Gender Differences in Financial Advice

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Abstract

Financial advisors are more likely to recommend costly products to women than to men. We use minutes from about 27,000 advisor-client meetings plus archival data on client portfolios and show that there are systematic differences in why men and women receive expensive fund recommendations: For men, the likelihood of risky funds being recommended is higher and these are generally more expensive; on the other hand, within any given risk category, funds recommended to women are more costly on average. Beyond this, men are significantly more likely to receive rebates on funds' upfront fees. These results can be predicted by a stylized model where advisors observe imprecise signals of clients' financial literacy – in this case gender – and less literate clients are more likely to follow advice, even when it is not optimal. In line with the prediction, we show that objectively knowledgeable clients signaling low financial aptitude reject advisor recommendations more frequently than equally knowledgeable clients with high signals.

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1 Introduction

If Mr. and Mrs. Smith need to have their car serviced, which one of them should take it to the garage? Even if the two were equally clueless (or expert) with respect to car maintenance, common wisdom points toward Mr. Smith. If the population contains many more incompetent female than male garage visitors, then any mechanic will be more inclined to sell or charge for redundant services to Mrs. Smith than to Mr. Smith, because a priori the likelihood that Mrs. Smith will notice such malfeasance is lower. An interesting implication of this is that female car experts should be substantially more likely to experience, detect and ultimately reject poor service than equally knowledgeable men.[1]

We apply this logic to another important context: Financial advice. The objective is to document the differences in financial product advice across client' genders and to understand which mechanisms can explain observed differences in treatment of men and women by financial advisors.

We use administrative data of a large German bank on advisor-client interactions. This data set contains advisor recommendations from around 27,000 advisory meetings that took place between 2009 and 2017. In a first step we document differences for male and female clients in the type, risk and fees of the recommended products. We find that women receive significantly fewer recommendations to invest in pure equity funds, and lower equity shares in their investment are recommended. This effect is present despite controlling for differences in individual risk preferences. Second, the bank's own balanced funds are more likely to be suggested to women than to men. Third, advisors recommend funds with higher management fees (within given fund risk categories) to women. This effect is explained in part by the fact that the bank's own balanced funds are more expensive compared to funds with the same risk level. Finally, women are significantly less likely to receive rebates on the upfront load of any given product. While the more frequent recommendations for the (expensive) bank own funds could be related to a hypothetical higher willingness to pay for delegating the investment decision, this argument does not explain why women less often receive discretionary rebates on the upfront fees charged upon purchase of a fund, i.e., pay more for given funds.

A mechanism that could explain the observed differences in the financial advice by gender, is related to the fact that financial advice is a prototypical credence good (see Dulleck and Kerschbamer (2006) and Kerschbamer and Sutter (2017) for reviews), where knowledgeable clients are more able to assess service quality, even *ex post*. Advisors incentivized by sales commissions and kickbacks might attempt to sell costly or unsuitable products to clients who appear or seem clueless (e.g., Chen and Gesche, 2018; Inderst and Ottaviani, 2012a; Stoughton, Wu, and Zechner, 2011; Mehran and Stulz, 2007). Since actual financial aptitude might be hard to observe for advisors, they might use easily observable proxies for client's financial aptitude to tailor advice. Various studies show that financial literacy of women is on average significantly lower than that of men,

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[1] In a study on car repairs Busse, Israeli, and Zettelmeyer (2017) show that women who signal more knowledge of the market price are in fact offered better prices for the same service compared to women who do not signal this knowledge. This effect was not detected for men.

even after controlling for factors such as education, age, and income (e.g., Lusardi and Mitchell, 2011; Bucher-Koenen, Lusardi, Alessie, and van Rooij, 2016). Inferring from population averages and own experiences, therefore, advisors may have an incentive to treat female clients differently than males. In order to understand the empirical findings better, we set up a simple yet general analytical framework for advisor interactions with clients who differ according to their financial aptitude. We start from the assumption that knowledgeable clients possess better do-it-yourself outside options when choosing investment products than their less knowledgeable peers. This characteristic gives advisors interested in client relationships a (financial) incentive to provide higher quality advice to knowledgeable clients. If advisors cannot observe true client skills, but only a noisy signal that is on average informative, then clients who appear to be knowledgeable (here: men) will receive better advice, while clients who appear to be less knowledgeable (here: women) will receive worse advice (mis-selling hypothesis). Since the signal is imprecise, some clients will appear less financially literate, but are actually capable. These clients will receive low-quality advice, will notice the poor quality, and will reject it (the rejection hypothesis). In our context this means that women with high financial literacy skills should be more likely to reject financial advisors' recommendations.

We find empirical support for the mis-selling hypothesis in our data as reported above. However, going one step further we can also test the rejection hypothesis. Specifically in the bank data, we observe the objective, test-based financial literacy for a subset of clients who participated in a survey. We can confirm that women with higher financial literacy are more likely to reject advisor recommendations. In addition, we make use of an alternative data set, namely the SAVE household panel, where we observe test-based financial literacy and a self-reported measure of clients' adherence to financial advice. Our results from the survey data are also consistent with the model predictions. Financially literate women are more likely to reject advice than their less knowledgeable female fellow clients; this pattern is not observed for men.

Despite our extensive set of controls in all regressions, one could, however, argue that advisors cater to their clients' requests for all-in-one products, when selling the bank's own target funds. Women might simply be willing to pay a price premium for not having to build, and then re-balance portfolios from multiple funds that each invest in just one asset class. High fund fees would then not indicate poor advice or mis-selling, but would rather imply a catering effect in line with Hackethal, Laudenbach, Meyer, and Weber (2018) and Gennaioli, Shleifer, and Vishny (2015). We do, however, not find any evidence that women, in general, have a higher preference for these bank-owned funds. Results are robust to the exclusion of meetings that were initiated by the client or to product recommendations that can be traced back to a specific client idea. In addition, women are not more likely to follow recommendations for a bank-owned fund in comparison to alternative recommendations. From a survey of a sub-sample of clients, we find evidence that raises the possibility that women may have slightly different motives for seeking financial advice, which could conceivably be related to receiving recommendations of the bank's own funds more often. It is an open question whether they are aware of the substantially higher costs of these

all-in-one products compared to funds with the same risk category and similar returns. Finally, even if these differences in motives to consult financial advisors are relevant, they do not explain why men have a higher likelihood for receiving a rebate on the up front load for a given product.

The wider empirical literature on financial advice underlines the relevance of our results: the majority of households rely on professional advice when investing. A survey of US retail investors shows that 73 percent consult advisors when investing in stocks or bonds (Hung, Clancy, Dominitz, Talley, Berrebi, and Suvankulov, 2008). Parallel results hold for Europe, where 80 percent of the households who recently bought investment products interacted with a personal advisor and 58 percent followed the advice (Chater, Huck, and Inderst, 2010a). Moreover, in Germany between 60 percent and 80 percent of individual investors rely on professional advice when making investment decisions (Burke and Hung, 2015; Bluethgen, Meyer, and Hackethal, 2008) and in the Netherlands more than half of the investors with an investment portfolio rely on financial advice (Kramer, 2012). At the same time, clients seem to be unaware of advisors' conflicts of interest. For example, Chater, Huck, and Inderst (2010a) report that more than half of the respondents in their survey believed that the advice they received was completely independent. On the other hand, individuals' ability to identify and value truly independent advice in quasi-experimental settings seems doubtful: Bhattacharya, Hackethal, Kaesler, Loos, and Meyer (2012) find that only 5 percent out of about 8,000 retail clients of an online broker solicited advertised free and unbiased advice and even fewer followed the advice given.

Empirical investigations of who consults with an advisor reveal that mainly households with higher levels of education, income and wealth and older, more experienced and better informed investors consult professionals (e.g., Bi, Montalto, and Fox, 2002; Hackethal, Haliassos, and Jappelli, 2012; Van Rooij, Lusardi, and Alessie, 2011; Kramer, 2012). These observations point to a complementary relationship between financial literacy and financial advice rather than a substitute relationship. Hackethal, Haliassos, and Jappelli (2012) argue that higher opportunity costs of time lead wealthier and older clients to make use of financial planners, even though they would be relatively better suited to perform financial planning themselves. Some recent papers theoretically modeling financial advice have also recognized that customers might differ in terms of their levels of financial sophistication (Gabaix and Laibson, 2006; Inderst and Ottaviani, 2012b; Georgarakos and Inderst, 2011; Calcagno and Monticone, 2015). Within the broader literature on financial advice, we provide further insights on the determinants of adherence to financial advice. In contrast to Bhattacharya, Hackethal, Kaesler, Loos, and Meyer (2012) and Stolper (2018), who do not find that women and men generally differ in their following behavior, we find evidence for a significant interaction effect of gender and financial literacy on adherence to financial advice.

With regard to the quality of financial advice in general, some systematic issues have been uncovered. Recent studies comparing do-it-yourself and advised individual investor portfolios suggest that on average, advisors have a negative impact on portfolio performance (Hoechle, Ruenzi, Schaub, and Schmid, 2018, 2016; Chalmers and Reuter, 2012; Hackethal, Haliassos, and Jappelli, 2012). Egan, Matvos, and Seru (2019) document frequent misconduct among US financial advisors with

limited consequences for the offending advisors. However advice is also shown to improve financial planning (Lusardi and Mitchell, 2011) and to ameliorate investment mistakes.[2] In this paper, we do not intend to evaluate the overall benefits of financial advice. Rather, we look at differences in the advice provided to different client types, namely men and women.

Our paper is also related to recent research on discrimination in financial markets, which so far focuses mainly on credit markets. For example, Alesina, Lotti, and Mistrulli (2013) find that compared to male business owners, female business owners in Italy pay higher interest rates conditional on risk characteristics. They also provide references to the literature on ethnic discrimination in credit markets in the US (see Cavalluzzo and Cavalluzzo, 1998 and Blanchflower, Levine, and Zimmerman (2003) for reviews). Egan, Matvos, and Seru (2017) document gender differences on the supply, namely the advisor, and not on the demand side. The authors find that female compared to male advisors are more severely charged for misconduct. To the best of our knowledge, no other literature examines gender-based differences on the demand, namely the client side, in financial markets.

Our findings have considerable welfare implications. We show that individuals who appear less financially literate are more likely to receive recommendations for more expensive products from advisors. If less skilled clients are unable to recognize poor advice, then they are likely to adhere to it and make inferior financial decisions. We believe that the basic mechanism in our theoretical framework, which is supported by the empirical findings, is not limited to the domain of financial advice but applies to many credence goods (Kerschbamer and Sutter, 2017). For example, individuals who appear more intimate with the subject of cars should receive better advice from their mechanics. Other relevant applications include taxi services (see Balafoutas, Beck, Kerschbamer, and Sutter, 2013), health care (see e.g., Gottschalk, Mimra, and Waibel, 2018), or legal matters.

2 Data

We use data on advised investors at a large German bank operating a nationwide branch network. Our main source of information are advisory minutes that provide great detail on the interactions of clients with their bank financial advisors. Since January 2010, advisors are mandated by law to documents all client advisory meetings in written form, including the motivation for and duration of the meeting, as well as the advisor's final product recommendations, along with a justification for the recommendations made. Our data covers 27,617 advisory meetings between 13,723 retail clients and 4,649 advisors. The meetings took place between January 2009 and December 2017. We complement this rich source of information with data on clients' security transactions and demographic information. For a small subsample of 523 clients (1,341 product recommendations), we observe information on test-based financial literacy and qualitative information on attitudes

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[2]Specifically, mistakes such as under-diversification (Hoechle, Ruenzi, Schaub, and Schmid, 2016; Gaudecker, 2015), home bias (Kramer, 2012; Bluethgen, Meyer, and Hackethal, 2008), and the disposition effect (Hoechle, Ruenzi, Schaub, and Schmid, 2016; Shapira and Venezia, 2001).

towards financial advice from an online survey administered to a random sample of clients at the bank.

In Germany, as in many other European countries such as Sweden, Italy, or France, financial advice to retail investors is primarily provided by banks.[3] Most German households make financial decisions in cooperation with their house bank financial advisor. Figures for German households relying on financial advice range from 60% to 80% across studies (Burke and Hung, 2015; Chater, Huck, and Inderst, 2010b; Droesser, 2016). This marks an important difference to the US, where advice to retail investors is often provided by independent financial advisors.

When opening an account with the bank, clients are assigned a designated advisor. In the retail segment, the client-advisor match is based on branch location, but it is otherwise independent of customer characteristics. Bank customers either conduct transactions unassisted or consult with their advisor. Complete delegation of financial decisions is rare in Germany and is mostly limited to the wealthiest customers.[4] Bank customers pay for financial advice indirectly through product fees and commissions, that are (partly) channeled to the bank.

The advisors in our sample are full-time employees of the bank who have completed a three-year vocational training. They are paid a fixed wage in accordance with the collective wage agreement of the banking industry. Variable components of monthly pay must not amount to more than 10 percent of total salary and are typically a function of team or branch performance, acquisition of new client assets, and surveyed client satisfaction. While advisors are not directly compensated for their individual sales performance, career concerns may provide indirect sales incentives (Hoechle, Ruenzi, Schaub, and Schmid, 2018).

Clients and Advisors. All clients in our sample interact with a bank advisor at least once over the sample period. On average, both female and male clients consult the bank for advice about twice during our sample period. Panel A of Figure A1 in the appendix shows the distribution of the number of meetings by client. For about one quarter of the clients we observe only one advisory meeting in our sample period. Around 23% of the clients are observed twice, and about half of the sample is observed more than three times within the sample period. Panel B of Figure A1 shows the distribution of protocols over calendar months. The figure reveals that that there are seasonal patterns in the distribution of advisory meetings, which we will account for in our analyses by controlling for time fixed effects.

Summary statistics on the overall sample as well as split by gender are reported in Table 1. In Panel A we show statistics at the client level, in Panel B we report statistics at the recommendation level. Slightly less than half (45 percent) of the clients in the sample are female. The median client is 65 years old or older. Clients in our sample are on average risk-averse, with the majority willing to take only moderate financial risk (53% are in the second - "low" category on a 1-4 scale). In line with

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[3]With a high importance of independent financial advisors, the United Kingdom is an exception among European countries.

