

Advertising and Portfolio Choice^{*}

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Abstract

This paper examines the role that advertising plays in the mutual fund industry and whether advertising affects investors' fund and portfolio choices. Content analysis shows that only a small fraction of fund advertising is directly informative about characteristics relevant for rational investors, such as fund fees. Higher quantities of advertising do not signal ex ante higher unobservable fund manager ability, because funds that advertise more are not associated with higher post-advertising excess returns. Fund advertising is shown to affect investors' choices, although it provides little information. These results do not seem to be driven by the endogeneity of advertising, and are robust to a series of robustness checks. Finally, advertising is found to steer people towards portfolios with higher fees and more risk, through higher exposure to equities, more active management, more "hot" sectors, and more home bias. This evidence has implications for welfare analysis, asset pricing and public policy, and may serve as a starting point for broader analysis of marketing and persuasion efforts in financial markets.

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1. Introduction

Advertising is an important phenomenon in the mutual fund industry, with funds in the U.S. spending about \$6 billion a year on advertising. Some funds launch campaigns with full-page newspaper advertisements and primetime TV commercials, and some recruit “brand managers” from successful retailers such as Taco Bell (e.g., Brandstrader (1996)). Yet, research in finance has paid little attention to fund advertising. This gap in the literature prompts me to ask the following questions: does fund advertising affect people’s portfolio choices, and if so, what are the economic effects for investors who base their portfolio choices on advertising?

There are at least two global trends that make it important to study the role of fund advertising in financial markets. First, companies are moving from defined benefit plans to defined contribution (DC) savings plans, like 401(k) plans in the U.S. This investor autonomy trend is apparent also in debates over whether to reform public pension systems, like Social Security in the U.S. Second, there is a trend towards an expansion in the number of investment alternatives. About a decade ago, investors in the world’s largest DC plan had only two choices: a bond fund (TIAA) and a stock fund (CREF). Today, most plans offer more than one fund provider and often hundreds of funds. Statistics from the Investment Company Institute show that people have 8,256 fund choices in the U.S. The potential role for advertising in affecting portfolio choices is much greater today when more people act as their own money managers, and when the number of investment alternatives is large.

Economic theory and experimental evidence suggest that advertising may affect investors’ portfolio choices. First, advertising can provide direct information about relevant characteristics of a product. For example, fund advertising might provide information about “price”, i.e., a fund’s fee. Second, the quantity of “uninformative” advertising may act as a signal for the ex ante unobservable quality of a product. If some fund managers are more able or

have more talent than others, then higher advertising expenditures can be used to signal higher returns. Finally, experimental evidence has shown that mere repeated exposure to a particular stimulus enhances people's attitude towards it. Thus, mere exposure to a fund's advertising may enhance investors' attitude towards the fund, even if the ads provide little or no information. These hypotheses regarding potential links between advertising and investors' portfolio choices motivate the formal empirical work pursued in this paper.

It is difficult to obtain detailed, comprehensive data on either people's investment choices or advertising. While important in turning financial economists' attention to fund advertising, Jain and Wu (2000) illustrates this problem. They use a small sample of print advertisements in two specialized business magazines (Barron's and Money) during three years, 1994-1996. I deal with the data availability problem by analyzing data from a unique event: the year 2000 launch of a new pension system in Sweden. The data set on portfolio choices comes from the government authority that administers the system, and consists of the portfolio choices for 4.4 million workers, allocating a total of \$5.6 billion. The data set on fund advertising comes from a marketing research company, and contains detailed information on the advertising campaigns by the 455 participating funds, a total of \$94.4 million in expenditures, and close to 50,000 different fund advertisements and commercials.

I report four main results. First, content analysis shows that only a small proportion of fund advertising can be construed as directly informative about characteristics relevant for rational investors, such as funds' expense ratios. Second, funds that advertise more do not produce higher post-advertising excess returns, so advertising does not appear to signal higher fund manager ability. Third, fund advertising affects investors' portfolio choices, even when advertising provided little information. Finally, I find that fund advertising has significant

economic effects for investors: it steers people into portfolios with lower expected returns (because of higher fees) and higher risk (through a higher exposure to equities, more active management, more “hot” sectors, and more home bias). This evidence has important implications for welfare analysis, asset pricing and policy making, and may serve as a starting point for broader analysis of marketing and other persuasion efforts in financial markets.

The paper is organized as follows. Section 2 reviews the economic theory and experimental evidence that suggests that fund advertising may affect investors’ portfolio choices, and explains how I test these arguments. Section 3 describes the event and the data. In Section 4, I report my main results and perform robustness checks. Section 5 estimates the economic effects of fund advertising on portfolios’ expected returns and risk. Section 6 concludes.

2. Theories regarding advertising and portfolio choice

2.1. Advertising as direct information

An early literature on the economics of advertising started with a series of important papers by Nelson (1970, 1974), which emphasize advertising’s information role. An obvious procedure available to a rational consumer when obtaining information about the price or quality of a product is costly search. For “search qualities,” i.e., qualities of a product that can be determined by inspection prior to the purchase (such as the price or style of a suit), advertising can provide direct information, and thus reduce search costs.

