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Is Unbiased Financial Advice To Retail Investors Sufficient? Answers from a Large Field Study*

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Abstract

Working with one of the largest brokerages in Germany, we record what happens when unbiased investment advice is offered to a random set of roughly 8,000 of the brokerage's several hundred thousand active retail customers. We find that investors who most need the financial advice are least likely to obtain it. The investors who do obtain the advice (about 5%), however, hardly follow the advice, and so do not improve their portfolio efficiency much. Overall, our results imply that the mere availability of unbiased financial advice is a necessary but not sufficient condition for benefiting retail investors.

Is Unbiased Financial Advice To Retail Investors Sufficient? Answers from a Large Field Study

1. Introduction

Hwa is thet mei thet hors wettrien the him self nule drinken (Who can give water to the horse that will not drink of its own accord?)

Oldest English proverb, first recorded in 1175, compiled by Heywood (1546)

There is a large and growing literature in household finance documenting how retail investors make investment mistakes by deviating from the prescriptions of normative finance.[1] These investment mistakes are serious.[2] As Campbell (2006) notes, a number of potential remedies have sprung up over the years to resolve these investment mistakes. These include financial education, default options, and regulation by governments. An important remedy is financial advice provided by professionals.

Providing financial advice is big business. In the United States, the financial planning and advice industry is estimated to have a size of 39 billion dollars (2010).[3] The Investment Company Institute

[1] This literature is too vast to cover here. We thus offer a sample of important findings. The majority of households do not even participate in the stock market (Guiso, Haliassos and Jappelli (2002)) despite the large equity premium that exists (Mehra and Prescott (1985); Dimson, Marsh and Staunton (2007)). The few households that do participate in equity markets hold under-diversified portfolios (Blume and Friend (1975); Kelly (1995); Goetzmann and Kumar (2008)). Under-diversification with regard to geographical diversification is particularly acute—investors are found to exhibit both a home bias and a preference for local stocks (French and Poterba (1991); Lewis (1999); Cooper and Kaplanis (1994); Huberman (2001); Zhu (2002); Ahearne, Griever and Warnock (2004); Calvet, Campbell and Sodini (2007)). Research observes inertia, resulting in individual investors making insufficient portfolio adjustments in response to general market movements (Agnew, Balduzzi and Sundén (2003); Calvet, Campbell and Sodini (2009a); Madrian and Shea (2001)). Investors trade too much because they are overconfident (Odean (1999); Barber and Odean (2000); Deaves, Lüders and Luo (2003)). Investors tend to sell winners too early and hold on to losers too long, an investment mistake called the disposition effect (Shefrin and Statman (1985); Odean (1998); Frazzini (2006)). Investors are fixated on cognitive reference points (Bhattacharya, Holden and Jacobsen (2011)).

[2] Barber and Odean (2000) find that overconfidence leads to substantial return decreases after the deduction of transaction costs. Looking at the aggregate portfolio of individual Taiwanese investors, Barber, Lee, Liu and Odean (2009) document an annualized loss of 3.8%. Calvet, Campbell and Sodini (2007) measure the cost of non-participation and under-diversification and report a substantial loss compared to the world market for Swedish households. Malkiel (1995) and Carhart (1997) show that even mutual funds underperform the market, net of expenses. Barras, Scaillet and Wermers (2010) and Fama and French (2010) find no evidence that the average mutual fund produces alphas that cover its costs.

[3] http://www.ibisworld.com/industry/default.aspx?indid=1316.

(2007) notes that over 80% of respondents state that they obtain financial advice from professional advisors or other sources in the United States. In Germany, a survey among retail investors indicates that more than 80% of investors consult a financial advisor.[4]

Financial advice, however, is offered by third parties. This advice may be biased. The theoretical literature notes that the apparent information asymmetry between investor and advisor may provide camouflage to advisors to act in their own interests to the detriment of their clients.[5] Recent empirical evidence supports the agency conflict claims formalized in the above theoretical models.[6] A survey of European Union members by the CFA Institute (2009) revealed that 64% of respondents believe that the prevailing fee structure is intended to steer sales instead of serving the customer.

So, if retail investors make serious investment mistakes, and if investment advice provided to them by professional advisors to ameliorate these mistakes is conflicted and biased, it would seem that retail investors would benefit if they could receive unbiased and theoretically sound professional advice. This supply-side cure to improve the portfolio efficiency of retail investors should work. Regulators certainly think so. The plethora of financial market reforms being instituted in major financial markets, like the "Restoring American Financial Stability Act of 2010" (also known as the Dodd-Frank Act) in the United States or the "Markets in Financial Instruments Directive" in the European Union, which are devised mainly to clean up the conflicts of interest and improve disclosures in the financial sector, are essentially supply-side remedies.

[4] Two-thirds say that they obtain financial advice from their main bank, whereas about a fifth obtains advice from an independent financial advisor (DABbank (2004)).

[5] See, for example, Bolton, Freixas and Shapiro (2007), Carlin (2009), Inderst and Ottaviani (2009), Carlin and Gervais (2009), Stoughton, Wu and Zechner (2011)) and Carlin and Manso (2011).

[6] Mutual funds in the U.S. sold through brokered channels underperform. Those funds that provide higher fees are sold more heavily, which in turn negatively affects returns (Bergstresser, Chalmers and Tufano (2009); Chen, Harrison and Kubik (2006); and Edelen, Evans and Kadlec (2008)). Hackethal, Haliassos and Jappelli (2011) find that individual investors whose account is run by, or in consultation with, a financial advisor achieve lower returns. Additionally, in an audit study, Mullainathan, Nöth and Schoar (2009) conclude that financial advisors seem to be aggravating the existing biases of their investors. In addition, recommendations made by research analysts who are compromised through an incentive scheme are shown to have only very limited potential for value enhancement (Womack (1996); Metrick (1999); and Barber, Lehavy, McNichols and Trueman (2001)).

Will investors really benefit from only supply-side remedies? To be specific, can unbiased financial advice steer retail investors toward efficient portfolios? This paper attempts to answer this important public policy question.

In this study, we worked with one of the largest brokerages in Germany. The brokerage offers financial advice for the first time to a random set of roughly 8,000 of their several hundred thousand active retail customers. The advice is free and aims at improving portfolio efficiency. The advice is unbiased—it is free of monetary incentives for the brokerage and generated by an algorithm that is designed to improve portfolio efficiency—and, as we will later document, the advice does significantly improve portfolio efficiency ex-post. We have demographic data on all retail customers who obtain the advice and who do not obtain the advice. For both groups, we also possess customers' daily trading records for a number of years before the advice is offered and up to 10 months after the advice is offered. Because of this, we can answer some key questions, including which types of customers accept the offer, whether the advice received is followed, whether portfolio efficiency improves for the average advisee who follows the advice or does not follow the advice, and whether investors who most need the financial advice are least likely to obtain it.

In trying to answer the above questions, this paper explores the demand side of financial advice. To the best of our knowledge, this is the first study to link the recommendations of advisors with actual customer behavior after the advice is given.

We arrive at several interesting findings. First, those who accept the offer (5%) are more likely to be male, older, richer, more financially sophisticated, and have a longer relationship with the brokerage. Second, of those who accept the offer, the advice is hardly followed. Third, though portfolio efficiency hardly improves for the average advisee, it does improve for the average advisee who follows the advice. Fourth, it seems that investors who most need the financial advice are least likely to obtain it. Overall, our results imply that the mere availability of unbiased and theoretically sound financial advice is a

necessary but not sufficient condition for benefiting retail customers. As the adage goes, you can lead a horse to water, but you can't make it drink.[7]

The construction of our study allows for a greater understanding of the factors that contribute to a person opting to obtain and then to follow financial advice. A probit test gives us a fairly good handle on why advice is not being sought: lack of financial sophistication as measured by poor past portfolio performance (has many interpretations), a desire to not increase tax payments, and lack of familiarity and/or trust, as measured by the length of relationship with the brokerage. It does seem from the first result that the clients who most need (least need) the financial advice are the ones who are least likely to obtain it (most likely to obtain it). This conclusion is buttressed by a more formal test later.

The results of a regression on why clients do not follow the advice once they get it is not so extensive. The only results we have are that wealthier investors and investors with lower risky portfolio values tend to follow the advice more. Though we have few positive results, we can definitely rule out many obvious suspects like trust or financial sophistication or clients not following advice because the advice asked for a dramatic increase in investments. We suspect the lack of results with respect to the other variables in this test is due to a lack of power; there is little variation in the dependent variable: most clients who opt for advice do not follow the advice. The other reason could be that a systematic cause may not exist that explains why people do not follow advice.[8]

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[7] Campbell (2006), and especially Campbell, Jackson, Madrian and Tufano (2011), recognize that consumers need financial protection not just because of supply-side problems but also because of demand-side problems. Using the latest research from behavioral economics, Campbell, Jackson, Madrian and Tufano (2011) make a very powerful argument that many consumers do not have the ability to understand complex financial products in an age where they have to make most of their own financial decisions. Benartzi and Thaler (2004) document demand-side problems in the context of savings decisions. They offer possible solutions by taking into account behavioral factors when designing saving plans. They develop a choice architecture system called "Save More Tomorrow"™ (SMarT), which is designed to help people commit in advance to defined contribution increases in pension plans. In an experiment on payday loan borrowers, Bertrand and Morse (2009) examine the cognitive limitations of these borrowers, and focus on solutions. They find that information disclosure that aims at "de-biasing" is effective.

[8] A multitude of reasons are posited in the literature that may explain why people may not follow advice. These incude bounded rationality (Kahneman (2003)) and procrastination that leads to inertia (Samuelson and Zeckhauser (1988); Laibson (1997); O'Donoghue and Rabin (1999)). Other studies, such as Barber and Odean (2000), find that investors tend to be overconfident, and overconfident individuals tend not to follow advice. Other influences on the propensity to opt for and follow financial advice may be social interaction (Hong, Kubik and Stein (2005)) and financial literacy (Christelis, Jappelli and Padula (2010)). More papers are discussed later.

To summarize, the contribution of our paper is to highlight the centrality of the demand-side problem—unbiased financial advice is useless unless it is followed—and to recognize the limitations of regulations in dealing with this demand-side problem. How can regulation *convince* a person to follow unbiased and sound financial advice, when we do not understand very well why people follow advice? Though the answer to this question is beyond the scope of this paper, our paper does cast some doubt on some of the reasons trotted out to answer this question: non-comprehension of the financial advice, mistrust of advisor, or simply inertia.[9]

The analysis is organized as follows. Section 2 describes our field study, including details of the offer made to the retail customers by the brokerage, and the particulars of the advice. We explain how the recommendations are generated and argue that the advice is unbiased and theoretically sound. Section 3 details the raw data and describes the methodology used to estimate portfolio efficiency and the degree to which investors follow the advice. Section 4 gives some revealing descriptive statistics. Section 5 examines which retail customers are most likely to choose to receive the advice. Section 6 examines who follows the advice. Section 7 explores the portfolio efficiency of the customers after receiving the advice. Section 8 analyzes which customers would benefit most from the advice. Section 9 concludes.

2. Field study

2.1 Overview

The brokerage we work with was originally founded as a direct bank. Its focus was on offering brokerage services via telephone and the internet. Over time, it evolved into a full service bank, providing clients with brokerage and banking services as well as advice on mortgages. However, the

[9] The same issues are faced in medicine as well. Research on patients' adherence to medical advice has been conducted for decades. A meta-analysis of 50 years of research in this field finds that "the average non-adherence rate is 24.8%". The reasons for not following a doctor's advice are: patients think they know more than the doctor, depression, lack of social support, or simply because they misunderstand or forget what they have been told. Adherence increases with more circumscribed regimens, as well as education and income, but not as a function of demographic characteristics (such as gender or age) or the severity of illnesses (DiMatteo (2004)). Another finding in the medical literature, which parallels our finding, is that people who most (least) need to go to their doctor go less (more) often.

bank never offered investment advice to their clients; all client trades were self-directed. This changed in 2009. In order to retain existing customers and attract new ones, the brokerage set out to introduce a financial advisory business. As a new entrant to the investment advisory market, the brokerage designed a financial advice model that was distinctly different from those offered by traditional retail banks. First, the financial advice offered would not be conflicted; that is, recommendations would be independent of product issuers. Second, the financial advice would not be discretionary advice from an individual advisor but rather recommendations produced by an optimizer that improves portfolio efficiency. The optimizer would primarily use Exchange Traded Funds (ETFs) and mutual funds to increase diversification within and across asset classes, both domestic and foreign. Third, in order to ensure and signal the objectivity of its financial advice, the bank would avoid any incentive problems by not charging commission on trades based on the recommendations offered. Fourth, during a test phase, from which our data originate, the advice itself would also be free of charge.

2.2 Details of the offer

About 8,000 customers were selected randomly from the brokerage's several hundred thousand active customers. Active customers are defined as customers with at least EUR 25,000 account volume, at least three trades over the past 12 months, and between 18 and 80 years of age. A total of 8,195 customers were offered the advice. In early May of 2009, an email was sent to selected customers' banking account inbox (not private email). In this email, the new advisory service was advertised to be objective. It was mentioned that, 1) the recommendations would be system-generated and independent of product issuers; 2) no commissions, overt or covert, would be charged for trades based on the recommendations; and 3) the advice would be free during the test phase. Customers were told that at the end of the test phase, the free advisory service would be terminated automatically. It was also made clear to the customers that there would be no obligation to make any transactions based on the recommendations given. Thus, there would be no risk of unintended future commitment for the customer.

If customers did not respond to the offer, a follow-up phone call was initiated, and an advisor explained the offer again, and answered questions.

2.3 Details of the advice

All customers who opt to receive the free advice from the brokerage are assigned to our treatment group. All customers who decline the offer form our control group. Note that this is not a random assignment. However, our basic empirical methodology—difference in difference—somewhat ameliorates this shortcoming of our field study.

Every person in the treatment group was contacted by an advisor to schedule an initial call. This call was used to gather additional demographic information (e.g., job, household size) and wealth proxies (income, total financial wealth including cash, other assets). Risk preferences were mainly solicited by asking advisees to select between six categories ranging from "safe" to "opportunity" as their investment philosophy. There were no replies for the two most risk averse categories; we are therefore left with four levels of risk aversion. Based on demographic data and the above customer inputs, the brokerage calculated a risk capacity score that determined the maximum possible level of risk a client should be exposed to in the recommended portfolio.

This risk capacity score is the main input for forming customer-specific recommendations that enhance portfolio efficiency. The customer received detailed documentation (see Appendix A1 for a disguised example of a detailed recommendation) that included the following information:

- Description of the idea of diversification by investing in different asset classes and markets
- Explanation of important concepts (e.g., volatility, mean-variance efficiency, Sharpe ratio)
- Analysis of the existing portfolio (historical and expected risk/return profile)
- Analysis of the recommended portfolio (list of securities, risk/return profile compared to the existing portfolio)
- Inclusion of client's requests into recommendations (e.g., securities to retain)
- Consideration of tax advantages by keeping old investments in the portfolio

- List of trades necessary to realize the recommended portfolio
- Fact sheet for each security on recommended list

In addition to the detailed written documentation that was sent via email, an advisor also explained the recommendations to the customer over the phone.

2.4 Recommendations

The bank's recommendations are generated by a mean-variance optimizer, based on the original framework of Markowitz (1952), that focuses on portfolio efficiency. The household finance literature indicates that retail investors make mistakes by holding under-diversified portfolios. This under-diversification is typically not linked to investment skill (Goetzmann and Kumar (2008)). If a portfolio optimizer improves diversification, it will consequently add value for a typical retail investor.

It is relatively unimportant which optimization method is applied, as long as it increases diversification. DeMiguel, Garlappi and Uppal (2009) show that more sophisticated techniques are not significantly better than a naive 1/N portfolio strategy. To build efficient portfolios, however, it is always desirable that the expected return estimates are not biased by any past extreme return realizations. Two precautionary measures are taken. First, the optimizer uses a shrinkage factor as proposed in Jorion (1986) and Michaud (1998). The shrinkage factor is implemented using a security's deviation from the long-run average return of securities with a comparable level of risk. Second, and more important, the optimizer is set up in such a way that it selects only from a set of only 80 securities, predominantly ETFs and/or mutual funds. For such highly diversified portfolios, Holden (2009) notes that the potential effect of past idiosyncratic realizations is minimized. Volatilities are estimated using historical figures. The risk capacity score of the customer is the final input into the optimizer.

Even though only 80 securities are considered in the basic investment opportunity set of the optimizer, the potential opportunity set of the optimizer is much larger because it is capable of considering almost all securities held by the investors in our sample. Additionally, the optimization is subject to some constraints and side conditions such as maximum weight on an asset class due to a

client's wishes or risk capacity, maximum number of securities, minimum weight on a single security and short sale constraints. It is also possible to define other constraints, such as the number of securities retained from the existing portfolio. As shown in Table 6A2 in the Appendix, on average, about 25% of the value of the original portfolio is retained. This is done for two reasons: first, to retain some securities for which customers have a tax advantage and second, to increase the chance that the investors will act on the recommendations. This implies that the recommended portfolios are different across investors because investors differ in their risk capacity score, prior portfolio allocations, side constraints and the point in time at which they receive their recommendations.