[4]As a bank's financial advice provided to retail clients is likely to differ from financial advice in the wealth management and business client segments, we exclude wealth management clients with portfolio holdings of at least €500,000 and business clients from our analyses.

the literature, male clients show a higher risk tolerance (49% are in the top two risk categories) compared to female clients (42% in the top risk categories). The median portfolio value in our sample is around EUR 40,000 (mean: EUR 62,000), compared to the median portfolio value held by Germany households conditional on capital market participation which is EUR 16,600 (mean: EUR 54,200) (Deutsche Bundesbank, 2016). On average 75 percent of the assets are invested in mutual funds.

The majority of client-advisory meetings takes place in person (86 percent for female, 83 percent for male clients), in only a small fraction of cases advice is received over the phone. The majority of interviews takes 30 minutes or longer (see Panel B in Table 1).

Overall we observe recommendations by 4,649 different advisors, who are approximately balanced by gender (48 percent are male). However, there is wide variation in the number of observations per advisor. This is due to the fact that our sample is a random draw across bank clients, rather than advisors.[5] Among those clients for whom we observe more than one interview, 20 percent of the meetings after the first are with a new advisor. Advisor changes in the retail segment are not uncommon and are mostly driven by fluctuations in the career position or the location of bank employees.

Product Recommendations As a result of regulatory tightening and ensuing compliance concerns, large banks have standardized their financial advice, especially in the retail client segment. Advisors at the bank are supposed to pick recommendations from a pre-selected list of actively managed mutual funds, covering different asset classes and risk categories. Individual stocks, individuals bonds, certificates, index funds, or exchange traded funds (ETFs) can also be recommended and discussed with the clients. While in principle the bank maintains an open fund architecture, which means that advisors have a bank's own funds as well as outside options in their menu, the banks' own fund products figure prominently on the product menu. As a result of standardization, the 10 products that are recommended most often account for 40% of all purchase recommendations in our sample (see Figure A2 in the appendix). All of these top 10 products are actively managed mutual funds, 7 of which are bank-own products. Overall the bank's own balanced fund products also account for the lion's share of fund recommendations to retail clients. These products are multi-asset funds that invest both in stocks and funds with different allocations and are designed to provide an all-in-one portfolio solution to retail clients.[6]

Panel A of Figure 1 shows the distribution of recommendations across product types by gender. It closely mirrors the precepts of the bank's standardized advisory approach. Overall, funds are the most recommended product category to both male and female clients. However, female clients receive recommendations for funds more frequently than men (67% for female versus 64% for male

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[5]We observe exactly one meeting for 27 percent of advisors, for 30 percent of the advisors we observe more than five meetings.

[6]We exclude recommendations for a topic specific in-house fund from our data. The distribution of this fund was accompanied by comprehensive marketing campaigns, which we cannot control for. Results are robust to the inclusion of these recommendations and, importantly, the share of recommendations for this fund does not significantly differ between male and female clients.

clients). The frequency of single bond recommendations is comparable (11% for female versus 10% for male clients). Single stocks are rarely recommended, and if so, they are more often recommended to male than to female clients (4% versus 2% of all recommendations in our sample). Given their predominance, the main focus of our analyses is on recommendations to invest in mutual funds.

Quality of recommendations – risk and costs. We consider two aspects of the quality of advisor recommendations, (1) risk adequacy and (2) fees. The Markets in Financial Instruments Directive (MiFID) of the European Parliament and the European Council (2004 and 2006) stresses risk adequacy, requiring investment recommendations to match investor risk preferences.[7]

Mullainathan, Noeth, and Schoar (2012) consider retail financial advice as high quality if it provides the clients with a broadly diversified, but low-cost portfolio. We therefore assess the fees of the fund recommendations as a second criterion. Fees for mutual fund purchases typically have two components: initial up-front fees (loads) paid upon purchase of a mutual fund and recurring fees summarized by the Total Expense Ratio (TER) which are paid annually in proportion to the amount invested. Upfront fees paid upon fund purchase are directly collected by the bank. In case of bank-own funds, a significant fraction of recurring fees accrues to the bank, as well.[8] As opposed to returns, which at least in part result from luck, fund fees can directly be influenced by the advisor. [9] Funds differ considerably with regard to their total expense ratios (TER).

While a fund's TER applies equally to all investors, upfront loads paid upon purchase can be adjusted to the individual client. In particular, advisors can offer discretionary rebates (up to 100 percent) on the upfront charge. From the advisory minutes, we observe whether the advisor granted a partial or full rebate on the upfront load of a recommended fund. About 24% of all fund recommendations come with a rebate on the up front load (see Panel B in 1). Panel A of Figure 4 shows that there is considerable variation at the level of individual funds with regard to whether a rebate was granted to clients or not. For the graph, we consider only funds that are recommended for at least 50 times. The graph shows, that the granting of rebates is not a feature for specific funds. There are no funds for which a rebate is always granted, about 18% of the recommended funds never come with a rebate. Slightly more than 30% of the recommended funds are offered with a rebate on the upfront load in about 30% of the cases.

Adherence to advisor recommendations As an outcome of the advisory meeting, we can observe if recommendations are implemented afterwards by the client. We define a recommendation as implemented, if the client buys the recommended security within 30 days after the meeting. Overall, 62% of all recommendations are followed by the clients within 30 days (see Panel B in 1).

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[7]Investment firms are required to obtain 'information as is necessary for the firm to understand the essential facts about the customer" (Article 35, 1) and to elicit the customerÔÇÖs 'preferences regarding risk taking, his risk profile, and the purpose of the investment" (Article 35, 4).

[8](Hoechle, Ruenzi, Schaub, and Schmid, 2018) study a comparable bank setting in Switzerland and show that trades in bank-own mutual funds are the most profitable for the bank in the context of retail financial advice.

[9]Grinblatt, Ikäheimo, Keloharju, and Knüpfer (2016) argue that variations in risk-adjusted returns on mutual fund portfolios result largely from differences in fees.

3   Gender Differences in Product Recommendations and Fees

Our aim is to understand whether male and female clients receive different product recommendations from financial advisors. We will first look at gender differences in the type and risk level of the funds advisors recommend. In a second step, we analyse differences in fund fees.

3.1   Fund type and risk level

Panel B of Figure 1 presents the distribution of fund recommendations by fund type and gender. Most apparently, female clients are significantly more likely to get recommendations for one of the bank's own balanced funds (71% for female versus 60% for male clients) that come at different asset allocations. Balanced funds which are not under the bank's own management are slightly more often recommended to men (6% to men vs. 4% to women). Male clients are also significantly more likely to get recommendations for pure equity funds (22% for male versus 14% for female clients). Bond funds are recommended with similar probability (6% for female versus 5% for male clients). The overall pattern in advisors' fund recommendations is in line with the general finding that women on average are less risk-tolerant compared to men.

Differences in the riskiness of recommended products are also apparent from Panel A of Figure 2. According to the European Market in Financial Instruments Directive (MiFID), all funds are classified into seven risk classes according to the average volatility over the last five years. Funds in category 1 exhibit the lowest risk levels, category 7 implies high risks. The figure shows the distribution of fund recommendations over the seven fund risk categories by gender. In line with a lower average risk-tolerance observed in women, the distribution of recommendations for female clients has more mass on lower risk categories. Next, we analyze what drives the risk level of funds recommended in a multi-variate regression framework.

Empirical specification. We measure the riskiness of a fund being recommended using three alternative variables. First, *equity* is a dummy equal to one if a recommended fund is a pure equity fund. This applies to 18 percent of all fund recommendations. Second, *equity share* is the share of equity in a fund's holdings. The equity share varies between 0 percent (e.g., bond funds) and 100 percent (stock funds). Equity shares of balanced funds take intermediate values, depending on their investment strategy.[10] The average equity share over all fund recommendations is 48 percent. Third, we use the *fund risk category*. The average fund recommended falls into category 4.

We Would like to understand whether advisors recommend different funds to women as compared to men controlling for client risk preferences and a broad set of other factors. We run linear regressions using the three measures of fund risk as the dependent variable. The unit of observation is a single recommendation provided during one of client i's advisory meetings. Since a client can be involved in multiple meetings, we introduce the subscript j to designate meetings. We estimate

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[10]Equity allocations of funds are taken from the Morning star data base.

linear regression models of the form:

$$y_{ij} = \beta_0 + \beta_1 female_i + \beta_2 characteristics_i + \beta_3 meeting_{ij} + \mu_t time + \mu_a advisor_{ij} + \epsilon_{ij} \quad (1)$$

The dependent variable y is one of our three risk measures for the recommended fund. The variable $female$ is an indicator equal to one if the client is female, zero otherwise. $characteristics_i$ captures the client's personal and financial characteristics, in particular personal risk tolerance (on a 1-4 scale), log financial wealth with the bank, dummies for age groups, and occupational and educational status (employed, manager, and academic (PhD)). We also include variables to control for the circumstances of the meeting ($meeting_{ij}$). These are indicators for whether advice was received in person rather than over the phone and whether the meeting took longer than 30 minutes. We also control for the length of the relationship the client has with the bank in years. All regressions include year-times-month fixed effects. Following Foerster, Linnainmaa, Melzer, and Previtero (2017), we also include advisor fixed effects $\mu_\mathbf{a}$ to control for advisor heterogeneity. Standard errors are clustered at the client level.

Results. The results in Table 2 show that, controlling for client's risk tolerance and a large set of control variables, women are on average 2pp less likely to receive an equity fund recommendation (Column 1). Compared to an average of 18% equity fund recommendations this translates into an 11% lower likelihood to receive an equity fund recommendation for women. The equity share of the recommended fund is on average 1,69 pp lower, corresponding to a 3.5% lower equity allocation based on the same risk preferences and other characteristics (Column 2). Moreover, the recommended funds' risk categories are significantly lower for women (Column 3), which is in line with the graphical results from figure 2. In Columns (4) and (5), we show that results for equity share (Col 4) and risk category (Col 5) hold, when we restrict our analyses to fund recommendations that contain at least a minimal equity share (excluding bond and money market funds). The results even become slightly stronger without the low-risk-funds. The final analysis regarding the recommended product type is reported in Column (6). Here the dependent variable is a dummy indicating a recommendation for one of the bank's own balanced funds. We find that women are 3 pp more likely to receive a recommendation for one of the bank's own products compared to men (an increase of 4.6% relative to the average share of recommendations of bank own products of around 65%).

Overall, these results show that, even taking into account and controlling for client risk preferences as measured by the advisor during the meeting, advisors tend to recommend less risky products to female clients. This could be related to the fact that the bank's own risk assessment on a 4-point scale does not entirely reflect clients' risk preferences and further information on risk preference is communicated during the meeting. For a subsample of client's we have a self-assessed survey measure of risk preferences on a 7-point scale. However, when we include this measure instead of the risk measure reported in the protocol our findings remain unchanged.

3.2 Product Fees

In the next set of analyses we look at differences in product fees. A mere comparison of average total expense ratios (TER) of the funds recommended to male and female clients seems to suggest that there are no gender-specific differences in average fund fees paid. For male clients the average TER is 1.91 percentage points, for female clients it is 1.90. Generally, total expenses are higher for more risky funds (Gennaioli, Shleifer, and Vishny, 2015), and they increase in the level of active management (Linnainmaa, Melzer, and Previtero, 2018). Given this evidence, the finding that fund fees do not differ by gender is rather surprising, since we just showed that funds recommended to male clients exhibit higher risk levels. Panel B of Figure 2 shows the relationship between total expense ratios and fund risk; higher risk comes at higher cost, but the fees for pure equity funds are on average lower compared to actively managed balanced funds with a high equity share. There is also substantial variation in the total expense ratios within risk categories. In the lowest risk category, we observe a difference of 97 basis points between funds with the lowest fees and those with the highest fees. In the highest risk category this difference is 187 basis points.

Therefore, we compare the management fees conditional on the recommended fund's risk in a next step. For this purpose, we follow a similar strategy as Linnainmaa, Melzer, and Previtero (2018) and use a management fee rank approach. In particular, within each fund risk category (from 1 to 7), we sort funds into quintiles according to their total expense ratios charged. This means that within each risk category we measure the 20% cheapest (lowest quintile) up to the 20% most expensive (highest quintile) products. According to this metric, the average management fee quintile of the recommended products in our sample is 3.87; 44% of all fund recommendations fall into the highest quintile. Figure 3 shows the distribution of fund recommendations for male and female clients over the fee quintiles: for women there is more mass in the higher quintiles (category 4 and 5). This means, that female clients receive more expensive recommendations within a given risk category. We examine the relationship between gender and the fund's fee quintile more closely in a multivariate framework.

Empirical Specification. We use an OLS regression model of the form:

$$y_{ij} = \beta_0 + \beta_1 female_i + \beta_2 characteristics_i + \beta_3 meeting_{ij} + \mu_t time + \mu_a advisor_j + \epsilon_{ij} \quad (2)$$

The dependent variable y is the management fee quintile of the fund recommended to client i during the meeting j. Our main independent variable, $female$, and the other control variables are the same as in the previous regressions. Most importantly we include month-times-year and advisor fixed effects.

Results. Column (1) of Table 3 reports a regression controlling only for gender, advisor, and time fixed effects. We find that advisors recommend more expensive funds to women using the fee quintile within a risk category as a dependent variable. Results get weaker, but stay significantly

positive if we include further controls in Column (2). What explains the differences in management fees, that go beyond differences in the funds' riskiness? From the descriptive results in Panel B of Figure 1 and Table 2, we know that women are more likely to receive recommendations for balanced funds, and especially for the bank's own balanced funds. These bank owned funds have a high degree of active management, and tend to charge higher fees compared to other funds in the same risk category. In Panel B of Figure 3) we show the average TER by fund risk category and differentiate between external funds on the left and fund's under the banks' own management on the right. In each risk category the bank managed funds are more expensive than comparable funds. If we control for a recommendation being for one of the bank's own balanced funds in our fee regression in Column (3), the female indicator turns significantly negative. This implies, that women receive more expensive product recommendations than men, because they receive recommendations for the banks' own managed funds, which carry particularly high product fees.