When I apply Nelson’s theory to fund advertising and portfolio choice, the question to ask is: what funds characteristics may advertising provide information about? Since there is little evidence that funds that have outperformed in the past will continue to do so, fund

advertising about past returns seems non-informative.¹ However, there is evidence (e.g., Elton, Gruber, Das and Hlavka (1993)) that funds with lower fees outperform net of fees. Hortacsu and Syverson (2004) show that fees among U.S. index funds, a homogeneous group, ranges from below ten to over 250 basis points per year. By providing information about fund fees, advertising can reduce investors' search costs.

I test the "direct information hypothesis" by systematically identify the content/message of fund advertising. I apply the observational research methods previously used by marketing researchers and in political science to identify the content of election campaign ads.

2.2. *Advertising as a signal of quality*

A lot of advertising appears to convey no direct information about relevant product characteristics. Motivated by this observation, Kihlstrom and Riordan (1984) and Milgrom and Roberts (1986) develop models in which advertising can be indirectly informative when there exists a market mechanisms that ensures a positive relation between product quality and advertising expenditures. Consumers can infer ex ante unobservable quality from the level of observable advertising.

Chevalier and Ellison (1999) study fund manager characteristics and performance for a sample of U.S. funds. They show that some managers, particularly those who attended higher SAT undergraduate institutions, produce higher excess returns. The finding that managers with certain observable attributes outperform others raises the possibility that managers with certain *unobservable* (to investors) ability and talent are also better than others. Under some conditions,

¹ Hendricks, Patel and Zeckhauser (1993) and Brown and Goetzmann (1995) find evidence of persistence in fund performance over relatively short horizons (one to three years). Grinblatt and Titman (1992) suggest that a fund's current performance can predict performance 5-10 years into the future. In contrast, Carhart (1997) suggests that most of the after-expenses performance persistence in his sample can be attributed to the one-year momentum effect of Jegadeesh and Titman (1993) in the underlying stock returns, with much of the remaining persistence attributable to the worst-performing funds.

such as learning about quality through repeat business, fund managers of ex ante higher quality can use higher fund advertising expenditures to signal higher quality.²

I test the “quality signaling hypothesis” by analyzing whether funds that advertise more are associated with higher post-advertising abnormal returns.

2.3. *Advertising as mere exposure*

Behavioral researchers have argued that individuals’ choices are determined by a mix of cognition and emotions (e.g., Kahneman, Slovic and Tversky (1982)). In particular, two concepts from the theory of “mere exposure” (Zajonc (1968)) have been actively explored in marketing practices and research: people’s attitudes can change without cognition, and mere exposure makes attitudes more favorable.³ While Zajonc’s conclusion that “mere repeated exposure of the individual to a stimulus is a sufficient condition for the enhancement of his attitude towards it” (p.1) was controversial in the 1960s, Bornstein (1989) has shown, through his meta-analysis of over 200 experiments, that mere exposure effects can be replicated in many settings. Psychologists have also found that “overexposure” is a limit to advertising.⁴

² Let me briefly elaborate on the intuition behind the conditions that need to be in place between funds and their investors for there to exist a separating equilibrium. Advertising can signal quality only if higher-quality funds find it profitable to invest in relatively more advertising than do lower-quality funds. If advertising costs are the same for all funds, then the returns to advertising must be greater for higher-quality funds. The greater returns may, e.g., be learning through repeat business. While it is optimal for higher-quality funds to initially spend a lot on advertising (because of the repeat business that it will generate when people realize that this is a higher-quality fund), it is not the case for lower-quality funds, because they will not be able to recoup their initial advertising expenditures as people will realize that they are of lower quality and not give them any repeat business.

³ In Zajonc’s experiment, subjects were exposed to 12 stimuli of Turkish words, Chinese characters or yearbook photographs for two seconds with six frequencies (0, 1, 2, 5, 10, and 25). The instructions informed subjects that the study deals with “pronouncing foreign words,” “learning a foreign language” and “visual memory,” and subjects were asked to rate how “good” they thought that the meaning of each word and character was, and how much they liked the person pictured in each photograph. While no information, only exposure, was communicated, subjects’ attitudes towards a particular word, character or photograph were shown to be significantly more positive as the frequency of their stimuli was increased.

⁴ Miller (1976) showed people posters about stopping foreign aid up to 200 times. People were persuaded most by moderate levels of mere exposure.

In the area of mutual funds, the theory of mere exposure means that advertising a fund can enhance people's attitude towards the fund, although the advertising provides little direct or indirect information. That is, the choice of a particular fund or portfolio by an investor is not necessarily the result of rational conscious information-processing. Instead, fund advertising can arouse certain key positive emotions (e.g., familiarity) in investors that make their attitudes towards the fund more favorable.⁵

The "mere exposure hypothesis" provides an alternative theory for a link between fund advertising and investors' portfolio choices even if I find that fund advertising does not provide direct information about fund fees or signal higher post-advertising excess returns.

3. The event and data

3.1. Sweden's pension system reform

In 2000, Sweden launched a partial privatization of its public pension system, called the "Premium Pension". Under the new system, workers contribute 2.5% of their annual earnings to individual savings accounts. In summary, the plan has the following six important features:⁶

1. Participants are allowed to form their own portfolios by selecting from an approved list of Swedish and international mutual funds. (Some of these funds specialize in only one type of asset, such as technology funds, while others, life-cycle funds, are designed with retirement savings in mind.)
2. One fund, *Sjunde AP-Fonden's Premiesparfonden*, is designated as the default fund for anyone who does not make an active portfolio choice.