Despite these constraints, Tables 1a–1c show that the optimizer is indeed able to improve the diversification of the portfolios along three important dimensions. First, Table 1a shows that investments in single stocks are reduced from 53% to 27%. Clients are advised to invest 67% in well-diversified ETFs and mutual funds. Recall that the bank has no incentive to push certain funds due to commissions. Second, Table 1b shows that the average recommended portfolio is more diversified along different asset classes than the average existing portfolio before the advice. The share of equity is reduced from 73% to 59%, while the share of fixed income and real estate securities is increased from 7% to 23%. Likewise, the average share of commodities increased from 1% to 13%. Third, Table 1c shows that international diversification is strongly enhanced by the recommendations. Prior to the advice, investors hold about 52% of their equity in German securities; the recommendations suggest holding 30%.

Table 1d shows the size of the recommended portfolios compared to their other portfolios for each advisee. As can be seen, the median recommended portfolio has *exactly the same size* as the original portfolio. This implies that most of our clients are advised not to increase or decrease their investments in risky assets. This table also shows that the mean recommended portfolio is 19% bigger than the original portfolio. This is because, by default, the optimizer matched the size of the recommended portfolio with the size of the advisee's original portfolio, but the advisee could request a bigger (smaller) size of the recommended portfolio if he or she wanted to invest (divest). Even those investors who wanted to invest considerably more had sufficient financial assets to cover this net investment, as shown by the ratio of the

recommended portfolio divided by total financial wealth (median 48%; even the 95 percentile of the distribution had enough financial assets to cover the required net investment with a ratio of 97%) in Table 1d. As our clients may not follow advice because they are asked to increase their investments in risky securities, we use the ratio of the recommended and original portfolio as another independent variable in our test of why clients choose to follow or not to follow the advice they opted for. We will find later that this variable has no significant effect on this decision.

Table 1d also shows that the median recommended portfolio is 90% of the financial wealth held with the brokerage (the other 10% is cash), is 48% of the total financial wealth, and is 21% of total wealth. These large numbers imply that the risky portfolio investment held in this brokerage is not "play money".

[INSERT TABLES 1a–1d ABOUT HERE]

Table 2 provides evidence that the optimizer also aligns each client's risk capacity with the riskiness of his or her recommended portfolio. From risk class 1 (highly risk averse) to risk class 4 (least risk averse), the share of equity and commodities monotonically increases while the share of fixed income, money market and real estate investments declines.

[INSERT TABLE 2 ABOUT HERE]

Overall, given the constraints, it seems as if the optimizer manages to recommend well-diversified portfolios to each investor.

2.5 Timeline

The offer was sent to a random sample of 8,195 customers drawn from a population of several hundred thousand customers in early May 2009. This is our "event date," which we index as t = 0 on the event timeline.

We collect demographic data on our sample of 8,195 customers. It is an unbalanced panel. Only 5,952 customers were with the brokerage in September 2005. The other 2,243 joined afterwards, but before May 2009. The period between September 2005 and May 2009 is called the "pre-advice" period.

Thus the pre-advice period is t = -44 months to t = 0. The 8,195 sample customers could join the treatment group between May and October 2009. The first free recommendation was given on May 13, 2009, and the last customer opted in during the last week of September 2009. This is why we define the "post-advice" period as the period after September 2009. The "post-advice" period lasts 6 months, ending on March 31, 2010. Figure 1 illustrates the timeline.

[INSERT FIGURE 1 ABOUT HERE]

3. Data and methods

3.1 Data collected

The first part of the dataset consists of demographics for the entire random sample group of 8,195 customers. Table 3 shows the data collected.

[INSERT TABLE 3 ABOUT HERE]

These data include gender, age and micro geographic status, as well as time-invariant account information such as the account opening date. The micro geographic status measures the average wealth level of people living in a given micro area (on a street level). It has nine categories, with 9 being the wealthiest. This variable is provided by a specialized data service provider that uses several factors (such as house type and size, dominant car brands, rent per square meter and unemployment rate) to construct this variable. For our multivariate tests, we further group this variable into three categories: low wealth (1-3), medium wealth (4-6) and high wealth (7-9). The account opening date allows us to compute the length of the relationship between a customer and the brokerage. The total financial and non-financial wealth (e.g., real estate) held by the client outside the brokerage is an estimate given to us only by clients who opted to take the advice.

The second part of the dataset includes portfolio characteristics for each customer. Portfolio characteristics include position statements, transactions and transfers of holdings from other portfolios. Position statements are on a security-by-security level and are taken from the beginning of each month. We obtain the International Security Identification Number (ISIN), the number of securities held per ISIN

and the respective EUR-value for each position. Transactions and transfers are recorded on a daily basis. For each transaction, we know the ISIN, trade volume and transaction price. We use this to calculate portfolio turnover as in Barber and Odean (2001) as well as trades per month. We also have information on the cash accounts of each customer at t = 0, enabling us to calculate the risky share as the risky portfolio value divided by financial wealth with the brokerage (risky portfolio value plus cash value).

Further, for the customers who opted to receive advice, we have data on when a customer received advice and what exactly the customer was recommended to buy and sell. This permits us to calculate four different daily return series for each customer in the treatment group (customers who opted to obtain advice): *actual* investment returns in the pre-advice period, *actual* investment returns in the post-advice period, *buy & hold* investment returns in the post-advice period *if the portfolio had not changed from the day before the advice was given*, and investment returns on the *recommended* portfolio in the post-advice period *if advice had been followed exactly*. The data also allow us to calculate two different daily return series for each customer from the control group (customers who opted not to obtain advice): *actual* investment returns in the pre-advice period and *actual* investment returns in the post-advice period.

The third part of the dataset contains market data from Thomson Financial Datastream. Sample customers hold and trade a total of 46,361 securities over the observation period. Thomson Financial Datastream covers 97% of these securities, as measured by total portfolio holdings. A number of our tests use the Carhart (1997) model to estimate risk-adjusted returns. Therefore, we also produce weekly return series for the following four factors: the country market factor (MKT), small minus big (SMB), high minus low (HML) and the momentum factor (MOM).

3.2 Return calculations

The brokerage data in conjunction with the market data from Thomson Financial Datastream allow us to compute daily portfolio returns and daily holdings on a security-by-security level.

To do this, we first infer daily holdings from monthly position statements, security transactions and account transfers. We have end-of-day holdings for the last day in every month. To obtain the next end-of-day holdings we multiply the end-of-day value of each holding by the corresponding price return (excluding dividends but taking into account any capital actions) for that security. These holdings are then properly adjusted for any sales, purchases and account transfers that occurred on that same day. We repeat this procedure for every security and investor for each trading day in a given month. The holdings on the last day of each month are then reconciled with the true holdings obtained from the brokerage.[10]

Second, we compute daily portfolio returns as the weighted average of the returns of all securities held, purchased or sold by the investor on that day. We use total return data (including dividends) for securities without transactions on that day. For securities that are either purchased or sold, we take into account exact transaction prices to compute returns. We weight each security's return to calculate investors' daily portfolio returns. All holdings and sales are weighted using values in EUR based on the previous day's closing prices. All purchases are weighted using the transaction value in EUR.

To compute hypothetical returns for portfolios recommended by the broker, we follow the same procedure and assume that purchase and sale transactions occur at the price that prevails at the end of the day on which the recommendation was given.[11]

For our regressions, we cumulate all daily portfolio returns into weekly returns. Portfolio excess returns are weekly portfolio returns minus the risk-free rate, which we assume to be equal to the 3-month EURIBOR. We regress this excess return on the four factors used by Carhart (1997),

$$R_{j,w}-R_{f,w}=\alpha_{j,w}+\beta_{j,w}\cdot(R_{m,w}-R_{f,w})+s_{j,w}\cdot SMB_w+h_{j,w}\cdot HML_w+m_{j,w}\cdot MOM_w+\varepsilon_{j,w} \quad (1)$$

where $R_{j,w}$ is the return on investor j's portfolio in week w, R_{fw} is the 3-month EURIBOR rate in week w, $R_{m,w}$ is the return in week w on a broad domestic stock market index (MKT), SMB_w and HML_w are the

[10] The deviations between inferred and actual holdings are negligible.

[11] We can compute net returns for actual transactions because we know all transaction costs. However, since we cannot compute these net returns for the benchmark "buy & hold" portfolios or the "recommended" portfolios, all our analysis is done with bid-ask adjusted gross returns (computed at bid and ask prices). Net returns for *actual* portfolios are on average 1.5% lower per year than their corresponding gross returns.

returns for the size and value-growth portfolios according to Fama and French (1993) in week w, and MOM_w is the 1-year momentum return from Carhart (1997) in week w.

The intercept (alpha) in regression (1) is our measure for risk-adjusted portfolio return. For robustness we also calculate Jensen's one-factor alphas for both the domestic stock market as well as the MSCI World in EUR. All results that we report later are robust to using these measures. Note also that we estimate alphas only in the pre-advice stage where we have 44 months of data. We do not estimate alphas in the post-advice period since we only have 6 months of data. We do, however, estimate measures of portfolio efficiency as described below.

3.3 Measures of portfolio efficiency

We first focus on measuring diversification in a portfolio. To do so, we use two primary measures – the Herfindahl-Hirschman index (HHI) and the idiosyncratic variance share – and a secondary measure – home bias. The HHI is a commonly accepted and simple measure of diversification (Dorn, Huberman and Sengmueller (2008); and Ivkovic, Sialm and Weisbenner (2008)). It is calculated by summing up the squared portfolio weights of all securities. Therefore, it follows that the lower the HHI, the better the diversification. We follow Dorn, Huberman and Sengmueller (2008) in assuming that if the security is a fund, the fund consists of 100 equally weighted positions. We use idiosyncratic risk in investor portfolios as a measure of diversifiable risk. For that purpose we take the variance of the residuals from regression (1) and, as in Calvet, Campbell and Sodini (2007), divide it by the total variance of the dependent variable from the same regression. As this share increases, the investor bears more diversifiable idiosyncratic risk. Therefore, it follows that the lower this ratio, the better the diversification. We calculate the home bias as the percentage of equity in German companies out of total equity. Therefore, it follows that the lower the home bias, the better the diversification.

We next focus on two portfolio performance metrics, the Sharpe ratio and a manipulation-proof performance measure (MPPM). The Sharpe ratio (Sharpe (1966)) is a commonly accepted measure of risk-adjusted portfolio performance. It is calculated by dividing the portfolio excess return by the

portfolio return's standard deviation. The larger the Sharpe ratio, the better is the portfolio performance. The Sharpe ratio is however subject to several shortcomings that Goetzmann, Ingersoll, Spiegel and Welch (2007) address. They propose a new manipulation-proof performance measure (MPPM). We follow their MPPM formula and, similar to other studies (e.g., Deuskar, Pollet, Wang and Zheng (2011)), use the values 2, 3 and 4 for the risk-aversion coefficient ρ. We report results for only ρ = 3, as all our results are qualitatively unaltered with ρ = 2 or 4. The larger the MPPM, the better is the portfolio performance.[12]

3.4 Degree of following

To measure the extent to which investors who opted into the advisory model actually follow the recommendations, we construct a variable that captures the degree of following the advice:

$$Degree\ of\ following_{j,d} = \frac{\sum_{i=1}^{N} Euro \mid j,i,d_{actual} \cap j,i,d_{recommended}}{\sum_{i=1}^{N} Euro \mid j,i,d_{actual} + \sum_{i=1}^{N} Euro \mid j,i,d_{recommended} - \sum_{i=1}^{N} Euro \mid j,i,d_{actual} \cap j,i,d_{recommended}} \quad (2)$$

where j denotes the investor, i indicates the specific security and d indexes the trading day, and Euro is the value in EUR that investor j holds in security i on trading day d. The numerator is the sum in EUR of all overlapping securities (i.e., of those securities that occur both in the *actual* and the *recommended* portfolio). The denominator is the value of the *actual* portfolio plus the value of the *recommended* portfolio, less the overlap. Thus the degree of following is actually a ratio between the intersection of the two sets and the union of the two sets, where the two sets are the *actual* portfolio and the *recommended* portfolio. The ratio can only take on values between 0 and 1. The ratio is 1 if a customer fully follows the advice, and 0 if the *actual* and *recommended* portfolio do not share a single security.

Table 4 uses a real recommendation to illustrate how this metric works.

[12] The MPPM is not defined for returns of negative 100% (e.g., when an investor holds only one security that defaults on a specific day and loses all its value). These observations in our data (about 0.001% of the total number of our observations) are set to missing.

[INSERT TABLE 4 ABOUT HERE].

The degree of following variable is a measure of how closely advice is implemented at a particular point in time. We also calculate the change in the degree of following from the day the advice is given to each day in the period from t = 5 to t = 11. This change in the degree of following is an exact measure of the client's efforts to implement the advice; if the measure is increasing, it implies that the advisee is acting according to the recommendations of the advice.

Our measure considers both the buy and sell sides of following advice. If a security in the advisee's portfolio is not included in the *recommended* portfolio, this suggests that the investor has been advised to sell this security. It is, however, possible that the advisee sells a security for reasons other than following the advice (e.g., liquidity or tax motives). As a check for robustness, we construct an alternative measure of the degree of following. This measure considers only the buy side and is simply the share of the *recommended* portfolio that the investor holds at any time. Appendix A2 shows that all results remain qualitatively the same when using this alternative measure.

4. Descriptive statistics

4.1 Statistics on clients and portfolios

Table 5 provides summary statistics. It divides the sample group into customers who opt to obtain the free advice and customers who opt not to obtain the free advice. P-values of t-tests from our tests for the equality of variables across these two groups are provided in the last column.

[INSERT TABLE 5 ABOUT HERE]

Table 5 shows that 91% of the customers who accepted the offer are male, compared to 81% in the control group. The mean age is also slightly higher (52.9 years vs. 49.0 years), as is the wealth level measured by the micro geographic status (mean 6.6 vs. 6.3). This indicates that the customers who accept the offer are more likely to be male, older, and richer. The customers who accept the offer have a longer relationship with the bank (9.1 years vs. 7.4 years). Portfolio characteristics are also significantly different for the two sub-groups of our sample. The customers who accept the offer have a higher risky

portfolio value at t = 0 (EUR 70,800 vs. EUR 45,300), a higher share of risky assets (75.9% vs. 66.1%), more trades per month (2.4 vs. 1.9), and lower portfolio turnover (5.8% vs. 7.5%).[13] We also calculate the disposition effect for each investor during the pre-advice period by applying the Odean (1998) method. Differences between advisees and non-advisees exist, but are not significant.

For those customers who have an account from September 2005 to May 2009—the pre-advice period—we calculate average daily returns of their investment portfolios, the standard deviations of these returns and four-factor alphas. The raw returns are not significantly higher for the customers who accept the offer than for the customers who do not accept the offer. The standard deviations of returns are significantly lower for the customers who accept the offer than for the customers who do not accept the offer. The alphas are significantly higher for the customers who accept the offer than for customers who do not accept the offer, though both their alphas are significantly negative. The Sharpe ratios and the betas are similar. However, MPPM is significantly higher for the customers who accept the offer than for customers who do not accept the offer, though both their MPPMs are negative. All of this evidence suggests that the customers who accept the offer are likely to be more financially sophisticated.

We also notice that diversification (as measured by lower HHI, lower idiosyncratic risk share and lower home bias) is significantly higher for the customers who accept the offer than for the customers who do not accept the offer. This further confirms that the customers who accept the offer are likely to be more financially sophisticated. All the above results are confirmed in section 5 by multivariate tests.

It is important to mention here that the largely negative alpha estimates in the pre-advice period tell us that all our customers, regardless of whether or not they accept the offer, significantly underperform the benchmark index. Similarly, high idiosyncratic risk shares, HHIs and home bias show significant potential for improvement of diversification. Regardless of whether investors are self-directed

[13] In comparison to official statistics provided by Deutsche Bundesbank (2010) and Deutsches Aktieninstitut (2009), the investors in our sample have about the same age (50 years), but are more likely to be male and richer. The larger portfolio and large cash values signal that these brokerage accounts do not represent "play money" (Goetzmann and Kumar (2008)). In line with Calvet, Campbell and Sodini (2007), our investors also hold portfolios with high idiosyncratic volatility shares.

or follow some outside advice, they could benefit from unbiased and theoretically sound advice, especially the ones who were doing relatively worse.

We notice that the improvement in actual raw returns from the pre-advice period to the post-advice period for the customers who accept the offer (-5.3% to 21.2%) does not seem to be much different from the customers who do not accept the offer (-7.0% to 17.0%). The drop in standard deviations from the pre-advice period to the post-advice period for the customers who accept the offer (25.8% to 15.0%) also does not seem to be much different from the customers who do not accept the offer (30.4% to 21.2%). A multivariate test later confirms that obtaining advice does not improve diversification: there is no significant decrease in HHI or the idiosyncratic risk of advisees' portfolios compared to the non-advisees' portfolios. The results with respect to portfolio performance are mixed: there is a slight increase in Sharpe ratio but no increase in MPPM of advisees' portfolios compared to the non-advisees' portfolios. Taken together, this suggests that the average advisee does not benefit much from the advice.

There are several explanations of why the average advisee does not benefit much from the advice. It could be that the advice is not sound, or that the average advisee does not follow the advice. To check whether the advice is sound, we perform two simple univariate tests: we compare the *recommended* portfolios with the investors' *actual* portfolios and their *buy & hold* portfolios.