In addition to the management fees funds carry sales fees—the so called upfront load. Upfront loads are one-time costs to the investor, charged upon purchase of the fund. As opposed to the fund's TER, reductions on the upfront load can be granted at the discretion of the advisor. This fact is neither advertised nor typically known by clients. Studying these rebates, we are able to see whether the costs for the very same financial product suggested by advisors differ by the gender of the client. Note that we observe rebates only for recommendations that were actually executed. Roughly one quarter of all fund purchases in our sample come with a rebate on the upfront load. We show differences in the share of fund purchases, which are associated with a rebate by fund risk category and gender in Figure 4 Panel B. The comparison reveals that the share of purchases with a rebate on the load is larger for male clients across all fund risk categories. Next, we examine this in a multivariate regression framework.

Empirical Strategy. The dependent variable of our regressions is an indicator equal to one if the client has received a rebate on the mutual fund load. In order to test whether female clients face higher costs than men for the same financial products we include fund fixed effects (ISIN fixed effects) into the regression. Otherwise, the structure of the model is unchanged from the previous set of regressions.

Results. Results in Table 4 reveal that female clients are significantly less likely to receive a rebate when they purchase funds. The difference of 2 percentage points translates into a 8.3% lower probability for female clients to get a rebate on a fund load compared to men. Since rebates matter more for short term investments, we control for the investment horizon in Column (2) and the results stay the same. In Column (3) we include all other control variables and in Column (4), we restrict the sample to funds (ISIN codes) that are recommended at least 50 times. Again, results are stable. For a last test, we exclude bank-owned funds from the regression to show that results are not driven by the fact that the bank-owned funds might come with different rebates compared to other funds. The effect remains in the same order of magnitude and highly significant. Note that in all regressions the differences between men and women are only identified through differences in fees paid on the same product offered by the same advisor to different clients. Female clients are

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in fact significantly less likely to receive a rebate on the fund load for any given product. Clearly, this finding cannot be explained by preferences for certain kinds of products.

To summarize, we find first that women receive significantly fewer recommendations to invest in pure equity funds and are recommended lower equity shares in their investment. This effect is present despite controlling for differences in individual risk preferences. Second, women receive more recommendations for the bank's own balanced funds. Third, advisors recommend funds with higher management fees within the same fund risk category to women. This effect is mostly due to the fact that the bank's own balanced funds are more expensive compared to funds with the same risk level. Finally, women are significantly less likely to receive rebates on the upfront load of any given product. While the more frequent recommendations for the (expensive) bank own funds could be related to a hypothetical higher willingness to pay for delegating the investment decision, this argument does not explain why women less often receive discretionary rebates on the upfront fees charged upon purchase of a fund. In the next section we will propose a potential mechanism for the findings reported.

4   What explains differences in product recommendations and costs?

4.1   Gender as a signal for financial literacy?

The central question therefore is: Why do advisors treat women differently than men? In the previous section we showed that the results do not seem to be driven by gender differences in risk preferences, they are also not driven by differences in the wealth held at the bank or the value of the recommendations. However, a fact that has widely been documented in the literature is that women on average have lower levels of financial literacy than men (for a review, see Bucher-Koenen, Lusardi, Alessie, and van Rooij (2016)). This matters in our context, because higher financial literacy is associated with significantly better financial decision making skills (for a review, see Lusardi and Mitchell (2014)).

In this section we set up a simple theoretical model which relates financial advice to clients' gender and financial literacy and we derive some predictions regarding the financial advice given to women and men. The predictions of the model are closely related to our empirical analysis. As is typically assumed in the recent advice literature, the advisor in our model benefits in some way if the client picks from a certain subset of alternatives – this may be due to kickbacks or due to greater familiarity with certain options, which therefore require less research and effort on the part of the advisor. The advisor therefore prefers to suggest options from this subset to his client, all else given. We add an additional model ingredient to this, in that the advisor is uncertain with regard to the client's aptitude.

Why is aptitude important? Higher financial literacy of clients implies that they have a better understanding of financial matters and are able to make better decisions on their own and reject

advice once their outside option grants higher utility. The advisor tries to infer the client's financial literacy from observable traits, because this knowledge helps him to optimally tailor his advice: less informed clients are less likely to recognize more costly or bad advice (which may be particularly lucrative to the advisor, as in the case of kickbacks for a product sold by the advisor's firm). On the other hand, better informed clients are more likely to recognize and reject bad advice. The advisor therefore has an incentive to suggest better options to clients with higher *signals* of financial literacy. Assuming that advisors use gender as a signal of financial literacy and putting these arguments together, clients signalling low literacy (women) but who are in fact well informed should be substantially more likely to reject advice they have received, since they (a) receive and (b) recognize bad advice with a substantially higher probability. Next, we formally derive these relationships and in the following subsection we will empirically examine the additional hypotheses derived from the model.

General Setup. Consider a setting with two rational agents, a client and a financial advisor. The client faces the task of choosing a product (e.g., an investment fund) from a set $Q = \{q_1, ..., q_z\}$ of potential alternatives. She derives utility $u(q_j)$ from alternative q_j, whereas she receives a utility normalized to 0 if no alternative is chosen. Clients differ in their levels of financial literacy or aptitude θ_i, with $\theta \in [0, 1]$.[11] A higher θ signifies stronger ability.

Ex ante, the client does not know the full set of potential alternatives. In the spirit of Stigler (1961) she can engage in a search to uncover them on her own, which determines her outside option in the "advice game" described below. We assume that the expected utility from random search is $Eu(q_S|\theta_j)$.[12] As Rothschild (1974) demonstrates, this expected utility generally increases as clients' search costs decrease. We assume that clients' search costs are decreasing as their level of financial literacy rises, and therefore $Eu(q_S|\theta_i)$ is strictly increasing in θ.[13] This assumption seems natural: Higher aptitude could be associated with a better grasp of technical terms and concepts such as compound interest, so that less effort is required to study each offer. It could also decrease the time necessary to recognize and dismiss unsuitable offers.

We model the interactions with the advisor as a reduced form game of asymmetric information with the following timing and information structure:

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

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[11]Here, we think of financial literacy as 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.

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

[13]Hackethal, Haliassos, and Jappelli (2012) argue for the opposite relationship owing to potentially higher opportunity costs of time spent on research for people with higher aptitude. However, we have evidence that on average, clients with higher financial literacy compare more alternative products.

2. The client decides whether to accept or reject the offer. If the client accepts the offer, she receives the utility $u(q_a)$ and the advisor receives the utility $\nu(q_a)$. If she rejects the offer, the advisor receives utility $-\lambda_i$, for example, owing to complaints or the possibility of lost future business. The client can then decide whether to search independently or to choose no option and obtain a utility of 0.

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

$$u(q_a) \geq \max\{Eu(q_s|\theta_i), 0\} \tag{3}$$

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

Hypothesis 1: *For a given suggested alternative q_a, the probability that a client will accept is (weakly) decreasing in the client's level of financial literacy θ_i.*

In other words, more financially literate clients are more selective regarding advice, owing to their more valuable outside option from independent search.

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

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

$$p^+(q_j|s_i) = F(\theta^c(q_j)|s_i) \tag{4}$$

The advisor's utility is $\nu(q_a)$ if the client picks the suggested alternative, whereas he suffers expected (dis)utility $-\lambda_i$ if the client refuses the offered advice, the size of which may depend on the client's characteristics. This approach captures the possibility of losing future business if the client is dissatisfied or if complaints are logged. The advisor facing client i solves the maximization problem:

$$\max_{q_a \in Q} p^+(q_a|s_i)\nu(q_a) - (1 - p^+(q_a|s_i))\lambda_i \tag{5}$$

Assume that alternatives can be ordered such that a higher index represents a better alternative from the perspective of the client. The advisor will prefer to suggest alternative $j+1$ over alternative

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j, that is, he will offer better advice for the client, if the following condition holds:

$$\frac{p^+(q_{j+1}|s_i)}{p^+(q_j|s_i)} > \frac{(\nu(q_j) + \lambda_i)}{(\nu(q_{j+1}) + \lambda_i)} \tag{6}$$

Intuitively, the increased probability of the client following advice has to outweigh the advisor's utility loss from suggesting a less preferred (from the advisor's perspective) option. The advisor trades off the additional likelihood of the better suggestion being accepted versus the foregone private benefit from lower compensation. The inequality is trivially satisfied whenever $\nu(q_{i+1}) \geq \nu(q_i)$. In this case, the interests of the advisor and the client are aligned and alternative q_j is dominated – the advisor can increase either his own payoff or the probability of acceptance by picking the dominant alternative. In general, screening out dominated alternatives is an important benefit that financial advisors offer their clients. Finally, note that the righthand-side of the inequality is decreasing in the value of λ_j: as the disutility from failing to convince the client grows larger, the necessary increase in the likelihood of acceptance from offering better advice shrinks.[14]

Conflict of interest and kickbacks or standard products. Next, we zoom in on the structure of ν, the advisor's compensation. Financial advisors are frequently incentivized through kickbacks or bonus payments if they sell certain products. Bank financial advisors receive a fixed salary, but banks are allowed to pay their employees bonuses based on the success of the branch, the team, and/or the entire bank. Alternatively (or in addition) advisors may have an incentive to recommend standard products predefined by their employer, because it reduces the effort required on their part (e.g., time spent researching alternatives), while the bank benefits from selling own products (Hoechle, Ruenzi, Schaub, and Schmid, 2018), in turn.

Assume that the advisor (or the bank) receives a base utility of v (fixed-wage component) as well as a private advantage (via a kickback or lower effort cost) of $b > 0$ only if he successfully suggests an alternative from the set $Q_b \subset Q$ to the client. Within Q_b, the advisor then has an incentive to suggest the alternative that conveys maximal utility to his client, because it has the highest probability of acceptance. Analogously, all but one of the alternatives for which the advantage b does not accrue to the advisor must be (weakly) dominated: The one that conveys the maximal utility to the client. If the overall optimal (from the perspective of the client) alternative is not within Q_b,[15] then the advisor's problem is reduced to suggesting either an alternative for which he receives an advantage, which we denote as a_1, or the best overall option, which we denote as a_2, with $u(a_2) > u(a_1)$, while $\nu(a_1) > \nu(a_2)$. From this, we derive the following:

Lemma 1: *If the advisor receives a private advantage $b > 0$ for successfully suggesting an alternative from the set $Q_b \subset Q$, by elimination of (weakly) dominated alternatives his problem is*

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[14]In the extreme (as $\lambda_i \to \infty$), the right-hand side approaches 1: If a certain client is very important or valuable, the advisor will have an incentive to maximize the probability of her acceptance of his advice by making the best available suggestion. For this reason and since we allow λ_i to depend on the client's characteristics, we have to control for the client's importance to the bank, such as by using overall financial wealth with the bank or the value of the specific recommendation.

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

reduced to suggesting one of (at most) two alternatives a_1 and a_2.

Financial literacy and the quality of advice. An advisor would prefer to convince the client to pick alternative a_1, even while he knows that the client would be better served by a different option. Given the findings above, we derive the following central result. Assume that an advisor receives $b > 0$ if he successfully suggests an alternative from $Q_b \subset Q$ to the client. Further assume that an alternative a_Z exists, with $u(a_Z) > u(q_b) \,\forall q_b \in Q_b$ and $u(a_Z) \geq u(q_i) \,\forall q_i \in Q$.

Hypothesis 2: *For two signals $s' > s$, the probability of the advisor suggesting a_Z is greater if he observes the signal of higher financial literacy s' than if he observes signal s.*

Proof: If an alternative a_Z with the properties described above exists, then $p^+(a_Z|s_j) = 1 \,\forall s_j$ and a_Z must be one of the two alternatives that the adviser considers. Denote the alternative in Q_b that maximizes the acceptance probability by the client as a_1. By Lemma 1, we know that the advisor only considers these two alternatives. Denote the distribution function of ϵ as $\mathcal{N}$. Plugging into (6), we can explicitly derive the probability of the advisor suggesting a_Z over alternative a_1 as $1 - \mathcal{N}\left(\frac{p^+(a_1|s_j)}{1-p^+(a_1|s_j)}b - v - \ell_j\right)$. By first order stochastic dominance, $p^+(a_1|s') < p^+(a_1|s)$ if $s' > s$ which yields Hypothesis 2.

A higher observed signal of financial literacy is more likely to induce the advisor to offer better advice to the client, and (partially) forego his private advantage. This response is the central mechanism we are interested in. To paraphrase: Clients who *appear to be smarter* are more likely to receive better advice from advisors. We refer to this hypothesis as *miss-selling hypothesis*.

Finally, this analytical framework suggests an additional aspect, which can be empirically examined: As a high signal of financial literacy is associated with receiving better advice, it is rational to adhere, irrespective of actual financial knowledge of the client. So we should observe the mechanism of Hypothesis 1 – smarter clients reject advice more often – mainly or only when they also receive suboptimal advice due to a bad signal – Hypothesis 2. Intuitively, two factors must coincide for an offer to be rejected: 1) The advice received from the advisor must be suboptimal and 2) the client must recognize this and be able to do better on her own. Thus we hypothesize that clients with bad signals of financial literacy but high actual financial literacy are more likely to reject a given advisor recommendation. We refer to this as the *rejection hypothesis*.

Our empirical observations in the administrative bank data reported in Section 3 are: clients with a signal for lower financial literacy, i.e. women, are more likely to receive product recommendations which do not align with their risk preferences. They pay higher management fees for funds within the same risk category and they are less likely to receive rebates on the front-end loads. All of these observations are in line with the miss-selling hypothesis. In the next section, we will empirically investigate the rejection hypothesis.

