

Do Smarter Consumers Get Better Advice?

An Analytical Framework and Evidence from German Private Pensions*

Tabea Bucher-Koenen

Max-Planck-Institute for Social Law and Social Policy Munich(MPISOC-MEA) and Netspar

Johannes Koenen

University of Bonn

July 14, 2011

work in progress - please do not quote

First complete version November 2010

Abstract

The existing theoretical and empirical literature considers expert advice to be a substitute for a consumer's information: According to these papers, more informed consumers should ignore the advice given to them, but the advisor does not (or cannot) take this into account. We show in a simple analytical framework that higher signals of consumer information should indeed lead advisors to provide better services. The model also suggests an identification strategy, i.e. to focus on consumers with bad signals (proxied by low education) but high financial literacy and vice versa. To verify our main hypotheses, we choose a two-pronged approach using data from the SAVE-panel. First we show that individuals with higher financial literacy are more likely to solicit financial advice, but less likely to follow it. Then, we turn to data on the market for subsidized private pension plans in Germany. The data is uniquely suited to our investigation, as we observe whether

*Tabea Bucher-Koenen gratefully acknowledges financial support from Netspar. The authors greatly benefitted from discussions with Axel Börsch-Supan, Martin Gasche, Daniel Krähmer, Annamaria Lusardi, Frank Rosar, Konrad Stahl and Matthias Weiss as well as the comments from seminar participants in Mannheim and Bonn. We thank Inga Karrer and Pascal Busch for excellent research assistance.

consumers buy a contract with the firm employing their financial advisor. We show that individuals are strongly influenced by their source of advice – with dependent financial advisors steering customers towards choice options yielding higher kickbacks. We finally demonstrate that individuals with higher financial literacy are less susceptible to this effect.

1 Introduction

1.1 Motivation

Whether their names are Iago, Alcibiades, Haman, Wormtongue or Madoff: There are copious examples in history and literature of advisors who had their own fortune in mind before that of their advisees or customers. The conflict of interest between the two roles is generic, though its extent may differ: In the best – or at least not so bad – case, the advisor has to work and think harder to find a better solution for the person who has placed trust in him; and is tempted to take the easy route instead. In the worst case, an advisor’s incentives may be diametrically opposed to the customer’s interests: Consider the case of salespeople whose bonuses depend on their volume of sales irrespective of the customer’s utility.¹

Nevertheless, people routinely rely on other individuals’ paid or unpaid advice: on mechanics for car repairs, friends and salespeople when choosing a new outfit, relatives and spouses when evaluating a job offer, to name just a few. Arguably, it would be impossible (or at least uneconomical) to collect the required and relevant information for choices in every field oneself, which ensures that advisors will keep on playing a role in daily life. Their influence ranges from minor decisions (like the color of trousers to match a shirt) to very far-reaching ones, such as the choice of pension plans or major investments. This explains why economists from different areas of interest have recently started studying the role of financial advisors.

This paper contributes to our understanding of the role of financial advisors. First we offer a different analytical explanation for the apparent puzzle that mostly better informed, wealthier individuals employ financial advisors.² We argue in a simple analytical model, which includes the possibility to search for an option without seeking advice, that customers who appear to be better informed – customers with higher financial literacy – may induce their advisor to provide better advice on their behalf. As a result, individuals with a higher level of expertise may still be more likely to solicit advice, despite the fact that they are able to find better solutions on their own. By integrating the consumer’s choice whether or not to employ an advisor, this generates an *ex ante*

¹This case potentially arises in Inderst and Ottaviani (2009), which we discuss in the literature section below.

²See, e.g. Bi, Montalto, and Fox (2002), van Rooij, Lusardi, and Alessie (2011), Calcagno and Monticone (2011) or Hackethal, Haliassos, and Jappelli (2010) discussed below.

complementarity between information and advice, as opposed to the purely substitutive relationship proposed by, e.g., Georgarakos and Inderst (2010). The central hypothesis derived from the model is the following: Consumers whose level of information, or signal thereof, to the advisor is better, should receive better advice. As a consequence, they should be more likely to follow the advice given to them, all else equal.

We study two different settings to approach this subject empirically, both based on data from the representative SAVE survey: First we use a number of general questions and exploit the panel structure of the data to make first inferences about the relationship between financial literacy and financial advice. Then, in order to corroborate these results, we turn to the topic of German private pension contracts in particular. Some background is required to illuminate why this topic is of more than just regional interest: In 2001, Germany introduced state subsidies for private pension and old-age savings plans – the so called Riester-pension – part of a fundamental reform of the straining public pension system. Apart from its importance for the sustainability of the German social security system, this has also been a large scale choice experiment: Individuals were aware of the need to make decisions and choose private plans due to substantial cuts to the previously very generous public pensions; yet the typical heuristics of such an important choice – such as observing other people’s outcomes within social networks – were impossible to adopt as nobody had as of yet entered the payment phase. Faced with a wide array of complex financial products, many individuals procrastinated, which led to a number of substantial legal reforms aimed at simplifying the products.³ Within this changing legal framework, financial advisors played an extraordinarily important role in individuals’ decision-making – a perfect setting to study financial advice.

This allows us to better understand how “first-generation” individuals made their private pension choices, and what role their financial knowledge and external financial advice played. We especially find that financial literacy significantly reduces the chance that an individual signs a contract with a bank or insurance company with which she interacts in another function – which would clearly be in the interest of her (dependent) financial advisor, whose kickbacks should be maximized in this case. We further show that people with higher expertise are significantly more likely to compare multiple offers before making a decision and are more likely to confer with independent consultants.

³See Börsch-Supan, Reil-Held, and Schunk (2008); Coppola and Reil-Held (2009) for an overview of the regulations and the distribution of Riester pensions among German households between 2001 and 2008.

The remainder of this article proceeds as follows: First, we briefly present the related literature and define our contribution relative to existing articles. Then, we set up a simple model in which a single consumer chooses whether or not to interact with a single financial advisor. In the next section, we present the data and some descriptive statistics. Then, in section 4, we analyze the relationship between individuals' financial literacy and financial advice in general, before section 5 focuses on decisions related to private pensions. The final section concludes.

1.2 Related Literature and Contribution

1.2.1 Theory on Financial Advice and Choice of Financial Products

The article by Aghion and Tirole (1997) on authority within organizations can straightforwardly be interpreted as a model of advice. A principal and an agent both can exert effort to gather information on the set of project alternatives – if neither is successful, then it is optimal to choose inaction, while if only the agent is informed, it is optimal for the principal to rubber stamp his decision, as their incentives are aligned to a certain degree. In their language, an advisor-customer relationship can be regarded as a situation in which the customer retains formal control (makes the final decision on an investment), while the advisor provides her with suggestions. In this setup, they find that more information obtained by the principal crowds out the incentives to become informed for the agent. In this sense the two are substitutes.

More recent articles on advisors are based on the “cheap talk” game by Crawford and Sobel (1982). These include Krishna and Morgan (2001)⁴, Ottaviani and Sørensen (2006), Esö and Szentes (2007) and Inderst and Ottaviani (2009). In Esö and Szentes (2007), a client faces an advisor who receives a (potentially imperfect) signal regarding the value of a project to the customer. Soliciting this contractible advice can lead to a more efficient project choice by the client. Ottaviani and Sørensen (2006) study a setup in which professional advisors develop a reputation when advice and realizations are compared ex-post. The most relevant purely theoretical article in this context for our study is Inderst and Ottaviani (2009), who focus on the agency problems associated with financial advisors working for a financial services firm. Agents, who are compensated through a fixed-wage plus bonus contract as an incentive to prospect for new clients,

⁴An extension of the original game to two advisors.

are tempted to lie to their clients regarding the utility the latter will receive from the product. With a certain probability, these lies are discovered ex-post, in which case the principal (firm) incurs liability. Stronger incentives (higher bonuses) lead to a more pronounced misselling problem.

As opposed to the articles above – with the exception of Aghion and Tirole (1997) – we allow consumers to search on their own in case they do not wish to consult an advisor or follow his advice. This introduces a simple outside option which depends on the level of investor sophistication. Further, we distinguish between “hard” and “soft” information – the costs of the options proposed by the advisor may be verifiable by the client, i.e. “hard” information, again depending on the client’s financial acumen. In combination, this leads to a concave maximization problem on the part of the advisor. As a result, he can have an incentive to provide consumers with higher financial literacy with better advice.

1.2.2 Empirical Papers on Search and Financial Advice

Two recent papers show that search efforts and differing search costs have significant effects on outcomes in insurance and financial markets: Green, Hollifield, and Schürhoff (2007) empirically analyze the market power that dealers can exert in municipal bond markets, in which transaction data is only released ex-post so that at the time of the deal the markets can be considered opaque. The higher the customers’ incentives to gather information (larger deals) and the lower their complexity, the smaller the markups that dealers charge on average. Bolhaar, Lindeboom, and van der Klaauw (2010) study the search behavior of Dutch consumers for health insurance contracts. In a simple theoretical model, they provide a further rationale for price dispersion in a market for a relatively homogeneous good, namely different search costs.⁵ They further make use of a quirk in the system, according to which some consumers can (relatively randomly, at first glance) be offered so called group contracts—they show that more sophisticated consumers are significantly more likely to own (cheaper) group contracts.

The second related strand in the empirical literature focuses on the propensity and reasons of consumers to consult financial advisors: In a mainly descriptive paper, Bi, Montalto, and Fox (2002) address the question which households in a 1998 Survey of

⁵For a theoretical investigation into the incentives of firms to provide complicated price structures for homogenous goods, see Carlin (2009).

Consumer Finances dataset use financial planners. They find that better informed households are more likely to employ financial planners, which points in the direction of complementarities and supports our approach. Moreover, van Rooij, Lusardi, and Alessie (2011) as well as Lusardi and Mitchell (2006) find that individuals with low financial literacy are more likely to rely on informal sources of advice, like family and friends, whereas financially literate individuals are more likely to consult formal sources of advice like newspapers, magazines, the internet, and professional advisors. Hackethal, Haliassos, and Jappelli (2010) seek to provide an alternative explanation for this finding—they 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 better suited to perform the task themselves. Intriguingly, using two different data-sets with trade and banking data they find that investors whose accounts were supervised by agents had higher costs and lower returns on average than those who managed their own accounts.