Table 5 shows these results. The *recommended* portfolios perform much better than the *actual* portfolios of the advisees in the post-advice period: a return of 24.8% vs. 21.2%, a standard deviation of 9.6% vs. 15.0%, a Sharpe ratio of 35.2% vs. 21.8%, a MPPM of 22.4% vs. 17.3%, a HHI of 2.9% vs. 10.4%, an idiosyncratic risk share of 21.2% vs. 29.6%, and a home bias of 30.2% vs. 43.9%. It is also noteworthy that the *recommended* portfolios perform much better than the *buy & hold* portfolios of the advisees in the post-advice period: a return of 24.8% vs. 18.4%, a standard deviation of 9.6% vs. 14.5%, %, a Sharpe ratio of 35.2% vs. 13.9%, a MPPM of 22.4% vs. 14.4%, a HHI of 2.9% vs. 9.7%, an idiosyncratic risk share of 21.2% vs. 30.0%, and a home bias of 30.2% vs. 45.5%. These results suggest that the financial advice was sound, and that the average advisee does not follow the advice. If he or she

had followed the recommendations, he or she would have improved his or her investment performance. Formal tests conducted later confirm all these initial findings.

4.2 Statistics on the degree of following the advice

We now give descriptive statistics on the measure of degree of following to give a sense of how many investors follow the advice once they elect to receive it.

[INSERT FIGURE 2a, 2b, 2c ABOUT HERE]

Figure 2a gives the distribution of the degree of following on the day the recommendation is received by an investor. This figure shows that the *recommended* portfolio is very different from the average advisee's existing portfolio. For about one in five investors, there is essentially no overlap, and for about half of them, overlap is less than 20%. In fact, no one's existing portfolio coincides with his or her *recommended* portfolio.

Figure 2b gives the distribution of the average degree of following between t = advice start through t = 11 months, which is the "post-advice" period, for investors who choose to receive advice. Compared to Figure 2a, this figure indicates that some mass of the distribution shifted to the right. This implies that some investors follow the advice in the "post-advice" period and increase the degree of following. However, the distributions shown in Figures 2a and 2b are not very different from each other, suggesting that few investors really follow the advice.

Figure 2c gives the distribution of the increase in the degree of following from the date the investor receives the advice to t = 11. As the big mass is at 0, it tells us that most investors do not follow the advice at all. In fact, some mass is in the negative zone, indicating that some investors actually go against the advice, i.e., sell securities they are recommended to keep and/or buy securities that are not recommended. However, more investors follow the advice than go against it (though there are relatively few of each). Figure 2c looks similar when we measure the increase in the degree of following from the date of the recommendation to 10 days later, 20 days later, 30 days later or use the average increase over the entire post-advice period.

Table 6 gives the descriptive statistics on distributions of the degree of following taken at different points in time.

[INSERT TABLE 6 ABOUT HERE]

We see in this table that the mean degree of following is 15.6% on the day of the recommendation for the average advisee. This means that, on average, the majority of the positions in the original portfolio have to be changed. This is not an onerous task because the average advisee's portfolio already experiences an annual turnover of roughly 70%.

For the average advisee, the mean degree of following increases to 21.6% 10 days after the advice, to 24.4% 20 days after the advice and to 25.4% 30 days after the advice. However, the mean degree of following is lower (16.4%) at the end of the post-advice period, suggesting that although they may initially act according to the advice, they do not stick to it. This also explains why the mean degree of following for the entire post-advice period is only 21.1%. An important statistic in this table is the number of investors who at least partially follow the advice. Of the 385 who opt to receive advice, 260 (385-125) do not follow it, as measured at the end of the post-advice period. The 125 investors who do follow the advice, as can be seen in Figure 2c, follow it very little.

Our conclusions from Figure 2 and Table 6 are straightforward. *Recommended* portfolios are very different from the average advisee's *actual* portfolios and the average advisee does not much heed the financial advice. We do not believe that this is due to transactions costs because, as stated above, investors already turn over their portfolios very frequently.

5. Who chooses to obtain advice?

By October 2009, a total of 385 customers, out of the 8,195 customers that were offered free and unbiased financial advice, elected to accept the offer. This constitutes a little less than 5% of the customers contacted. A total of 38 investors joined in May 2009, 146 in June 2009, 73 in July 2009 and the remaining 128 joined later.

We now formally examine who chooses to receive advice. Table 7 reports the results of a probit test, where the dependent variable is set to 1 if a client opted to receive financial advice and 0 otherwise.[14] We make the following conclusions.

[INSERT TABLE 7 ABOUT HERE]

Though our sample is predominantly male, old and rich, the clients who opt to receive free financial advice are more likely to be male, older, richer (to be precise, the effect comes from low wealth clients who choose not to obtain advice), and have a higher risky portfolio value. They are more active traders, as measured by the number of trades per month, but have less portfolio turnover relative to their risky portfolio values. Their alphas are higher, their HHI are lower, their home bias is lower, and their disposition effect bias is lower. Their long term raw returns are higher, but their short term raw returns are lower. They also have more experience with the brokerage, where experience is measured by the length of the relationship between the client and the brokerage. A lower share of tax free assets, especially when controlling for diversification, is positively correlated with opting for advice.[15]

Age and wealth are linked to financial sophistication in the literature (Calvet, Campbell and Sodini (2007; 2009b)), though being male is not linked to financial sophistication (Barber and Odean (2001)). Higher alphas, lower HHI, lower home bias and lower disposition effect bias are definitely linked to financial sophistication. So why do the financially sophisticated opt for advice? It is possible that these investors became financially sophisticated because of financial literacy training – see Carlin and Robinson (2010) – and so they have a positive view of advice. A second hypothesis is plausible: as men, elderly and financially more sophisticated are more likely to be defrauded (NASD (2006)), or as older

[14] In order to address the issue of commonality among the recommendations, all our results in Tables 7 and 8 are also estimated using a cluster robust regression analysis with risk class being the cluster variable. All non-advised clients were grouped into one class. Results remain qualitatively unaltered. We also notice that investors opted for the advice at different points in time. To deal with this, we also use clustered standard errors in Tables 7 and 8 with week of opting being the cluster variable. Again results remain qualitatively unaltered.

[15] Poterba and Samwick (2003) suggest that taxes may influence investors trading decisions. A tax law change in Germany made it favorable to hold assets that were in existing portfolios at the end of 2008 because they would remain tax-free if held for more than one year. We calculate the share of tax-free assets in the portfolio at the time of the offer. As this share increases, propensity to seek financial advice may decrease. However, advisees on average sell 57.5% of their tax-free assets until the end of our measurement period. So they lose most of their tax advantage anyway.

investors are more likely to make erroneous financial investment decisions (Agarwal, Driscoll, Gabaix and Laibson (2009)), opting for financial advice by these groups could also be interpreted as an attempt to address these disadvantages. It is also possible that it is not financial sophistication, but a third hypothesis that explains the results: regret. Investors who have performed poorly in the past have regret. They are reluctant to obtain advice and to acknowledge past mistakes. They prefer inaction (ignore advice and be wrong at a lower psychic cost) to action (obtain advice, change portfolio, and risk being wrong at a higher psychic cost). Carlin and Robinson (1999) have a good example of this happening in Las Vegas. This regret hypothesis is, however, weakened by our finding that investors with lower short-term returns opt for advice more. Further, we computed a variable called the "proportion of paper losses" in an advisee's portfolio when the advice was offered, and this variable seemed to have no effect. A fourth hypothesis could be the "once bitten, twice shy" hypothesis: investors who had followed past advice and had done well want to receive more advice, whereas investors who had followed past advice and had not done well, do not want to receive more advice. However, any past advice received by these investors could not have come from this brokerage, as this is the first time that the brokerage has offered advice. A fifth hypothesis could be that our clients are optimistic, perhaps extremely optimistic. Puri and Robinson (2007) show that optimists invest more in individual stocks, and extreme optimists display imprudent financial behavior (like not wanting advice). That could be, but since we do not have any psychological metrics on our clients, we cannot test this hypothesis. A sixth hypothesis could be that investors receive advice from other sources. Even if they receive outside advice, the outside advice must either be bad or not followed because we find portfolios to be largely inefficient before as well as after the advice is offered. A seventh hypothesis could be that the offer of free and unbiased financial advice is just regarded as spam. Again, the evidence suggests otherwise. The email containing the offer was an official message sent to the inbox of the banking account. This inbox is never crowded because these emails have a predetermined maturity. Also, if there is no reaction to the initial email, a personal phone call follows.

To summarize, we do have a fairly good handle on why advice is not being sought: lack of financial sophistication as measured by poor past portfolio performance (has many interpretations), a

desire to not increase tax payments, and lack of experience, familiarity and/or trust, as measured by the length of relationship with the brokerage. It does seem from the first result that the clients who most need (do not need) the financial advice are the ones who are least likely to obtain it (most likely to obtain it). We will explore this hypothesis more fully in a section 8.

6. Who chooses to follow the advice if they obtain it?

We now formally examine who chooses to follow the advice once they obtain it. Recall that advisees rarely follow the advice, and when they do, it is only followed in small part. Table 8 reports OLS regression results where the dependent variable is the increase in the degree of following the advice. We find that wealthier investors (as measured by the micro geographic status) and investors with lower risky portfolio values tend to follow the advice more. Interestingly, though investors with higher portfolio value opt for the advice, investors with lower portfolio value follow it more. One interpretation of this seeming contradiction is that people with lower portfolio value amongst the richer clients have relatively less experience with risky assets and may, therefore, follow advice more.

[INSERT TABLE 8 ABOUT HERE]

The more interesting observation in Table 8 is the set of non-results. None of the other variables have a significant effect on the degree to which advice is followed, including the disposition effect. The paragraph below discusses more non-results.

First, it is conceivable that investors do not pay attention to advice because they consider their accounts in the brokerage as just "play money". The evidence suggests otherwise. As can be seen in Table 1d, the median original portfolio of the client has the same size as his median recommended portfolio which, in turn, is about 48% of his total financial wealth. This suggests that we are looking at investors' main accounts, and that their financial wealth is predominantly held by this brokerage.[16] Additionally, in comparison to official statistics provided by Deutsche Bundesbank (2010) and Deutsches

[16] As pensions in Germany are provided by the state and the employer, such a concentration of savings in one brokerage does not seem excessive.

Aktieninstitut (2009), the average investor in our sample has a much higher account value than the average retail investor in the population.

Second, it could be that the advice is not followed because investors are asked to increase their investments in risky assets. However, our research design recommended an increase only if the investor asked for an increase. Even these investors had sufficient financial assets to cover this net investment, as shown by the ratio of the recommended portfolio divided by total financial wealth (median 48%; even the 95 percentile of the distribution had enough financial assets to cover the required net investment with a ratio of 97%) in Table 1d. Moreover, we use the ratio of the recommended portfolio size to the original portfolio size as another independent variable in Table 8. As can be seen, this variable has no significant effect on the decision whether or not to follow advice.

Third, one could argue that the advice was short-lived and therefore ignored. Again, the evidence suggests otherwise. Our clients trade often; their average holding period is only a little more than 1 year. The advice does not seem short-lived compared to their trading horizons. Moreover, even if the free advice ceased after a test phase, there should be no utility loss from investing in an efficient portfolio. Fourth, it is conceivable that investors may ignore the advice merely because they are not sophisticated. However, our results show that subjects who choose to receive the advice are actually more sophisticated, measured by their past investment performance, than their peers who do not accept the offer. Fifth, investors may also choose to ignore the advice because they do not trust the brokerage, but our results also show that customers who opt for the advice have a long relationship with the brokerage (on average 9.1 years), even significantly longer than non-advisees.

Sixth, is inertia causing them to ignore the advice? Subjects do not seem to be inert because they trade actively after the recommendation was given, though they do not follow the recommendation. Seventh, it is also unlikely that the investors are simply too busy to heed the advice, considering that they seem to have enough time on their hands to trade actively. Eighth, it could be that clients follow advice only after a certain time. We recomputed our dependent variable in Table 8–degree of following from t=0 to t=20–for various other time durations. Our results do not qualitatively change. Ninth, it could be

that clients do not buy the stocks they are not familiar with. We defined a stock to be familiar if an advisee had traded it in the past, and then computed the proportion of stocks in the recommended portfolio that an advisee was familiar with. This variable also had no effect in Table 8. Tenth, advisees may not heed advice because they are too risk-averse. Though the recommendations were tailored for their risk aversion, we checked whether this variable had an effect in Table 8. The answer is no.

To summarize, our results cannot pinpoint why financial advice is ignored after it is sought. The only results we have are that wealthier investors and investors with lower risky portfolio values tend to follow the advice more. We suspect the lack of results with respect to the other variables in this test is due to a lack of power; there is little variation in the dependent variable. As seen in Figure 2c, most clients who opt for advice do not follow the advice. The other reason could be that a systematic cause may not exist that explains why people do not follow advice.

7. Does the advice benefit the advisee?

We now come to the most critical issue addressed by our study—whether advisees benefit from financial advice. Many previous studies have documented that financial advice does not benefit the advisee, but the reason given as the root cause of the finding was that the advice was conflicted. Our research design ensured that the financial advice was unbiased, un-conflicted, and theoretically sound ex-ante. Was this true ex-post, too?

7.1 Is the financial advice sound?

From the description of the dataset and the timeline, it follows that the natural research design to investigate the quality of financial advice is to examine its effect using a difference-in-difference methodology. This requires calculating the improvement of portfolio efficiency between the pre-advice period and the post-advice period for the treatment group (clients who opt to receive advice) *if they had fully followed the advice*, and comparing this difference with the improvement of portfolio efficiency between the pre-advice period and the post-advice period for the control group (clients who opt not to

receive advice). To do this, we define a *recommended* portfolio as the portfolio the treatment group would hold had they followed their advice completely.

We use two measures of diversification – HHI and the share of idiosyncratic risk (the part of the risk that is uncompensated) – and two measures of portfolio performance–the Sharpe Ratio and MPPM– as our four measures of portfolio efficiency. The HHI for the pre-advice period is computed from the *actual* portfolios of both the treatment group and the control group at t = 0. The HHI for the post-advice period for the treatment group is computed on the *recommended* portfolios of the treatment group at t = 11. The HHI for the post-advice period for the control group is computed from their *actual* portfolios at t = 11. The share of idiosyncratic variance in the pre-advice period is computed by running regression (1) on the *actual* portfolios of both the treatment group and the control group in the period from September 2005 to May 2009. The share of idiosyncratic variance in the post-advice period for the treatment group is computed by running regression (1) on the *recommended* portfolios of the treatment group in the period from October 2009 to April 2010. This computation is possible because the date and the details of each of the recommendations are known. The share of idiosyncratic risk in the post-advice period for the control group is computed by running regression (1) on the *actual* portfolios of the control group in the period from October 2009 to April 2010. Sharpe ratios and MPPM in the pre-advice period are computed for the *actual* portfolios of both the treatment group and the control group in the period from September 2005 to May 2009. Sharpe ratios and MPPM in the post-advice period for the treatment group are computed for the *recommended* portfolios of the treatment group in the period from October 2009 to April 2010. Sharpe ratios and MPPM in the post-advice period for the control group are computed for the *actual* portfolios of the control group in the period from October 2009 to April 2010.

If the decrease (improvement) in the HHI or share of idiosyncratic variance from the pre-advice period to the post-advice period for the treatment group is greater than those of the control group, it would suggest that the advice is theoretically sound. If the increase (improvement) in the Sharpe ratio or MPPM from the pre-advice period to the post-advice period for the treatment group is greater than those of the control group, it would suggest that the advice is theoretically sound.

We run four sets of OLS regressions. The dependent variable in our first set of OLS regressions is the decrease in HHI from the pre-advice period to the post-advice period. The dependent variable in our second set of OLS regressions is the decrease in the share of idiosyncratic variance from the pre-advice period to the post-advice period. The dependent variable in our third set of OLS regressions is the increase in Sharpe ratio from the pre-advice period to the post-advice period. The dependent variable in our fourth set of OLS regressions is the increase in MPPM from the pre-advice period to the post-advice period. The main independent variable of interest in all the four sets of OLS regressions is a "dummy advice" variable set to 1 for the treatment group and 0 for the control group. Table 9 reports the results of these regressions.

[INSERT TABLE 9 ABOUT HERE]

The coefficient on the "dummy advice" variable is positive and statistically significant in all four sets of regressions. This implies that if advisees had fully followed the advice, they would have improved their portfolio efficiency (decreased the HHI and share of idiosyncratic risk in their portfolios, and increased the Sharpe ratios and MPPM of their portfolios). Thus the advice does improve portfolio efficiency.

7.2 Does advice benefit the average advisee?

We use the same research design as above with one important change. Instead of computing the HHI, share of idiosyncratic risk, Sharpe ratio and MPPM in the post-advice period for the treatment group by using their *recommended* portfolios, we instead use their *actual* portfolios.

[INSERT TABLE 10 ABOUT HERE]

The coefficient on the "dummy advice" variable is statistically insignificant in the HHI and the idiosyncratic risk share cases, but is positively significant in the Sharpe ratio case, and is positively significant in 1 out of 4 models in the MPPM case. Comparing the coefficients in these latter significant cases with their counterparts in Table 8 reveals that the coefficients are much smaller (of the order of one-

third to one-half). All this evidence implies that the average advisee does not improve portfolio diversification from the advice, but does improve portfolio performance, though very modestly.

Why does the average advisee not benefit much? Given that the advice was theoretically sound, it follows that the average advisee did not benefit much because he or she did not follow the advice. We provided evidence that the average advisee does not follow the advice in Section 4.2.