⁵ Recent research suggests that people like to invest in the familiar. Huberman (2001) shows that a Regional Bell Operating Company's (RBOC's) customers tend to hold its shares rather than those of some other RBOCs. Benartzi (2001) reports that 30% of assets in large retirement savings plans are in company stock and that those who consider themselves "very familiar" with their employing firm invest more in own-company stock.

⁶ See Cronqvist and Thaler (2004) for a discussion of design choices in privatized social security systems, as well as the specific choices that the Swedish plan designers adopted.

3. Any fund that meets standard fiduciary standards is allowed into the system.
4. Information about the funds, including fees, past performance, etc., is provided in the Fund Catalogue to all participants before they make their initial portfolio choices.
5. Balances and future contributions can be changed at any time, but unless some action is taken, the initial allocation determines all future contribution flows.
6. Funds, except for the default fund, are allowed to advertise.

This event provides a unique opportunity to study whether fund advertising affects people's investment choices. First, real money is at stake for millions of investors. Second, free market entry determines the list of funds. Finally, different funds choose different levels of advertising expenditures, from none to spending millions on fund advertising.

3.2. Data sources and summary statistics

The data set on portfolio choices comes from the Premium Pension Authority, the government authority that administers the accounts. Panel A of Table 1 shows that there are about 4.4 million individuals with total allocations of \$5.6 billion. Account size ranges from \$10 to \$2,639. The mean is \$1,265. Although the average stake are small, since many individual investors exhibit a status quo bias in their retirement savings accounts (e.g., Samuelson and Zeckhauser (1988) and Madrian and Shea (2001)), the present value of an individual's future contributions is many times greater than these "year 0" numbers alone suggest.

The data set on fund advertising comes from a marketing research company's database (MarketWatch). It contains nearly all advertisements and commercials that appear in media:

- Advertisements in more than 250 newspapers, in the popular press and professional journals, outdoor ads on billboards and buses, and in subway stations, etc.

- Commercials from all major television and radio networks, and those that appear in the largest movie theaters.

I manually compiled the data set of advertisements and commercials by searching for the names of the funds and fund complexes that provide funds in the new pension system.

Panel B of Table 1 shows that during the two years leading up to the reform, funds spent about \$95 million on advertising. The data set contains 23,604 advertisements (47.2% of total expenditures), ranging in size and scope from large billboards, such as one covering a 34-storey office building in downtown Stockholm, to small local newspaper ads. There are also 20,647 commercials (52.8% of expenditures), ranging from an 8.5-minute “infomercial” on how to choose the fund complex’s funds to two-second weather sponsorship spots. Advertisements in print media, such as newspaper ads, and TV commercials account for about 90% of the advertising expenditures.

Finally, Panel C reports means and standard deviations for the variables that I use as controls in the next section. As can be seen, the data set has significant variation when it comes to fund as well as manager characteristics.

4. Results

In this section, I report my main results and perform robustness checks.

4.1. Descriptive evidence

Before I present the main results, it is useful to first briefly have a look at three pieces of descriptive evidence. First, I present evidence on “fund advertising recall ratios” from a large survey. A leading phone survey company (Sifo) did the survey of 1,083 retirement savers between the age of 20 and 62 (selected to be representative of the population) during the days

immediately after investors' initial portfolio choices. Figure 1 shows recall ratios for different categories of fund advertising. I note that that 75% of the investors recalled seeing some fund advertisement in a newspaper/magazine or other print media, and as many as 86% recalled seeing some TV commercial for a fund. Thus, most investors appear to have been exposed to at least some fund advertising before choosing their portfolios.

Second, I report evidence on the total quantity of fund advertising and the fraction of investors who made an "active choice". Figure 2 compares total advertising and percent active choices in 2000 and in subsequent years, 2001-2005. For year 2000, I focus on active choices among *young* investors (age < 22) to be able to compare with other years, when joining participants tend to be young individuals. Funds advertised a lot more in 2000 when the returns were higher: 4.4 million individuals made their first fund choices, and \$5.6 billion was at stake for fund managers. Compare this to subsequent years, when only a couple of hundred thousand new participants join the plan each year allocating much less money. The evidence that the proportion of active choices is higher in 2000 than in any subsequent year is suggestive of a link between fund advertising and investment choices.

Finally, I present evidence on the univariate relation between fund advertising and fund choices. Figure 3 shows a positive (0.544) and statistically significant correlation between a fund's advertising expenditures and the dollar allocation to the fund. This result does not say anything about why fund advertising might have affected investors, i.e., whether it provided direct information, signaled higher quality, or affected investors by mere exposure. Also, at this stage of my analysis, the positive correlation is only suggestive of a link between advertising and portfolio choices because advertising may simply proxy for some omitted characteristics, e.g., fund size, which might also affect investment choices.

4.2. *Evidence on fund advertising as direct information*

I test the direct information hypothesis by systematically identify the content/message of fund advertising. Specifically, I implement the Resnik and Stern (1977) content analysis method. They classify cues in ads into the following categories: price, performance, independent research, company research, availability, components or contents, new ideas, quality, special offers or promotions, guarantee, nutrition, packaging or shape, safety, and taste. (Several categories, e.g., nutrition, are not applicable to the fund industry.)