There are a couple of article similar to ours. Georgarakos and Inderst (2010) is both a formal and empirical study of individual investment behavior in relation to financial advice. They construct a “cheap talk”-game, in which an advisor (agent) recommends one of two investment alternatives as more suitable for the investor (principal). While an uninformed investor must decide whether or not to trust the advice, an informed investor will (from a threshold level of information on) choose to completely disregard the advice and make her own decision—in this sense, information and advice are substitutes. They verify this result empirically using Eurobarometer data and show that “trust” only plays a role for less sophisticated investors, which supports their theory. Hackethal, Inderst, and Meyer (2011) consider, both in a simple theoretical model as well as empirically, how the reliance on an advisor affects the trading behavior of individuals. They show, similar to our results, that investors are less likely to follow advice given to them the more precise their own information and the larger the perceived conflict of interest of the advisor. More trades, which are beneficial to the advisor, should occur when individuals follow the recommendations. Both of these results are verified empirically using data from brokerage accounts. Calcagno and Monticone (2011) also model the interaction between an uninformed investor and a perfectly informed advisor. In their model the advisor has an incentive to reveal his information about asset returns to financially literate customers, while he does not have an incentive to reveal information to financially illiterate customers. Illiterate investors can either delegate their asset

choice fully to the advisor or they can invest autonomously. This leads to the prediction that financially literate consumers are more likely to consult advisors, because they can improve their knowledge by asking for advice. The authors can confirm their predictions on the basis of data on the customers of a large Italian bank.

1.2.3 Contribution

Our paper contributes to the theoretical and empirical literature on advice in general and financial advice in particular. In our analytical model, we introduce a game of advice in which the customer’s degree of sophistication (or access to information) and the advisor’s quality of service are *ex ante* complementary, as opposed to the substitutive relationship proposed so far. From this model we derive a number of hypotheses regarding the likelihood of consulting an advisor and following his advice given a consumer’s financial literacy. Our central hypothesis is that an advisor’s (beneficial) effort should increase in the signal of the consumer’s financial knowledge that he observes.

We use a dual strategy to test our hypotheses: Using the SAVE-panel, we first study how consumers interact with financial advisors in general—as a crucial difference to Georgarakos and Inderst (2010), we include the decision whether or not to consult an advisor in the analysis. We find that the probability of consulting an advisor increases with the level of financial knowledge of a consumer, while the (self-assessed) likelihood of following his advice decreases in financial literacy.

We then turn to German private pension contracts in particular. We find that more knowledgeable consumers on average compare more offers, which indicates lower search costs. They are also more likely to consult with advisors, but less likely to follow their advice in the case of dependent advisors. We are able to study this last question, because we observe whether the chosen plan originated with a customer’s bank or insurance – therefore we observe whether or not the individual has chosen the *advisor’s* favored alternative. We show that individuals are less likely to adopt this “default” choice, the higher their level of financial literacy and the more search effort (measured by the number of products they report to have compared) they have exerted.

2 Analytical Framework and Hypotheses

We try to depict the following typical situation in our model: A customer at a bank sits down with an advisor – either for the first time or the advisor does not have a very close relationship to the client, which appears likely for most cases – in order to discuss the purchase of a financial product such as a private pension. Therefore the advisor tries to “get to know” his client with a few questions regarding her investment goals and major expenditures in the foreseeable future.⁶ From this conversation and the bank database, he can derive her educational attainment as well as her monthly income. Based on this information, which we call *signal* in the model, he can judge her knowledge of financial matters to a certain degree and decides what kind of an investment alternative to suggest to her. In addition to the hard evidence in the data, we can draw on a number of experiences and ample anecdotal evidence to support this setting, e.g. an advisor getting a different binder with information materials after hearing that a customer has a PhD in economics or a different advisor offering to consult with the research department of the bank after a number of (semi-) informed questions and then coming up with a different offer. At the other end of the spectrum: a young woman without a high-school degree returning from a trip to the bank—originally to open an account—with a contract for a private pension insurance whose monthly required payments exceeded her disposable income.

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.⁷

Based on this understanding, our model combines the following central building blocks:

- 1) Individuals with higher financial literacy should have lower search costs, i.e. a better outside option apart from financial advice.

⁶According 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.

⁷Applied to the example of private pensions, this would include benefits to the surviving spouse and guaranteed annuities on the up-side, and administrative costs or limitations of withdrawals on the down-side.

- 2) Individuals with higher financial literacy should be able to better understand the advice given to them (in a way presented in detail below).
- 3) Advisers perceive a signal of the customer’s financial literacy and are able to react to (1) and (2)—therefore they may have an incentive to give individuals with higher financial literacy (or signals thereof) better advice.

In the following sections, we present our brief model which organizes our empirical predictions. In order to further stress the inter-connectedness between the theory and the empirical part of the analysis, we phrase our results as testable “hypotheses” instead of “propositions”.

2.1 Financial Literacy and Consumer Outside Option

Consider a model with two agents, a consumer/client (she) and a financial advisor (he). The consumer faces an investment choice from a distribution Q of potential investment alternatives. Each alternative a_i out of Q gives the consumer utility $u(a_i)$ respectively. Consumers differ in their levels of financial know-how or literacy θ , with consumer j ’s financial literacy normalized to the half-open interval $\theta_j \in [0, 1)$.

We assume that the consumer does not know the potential alternatives open to her ex ante. Instead, to uncover them on her own, she may engage in random search along the lines of Stigler (1961). Instead of spelling out the search model, we simply assume that this random search results in an alternative that yields expected utility $Eu(a_S|n^*(\theta_j))$. Here, $n^*(\theta)$ denotes the (ex ante) optimal number of search items that an individual with a given level of financial literacy chooses.⁸ Rothschild (1974) demonstrates in a rather general setting that n^* and thereby Eu should be increasing as the search costs that an individual faces decrease.⁹ In the following, we simplify notation for this term to $Eu(a_S|\theta_j)$.

For our theoretical framework, we posit that $Eu(a_S|\theta_j)$ is strictly increasing in θ which corresponds to strictly decreasing search costs in the level of financial literacy. We will try to establish this relationship empirically (see hypothesis 1 below). There are a number of arguments in favor: First, higher financial literacy may be associated

⁸Equivalently, one could define a reservation value depending on the level of financial literacy. A higher reservation value is ex ante equivalent to an (in expectation) higher optimal number of search items.

⁹In particular, these results do not depend on the consumer knowing the distribution of prices.

with faster comprehension of technical terms and concepts, therefore less time and effort need to be spent for every search step. Second, better financial skills may be related to more efficient search techniques, such as requiring less time to recognize and dismiss unsuitable offers. Third, psychological costs such as anticipating discomfort due to lack of understanding should be lower the higher the level of expertise. It should be noted that Hackethal, Haliassos, and Jappelli (2010) argue for the opposite relationship due to higher opportunity costs of the time spent on research for people with better skills. We test the following prediction with regard to private pension contract offers empirically in section 5.

Hypothesis 1: *Due to lower search costs, the optimal number of alternatives that individuals compare when making investment decisions is increasing in their financial literacy.*

2.2 Structure of the Financial Advice Game

As opposed to searching for an alternative on their own, consumers may also turn to a financial advisor. The timing of our model of advice is the following: First the consumer makes the choice whether to consult a financial advisor or to search on her own (a consumer who decides to search on her own and picks $n = 0$ stays out of the market). If she approaches an advisor, he observes a noisy signal s of her financial literacy. Denoting the type distribution function of individuals who approach financial advisors as $F(\theta)$, we model the signal by $s' > s \Rightarrow F(\theta|s') < F(\theta|s) \forall \theta$. Therefore, the higher the signal, the higher the estimate of the customer's financial literacy by the advisor. We denote the associated density function as $f(\theta)$. This form of noisy signal appears justified, as in practice, the advisor may ask the customer about her income, educational attainment and previous investment experience, which are known to be related to financial literacy, but cannot force her to complete a sophisticated test on the premises. Then, the advisor suggests an alternative a_A to the consumer, who only understands this advice with probability θ_j in a sense described in detail below. Finally, the consumer decides whether to follow the advice given to her, to decline and search on her own, or not to invest.

If the consumer chooses to consult an advisor, she incurs the fixed costs κ , which can be interpreted as the time and hassle costs of making an appointment in addition to eventual fees charged by the institution. For our model, to get clearer effects we assume

that these costs are identical for all customers.

The advisor's task is to choose and suggest an alternative a_A for the consumer. We assume that the alternatives in Q can be ordered according to the preferences of the advisor and the customer in the following way: for every $a_i \in Q$, there exists a choice variable of the advisor $e_i \in [0, E]$ which determines the utility $\nu(e)$ the advisor derives if the customer follows the advice and accepts the offer. As an interpretation, e may resemble the difference between the maximum possible kickback an advisor could receive and the kickback from the alternative chosen, or different levels of (effort) cost may be associated with preparing and customizing different offers. We further assume that, given that the offer is accepted by the customer, the utility to the advisor $\nu(e) > 0 \forall e$, while if the customer rejects the offer the advisor receives a strictly lower utility, normalized to 0. The assumption that even the alternative favored least by the advisor is still preferable to rejection by the consumer could be explained, for example, by the advisor's reputation suffering from his suggestion being shunned – in the extreme, an advisor is liable for demonstrably bad advice in many jurisdictions, so in particular, one could imagine advisors being punished for (detected) bad advice along the lines of Inderst and Ottaviani (2009). A minimum value of 0 for the rejection resembles limited liability of the advisor.¹⁰ We refrain from subtracting eventual effort costs in order to ease the notational burden in the following – our results below would be qualitatively unchanged if we assumed that the advisor is left with a utility of $-c(e)$ if his advice is rejected, with $c(e)$ nondecreasing in e . To summarize: In our setting, the advisor either makes a successful sale and receives $\nu(e)$ or he is left with a payoff normalized to 0.

We assume that there is an inherent conflict of interest between the advisor and the advisee in that there is a subset of Q which we call the *relevant alternatives*, such that (I) $\frac{\partial u(a_A(e))}{\partial e} > 0$ and (II) $\frac{\partial \nu(e)}{\partial e} < 0$: A higher choice of e improves the result for the customer, while it reduces the advisor's utility. In particular, the advisor has a most favored (default) alternative that he can suggest with $e = 0$, which we call a_0 . This implies, that switches away from the default alternative are beneficial to the customer. The relevant alternatives can be generated by eliminating all alternatives from Q which are dominated (an alternative a_i is dominated if a_j exists, such that both $u(a_j) > u(a_i)$ and $\nu(a_j) > \nu(a_i)$). This leaves at least one alternative, a_0 , which will be the only

¹⁰For advisors dependently employed, this is part of their contract, independent financial advisors are required to own malpractice insurance.

alternative only if it is also the option that maximizes the customer’s utility. Our assumption regarding the conflict of interest implies that this is not the case. It also implies that the advisor does not wish to unnecessarily harm the consumer while at the same time reducing his own utility. The additional assumption implied by (I) and (II) is that $\nu(e)$ is differentiable and for simplification we also assume that it is strictly concave: improving the customer’s utility becomes increasingly expensive in foregone premiums for the advisor.

To summarize, there are two ways of interpreting this setup: It may either be costly for the advisor, in terms of mental effort and time, to research alternatives beyond the standard suggestion waiting in his drawer and to explain them to the satisfaction of the consumer; or the default investment is simply the alternative that yields the highest provision, and accordingly higher costs to the advisor resemble smaller provisions.¹¹ These two alternatives are not mutually exclusive, the utility $\nu(e)$ should be interpreted as an amalgam of monetary and non-monetary payoffs.

