since the decision in question is only whether or not to follow suggestions received from an advisor, with neither option requiring significantly more

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[24]As one of the robustness checks, we also provide results of an ordered logit specification.

advance effort than the other. More importantly, even if there were reverse causality, the central mechanism we are interested in is even more subtle: We predict a different effect of financial literacy on the decision to follow advice for individuals with bad and individuals with good signals. It is this interaction of signal, actual literacy and the decision to follow that allows us to make inferences concerning the quality of advice. Similarly, one might be worried about selection into those that consult an advisor and those who do not, which has been shown to be associated with financial literacy. Therefore, in particular at lower levels of financial literacy this may introduce a bias. Note that our identification strategy relies on the differences in effects between groups, which alleviates this issue.

Moreover, even the established quiz-type approach we use to assess consumers' financial literacy is associated with measurement error, which can introduce a bias towards zero in the empirical results. Note that our identification strategy relies primarily on the clearly observable signals gender and education, instead of purely on the effects of the financial literacy measure; further, we test our predictions in various different settings with consistent and stable outcomes.

As a third potential issue, in the first specification we use a self-reported measure for following financial advice. The measure is by necessity imperfect: There is noise with regard to individuals idiosyncratically interpreting the meaning of the scale, etc. If unable (or unwilling) to answer the question correctly, individuals may have the tendency to choose the center option as a type of default option, as could be indicated by the higher frequency of this answer. As a simple robustness check, we estimate the model excluding respondents who answer with the option at the center of the scale and see if the effects still hold. Furthermore and more importantly, in addition to this general financial advice setting, we will also apply a parallel approach in the context of private pension insurances in the next section; obtaining results that are consistent with the analytical framework in the separate empirical settings allows us to make an overall convincing argument.

Results. Figure 2 reflects the central thrust of our results. We plot the average response given to the question on following professional advisors' recommendations for different levels of financial literacy measured by the number of correct responses. To mirror the interacted model, we separate this analysis a) by gender and then b) by whether tertiary education was attained. The first noteworthy observation is how

similar the effects of the two different exercises are, with the graph for women closely resembling the picture for individuals without tertiary education. The central pattern observable in the figure is in favor of our main hypothesis: Among those with bad signals of financial expertise (women; low education) there is a significant negative correlation between financial literacy and following professionals' advice (women: Corr -0.1527, p-value 0.0071; no tertiary education: Corr -0.1142, p-value 0.0095). In contrast to that there is no significant relationship between following and financial literacy among those with high signals of literacy (men: Corr -0.0334, p-value 0.5352; tertiary education: Corr 0.0059, p-value 0.9447).[25]

Figure 2: Following Financial Advice

This figure shows the average response of following professional advisors recommendations by levels of financial literacy separately for men, women and those with high and low education among the SAVE respondents in 2009. Levels of financial literacy are measured by the number of correct responses given to the advanced financial literacy questions (0 to 4). N=660.
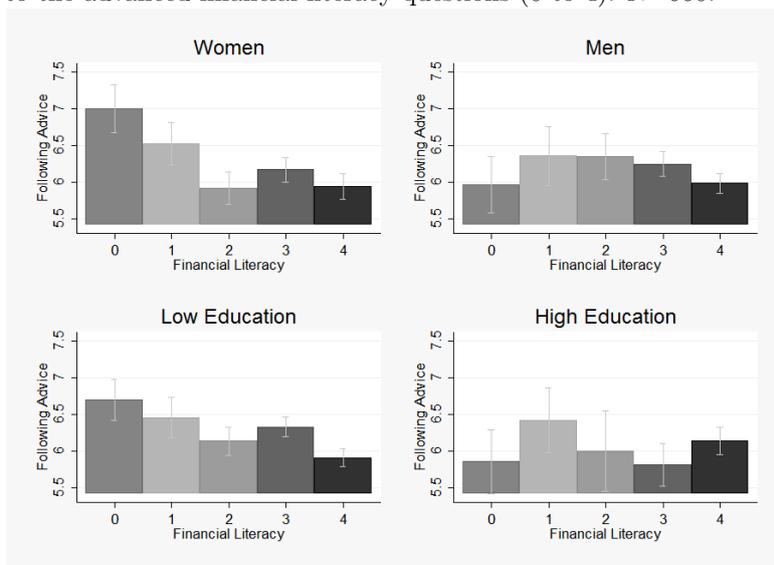
Obviously, a number of additional factors, which may affect the quality of advice and the decision whether to follow it, need to be taken into account in a multivariate regression. From the model, we know that we need to control for consumer characteristics which make her more valuable to the advisor or the advisor's employer; as proxies for the value the customer brings to the relationship we control for her income and financial wealth. To address potential effects of repeated interactions between the advisor and

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[25]Note that the intercept appears to be lower for men than for women. As the multivariate analysis shows, this artefact disappears when the effects of age are taken into account.

the consumer, we introduce a dummy variable that controls whether previous financial advice was solicited by the consumer (advice 2008).[26] An important issue is who actually makes financial decisions in non-single households. To capture potential effects of joint decision-making, we introduce the marital status of the survey respondent as a dummy variable.[27] Finally, we control for age using age-group dummies, since there might be critical periods in life during which individuals are more likely to consult and follow financial advisors, e.g. when buying a house, starting a new job or entering retirement.[28] In our preferred regressions, we estimate fully interacted models, thereby allowing, e.g., marriage and age to affect members of the respective groups in question differently.

For the full sample, we find a significant negative effect of financial literacy on following professionals' financial advice (see model 1 in table 2), which is concurrent with Hypothesis 1. Objectively more knowledgable consumers are more likely to reject advice. For the full sample, we do not find a significant effect of our signals "male" and "tertiary education". Splitting the sample twice along the dimension gender (models 2 and 3) and education (models 4 and 5) unearths the effects that our model predicts. It is only women and individuals without higher education who are significantly less likely to follow advice as their financial sophistication increases (Corrolary 2). More than that, a $\chi 2$ test of the constants in models 2 and 3 reveals that women are on average significantly less likely to follow advice than men, controlling for central additional factors (Corrolary 1).[29] We find that the overall negative effect of financial literacy observed in the full sample is due only to those individuals who display bad signals: The effects of financial literacy both for men and individuals with tertiary education are small and insignificant. Higher levels of financial literacy do lead to customers being more likely to reject the advice they have received – but this mainly holds for individuals endowed with bad signals of their financial skills. See Table A3 in the Appendix for a robustness check with an alternative definition of the financial literacy measure – the results are

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[26]In particular, consumers who received good advice previously might be more likely to consult their advisor again.