I consolidate these cues into three categories:

1. Fee cue. A fund ad is considered to have a “price,” i.e., fee, cue if it contains a reference to price, fees, charges, or expense ratios.
2. Performance cue. I aggregate the cue categories of performance, independent research, and company research into one category since, in the fund industry, these factors are all related to past returns. A fund ad has a performance cue if it contains the fund’s return over some period (e.g., past year, past five years or the fund’s lifetime), Morningstar or other independent research company’s ratings, or any other return comparison with an index or category, chosen by the advertising fund.
3. Other cue. These are ads that do not contain a fee or performance cue.

I implement the content analysis by combining information in the content description field in MarketWatch’s database and information from the archives of the National Library of Sweden.

Table 2 shows some representative examples, and the Appendix provides one illustration for each category of fund advertising. The content analysis is important because this is the first attempt in finance research to identify the content of fund advertising that investors are exposed to. First, the table shows that fee advertising contains a message such as “If the price of milk

goes up, does it then taste better?” Interestingly, very few of these ads contain information that actually enables investors to compare the advertising fund’s charges to those of its competitors. An example of this is an ad stating “Compare our fees!” without information that allows an investor to infer how much lower the fund’s expense ratio in fact is.

Second, performance advertising emphasizes Morningstar ratings or past returns, some over the past year, others over five years, still others over the lifetime of the fund, supposedly depending on what period shows the highest relative performance for the advertised fund compared to its competitors. Most importantly, the vast majority focuses on “hot” sectors, i.e., those with high past (raw) returns. Since the event took place in 2000, much performance advertising in my data set focuses on technology (i.e., Internet and telecom) funds.

Finally, the category “other advertising” contains a very wide variety of different messages. To mention just one example, one fund featured actor Harrison Ford in print ads and also placed TV commercials in blocks of the television premiere of the movie “Air Force One,” starring Harrison Ford. The evidence that funds tend to differentiate themselves through their advertising is very interesting, but it is beyond the scope of this paper to evaluate the relative effectiveness of different fund advertising campaigns.

Table 3 reports the proportion of advertising dollars attributable to fee, performance, and other advertising, respectively. I note that 7.9% of all the advertising involves a fee cue. In sharp contrast, performance advertising accounts for 30%, while the remaining 62% contains some other cue. I also note that fund advertising in print media is relatively more informative about fund fees than commercials; 13.5% compared to 2.9% of the advertising go to fee advertising.⁷

⁷ An ad with a fee cue may be relatively more effective than an ad with some other cues (i.e., investors need to see the fee ad only once to get the message). This could explain why fee advertising expenses are lower.

In sum, my content analysis of fund advertising provides little support for the direct information hypothesis (see Nelson (1970, 1974)). First, only a very small fraction of fund advertising appears directly informative in the sense that it contains information about the fund's fee. Second, even fund ads with a fee cue are not particularly informative. Only 9.8% of the fee advertising, i.e., 0.8% of all advertising, contains information that actually enables an investor to compare the expense ratio of the advertised fund to that of some other fund. As a result, advertising does not seem to be an important source of information for individual investors who rationally search for funds with lower fees.

4.3. Evidence on fund advertising as a signal of quality

I test the quality signaling hypothesis by analyzing whether funds that advertise more are associated with higher post-advertising abnormal returns. I do so by estimating the following regression model:

$$AR_i [0, T] = \alpha + \beta ADEX_i + \gamma FUND_i + \varepsilon_i \quad (1)$$

where i indexes funds, $AR_i [0, T]$ is a measure of the abnormal return in percent over a post-advertising period of T months,⁸ $ADEX_i$ is a measure of the quantity of advertising expenditures prior to investors' portfolio choices, $FUND_i$ is a vector of observable fund and fund manager characteristics (including 29 fixed fund category effects), and ε_i is an error term. The signaling hypothesis predicts that $\beta > 0$. I correct the standard errors for clustering at the fund category level.

⁸ In this section, I examine gross returns because I hypothesize that funds with higher advertising expenses produce higher total returns. In section 5, I then turn to an analysis of the link between advertising and funds fees.

To start with, I define abnormal returns as “simple excess returns,” i.e., a fund’s annual return minus the average annual return of all the funds in the fund’s Morningstar category. For my purposes, this is a conservative benchmark. Mutual funds tend to underperform broader benchmarks (e.g., Jensen (1968)). Thus, under the signaling hypothesis, it should be relatively easy for an advertising fund to outperform this narrow benchmark. Below, I check the robustness to this particular choice of benchmark. I examine a 12-month horizon to begin with. This relatively short post-advertising period gives me far fewer data points for the estimation than I would have preferred, but I am concerned that many fund characteristics change over longer periods. I will however check the robustness of this choice of horizon below.

Table 4 reports the results. In column (1), I use total fund advertising expenditures as a measure of the quantity of advertising, and thus as a measure of the strength of the quality signal. I add a squared term to account for possible nonlinearities in the relationship. However, contrary to the signaling hypothesis, I find no evidence of a positive association between fund advertising and abnormal returns. The coefficient on advertising is negative (-0.0051), but statistically insignificant. In column (2), I interact fund advertising with a dummy that is one if the fund is in the highest fund advertising quartile, because it is possible that an extreme quantity of advertising is necessary to signal higher quality. However, I find no such evidence.