2.3 The Advisor’s Problem

For a rational consumer to make a decision, she has to compare the utility she derives from the advisor’s offer with the expected utility from searching in the market on her own. Some customers may not be able to perform the required computations. To take this into account, we assume – following, e.g., Inderst and Peitz (2008) – that expertise/financial literacy influences the informativeness of advice to the consumer: with probability θ_j , the customer “understands” advice given to her, i.e. she is able to judge the relationship between $Eu(a_S)$ and $u(a_A)$. In other words, with probability θ_j , the offer by the financial advisor is hard information for the customer, with probability $1 - \theta_j$ it is soft information and all the customer learns is that the given investment alternative was suggested.

Let us first consider the decision of a consumer who has hard information: She should reject (not follow) advice whenever the following condition holds, i.e. she derives a higher expected utility from independent search than from the advised alternative:

¹¹In the extreme for the second interpretation, there may only be two classes of alternatives from the point of view of the advisor: contracts yielding a provision, or contracts yielding no provision. This second interpretation on its own would be in conflict with the differentiability assumption above, while the mental-effort interpretation can easily be reconciled with this assumption.

$$u(a_A) < Eu(a_S|\theta_j) \tag{1}$$

As we assumed that $u(a_A)$ is a function of the choice e by the advisor and $Eu(a_S|\theta_j)$ is strictly increasing in θ_j , by (1) we can specify a critical value $\hat{\theta}(e)$ for each e , such that $u(a_A) = Eu(a_S|\hat{\theta})$. Then a consumer will only accept the offer if her financial literacy is below this cutoff-value, i.e. $\theta_j \leq \hat{\theta}(e)$. The advisor who has observed (noisy) signal s of the customer's financial literacy, expects her to accept a given offer with probability $F(\hat{\theta}(e)|s)$. This probability is strictly decreasing in s and increasing in e . For simplicity, we make the strong assumption that uninformed consumers, for whom the advice is soft information, comply with the suggestion of the advisor.¹² As a justification for this assumption (outside the model), it may be easier for an advisor to dupe a consumer if she cannot understand the details of the given offer. Therefore, the expected gain $E[\Pi|s]$ that the advisor derives from choosing e given the observed signal s is:

$$E[\Pi|s] = \nu(e)(1 - E[\theta|s](1 - F(\hat{\theta}(e)|s))) \tag{2}$$

The advisor expects to gain utility $\nu(e)$ unless he is facing an informed consumer whose financial literacy is above $\hat{\theta}(e)$. The advisor's choice e given the signal s gives rise to the following first order condition:

$$\frac{\partial E[\Pi|s]}{\partial e} = \nu'(e)(1 - E[\theta|s]) + E[\theta|s][\nu'(e)F(\hat{\theta}(e)|s) + \nu(e)f(\hat{\theta}(e)|s)\frac{\partial \hat{\theta}}{\partial e}] \tag{FOC}$$

A change in e has the following effects: First, it reduces the advisor's utility in the case that the customer is uninformed (first term). Second, it reduces the advisor's utility in the case that the customer is informed but would have chosen the advised alternative nevertheless. Finally, it increases the probability that an informed consumer will choose to follow his advice at the margin of $F(\hat{\theta}|e)$. When is (FOC) also sufficient? It turns out

¹²The alternative would be to compare the expected utility from advice, given the signal of financial literacy the consumer expects the advisor to have received, with the expected utility from search. We show that the distortions introduced by our assumption are not too extensive, and that they are smaller for consumers with low financial literacy below, when discussing the consumer's participation constraint.

that the expected profit function of the advisor is concave as long as the signal s is not too informative;¹³ but one cannot rule out that the function is downward sloping over the entire domain – in which case the optimally suggested alternative by the advisor is clearly $e = 0$. If one defines incentive compatibility for the advisor as the condition for suggesting *any* but the default alternative, this boils down to the following:

$$|\nu'(0)(1 - E[\theta|s]) + E[\theta|s][\nu'(0)F(\hat{\theta}(0)|s)]| < E[\theta|s]\nu(0)f(\hat{\theta}(0)|s)\frac{\partial \hat{\theta}}{\partial e} \quad (\text{IC})$$

We are interested in when this condition is more likely to hold: Much depends on the value of $\nu'(e)$, which can be interpreted as the foregone bonus if an alternative other than the one most favored by the advisor is selected. This is equivalent to the finding of Inderst and Ottaviani (2009) that higher bonuses for advisors increase the misselling problem in a purely binary setup. In our setting, the larger the step down from the optimum, the higher the incentive for the advisor to sell nothing but the default option. We find multiple effects of higher financial literacy: First, the share of informed consumers increases, which puts more weight on the second term on the left-hand side. Then, $F(\hat{\theta}(0)|s)$ decreases together with the cutoff-value above which consumers prefer acquiring information on their own. Finally, the right-hand side increases, again, as long as the signal to the advisor is not too informative, i.e. as long as $f(\hat{\theta}(0)|s)$ is non-degenerate. All of these effects work in the same direction: The higher the (perceived) financial literacy of the consumer, the more likely the advisor is to give better advice. From a policy perspective, this finding may be surprising: The more an individual is educated with regard to financial matters, the more likely she is to get useful financial advice from a bank or insurance agent.

The last component of the inequality is the initial level of $\nu(0)$. Interestingly, an increase of this value enhances the likelihood that a financial advisor picks a more useful alternative for the consumer ($e > 0$). In terms of incentives, this means that it is preferable to have a relatively high compensation for the advisor when he sells a contract to a customer (high $\nu(0)$), with as little as possible differentiation between the different alternatives that he can offer (small slope of ν). Clearly, if the financial advisor is employed by a firm selling financial products of its own, this will generally not be in

¹³See the mathematical appendix for a detailed discussion.

the interest of the company. This may introduce systematically different effects between dependent advisors, i.e. advisors employed by a bank or insurance company, and independent financial advisors, if the former have “steeper” incentive functions.¹⁴ We will use this distinction in our empirical approach in section 5.

Condition (IC) is more likely to be satisfied the higher the signal s and thereby the higher $E[\theta|s]$. This allows us to derive the central hypothesis of our model: As the signal s is informative with regard to the consumer’s financial literacy θ_j , this implies that with increasing signals of financial literacy, the advisor is more likely to provide positive effort. Using (FOC), which solves the advisor’s maximization problem whenever (IC) is satisfied, it is straightforward to see that a higher signal also induces a higher *level* of the advisor’s effort in optimum. We combine these observations in the following hypothesis:

Hypothesis 2: *The higher the signal of financial literacy s that the advisor observes,*
a) *the more likely he is to suggest an alternative that is better for the consumer than the default, and b) the better the advice he gives in this case.*

While this is the effect we were searching for, given the data available to us, we cannot observe the effort choice of advisors directly. What we do see is the choice behavior of consumers. Intuitively, we would expect consumers who receive better advice to be more willing to follow it. If we back out the advisor’s optimal choice $e^*(s)$ and insert it into the consumer’s constraint (1), we can show that this is true. This allows us to derive the following corollary, which we use in our identification strategy in the empirical part of the paper:

Corollary to Hypothesis 2: *For a given level of financial literacy of the consumer, the higher the signal that the advisor observes, (the better the suggested alternative and) the more likely the consumer is to follow the advice she receives.*

¹⁴From discussions with current and former employees of independent financial advisors, we learned that some firms enforce a cap to sales kickbacks for individual contracts which results in a comparatively “flat” structure of bonuses.

2.4 Financial Literacy and the Decisions to Solicit and Follow Advice

To close the model, we now have to consider on the one hand which consumers decide to consult a financial advisor and on the other hand how likely they are to follow the advice they receive given that they sought it. For a consumer to approach an advisor, the expected utility gain over searching autonomously must exceed her costs κ . The consumer's participation constraint is:

$$(1 - \theta_j)E[u(a_A)|\theta_j] + \theta_j E \max\{u(a_A|\theta_j), E[u(a_S)|\theta_j]\} - \kappa > E[u(a_S)|\theta_j] \quad (\text{PC})$$

The left-hand side of the inequality resembles the *ex ante* expected utility from the decision to consult a financial advisor: If the consumer does not understand the advice, she accepts the offer as assumed above. The utility from the advised alternative is an expected value due to the fact that the consumer herself cannot perfectly observe the signal s as perceived by the advisor; she can only anticipate the level of effort he will exert based on the distribution of s given her financial literacy θ_j . The second term, implying that she understands the advice, resembles an option value: If she prefers the suggestion to searching on her own, she takes it, otherwise she declines. As $E \max\{u(a_A|\theta_j), E[u(a_S)|\theta_j]\}$ is strictly larger than $E[u(a_A)|\theta_j]$ and $E[u(a_S)|\theta_j]$, respectively, this option is valuable to the consumer.¹⁵

First note that individuals with very low financial literacy expect to have to take the advice they receive at face value. If the signal s is informative for low values of θ , the likelihood that the financial advisor will take advantage of them is high. If their outside option $E[u(a_S)|\theta_j]$ is negative *and* they expect to receive bad advice, they prefer to stay out of the market entirely. This reflects the stylized fact that individuals with very low financial knowledge are generally less likely to participate in stock markets (see, e.g., van Rooij, Lusardi, and Alessie (2011)) or own private pension insurance (see, e.g., Bucher-Koenen (2010)). Further, this would be exacerbated if one allows κ to be decreasing in the financial literacy of consumers, say if it were to include psychological costs of soliciting advice.

¹⁵Note that θ is defined on an open interval – therefore there is always a possibility that the consumer's financial literacy will be overestimated to her benefit.

Now consider the effects of an increase in the level of financial literacy of the consumer. If the (expected) signal s is positively correlated with the actual value, then the advice becomes more valuable in expectation. Further, the customer will be more likely to understand the advice given to her – this increases the probability of benefitting from the option value of being able to (informedly) choose between the advised option and own search. These two effects both make it more likely for more financially literate consumers to solicit advice.

There are two at least potentially countervailing effects: First, the value of the outside option – own search – straightforwardly increases. If this effect is dominant, this would lead consumers to prefer own search to advice. Finally, there is the effect of θ on what we coined the option value of advice $E \max\{u(a_A|\theta_j), E[u(a_S)|\theta_j]\}$. As θ is defined on a half-open interval, there is always the possibility that the consumer’s financial literacy will be over-estimated from the signal and as a result, the option value is always positive, though it may be decreasing in θ – intuitively, the advisor, from a certain level on, cannot feasibly do better than the customer.

Given this brief discussion and the stylized fact that consumers with the lowest levels of financial literacy abstain from entering the market for risky asset and are significantly less likely to own private pension insurance – i.e. the least knowledgeable customers’ outside option of own search must be negative – we propose that the probability of consulting a financial advisor must be at least locally increasing in their level of financial literacy. While this effect does not necessarily have to be monotone, we propose the following hypothesis:

Hypothesis 3: *Individuals with higher levels of financial literacy are more likely to solicit financial advice than those with the lowest level of financial literacy.*

Note that if consumers are aware of the signal-generating process, then for a given level of financial literacy a higher signal unequivocally would lead a consumer to be more likely to solicit advice: Intuitively, a graduate from a prestigious university *expects* to receive better advice than a high-school dropout, even if both persons are equally knowledgeable in financial matters.