[27]In a robustness check we also restrict the sample to households with single decision makers. The overall pattern of our results remains, but we lose significance due to the lower number of observations.

[28]In the general setting we define 10 different age groups; in the settings that are contingent on private pension insurance purchases, we observe substantially fewer respondents (and exclude respondents older than 60) – therefore we reduce the number of groups in this setting to 5, with approximately the same number of observations per group as previously.

[29]The difference in the coefficients for marital status, and previous advice, in particular, show that the fully interacted specification is justified. It is the less educated and women (at the edge of significance), for whom being married is associated with being less likely to follow advice they have received.

slightly weaker but qualitatively unchanged, overall.

Table 2: Determinants of Following Financial Advice

This table reports the effect of financial literacy and various covariates on following financial advice using OLS. Coefficients and standard errors (se) are reported. They are calculated using 5 imputed data sets and are combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured as the number of correct answers to the advanced financial literacy questions, ranging from 0 to 4. (d) indicates the change of a dummy variable from 0 to 1.

	(1)	(2)	(3)	(4)	(5)
	All	Men	Women	High Education	Low Education
Advanced Financial Literacy	-0.16**	-0.09	-0.25***	-0.01	-0.19**
	(0.070)	(0.105)	(0.096)	(0.148)	(0.079)
Male (d)	0.03			0.03	0.01
	(0.165)			(0.385)	(0.185)
Tertiary Education (d)	-0.12	-0.07	-0.28		
	(0.190)	(0.254)	(0.298)		
Log Income	0.02	-0.11	0.32	-0.06	0.07
	(0.148)	(0.149)	(0.254)	(0.205)	(0.230)
Log Financial Wealth	-0.00	0.02	-0.04	-0.02	-0.00
	(0.038)	(0.055)	(0.051)	(0.094)	(0.044)
Married (d)	-0.22	0.01	-0.42	0.21	-0.40*
	(0.194)	(0.295)	(0.277)	(0.385)	(0.227)
Advice 2008 (d)	0.33*	0.31	0.42	-0.54	0.56***
	(0.180)	(0.254)	(0.277)	(0.435)	(0.204)
Agegroup dummies (d)	YES	YES	YES	YES	YES
Constant	7.32***	9.23***	5.28***	7.47***	6.96***
	(1.181)	(1.200)	(1.953)	(1.228)	(1.755)
Observations	660	350	310	142	518
R^2	0.028	0.034	0.072	0.066	0.049

Table 3 summarizes a number of other robustness checks that we perform. In Panel A we report the effects of advanced financial literacy (the measure employed above), when additionally controlling for basic literacy and cognitive abilities. Here, the effects are slightly stronger. In panel B we drop all respondents whose answer is the center of the scale of the "following" question, i.e. those who respond with "5". Even though we lose about a quarter of our sample the results become even more distinct and remain qualitatively identical: Only individuals with low education and women are significantly more likely to reject advice given higher levels of literacy. Finally in panel C we report the effects when estimating an ordered probit instead of an OLS model. Again the results remain unchanged.

Table 3: Determinants of Following Financial Advice – Further Robustness Checks

This table reports the effect of financial literacy and various covariates on following financial advice. Coefficients and errors (se) are reported. They are calculated using 5 imputed data sets and are combined according to Rubin's Rule (Rubin (1987, 1996)). Additional controls in all specification are gender, tertiary education, log income, log financial wealth, marital status, whether advice was obtained in the previous year and agegroup dummies.

	All	Men	Women	High Education	Low Education
Panel A: Including Basic Financial Literacy and Cognitive Skills					
Advanced Financial Literacy	-0.18**	-0.03	-0.31***	0.13	-0.24***
	(0.082)	(0.124)	(0.107)	(0.194)	(0.090)
Basic Financial Literacy	0.03	-0.13	0.13	-0.25	0.09
	(0.093)	(0.133)	(0.129)	(0.200)	(0.106)
Cognitive Score	0.04	0.05	0.02	-0.11	0.07
	(0.090)	(0.111)	(0.143)	(0.205)	(0.101)
N	660	350	310	142	518
R^2	0.030	0.036	0.078	0.080	0.054
Panel B: Excluding middle answer option (5)					
Advanced Financial Literacy	-0.19**	-0.12	-0.29**	0.05	-0.27***
	(0.085)	(0.317)	(0.114)	(0.166)	(0.096)
N	500	273	227	111	389
R^2	0.035	0.045	0.089	0.096	0.066
Panel C: Ordered Logit					
Advanced Financial Literacy	-0.16**	-0.12	-0.23**	0.01	-0.19**
	(0.066)	(0.101)	(0.093)	(0.133)	(0.078)
N	660	350	310	142	518

3.3 Financial Advice and Private Pension Choice

3.3.1 Riester Pensions

In the previous section, we provided evidence that individuals with bad signals of financial literacy may receive worse financial advice, using information on whether they follow financial advice received in a general setting. This approach was subject to two disadvantages: First, the outcome variable was a self-reported subjective assessment and second, we do not observe economic outcomes attached to the decision whether or not to follow the advice received. In this section, we apply our analytical framework to a complementary empirical setting which addresses both of these issues, the choice of subsidized private pensions in Germany. This subsidized set of products was introduced by law relatively shortly before the survey was carried out, but immediately spawned a huge amount of complex pension contracts offered by a large number of suppliers, including insurance companies and banks, as would be expected, to perhaps less obvious providers like Tchibo, a big retailer of coffee and a weekly changing portfolio of mostly clothing and electronics. As a result, at the time of the survey, there was a very large

number of opaque products in the market. Further, consumers could not rely on typical heuristics such as trusting the experience of others, because we still observe the first generation of customers. Both of these factors bolster the importance of advisors, which makes the market a fascinating application for our analytical framework.