In column (3), because 30% of the advertising is performance advertising, I restrict my analysis to advertising with a performance cue. One possibility is that fund managers who have outperformed others in the recent past and who know that this performance is due to their unobservable superior ability, as opposed to luck, use more performance advertising as a signal. This might explain the enormous emphasis on past returns in fund advertising. However, the

negative (-0.0398) and almost significant coefficient on performance advertising is inconsistent with such a hypothesis.

Finally, in column (4), I drop the 29 fixed fund category effects. I report this specification just to show that these fixed effects, not fund advertising, drive essentially all of the explanatory power in the other columns of the table (adjusted R^2 s in the range of 26-30%). That is, fund advertising predicts very little of the heterogeneity in post-advertising excess returns across funds, at least in my sample and over the relatively short period examined here.

Table 5 addresses several concerns about the robustness of the above reported results. As an alternative to simple excess returns, I regress each mutual fund's monthly returns on the returns of the fund's comparable Morningstar index. I then use the intercepts of these regressions as measures of abnormal returns when estimating equation (1). Column (1) shows that the results are even weaker for this definition of excess returns: the coefficient drops to -0.0023. Column (2) reports the results for a 36-month post-advertising period because it might provide less noisy excess return estimates than a 12-month horizon. However, the coefficient is even more negative compared to the 12-month horizon.

The table also presents further evidence on the possible link between fund advertising and abnormal returns by focusing on funds and fund managers for which quality signaling effects are likely to be most important. The above results link fund advertising to a fund and not necessarily to a specific fund manager. In the first three years after the event, 31 managers quit or were replaced. Perhaps fund advertising signals higher quality only when the manager at the time of the advertising remains with the fund during the post-advertising period. Therefore, in column (3), I exclude from my analysis any manager who leaves during the 36-month post-

advertising period, and reestimate the regression model. However, I find no evidence of an association between specific fund managers, advertising, and subsequent returns.

Another possibility is that fund advertising is used as a costly signal only by managers who do not seem to have superior skills based on observable measures of ability, such as experience. Therefore, I interact fund advertising with proxies for lack of experience, such as the manager being either in the lowest quartile of industry experience or in the lowest quartile of tenure. I also interact fund advertising with a dummy that is one if the manager does not have an MBA, and zero otherwise. However, the interaction effects in column (4) are individually as well as jointly insignificant (F-value = 0.26). That is, I find no evidence that more advertising is used to signal higher returns by better managers who have little experience.

Because skill may play a particularly important role when managing funds with specialized assets, fund advertising might be used by managers with superior skills who are managing such assets. Therefore, in column (5), I interact fund advertising with a dummy that is 1 if the fund is a pharmaceutical fund (7 funds in my sample), an Internet and telecom fund (18 funds) or an emerging markets fund (21 funds). However, I find no evidence that more fund advertising is used as a signal by better managers of funds with highly specialized assets.

Another possibility is that fund advertising is used as a costly signal only when the potential asymmetric information problem between the fund and potential investors is particularly great, such as when the fund is newly started. Therefore, in column (6), I interact advertising with a new fund dummy, but I find no evidence that better new funds use more advertising as a signal of higher returns. Another proxy for information about a fund is the number of news articles in media about the fund. In column (7), I interact fund advertising with a dummy that is one if the fund is in the lowest quartile of media attention. However, there is no

evidence that better funds with little news coverage use more advertising as a signal. Another information proxy is whether the fund is part of a foreign fund complex. In column (8) I interact advertising with a foreign fund dummy, but I find no evidence that better foreign funds use more advertising as a signal.

In sum, my results do not appear to support theories on advertising and quality signaling (see Kihlstrom and Riordan (1984) and Milgrom and Roberts (1986)). One caveat is that there may not be a market mechanism (e.g., learning about quality through repeat business) that ensures a positive relation between the quality of a fund manager and advertising expenditures. In retirement savings accounts, people are known to exhibit a status quo bias. Inertia means that investors do not update very frequently their prior beliefs about the quality of a fund or fund manager. If there is no market mechanism that ensures that low-quality funds do not get repeat business (i.e., contributions into the retirement account) year after year, then there is no separating equilibrium, and fund advertising cannot act as a signal of quality in this particular industry.

Another caveat is that little can reliably be said about the heterogeneity in post-advertising excess returns across funds in the short run. Superior managerial ability or talent might reveal itself only in the long run, or in extreme states of the world. On the other hand, fund characteristics, and in particular fund managers, also change over time. As a result, it is very difficult to attribute performance differences in the post-advertising period to fund advertising in the past when the horizon is long.

4.4. Does advertising matter for investors' fund choices?

So far, my analysis suggests that fund advertising provides little information, either directly or indirectly. I now want to examine whether fund advertising still affects investors' portfolio choices.⁹ Therefore, I estimate the following regression model:

$$\log ALLOCATION_i = \alpha + \beta ADEX_i + \gamma FUND_i + \varepsilon_i \quad (2)$$

where i indexes funds, $\log ALLOCATION_i$ is the natural log of the dollar allocation to a fund, $ADEX_i$ is a measure of the level of advertising expenditures prior to the event, $FUND_i$ is a vector of observable fund and fund manager characteristics, and ε_i is an error term. I correct the standard errors for clustering at the fund category level.