This brief discussion allows us to revisit the behavioral assumption above that uninformed consumers follow the advisors’ suggestions: First-off, it is completely rational for consumers to act in this manner as long as $E[u(a_A)|\theta_j] > E[u(a_S)|\theta_j]$. Given that

advice was solicited, (PC) a relatively financially illiterate consumer should follow this rule: then the participation constraint immediately implies the above. This can intuitively be interpreted in the following way: If someone did not expect to understand the advice she received, but still solicited it (incurring cost κ in the process), then she must expect to follow the advice even if turns out not to be intelligible ex post.¹⁶ The higher the costs κ , the more slack there will be for this constraint. For higher levels of θ , i.e. consumers who solicit advice with the expectation that they will be able to make sense of it, this argument no longer holds. But as they are more likely to understand the advice given, the share of individuals, for which the behavioral assumption applies, decreases in θ .

Finally, we study the likelihood of a given consumer who *has* solicited advice following the suggestion she receives. According to our assumptions above, she understands the suggestion with probability θ_j and she follows it whenever she does not understand it. Ex ante, therefore a consumer who has approached an advisor will *disregard* advice with probability $\theta_j \Pr(u(a_A) > Eu(a_S)|\theta_j)$, where \Pr denotes the probability with respect to the realization of s given θ_j . Again, we observe multiple effects of increasing levels of financial literacy θ : On the one hand, the probability of understanding the offer and therefore being able to decline it increases. It is further increased by the higher value of the outside option. The countervailing effect is that the increased efforts of the advisor may overcompensate the better outside option. If we are able to control for the signal that the advisor observes, we can eliminate the countervailing effect for our next hypothesis¹⁷:

Hypothesis 4: *Given a signal level s , the higher a consumer's financial literacy, the higher is the likelihood that she will reject the advisor's suggestion.*

The structure of the problem allows us to make a further prediction regarding individual choice behavior: By Hypothesis 2, the advisor exerts more effort if he observes a better signal, which in turn leads consumers to be more likely to follow advice. By Hypothesis 4, the magnitude of this second effect should differ over levels of financial literacy. In particular, it should be more visible for individuals with high financial liter-

¹⁶See Hackethal, Inderst, and Meyer (2011) for a similar argument.

¹⁷Note again that the strong behavioral assumption is not necessary for our result, as the increased expected value of own search efforts would be sufficient, given that one can control for the signal

acy, in other words, the cross-partial derivative of the signal and financial literacy on the probability of following advice should be positive. We state this in our final hypothesis:

Hypothesis 5: *For individuals with higher levels of financial literacy, the increase in the likelihood of following financial advice with the level of the signal s should be stronger than for individuals with lower levels of financial literacy.*

3 Data

3.1 The SAVE Survey

In the empirical part of this article, we use SAVE, a panel of German households that contains detailed information on households' financial situation and socio-economic as well as psychological characteristics.¹⁸ Our analysis is mainly based on data from SAVE 2008. There are 2,608 observations in the sample. We make extensive use of a special module of questions regarding Riester-pensions and the search process which we were able to add to the questionnaire in 2008. In addition to that we use information on financial literacy from the survey conducted in 2007.

Due to item non-response, the SAVE data set is imputed using an iterative multiple imputation procedure based on a Markov-Chain Monte-Carlo method (Schunk (2008)). The goal of this procedure is to increase the efficiency of our estimates due to a larger number of observations and to reduce the item non-response bias that occurs if observations with and without missing values differ systematically. For our analysis, all five multiply imputed data sets are used and the results are derived using Rubin's method (Rubin (1987, 1996)). In the case of our explained variables (financial advice and following the advice) and key explanatory variables (financial literacy), we do not use imputed values. The socio-demographic characteristics of the sample are provided in Table B1 in the appendix.

All descriptive statistics are weighted and results are representative for the German population.¹⁹ For the regression analyses no weights are used, following Deaton (1997).

¹⁸SAVE was first conducted in 2001 by the Mannheim Research Institute 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).

¹⁹The reference statistic to calibrate weights according to income and age classes is the German

3.2 Variables

3.2.1 Financial Advice—General Context

As discussed above, we use a dual strategy in trying to test our hypotheses, with measures of behavior regarding financial advice in general and behavior regarding the private pension choice in particular. For the general context, we use the following measures:

In the context of 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 provider. In 2008 about one third of the respondents in the sample talked to financial advisors (33.24%).

As a follow-up question we asked those respondents who consult professional advisors how closely they followed the 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”* Answers to this question are depicted in the histogram in Figure ??.

3.2.2 Financial Advice—Riester-pensions

In SAVE 2008 we added four questions regarding the search process of consumers for subsidized private pension plans, so-called Riester-pensions. Two questions examined the number of alternative providers from which the households obtained offers and the number of written offers they obtained in total. In addition to this, we asked households how they obtained the information on the different offers, in particular whether they conducted own research, consulted peers or contacted dependent and independent financial advisors. The final question focused on the actual contract partner. We asked respondents whether they signed the contract with a familiar contract partner, i.e. a bank or insurance company with which they already have other contracts, or an unfa-

Mikrozensus. For a detailed description see Börsch-Supan, Coppola, Essig, Eymann, and Schunk (2009), p. 48-52.

miliar contract partner, i.e. a bank or insurance company or other provider of contracts with whom there were no prior relations. The wording of the questions is in appendix D.

3.2.3 Measuring Financial Literacy

We measure financial sophistication using an “objective” –as opposed to a “subjective”, i.e. self-assessed–measure of financial literacy. A set of three basic quiz-like questions was developed by Lusardi and Mitchell (2006) for the Health and Retirement Study in 2004 in order to assess the fundamental skills that are at the core of individual saving and investment decisions. These questions were included in SAVE 2007, 2008 and 2009. The wording of the questions can be found in the appendix. We use the answers to the financial quiz from the SAVE survey in 2007. Arguably, they have the greatest validity as it is the first time that respondents try to answer the questions.

Finally, we define our measure of financial literacy: a dummy variable, which takes the value 1 if all questions were answered correctly and 0 otherwise. In the year 2007 out of our sample 52.5% of the respondents were able to answer all financial literacy questions, whereas 47.5% had a least one incorrect answer or “do not know”.²⁰ Previous studies of financial literacy among SAVE respondents analyzed the answers to the individual questions in more detail and show that this dummy is a good indicator of individuals’ knowledge—they also revealed that financial literacy is particularly low among women, individuals with low education or income and individuals living in east Germany (see Bucher-Koenen and Lusardi (2011)).

4 Financial Literacy and Financial Advice

First, we briefly outline our empirical strategy to emphasize the relationship to our analytical framework. It relies on the fortunate fact that due to the structure of our questionnaire, we have access to the measure of the customer’s financial literacy which the advisor does not observe directly. For the signal of the advisee’s expertise, we need a characteristic that is indicative of the individual’s financial literacy as well as

²⁰In the questionnaire 2007 the interest and the inflation question did not have a “do not know” option. For this reason we treat missing answers as “do not know” and do not drop them from the sample.

generally observable. We choose educational attainment, in particular whether or not the individual has completed tertiary education, because it fulfills both requirements: It is correlated with financial literacy (Spearman rank correlation coefficient .181, $p < 0.01$) and it has widely been used as a proxy for financial expertise in studies such as e.g. Georgarakos and Inderst (2010). Regarding observability, tertiary education confers a title to its holder, which is typically included in bank forms and protocols of advice sessions.

A number of empirical issues arise in our approach, some of which derive directly from our model. The first issue is one of endogeneity: If one were to observe that higher levels of financial literacy are associated with a visit to a financial advisor, the causality is unclear. Perhaps an individual learned from the advisor, then the higher level of literacy may be a result of, not a reason for the visit. We solve this by using the panel structure of our data and employing the level of financial literacy that the customer exhibited in the period *before* she solicited financial advice.

The second issue is related to the question of who follows financial advice. As our model predicts, individuals with higher levels of financial literacy should be more likely to approach a financial advisor. This introduces a potential selection bias for the decision whether or not to follow the advice one receives, as both steps depend on the level of financial literacy. We account for this by using a Heckman (1979) selection model in our estimation of the second stage.

Finally, the strong correlation between financial literacy and educational attainment is both a blessing, due to the reasons discussed above, and a curse. This correlation introduces collinearity between the two measures, as a result, we will not easily be able to separate their effects.

4.1 Financial Literacy and the Demand for Financial Advice

In this section, we analyze which characteristics contribute to the decision whether or not to consult a financial advisor. We estimate different probit models of the following form:

$$y_{jt} = \beta_0 + \beta_1 x_{jt-1} + \beta_2 z_{jt} + \epsilon \tag{3}$$

Here, y is a dummy-variable that signifies whether someone has talked to a financial advisor, x is a measure of financial literacy from the previous period and z contains a set of controls. The detailed results and specifications of the different models that we estimate for this section can be found in Table 1. Hypothesis 3 predicts a significantly positive sign of β_1 : The higher the level of financial literacy, the more likely the individual should be to solicit advice.

In all models, we find a significantly positive effect of financial literacy in the previous year on the decision to consult a financial advisor. Someone who answers all three questions correctly is between 3% and 9% more likely to solicit financial advice than someone who does not.²¹ We find significantly positive effects of income and educational attainment. Both gender and whether or not someone is living in eastern Germany do not have a significant effect on the choice to approach a financial advisor. The effects are robust to controlling for positive financial wealth.

While we did not include it in our analytical approach, relational factors²² are likely to play a role in the decision of individuals. To take this into account, we control for whether somebody has received financial advice in the previous year, to which the results are robust. Finally, we also limit the sample to those individuals who report not to have consulted with a financial advisor prior to 2008. Also for this subsample of individuals, financial advice has a significant and positive effect on the likelihood of consulting a financial advisor in 2008.

To summarize our findings: Beside financial literacy, the other main factors that encourage individuals to obtain financial advice are high income, age and higher education, which resembles the findings by Bi, Montalto, and Fox (2002) and Hackethal, Haliassos, and Jappelli (2010). We find robust evidence that is consistent with hypothesis 3: Individuals with higher levels of financial expertise are more likely to solicit financial advice.

²¹As a robustness check, we also introduced dummies for the respective number of correct answers. We find that giving one wrong answer and two wrong answers respectively lower the probability of soliciting financial advice significantly, but the difference between the two effects is not statistically significant. Therefore it appears to be justified to continue using a dummy for answering all questions correctly.

²²See Ottaviani and Sørensen (2006) for a model of reputation acquisition of advisors.