A brief outline of the institutional details is helpful to understand these arguments better: The fundamental idea of the so-called Riester Pensions—named after the former labor minister Walter Riester—is that eligible individuals contribute 4% of their monthly gross income to a private pension contract and receive a lump-sum subsidy of currently 154 Euros per year in addition to the gains in value of the underlying pension plan. Additionally, families with children obtain 300 Euros for each kid (185 Euros, if the child was born before 2008). Thus, Riester subsidies are particularly generous for individuals with lower income and families with children. Every person potentially affected by the future reductions in public pensions due to recent pension reforms is eligible for subsidies, which applies to about 40 million individuals in Germany. Around 13 million contracts had been signed by 2009.[30]

Lively discussions concern the alleged lack of transparency in the market—both regarding the multitude of offers at the macro-level[31] and the complexity of the cost structure of individual contracts.[32] Gasche, Bucher-Koenen, Haupt, and Angstmann (2013) compare costs of 36 classic Riester pension contracts— representative for these types of contracts—and find that the variation in costs is substantial. There is a cost difference of almost 20 percentage points between the most and the least expensive contract in the sample, which is equivalent to potentially tens of thousands of euros of wealth difference at pension age. To avoid serious investment mistakes, the comparison of alternatives before signing such a contract would appear to be crucial. However, comparing individual offers in this market is more difficult than one would expect.[33] Due to the pension character of products and the dependence of rates, annuities and the levels of subsidies on

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[30]Börsch-Supan, Coppola, and Reil-Held (2012) provide an overview of regulation and the dynamic of the adoption of Riester pensions by German households.

[31]In 2008 around 4,300 different Riester products were registered as certified products by the *Bundesanstalt für Finanzdienstleistungsaufsicht*— the Federal Financial Supervisory Authority— which is responsible for the regulation. Of those contracts, customers could choose from around 4,000 at the time. This number is inflated as identical offers may go by different names, which contributes to the opacity of the market.

[32]For a comprehensive overview, we refer to the book-length study by Feigl, Jaroszek, Leinert, Tiffe, and Westerheide (2010).

[33]Or, to be cynical, is precisely as hard as one would expect given the stakes.

age, marital status, current income and number of kids, among other factors, contracts are highly individualized. If a consumer wishes to compare contracts, she therefore has to provide these characteristics in order to obtain a spelled-out personalized offer. The lack of standardization and the complexity of the cost structure of individual offers, as well as customers' reluctance to share highly sensitive personal data have prevented simple (e.g., online-) tools for comparing offers to be created. This assigns a pivotal role to financial advisors in the decision making context, which forms the background of our examination.

3.3.2 Variables

Sample restriction. For this part of our analysis, we again rely on the SAVE data set. Since we are interested in retirement savings decisions, we restrict our sample in a first step to respondents who are not retired and who are younger than 60 years of age in 2008. Further, we restrict the sample to respondents who were eligible for Riester subsidies in 2007 or 2008.[34] We would like to point out that the advanced financial literacy measure is only available in SAVE 2009. Thus, our sample consists of respondents participating in the surveys in 2008 and 2009 so that we can use both the information from the Riester questions and the information on financial literacy. As in the previous section we also exclude those with missing information in the advanced financial literacy task despite the do-not-know option. Again we drop those respondents with unspecified education. The socio-demographic characteristics of the 1,021 remaining respondents from SAVE 2008 are provided in Table A2 in the appendix. In this sample 37% of the households owned at least one Riester pension contract in 2008, 9% report that they are planning to buy such a contract in the near future. More than half (54%) of the respondents neither owned nor planned to purchase a Riester pension in 2008. For most of our analyses we only include respondents who already own a contract since we have information on the information process prior to signing the contract only for those.[35] We also have some information for the "planners" which we use in parts of the analysis.

As discussed above, in this section we use a complementary approach to better un-

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[34]Eligible individuals are those insured in the public pension system and civil servants as well as those married to an eligible person. Unemployed and self-employed who are not married to an eligible person cannot obtain subsidies. Around 86% of the non-retired respondents in our sample are eligible for the state subsidies.

[35]Summary statistics for this subsample are also provided in table A2 in the appendix.

derstand how quality of advice depends on (signals of) financial ability. In our empirical specifications, we will make use of the following two dependent variables:

Comparability/Number of written offers. As explained above, a prerequisite to be able to compare contracts and make an informed decision with regard to the subsidized private pension is to obtain individualized, spelled out offers. This allows us an important deeper insight into the advisory process in this specific context. Respondents were asked: *"How many offers in written form did you or your partner obtain before signing a contract over the course of your planning process?" None / One offer in written form / Two to three offers in written form / More than three offers in written form.* This gives us an understanding, whether advisors presented actual alternatives to the advisee, which will allow us to make direct inferences about the quality of the advice offered to a customer based on objective characteristics. In this context, we include "planners" in the sample since we condition on the fact that they already consulted a financial advisor.[36]

Table 4 depicts the number of offers households obtained when consulting an advisor.[37] The distribution of the numbers of offers is depicted in column "All". Among owners of Riester pensions 34.7% of the respondents signed the contract without studying a written offer, a further 34.4% only obtained and studied a single offer in writing. Therefore the share of individuals who did not compare written offers is around 70% among those who bought such a contract. Just around 30% of the respondents compared different alternatives. With this large fraction of consumers choosing the first option they encounter, the origin of this offer, i.e. their source of information and financial advice, clearly plays a crucial role in this important long-term decision.[38]

Familiar contract partner. In the private pension context, we are able to specifically study the economic effects of not following advice. We introduced an item into the survey regarding the choice of contract partner of customers. Respondents indicate whether they signed a contract with a familiar contract partner, i.e., a bank or insurance company with which they already have other contracts and from whom they

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[36]We also provide evidence for the sample including only owners of pensions.

[37]We also asked how individuals obtained information, when buying a Riester pension. The majority of the households who own a Riester pension consulted financial advisors (64%); around 12% only searched by themselves and almost one quarter of the Riester owners claim that they did not obtain any information prior to buying such a contract (24%). This is a worrisome outcome in itself and points to the fact that individuals are not well equipped when making complex decisions about their long-term finances.