Table 6 reports the results. Column (1) shows that there appears to be a positive and statistically significant relation between fund advertising and dollar allocations to funds. In column (2), I add a squared term and the negative sign on the coefficient indicates that the marginal returns to fund advertising are decreasing, consistent with the notion of overexposure. In column (3), I also include fixed fund category effects, to control for heterogeneity across different categories of funds. I note that the size of the effect of fund advertising decreases by almost a third when controlling for fund categories, although it remains statistically significant at all levels.

One possible alternative explanation for the association between fund advertising and fund allocations could be that funds that advertise more also differ on other fund characteristics that investors care about. A correlation between such characteristics and fund advertising can lead me to overestimate the effect that is directly attributable to fund advertising. Therefore, in

⁹ A first-order factor that any rational investor should care about is taxes. As individuals get a saving from having taxable savings in their retirement accounts, they may care about tax efficiency. While taxes may explain a preference for equity funds, it is difficult to see how taxes could explain a preference for advertising equity funds.

column (4), I add a dummy variable for local funds. Consistent with local funds advertising more (e.g., because of lower transactions costs) and investors having a strong preference for local funds, the coefficient on fund advertising decreases and the coefficient on the local fund dummy is positive and significant. Column (5) controls separately for the location of a fund and the location of its assets, but the results are qualitatively similar compared to simply using a dummy for local funds. The evidence that investors prefer local funds is not particularly surprising given the existing evidence on a “home bias” in portfolios (e.g., French and Poterba (1991) and Coval and Moskowitz (1999)).

In column (6), I control for fund size, and in column (7) I control for pre-event market shares in the retail fund, banking, and insurance industries, respectively. I find that larger funds and banks and insurance companies with larger pre-event market shares are able to attract more investors. I note that the magnitude of the effect of fund advertising decreases somewhat when adding these sets of control variables.

Column (8) controls for media attention. I find that investors allocate more to funds about which there have been more news coverage in the recent past. The effect of fund advertising decreases substantially when controlling for media attention. Interestingly, fund advertising was previously, at least partly, a proxy for media attention. This evidence is consistent with advertising funds getting more media attention (see Reuter and Zitzewitz (2006)).

In column (9), I control for past performance over the past 12 months. I use raw returns as a measure because these figures are readily available to investors. For the subset of funds that are newly started, I set past performance to zero and include a dummy that is one if the fund is new, and zero otherwise. As can be seen, investors allocate more to funds with higher recent

returns. Again, the effect of fund advertising decreases significantly when controlling for past performance, although the effect is still significant at all levels.

Finally, I include all the fund characteristics at the same time in column (10). I note that there is a significant reduction in the size of the fund advertising effect compared to a baseline specification (e.g., column (3)) that does not control for fund characteristics. My interpretation of this finding is that certain funds, such as local and larger funds with higher recent returns, advertise much more than other funds. Not controlling for such fund characteristics would upward bias the coefficient on fund advertising, i.e., overestimate the effect attributable to fund advertising. Most importantly, however, the positive and statistically significant link between fund advertising and dollar allocations to funds is present also after controlling for an extensive list of fund characteristics.

The last column of the table reports the effect on the dollar allocation to funds, in percent, of changing each continuous (dummy) variable by one standard deviation (from 0 to 1). My evidence suggests that the effect of fund advertising is economically large, and at least as large as an effect of fund size, media attention, or past performance, though arguably not as large as the effect of local funds (the home bias effect).

For space reasons, I summarize, but do not directly report, some robustness tests that I have performed. (These results are available on request.) First, I reestimate all the basic models by including additional control such as the number of employees and turnover; the results are unaffected. Second, I replicate all of the analysis for equity funds and for local funds only; again, the results are unaffected. Finally, I reestimate all regressions for the top 100 most popular funds; the results are stronger in spite of this substantial reduction in sample size.

4.5. *Determinants of fund advertising and investors' fund choices*

My primary concern regarding the evidence presented so far is that fund advertising is not randomly allocated across funds. Indeed, the above results indicate that certain funds advertise more than others. While I have attempted to control for many determinants of fund advertising in my analysis, it is still difficult to argue that more fund advertising *causes* investors to allocate more to funds that advertise more.

One approach to this endogeneity problem is to find an instrument that is correlated with advertising but not directly correlated with fund allocations. A measure of plausibly exogenous variation in advertising across funds is the relative cost of advertising. The lower the cost, the more advertising is likely “supplied” by a fund. While it is easy to come up with proxies for the cost of advertising, e.g., fund location due to transactions costs in advertising, it is difficult to find a proxy that is not directly correlated with investment choices. As shown in Table 6, fund location is directly correlated with fund allocations, and is thus not an appropriate instrument. For many other potential instruments, the variation in data is limiting. For example, one potential instrument is an indicator for whether the fund complex is part of a media conglomerate. Because of relatively lower costs of advertising, such a fund may supply more advertising. The problem is that only one fund is part of such a conglomerate. Thus, it is not a possible instrument either.

I employ lagged fund advertising as an instrument for contemporaneous advertising. A high quantity of advertising in the past can be interpreted as relatively low costs of advertising today, because of factors such as economies of scale and learning effects. Indeed, the univariate correlation between fund advertising and lagged fund advertising in my sample is 0.536. One concern is “long-term branding effects” of fund advertising. If advertising has long-term effects, then past advertising may be directly correlated with investment choices, and thus not an

appropriate instrument. An argument against such long-term branding effects is that effects of fund advertising appear to decay rapidly. A phone survey by Sifo, done in March 2001 and involving 1,000 retirement savers, reveals that as many as 73% did not recall what funds they had chosen for themselves six months earlier.