4.2 Are Women with higher financial literacy more likely to reject advice?

In order to examine the rejection hypothesis we need a data set in which we observe both the signal as well as the "true" financial literacy of the client. Unfortunately, for the majority of clients in our bank sample we do not observe the true financial literacy. However, within the bank data set, we observe a subsample of clients and their respective recommendations, for whom we have an overlap with two surveys conducted among bank clients in 2018/2019. In these surveys clients' financial literacy was assessed using financial literacy quizzes. In the first survey among 520 clients five literacy questions were asked and in a second survey among 258 clients two additional literacy questions were asked (see appendix tables B1 and B2 for the wording of the questions). The results of the survey for individual clients are unknown to the bank. The financial literacy questions entail the three basic literacy questions by Lusardi and Mitchell (2007) and some additional questions asking about the riskiness of different savings products and some institutional knowledge about investment funds. We group the financial literacy questions into four general questions of financial literacy and questions of fund specific knowledge. The distributions of correct answers for both measures are shown in figure 5. In the first measure the median client answered three out of four questions correctly. In the fund literacy survey the median client answered 2 out of 3 questions correctly. The figure also reveals that on average in our sample women have lower levels of test based financial literacy which is in line with results in the literature. Men answer on average 3.25 general and 1.67 fund questions correctly, vs. 2.97 and 1.3 correct answers among women, respectively. For the purpose of our study, we define a high-literacy (high fund-literacy) client as someone who answers all general questions (fund questions) correctly.

Empirical Strategy. On the basis of the analytical framework, our identification strategy in this section hinges on the fact that the data allow us to observe a measure of the client's true financial literacy, which is unavailable to the advisor, in addition to the signal of financial literacy, which is observable to both the advisor and us as researchers. We employ being female as a signal of low aptitude and being male as a signal of high aptitude.[16]

To test the rejection hypothesis, we estimate linear models of the following form:

$$y_i = \beta_0 + \beta_1 x_i * gender_i + \beta_2 z_i + \epsilon \tag{7}$$

where, y is a measure of client i's adherence to the advisor's recommendation. More specifically it is an indicator if the recommended investment alternative was implemented within 30 days after the meeting. x is the objective measure of financial literacy, and z is a vector of controls including the same variables as in our previous regressions. In order to test our predictions, we interact financial literacy and gender. Corresponding to the 'rejection hypothesis', financial literacy should

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[16]One potential problem in this context is that couples make financial decisions jointly given the financial advice they have received; to account for this, we control for the marital status of respondents in all specifications.

have a significant effect on following advice only for individuals with "bad" signals, in our context women. Since the sample for this analysis is substantially smaller than the samples before, we cannot add year times month and advisor fixed effects. Instead we add month fixed effects and average all control variables by advisor and include these advisor averages instead of advisor fixed effects (Mundlak correction).

Results. The results are reported in Table 5. The average effect of financial literacy on adherence is negative and insignificant for the general financial literacy measure (Column 1), it is negative and significant for the more specific fund literacy measure (Column 2). Differentiating the effects by gender (column 3 and 4) reveals that only financially literate female clients are significantly less likely to follow advice. An F-test shows that the coefficients for men and women differ significantly in both regressions. Higher financial literacy, or a better outside option, only makes rejections more likely for women, a finding compatible with the prediction derived in the analytical framework.

Since the bank data set in combination with the survey is limited, we additionally make use of a panel data set of German households called SAVE. The SAVE data set contains detailed information on households' financial situation as well as their socio-economic and psychological characteristics.[17] Our analysis is primarily based on data from SAVE 2009, which contains 2,222 observations and which elicited respondents' financial literacy. Our main variables of interest are the household's level of financial literacy, whether the household solicited financial advice, and whether the household followed the financial advice it received. Summary statistics are provided in the appendix Table .[18] In the SAVE data, about one-third (33.7 percent) of the overall sample reports having consulted an advisor in the previous year.[19] As a follow-up question, respondents who consult professional advisors were asked how closely they adhere to the received advice on a scale from 1 to 10 (from 0 = not at all to 10 = entirely). On average, respondents tend to follow advice – only around 15.8 percent of the responses are below the center of the scale (5). Financial literacy is elicited using objective measures of financial literacy based on quizzes similar to questions in prior work, e.g. Lusardi and Mitchell (2007) and Van Rooij, Lusardi, and Alessie (2011). In total, nine financial literacy questions were asked in SAVE in 2009. We can construct two measures of financial literacy – basic and advanced. Each literacy measures is composed of a set of four questions, which are – judging by the answering behavior of respondents – relatively easy (basic literacy) respectively difficult (advanced literacy).[20] We create two indices from the

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[17]For a detailed description see Börsch-Supan, Coppola, Essig, Eymann, and Schunk (2009).

[18]We drop observations with missing information on our dependent variables or the central explanatory variable financial literacy.

[19]This refers to advisors from banks, insurance companies, or other financial service providers. The fraction of households consulting advisors is rather stable over time.

[20]Van Rooij, Lusardi, and Alessie (2011) and Bucher-Koenen (2011) conduct factor analyses to group financial literacy items into different constructs. The basic questions examine the understanding of interest, inflation, compound interest, and money illusion. The fraction of correct answers among these questions ranges from 57.2 percent on the money illusion to 85.7 percent on the interest question . The advanced questions test the understanding of return fluctuations, stock markets, risk and diversification, and mutual funds. The percentage of correct answers ranges from 47.4 percent on the funds question to 73.4 percent on the return question.

number of correct answers. Around 17 percent (8.4 percent) of the respondents in the survey were unable to give even a single correct answer to the four advanced (basic) questions, while 31 percent (41 percent) were able to answer each advanced (basic) question correctly.

We apply the same empirical strategy as before using the survey measure of adherence. Table 6 shows the results within the SAVE Panel: We find a significant negative effect of financial literacy on self-reported following professionals' financial advice. This finding is concurrent with our hypothesis that more knowledgeable clients are more likely to reject advice. Comparison of the effects for basic and advanced financial literacy shows that for the rejection of financial advice, only advanced literacy matters. Inserting interaction terms of the objective financial literacy with gender (Column 2) reveals again that only women with higher advanced financial aptitude reject received financial advice with a significantly higher likelihood. In fact, for men this effect is not only insignificant, but actually 0.00 in the survey sample. In accordance with the rejection hypothesis, an F-test of the coefficients for men and women reveals that compared to men, the effect of advanced financial literacy on women's decisions is significantly stronger. Higher levels of financial literacy do make clients more likely to reject advice, but this result holds only for individuals endowed with a bad signal of their financial skills – here, women.

Overall, predictions of our theoretical framework are in line with the results, that we obtained in the data. It seems that advisors tailor their advice to their clients based on observed signals of financial aptitude. As a result women, receive lower quality advice, i.e recommendations for products that are less in line with their risk preferences and more costly. However, given that their true literacy is high they are more likely to reject this advice.

5   Discussion

In this section we discuss some alternative mechanisms, which could conceivably explain the observed differences in advice to male and female clients. We also raise the issue of possible economic consequences of the different product recommendations for women's portfolios.

5.1   Catering to specific (gender-based) client requests?

We observe empirically that women are more likely to receive recommendations for the bank-owned balanced funds. However, some clients might actually be willing to incur higher costs in exchange for specific product features. In the following, we analyse whether there might be characteristics of bank-owned balanced funds that make them more attractive to female clients, in particular.

From the administrative bank data we can examine whether the advisory meeting was initiated by the client or the advisor. Overall, 72% of the meetings are initiated by the advisor (no significant differences between male and female clients). In Column 1 of Table 7 we run a regression on whether bank own funds were recommended based on the sample of meetings that were initiated

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by the advisor – here, the clients own motives should play less of a role compared to meetings initiated by clients. The results in Table 7 reveal that our previous findings hold: Female clients are significantly more likely to receive a recommendation for one of the bank's own balanced funds in meetings initiated by the advisor. To further pursue the issue, we next consider adherence to recommendations with a focus on bank own funds. If women were more likely to follow this type of recommendation (while controlling for other relevant factors), this could be a signal of (revealed) client preferences. Again adherence is defined as an indicator equal to one if a purchase recommendation is followed within 30 days after the meeting. There is no evidence that women are more likely than men to adhere to advice, if a bank-owned balanced fund is recommended to them (interaction-term in Column 2).

What else could lead to higher willingness to pay for bank owned balanced funds? Figure 6 summarizes potential differences in motives and goals of male and female clients for seeking advice. The data are again obtained from a survey that was run with clients of the bank, which randomly overlaps with 199 clients (135 men) in our sample. Figure 6 reveals that women are more likely to seek advice in order to find a suitable asset allocation and feel relief due to being able to delegate the investment decision. The fund brochures of the bank's own balanced funds directly appeal to these desires. Rather than having to make a series of individual investment decisions, these products promise to be a "convenient" all-in-one portfolio solution that does not require any further action on the part of the investor.

Based on the transcribed advisory meeting protocols, we are able to examine whether advisors make use of these arguments. For this, we run a text analysis on the reasons that advisors state for recommending a certain product. Due to the variation in phrasings, typos, and abbreviations in the protocols a fully automated text analysis is unfeasible. Therefore, we hand-collected the evidence on client preferences as stated by advisors. Figure 8 shows the most frequently stated reasons for recommending a product, separately for bank own funds and other fund products. Diversification is the reason most often stated for both categories equally (it was stated as relevant for recommending in 78% of cases for other products and for 81% of cases in bank-owned funds). A fund's investment strategy plays a role in slightly less than 20% of the cases, respectively. As opposed to this, we observe substantial differences when looking at the role of "hand-holding" and "convenience". These reasons are relevant for around half of the recommendations for the bank's own funds compared to almost no references (4% hand holding, 0% convenience) in case of other product recommendations. Taking the evidence from both figures together, we do observe a certain level of correspondence between the motives stated by women for seeking investment advice and the reasons stated by advisors for recommending bank owned funds. In the following, we demonstrate how expensive this (possible) preference can turn out to be.

In order to understand if the differences in fees resulting from advisors' differential treatment of men and women are economically relevant, we perform a simple back of the envelop calculation. The most frequently recommended bank-owned fund invests 40% in equity and 60% in bonds, and is associated with a total expense ratio of 2.2%. A similar portfolio could therefore be achieved

by investing 40% of the assets into an equity fund and 60% into a bond fund. The average equity fund recommended in our sample has an expense ratio of 1.5, the average bond fund of 0.97. It is important to note that we use a rather conservative approach to calculate fee differences by focusing on funds which are recommended – a more extreme approach would be to instead consider the fees of index funds or exchange traded funds (ETFs) as a benchmark. Figure 9 shows the results from this exercise if a client invests 10,000 Euros in total over different investment horizons. The alternative combination of funds would, holding returns constant at 6%, result in a difference in final wealth of around 1,500 Euros after 10 years and 4,500 Euros after 20 years, which is in line with the fact that 48% of the recommendations in the sample are tailored to a long-term investment horizon. These cost differences are substantial.

Thus, while these motives might explain why women get more recommendations for the bank's own balanced funds, for which they would be willing to pay a premium, it remains unclear whether they are fully aware of the full costs they pay. As one piece of evidence, the fact that women less often receive (ask for) a rebate on the upfront fee charged upon mutual fund purchase casts doubt on the hypothesis, that the higher fund fees paid by women exclusively reflect a higher willingness to pay for additional service.

Thus, even though the evidence suggests that women tend to look for investment opportunities that allow them decision delegation and an easy solution to their portfolio management. And that advisors tend to sell the bank's own funds exactly under these premises we are not convinced that the clients who follow these recommendations are aware of the price they pay. Interestingly a disclosure of the Euro price might not help in these cases either because individuals are not able to make a price and product comparison easily.

5.2 Differences by advisor gender?

Since the finance industry is male-dominated, differential treatment of male and female clients could be present. We split our sample by advisor gender and run the same regressions as before in order to check if the results differ for male and female advisors (see Table).

We find that differential treatment of female and male clients is almost only significant and relevant in the regression for the male advisors. Male advisors are more likely to recommend less risky products, a lower equity share and a higher fraction of bank own funds to female clients. While female advisors tend to recommend similar products to male and female clients. The differences in the product fees and rebates recommended by female and male advisors to their female clients are less clear. While these results do not contradict our proposed mechanism we need to investigate the precise recommendations by male and female advisors in more detail.

5.3 Negotiation skills?

Another driver of the results could be differences in the tendency to negotiate by gender. There is ample empirical evidence that women are less willing to negotiate compared to men. Thus in an

advisory meeting women might be less likely to ask for investment alternatives or a rebate. With the evidence available to us at this moment, unfortunately, we cannot examine this mechanism further. However, we are aware that this could be an interesting mechanism and it is definitely worth examination in the future. Overall, the conclusions of the paper would not change fundamentally because of this alternative mechanism. However, the policy conclusions might be slightly different. If financial literacy is the main driver, investment in financial literacy might help, if negotiation skills are required, higher levels of financial literacy might not help women in getting better investment advice. However, financial literacy and negotiation skills might even be interrelated. If women were more financially literate and confident about their knowlegde they might also be more likely to ask for alternative product recommendations or rebates. However, closer examination is required here in future work.

5.4   Alternative signals for financial literacy?

We suggest that individuals who appear to be less sophisticated receive worse advice, which implies that the effect goes beyond a pure gender effect. To test this broader idea, we can look into alternative measures for the appearance of low literacy, for example education and German citizenship. Education is correlated with financial literacy and has been used as a proxy for financial expertise in studies such as e.g. Georgarakos and Inderst (2011). Since we do not have a direct measure for education in our bank data, we can examine if the client holds a doctoral degree or a management position. In addition, we use a second proxy for apparent low literacy, namely whether a client has a foreign citizenship. The reasoning is that these clients are less accustomed to the German banking system and therefore are likely to have a lower institutional knowledge, which is also a part of financial literacy. These clients account for 5 percent of the clients in our sample. Results show that, clients with an academic degree or a those holding a management position are less likely to receive recommendations to purchase a bank-owned fund (see Table 2 Column 6). The effect of foreign citizenship is insignificant in this regression. With regard to the fund fee, we find no significant effect for foreign customers or management position or academic degree. However, the probability to be offered a rebate, is significantly lower among foreign citizens. Overall, the results indicate that the effect of adjusting advice to apparent signals of literacy might go beyond a pure gender effect. Results are, however, not as robust, which can be explained by the fact that the alternative signals display lower salience and a less favorable sample splits than the gender signal.