[38]The fractions are almost identical, when including the planners in the sample.

Table 4: Number of Written Riester Contract Offers and Contract Partner

This table shows the fraction of households that obtain "zero" to "more than three" written offers conditional on consulting an advisor in the decision making process and conditional on owning a Riester pensions (Panel A), as well as the fraction of those households that bought the Riester contract with a familiar or an unfamiliar provider (Panel B). Results are shown for all households, and separately by gender, education (High/Low Educ.) and financial literacy levels (High/Low FL.) Deviations in the number of observations between the two samples are due to different missing values in the dependent variables. In Panel B, fractions do not add to 100% because households can own more than one contract.

	All	Men	Women	High Educ.	Low Educ.	High FL	Low FL
Panel A: Written offers							
none	34.7	29.5	40.6	30.4	35.7	30.9	37.4
one	34.4	31.7	37.4	29.9	35.3	33.3	35.1
two to three	25.1	32.0	17.2	34.8	23.0	29.4	22.1
three or more	5.8	6.8	4.8	5.0	6.0	6.5	5.3
Observations	223	119	104	40	183	92	131
Panel B: Contract partner							
Familiar	73.6	71.5	76.1	71.2	74.2	65.9	78.8
Unfamiliar	29.8	32.5	26.7	38.5	28.0	39.5	23.4
Observations	231	124	107	41	190	92	139

receive financial advice, or an unfamiliar contract partner. The latter is defined as a bank, insurance company or other contract provider with whom there were no prior relations. The exact wording of the question is the following: *"What provider did you or your partner procure/ are planning on procuring the Riester contract from? Several answers are possible" My/ our main bank / Another bank / An insurance company that I/ we have already concluded another insurance contract with (e.g. liability or household insurance) / An insurance company that I/ we do not have any other insurance contracts with / Another provider of Riester products, please specify...* If the contracting partner is a previous provider of banking or insurance services to the respondent, we define the firm as a "familiar contracting partner". If, on the other hand, the consumer has no previous interaction with the provider of her pension, we refer to the firm as an "unfamiliar contracting partner". This variable has a strong interpretation in the context of our model: Advisors working for a familiar contracting partner have a strong incentive to suggest one of their own insurance products; if the consumer ends up with another firm, this conveys important information to us. We describe how we make use of this in detail in the section on our empirical strategy below. Overall 73.6% of respondents own a Riester pension with a familiar contract partner, and 29.8% choose an unfamiliar

contract partner.[39] Among those who intended to buy a Riester pension in 2008 82% planned to buy one with a familiar contract partner.

The financial literacy indicator and the signals of financial literacy observed by the advisor remain the same as in the previous analysis. In SAVE 2007 a different financial literacy measure consisting only of three questions parallel to those used in Bucher-Koenen and Lusardi (2011) and Lusardi and Mitchell (2011) is available. We employ this measure in a robustness check with identical qualitative results (not reported).

3.3.3   Results: Financial Literacy and Number of Offers

Empirical strategy. An important factor in choosing a good private pension plan is being able to compare different offers, which differ according to their costs, risk structure, and guaranteed value at pension age, among other dimensions. Therefore whether or not multiple offers were presented to the customer by the advisor is an indicator for the quality of advice, with the presence of multiple written offers indicating better quality.[40]

The descriptive results presented in subsection 3.3.2 shed first light on the relationship: Conditional on consulting an advisor around 30% of the customers received more than one written offer, whereas around 70% did not compare alternatives conditional on consulting advisors. Assume for the moment, that being able to compare multiple offers indicates better advice[41], then our model would yield the following prediction: Individuals who appear smarter (signal of high financial literacy) should be more likely to be offered multiple alternatives to pick from. This would be the case (as assumed in the model) if financial advice is one-directional, proffered by the advisor to the customer. If there is a "pull"-component to the advisory process, with actually more financially literate advisees perhaps being more likely to request additional options, we would further expect a positive effect of the objective measure of financial literacy on the likelihood of being offered multiple alternatives. To analyze these questions, we use the following

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[39]The numbers do not add to 100% because the information is provided at the household level and households can have multiple contracts with different providers.

[40]Clearly, there are limitations to this measure. For example, more choices may not necessarily be experienced as beneficial, or being offered multiple alternatives may reflect an attempt at framing to utilize a compromise effect by the advisor. While these arguments do introduce potential noise, taking the results of the next section into account, we feel confident that, overall, more options do indeed indicate better advice.

[41]We address other possible interpretations below.

probit specification:

$$P(Y_j = 1|x, z, advice) = P(Y_j^* > 0|x, z, advice) = \Phi(\beta_0 + \beta_1 x_j + \beta_2 z_j + \beta_3 s_j), \quad (6)$$

where the underlying latent model has the form:

$$Y_j^* = \beta_0 + \beta_1 x_j + \beta_2 z_j + \beta_3 s_j + \epsilon, \text{ if } advice > 0 \quad (7)$$

and $Y_i = 1$ if $Y_i^* > 0$, and $Y_i = 0$ else.

Again, concurrent with and based on the predictions of our theoretical model, the analysis is conditional on the consumer having solicited advice. Note that in this setting, we observe a measure that can directly be interpreted with regard to the quality of advice, therefore we do not require an interacted model, as opposed to the previous approach.[42] We analyze the probability Y that the customer obtains more than one written offer from the advisor and relate it to her objective level of financial literacy x, the signals for financial literacy s as well as a set of controls z. Our model predicts a positive sign for β_3 — higher signals of financial literacy should lead to better advice being offered (Hypothesis 2). A positive and significant sign for β_1, the effect of financial literacy itself, could imply that the signals we employ do not capture everything that the advisor observes or that the advisee takes an active role in the process.