We now investigate whether advice benefits the advisee if he or she *partially* follows the advice. To do this, we run the same regressions we ran for Table 10 with an additional independent variable—the variable measuring the increase in the degree of following the advice between the time a client first received the advice and the end of the post-advice period (see Figure 2c). Recall that this variable is positive (negative) if the advisee is partially or fully acting on (acting against) the advice.

[INSERT TABLE 11 ABOUT HERE]

Table 11 shows the results. The coefficient on the "increase in the degree of following" measure is statistically significant if we use HHI as diversification measure but statistically insignificant if we use the idiosyncratic risk share as our measure of diversification. The coefficient on the "increase in the degree of following" measure is statistically significant if we use Sharpe ratio as a portfolio performance measure but statistically insignificant if we use MPPM as a portfolio performance measure. Our results thus show that even partially following the advice would have improved the efficiency of the portfolio.

8. Who would benefit the most from the advice?

We now explore an important public policy question: are the individuals who are most likely to benefit from financial advice the ones least likely to obtain the advice, and the persons least likely to benefit from financial advice most likely to obtain and follow the advice? Section 5 indicates that this seems to be the case; the evidence there showed that the more (less) financially sophisticated investors are the more (less) likely to obtain advice.

We revisit the probit regression that was run to generate the results in Table 7, the test that investigates who elects to receive financial advice. We take probit model (5) in Table 7 because it has the

highest pseudo-R-squared value and can be estimated for 7,432 customers. We then use the coefficient estimates from this regression to predict the 5% of the 7,432 clients with the highest probability of obtaining the advice.[17] We define those 5% (372 investors) as "predicted to obtain advice" and the remaining 95% (7,060 investors) as "not predicted to obtain advice". Of the former group, 62 opted for advice and 310 did not. Of the latter group, 307 opted for advice and 6,753 did not. Thus we can test whether persons predicted to less likely obtain the advice are the ones who benefit more from the advice (i.e., whether the 307 benefited more than the 62).

We now run the same regression that generated the results in Table 9 for both these subgroups. The first subgroup consists of clients who are predicted to obtain advice. Group size is 372. Of these, 62 took advice and so have the indicator variable "dummy advice" turned on to equal 1, and 310 did not take advice and so have the indicator variable "dummy advice" turned on to equal 0. The second subgroup is clients who are not predicted to obtain advice. Group size is 7,060. Of these, 307 took advice and so have the indicator variable "dummy advice" turned on to equal 1, and 6,753 did not take advice and so have the indicator variable "dummy advice" turned on to equal 0. Table 12 reports the results for these regressions. The number of observations in these subgroups is lower than 372 and 7,060 because of data availability.

[INSERT TABLE 12 ABOUT HERE]

The coefficient on the "dummy advice" variable is 0.042 (positive and statistically significant) in the HHI regression for the clients who are predicted to opt for the advice and did opt for it. The coefficient on the "dummy advice" variable is 0.099 (positive and statistically significant) in the HHI regression for the clients who are predicted to not obtain the advice, but did obtain it. The difference between these two coefficients is positive and statistically significant.

The coefficient on the "dummy advice" variable is 0.066 (positive and statistically significant) in the idiosyncratic risk regression for the clients who are predicted to opt for the advice and did opt for it.

[17] Results are robust to different cut off points, including 10%, 20% or even 50%, with highest likelihood to opt for advice.

The coefficient on the "dummy advice" variable is 0.077 (positive and statistically significant) in the idiosyncratic risk regression for the clients who are predicted to not obtain the advice, but did obtain it. The difference between these two coefficients is positive, but not statistically significant.

The coefficient on the "dummy advice" variable is 0.147 (positive and statistically significant) in the Sharpe ratio regression for the clients who are predicted to opt for the advice and did opt for it. The coefficient on the "dummy advice" variable is 0.194 (positive and statistically significant) in the Sharpe ratio regression for the clients who are predicted to not obtain the advice, but did obtain it. The difference between these two coefficients is positive and statistically significant.

The coefficient on the "dummy advice" variable is -0.034 (negative but not statistically significant) in the MPPM regression for the clients who are predicted to opt for the advice and did opt for it. The coefficient on the "dummy advice" variable is 0.053 (positive and statistically significant) in the MPPM regression for the clients who are predicted to not obtain the advice, but did obtain it. The difference between these two coefficients is positive, but not statistically significant.

The important result here is that the decrease in HHI or the increase in the Sharpe ratio is significantly greater for clients predicted to not obtain the advice but who obtained it than for clients who are predicted to opt for the advice and did opt for it. As seen in Section 5, the former group are the investors who are less financially sophisticated than the latter group. We come to the same conclusion: those who most need (do not need) the financial advice are least (most) likely to obtain it.

9. Conclusion

Can unbiased financial advice steer retail investors toward efficient portfolios? To answer this question, we work with one of the biggest brokerages in Germany and offer advice that is unbiased and theoretically sound. First, we find that those who accept the offer (5%) are more likely to be male, older, wealthier, more financially sophisticated, and have a longer relationship with the brokerage. Second, of those who accept the offer, the advice is hardly followed. Third, though the average advisee's portfolio efficiency hardly improves, the average advisee who follows the advice does see an increase in portfolio

efficiency. Fourth, it seems that investors who most need the financial advice are least likely to obtain it. Overall, our results imply that the mere availability of unbiased financial advice is a necessary but not sufficient condition for benefiting retail customers. As the adage goes, you can lead a horse to water, but you can't make it drink.

At a time when protecting financial consumers has risen to the top of the regulatory agenda in many countries, the results of this paper provide a basis for skepticism of supply-side solutions imposed by regulators. However, examining the demand side of financial advice raises more questions than it answers. We learn that even honest and sound financial services are useless unless the customer actually follows them. In addition, it seems even more difficult to reach people who most need financial advice. Thus, if financial economists are to develop remedies to correct wide-spread investment mistakes made by retail investors, this study indicates that much additional research must be done on why people follow or do not follow advice. These reasons must be taken into account when trying to help people make asset allocation decisions. A promising start has been made by Benartzi and Thaler (2004; 2007) who, after taking into account behavioral factors, develop sophisticated savings plans.

Experimenting with alternative ways to offer advice is another useful avenue to explore. For example, in our study, the advice would require people to turn over 75% of their portfolios on average, since investors' existing portfolios are largely inefficient. Investors in our sample may have found it too complicated or too cumbersome to implement the full list of recommendations, though they did turn over 70% of their portfolios every year during the pre-advice period. Although the information given to our advisees is extensive and clear, it may not be much different from other less theoretically anchored sources of investment advice. Perhaps future settings could therefore seek to build greater trust with advisees.[18] To conclude, much more needs to be done to understand why and how financial advice is actually followed. What makes the horse drink?

[18] Bonacio and Dalal (2006) conduct a literature review to document the determinants of all effective advice, not just financial advice. A variety of characteristics of the advice are examined, including the distance of the advice from the original opinion (Yaniv (2004)); whether the advice was paid for (Gino (2008)); whether advice is didactic or just offers information about choices (Bonacio and Dalal (2010)); and many other aspects. Statman (2010) explores what investors really want.

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Table 1a
Advisees' original portfolios vs. recommended portfolios—by instrument

Table 1a shows the portfolio share by instrument of the advisees' *original* portfolio compared to the portfolio *recommended* to the advisees at the time of the recommendation.

	Portfolio share	
Instrument	Original	Recommended
Single stocks	53%	27%
Funds	26%	57%
ETFs	4%	10%
Single bonds	4%	0%
Others	13%	6%
Total	100%	100%

Table 1b
Advisees' original portfolios vs. recommended portfolios—by asset class

Table 1b shows the portfolio share by asset class of the advisees' *original* portfolio compared to the portfolio *recommended* to the advisees at the time of the recommendation.

	Portfolio share	
Asset class	Original	Recommended
Equity	73%	59%
Fixed income	6%	15%
Commodities	1%	13%
Real estate	1%	8%
Others	19%	5%
Total	100%	100%

Table 1c
Advisees' original portfolios vs. recommended portfolios—by region

Table 1c provides a regional break down of the equity share for the advisees' *original* portfolio compared to the portfolio *recommended* to the advisees at the time of the recommendation.

	Equity share	
Region	Original	Recommended
Germany	52%	30%
Europe	14%	24%
North America	12%	10%
Asia Pacific	9%	18%
World	8%	9%
CEE	2%	7%
Other EM	3%	2%
Total	100%	100%

Table 1d
Advisees' original portfolios vs. recommended portfolios—by size

Table 1d compares the size of the advisees' *recommended* portfolios with the size of other portfolios. The *original* portfolio of an advisee is the size of the portfolio held at the time of the recommendation. *Financial wealth with the brokerage* is the advisee's original portfolio plus the value of cash at the brokerage. *Total financial wealth* is the advisee's original portfolio plus the value of cash at the brokerage plus an estimate of financial assets held outside the brokerage (this estimate is provided by the client). *Total wealth* is the advisee's original portfolio plus the value of cash at the brokerage plus an estimate of financial and non-financial assets held outside the brokerage (this estimate is provided by the client). All sizes are measured in EUR at the time of the recommendation. Different counts of observations are due to data availability of certain variables (5 customers had no risky portfolio prior to the recommendations).

			Percentile				Standard	
Ratio	Mean	Median	5th	25th	75th	95th	deviation	N
Recommended portfolio/ original portfolio	1.19	1.00	0.92	0.99	1.04	1.88	0.91	380
Recommended portfolio/ financial wealth with the brokerage	0.90	0.90	0.43	0.75	0.99	1.29	0.43	365
Recommended portfolio/ total financial wealth	0.51	0.48	0.15	0.32	0.67	0.97	0.26	318
Recommended portfolio/ total wealth	0.28	0.21	0.05	0.12	0.40	0.77	0.23	318

Table 2
Average asset class shares of recommended portfolios by advisees' risk aversion

Table 2 shows the average asset class share within advisees' recommended portfolios for each level of risk aversion.

	Risk aversion			
Asset class	1 = Highest	2	3	4 = Lowest
Equity	38%	43%	53%	63%
Fixed income	27%	20%	14%	7%
Money market	14%	15%	13%	10%
Commodities	5%	9%	10%	13%
Real Estate	14%	10%	7%	5%
Other	2%	4%	3%	3%
Total	100%	100%	100%	100%
N	20	95	172	55

Table 3
Data collected

Table 3 summarizes the data collected during the course of the study. Client demographics and portfolio characteristics have been provided by the brokerage. The record date is July 2010. Market data are taken from Thomson Financial Datastream. The third column reports the availability of time series data and their frequency.

Type of data	Type of data	Dates available
Client demographics	Gender	Time-invariant
	Date of birth (measure of age)	Time-invariant
	Micro geographic status (measure of wealth)	Time-invariant
	Total financial and non-financial wealth (advisees only)	Time-invariant
	Risk aversion	Time-invariant
Portfolio characteristics	Actual position statements	Monthly
	Actual transactions	Daily
	Recommended securities	On day of recommendation
	Recommended transactions	On day of recommendation
	Cash	On day of recommendation
	Number of trades	Daily
	Account opening date (measure of length of relationship)	Time invariant
Market data	Carhart (1997) four factors on broad domestic index	
	- Market factor	Weekly
	- Small minus big (SMB)	Weekly
	- High minus low (HML)	Weekly
	- Momentum factor	Weekly
	Individual security returns	Daily

Table 4
Illustration of the degree of following

Table 4 provides an actual example of the measure that we call the degree of following. Securities E.ON and H&M overlap between the *actual* and the *recommended* portfolio. The value of the overlap is 4,224 EUR (681 EUR in E.ON and 3,543 EUR in H&M). We calculate the degree of following as the overlap between the two portfolios divided by the value of assets in EUR in the *actual* portfolio plus assets in the *recommended* portfolio, less the overlap (here: 4,224 / (23,426+23,688-4,224) = 10%).

Original portfolio (t = 0)		**Recommended portfolio (t = 0)**			**Interpretation**	**Buy**	**Sell**	**Keep**
	EUR		EUR			EUR	EUR	EUR
Deutsche Bank	8,646			→	Sell		8,646	
HSBC Indian Equity Fund	3,622			→	Sell		3,622	
Raiffeisen CEE Equity Fund	2,792			→	Sell		2,792	
HSBC BRIC Equity Fund	1,862			→	Sell		1,862	
Commerzbank	439			→	Sell		439	
E.ON	2,523	E.ON AG	681	→	Decrease		1,842	681
H&M	3,543	H&M	3,543	→	Keep			3,543
		Comstage ETF EONIA	4,072	→	Buy	4,072		
		Schroder ISF Europa Corporate Bond Fund	3,883	→	Buy	3,883		
		Allianz Pimco Europazins Bond Fund	3,799	→	Buy	3,799		
		Allianz Pimco Corporate Bond Europa Fund	2,434	→	Buy	2,434		
		UBS Lux Bond Fund	1,751	→	Buy	1,751		
		Grundbesitz Europa Real Estate Fund	1,470	→	Buy	1,470		
		Pictet EM Fund	1,247	→	Buy	1,247		
		Allianz RCM Small Cap Fund	808	→	Buy	808		
	23,426		**23,688**			**19,463**	**19,202**	**4,224**

Table 5
Summary statistics

Table 5 reports summary statistics on client demographics, portfolio characteristics, portfolio performance measures and portfolio diversification measures. The columns "Obtain advice" and "Not obtain advice" present means, medians and number of observations for the respective clients in each group. The last column reports p-values of a t-test on a difference of means. Client demographics comprise statistics on the share of male clients *(Gender),* the age of clients (*Age)* and the wealth of a client measured by the micro geographic status rating, 1 through 9, by an external agency *(Wealth)*. Portfolio characteristics comprise statistics on the years the client has been with the bank (*Length of relationship*), the risky portfolio value of the customer (*Risky portfolio value at t = 0*), the amount of cash held with this brokerage (*Cash at t = 0*), the proportion of risky assets held with this brokerage (*Risky share at t = 0*), the number of trades per month (*Average trades from t = -44 to t = 0*), the average portfolio turnover per month (*Average portfolio turnover from t = -44 to t = 0*), the difference between the proportion of realized gains and losses (*Disposition effect from t = - 44 to t = 0*) and the proportion of tax-free assets (*Share of tax-free assets at t = 0*). Portfolio performance measures comprise statistics on raw returns, standard deviations, Sharpe ratios, Manipulation Proof Performance Measures (*MPPM*), 4-factor alphas and 4-factor betas for the period before the advice was offered t = -44 to t = 0 and the period after the advice was offered t = 5 to t = 11. Portfolio diversification measures comprise statistics on the Herfindahl-Hirschmann Index (*HHI*), the idiosyncratic variance share (*Idiosyncratic variance share*) and the share of domestic equity (*Home bias*). Alpha, beta and idiosyncratic risk share stem from applying a Carhart (1997) four-factor model calibrated for Germany.