Table 1: Determinants of Consulting Financial Advisors

This table reports the effect of financial literacy and various covariates on consulting a financial advisor. The dependent variable in all specifications is a dummy that indicates if a household consulted with a financial advisor in 2008. I report marginal effects (me) after estimating a probit evaluated at the mean of all variables and the respective standard errors (se). Marginal effects and standard errors are calculated using 5 imputed data sets and combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured by a dummy equal to one if all questions of the task were correctly answered. (d) indicates the change of a dummy variable from 0 to 1. Ref. indicates the reference category if various dummies are used. N= 2392 for all specifications, except specification IV. This specification only contains households who did not consult an advisor in the previous year (i.e. 2007), N=1674.

	I		II		III		IV		V	
	me	se	me	se	me	se	me	se	me	se
Financial Literacy 2007 (d)	0.09***	0.02	0.07***	0.02	0.04**	0.02	0.03*	0.02	0.03**	0.02
Living in East Germany (d)	-0.01	0.02	-0.01	0.02	0.00	0.02	-0.02	0.02	0.01	0.02
Female (d)	0.00	0.02	0.01	0.02	0.02	0.02	0.01	0.02	0.02	0.02
Age: younger than 36 (d)	-0.03	0.03	-0.03	0.03	0.00	0.03	0.01	0.03	0.01	0.03
Age: 36-50 (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Age: 51-65 (d)	0.02	0.02	0.03*	0.02	0.04**	0.02	0.07***	0.02	0.04**	0.02
Log monthly net income	0.15***	0.02	0.11***	0.02	0.09***	0.02	0.06***	0.02	0.08***	0.02
Lower secondary education (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Intermediate secondary education (d)	-0.01	0.02	-0.02	0.02	-0.01	0.02	-0.01	0.02	-0.01	0.02
Upper secondary education (d)	0.01	0.03	-0.01	0.03	-0.01	0.03	0.01	0.03	-0.01	0.03
No vocational training (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Vocational Training (d)	0.05*	0.03	0.03**	0.03	0.02	0.03	0.01	0.03	0.02	0.03
University degree (d)	0.11***	0.05	0.09***	0.04	0.08**	0.04	0.07*	0.05	0.08**	0.04
Positive financial wealth (d)			0.25***	0.03	0.18***	0.03	0.16***	0.03	0.17***	0.03
Advice in the previous period (d)					0.32***	0.01			0.31***	0.01
Homeownership (d)									0.05***	0.02
Observations	2392		2392		2392		1674		2392	

Source: SAVE 2007 and 2008, own calculation. * significant at 10%; ** significant at 5%; *** significant at 1%.

4.2 Customer Expertise and Following Advice

As discussed above, we apply a Heckman selection model due to the fact that the two decisions, to approach an advisor and to follow his suggestions, appear to be dependent. For the selection stage, we use the model from the previous subsection, but include dummies for home ownership and positive financial assets as selection variables. For both of these, we have demonstrated a strong positive effect on consulting an advisor, while they have little or no effect regarding the decision to follow his suggestions. For the second stage we use specifications of the following form:

$$y_{jt} = \beta_0 + \beta_1 x_{jt-1} + \beta_2 x_{jt-1} * dummy_edu_t + \beta_3 dummy_edu_t + \beta_4 z_{jt} + \epsilon \quad (4)$$

x is our measure of financial literacy, $dummy_edu$ is a dummy for tertiary education, which we use as the signal that the advisor observes, and z resembles sets of controls. Here, y is the self-reported propensity to follow the advice received. The answers are on a 11-point scale (from 0 – “not at all” to 10 – “entirely”) in the questionnaire. This introduces a certain amount of noise into our results. It is not clear that each respondent will interpret the categories in the same way, which is further indicated by the slight peak of answers in the middle of the scale at 5, and the steps in between the categories are difficult to interpret.

To deal with these issues, we use two different specifications within the second stage of the Heckman model. On the one hand, we define a dummy variable which takes the value of 1 if an individual marked a value of 8 or higher for the question, and estimate a probit regression. The qualitative results are robust to shifting the cutoff value. In this specification, y resembles the probability that someone reports an 8 or higher. We also estimate a linear regression which suffers more from the issues described above, but makes more efficient use of the available information.

For both the probit and the linear specification, our hypotheses predict the following signs: β_1 should be negative by Hypothesis 4. β_3 should be positive (Hypothesis 5) and β_2 should be positive as well (Corollary to Hypothesis 2). For the sake of brevity we report only the results for the linear specification in Table 2.

We find some supporting evidence for Hypothesis 4: Individuals with higher financial literacy appear to be on average less likely to follow financial advice. For most of

our specifications, the p-value of financial literacy hovers around 0.1, though it is not consistently significant. The results regarding the other hypotheses are even less clear cut. We find that individuals with a higher level of education are, though in most specifications not significantly, less likely to follow advice. One cannot take this as a repudiation of hypothesis 5, though: As discussed above, due to the collinearity of financial literacy and education, it is impossible to clearly separate the signal from the level of expertise: We can at this point only state that the *overall* effect of the two variables is negative. Across the board, the estimates for β_3 produce positive, yet not significant coefficients with p-values around 0.2. Again, this does not allow us to reject any of our hypotheses.

Among our controls, we find a significant positive effect of having previously consulted an advisor, which again points in the direction of relational effects. In addition to this, individuals with higher income report following advice significantly less often. To summarize, with regard to our hypotheses, the only related effect we find is that individuals with higher financial literacy report that they are less likely to follow advice. Therefore, from the analysis of the general questions in SAVE, we find supporting evidence for our hypotheses 3 and 4: Individuals with higher financial literacy, all else given, are more likely to solicit advice, but less likely to follow.

Table 2: Determinants of Following Financial Advice

This table reports the effect of financial literacy and various covariates on following the advice after consulting a financial advisor. We estimated Heckman two-step models and report both steps in this table. The dependent variable in the second stage measures how strongly households follow the given advice on a scale from 0 to 10. The dependent variable in all selection equations (first stage) is a dummy that indicates if a household consulted with a financial advisor in 2008. Coefficient (coef) and standard errors (se) are calculated using 5 imputed data sets and combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured by a dummy equal to one if all questions of the task were correctly answered. (d) indicates the change of a dummy variable from 0 to 1. Ref. indicates the reference category if various dummies are used. N= 2362.

	I		II		III			
	second stage	first stage	second stage	first stage	second stage	first stage		
	coef	se	coef	se	coef	se		
Financial Literacy 2007 (d)	-0.15	0.15	0.11**	0.06	0.19***	0.06	0.17***	0.07
Financial Literacy * University (d)							-0.23*	0.16
Financial advice 2007	0.58**	0.27	1.07***	0.06			0.35	-0.31**
Log monthly net income	-0.21*	0.15	0.25***	0.06	0.27***	0.05	0.58**	1.07***
Living in east Germany (d)	-0.05	0.16	0.02	0.07	0.01	0.07	-0.21*	0.15
Female (d)	-0.14	0.14	0.05	0.06	0.16	0.06	-0.05	0.16
Age: 18-35 (d)	-0.19	0.22	0.04	0.09	0.14	0.06	-0.13	0.14
Age: 36-50 (d)	ref.	ref.	0.26	0.09	-0.22	0.09	-0.20	0.22
Age: 51-65 (d)	0.03	0.15	0.16***	0.07	ref.	ref.	ref.	ref.
Lower secondary education (d)	ref.	ref.	-0.04	0.15	0.08*	0.06	0.02	0.15
Intermediate secondary education (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Upper secondary education (d)	-0.02	0.17	-0.01	0.07	-0.04	0.07	-0.01	0.17
No vocational Training (d)	-0.18	0.22	-0.04	0.10	-0.17	0.09	-0.17	0.22
Vocational training (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
University (d)	0.10	0.28	0.06	0.11	0.14	0.10	0.11	0.28
Positive financial wealth (d)	0.27	0.34	0.28**	0.14	0.29	0.13	0.04	0.42
Homeownership (d)			0.59***	0.10	0.71***	0.10		
Constant	7.39***	1.41	-3.57***	0.42	0.27***	0.06	7.39***	1.41
Observations	2362		2362		-3.50***	0.40	2362	2362

Source: SAVE 2007 and 2008, own calculation. * significant at 10%; ** significant at 5%; *** significant at 1%.

5 Financial Advice and Private Pension Choice

We outlined in the introduction why the search for and choice of private pension is a fascinating application of our analytical framework. In the 2008 wave of our sample, 37.0% of individuals own a so called Riester private pension insurance contract, a further 9.2% report that they are planning to sign such a contract (see Table 3). Around 87% of individuals are eligible for state subsidies that make Riester pensions attractive investments. There is a lively current discussion about the alleged lack of transparency in the market—both regarding the multitude of offers on the macro-level and the complexity of the cost structure of individual contracts.²³ This complexity leads to interesting search patterns of individuals. 42.5% of consumers who either own a Riester contract or plan to buy one soon report that they acquired information from only one provider, 20.9% even state that they obtained no information concerning providers prior to signing their contract. In total therefore, more than 60% of consumers did not compare providers.²⁴

Comparing individual offers in this market is more difficult than one would expect. Due to the pension character of products and different levels of subsidies, contracts are individualized to a certain degree and therefore depend on starting age, marital status, number of children and current income, to name the most important factors. If a consumer wishes to compare contracts, she therefore has to provide these characteristics in order to obtain a spelled-out personalized offer. This is the background of the second question in our survey about how many written offers individuals compared before signing. Among owners of Riester pensions, 44.9% of individuals signed the contract without studying a written offer, a further 28.7% only obtained a single offer in writing. Therefore the share of individuals who did not compare offers is almost 74%. With about three-quarters of consumers choosing the first option they encounter, their source of information and financial advice clearly plays a crucial role.

In the remainder of this section, we proceed as follows: First we determine how the number of offers an individual obtained are related to her financial literacy. Due to the structure of the questionnaire, we are able to differentiate between access to offers through own search and through financial advisors. In the next subsection, we then

²³For a comprehensive overview, we refer to the book-length study by Feigl, Jaroszek, Leinert, Tiffe, and Westerheide (2010).

²⁴The pattern does not change substantially when excluding households who only plan to sign a Riester contract and have not done so yet.

Table 3: Riester Pensions—Coverage and Search for Information

This table displays the coverage with Riester pensions among eligible households in SAVE 2008 (Panel A), N=1087. It also displays the search for information for households. Panel B contains the number of providers contacted by individuals who own a contract or plan to sign one in the near future, N=500. Panel C shows the number of written offers obtained by those households who own a contract in 2008, N=406.