Results. We present results in table 5.[43] They are striking both for the effects we observe and those that we do not observe. The central and robust finding is that men are significantly more likely to obtain multiple offers than women. The effect is large, highly significant and persistent independent of the controls included. It is also not sensitive to the sample used for the estimation (past vs. past and planned purchases of insurance). The effect of tertiary education is positive, but not significant at the 10%-level.For the basic specification without controls and the larger sample, the measure of financial literacy has a positive and significant effect on the likelihood of obtaining multiple offers. But, as additional controls are introduced, this effect loses its significance. This is evidence that the outcome of advice depends more on the advisor (push) and his impression of the customer, than on the consumer's knowledge

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[42]In fully interacted specifications with all controls, the effects of financial literacy on the likelihood of obtaining multiple offers is not significantly different from zero.

[43]For a robustness check with the alternative financial literacy measure, see table A4 in the Appendix.

and questions (pull). Only gender, the most visible signal of financial literacy, has the expected robust effect. This means that on average men are between 15 and 16 percentage points more likely than women to receive more than one written offer, which indicates that men receive better financial advice.

Table 5: Determinants of Receiving Multiple Written Offers

This table reports the effect of gender, tertiary education, financial literacy and various covariates on receiving more than one written offer for a private pension insurance (Riester) contract. We estimate probit models. Coefficients, standard errors (se) and average marginal effects [marg] are reported. They are calculated using 5 imputed data sets and are combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured as the number of correct answers to the advanced financial literacy questions, ranging from 0 to 4. (d) indicates the change of a dummy variable from 0 to 1.

	Planners and Owners			Owners only		
	(1)	(2)	(3)	(4)	(5)	(6)
Male (d)	0.56***	0.51***	0.50***	0.47**	0.45**	0.44**
	(0.172)	(0.174)	(0.178)	(0.182)	(0.183)	(0.189)
	[0.183]	[0.166]	[0.153]	[0.159]	[0.153]	[0.142]
Tertiary Education (d)	0.29	0.23	0.33	0.23	0.18	0.23
	(0.219)	(0.227)	(0.245)	(0.231)	(0.239)	(0.256)
	[0.096]	[0.075]	[0.101]	[0.078]	[0.061]	[0.072]
Advanced Financial Literacy		0.12*	0.12		0.09	0.09
		(0.070)	(0.078)		(0.079)	(0.083)
		[0.039]	[0.036]		[0.031]	[0.028]
Log income			0.05			-0.05
			(0.202)			(0.241)
			[0.014]			[-0.016]
Log financial wealth			0.03			0.08
			(0.048)			(0.073)
			[0.009]			[0.025]
Married (d)			0.20			0.178
			(0.222)			(0.242)
			[0.062]			[0.057]
Agegroup dummies	NO	NO	YES	NO	NO	YES
Constant	-0.92***	-1.23***	-1.37	-0.80***	-1.06***	-0.901
	(0.132)	(0.230)	(1.436)	(0.140)	(0.263)	(1.665)
N	257	257	257	223	223	223

Robustness. We also conducted the same analyses using the financial literacy measure from SAVE 2007 with unchanged qualitative results. This measure is less specific and less difficult, so we prefer the specification featuring the advanced measure. However, using the 2007 questions leads to a slight increase of the sample size, because we do not lose respondents due to attrition between waves 2008 and 2009. We conducted further robustness checks, similar to the ones presented in the previous section, including information on basic literacy and cognition which does not change our results.

As indicated above, one could argue that more alternatives may actually indicate

worse advice, due to disutility to the consumer from having to choose or from attempts at framing or obfuscation by the advisor. If this were the more important effect, then our results would indicate that men receive worse, but in any case significantly *different*, financial advice than women. We provide more evidence that this alternative interpretation does not hold in the final step of our empirical analysis, when we analyze the contracting partner that survey respondents pick.

3.3.4 Results: Financial Literacy and the Choice of Contract Partners

Empirical strategy. In this final part of our empirical analysis, we return back to the indirect approach from the general setting, in which we studied the customer's decision to follow or not follow financial advice she received. One of the shortcomings in the general context was that we could not observe distinct economic outcomes of the decision. Now, in our application, we will consider a concrete outcome: Whether the customer signed a contract with the (familiar) contracting partner, from whom she receives financial advice, or a different provider of insurance services. The basic logic remains that, given a conflict of interest exists, the advisor can choose to offer a contract alternative that maximizes his own utility (low quality advice) or the utility of the customer (higher quality advice). If the customer appears more versed in financial matters, the advice offered should be better. Linking this with the contracting partner, which we observe, we would predict the following pattern: Individuals with better signals of financial literacy (men; individuals with an university degree) should be offered better advice by their advisor. It is more likely in their interest to follow this advice, therefore the effect of their objective financial literacy on signing with the familiar contract partner should be insignificant. On the other hand, customers with a signal of low financial literacy should be receiving worse advice; with higher levels of financial literacy, they should be significantly more likely to reject the advice received and therefore end up with an unfamiliar contract partner.[44]

Since in this model the dependent variable (familiar contracting partner) is binary we estimate a probit model of the following form:

$$P(Y_j = 1|x, z) = P(Y_j^* > 0|x, z) = \Phi(\beta_0 + \beta_1 x_j + \beta_2 z_j), \tag{8}$$

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[44]Note that the effect of the signal for the entire population cannot necessarily be signed; in fact, if women were overall more likely to reject offers than men this could indicate non-optimal behavior by the advisors.

where the underlying latent model has the form:

$$Y_j^* = \beta_0 + \beta_1 x_j + \beta_2 z_j + \epsilon. \tag{9}$$

with $Y_i = 1$ if $Y_i^* > 0$, and $Y_i = 0$ else.

Y captures whether the consumer has purchased a contract from a familiar firm, x is our measure of financial literacy, and z are the familiar controls. As before we estimate the model separately for men and women and by tertiary education. β_1 is expected to be significantly negative for those with bad signals of financial literary (women and those with low education levels) and not significant for those with high signals (men and those with tertiary education).