Data variable	Measurement units	Obtain advice			Not obtain advice			t-test
		Mean	Median	N	Mean	Median	N	p-value
Client demographics								
Gender	Dummy = 1 if male	91.4%	100.0%	385	81.3%	100.0%	7810	0.00
Age	Years	52.9	52.0	385	49.0	47.0	7810	0.00
Wealth	Micro Geo Status	6.6	7.0	340	6.3	6.0	6847	0.00
Portfolio characteristics								
Length of relationship with the bank	Years since account opening	9.1	9.7	385	7.4	8.8	7810	0.00
Risky portfolio value at t = 0	EUR thousands	70.8	46.3	369	45.3	31.6	7116	0.00
Cash at t = 0	EUR thousands	20.7	10.1	369	21.7	13.2	7116	0.52
Risky share at t = 0	Percent	75.9%	85.4%	369	66.1%	73.9%	7116	0.00
Average trades from t = -44 to t = 0	Trades per months	2.4	1.4	385	1.9	1.0	7810	0.01
Average portfolio turnover from t = -44 to t = 0	Percent, monthly	5.8%	3.6%	378	7.5%	4.0%	7745	0.00
Disposition effect from t = - 44 to t = 0	PGR - PGL	10.2%	5.3%	385	12.3%	2.7%	7810	0.13
Share of tax-free assets at t = 0	Percent	86%	97%	369	85%	99%	7081	0.82
Portfolio performance measures								
Raw returns								
From t = -44 to t = 0 (actual portfolios)	Percent, annualized	-5.3%	-4.7%	316	-7.0%	-5.4%	5232	0.13
From t = 5 to t = 11 (actual portfolios)	Percent, annualized	21.2%	20.4%	382	17.0%	20.2%	7157	0.21
From t = 5 to t = 11 (buy & hold portfolios)	Percent, annualized	18.4%	18.5%	384				0.68 [1]
From t = 5 to t = 11 (recommended portfolios)	Percent, annualized	24.8%	22.6%	383				0.02 [1]
Standard deviation								
From t = -44 to t = 0 (actual portfolios)	Percent, annualized	25.8%	23.8%	316	30.4%	26.5%	5232	0.00
From t = 5 to t = 11 (actual portfolios)	Percent, annualized	15.0%	14.0%	382	21.2%	17.9%	7157	0.00
From t = 5 to t = 11 (buy & hold portfolios)	Percent, annualized	14.5%	14.0%	384				0.00 [1]
From t = 5 to t = 11 (recommended portfolios)	Percent, annualized	9.6%	8.9%	383				0.00 [1]
Sharpe ratio								
From t = -44 to t = 0 (actual portfolios)	Percent	-4.1%	-4.8%	316	-4.0%	-4.3%	5231	0.69
From t = 5 to t = 11 (actual portfolios)	Percent	21.8%	22.5%	382	15.8%	16.5%	7137	0.00
From t = 5 to t = 11 (buy & hold portfolios)	Percent	13.9%	18.7%	384				0.02 [1]
From t = 5 to t = 11 (recommended portfolios)	Percent	35.2%	35.4%	384				0.00 [1]
MPPM								
From t = -44 to t = 0 (actual portfolios)	Percent	-16.0%	-13.3%	316	-22.3%	-14.6%	5232	0.06
From t = 5 to t = 11 (actual portfolios)	Percent	17.3%	17.5%	382	9.4%	16.0%	7157	0.03
From t = 5 to t = 11 (buy & hold portfolios)	Percent	14.4%	15.0%	384				0.18 [1]
From t = 5 to t = 11 (recommended portfolios)	Percent	22.4%	21.2%	384				0.00 [1]
4-factor alpha								
From t = -44 to t = 0 (actual portfolios)	Percent, annualized	-6.0%	-5.6%	316	-8.5%	-6.3%	5231	0.03
4-factor beta								
From t = -44 to t = 0 (actual portfolios)		0.8	0.8	316	0.9	0.9	5231	0.21
From t = 5 to t = 11 (actual portfolios)		0.5	0.5	381	0.7	0.7	7080	0.00
From t = 5 to t = 11 (buy & hold portfolios)		0.6	0.6	384				0.00 [1]
From t = 5 to t = 11 (recommended portfolios)		0.4	0.4	384				0.00 [1]
Portfolio diversification measures								
HHI								
At t = 0 (original portfolios)	Percent	12.0%	7.6%	369	20.3%	10.8%	7100	0.00
At t = 11 (actual portfolios)	Percent	10.4%	4.8%	377	19.8%	9.8%	7014	0.00
At t = 11 (buy & hold portfolios)	Percent	9.7%	4.7%	384				0.00 [1]
At t = 11 (recommended portfolios)	Percent	2.9%	1.6%	384				0.00 [1]
Idiosyncratic variance share								
From t = -44 to t = 0 (actual portfolios)	Percent	36.3%	30.6%	316	39.5%	33.9%	5231	0.01
From t = 5 to t = 11 (actual portfolios)	Percent	29.6%	21.9%	381	32.5%	23.7%	7080	0.03
From t = 5 to t = 11 (buy & hold portfolios)	Percent	30.0%	19.6%	384				0.06 [1]
From t = 5 to t = 11 (recommended portfolios)	Percent	21.2%	18.1%	384				0.00 [1]
Home bias at t = 0								
At t = 0 (original portfolios)	Percent of equity in Germany	51.2%	51.7%	369	55.2%	58.2%	7116	0.03
At t = 11 (actual portfolios)	Percent of equity in Germany	43.9%	41.3%	378	51.1%	52.2%	7177	0.00
At t = 11 (buy & hold portfolios)	Percent of equity in Germany	45.6%	42.5%	384				0.00 [1]
At t = 11 (recommended portfolios)	Percent of equity in Germany	30.3%	28.7%	384				0.00 [1]

1 Actual portfolios used for non-advised clients

Table 6
Summary statistics for the degree of following

Table 6 reports summary statistics for the degree of following. The table reports the mean degree of following, the median degree of following, the number of followers and observations for six distinct time periods (upon receiving the first recommendation, after 10 days, after 20 days, after 30 days and at the end of the measurement period and the average over the entire measurement period). These time intervals are specific to each investor in the sample. Number of followers is defined as the number of investors who increase their degree of following till that point in time at least marginally.

	t = Advice start	t = 10 days	t = 20 days	t = 30 days	t = 11 months (end of measurement period)	Average over measurement period (t = 5 to t = 11 months)
Degree of following						
Mean	15.6%	21.6%	24.4%	25.4%	16.4%	21.1%
Median	10.8%	14.2%	15.5%	16.2%	10.4%	14.7%
Number of followers	n/a	98	141	158	125	157
Observations	385	385	385	385	385	385

Table 7
Who opts for advice?—A probit test

Table 7 reports probit estimates of the participation in the advisory model offered by the brokerage. Clients are set equal to 1 once they obtain the advice. For the estimation of the probit model, we include the following independent variables: a dummy that is equal to 1 if a client is male (*Dummy male),* the age of a client (*Age)*, a dummy that is equal to 1 if a client falls into categories 1 to 3 of a micro geographic status rating by an external agency (*Dummy low wealth)*, a dummy that is equal to 1 if a client falls into categories 7 to 9 of the micro geographic status (*Dummy high wealth)*, the risky portfolio value of the customer (*Log portfolio value)*, years the client has been with the bank (*Length of relationship)*, the number of trades per month (*Trades per month),* the average portfolio turnover per month (*Portfolio turnover)*, the difference between the proportion of realized gains and losses *(Disposition effect),* the proportion of risky assets in the account (*Risky share)*, the proportion of tax-free assets *(Share of tax-free assets),* the weekly alpha of a particular customer before opting for financial advice (*Alpha),* the idiosyncratic variance share (*Idiosyncratic variance share),* the Herfindahl-Hirschman index (*HHI)*, the share of domestic equity *(Home bias)*, the raw return from the beginning of observation until 1 month prior to the offer of financial advice (*Long-term raw return*) and the raw return of the month before the offer of financial advice (*Short-term raw return*). Alpha and idiosyncratic risk share stem from applying a Carhart (1997) four-factor model calibrated for Germany. P-values are in parentheses. Pseudo R-squared values and number of observations are reported. Three stars (***) denote significance at the 1% level or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. Standard errors shown are not clustered but results remain qualitatively unaltered when clustering them by advice week or risk aversion. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

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	Dummy advice						
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dummy male	0.361***	0.278***	0.285***	0.288***	0.291***	0.290***	0.257***
	(0.000)	(0.001)	(0.002)	(0.002)	(0.000)	(0.000)	(0.007)
Age	0.009***	0.008***	0.011***	0.010***	0.008***	0.008***	0.011***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy low wealth	-0.255*	-0.267**	-0.177	-0.183	-0.264*	-0.271**	-0.200
	(0.059)	(0.047)	(0.213)	(0.197)	(0.050)	(0.043)	(0.181)
Dummy high wealth	0.048	0.062	0.047	0.047	0.065	0.067	0.030
	(0.353)	(0.233)	(0.413)	(0.417)	(0.217)	(0.201)	(0.615)
Log portfolio value (t=0)	0.144***	0.130***	0.130***	0.131***	0.102***	0.130***	0.138***
	(0.000)	(0.001)	(0.004)	(0.005)	(0.008)	(0.001)	(0.002)
Length of relationship		0.063***	0.098***	0.098***	0.068***	0.064***	0.102***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Trades per month (t=-44 to t=0)		0.042***	0.043***	0.042***	0.028***	0.037***	0.042***
		(0.000)	(0.000)	(0.000)	(0.008)	(0.000)	(0.001)
Portfolio turnover (t=-44 to t=0)		-1.104**	-1.042*	-1.030*	-0.450	-0.966**	-0.589
		(0.010)	(0.080)	(0.095)	(0.310)	(0.024)	(0.427)
Disposition effect (t=-44 to t=0)		-0.163*	-0.208**	-0.203**	-0.204**	-0.154*	-0.208**
		(0.065)	(0.031)	(0.035)	(0.027)	(0.079)	(0.039)
Risky share (t=0)		-0.103	-0.192	-0.201	-0.082	-0.103	-0.268**
		(0.353)	(0.115)	(0.101)	(0.468)	(0.356)	(0.029)
Share of tax-free assets (t=0)		-0.194*	-0.219*	-0.235*	-0.287**	-0.217*	-0.223
		(0.085)	(0.094)	(0.075)	(0.017)	(0.055)	(0.151)
Alpha (t=-44 to t=0)			21.836**				
			(0.012)				
Idiosyncratic variance share (t=-44 to t=0)				-0.189			
				(0.241)			
HHI (t=0)					-0.883***		
					(0.000)		
Home bias (t=0)						-0.197***	
						(0.008)	
Long-term raw return (t=-44 to t=-1)							27.917**
							(0.036)
Short-term raw return (t=-1 to t=0)							-2.750*
							(0.100)
Constant	-3.937***	-3.923***	-4.327***	-4.266***	-3.513***	-3.850***	-4.287***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	7,450	7,449	5,520	5,520	7,432	7,449	5,056
Pseudo R-squared	0.0381	0.0668	0.0677	0.0664	0.0778	0.0691	0.0682

Table 8
Who chooses to follow advice?

Table 8 reports OLS estimates of the coefficients related to an increase in the degree of following measure from the date the investor received advice to t = 20 days (*Increase in degree of following*). For the estimation of the model we include the following independent variables: a dummy that is equal to 1 if a client is male (*Dummy male),* the age of a client (*Age),* a dummy that is equal to 1 if a client falls into categories 1 to 3 of a micro geographic status rating by an external agency (*Dummy low wealth)*, a dummy that is equal to 1 if a client falls into categories 7 to 9 of the micro geographic status (*Dummy high wealth)*, the risky portfolio value of the customer (*Log portfolio value)*, years the client has been with the bank (*Length of relationship)*, the number of trades per month (*Trades per month),* the average portfolio turnover per month (*Portfolio turnover)*, the difference between the proportion of realized gains and losses *(Disposition effect),* the proportion of risky assets in the account (*Risky share)*, the proportion of tax-free assets *(Share of tax-free assets)*, a ratio of the required net investment (*Recommended portfolio/original portfolio*), the weekly alpha of a particular customer before opting for financial advice (*Alpha),* the idiosyncratic variance share (*Idiosyncratic variance share),* the Herfindahl-Hirschman index (*HHI)*, the share of domestic equity *(Home bias)* the raw return from the beginning of observation until 1 month prior to the offer of financial advice (*Long-term raw return*) and the raw return of the month before the offer of financial advice (*Short-term raw return*). Alpha and idiosyncratic risk share stem from applying a Carhart (1997) four-factor model calibrated for Germany. P-values are in parentheses. R-squared values and number of observations are reported. Three stars (***) denote significance at 1% or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. Standard errors shown are not clustered but results remain qualitatively unaltered when clustering them by advice week or risk aversion. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

	Increase in degree of following						
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dummy male	-0.080	-0.076	-0.055	-0.062	-0.079	-0.080	-0.048
	(0.122)	(0.131)	(0.298)	(0.238)	(0.119)	(0.115)	(0.374)
Age	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.535)	(0.826)	(0.995)	(0.967)	(0.872)	(0.925)	(0.797)
Dummy low wealth	-0.041**	-0.054**	-0.063***	-0.059**	-0.053**	-0.052**	-0.062**
	(0.046)	(0.031)	(0.007)	(0.018)	(0.035)	(0.049)	(0.011)
Dummy high wealth	0.045**	0.044*	0.038	0.038	0.044*	0.043*	0.033
	(0.039)	(0.051)	(0.120)	(0.115)	(0.051)	(0.055)	(0.182)
Log portfolio value (t=0)	-0.060***	-0.065***	-0.060***	-0.056***	-0.064***	-0.066***	-0.056***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Length of relationship		0.003	0.006	0.006	0.002	0.003	0.005
		(0.398)	(0.156)	(0.188)	(0.459)	(0.425)	(0.257)
Trades per month (t=-44 to t=0)		0.001	0.002	0.003	0.002	0.002	0.003
		(0.751)	(0.636)	(0.408)	(0.614)	(0.618)	(0.528)
Portfolio turnover (t=-44 to t=0)		-0.025	-0.052	-0.186	-0.054	-0.051	-0.304
		(0.906)	(0.842)	(0.470)	(0.806)	(0.811)	(0.413)
Disposition effect (t=-44 to t=0)		-0.027	-0.013	0.002	-0.026	-0.030	0.032
		(0.579)	(0.798)	(0.960)	(0.591)	(0.538)	(0.518)
Risky share (t=0)		0.002	-0.014	-0.018	-0.001	0.003	-0.002
		(0.973)	(0.753)	(0.684)	(0.976)	(0.945)	(0.970)
Share of tax-free assets (t=0)		0.051	0.054	0.084	0.057	0.057	0.083*
		(0.240)	(0.272)	(0.126)	(0.200)	(0.188)	(0.056)
Recommended portfolio / original portfolio		-0.003	-0.002	-0.003	-0.005	-0.003	0.014
		(0.829)	(0.841)	(0.830)	(0.728)	(0.785)	(0.464)
Alpha (t=-44 to t=0)			6.160				
			(0.155)				
Idiosyncratic variance share (t=-44 to t=0)				0.089			
				(0.152)			
HHI (t=0)					0.061		
					(0.534)		
Home bias (t=0)						0.031	
						(0.382)	
Long-term raw return (t=-44 to t=-1)							8.195
							(0.169)
Short-term raw return (t=-1 to t=0)							-0.872
							(0.401)
Constant	0.754***	0.752***	0.670***	0.580***	0.741***	0.751***	0.594***
	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)
Observations	369	365	313	313	365	365	297
R-squared	0.132	0.139	0.138	0.139	0.141	0.141	0.131

Table 9
Does financial advice improve diversification and portfolio performance?

Table 9 reports OLS estimates of the coefficients related to a decrease in HHI (models (1) to (4)), a decrease in idiosyncratic variance share (models (5) to (8)), an increase in Sharpe ratio (models (9) to (12)) and an increase in MPPM (models (13) to (16)). HHI and portfolio returns are calculated assuming investors had fully followed the recommendations (*recommended* portfolios). The focus of the table is on the variable *Dummy advice* that is equal to 1 if a client opts for financial advice. Additionally, the model controls for several other independent variables: a dummy that is equal to 1 if a client is male (*Dummy male),* the age of a client (*Age),* a dummy that is equal to 1 if a client falls into categories 1 to 3 of a micro geographic status rating by an external agency (*Dummy low wealth)*, a dummy that is equal to 1 if a client falls into categories 7 to 9 of the micro geographic status (*Dummy high wealth)*, the risky portfolio value of the customer (*Log portfolio value)*, years the client has been with the bank (*Length of relationship)*, the number of trades per month (*Trades per month),* the average portfolio turnover per month (*Portfolio turnover)*, the difference between the proportion of realized gains and losses *(Disposition effect),* the proportion of risky assets in the account (*Risky share)*, the proportion of tax-free assets *(Share of tax-free assets)* and the weekly alpha of a particular customer before opting for financial advice (*Alpha).* Alpha and idiosyncratic variance share stem from applying a Carhart (1997) four-factor model calibrated for Germany. P-values are in parentheses. Pseudo R-squared values and number of observations are reported. Three stars (***) denote significance at 1% or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

	Decrease in HHI				Decrease in idiosyncratic variance share			
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy advice	0.088***	0.091***	0.091***	0.091***	0.082***	0.087***	0.086***	0.086***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Dummy male		-0.000	-0.000	-0.000		0.007	0.005	0.004
		(0.993)	(0.983)	(0.959)		(0.309)	(0.523)	(0.549)
Age		-0.000	-0.000	-0.000		0.000	0.000	0.000
		(1.000)	(0.948)	(0.871)		(0.687)	(0.765)	(0.796)
Dummy low wealth		0.003	0.004	0.004		-0.006	-0.008	-0.008
		(0.714)	(0.691)	(0.693)		(0.618)	(0.530)	(0.525)
Dummy high wealth		0.003	0.003	0.002		0.008	0.009	0.009
		(0.430)	(0.499)	(0.558)		(0.144)	(0.116)	(0.115)
Log portfolio value (t=-44)		-0.001	0.002	0.002		-0.018***	-0.020***	-0.019***
		(0.698)	(0.266)	(0.292)		(0.000)	(0.000)	(0.000)
Length of relationship			0.000	0.000			-0.001	-0.001
			(0.673)	(0.753)			(0.257)	(0.257)
Trades per month (t=-44 to t=0)			-0.000	-0.000			0.003**	0.003**
			(0.918)	(0.938)			(0.042)	(0.038)
Portfolio turnover (t=-44 to t=0)			-0.007	-0.002			0.113	0.098
			(0.924)	(0.977)			(0.103)	(0.155)
Disposition effect (t=-44 to t=0)			-0.009	-0.009			0.012	0.014
			(0.282)	(0.287)			(0.228)	(0.165)
Risky share (t=0)			-0.032***	-0.032***			0.038***	0.039***
			(0.000)	(0.000)			(0.000)	(0.000)
Share of tax-free assets (t=0)			-0.020	-0.019			-0.046***	-0.045**
			(0.266)	(0.301)			(0.009)	(0.012)
Alpha (t=-44 to t=0)				0.167				-1.549
				(0.901)				(0.158)
Constant	0.002	0.006	0.018	0.020	0.072***	0.241***	0.274***	0.267***
	(0.225)	(0.732)	(0.437)	(0.400)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	7,255	5,426	5,403	5,402	5,453	5,450	5,444	5,444
R-squared	0.016	0.021	0.027	0.027	0.009	0.028	0.039	0.040

	Increase in Sharpe ratio				Increase in MPPM			
Dependent variable	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dummy advice	0.193***	0.193***	0.189***	0.190***	0.053***	0.057***	0.041**	0.083***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.002)	(0.016)	(0.000)
Dummy male		-0.020***	-0.015***	-0.015***		0.015	0.002	-0.016
		(0.000)	(0.006)	(0.004)		(0.392)	(0.908)	(0.317)
Age		-0.001***	-0.000*	-0.000*		-0.001	-0.001	-0.001**
		(0.004)	(0.075)	(0.068)		(0.245)	(0.209)	(0.050)
Dummy low wealth		0.013	0.011	0.011		-0.006	-0.001	-0.008
		(0.181)	(0.246)	(0.260)		(0.836)	(0.962)	(0.745)
Dummy high wealth		0.003	0.004	0.004		0.023	0.024	0.028
		(0.456)	(0.320)	(0.276)		(0.352)	(0.306)	(0.197)
Log portfolio value (t=-44)		0.010***	0.003*	0.004**		-0.008	-0.018	0.003
		(0.000)	(0.062)	(0.021)		(0.460)	(0.161)	(0.839)
Length of relationship			-0.001	-0.001			0.001	0.002
			(0.161)	(0.195)			(0.816)	(0.535)
Trades per month (t=-44 to t=0)			0.011***	0.011***			0.017	0.020**
			(0.000)	(0.000)			(0.147)	(0.022)
Portfolio turnover (t=-44 to t=0)			-0.513***	-0.548***			1.108**	0.034
			(0.000)	(0.000)			(0.029)	(0.906)
Disposition effect (t=-44 to t=0)			0.008	0.012			-0.232***	-0.110***
			(0.307)	(0.131)			(0.001)	(0.000)
Risky share (t=0)			0.008	0.009			0.085	0.107
			(0.252)	(0.169)			(0.215)	(0.107)
Share of tax-free assets (t=0)			0.064***	0.065***			0.072	0.154**
			(0.000)	(0.000)			(0.396)	(0.038)
Alpha (t=-44 to t=0)				-3.510***				-93.799***
				(0.000)				(0.000)
Constant	0.199***	0.138***	0.146***	0.131***	0.330***	0.429***	0.365***	-0.036
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.804)
Observations	5,479	5,476	5,470	5,469	5,487	5,484	5,478	5,477
R-squared	0.079	0.091	0.141	0.148	0.000	0.001	0.019	0.204

Table 10
Does the average advisee benefit?