Panel A: <i>Riester Ownership</i>		
	Freq.	Percent
no Riester	584	53.8
plan Riester	100	9.2
have Riester	403	37.0
Total	1087	100.0
Panel B: <i>Comparison of Providers</i>		
	Freq.	Percent
no info	105	20.9
1 provider	213	42.5
2 or 3	139	27.8
more than 3	44	8.8
Total	500	100
Panel C: <i>Written Offers</i>		
	Freq.	Percent
no written offer	182	44.9
1 offer	117	28.7
2 or 3	91	22.3
more than 3	16	4.1
Total	406	100

Source: SAVE 2008, data is weighted.

look at the determinants for the choice of whether to approach (or be approached) by a dependent or an independent financial advisor in the context of private pensions. In the last subsection, we then consider how the customer's expertise affects her decision to follow the advice or not, by analyzing whether she has signed the contract with an unfamiliar or familiar contract partner given her source of advice. Note that the population in our analysis is composed of all individuals who have either purchased a private pension insurance or report planning to do so in the near future. Prior to this, there is a selection step: some individuals consider Riester pensions while others do not. Bucher-Koenen (2010) analyses this decision in detail. For the remainder of this article, we report regression results that disregard this selection step. For each of the calculations, we have also carried out a Heckman selection model and confirmed that the results are qualitatively unchanged. For the selection equation, following the results in Bucher-Koenen (2010) we utilize the fact whether individuals have children.

5.1 Financial Literacy and Search Effort/Quality of Advice

The most basic question we ask in this context is how individuals' financial expertise affects the number of search steps that they perform. As our measure of the number of providers that consumers compared is coded "none, one, two to three, more than three", we run an ordered probit model ²⁵ of the following form:

$$y_{jt} = \beta_0 + \beta_1 x_{jt-1} + \beta_2 z_{jt} + \epsilon \quad (5)$$

Again, x is the measure of financial literacy and z resembles the controls. We find that a higher financial literacy has a strong positive impact on the number of offers that consumers compare (see Table 4). This result is robust to limiting our sample to those individuals who purchased their insurance contract post 2007, which allows us to partially address the endogeneity issue (specification II in Table 4). Among our controls, we find that women compare significantly less offers than men, and younger individuals compare more offers. Finally, higher levels of education positively affect the number of offers that individuals compare.

To ensure that these effects are really based on the efforts of individuals themselves, we interact the measure for compared offers with a dummy which takes the value of 1 when an individual reports "own search" as a source of information and use this as the dependent variable. We obtain qualitatively identical results for this specification. These results strongly support our Hypothesis 1 and indicate that individuals with higher levels of financial literacy have significantly lower search costs (see Specification I in Table 5).

By alternating the source of information, this setup also allows us to investigate the quality of advice that individuals receive in a more direct manner: In the next step, we interact the measure for the number of offers that individuals observe with a dummy that becomes 1 when an individual has consulted an independent financial advisor. As this term increases, it indicates that a consumer has received more suggestions from the independent advisor. Again performing ordered probit regressions, we find that individuals with higher financial literacy are offered significantly more alternatives by independent financial advisors (see Specification II in Table 5) – this result is robust to limiting the sample to those individuals who report that they have not searched for offers

²⁵We get identical results for a probit model for the probability of comparing more than 1 offer.

Table 4: Determinants of Search for Information

This table displays the results of an ordered probit regression of financial literacy and a variety of covariates on the number of providers households contacted before signing a contract. Specification I contains all households who either owned or planned to sign a contract in 2008 (N=479). Specification II uses only a reduced sample of households who did not report ownership of a Riester contract before 2007 (N=182). Coefficients and robust standard errors are calculated using 5 imputed data sets and combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured by a dummy equal to one if all questions were correctly answered in 2007. (d) indicates the change of a dummy variable from 0 to 1. Ref. indicates the reference category if various dummies are used.

	I		II	
	coefficient	standard error	coefficient	standard error
Financial Literacy 2007 (d)	0.35***	0.12	0.48***	0.18
Living in East Germany (d)	0.05	0.12	0.06	0.20
Female (d)	-0.33***	0.11	-0.39**	0.17
Age: 18-35 (d)	0.19	0.12	0.51***	0.19
Age: 36-50 (d)	ref.	ref.	ref.	ref.
Age: 51-60 (d)	-0.29*	0.15	0.25	0.28
Log monthly net income	0.12	0.10	0.19	0.14
lower secondary schooling (d)	ref.	ref.	ref.	ref.
intermediate secondary schooling (d)	-0.23*	0.13	-0.28	0.23
upper secondary education (d)	-0.14	0.17	-0.52**	0.29
No vocational training (d)	ref.	ref.	ref.	ref.
Vocational training (d)	0.12	0.22	0.17	0.28
University (d)	0.44*	0.27	0.76**	0.38
cut1	0.08	0.73	0.93	1.02
cut2	1.32	0.73	1.99	1.02
cut3	2.44	0.73	2.93	1.04
observations	479		182	

Source: SAVE 2007 and 2008, own calculation. * significant at 10%; ** significant at 5%; *** significant at 1%.

on their own in addition to consulting an advisor. It is worthwhile to note that the term for financial literacy is highly significant (at the .01 level), while our controls for gender, age, education and income all have p-values well above 10%. The observation that individuals with higher financial literacy are provided with a larger number of different offers is evidence in support of our Hypothesis 2: Smarter individuals do appear to get better advice in the market for private pensions in Germany, when consulting an independent financial advisor.

As the next step, we repeat this procedure, but interact the measure for the number of offers with a dummy for dependent advice as information source (see Specification III in Table 5). Note that our predictions are not necessarily the same, due to the following reasoning: As discussed above, the incentive structures of dependent financial advisors, employees of banks or insurance companies, and independent advisors appear to differ substantially. While the former have “own” products to sell and associated with

Table 5: Determinants of Information Depending on the Source of Advice

This table displays the results of three ordered probit regression of financial literacy and a variety of covariates on the number of providers households obtained information from before signing a contract. In Specification I the dependent variable is the number of providers contacted conditional on own research. In Specification II the dependent variable is the number of alternatives offered by independent advisors. Specification III regards the number of alternatives offered by dependent advisors. Coefficients (coef) and standard errors (se) are calculated using 5 imputed data sets and combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured by a dummy equal to one if all questions were correctly answered in 2007. (d) indicates the change of a dummy variable from 0 to 1. Ref. indicates the reference category if various dummies are used.

	I: own search effort		II: search effort independent advisor		III: search effort dependent advisor	
	coef.	se	coef.	se	coef.	se
Financial Literacy 2007 (d)	0.42***	0.14	0.46***	0.16	0.00	0.12
Living in East Germany (d)	0.07	0.14	-0.07	0.15	0.07	0.13
Female (d)	-0.24*	0.13	-0.20	0.14	-0.35***	0.11
Age: 18-36 (d)	0.21	0.14	0.17	0.15	-0.06	0.13
Age: 36-50 (d)	ref.	ref.	ref.	ref.	ref.	ref.
Age: 51-60 (d)	-0.21	0.18	-0.15	0.20	-0.26	0.17
Log monthly net income	0.24*	0.12	0.19	0.13	0.08	0.10
Lower sec. schooling (d)	ref.	ref.	ref.	ref.	ref.	ref.
Interm. sec. schooling (d)	0.04	0.18	-0.24	0.19	-0.14	0.14
Upper sec. schooling (d)	0.05	0.21	-0.10	0.21	-0.01	0.18
No vocational training (d)	ref.	ref.	ref.	ref.	ref.	ref.
Vocational training (d)	-0.16	0.24	-0.10	0.25	0.11	0.21
University (d)	0.25	0.29	-0.22	0.32	0.14	0.27
cut1	2.58	0.94	2.31	1.00	0.43	0.77
cut2	2.79	0.94	2.61	1.00	1.19	0.78
cut3	3.73	0.95	3.10	1.01	2.22	0.79
observations	479		479		479	

Source: SAVE 2007 and 2008, own calculation. * significant at 10%; ** significant at 5%; *** significant at 1%.

this relatively steep incentive functions (ν), the latter, as discussions with practitioners revealed, have relatively flat bonus-structures with strictly enforced upper limits. In their model which includes prospecting for clients, Inderst and Ottaviani (2009) demonstrate that higher powered contracts may induce agents to approach more clients and “oversell” their product, in which case an individual who intended only to open a bank account may find herself with a pension insurance in the evening. In this sense one should also interpret our analytical framework, which states that a flatter incentive structure should enhance the probability of receiving better advice, while vice versa a steep incentive structure is more likely to preclude the advisor from offering better services even when facing a customer with higher expertise. The results of our regressions confirm this line of reasoning: For customers who report consulting a dependent financial advisor, the level of financial literacy does not display a significantly positive or negative effect on the

number of offers received. Among this group, the only significant effect is that women receive a smaller number of offers than men – but this effect disappears when we exclude individuals who also report searching for offers on their own, which again indicates that men on average search for more offers than women when acquiring information themselves.

To summarize, we find different effects of the information sources independent vs. dependent financial advisors. While for the latter, higher levels of financial literacy result in a significantly larger number of offers (which can be interpreted as better advice) for the former this is not the case. An explanation for this is the steeper incentive structure: Bank and insurance employees are supposed to sell their products.

5.2 Sources of Financial Advice

In this section we consider which customers choose to solicit dependent and independent advice, respectively, in the context of subsidized private pension insurances. In contrast to section 4.1, we are now able to distinguish the source of advice. Table 6 displays the sources of information that consumers utilize: Roughly 30% of the households report that they conducted own research before signing a Riester contract. About 18% talked to family and friends. The majority of households consulted dependent advisors (50%) and about 24% talked to independent advisors.²⁶

Our model predicts potentially different effects for the choices to consult dependent vs. independent advisors: Hypothesis 3 generally states that individuals with higher financial literacy are more likely to solicit financial advice, which is in part driven by their expectation that due to their better expertise the advisor will exert higher effort. If this effect is stronger for independent than for dependent advisors, due to their incentive structure being “flatter” in the sense discussed above, then we should find that as consumers become smarter, the likelihood of approaching an independent advisor increases more strongly than the likelihood of approaching a dependent advisor.

To test this, we first treat the two decisions as independent and estimate probit models of the form:

$$y_{jt} = \beta_0 + \beta_1 x_{jt-1} + \beta_2 z_{jt} + \epsilon \tag{6}$$

²⁶The frequencies do not add to 100% because multiple responses were possible.

Table 6: Riester Pensions—Source of Information

This table displays the sources of information households used when searching for a Riester contract. Information is only for households who own a contract in 2008, N=406.

Panel A: <i>Own Research</i>		
	Freq	Percent
no own search	286	70.42
own search	120	29.58
Total	406	100

Panel B: <i>Family and Friends</i>		
	Freq	Percent
not talking to family and friends	331	81.63
talking to family and friends	75	18.37
Total	406	100

Panel C: <i>Dependent Advisor</i>		
	Freq	Percent
not consulting dependent advisors	202	49.76
consulting dependent advisors	204	50.24
Total	406	100

Panel D: Independent Advisor		
	Freq	Percent
not consulting independent advisors	309	76.2
consulting independent advisors	97	23.8
Total	406	100

Source: SAVE 2008, data is weighted.