Results. Table 6 displays the results of the probit regressions. For the full sample (column 1 in table 6), we find a negative and significant effect of financial literacy on the probability of contracting with a familiar firm, which is in line with Hypothesis 1; the more knowledgeable a consumer is, the more likely she is to disregard given advice and resort to a different contracting partner. When we split the sample to estimate the fully interacted model, we find large, highly significant negative effects *only* for those groups of individuals with bad signals, for women and for individuals without tertiary education. We are cautious about over-interpreting the result for the tertiary education-split, as here the better signal covers less than a quarter of the sample. But for the split by gender, in which both subsamples are of equal size, the striking result remains: While overall, smarter customers are more likely to contract with an unfamiliar partner, this effect is only significant in the case of smarter *women*. While for the setting in table 6 the effects are similar in size for the different groups and only the higher standard errors for men and higher educated lead to insignificance, with the alternative specification of the financial literacy measure in table A5 the effect sizes themselves differ even more substantially, as well.[45] With the additional knowledge that it is also only smarter women who are less likely to follow financial advice in the general setting, and that women were less likely to be offered a choice with regard to pension contracts, we find consistent and robust evidence overall that financial advice offered to men is of better quality than the

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[45]**Robustness**. Once again out results are robust when using the less advanced financial literacy measure from 2007 for men and women. The model cannot be estimated for the education split due to the small size of the high education sample. Results are robust to including basic literacy and cognitive abilities. For the single decision makers the pattern remains stable for the complete sample, but splitting the estimation sample in this case is not feasible due to the small number of observations.

advice offered to women in a representative survey of German consumers.

Table 6: Determinants of Signing with Familiar Contract Partner

This table reports the effect of financial literacy and various covariates on whether respondents signed their private pension insurance (Riester) contract with a familiar contract partner. We estimate probit models. Coefficients, standard errors (se) and average marginal effects [marg.] are reported. They are calculated using 5 imputed data sets and are combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured as the number of correct answers to the advanced financial literacy questions, ranging from 0 to 4. (d) indicates the change of a dummy variable from 0 to 1.

	(1) All	(2) Men	(3) Women	(4) High Educ.	(5) Low Educ.
Advanced Financial Literacy	-0.23**	-0.13	-0.36**	0.12	-0.26***
	(0.092)	(0.129)	(0.163)	(0.272)	(0.100)
	[-0.072]	[-0.039]	[-0.099]	[0.033]	[-0.079]
Male (d)	-0.12			-0.77	-0.10
	(0.186)			(0.688)	(0.204)
	[-0.042]			[-0.216]	[-0.031]
Tertiary education (d)	0.08	0.14	0.42		
	(0.246)	(0.332)	(0.426)		
	[0.028]	[0.043]	[0.117]		
Log income	0.00	-0.03	-0.13	-0.62	0.10
	(0.265)	(0.328)	(0.466)	(0.659)	(0.291)
	[0.005]	[-0.008]	[-0.036]	[-0.177]	[0.031]
Log financial wealth	0.01	-0.12	0.08	0.128	-0.04
	(0.067)	(0.093)	(0.106)	(0.213)	(0.073)
	[0.001]	[-0.037]	[0.021]	[0.036]	[-0.011]
Married (d)	-0.01	-0.24	0.38	0.659	-0.01
	(0.237)	(0.380)	(0.392)	(0.565)	(0.278)
	[0.002]	[-0.076]	[0.105]	[0.186]	[-0.002]
Agegroup dummies	YES	YES	YES	YES	YES
Constant	-1.44	1.89	1.48	2.92	0.82
	(2.349)	(2.424)	(3.329)	(4.267)	(2.092)
N	231	124	107	41	190

4   Discussion and Conclusion

One of the limitations of the empirical literature on advice, whether in the financial or other contexts, is that it is extremely difficult for the researcher to observe the inter-actions between the advisor and the customer, and therefore to evaluate the quality of advice. Up until now, the most promising approaches were field experiments, limited to relatively specific settings such as brokerage customers, for which external validity is an issue. One of the central contributions of this paper is that we provide an identification strategy which allows us to infer information about the quality of advice for respondents

of a survey that is representative for Germany, a large country with a well-developed financial system. We consider this an important complement to the existing evidence on the interaction between advisors and consumers. Clearly, the advantages of this empirical strategy are associated with limitations of their own: We have to rely on self-reported survey data. Lacking an experiment, we cannot directly test our hypotheses and despite the larger overall sample, the required restrictions and splits imply that we have to work with a relatively small number of observations to identify rather subtle effects. Though informed both by our theoretical model and by the average characteristics throughout the entire population, our choice of what advisors use as a signal to base their recommendations on cannot be proven correct; all we can say is that it results in systematic patterns throughout different empirical settings that are in line with the predictions of our analytical framework. This consistency of results with predictions both regarding very general ("Do you follow financial advice received") and rather specific items (number of contracts provided for comparison, likelihood of signing with a familiar contracting partner) is what makes us confident in the results that we have obtained.

For the approach that we introduced, which can and should be replicated in the future using similar surveys, we make use of the fact that we observe both a signal of the customer's financial literacy which is on average informative (the customer's gender), as well as an objective measure of financial literacy which is not available to the advisor. Our empirical results emphasize the problems surrounding the misalignment of incentives of advisors with bonus-contracts and their customers: To answer the question in the title of our paper: Consumers who *appear* to be more versed in financial matters receive better advice, on average. We provide evidence indicating that this is detrimental to large and clearly identified groups of customers: Women and individuals without tertiary education. This systematic differential treatment of customers by professional advisors has not been demonstrated before for a representative sample of advisees. It appears likely that this finding does not only apply to financial matters but can be generalized to other settings in which individuals receive advice from professionals.

The basic mechanism which is responsible for the conflict of interest is the contractual incentive structure of advisors, with higher bonuses exacerbating the problems; this is in line with findings from the literature, see e.g. Inderst and Ottaviani (2012a) or Inderst and Ottaviani (2009). Different policies to address this issue have been suggested: In particular, disclosure of the conflict of interest to consumers or flatter incentives

for advisors by reducing the bonus component of their contracts (see e.g., Inderst and Ottaviani (2012b) for an extensive discussion of potential measures). Clearly, these approaches may be associated with drawbacks of their own: Lacko and Pappalardo (2010) and Loewenstein, Cain, and Sah (2011) show in experimental settings that disclosure could be associated with other disadvantages, such as consumers becoming distracted from essential details due to information overload or advice even becoming more biased due to the interaction of trust and signalling effects. Fee based advisory contracts are also no panacea, since they may induce advisors to strategically inflate the number of interactions with each customer. Our findings should add an additional reason for and more urgency to these regulatory and policy efforts, since we show that the hidden costs of bad advice are borne disproportionately by women and the lesser educated. If this mechanism feeds back into individuals' decision whether to consult an advisor in the first place, it might contribute to the phenomenon that it is mainly wealthier, better educated individuals who solicit advice.