Table 10 reports OLS estimates of the coefficients related to a decrease in HHI (models (1) to (4)) and a decrease in idiosyncratic variance share (models (5) to (8)), an increase in Sharpe ratio (models (9) to (12)) and an increase in MPPM (models (13) to (16)). HHI and portfolio returns are calculated based on the *actual* portfolios of investors. The focus of the table is on the variable *Dummy advice* that is equal to 1 if a client opts for financial advice. Additionally, the model controls for the following independent variables: a dummy variable that is equal to 1 if a client is male (*Dummy male),* the age of a client (*Age),* a dummy that is equal to 1 if a client falls into categories 1 to 3 of a micro geographic status rating by an external agency (*Dummy low wealth)*, a dummy that is equal to 1 if a client falls into categories 7 to 9 of the micro geographic status (*Dummy high wealth)*, the risky portfolio value of the customer (*Log portfolio value)*, years the client has been with the bank (*Length of relationship)*, the number of trades per month (*Trades per month),* the average portfolio turnover per month (*Portfolio turnover)*, the difference between the proportion of realized gains and losses *(Disposition effect),* the proportion of risky assets in the account (*Risky share)*, the proportion of tax-free assets *(Share of tax-free assets),* the weekly alpha of a particular customer before opting for financial advice (*Alpha)*. Alpha and idiosyncratic variance share stem from applying a Carhart (1997) four-factor model calibrated for Germany. P-values are in parentheses. Pseudo R-squared values and number of observations are reported. Three stars (***) denote significance at 1% or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

	Decrease in HHI				Decrease in idiosyncratic variance share			
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dummy advice	0.013	0.011	0.010	0.011	-0.003	0.002	0.001	0.002
	(0.144)	(0.298)	(0.321)	(0.304)	(0.807)	(0.886)	(0.907)	(0.858)
Dummy male		-0.001	-0.000	-0.000		0.005	0.003	0.003
		(0.901)	(0.961)	(0.940)		(0.475)	(0.637)	(0.667)
Age		-0.000	-0.000	-0.000		0.000	0.000	0.000
		(0.598)	(0.619)	(0.553)		(0.635)	(0.647)	(0.676)
Dummy low wealth		0.003	0.004	0.004		-0.005	-0.006	-0.006
		(0.713)	(0.689)	(0.691)		(0.713)	(0.608)	(0.603)
Dummy high wealth		0.002	0.001	0.001		0.007	0.008	0.008
		(0.681)	(0.743)	(0.814)		(0.189)	(0.153)	(0.151)
Log portfolio value (t=-44)		0.000	0.003	0.003		-0.017***	-0.019***	-0.019***
		(0.899)	(0.131)	(0.151)		(0.000)	(0.000)	(0.000)
Length of relationship			0.000	0.000			-0.002	-0.002
			(0.756)	(0.839)			(0.126)	(0.126)
Trades per month (t=-44 to t=0)			0.001	0.001			0.003**	0.003**
			(0.390)	(0.376)			(0.017)	(0.015)
Portfolio turnover (t=-44 to t=0)			-0.050	-0.045			0.077	0.062
			(0.464)	(0.519)			(0.266)	(0.371)
Disposition effect (t=-44 to t=0)			-0.009	-0.009			0.016	0.017*
			(0.284)	(0.283)			(0.132)	(0.089)
Risky share (t=0)			-0.036***	-0.036***			0.035***	0.036***
			(0.000)	(0.000)			(0.000)	(0.000)
Share of tax-free assets (t=0)			-0.017	-0.015			-0.037**	-0.035**
			(0.367)	(0.407)			(0.039)	(0.048)
Alpha (t=-44 to t=0)				0.243				-1.611
				(0.857)				(0.144)
Constant	0.002	0.003	0.017	0.019	0.072***	0.232***	0.265***	0.258***
	(0.225)	(0.853)	(0.479)	(0.432)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	7,251	5,422	5,399	5,398	5,453	5,450	5,444	5,444
R-squared	0.000	0.000	0.007	0.007	0.000	0.017	0.026	0.027

	Increase in Sharpe ratio				Increase in MPPM			
Dependent variable	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dummy advice	0.060***	0.060***	0.056***	0.057***	0.010	0.014	-0.001	0.040**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.614)	(0.473)	(0.938)	(0.027)
Dummy male		-0.021***	-0.015***	-0.016***		0.015	0.002	-0.016
		(0.000)	(0.005)	(0.003)		(0.384)	(0.899)	(0.326)
Age		-0.001***	-0.000*	-0.000*		-0.001	-0.001	-0.001**
		(0.002)	(0.056)	(0.051)		(0.231)	(0.198)	(0.046)
Dummy low wealth		0.011	0.009	0.008		-0.007	-0.003	-0.010
		(0.288)	(0.377)	(0.395)		(0.788)	(0.914)	(0.699)
Dummy high wealth		0.003	0.004	0.004		0.022	0.024	0.027
		(0.513)	(0.364)	(0.317)		(0.365)	(0.318)	(0.207)
Log portfolio value (t=-44)		0.010***	0.004**	0.005**		-0.008	-0.018	0.003
		(0.000)	(0.042)	(0.014)		(0.449)	(0.161)	(0.841)
Length of relationship			-0.001	-0.001			0.001	0.002
			(0.139)	(0.169)			(0.815)	(0.539)
Trades per month (t=-44 to t=0)			0.011***	0.011***			0.018	0.020**
			(0.000)	(0.000)			(0.143)	(0.021)
Portfolio turnover (t=-44 to t=0)			-0.520***	-0.555***			1.116**	0.043
			(0.000)	(0.000)			(0.028)	(0.882)
Disposition effect (t=-44 to t=0)			0.008	0.012			-0.233***	-0.112***
			(0.322)	(0.144)			(0.001)	(0.000)
Risky share (t=0)			0.004	0.006			0.082	0.104
			(0.537)	(0.401)			(0.234)	(0.119)
Share of tax-free assets (t=0)			0.063***	0.065***			0.074	0.156**
			(0.000)	(0.000)			(0.381)	(0.035)
Alpha (t=-44 to t=0)				-3.417***				-93.756***
				(0.000)				(0.000)
Constant	0.199***	0.138***	0.148***	0.133***	0.330***	0.433***	0.367***	-0.034
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.813)
Observations	5,479	5,476	5,470	5,469	5,487	5,484	5,478	5,477
R-squared	0.008	0.021	0.074	0.081	0.000	0.001	0.019	0.203

Table 11
Does the average advisee benefit if the advice is partially followed?

Table 11 reports OLS estimates of the coefficients related to a decrease in HHI (models (1) to (4)) and a decrease in idiosyncratic variance share (models (5) to (8)), an increase in Sharpe ratio (models (9) to (12)) and an increase in MPPM (models (13) to (16)). HHI and portfolio returns are calculated based on the *actual* portfolios of investors. The focus of the table is on the variable *Improvement of degree of following* which shows the improvement of the degree of following from the time of the first recommendation to t = 11 and takes the value 0 for non-advised clients. *Dummy advice* is equal to 1 if a client opts for financial advice. Additionally, the model controls for the following independent variables: a dummy variable that is equal to 1 if a client is male (*Dummy male),* the age of a client (*Age),* a dummy that is equal to 1 if a client falls into categories 1 to 3 of a micro geographic status rating by an external agency (*Dummy low wealth)*, a dummy that is equal to 1 if a client falls into categories 7 to 9 of the micro geographic status (*Dummy high wealth)*, the risky portfolio value of the customer (*Log portfolio value)*, years the client has been with the bank (*Length of relationship)*, the number of trades per month (*Trades per month),* the average portfolio turnover per month (*Portfolio turnover)*, the difference between the proportion of realized gains and losses *(Disposition effect),* the proportion of risky assets in the account (*Risky share)*, the proportion of tax-free assets *(Share of tax-free assets),* the weekly alpha of a particular customer before opting for financial advice (*Alpha)*. Alpha and idiosyncratic variance share stem from applying a Carhart (1997) four-factor model calibrated for Germany. P-values are in parentheses. Pseudo R-squared values and number of observations are reported. Three stars (***) denote significance at 1% or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

	Decrease in HHI				Decrease in idiosyncratic variance share			
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Improvement of degree of following	0.136***	0.146***	0.147***	0.147***	0.113	0.103	0.119	0.118
	(0.002)	(0.003)	(0.003)	(0.004)	(0.122)	(0.150)	(0.100)	(0.104)
Dummy advice	0.012	0.009	0.008	0.009	-0.004	0.001	0.000	0.001
	(0.177)	(0.392)	(0.422)	(0.403)	(0.727)	(0.964)	(0.998)	(0.947)
Dummy male		-0.001	-0.000	-0.000		0.005	0.003	0.003
		(0.906)	(0.960)	(0.939)		(0.479)	(0.645)	(0.675)
Age		-0.000	-0.000	-0.000		0.000	0.000	0.000
		(0.625)	(0.647)	(0.580)		(0.619)	(0.628)	(0.657)
Dummy low wealth		0.003	0.004	0.004		-0.004	-0.006	-0.006
		(0.699)	(0.676)	(0.678)		(0.720)	(0.616)	(0.610)
Dummy high wealth		0.002	0.001	0.001		0.007	0.008	0.008
		(0.709)	(0.771)	(0.843)		(0.195)	(0.158)	(0.157)
Log portfolio value (t=-44)		0.000	0.003	0.003		-0.017***	-0.019***	-0.019***
		(0.876)	(0.126)	(0.146)		(0.000)	(0.000)	(0.000)
Length of relationship			0.000	0.000			-0.002	-0.002
			(0.772)	(0.855)			(0.121)	(0.121)
Trades per month (t=-44 to t=0)			0.001	0.001			0.003**	0.003**
			(0.354)	(0.341)			(0.016)	(0.014)
Portfolio turnover (t=-44 to t=0)			-0.050	-0.045			0.077	0.062
			(0.463)	(0.519)			(0.266)	(0.370)
Disposition effect (t=-44 to t=0)			-0.009	-0.009			0.015	0.017*
			(0.272)	(0.270)			(0.137)	(0.093)
Risky share (t=0)			-0.036***	-0.036***			0.036***	0.036***
			(0.000)	(0.000)			(0.000)	(0.000)
Share of tax-free assets (t=0)			-0.017	-0.016			-0.037**	-0.036**
			(0.342)	(0.380)			(0.036)	(0.044)
Alpha (t=-44 to t=0)				0.259				-1.603
				(0.848)				(0.147)
Constant	0.002	0.002	0.017	0.019	0.072***	0.232***	0.265***	0.258***
	(0.225)	(0.890)	(0.478)	(0.430)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	7,251	5,422	5,399	5,398	5,453	5,450	5,444	5,444
R-squared	0.001	0.002	0.008	0.009	0.001	0.017	0.027	0.028

	Increase in Sharpe ratio				Increase in MPPM			
Dependent variable	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Improvement of degree of following	0.193***	0.197***	0.187***	0.185***	0.018	0.006	0.085	0.026
	(0.001)	(0.001)	(0.001)	(0.002)	(0.752)	(0.913)	(0.199)	(0.645)
Dummy advice	0.058***	0.058***	0.054***	0.055***	0.010	0.014	-0.002	0.040**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.622)	(0.477)	(0.898)	(0.030)
Dummy male		-0.021***	-0.015***	-0.016***		0.015	0.002	-0.016
		(0.000)	(0.004)	(0.003)		(0.384)	(0.902)	(0.325)
Age		-0.001***	-0.000*	-0.000*		-0.001	-0.001	-0.001**
		(0.003)	(0.063)	(0.058)		(0.232)	(0.200)	(0.047)
Dummy low wealth		0.011	0.009	0.009		-0.007	-0.003	-0.010
		(0.278)	(0.365)	(0.383)		(0.789)	(0.917)	(0.700)
Dummy high wealth		0.003	0.004	0.004		0.022	0.024	0.027
		(0.539)	(0.383)	(0.334)		(0.365)	(0.320)	(0.207)
Log portfolio value (t=-44)		0.010***	0.004**	0.005**		-0.008	-0.018	0.003
		(0.000)	(0.039)	(0.013)		(0.449)	(0.161)	(0.840)
Length of relationship			-0.001	-0.001			0.001	0.002
			(0.128)	(0.155)			(0.818)	(0.540)
Trades per month (t=-44 to t=0)			0.011***	0.011***			0.018	0.020**
			(0.000)	(0.000)			(0.142)	(0.021)
Portfolio turnover (t=-44 to t=0)			-0.520***	-0.555***			1.116**	0.043
			(0.000)	(0.000)			(0.028)	(0.882)
Disposition effect (t=-44 to t=0)			0.008	0.012			-0.233***	-0.112***
			(0.342)	(0.156)			(0.001)	(0.000)
Risky share (t=0)			0.004	0.006			0.082	0.104
			(0.522)	(0.389)			(0.234)	(0.118)
Share of tax-free assets (t=0)			0.062***	0.064***			0.074	0.156**
			(0.000)	(0.000)			(0.384)	(0.036)
Alpha (t=-44 to t=0)				-3.405***				-93.754***
				(0.000)				(0.000)
Constant	0.199***	0.137***	0.148***	0.133***	0.330***	0.433***	0.367***	-0.034
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.813)
Observations	5,479	5,476	5,470	5,469	5,487	5,484	5,478	5,477
R-squared	0.011	0.023	0.077	0.084	0.000	0.001	0.019	0.203

Table 12
Who would benefit most from advice?

Table 12 reports coefficient estimates of the variable "dummy advice" when the tests of Table 9 are conducted on subgroups. The first subgroup consists of clients who are predicted to obtain advice. These are 5% of the 7,432 clients with the highest probability of obtaining the advice predictions as given in model 5 of Table 7. Their size is 372. Of these, 62 took advice and so have the indicator variable "dummy advice" turned on to equal 1, and 310 did not take advice and so have the indicator variable "dummy advice" turned on to equal 0. The second subgroup consists of clients who are not predicted to obtain advice. These are 95% of the 7,432 clients with the lowest probability of obtaining the advice predictions as given in model 5 of Table 7. Their size is 7,060. Of these, 307 took advice and so have the indicator variable "dummy advice" turned on to equal 1, and 6,753 did not take advice and so have the indicator variable "dummy advice" turned on to equal 0. R-squared values and number of observations are reported. Three stars (***) denote significance at 1% or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. The third column reports the p-value of a test of equality of the coefficients for *Dummy advice* using seemingly unrelated estimation. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

	Decrease in HHI			Decrease in idiosyncratic variance share		
Dependent variable	Predicted to obtain advice	Not predicted to obtain advice	P-value	Predicted to obtain advice	Not predicted to obtain advice	P-value
Dummy advice	0.042***	0.099***	0.00	0.066**	0.077***	0.73
	(0.000)	(0.000)		(0.013)	(0.000)	
Constant	-0.007*	0.003		0.112***	0.070***	
	(0.089)	(0.135)		(0.000)	(0.000)	
Observations	366	6,859		359	5,085	
R-squared	0.056	0.017		0.018	0.007	

	Increase in Sharpe ratio			Increase in MPPM		
Dependent variable	Predicted to obtain advice	Not predicted to obtain advice	P-value	Predicted to obtain advice	Not predicted to obtain advice	P-value
Dummy advice	0.147***	0.194***	0.00	-0.034	0.053***	0.18
	(0.000)	(0.000)		(0.579)	(0.006)	
Constant	0.250***	0.196***		0.439***	0.324***	
	(0.000)	(0.000)		(0.000)	(0.000)	
Observations	359	5,110		359	5,118	
R-squared	0.179	0.069		0.000	0.000	

Figure 1. Timeline

The sequence of events in the field study (dates are always at the beginning of the respective month).