Here, y captures whether someone solicited dependent (independent) advice, x is our measure of financial literacy and z is a set of controls. In a second step, to test the difference between the two effects that we are interested in and to acknowledge that the two decisions are not necessarily independent, we compute a simultaneous equation model in which y is a vector of the two choices. The coefficients of the two regressions are nearly identical, therefore we only report the outcomes of the separate probit models in Table 8.

Our results are strongly in line with our predictions. Individuals with higher financial literacy are significantly more likely to consult an independent financial advisor. This effect is robust to limiting the sample to individuals who bought their insurance post 2007, even though this reduces our sample by almost two-thirds to 182 observations. For the choice of dependent advisor, the effect is not only smaller, it is actually insignificant. If endogeneity (learning from the dependent advisor) were at play in this contest, it should lead us to overestimate this effect. Again it is interesting that neither education,

nor income are significant at the 10%-level. We do find that women are significantly less likely to approach (or be approached) by a dependent financial advisor. Regarding the difference in the influence of financial literacy on dependent and independent advice, χ^2 tests show that the effects on the two choices are significantly larger for independent than for dependent advisors at the 1% level.

Table 7: Determinants of Consulting Financial Advisors

This table displays the marginal effects and standard errors after estimating two separate probit models. In specification I the dependent variable is a dummy if a dependent advisor was consulted. In specification II the dependent variable is a dummy if an independent advisor was consulted. Marginal effects and standard errors are calculated using 5 imputed data sets and combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured by a dummy equal to one if all questions were correctly answered in 2007. (d) indicates the change of a dummy variable from 0 to 1. Ref. indicates the reference category if various dummies are used.

	I: dependent advisor		II: independent advisor	
	marginal effect	standard error	marginal effect	standard error
Financial Literacy 2007 (d)	-0.04	0.05	0.12***	0.04
Living in East Germany (d)	0.01	0.06	0.00	0.04
Female (d)	-0.09*	0.05	-0.05	0.04
Age: 18-35 (d)	-0.05	0.05	0.04	0.04
Age: 36-50 (d)	ref.	ref.	ref.	ref.
Age: 51-60 (d)	-0.10	0.07	-0.04	0.05
Log monthly net income	0.03	0.04	0.06	0.04
Lower sec. schooling (d)	ref.	ref.	ref.	ref.
Interm. sec. schooling (d)	-0.03	0.06	-0.06	0.05
Upper sec. schooling (d)	0.01	0.08	-0.02	0.06
No vocational training (d)	ref.	ref.	ref.	ref.
Vocational training (d)	0.09	0.08	-0.02	0.07
University (d)	0.07	0.11	-0.08	0.08
Observations	479		479	

Source: SAVE 2007 and 2008, own calculation. * significant at 10%; ** significant at 5%; *** significant at 1%.

Our results are in line with our Hypothesis 3: individuals with higher financial literacy are more likely to solicit the services of independent financial advisors. The fact that this effect is significantly stronger for independent than for dependent advice indicates that smarter consumers may not only get better advice – they also appear to pick better advisors on average.

5.3 Expertise, Advice and the Choice of Contract Partners

The last step of our analysis is to show that the choice of advisor related to consumers' levels of financial literacy is associated with other economically relevant decisions that consumers make. In particular, we will show that it significantly affects the contracting

Table 8: Determinants of Consulting Financial Advisors: SEM

This table displays the marginal effects and standard errors after estimating a simultaneous probit equation model (biprobit). The two dependent variables are one dummy if a dependent advisor was consulted and a second dummy if an independent advisor was consulted. Marginal effects and standard errors are calculated using 5 imputed data sets and combined according to Rubin’s Rule (Rubin (1987, 1996)). Financial literacy is measured by a dummy equal to one if all questions were correctly answered in 2007. (d) indicates the change of a dummy variable from 0 to 1. Ref. indicates the reference category if various dummies are used.

	I: dependent advisor		II: independent advisor	
	marginal effect	standard error	marginal effect	standard error
Financial Literacy 2007 (d)	-0.04	0.05	0.12***	0.04
Living in East Germany (d)	0.01	0.06	0.00	0.04
Female (d)	-0.10*	0.05	-0.05	0.04
Age: 18-35 (d)	-0.05	0.06	0.05	0.05
Age: 36-50 (d)	ref.	ref.	ref.	ref.
Age: 51-60 (d)	-0.10	0.07	-0.04	0.05
Log monthly net income	0.03	0.04	0.06	0.04
Lower sec. schooling (d)	ref.	ref.	ref.	ref.
Interm. sec. schooling (d)	-0.03	0.06	-0.06	0.05
Upper sec. schooling (d)	0.01	0.08	-0.02	0.06
No vocational training (d)	ref.	ref.	ref.	ref.
Vocational training (d)	0.09	0.08	-0.02	0.07
University	0.08	0.11	-0.07	0.07
Observations	479		479	

Source: SAVE 2007 and 2008, own calculation. * significant at 10%; ** significant at 5%; *** significant at 1%.

partner that individuals contract with. Regarding this contract choice of consumers who own a Riester pension, we observe whether they contracted with a company that is also their provider of banking or insurance services. In this case, we refer to the firm as “familiar contracting partner”. If the consumer has no such interactions with her pension provider, we refer to the situation as “unfamiliar contracting partner”. As the final step of our analysis, we now turn to the question which customers sign a contract with a firm that is likely also to employ their (dependent) advisor as opposed to with an unfamiliar firm.

We first estimate a basic model of the following form:

$$y_{jt} = \beta_0 + \beta_1 x_{jt-1} + \beta_2 z_{jt} + \epsilon \tag{7}$$

y captures whether the consumer has purchased a contract from a familiar firm an x is our measure of financial literacy, while z are the familiar controls. We would expect the overall effect of financial literacy to be negative. Next, we add the channels of this effect

that we have identified above. In our first alternative model, we control for the source of information with dummies for whether the individual has respectively consulted a dependent or independent advisor, or searched on her own. In the second alternative, we look at the effect of comparing more than one offer. In the last specification, we include both the sources of information and the fact whether or not somebody compares multiple offers. For the detailed specifications and results, we refer to Table 9.

For our basic model, as expected, we find a significantly negative effect of financial literacy on the probability that the consumer purchases her contract with a known firm. The only other control we find that shows a significantly negative sign, which is robust over all specifications, is the dummy for the oldest age group. This may be related to a higher level of experience and more possibilities of interaction with players apart from the relational savings and insurance company. While the overall effect of financial literacy is negative, we also care about the channel by which this comes to be. Controlling for the sources of information, the coefficient for financial literacy is slightly smaller and still significant at the 5%-level. What we do find, though, is that individuals who consult an independent advisor are significantly less likely to sign a contract with a familiar firm. In itself, this is not surprising. It points in the direction that part of the overall sign of financial literacy is due to the fact that more literate consumers are more likely to consult an independent advisor as discovered above. In the next specification, we control for the customer stating that she compared multiple offers, which has a significantly negative effect on the probability that the consumer stays with a familiar company. For this regression, the term for financial literacy also remains significant. Combining all controls in the final specification, we find significantly negative effects for consulting an independent and significantly positive effects for consulting a dependent advisor. The effect of financial literacy is right on the border of being significantly negative.

To summarize these results: The overall effect of higher financial literacy on the probability that an owner of a Riester pension contract signed with a familiar company is significantly negative. These consumers are more likely to collect more alternatives to compare than their peers, are more likely to solicit independent and less likely to solicit dependent advice, as shown above. Each of these factors contributes to their choosing a contract partner beyond their “default” alternatives, their relational bank or insurance company.

Table 9: Determinants Contract Partner

This table reports the effect of financial literacy and various covariates on signing a Riester contract with a familiar provider. The dependent variable in all specifications is a dummy that indicates if a household owned a Riester contract provided by a bank or insurance company where the households also owned other products. We report marginal effects (me) after estimating a probit evaluated at the mean of all variables and the respective standard errors (se). Marginal effects and standard errors are calculated using 5 imputed data sets and combined according to Rubin's Rule (Rubin (1987, 1996)). Financial literacy is measured by a dummy equal to one if all questions of the task were correctly answered in 2007. (d) indicates the change of a dummy variable from 0 to 1. Ref. indicates the reference category if various dummies are used, N= 479.

	I		II		III		IV	
	me	se	me	se	me	se	me	se
Financial Literacy 2007 (d)	-0.11**	0.05	-0.08**	0.05	-0.10**	0.05	-0.08*	0.05
Dependent advice (d)	-	-	0.08*	0.05	-	-	0.10**	0.05
Independent advice (d)	-	-	-0.14***	0.05	-	-	-0.11**	0.05
Own search (d)	-	-	-0.05	0.05	-	-	-0.01	0.06
No information (d)	-	-	-0.02	0.08	-	-	-	-
More than 1 provider (d)	-	-	-	-	-0.08**	0.04	-0.07	0.06
Living in East Germany (d)	-0.05	0.05	0.05	0.05	0.06	0.05	0.06	0.05
Female (d)	-0.13**	0.06	-0.01	0.04	-0.02	0.04	-0.02	0.04
Age: younger than 36 (d)	-0.01	0.04	-0.03	0.05	-0.04	0.05	-0.03	0.05
Age: 36-50 (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Age: 51-60 (d)	0.06	0.05	-0.13**	0.06	-0.14***	0.06	-0.13**	0.06
Log of monthly net income	0.01	0.05	0.01	0.04	0.01	0.05	0.02	0.04
Lower secondary education (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Intermediate secondary education (d)	-0.04	0.06	-0.05	0.06	-0.05	0.06	-0.05	0.06
Upper secondary education (d)	-0.07	0.07	-0.07	0.07	-0.08	0.07	-0.08	0.07
No vocational training (d)	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Vocational training (d)	0.05	0.07	0.04	0.07	0.05	0.07	0.04	0.07
University degree(d)	0.12	0.10	0.10	0.10	0.13*	0.10	0.11	0.10
Observations	479		479		479		479	

Source: SAVE 2007 and 2008, own calculation. * significant at 10%; ** significant at 5%; *** significant at 1%.

6 Conclusion

The question that motivated our study was why more informed individuals with higher levels of financial literacy are more likely to solicit advice in general and financial advice in particular. Existing explanations focus on higher opportunity costs of people with higher incomes, such as Hackethal, Haliassos, and Jappelli (2010). Controlling for income simultaneously should eradicate this effect, but it does not: The level of financial literacy still significantly contributes to explaining whether or not an individual solicits financial advice. We suggest an alternative channel in an analytical model. Individuals with higher levels of expertise may receive (and expect to receive) better advice, which would result in ex-ante complementarities between advice and consumer information. Similarly to Inderst and Ottaviani (2009) this will especially be the case if the advisor's incentives are not stacked to greatly on behalf of one favored option; as opposed to, for example, a bank employee charged with selling his banks products exclusively. Resultingly, our model predicts that individuals with higher levels of financial literacy should be more likely to solicit financial advice. On the other hand, they may be less prone to follow the advice given to them conditional on soliciting it, as they are more often aware of the fact that their outside option, own search, yields better expected outcomes.