A Summary Statistics and Further Robustness Checks

Table A1: Summary Statistics 1

Variable	All		Conditional on Advice	
	Mean	Std. Dev.	Mean	Std. Dev.
Male	0.49	0.50	0.53	0.50
Age	54.90	15.19	55.60	15.07
No Vocational Training	0.11	0.31	0.08	0.27
Vocational Training	0.71	0.45	0.70	0.46
University Degree or equivalent	0.18	0.39	0.22	0.41
Married	0.64	0.48	0.74	0.44
Net Household Income (in Euros)	2,382	1,597	2,680	1,496
Financial Wealth (in Euros)	45,687	115,068	79,262	178,614
Advice 2009	0.34	0.47	1	0
Observations	1958		660	

SAVE 2009

Table A2: Summary Statistics 2

Variable	All		Conditional on a Riester Pension	
	Mean	Std. Dev.	Mean	Std. Dev.
Male	0.49	0.50	0.47	0.50
Age	42.74	9.73	41.42	8.59
No Vocational Training	0.12	0.32	0.07	0.26
Vocational Training	0.71	0.45	0.74	0.44
University Degree or equivalent	0.17	0.37	0.18	0.39
Married	0.60	0.49	0.69	0.46
Net Household Income (in Euros)	2,298	1,315	2,581	1,171
Financial Wealth (in Euros)	33,117	56,008	44,565	66,754
No Riester pension	0.54	0.50		
Plan to Purchase Riester pension	0.09	0.28		
Own Riester Pension	0.37	0.48		
Observations	1,021		381	

SAVE 2008

Table A3: Robustness Check: Determinants of Following Financial Advice

This table reports the effect of financial literacy and various covariates on following financial advice using OLS. Coefficients and standard errors (se) are reported. They are calculated using 5 imputed data sets and are combined according to Rubin's Rule (Rubin (1987, 1996)). As a robustness check, here, financial literacy is measured as a dummy variable indicating whether at least 3 questions were answered correctly (High Financial Literacy). (d) indicates the change of a dummy variable from 0 to 1.

	(1) All	(2) Men	(3) Women	(4) High Education	(5) Low Education
High Financial Literacy (d)	-0.30	-0.24	-0.44*	-0.16	-0.34*
	(0.185)	(0.285)	(0.251)	(0.467)	(0.205)
Male (d)	0.01			0.05	-0.02
	(0.165)			(0.381)	(0.186)
Tertiary Education (d)	-0.13	-0.07	-0.30		
	(0.189)	(0.254)	(0.297)		
Log Income	0.00	-0.11	0.28	-0.05	0.03
	(0.146)	(0.147)	(0.255)	(0.203)	(0.229)
Log Financial Wealth	-0.01	0.01	-0.05	-0.01	-0.01
	(0.037)	(0.054)	(0.050)	(0.092)	(0.043)
Married (d)	-0.24	-0.00	-0.44	0.20	-0.41*
	(0.194)	(0.296)	(0.280)	(0.385)	(0.227)
Advice 2008 (d)	0.32*	0.30	0.39	-0.52	0.55***
	(0.182)	(0.255)	(0.287)	(0.430)	(0.206)
Agegroup dummies (d)	YES	YES	YES	YES	YES
Constant	7.34***	9.18***	5.39***	7.39***	7.08***
	(1.164)	(1.176)	(1.943)	(1.240)	(1.736)
Observations	660	350	310	142	518
R^2	0.024	0.034	0.056	0.066	0.041

Table A4: Robustness Check: Determinants of Receiving Multiple Written Offers

This table reports the effect of gender, tertiary education, financial literacy and various covariates on receiving more than one written offer for a private pension insurance (Riester) contract. We estimate probit models. Coefficients, standard errors (se) and average marginal effects [marg] are reported. They are calculated using 5 imputed data sets and are combined according to Rubin's Rule (Rubin (1987, 1996)). As a robustness check, here, financial literacy is measured as a dummy variable indicating whether at least 3 questions were answered correctly (High Financial Literacy). (d) indicates the change of a dummy variable from 0 to 1.

	Planners and Owners			Owners only		
	(1)	(2)	(3)	(4)	(5)	(6)
Male (d)	0.56***	0.52***	0.50***	0.47**	0.45**	0.44**
	(0.172)	(0.174)	(0.178)	(0.182)	(0.183)	(0.189)
	[0.183]	[0.169]	[0.155]	[0.159]	[0.153]	[0.141]
Tertiary Education (d)	0.29	0.26	0.36	0.23	0.20	0.24
	(0.219)	(0.223)	(0.242)	(0.231)	(0.234)	(0.252)
	[0.096]	[0.084]	[0.109]	[0.078]	[0.067]	[0.076]
High Financial Literacy (d)		0.26*	0.25		0.21	0.22
		(0.191)	(0.205)		(0.204)	(0.213)
		[0.086]	[0.077]		[0.070]	[0.070]
Log income			0.06			-0.05
			(0.200)			(0.239)
			[0.017]			[-0.015]
Log financial wealth			0.04			0.08
			(0.047)			(0.072)
			[0.011]			[0.027]
Married (d)			0.21			0.183
			(0.222)			(0.242)
			[0.065]			[0.059]
Agegroup dummies	NO	NO	YES	NO	NO	YES
Constant	-0.92***	-1.08***	-1.35	-0.80***	-0.94***	-0.896
	(0.132)	(0.178)	(1.419)	(0.140)	(0.197)	(1.653)
N	257	257	257	223	223	223

Table A5: Robustness Check: Determinants of Signing with Familiar Contract Partner

This table reports the effect of financial literacy and various covariates on whether respondents signed their private pension insurance (Riester) contract with a familiar contract partner. We estimate probit models. Coefficients, standard errors (se) and average marginal effects [marg.] are reported. They are calculated using 5 imputed data sets and are combined according to Rubin's Rule (Rubin (1987, 1996)). As a robustness check, here, financial literacy is measured as a dummy variable indicating whether at least 3 questions were answered correctly (High Financial Literacy). (d) indicates the change of a dummy variable from 0 to 1.