6   Conclusion

A limitation of the empirical literature on advice, whether in the financial context or other contexts, is that observing the interactions between the advisor and the customer is extremely difficult, and therefore evaluating the quality of advice is also challenging. We are able to overcome some of these limitations with a very detailed data set on advisory meetings. In addition, we make

use of survey data for additional information not recorded in administrative bank data. For the approach that we introduced, which can and should be replicated in the future, we use both a signal of the respondents' financial literacy, which is on average informative (the respondent's gender), and an objective measure of financial literacy, which is not available to the advisor.

Our empirical results emphasize the problems surrounding the misalignment of incentives of advisors and their customers. To refer back to the title of the paper, yes, women seem to get different financial advice compared to men. However we propose that this is not a pure gender result but comes from the fact that individuals who *appear* to be more versed in financial matters receive better advice, on average. This systematic differential treatment of customers by professional advisors has not previously been demonstrated for large sample of bank customers. It appears likely that this finding not only applies to financial matters but can be generalized to other settings in which individuals receive advice from professionals.

The basic mechanism responsible for the conflict of interest is the contractual incentive structure of advisors, with higher bonuses exacerbating the problems. This finding is in line with findings from the literature , e.g., Inderst and Ottaviani (2012a) or Inderst and Ottaviani (2009). Various policies to address this issue have been implemented, in particular disclosure of the conflict of interest to clients or a decrease in incentives for advisors by reducing the bonus component of their contracts. Clearly, these approaches may have drawbacks of their own: Lacko and Pappalardo (2010) and Loewenstein, Cain, and Sah (2011) show in experimental settings that disclosure could be associated with other disadvantages, such as clients becoming distracted from essential details owing to information overload, or advice even becoming more biased owing to the interaction of trust and signaling effects. Fee-based advisory contracts are also no panacea, since they may induce advisors to strategically inflate the number of interactions with each customer. Our findings should add an additional reason for and more urgency to these regulatory and policy efforts, since we show that costs associated with product recommendations are borne disproportionately by women. While the intention of this paper is not to question the overall quality of advice, the documented mechanism adversely affects those generally more in need of professional financial advice. The Federal Trade Commission provides shopping tips and questions to ask for customers on its website (https://www.consumer.ftc.gov/topics/shopping-saving). Initiatives like that may help less sophisticated clients to at least ask the right questions in an advisory meeting.

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Figure 1: Variation in Product Recommendations by Gender

This figures shows the share of different product categories recommended to male and female clients separately.

Panel A: Recommendations by Product Category and Gender
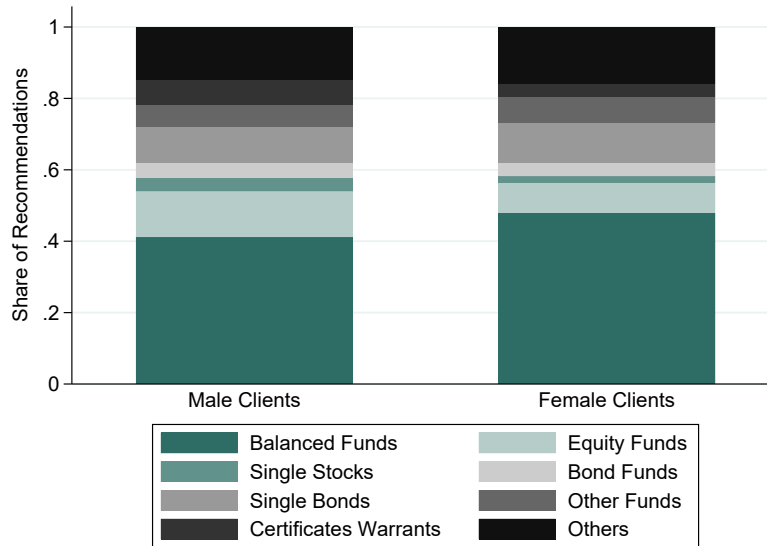
Panel B: Recommendations by Fund Type and Gender
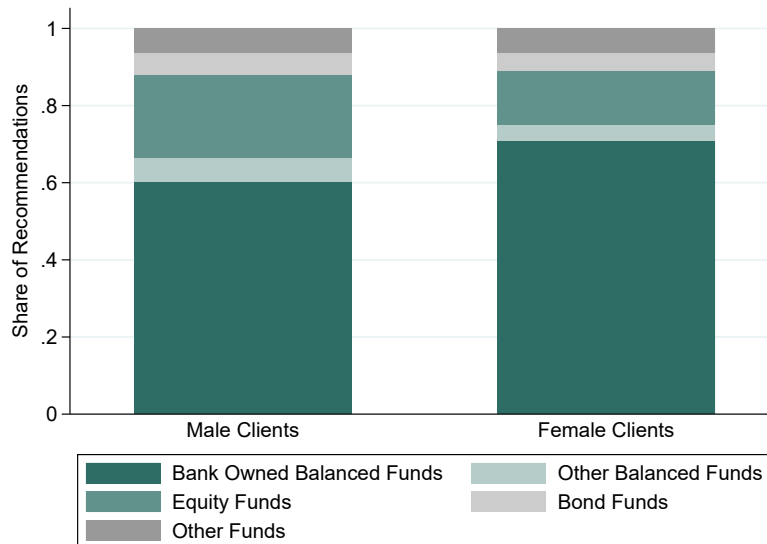
Figure 2: Fund Recommendations: Management Fees and Risk Categories

Panel A: Distribution of Risk Categories by Gender
For each risk category the figure show the share of recommendations for male and female clients separately.
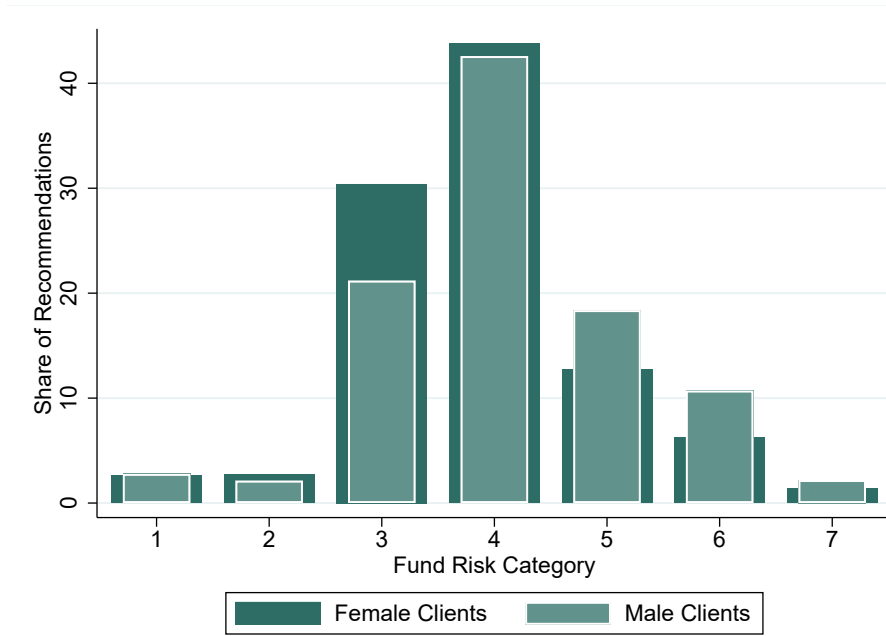
Panel B: Management Fees by Risk Category
For each risk category the figure show the total expense ratios for all funds in our sample.
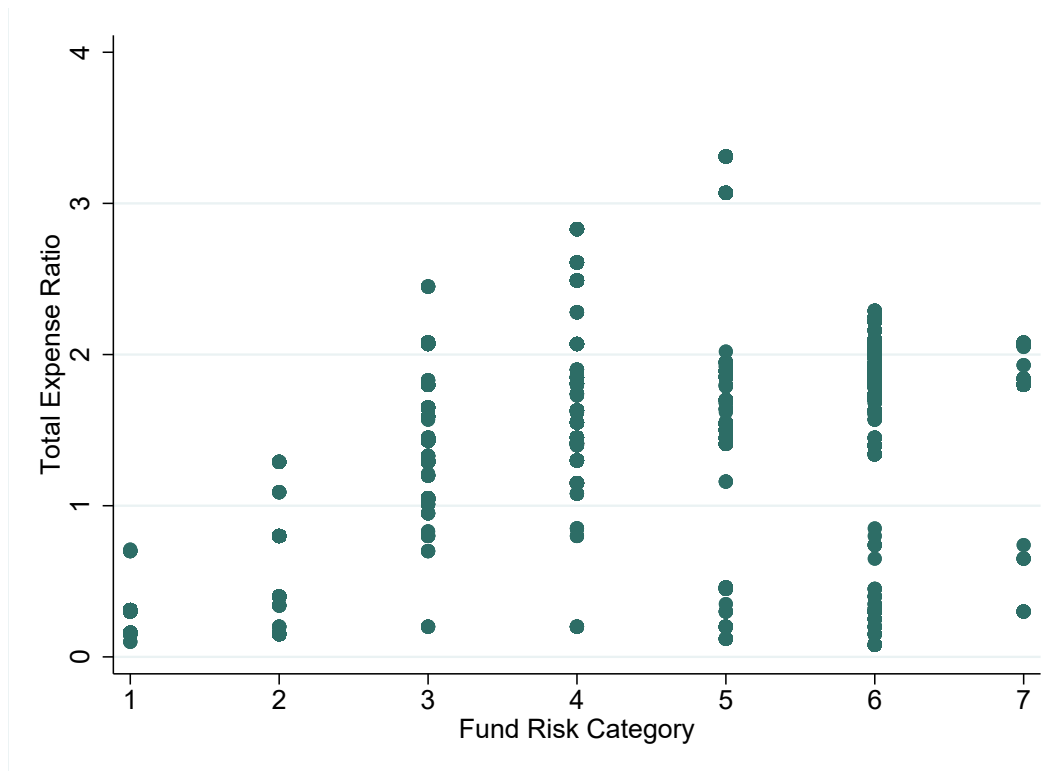
Figure 3: Fee Rank and Management Fees by Risk Category

Panel A of this figures shows the distribution of fund recommendations across five bins, from low to high costs, for female and male clients separately. The quintiles (ranks) were calculated for each of the seven risk categories separately. The figure in Panel B, shows the average management fee for bank owned balanced and other funds separately by fund risk category.

Panel A: Distribution of Fee Rank by Gender

Panel B: Fees by Risk Category and Ownership
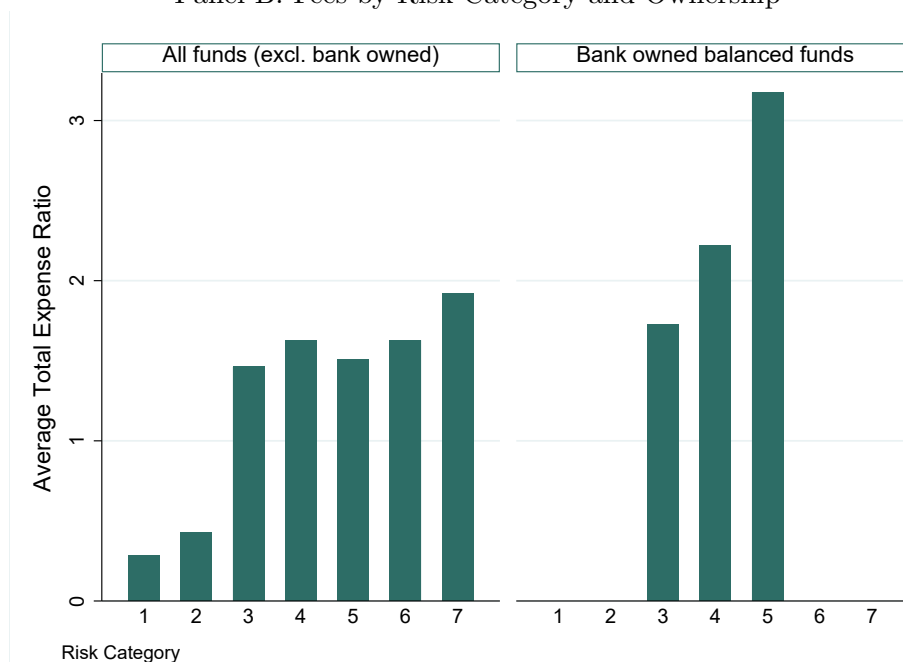
Figure 4: Rebate on Fund Loads to male (M) and female (F) clients

For each risk category the figure shows the share of fund purchases that were granted a rebate by the advisor for male and female clients separately.