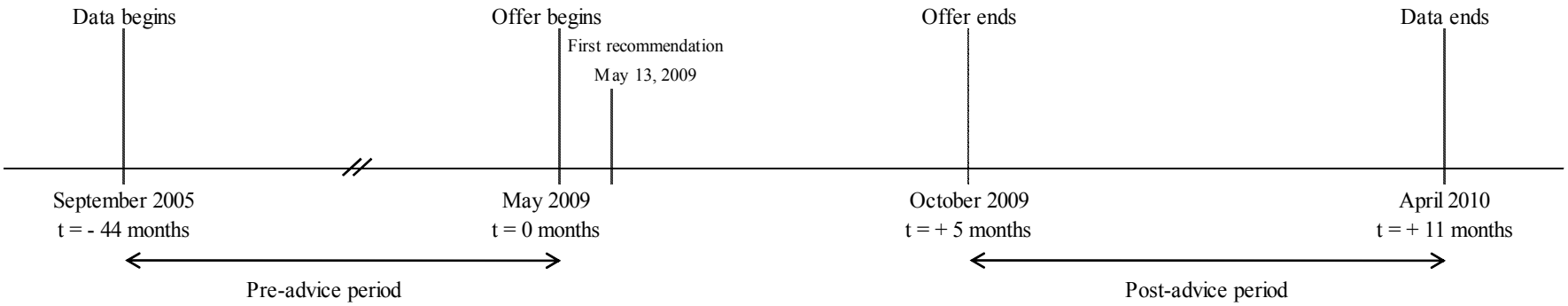


Figure 2a. Initial degree of following

The cross-sectional distribution of the degree of following when the first recommendation was given.

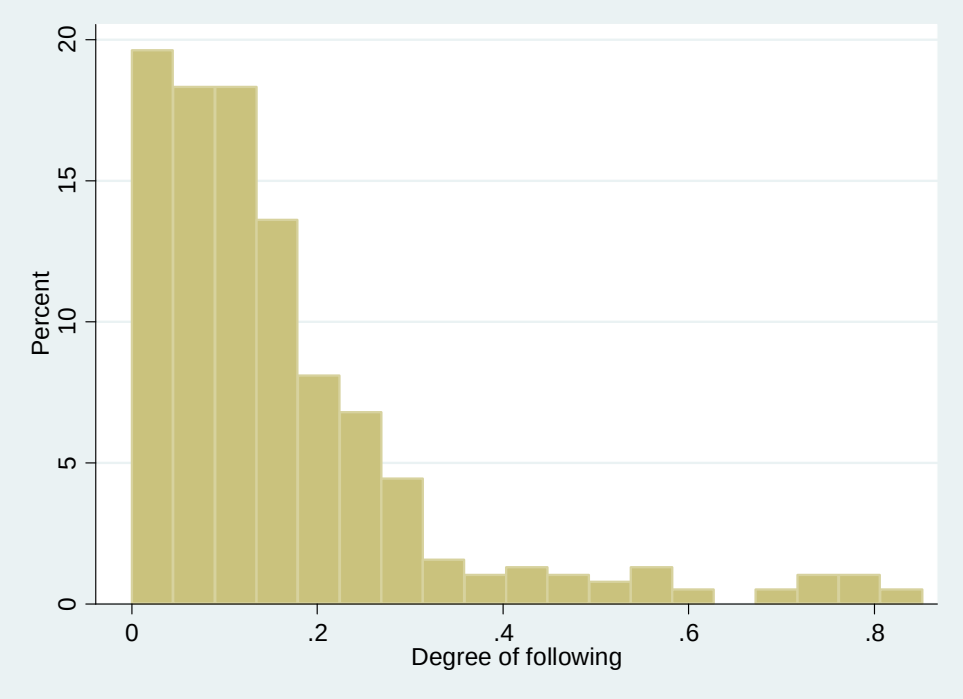


Figure 2b. Subsequent degree of following

The cross-sectional distribution of the average degree of following between time t = advice start and t = 11 months.

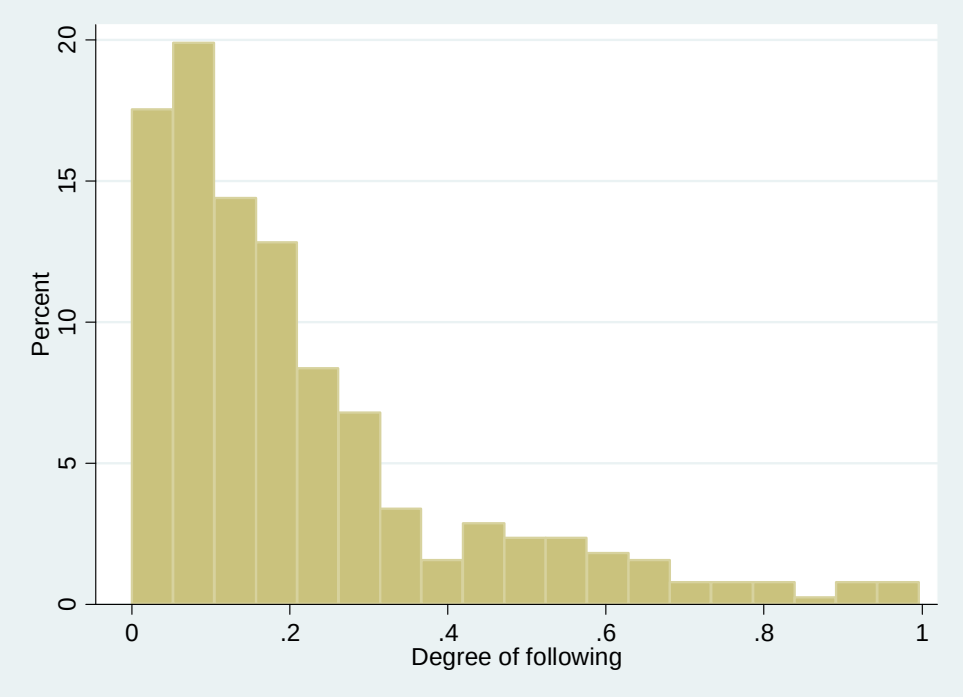
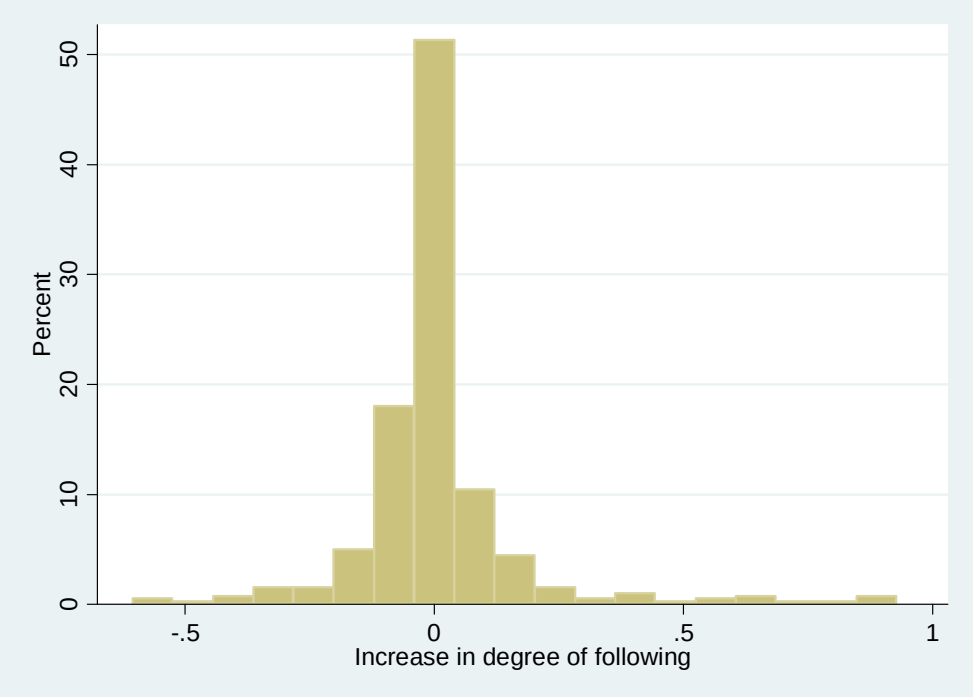


Figure 2c. Increase in degree of following

Increase in degree of following from the time of the first recommendation to t = 11.

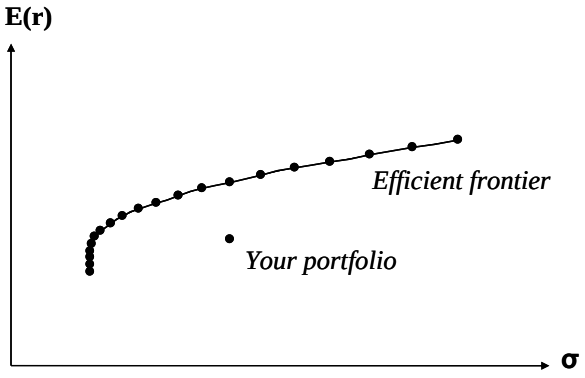


Appendix

A1) Disguised example of advice that was sent to advisees

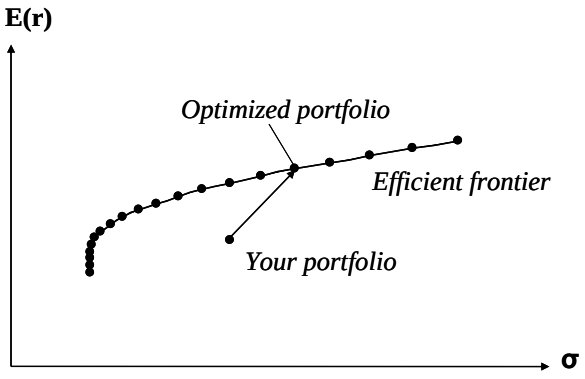
I) Description of the idea of diversification, explanation of important concepts, intuitive explanation of the portfolio optimization methodology, and discussion of tax implications.

II) Analysis of the existing portfolio.



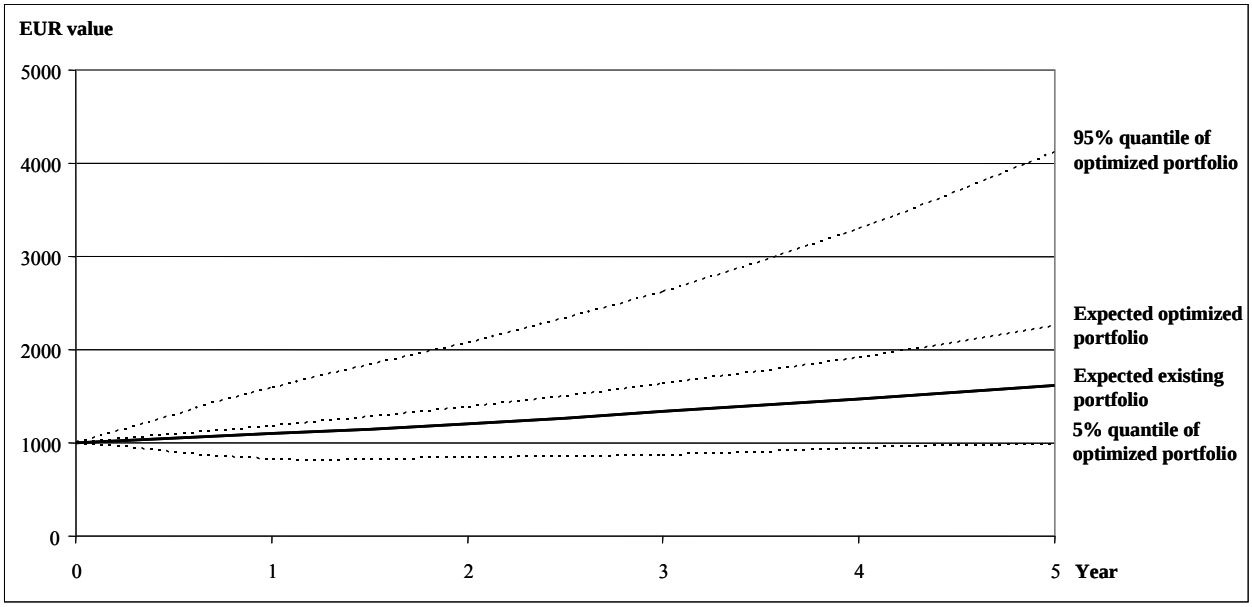
Existing portfolio	
Return (past year):	x %
Standard deviation (past 1 year):	x %
Expected return:	x %
Expected standard deviation:	x %
Expected Sharpe ratio:	x %

III) Analysis of *recommended* (optimized) portfolio[19]



Recommended (optimized) portfolio	
Expected return:	x %
Expected standard deviation:	x %
Expected Sharpe ratio:	x %

[19] Recall that the goal of the optimizer is to enhance portfolio efficiency by improving diversification. This may improve portfolios along two dimensions: either the risk for a given level of return decreases or the expected return for a given level of risk increases. The brokerage communicated in this report changes along both dimensions.



	Model calculation of possible portfolio development in 5 years			
	Current value	Expected value	Lower bound (5%)	Upper bound (95%)
Existing portfolio	EUR 1000	EUR 1700	EUR 1100	EUR 2500
Recommended (optimized) portfolio	EUR 1000	EUR 2200	EUR 1000	EUR 4100

Model calculation assumes constant risk/return estimates

IV) The client's investment requests

V) List of necessary transactions

VI) Fact sheet for each security on recommendation list

A2) Alternative measure for the degree of following

Our degree of following measures both the buy and sell sides of following advice. If a security in the advisee's portfolio is not included in the *recommended* portfolio, this suggests that the investor has been advised to sell this security. It is, however, possible that the advisee sells a security for reasons other than following the advice (e.g., liquidity or tax motives). As a check for robustness, we construct an alternative measure of the degree of following. This measure considers only the buy side and is simply the share of the *recommended* portfolio that the investor holds at any time.

The tables below that use this alternative measure of the degree of following–Table 4A2, Table 6A2, Table 8A2 and Table 11A2–are the counterparts of the tables in the text–Table 4, Table 6, Table 8 and Table 11.

[INSERT TABLE 4A2, TABLE 6A2, TABLE 8A2 and TABLE 11A2 ABOUT HERE]

The figures below that use this alternative measure of the degree of following–Figure 2aA2, Figure 2bA2 and Figure 2cA2–are the counterparts of the figures in the text–Figure 2a, Figure 2b and Figure 2c.

[INSERT FIGURES 2aA2, 2bA2 and 2cA2 ABOUT HERE]

Table 4A2
Illustration of an alternative degree of following (buy side only)

Table 4A2 provides an actual example of our alternative measure of degree of following that considers only the assets the advisee is recommended to buy. Securities E.ON and H&M overlap between the *actual* and the *recommended* portfolio (E.ON only partially). The value of the overlap in this case is 4,224 EUR (681 EUR in E.ON and 3,543 EUR in H&M). We calculate the degree of following for each day as the EUR-value of recommended assets in the investor's *original* portfolio divided by the value of assets in EUR in the *actual* portfolio (here: 4,224 / 23,688 = 18%).