Table 7 reports evidence on determinants of fund advertising and investors' portfolio choices. In column (1) I analyze the determinants of fund advertising. As can be seen, certain funds advertise much more than others. In particular, the coefficient on lagged advertising is positive (0.792) and statistically significant at all levels, i.e., funds tend to advertise more when they have advertised more in the recent past. I also note that funds advertise more when they are local funds, when they are larger (although this effect is not significant), and when they have produced higher past returns. These results are consistent with economic factors such as transactions costs, economies of scale, and learning effects playing an important role in determining the optimal quantity of advertising across funds.

In column (2), I report evidence on fund advertising and investors' fund choices after using lagged advertising as plausibly exogenous determinant of fund advertising. Specifically, I employ a two-stage least squares estimation procedure in which lagged fund advertising is used as an instrument for fund advertising. I find that the strong positive and statistically significant link between fund advertising and dollar allocations to funds is present also after instrumenting for fund advertising. This evidence makes it less plausible that endogeneity of fund advertising constitutes the main driver of my evidence on a positive relation between fund advertising and dollar allocations to funds.

4.6. *The role of performance vs. other fund advertising*

So far I have found that a performance cue is the single most important message in fund advertising, accounting for about 30% of all the expenditures. I have also shown that funds with higher recent performance advertise significantly more. Therefore, I now want to examine the role of performance vs. other advertising. (I do not analyze fee advertising as it accounts for such a small fraction of all advertising.)

In Table 8, I examine the effect of fund advertising on fund choices, distinguishing between advertising with a performance cue and advertising with another cue. In column (1), I analyze performance advertising and past performance. In column (2), I examine advertising with another cue than performance. In column (3), I include all these variables at the same time, and I also interact performance advertising with past performance.

I report two main results from this exercise. First, performance advertising and past performance both have a positive effect on fund allocations. The finding regarding performance is in line with a larger literature documenting that fund investors allocate disproportionate amounts of money to funds that performed well in the recent past (e.g., Chevalier and Ellison (1997) and Sirri and Tufano (1998)). More importantly, the positive and significant interaction of performance advertising and past returns suggest that funds use performance advertising to market to investors a fund characteristic, past performance, that investors seem to care a lot about.¹⁰

Second, advertising with a cue other than performance also has a positive effect on fund allocations. However, the relative effectiveness of other advertising seems to be lower than for performance advertising. Other advertising is only about half as effective in attracting money

¹⁰ The existing literature has provided both behavioral explanations (see, e.g., the work on representativeness by Tversky and Kahneman (1974) and Griffin and Tversky (1992)) as well as rational explanations for performance-chasing behavior (Berk and Green (2004)).

compared to performance advertising. These results can explain the enormous emphasis on past returns in fund advertising. A fund that has a 5-star Morningstar rating should rationally choose to market this fact in its advertising rather than to communicate some other cue.

4.7. Indirect and direct returns to fund advertising

From the perspective of a mutual fund, there are direct and indirect returns to fund advertising. Indirect returns have been found by Reuter and Zitzewitz (2006). They show that some personal finance magazines (Money, Kiplinger's, and SmartMoney) that recommend funds to their readers are more likely to recommend those of past advertisers, controlling for other fund characteristics. Since they show that recommendations of these magazines are an important determinant of fund flows, there appear to be indirect return to advertising through more and better recommendations.

I focus on direct returns to advertising, through more allocations and ultimately more fees collected from investors. It is difficult to come up with precise estimates of the rate of return to fund advertising given the limitations on my dataset. However, I can present some simple calculations. In 2000, a total of \$5.6 billion was allocated to mutual funds. Since the average fee was about 97 basis points, funds collected about \$54.3 million in fees in 2000 alone. However, the total payoff is not received immediately, but rather as a stream of fee payments over many years. To get a precise estimate of the present value of fees to be received one would have to make detailed assumptions about the degree of status quo bias that people are subject to, real wage growth rates, the real discount rate, etc. With various such assumptions it appears that already within five years or so, fees in excess of the amount initially spent on advertising (\$94.4 million) will be collected in aggregate.

It is important to note, however, that there are important limitations to how much a fund should optimally spend on advertising. Otherwise all funds should have advertised a lot more. One limitation that applies to all funds is overexposure. There is some evidence in my data that the marginal returns to fund advertising are decreasing, which is consistent with overexposure. Other limitations that may differ across funds are related to transactions costs or other market frictions, e.g., capital constraints or shortage of brand and advertising manager talent to employ, and so on. These frictions can explain why all funds do not advertise and why all funds do not advertise the same amounts, and why the direct returns to advertising can differ in the cross section of funds.

5. Economic effects of fund advertising

I have show that there is a robust positive relation between more fund advertising and more investors choosing a particular fund. In this section, I explore the economic effects, from the perspective of an individual investor, of basing portfolio choices on fund advertising.