Panel A: Distribution of Rebates by Asset

Panel B: Distribution of Rebates by Gender and Risk Category
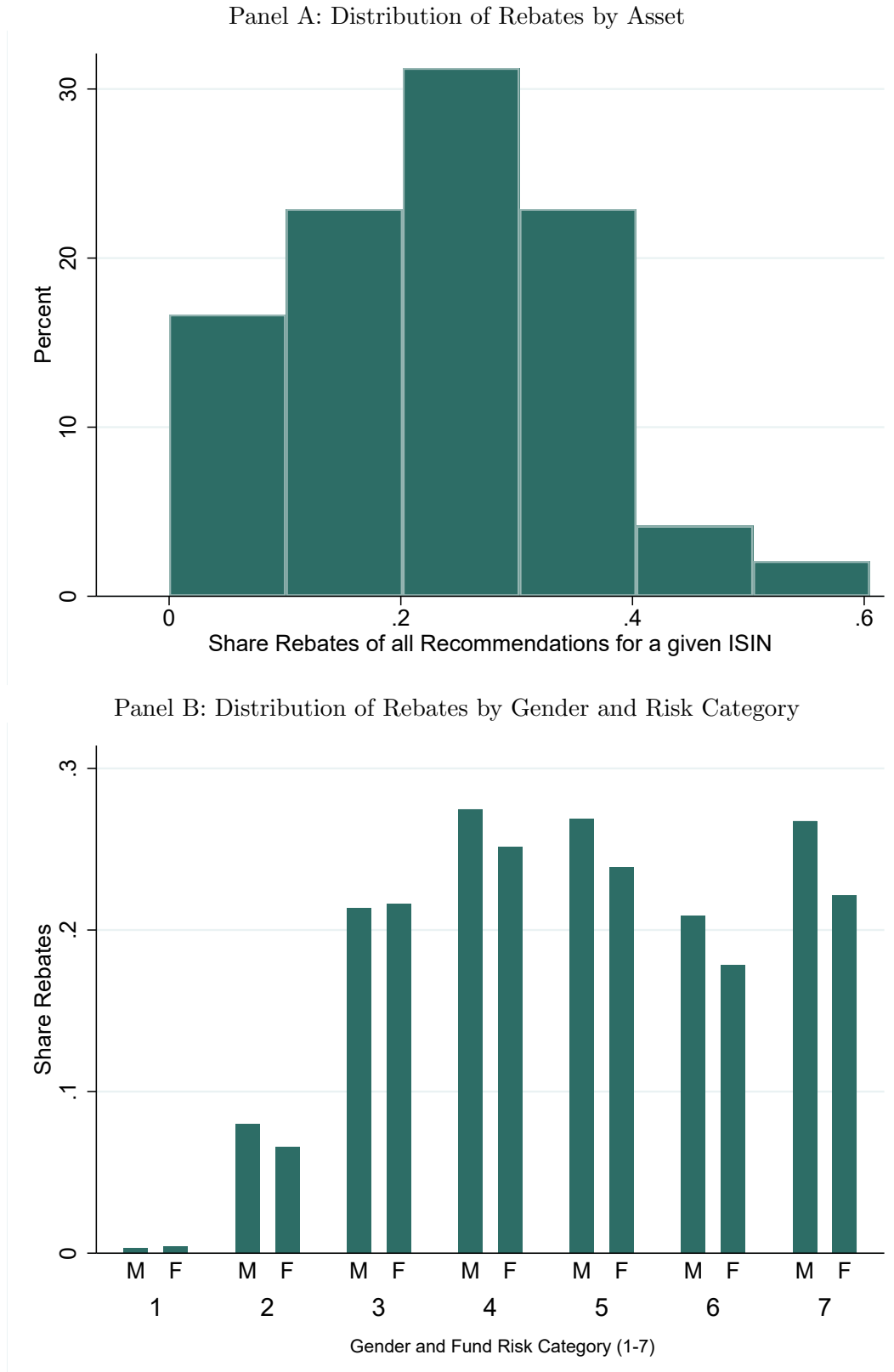
Figure 5: Financial literacy by gender

Panel A of this figures shows the distribution of correct answers to the four general literacy questions by gender. Panel B shows the distribution of correct answers to three fund literacy questions by gender. Detailed wording of questions can be found in the appendix.

Panel A: Distribution of Correct Answers to General Questions
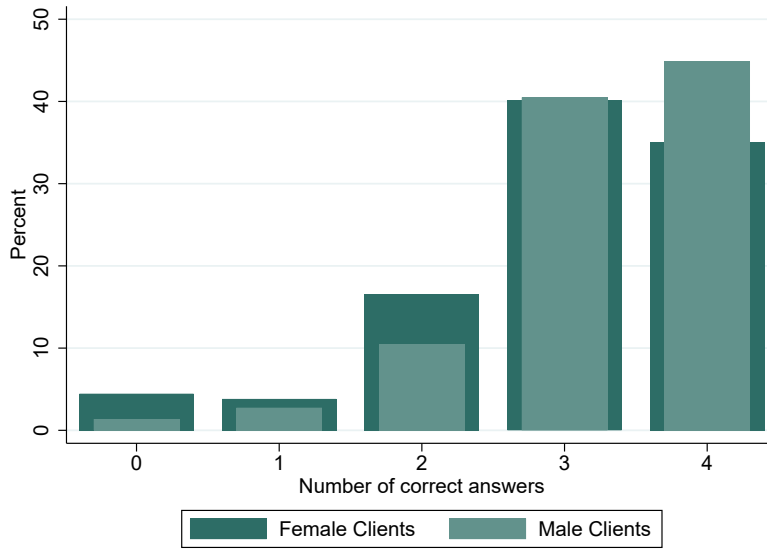
Panel B: Distribution of Correct Answers to Fund Literacy Questions
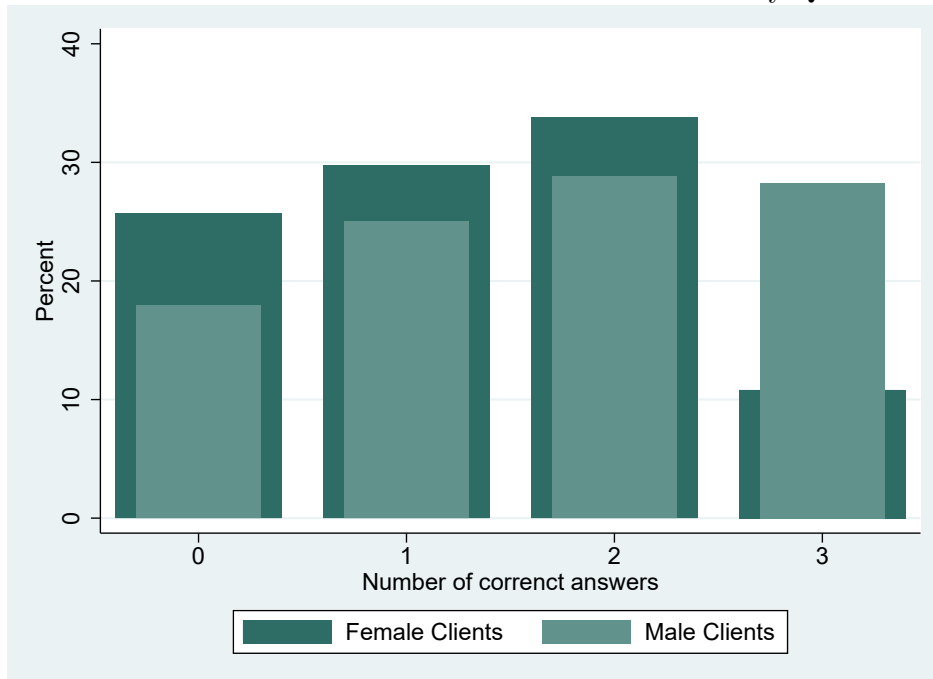
Figure 6: Motives for Advice Seeking by Gender

This figures shows the underlying reasons for advice seeking by gender.
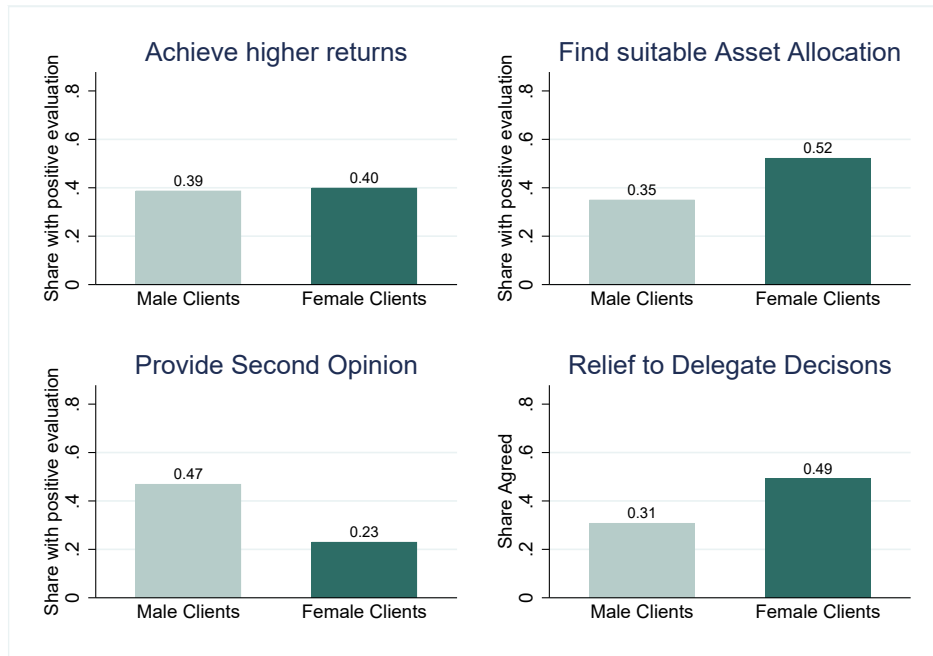
Figure 7: Returns of bank-owned versus other funds over the sample period

This figure shows the average returns of all bank-owned versus all other funds over the sample period.
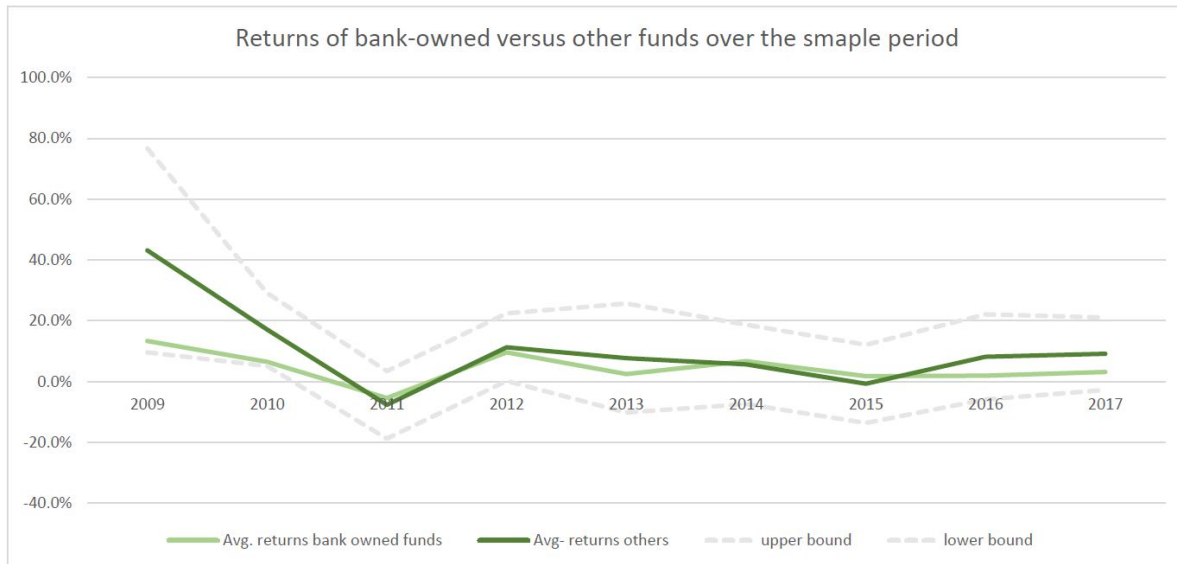
Figure 8: Differences in Reasons for Recommendations

This figure shows differences in reasons for the recommendations of bank-owned versus other fund products.
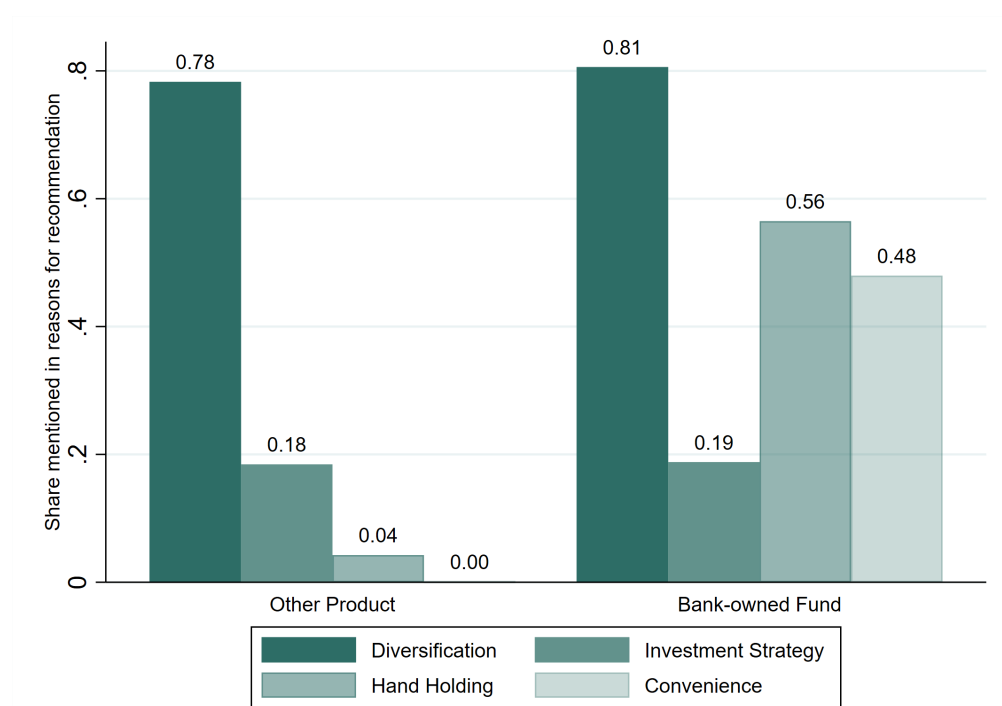
Figure 9: Stylized Differences in Financial Wealth as a result of Fund Selection

This figures shows the result of a stylized calculation of the financials wealth as a result of a bank-owned versus own investment approach. The total expense ratio of 2.2% represents the TER of the most recommended bank-owned fund. The ter of 1.18% reflects a combined solution with the same risky share based on the combination of a pure equity and a bond fund. Return is fixed to 6% per year for both funds.
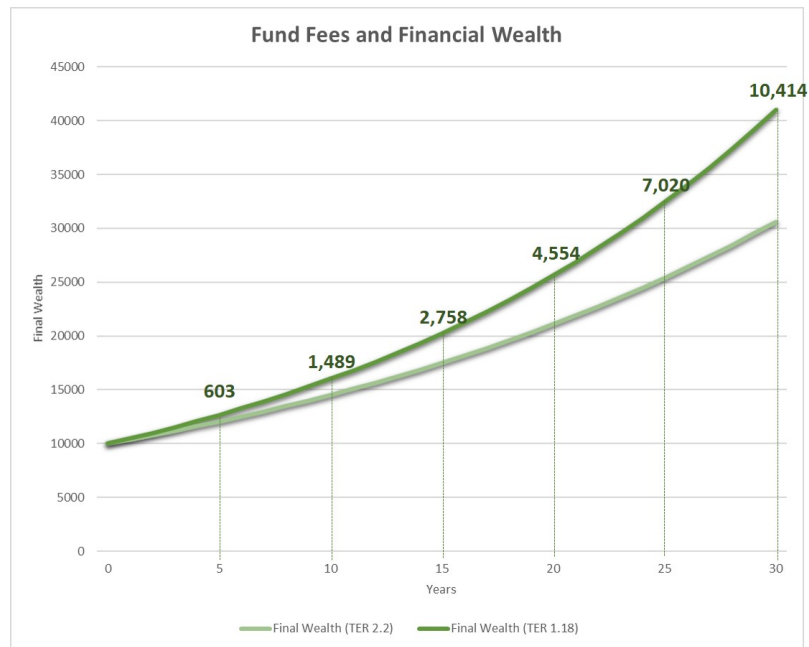
Table 1: Summary Statistics