Original portfolio (t = 0)	EUR	**Recommended portfolio (t = 0)**	EUR		**Required action**	**Keep** EUR	**Buy** EUR	
Deutsche Bank	8,646			→	Sell			Ignored for measuring alternative "degree of following advice"
HSBC Indian Equity Fund	3,622			→	Sell			
Raiffeisen CEE Equity Fund	2,792			→	Sell			
HSBC BRIC Equity Fund	1,862			→	Sell			
Commerzbank	439			→	Sell			
E.ON	2,523	E.ON	681	→	Keep/Decrease	681		Considered for measuring alternative "degree of following advice"
H&M	3,543	H&M	3,543	→	Keep	3,543		
		Comstage ETF EONIA	4,072	→	Buy		4,072	
		Schroder ISF Europa Corporate Bond Fund	3,883	→	Buy		3,883	
		Allianz Pimco Europazins Bond Fund	3,799	→	Buy		3,799	
		Allianz Pimco Corporate Bond Europa Fund	2,434	→	Buy		2,434	
		UBS Lux Bond Fund	1,751	→	Buy		1,751	
		Grundbesitz Europa Real Estate Fund	1,470	→	Buy		1,470	
		Pictet EM Fund	1,247	→	Buy		1,247	
		Allianz RCM Small Cap Fund	808	→	Buy		808	
	23,426		**23,688**			**4,224**	**19,463**	

Table 6A2
Summary statistics of the alternative degree of following (buy side only)

Table 6A2 reports summary statistics of the alternative degree of following. The table reports mean alternative degree of following, median alternative degree of following, number of followers and observations for six distinct time periods (upon receiving the first recommendation, after 10 days, after 20 days and at the end of the post-advice period and the average over the entire post-advice period). These time intervals are specific to each investor in the sample. Number of followers is defined as the number of investors who increase their alternative degree of following at least marginally.

	t = advice start	t = 10 days	t = 20 days	t = 30 days	t = 11 months (end of measurement period)	Average between t = advice start and t = 11 months
Degree of following						
Mean	25.0%	32.7%	36.0%	37.8%	26.3%	32.9%
Median	21.4%	26.3%	27.4%	28.9%	21.0%	28.1%
Number of followers	n/a	99	142	169	148	175
Observations	385	385	385	385	385	385

Table 8A2
Who chooses to follow advice? (buy side only)

Table 8A2 reports OLS estimates of the coefficients related to an increase in the alternative degree of following measure from the date the investor received advice to t = 20 days (*Increase in alternative degree of following*). For the estimation of the model we include the following independent variables: a dummy that is equal to 1 if a client is male (*Dummy male),* the age of a client (*Age),* a dummy that is equal to 1 if a client falls into categories 1 to 3 of a micro geographic status rating by an external agency (*Dummy low wealth)*, a dummy that is equal to 1 if a client falls into categories 7 to 9 of the micro geographic status (*Dummy high wealth)*, the risky portfolio value of the customer (*Log portfolio value)*, years the client has been with the bank (*Length of relationship)*, the number of trades per month (*Trades per month),* the average portfolio turnover per month (*Portfolio turnover)*, the difference between the proportion of realized gains and losses *(Disposition effect),* the proportion of risky assets in the account (*Risky share)*, the proportion of tax-free assets *(Share of tax-free assets)*, a ratio for the required net investment (*Recommended portfolio/original portfolio*), the weekly alpha of a particular customer before opting for financial advice (*Alpha),* the idiosyncratic variance share (*Idiosyncratic variance share),* the Herfindahl-Hirschman index *(HHI)*, the share of domestic equity *(Home bias)* the raw return from the beginning of observation until 1 month prior to the offer of financial advice (*Long-term raw return*) and the raw return of the month before the offer of financial advice (*Short-term raw return*). Alpha and idiosyncratic risk share stem from applying a Carhart (1997) four-factor model calibrated for Germany. P-values are in parentheses. Pseudo R-squared values and number of observations are reported. Three stars (***) denote significance at 1% or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. Standard errors shown are not clustered but results remain qualitatively unaltered when clustering them by advice week or risk aversion. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

	Increase in alternative degree of following (buy side only)						
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dummy male	-0.063	-0.062	-0.041	-0.049	-0.066	-0.065	-0.028
	(0.223)	(0.226)	(0.444)	(0.361)	(0.197)	(0.203)	(0.605)
Age	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.619)	(0.746)	(0.896)	(0.871)	(0.807)	(0.825)	(0.664)
Dummy low wealth	-0.048*	-0.061**	-0.071**	-0.066**	-0.059*	-0.058*	-0.062**
	(0.075)	(0.046)	(0.016)	(0.033)	(0.051)	(0.064)	(0.048)
Dummy high wealth	0.046*	0.042	0.031	0.031	0.042	0.041	0.030
	(0.073)	(0.114)	(0.266)	(0.259)	(0.114)	(0.121)	(0.305)
Log portfolio value (t=0)	-0.068***	-0.069***	-0.065***	-0.061***	-0.068***	-0.070***	-0.059***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Length of relationship		0.002	0.004	0.004	0.001	0.002	0.003
		(0.685)	(0.454)	(0.509)	(0.786)	(0.712)	(0.635)
Trades per month (t=-44 to t=0)		0.002	0.002	0.003	0.004	0.003	0.001
		(0.639)	(0.729)	(0.482)	(0.472)	(0.537)	(0.804)
Portfolio turnover (t=-44 to t=0)		-0.151	-0.017	-0.169	-0.198	-0.176	-0.116
		(0.590)	(0.955)	(0.569)	(0.504)	(0.537)	(0.800)
Disposition effect (t=-44 to t=0)		-0.007	0.016	0.033	-0.006	-0.010	0.062
		(0.899)	(0.782)	(0.563)	(0.917)	(0.853)	(0.288)
Risky share (t=0)		-0.016	-0.036	-0.041	-0.021	-0.014	-0.013
		(0.764)	(0.513)	(0.461)	(0.712)	(0.787)	(0.837)
Share of tax-free assets (t=0)		0.008	0.058	0.092	0.017	0.013	0.080
		(0.910)	(0.310)	(0.160)	(0.816)	(0.854)	(0.141)
Recommended portfolio/original portfolio		0.001	0.000	0.000	-0.002	0.000	0.026
		(0.951)	(0.985)	(0.992)	(0.904)	(0.987)	(0.245)
Alpha (t=-44 to t=0)			7.230				
			(0.161)				
Idiosyncratic variance share (t=-44 to t=0)				0.100			
				(0.202)			
HHI (t=0)					0.099		
					(0.483)		
Home bias (t=0)						0.030	
						(0.470)	
Long-term raw return (t=-44 to t=-1)							8.582
							(0.208)
Short-term raw return (t=-1 to t=0)							-1.995*
							(0.093)
Constant	0.842***	0.859***	0.759***	0.656***	0.842***	0.859***	0.668***
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)
Observations	369	365	313	313	365	365	297
R-squared	0.118	0.115	0.126	0.127	0.118	0.117	0.123

Table 11A2
Does the average advisee benefit if partially followed? (buy side only)

Table 11 reports OLS estimates of the coefficients related to a decrease in HHI (models (1) to (4)) and a decrease in idiosyncratic variance share (models (5) to (8)), an increase in Sharpe ratio (models (9) to (12)) and an increase in MPPM (models (13) to (16)). HHI and portfolio returns are calculated based on the *actual* portfolios of investors. The focus of the table is on the variable *Improvement of alternative degree of following* which shows the improvement of the alternative degree of following from the time of the first recommendation to t = 11 and takes the value 0 for non-advised clients. *Dummy advice* is equal to 1 if a client opts for financial advice. Additionally, the model controls for the following independent variables: a dummy variable that is equal to 1 if a client is male (*Dummy male),* the age of a client (*Age),* a dummy that is equal to 1 if a client falls into categories 1 to 3 of a micro geographic status rating by an external agency (*Dummy low wealth)*, a dummy that is equal to 1 if a client falls into categories 7 to 9 of the micro geographic status (*Dummy high wealth)*, the risky portfolio value of the customer (*Log portfolio value)*, years the client has been with the bank (*Length of relationship)*, the number of trades per month (*Trades per month),* the average portfolio turnover per month (*Portfolio turnover)*, the difference between the proportion of realized gains and losses *(Disposition effect),* the proportion of risky assets in the account (*Risky share)*, the proportion of tax-free assets *(Share of tax-free assets),* the weekly alpha of a particular customer before opting for financial advice (*Alpha)*. Alpha and idiosyncratic variance share stem from applying a Carhart (1997) four-factor model calibrated for Germany. P-values are in parentheses. Pseudo R-squared values and number of observations are reported. Three stars (***) denote significance at 1% or less; two stars (**) significance at 5% or less; one star (*) significance at 10% or less. Heteroscedasticity robust standard errors are used. Different counts of observations are due to data availability of certain variables (see Table 5); results are robust to using the lowest common denominator.

	Decrease in HHI				Decrease in idiosyncratic variance share			
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Improvement of alternative degree of	0.176***	0.197***	0.196***	0.196***	0.139**	0.134**	0.149**	0.148**
following	(0.001)	(0.001)	(0.001)	(0.001)	(0.025)	(0.029)	(0.016)	(0.017)
Dummy advice	0.011	0.007	0.006	0.007	-0.005	-0.001	-0.001	-0.000
	(0.218)	(0.506)	(0.543)	(0.521)	(0.661)	(0.965)	(0.925)	(0.976)
Dummy male		-0.001	-0.000	-0.001		0.005	0.003	0.003
		(0.874)	(0.924)	(0.903)		(0.492)	(0.662)	(0.693)
Age		-0.000	-0.000	-0.000		0.000	0.000	0.000
		(0.626)	(0.649)	(0.582)		(0.621)	(0.630)	(0.658)
Dummy low wealth		0.004	0.004	0.004		-0.004	-0.006	-0.006
		(0.688)	(0.666)	(0.668)		(0.724)	(0.619)	(0.613)
Dummy high wealth		0.001	0.001	0.001		0.007	0.008	0.008
		(0.738)	(0.799)	(0.872)		(0.203)	(0.165)	(0.164)
Log portfolio value (t=-44)		0.000	0.003	0.003		-0.017***	-0.019***	-0.019***
		(0.878)	(0.131)	(0.152)		(0.000)	(0.000)	(0.000)
Length of relationship			0.000	0.000			-0.002	-0.002
			(0.777)	(0.861)			(0.119)	(0.119)
Trades per month (t=-44 to t=0)			0.001	0.001			0.003**	0.003**
			(0.321)	(0.310)			(0.014)	(0.013)
Portfolio turnover (t=-44 to t=0)			-0.051	-0.045			0.077	0.061
			(0.456)	(0.513)			(0.269)	(0.373)
Disposition effect (t=-44 to t=0)			-0.009	-0.009			0.015	0.017*
			(0.268)	(0.265)			(0.140)	(0.095)
Risky share (t=0)			-0.035***	-0.036***			0.036***	0.036***
			(0.000)	(0.000)			(0.000)	(0.000)
Share of tax-free assets (t=0)			-0.018	-0.017			-0.038**	-0.036**
			(0.326)	(0.362)			(0.034)	(0.042)
Alpha (t=-44 to t=0)				0.269				-1.596
				(0.842)				(0.149)
Constant	0.002	0.003	0.018	0.020	0.072***	0.232***	0.265***	0.258***
	(0.225)	(0.879)	(0.456)	(0.408)	(0.000)	(0.000)	(0.000)	(0.000)
Observations	7,251	5,422	5,399	5,398	5,453	5,450	5,444	5,444
R-squared	0.003	0.005	0.011	0.011	0.001	0.018	0.028	0.028

	Increase in Sharpe ratio				Increase in MPPM			
Dependent variable	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Improvement of alternative degree of following	0.131***	0.134***	0.128**	0.127**	0.027	0.018	0.088	0.031
	(0.007)	(0.008)	(0.012)	(0.014)	(0.625)	(0.743)	(0.145)	(0.553)
Dummy advice	0.058***	0.058***	0.054***	0.055***	0.009	0.014	-0.003	0.040**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.631)	(0.484)	(0.876)	(0.031)
Dummy male		-0.021***	-0.015***	-0.016***		0.015	0.002	-0.016
		(0.000)	(0.004)	(0.003)		(0.385)	(0.906)	(0.324)
Age		-0.001***	-0.000*	-0.000*		-0.001	-0.001	-0.001**
		(0.003)	(0.059)	(0.054)		(0.232)	(0.199)	(0.047)
Dummy low wealth		0.011	0.009	0.008		-0.007	-0.003	-0.010
		(0.280)	(0.368)	(0.385)		(0.789)	(0.917)	(0.700)
Dummy high wealth		0.003	0.004	0.004		0.022	0.024	0.027
		(0.545)	(0.389)	(0.339)		(0.365)	(0.321)	(0.208)
Log portfolio value (t=-44)		0.010***	0.004**	0.005**		-0.008	-0.018	0.003
		(0.000)	(0.041)	(0.014)		(0.449)	(0.161)	(0.841)
Length of relationship			-0.001	-0.001			0.001	0.002
			(0.130)	(0.159)			(0.818)	(0.540)
Trades per month (t=-44 to t=0)			0.011***	0.011***			0.018	0.020**
			(0.000)	(0.000)			(0.142)	(0.021)
Portfolio turnover (t=-44 to t=0)			-0.521***	-0.555***			1.116**	0.043
			(0.000)	(0.000)			(0.028)	(0.882)
Disposition effect (t=-44 to t=0)			0.008	0.012			-0.233***	-0.112***
			(0.338)	(0.154)			(0.001)	(0.000)
Risky share (t=0)			0.005	0.006			0.082	0.104
			(0.505)	(0.375)			(0.233)	(0.118)
Share of tax-free assets (t=0)			0.063***	0.064***			0.074	0.156**
			(0.000)	(0.000)			(0.385)	(0.036)
Alpha (t=-44 to t=0)				-3.405***				-93.753***
				(0.000)				(0.000)
Constant	0.199***	0.138***	0.149***	0.133***	0.330***	0.433***	0.367***	-0.034
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.003)	(0.814)
Observations	5,479	5,476	5,470	5,469	5,487	5,484	5,478	5,477
R-squared	0.010	0.022	0.076	0.083	0.000	0.001	0.019	0.203

Figure 2aA2. Initial alternative degree of following

The cross-sectional distribution of the degree of following when the first recommendation was given.

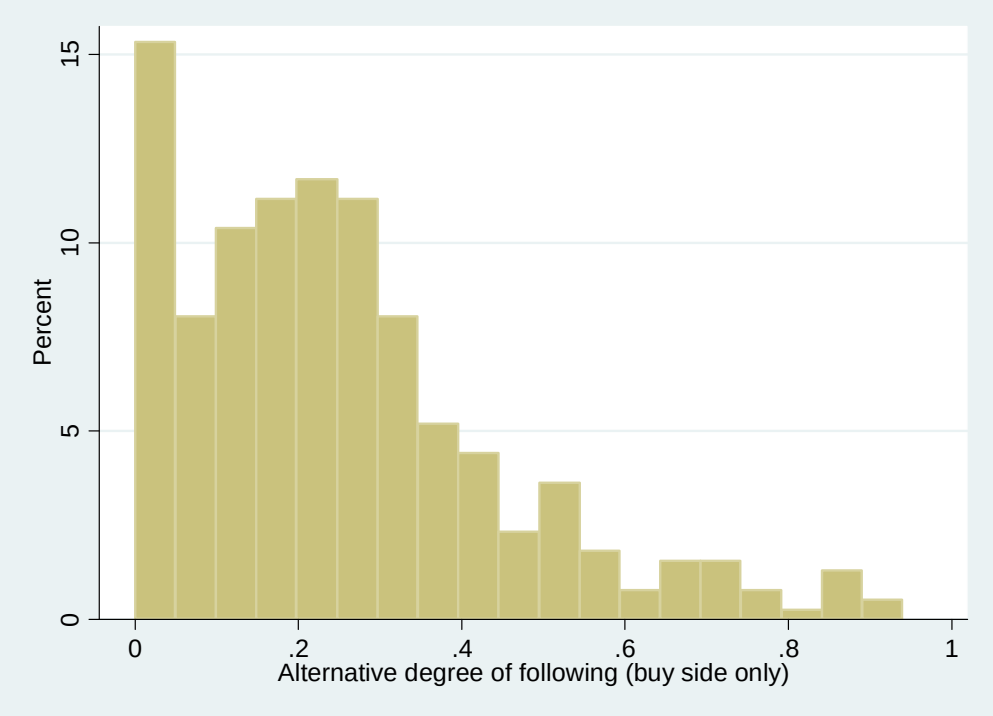


Figure 2bA2. Later alternative degree of following

The cross-sectional distribution of the average degree of following between time t = advice start and t = 11 months.

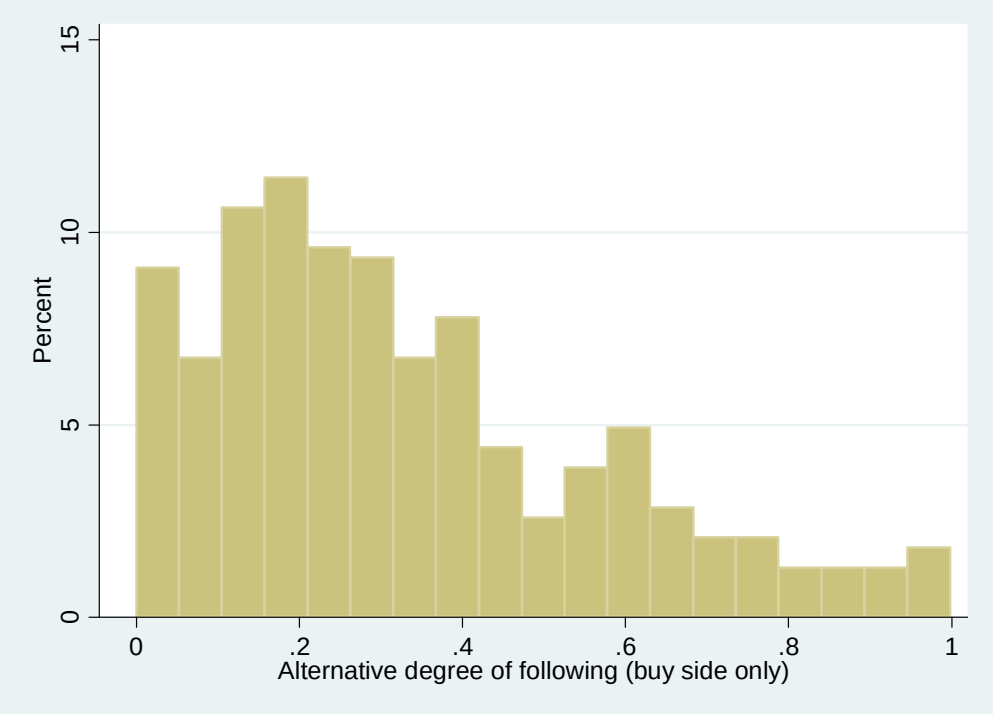


Figure 2cA2. Increase in alternative degree of following

Increase in degree of following from the time of the first recommendation to t = 11.