	(1)	(2)	(3)	(4)	(5)
	All	Men	Women	High Educ.	Low Educ.
High Financial Literacy	-0.63***	-0.34	-1.08***	0.05	-0.67***
	(0.229)	(0.320)	(0.341)	(0.833)	(0.237)
	[-0.196]	[-0.105]	[-0.290]	[0.151]	[-0.203]
Male (d)	-0.13			-0.73	-0.10
	(0.187)			(0.693)	(0.205)
	[-0.041]			[-0.207]	[-0.030]
Tertiary education (d)	0.07	0.12	0.43		
	(0.246)	(0.332)	(0.416)		
	[0.021]	[0.038]	[0.115]		
Log income	0.02	-0.02	-0.14	-0.57	0.10
	(0.255)	(0.326)	(0.440)	(0.646)	(0.285)
	[0.006]	[-0.007]	[-0.037]	[-0.164]	[0.030]
Log financial wealth	-0.01	-0.13	0.07	0.15	-0.05
	(0.065)	(0.090)	(0.103)	(0.193)	(0.072)
	[-0.004]	[-0.041]	[0.019]	[0.044]	[-0.015]
Married (d)	-0.01	-0.26	0.40	0.59	-0.04
	(0.240)	(0.379)	(0.389)	(0.567)	(0.273)
	[-0.003]	[-0.081]	[0.107]	[0.168]	[-0.011]
Agegroup dummies	YES	YES	YES	YES	YES
Constant	0.83	1.87	1.34	2.64	0.71
	(1.786)	(2.410)	(3.091)	(4.225)	(2.019)
N	231	124	107	41	190

B   Measures of Financial Literacy

Advanced Financial Literacy (SAVE 2009)

1. *Understanding Average Asset Fluctuations* (**return question**)

   "Normally, which asset displays the highest fluctuations over time: Savings accounts, bonds, stocks?" Do not know / refuse to answer

2. *Understanding of the Main Function of the Stock Market*(**market question**)

   "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. / Do not know / refuse to answer

3. *Understanding of Risk and Diversification*(**risk question**)*

   "Do you think that the following statement is true or false? Buying a single company stock usually provides a safer return than a stock mutual fund." do not know

4. *Understanding of Mutual Funds*(**funds question**)

   "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. / Do not know / refuse to answer

Basic Financial Literacy (SAVE 2009)

1. *Understanding of Interest Rate* (**numeracy question**)*

   "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. *Understanding of Inflation*(**inflation question**)*

"Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account?"

3. *Understanding of Compound Interest* (**compound interest question**)

"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 ?" do not know / refuse to answer

4. *Understanding of Money Illusion* (**money illusion question**)

"Suppose that in the year 2012, your income has doubled and prices of all goods have doubled too. In 2012, how much will you be able to buy with your income: more than today, the same, less than today?" do not know / refuse to answer

* Questions marked with an asterisk have been asked in SAVE 2007 and 2008 and are used in the robustness checks.

Table B6: Basic Financial Literacy

This table shows the relative frequency of the answers to the basic financial literacy questions among the SAVE respondents in 2009. N=1958.

Variable	all	men	women	no tertiary education	tertiary education
Panel A:					
interest question	84.6	87.2	82.2	83.0	92.1
inflation question	80.0	85.5	74.7	77.6	91.0
compound interest question	65.5	70.0	61.2	62.6	78.7
money illusion question	57.5	60.7	54.5	55.4	67.1
Panel B:					
no. of correct answers					
0	8.5	6.5	10.4	9.7	3.1
1	6.3	4.8	7.8	7.4	2.3
2	14.7	13.5	15.8	15.5	10.7
3	30.1	29.3	30.8	30.0	30.6
4	40.5	45.9	35.2	37.6	53.4
N	1958	961	997	1602	356

C   Extension: The Decision to Consult an Advisor

The question who consults financial (or other) advisors is not the main focus of our study. Our empirical analysis is concerned with the interaction between advisor and

consumer, *given that advice was solicited.* Nevertheless, it is important to understand, in our setting, what motivates consumers to consult advice as a backdrop to the questions above and to better understand under which other circumstance our reasoning might apply. For this, we briefly turn to the first stage of the game.

The consumer should decide to solicit financial advice in the first stage, if the following holds:

$$E\left[\max\left(u(q_a|\theta_j), Eu(q_s|\theta), 0\right)\right] - \kappa > \max\left(Eu(q_s|\theta_j), 0\right) \quad \text{with } q_a \in \{a_1, a_2\} \qquad (10)$$

From this, we informally derive motives for different groups of consumers soliciting financial advice:

Consumers with low financial literacy should seek financial advice even if they realize their susceptibility to mis-selling as long as the expected quality of advice is above their outside option.[46] Why might this be the case? In general, the advisor has an incentive to eliminate dominated alternatives, as discussed above, which is (at least weakly) beneficial for the consumer. Further, consumers with low financial literacy may realize that they appear more sophisticated than they are, which would improve the expected quality of advice.

As consumers' financial literacy increases to the point where their outside option is above the expected utility from following advice blindly, they may still want to consult an advisor due to the *option value* reflected by the second term of (10). If mis-selling is detected and the proposal is unsatisfactory, they may still reject it, while they benefit from following it otherwise.

Finally, for consumers whose financial literacy approaches the upper bound, the motivation to solicit advice is akin to the one proposed by **?**. If their independent search costs relative to the costs of soliciting advice make this feasible, i.e., for very low values of κ, they may prefer to let the advisor come up with a good alternative, in the secure knowledge that they will detect any attempt at mis-selling.

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[46]As long as this is the case, it would even be fully rational for the consumer to follow advice that she does not understand.

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