Panel A: Client level information

	All		Women		Men	
	N	mean	N	mean	N	mean
Female	13723	0.45	6210	1	7513	0
Financial literacy (general)	520	3.17	157	2.97	363	3.25
Financial literacy (funds)	258	1.57	74	1.3	184	1.67
risk tolerance: very low	13723	0.07	6210	0.09	7513	0.05
Risk tolerance: low	13723	0.53	6210	0.6	7513	0.47
Risk tolerance: high	13723	0.23	6210	0.19	7513	0.26
Risk tolerance: very high	13723	0.18	6210	0.11	7513	0.23
Investment horizon: < 3 y.	13723	0.01	6210	0.01	7513	0.01
Investment horizon: 3 - 5 y.	13723	0.55	6210	0.56	7513	0.54
Investment horizon: > 5 y.	13723	0.44	6210	0.43	7513	0.45
Log financial wealth	13723	10.81	6210	10.73	7513	10.87
Married	13723	0.55	6210	0.45	7513	0.63
Age: younger than 50	13723	0.17	6210	0.18	7513	0.17
Age: 50 to 65	13723	0.31	6210	0.3	7513	0.31
Age: older than 65	13723	0.52	6210	0.52	7513	0.52
Employed	13723	0.39	6210	0.39	7513	0.39
Academic	13723	0.05	6210	0.02	7513	0.07
Manager	13723	0.04	6210	0.02	7513	0.05
Client-bank-relation (in years)	13723	18.47	6210	18.46	7513	18.47
Foreign citizenship	13723	0.07	6210	0.06	7513	0.07

Panel B: Recommendation level information

	All		Women		Men	
	N	mean	N	mean	N	mean
Fund equity share	35872	47.65	15267	43.65	20605	50.61
Fund risk category	36083	4.01	15356	3.86	20727	4.13
Equity fund	36083	0.18	15356	0.14	20727	0.22
Bank owned fund	36083	0.65	15356	0.71	20727	0.6
Management fee	36083	1.95	15356	1.95	20727	1.95
Quintile of the fee rank	36083	3.85	15356	3.95	20727	3.78
Rebate	29763	0.24	13005	0.23	16758	0.24
Adherence to recommendation	36083	0.62	15356	0.64	20727	0.6
Advice in person	36083	0.84	15356	0.86	20727	0.83
Meeting duration > 30 min.	36083	0.74	15356	0.75	20727	0.74
Recomm. value (in Euros)	36083	22241	15356	28905	20727	17304

Table 2: Differences in product recommendations for male and female clients

The dependent variables are: Col (1) an indicator equal to one if the recommendation is an equity fund, Col (2) and (4) the equity share of the recommended fund, Col (3) and (5) the risk category of the recommended fund, (6) and indicator equal to one if the recommendation is one of the bank's own balanced funds. Standard errors clustered by client in parentheses. */**/*** denote significance at the 10/5/1%-level.

VARIABLES	(1) Equity fund	(2) Equity share	(3) Risk cat.	(4) Equity share	(5) Risk cat.	(6) Bank fund
Female	-0.02***	-1.69***	-0.08***	-2.44***	-0.10***	0.03***
	(0.00)	(0.39)	(0.01)	(0.37)	(0.01)	(0.01)
Risk tol. very low [Ref.]						
Risk tol. low	0.05***	12.90***	0.71***	5.25***	0.42***	0.16***
	(0.01)	(0.75)	(0.03)	(0.77)	(0.03)	(0.01)
Risk tol. high	0.14***	25.98***	1.17***	18.62***	0.85***	0.06***
	(0.01)	(0.84)	(0.03)	(0.85)	(0.03)	(0.01)
Risk tol. very high	0.29***	36.72***	1.50***	29.31***	1.18***	-0.08***
	(0.01)	(0.92)	(0.03)	(0.90)	(0.03)	(0.02)
ln (value of recomm.)	-0.05***	-4.01***	-0.17***	-3.43***	-0.12***	0.04***
	(0.00)	(0.13)	(0.00)	(0.12)	(0.00)	(0.00)
ln (financial wealth)	0.01***	0.86***	0.04***	1.15***	0.04***	-0.02***
	(0.00)	(0.14)	(0.01)	(0.13)	(0.00)	(0.00)
Married	0.01*	0.33	0.00	0.64*	0.01	-0.02***
	(0.00)	(0.39)	(0.01)	(0.37)	(0.01)	(0.01)
Employed	-0.00	0.06	0.01	-0.31	-0.00	0.00
	(0.01)	(0.60)	(0.02)	(0.56)	(0.02)	(0.01)
Academic	0.03**	1.70*	0.08**	1.88**	0.07**	-0.03*
	(0.01)	(0.99)	(0.03)	(0.94)	(0.03)	(0.02)
Manager	0.03**	1.86	0.06	2.60**	0.05	-0.06***
	(0.01)	(1.16)	(0.04)	(1.08)	(0.04)	(0.02)
Client-bank-relat.	-0.00	-0.01	-0.00	-0.01	-0.00	0.00**
(in years)	(0.00)	(0.02)	(0.00)	(0.02)	(0.00)	(0.00)
Foreign citizen	0.01	-0.45	-0.02	-0.15	-0.01	-0.01
	(0.01)	(0.84)	(0.03)	(0.82)	(0.03)	(0.01)
Advice by phone [Ref.]						
Personal advice	-0.03***	-0.94*	-0.04*	-2.62***	-0.08***	0.06***
	(0.01)	(0.57)	(0.02)	(0.53)	(0.02)	(0.01)
Meeting duration:	0.05***	4.10***	0.17***	3.34***	0.10***	-0.04***
over 30 min	(0.01)	(0.45)	(0.02)	(0.41)	(0.01)	(0.01)
Constant	0.47***	52.24***	4.22***	68.25***	4.49***	0.14**
	(0.04)	(3.42)	(0.15)	(2.46)	(0.09)	(0.06)
Age Group Dummies	X	X	X	X	X	X
Month Fixed Effects	X	X	X	X	X	X
Advisor Fixed Effects	X	X	X	X	X	X
Observations	36,083	35,872	36,083	31,840	31,919	36,083
R-squared	0.36	0.36	0.40	0.48	0.50	0.43
Adjusted R-squared	0.26	0.27	0.30	0.39	0.41	0.34

Table 3: Differences in Fund Fees by Gender

The dependent variable fee is the management fee quintile within a given fund risk category. Standard error are reported in parentheses. */**/*** denote significance at the 10/5/1%-level.

VARIABLES	(1) Fee	(2) Fee	(3) Fee
Female	0.08***	0.03*	-0.03**
	(0.02)	(0.02)	(0.01)
Bank own fund			2.00***
			(0.01)
Risk tol. very low [Ref.]			
Risk tolerance low		0.46***	0.14***
		(0.03)	(0.03)
Risk tol. high		0.41***	0.29***
		(0.04)	(0.03)
Risk tol. very high		0.08**	0.25***
		(0.04)	(0.03)
ln (value of recom.)		0.06***	-0.01***
		(0.01)	(0.00)
ln (financial wealth)		-0.03***	0.01**
		(0.01)	(0.00)
Married		-0.05***	-0.01
		(0.02)	(0.01)
Employed		0.04*	0.04**
		(0.02)	(0.02)
Academic		-0.05	-0.00
		(0.04)	(0.03)
Manager		-0.07	0.04
		(0.04)	(0.03)
Client-bank-rel.		0.00	-0.00
		(0.00)	(0.00)
Foreign citizen		-0.02	0.00
		(0.04)	(0.02)
Advice by phone [Ref.]			
Personal advice		0.11***	-0.01
		(0.02)	(0.02)
Meeting duration		-0.06***	0.03**
longer than 30 min		(0.02)	(0.01)
Age Group Effects		X	X
Month Fixed Effects	X	X	X
Advisor Fixed Effects	X	X	X
Constant	3.37***	2.78***	2.51***
	(0.13)	(0.15)	(0.12)
Observations	36,083	36,083	36,083
R-squared	0.28	0.3	0.63
Adjusted R-squared	0.175	0.195	0.569

Table 4: Rebates on fund purchases

Panel A Rebate is an indicator equal to one if a client received a rebate on the upfront fee on a mutual fund purchases (load). Specification (1) to (4) include all fund purchases, specification (5) include purchases of the 50 most frequently recommended funds, and specification (6) contains only purchases of funds that are not under the bank's own management. Standard errors are reported in parentheses. */**/*** stars denote significance at the 10/5/1%-level.

VARIABLES	(1) rebate	(2) rebate	(3) rebate	(4) rebate	(5) rebate	(6) rebate
Female	-0.02**	-0.02**	-0.02**	-0.02**	-0.02**	-0.04**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
ln (value of the recommendation)			0.06***	0.06***	0.06***	0.06***
			(0.00)	(0.00)	(0.00)	(0.01)
Inv. Horizon: <3y [Ref.]						
Inv. Horizon: 3y to 5y			0.03	0.03	0.03	0.05
			(0.04)	(0.04)	(0.05)	(0.07)
Inv. Horizon: > 5y			0.04	0.04	0.04	0.06
			(0.05)	(0.05)	(0.05)	(0.07)
Risk tolerance very low [Ref.]						
Risk tolerance low				0.01	0.01	0.00
				(0.02)	(0.02)	(0.03)
Risk tolerance high				-0.01	-0.01	-0.04
				(0.02)	(0.02)	(0.04)
Risk tolerance very high				-0.02	-0.01	-0.05
				(0.02)	(0.02)	(0.04)
ln (financial wealth)				0.00	0.00	-0.00
				(0.00)	(0.00)	(0.00)
Married				0.01	0.01	0.02
				(0.01)	(0.01)	(0.02)
Client-bank-relation				0.00	0.00	-0.00
				(0.00)	(0.00)	(0.00)
Foreign citizen				-0.06***	-0.06***	-0.07*
				(0.02)	(0.02)	(0.04)
Advice by phone [Ref.]						
Personal advice				0.01	0.01	-0.00
				(0.01)	(0.01)	(0.02)
Duration of the meeting				-0.01	-0.01	-0.01
longer than 30 min				(0.01)	(0.01)	(0.02)
Constant	0.23***	0.23***	-0.34***	-0.38***	-0.31***	-0.18
	(0.04)	(0.07)	(0.09)	(0.09)	(0.10)	(0.13)
Controls: age group, employment				X	X	X
Month fixed effects	X	X	X	X	X	X
Fund (ISIN) fixed effects		X	X	X	X	X
Observations	21,785	21,785	21,778	21,778	20,510	7,492
R-squared	0.35	0.38	0.41	0.41	0.41	0.51
Adjusted R-squared	0.2	0.23	0.26	0.26	0.26	0.31

Table 5: Following Financial Advice

This table reports the effect of financial literacy and various covariates on following financial advice using OLS regressions. Adherence is measured on the basis of the recommendations implemented after a meeting with a financial advisor . Financial literacy is measured by a dummy indicating high financial literacy based on survey questions. Additional controls are the same as in our previous models. Standard errors are clustered at the client level and reported in parentheses.*/**/*** stars denote significance at the 10/5/1%-level.

VARIABLES	(1) adherence	(2) adherence	(3) adherence	(4) adherence
Financial literacy	-0.08			
	(0.10)			
Fund literacy		-0.75**		
		(0.36)		
Financial literacy*female			-0.30*	
			(0.17)	
Financial literacy*male			0.06	
			(0.11)	
Fund literacy* female				-0.79**
				(0.35)
Fund literacy*male				-0.43
				(0.36)
Female	-0.05	-0.11	0.05	-0.04
	(0.08)	(0.15)	(0.10)	(0.18)
Controls	X	X	X	X
Month fixed effects	X	X	X	X
Mundlak correction	X	X	X	X
Observations	1,342	675	1,342	675
R-squared	0.08	0.17	0.08	0.17
Adjusted R-squared	0.05	0.11	0.05	0.11

Table 6: Following Financial Advice - SAVE data

This table reports the effect of financial literacy and various covariates on following financial advice using OLS regressions. Following behavior is measured on a self-assessed survey measure on a scale from 0 to 10. Additional controls are age, education, married, net income, financial wealth, previous consultation of a financial advisor, cognition, risk aversion. Standard errors are reported in parentheses. */**/*** stars denote significance at the 10/5/1%-level.

	(1)	(2)
Female	-0.08	-0.01
	(0.168)	(0.623)
Advanced financial literacy	-0.18**	
	(0.083)	
Basic financial literacy	0.02	
	(0.096)	
Advanced financial literacy x female		-0.30***
		(0.107)
Advanced financial literacy x male		0.00
		(0.119)
Basic financial literacy x female		0.11
		(0.13)
Basic financial literacy x male		-0.14
		(0.137)
F-test: advanced financial literacy x female		$F(1, 626) = 3.72$
= advanced financial literacy x male		$Prob > F = 0.0542$
F-test: basic financial literacy x female		$F(1, 626) = 1.69$
= basic financial literacy x male		$Prob > F = 0.1944$
N	649	649
R-sq	0.034	0.040

Table 7: Catering to client requests?