In the empirical part of this work we are fortunate in that we are both able to observe individual's choice *whether* to consult a financial advisor, as opposed to the related work of Georgarakos and Inderst (2010), and also which kind of advisor they consult, the latter in the context of private pension contracts. We show that it is more sophisticated consumers who consult advisors more frequently in the general context, and that the more financial literate individuals report to be somewhat less likely to follow the advice they received. For the choice of private pension provider, more sophisticated consumers in their own search efforts compare more offers than the less financially literate—an indication that their search costs are *lower*. While they are neither more nor less likely to consult a dependent financial advisor at their bank or insurance company, they are substantially more likely to consult a third-party independent financial advisor. These observations have a clear consequence with respect to their investment choice: financially literate consumers are significantly less likely to sign the pension contract with a familiar company, their default option: Due to the non-homogeneous fee-structures of Riester pensions spelled out in detail in Feigl, Jaroszek, Leinert, Tiffe, and Westerheide (2010)

comparing multiple offers can result in substantial savings in fees: One example where higher levels of financial literacy may result in considerable payoffs.

In answering the question posed in our title: We provide a theoretical foundation and find empirical evidence that smarter consumers do receive better advice. Beyond that, they are also more likely to ask for it and are better at picking advisors who are more likely to give them advice that is in their interest. From a welfare point of view, this is a serious conundrum: those whose financial decision making capabilities are worst are actually less prone to ask for the help they need. As consultations with financial advisors can also be a source of financial knowledge and improve financial decision making, the more sophisticated consumers are caught in a virtuous circle, while those most in need watch inactively from the sidelines. Our analysis suggests two reasons for this fact: less financially literate consumers may expect not to understand the advice they are going to receive and they anticipate that the advisor will provide them with sub-par services. The latter may include being talked into purchasing products which are over-priced or not suited to the consumer's current situation. Recent legal reforms require financial advisors to provide a written protocol of the advisory session with the aim of increasing transparency of the process. It will be interesting to observe whether this measure leads to an increase of individuals seeking financial advice.

A Mathematical Appendix

The advisor's maximization problem - sufficiency

Concavity of the advisor's expected profit function requires the following second derivative to be negative:

$$\begin{aligned} \frac{\partial^2 E[\Pi|s]}{\partial e^2} &= v''(e)(1 - E[\theta|s]) + E[\theta|s][v''(e)F(\hat{\theta}(e)|s)] + \\ &2v'(e)f(\hat{\theta}(e)|s)\frac{\partial \hat{\theta}(e)}{\partial e} + v(e)\frac{\partial^2 \hat{\theta}(e)}{\partial e^2}[f(\hat{\theta}(e)|s) + \frac{\partial f(\hat{\theta}(e)|s)}{\partial \hat{\theta}}] \end{aligned} \quad (8)$$

Inspecting the individual terms, we find that $v''(e)$ is negative due to the concavity of $v(e)$, i.e. increasing costs of effort, therefore the first term and the first part of the second term are negative. The second part of the second term is negative as $v'(e)$ is negative. The sign of $\frac{\partial^2 \hat{\theta}(e)}{\partial e^2}$ depends on assumptions regarding the customer's utility and search costs in relationship to the distribution of offers. It appears sensible to impose that the increase in the critical type is non-increasing in the effort spent, therefore this term is non-positive. This leaves the last part of the second term. We know that the second derivative must be negative if $f(\hat{\theta}(e)|s) \geq |\frac{\partial f(\hat{\theta}(e)|s)}{\partial \hat{\theta}}|$.²⁷ This will be the case if the conditional distribution of types is relatively "smooth", or equivalently, if the signal obtained by the advisor is not too informative. To illustrate, take the case of a perfectly informative signal, such that $E[\theta|s] = \theta$. Then one of two choices must be optimal for the advisor: either $e = 0$ or making the informed consumer exactly indifferent between accepting and rejecting the offer, a generally convex problem.

²⁷This condition is stronger than necessary, if it is not fulfilled, the shape of the function depends on the relative magnitude of the terms.

B Summary Statistics

Table B1: Summary Statistics

This table contains summary statistics for 2,608 respondents in SAVE 2008.

Variable	Mean	Std. Dev.	Min	Max
Age	51.28	16.40	21	96
Female	0.55	0.50	0	1
Living in East Germany	0.28	0.45	0	1
Living with a partner	0.63	0.48	0	1
Householdsize	2.43	1.24	1	9
Retired	0.33	0.47	0	1
No vocational training	0.14	0.34	0	1
Vocational Training	0.70	0.46	0	1
University Degree	0.17	0.37	0	1
Lower sec. schooling	0.35	0.48	0	1
Intermediate sec. schooling	0.37	0.48	0	1
Upper sec. schooling	0.28	0.45	0	1
Income (per month in Eur.)	2,100	1,453	18	22,500
Net wealth at the end of 2007	179,503	340,635	0	7,720,000

Source: own calculation on the basis of SAVE 2008, data is weighted and imputed.

C Measures of Financial Literacy

Financial Literacy 2007 and 2008

1. *Understanding of Interest Rate (Numeracy)*

“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*

“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 Risk and Diversification*

“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

D Questions relating to private pension choice

1. *Comparison of providers*

“In case that you or your partner have signed or are planning to sign a Riester contract in the near future: How many providers did you consult?” None / One provider / Two to three providers / More than three / Question does not apply; I/ we have neither procured nor plan to procure a Riester contract in the near future”

2. *Comparison of offers*

“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

3. *Sources of information*

“How/ from whom did you obtain information on the different offers? Several answers are possible” Own research / Relatives / Friends / Colleagues / Consultants employed by a bank and/ or an insurance company / Independent financial or investment advisors

4. *Chosen provider*

“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:

References

- AGHION, P., AND J. TIROLE (1997): “Formal and Real Authority in Organizations,” *The Journal of Political Economy*, 105, 1–29.
- BI, L., C. P. MONTALTO, AND J. J. FOX (2002): “Household Search For and Use of Financial Information,” *Consumer Interests Annual*, 48, 1–9.
- BOLHAAR, J., M. LINDEBOOM, AND B. VAN DER KLAAUW (2010): “Insurance Search and Switching Behavior,” *Tinbergen Institute Discussion Paper TI 2010-072/3*.
- BÖRSCH-SUPAN, A., M. COPPOLA, L. ESSIG, A. EYMANN, AND D. SCHUNK (2009): *The German SAVE Study - Design and Results*. Mannheim Institute for the Economics of Aging (MEA), second edn.
- BÖRSCH-SUPAN, A., A. REIL-HELD, AND D. SCHUNK (2008): “Saving Incentives, Old-age Provision and Displacement Effects: Evidence from the Recent German Pension Reform,” *Journal of Pension Economics and Finance*, 7(3), 295–319.
- BUCHER-KOENEN, T. (2010): “Financial Literacy and private Old-Age Provision in Germany,” *mimeo*.
- BUCHER-KOENEN, T., AND A. LUSARDI (2011): “Financial Literacy and Retirement Planning in Germany,” *Journal of Pension Economics and Finance*, (forthcoming).
- CALCAGNO, R., AND C. MONTICONE (2011): “Financial Literacy and the Demand for Financial Advice,” *CeRP Discussion Paper*, 117.
- CARLIN, B. I. (2009): “Strategic price complexity in retail financial markets,” *Journal of Financial Economics*, 91, 278–287.
- COPPOLA, M., AND A. REIL-HELD (2009): “Dynamik der Riester-Rente: Ergebnisse aus SAVE 2003 bis 2008,” *MEA Discussion Paper*, 195.
- CRAWFORD, V. P., AND J. SOBEL (1982): “Strategic Information Transmission,” *Econometrica*, 50, 1431–1451.
- DEATON, A. (1997): *The Analysis of Household Surveys: A Microeconometric Approach to Development Policy*. Baltimore, MD: Published for the World Bank by Johns Hopkins University Press, 3rd edn.

- ESÖ, P., AND B. SZENTES (2007): “The Price of Advice,” *The RAND Journal of Economics*, 38, 863–880.
- FEIGL, M., L. JAROSZEK, J. LEINERT, A. TIFFE, AND P. WESTERHEIDE (2010): *Transparenz von privaten Riester und Basisrentenprodukten—Abschlussbericht zum Projekt Nr. 7/09*. Zentrum für Europäische Wirtschaftsforschung (ZEW).
- GEORGARAKOS, D., AND R. INDERST (2010): “Financial Advice and Stock Market Participation,” *mimeo* (July 17, 2010).
- GREEN, R. C., B. HOLLIFIELD, AND N. SCHÜRHOFF (2007): “Financial Intermediation and the Costs of Trading in an Opaque Market,” *The Review of Financial Studies*, 20, 275–314.
- HACKETHAL, A., M. HALIASSOS, AND T. JAPPELLI (2010): “Financial Advisors: A Case of Babysitters?,” *Netspar Discussion Paper*, 04/2010 - 017, 1–43.
- HACKETHAL, A., R. INDERST, AND S. MEYER (2011): “Trading on Advice,” *mimeo* University of Frankfurt.
- HECKMAN, J. J. (1979): “Sample Selection Bias as a Specification Error,” *Econometrica*, 47, 153–161.
- INDERST, R., AND M. OTTAVIANI (2009): “Misselling Through Agents,” *The American Economic Review*, 99, 883–908.
- INDERST, R., AND M. PEITZ (2008): “Selling Service Plans to Differentially Informed Customers,” *ZEW Discussion Paper No. 08-125*, pp. 1–35.
- KRISHNA, V., AND J. MORGAN (2001): “A Model of Expertise,” *The Quarterly Journal of Economics*, 116, 747–775.
- LUSARDI, A., AND O. MITCHELL (2006): “Financial Literacy and Planning: Implications for Retirement Wellbeing,” *Pension Research Council Working Paper*, 1.
- OTTAVIANI, M., AND P. N. SØRENSEN (2006): “Professional Advice,” *Journal of Economic Theory*, 126, 120–142.
- ROTHSCHILD, M. (1974): “Searching for the Lowest Price When the Distribution of Prices is Unknown,” *The Journal of Political Economy*, 82, 689–711.

- RUBIN, D. B. (1987): *Multiple Imputation for Nonresponse in Surveys*. New York: Wiley.
- (1996): “Multiple Imputation After 18+ Years,” *Journal of the American Statistical Association*, 91(434), 473–489.
- SCHUNK, D. (2008): “A Markov Chain Monte Carlo Algorithm for Multiple Imputation in Large Surveys,” *Advances in Statistical Analysis*, 92, 101–114.
- STIGLER, G. J. (1961): “The Economics of Information,” *The Journal of Political Economy*, 69, 213–225.
- VAN ROOIJ, M., A. LUSARDI, AND R. ALESSIE (2011): “Financial Literacy and Stock Market Participation,” *Journal of Financial Economics*, forthcoming.