Bank-owned fund is an indicator equal to one if the recommended purchase is a bank-owned balanced fund. Adherence is an indicator if the recommendation was implemented within 30 days. Standard errors are reported in parentheses. */**/*** stars denote significance at the 10/5/1%-level.

VARIABLES	(1) bank own fund	(2) adherence
Bank own fund*female		0.00
		(0.01)
Bank own fund		0.03***
		(0.01)
Female	0.03***	0.02
	(0.01)	(0.01)
Risk tolerance very low [Ref.]		
Risk tolerance low	0.16***	0.08***
	(0.01)	(0.02)
Risk tolerance high	0.06***	0.09***
	(0.02)	(0.02)
Risk toleance very high	-0.09***	0.06***
	(0.02)	(0.02)
ln (value of the recommendation)	0.04***	0.01***
	(0.00)	(0.00)
ln (financial wealth)	-0.02***	-0.01***
	(0.00)	(0.00)
Married	-0.01*	-0.02**
	(0.01)	(0.01)
Client_bank_relationship in years	0.00**	-0.00
	(0.00)	(0.00)
Foreign citizen	-0.01	-0.02
	(0.02)	(0.02)
Advice by phone [Ref.]		
Personal advice	0.05***	0.07***
	(0.01)	(0.01)
Duration of the meeting longer than 30 min	-0.04***	0.00
	(0.01)	(0.01)
Constant	0.13*	0.33***
	(0.07)	(0.07)
Controls: Age groups, employment	X	X
Advisor fixed effects	X	X
Month fixed effects	X	X
Observations	26,129	36,083
R-squared	0.45	0.26
Adjusted R-squared	0.35	0.14

Table 8: Results by advisor gender

VARIABLES	(1) Equity fund Female	(2) Equity fund Male	(3) Equity share Female	(4) Equity share Male	(5) risk cat. Female	(6) risk cat. Male
female	0.00	-0.03***	-0.39	-2.61***	-0.03	-0.12***
	(0.01)	(0.01)	(0.55)	(0.53)	(0.02)	(0.02)
Controls	X	X	X	X	X	X
Month fixed effects	X	X	X	X	X	X
Advisor fixed effects	X	X	X	X	X	X
Constant	0.40***	0.70***	49.35***	62.77***	3.63***	4.75***
	(0.05)	(0.05)	(3.87)	(4.93)	(0.16)	(0.15)
Observations	15,384	20,632	15,354	20,451	15,384	20,632
R-squared	0.36	0.36	0.4	0.35	0.43	0.39
Adjusted R-squared	0.234	0.274	0.282	0.260	0.313	0.303

VARIABLES	(7) bank own fund Female	(8) bank own fund Male	(9) fee Female	(10) fee Male	(11) rebate Female	(12) rebate Male
female	0.01	0.03***	-0.00	0.05**	-0.02	-0.02*
	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
Controls	X	X	X	X	X	X
Month fixed effects	X	X	X	X	X	X
Advisor fixed effects	X	X	X	X	X	X
ISIN fixed effects					X	X
Constant	0.35***	0.06	2.85***	2.59***	-0.54***	-0.43***
	(0.06)	(0.05)	(0.18)	(0.15)	(0.19)	(0.11)
Observations	15,384	20,632	15,384	20,632	9,470	12,261
R-squared	0.41	0.434	0.33	0.29	0.44	0.42
Adjusted R-squared	0.296	0.359	0.191	0.192	0.246	0.284

Online Appendix: Gender Differences in Financial Advice

Tabea Bucher-Koenen[1]   Andreas Hackethal[2]   Christine Laudenbach[3]

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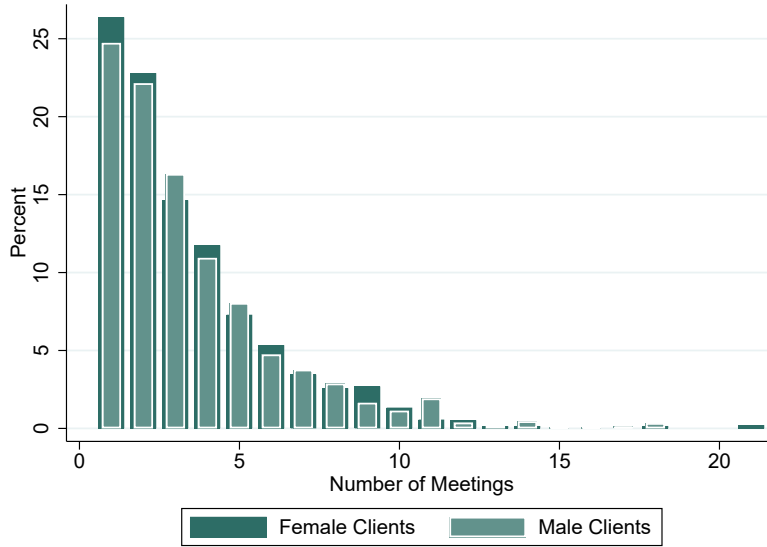
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A   Additional figures

Figure A1: Distribution of the Protocols over Calendar Months

This figures shows the the number of protocols in our sample over calendar months.

Panel A: Distribution of the number of meetings by client

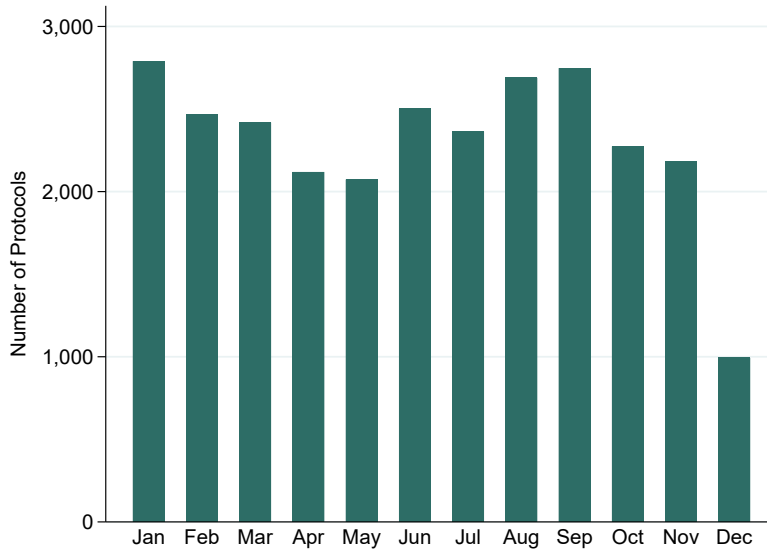Panel B: Distribution of Protocols over Calendar Month

Figure A2: Variation in Product Recommendations by Gender

This figures shows the cumulative distribution of distinct product recommendations. On the x-axis securities (identified by their ISIN) are ordered by their frequency of occurrence in the data (equally weighted). The vertical dashed line intersects with the distributional graph at the point of the 10 (20, 30, 40, 50) most recommended securities in the sample.

Variation in product recommendations
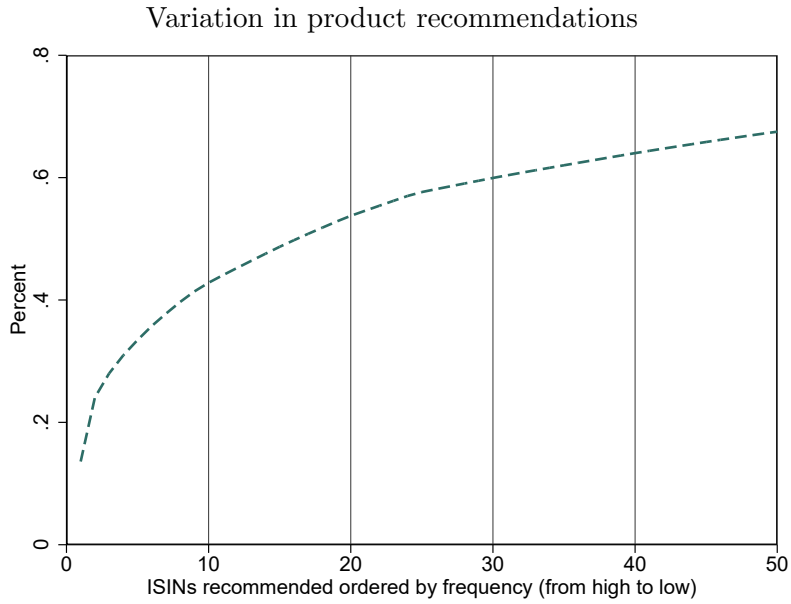
B Additional Tables

Table B1: General financial literacy questions

The table presents the exact wording of the four general financial literacy questions along with their answer format.

Concept	Question text	German original
Compound interest	Suppose you had EUR 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? *a) More than EUR 102, b) Exactly EUR 102, c) Less than EUR 102, d) Do not know*	Angenommen, ein Sparguthaben von 100 EUR wird mit 2% pro Jahr verzinst. Was mei- nen Sie: Wie viel Guthaben weist das Sparkonto nach 5 Jahren auf? *a) Mehr als EUR 102, b) Genau EUR 102, c) Weniger als EUR 102, d) Ich weiß es nicht, e) Keine Angabe*
Inflation	Imagine that the interest rate on your savings account was 1% per year and inflation was 2% per year. After 1 year, how much would you be able to buy with the money in this account? *a) More than today, b) Exactly the same, c) Less than today, d) Do not know*	Angenommen, die Verzinsung eines Spar- kontos beträgt 1% pro Jahr und die Infla- tionsrate beträgt 2% pro Jahr. Was glau- ben Sie: Könnte man nach einem Jahr mit dem Guthaben des Sparkontos genau- so viel, mehr oder weniger als heute kaufen? *a) Mehr als heute, b) Genauso viel, c) Weniger als heute, d)Ich weiß es nicht, e) Keine Angabe*
Diversification	Please tell me whether this statement is true or false. "Buying a single company's stock usually provides a safer return than a stock mutual fund." *a) True, b) False, c) Do not know*	Ist die folgende Aussage wahr oder falsch: "Die Anlage in Aktien eines einzelnen Unternehmens ist weniger riskant als die Anlage in einem Fonds mit Aktien ähnlicher Unternehmen." *a) Wahr, b) Falsch, c) Ich weiß es nicht, d) Keine Angabe*
Product risk	Please rank the following investment products according to their financial risk involved (in ascending order, starting with the one with the lowest risk) *Correct ranking: 1. Savings account 2. Corporate bond 3. Stock; alternatively, clients yould choose "Do not know"*	Bitte ordnen Sie die vier untenstehenden Anlageformen nach ihrem durchschnitt- lichen Risiko (in aufsteigender Reihen- folge, beginnend mit dem Produkt mit dem geringsten Risiko). *Korrekte Reihen- folge: 1. Sparkonto 2. Unternehmensan- leihe 3. Aktie; alternative Antwortmö- glichkeit: "Ich weiß es nicht"*

The table presents the exact wording of the three fund literacy questions along with their answer format.

Concept	Question text	German original
Fund fees: actively managed vs. passive funds	Please state whether this statement is true or false. "ETFs and other passive funds on average charge higher annual fees compared to actively managed funds." *a) True, b) False, c) Do not know*	Ist die folgende Aussage wahr oder falsch: "ETFs und andere passive Fonds verlangen in der Regel höhere jährliche Gebühren als aktiv gemanagte Investmentfonds." *a) Wahr, b) Falsch, c) Ich weif es nicht.*
Fund fees: Size of upfront charge	In many cases, a upfront fee is charged upon purchase of an actively managed investment fund. In what range does this fee fall for an average actively managed equity fund? *a) 0-0.5% of the amount invested, b) 1-2% of the amount invested, c) 4-6% of the amount invested, d) 8-10% of the amount invested, e) I do not know the average size of this feet, f) I did not know that there is such a fee*	Beim Kauf von aktiv gemanagten Investmentfonds fällt häufig eine Ausgabege- bühr an. In welcher Größenordnung liegt dieser sogenannte Ausgabeaufschlag regu- lär für einen durchschnittlichen, aktiv gemanagten Aktienfonds? *a) 0-0,5% der Anlagesumme, b) 1-2% der Anlagesumme, c) 4-6% der Anlagesumme, d) 8-10% der Anlagesumme, e) Ich weiß nicht wie hoch diese Gebühr ist, f) Ich wusste nicht, dass eine solche Gebühr existiert*
Mutual fund	Which one of the following statements is NOT a possible advantage of investing in investment funds from the perspective of an investor? a) The possibility to invest diversified, b) The possibility to invest in special markets, c)The possibility to invest small amounts of money, d) The possibility to participate in the choice of individual stocks, e) Do not know.	Bei welchem der folgenden Punkt handelt es sich aus der Sicht eines Anlegers NICHT um einen möglichen Vorteil eines Fonds? *a) Die Möglichkeit diversifiziert zu investieren, b) Die Möglichkeit in spezielle Märkte zu investieren, c) Die Möglichkeit mit kleinen Beträgen zu investieren, d) Die Möglichkeit bei der Titelauswahl mitzuentscheiden, e)Ich weiß es nicht*

Table B3: Summary Statistics SAVE

Variable	N	Full sample Mean	Std.Dev.	N	Conditional on advice Mean	Std.Dev.
Female	1,910	0.51	0.50	649	0.47	0.50
Age	1,910	54.89	15.14	649	55.58	15.04
Low education	1,910	0.10	0.31	649	0.08	0.28
Intermediate education	1,910	0.71	0.45	649	0.71	0.46
High education	1,910	0.18	0.38	649	0.21	0.41
Married	1,910	0.64	0.48	649	0.74	0.44
Net income (monthly in Euros 2009)	1,910	2383	1604	649	2666	1494
Financial wealth (in Euros 2009)	1,910	45,843	116,040	649	79,291	179,661
Consulted advisor in 2009	1,910	0.34	0.47	649	1.00	0.00
Consulted advisor in 2008	1,910	0.35	0.48	649	0.65	0.48
Following of advice				649	6.16	1.99
Advanced financial literacy	1,910	2.41	1.46	649	2.78	1.31
Basic financial literacy	1,910	2.90	1.24	649	3.13	1.10
Cognition	1,910	1.21	1.07	649	1.38	1.06
Risk aversion	1,910	2.25	2.56	649	2.48	2.47