5.1. Fund advertising, fees, and expected returns

I start by estimating the effects of fund advertising on the expected returns of investors' portfolios.¹¹ The signs of the fund advertising coefficients in section 4.3 (where I test the signaling hypothesis) suggest a negative, but statistically insignificant, relation between fund advertising and post-advertising excess returns. In contrast, Jain and Wu (2000) show that the advertising funds in their sample underperform the S&P index by as much as 7.9% per year (t-

¹¹ Many studies have pointed to mistakes that consumers might make in their financial decisions (e.g., Shefrin and Thaler (1988)). It still remains largely unclear exactly how costly these mistakes are. DellaVigna and Malmendier (2005) find that consumers systematically choose sub-optimal gym membership plans. By contrast, Miravete (2003) finds consumers' choices of phone plans to be closer to optimal, and Agarwal, Chomsisengphet, Liu and Souleles (2005) find that on average consumers chose the advertised credit card offering that ex post minimizes their net costs.

statistic = 11.5). Thus, while it appears that fund advertising is not associated with higher gross post-advertising returns (at least not in the short run), it is unclear whether advertising funds underperform those that do not advertise.

Another component of expected portfolio returns, which can be measured more precisely even with limited time-series data available, is funds' expense ratios. Like companies in most industries, funds may want to avoid price competition, i.e., "fee competition". One way to do so is by product differentiation. Experimental evidence in marketing research (e.g., Carpenter, Glazer and Nakamoto (1994)) shows that such differentiation can be on a unimportant characteristic rather than one that is relevant and valuable to consumers, and people may even be willing to pay a premium for such "meaningless differentiation". As a result, investors may be willing to pay higher fees for funds that advertise more, even if much of the advertising does not provide direct information.

In Table 9, I examine whether more fund advertising is linked to higher fees. I estimate the following regression model:

$$Fee_i = \alpha + \beta ADEX_i + \gamma FUND_i + \varepsilon_i \quad (3)$$

where i indexes funds, Fee_i is the fund's annual expense ratio in percent, $ADEX_i$ is a measure of the level of advertising expenditures prior to the event, $FUND_i$ is a vector of observable fund and fund manager characteristics (including 29 fixed fund category effects), and ε_i is an error term. I correct the standard errors for clustering at the fund category level. Consistent with the product differentiation hypothesis, column (1) shows that funds that use more advertising are able to charge their investors significantly higher fees.

Advertising, even if it does not provide any direct information about fund fees, can be used to catch people's attention and to encourage them to call a fund's toll-free phone number or

visit the fund's website.¹² Therefore, the relation between fund advertising and fees may just reflect that advertising funds bundle fund provision with services to investors, such as financial advice and retirement planning, and that funds are appropriately compensated for doing so.

In column (2), I add Log (Assets under management) and Log (Other employees) because larger funds and funds with more employees other than fund managers and analysts may be more likely to provide financial services. Although there is some evidence that funds that are part of fund complexes with more such employees charge higher fees, this effect does not eliminate the link between fund fees and fund advertising. Perhaps a better proxy for service provision is whether the fund complex that a fund is part of has retail outlets, such as bank branches and local insurance agents. Column (3) shows that funds with retail outlets are able to charge higher fees, but again the effect of advertising on fees remains. In column (4), I include all the proxies for services provision simultaneously, and in the last column I provide a sense for the economical magnitude of the effects. As can be seen, the positive and significant link between fund advertising and fees remain even after controlling for some proxies for the provision of financial services bundled with funds.

If an investor chooses funds based on advertising and as a result pays higher fees per year until retirement, what are then the effects on accumulated wealth? I have attempted to quantify the answer to this question by some simple calculations. Suppose the investor is currently 20 years old, with 45 years till retirement, expects to get an average annual real wage increase of 2% per year, and pays 100 basis points higher fees per year because he based his portfolio choice to a large extent on fund advertising. My calculations suggest that this investor will accumulate

¹² I thank Laura Starks for suggesting an analysis of funds' service provisions along these lines.

15-20% less wealth in his retirement savings account.¹³ That is, higher fees due to product differentiation in the fund industry can, over time, accumulate to an economically significant effect on wealth.

5.2. Fund advertising and risk characteristics

Estimating the effects of fund advertising on portfolio risk is difficult. I propose constructing what I call an “advertising-based portfolio” (AP) by investing in different funds in proportion to their levels of advertising expenditures, and then compare the risk characteristics of such a portfolio to those of the default fund. In particular, I calculate a risk characteristic of the advertising-based portfolio as follows:

$$RC_{AP} = \rho_i RC_i \quad (4)$$

where

$$\rho_i = \frac{ADEX_i}{\sum_{i=1}^{455} ADEX_i} \quad (5)$$

and where i indexes funds, RC_i is a risk characteristic, $ADEX_i$ is a measure of the level of advertising expenditures prior to the event.

¹³ Assume that a percentage fee f is charged each year $t \in (0, T]$, where T is the investor’s investment horizon, on the beginning of the year market value of the fund, V_t . The fraction of the initial market value of the fund, V_0 , to be paid the first year is f , leaving a fraction $(1 - f)$ of V_0 to the investor. On this remaining fraction, another fraction f is paid the second year, corresponding to a fraction $f(1 - f)$ of V_0 , leaving the investor with a fraction of V_0 not paid as a fee the first or second year of

$$1 - [f + f(1 - f)] = (1 - f)^2.$$

Thus, the present value of the fees to be paid over the first two years is

$$\left[1 - (1 - f)^2\right] V_0.$$

It can be shown, following Ross (1978), that that the present value of the fees paid over T years is

$$\left[1 - (1 - f)^T\right] V_0.$$

Table 10 shows a comparison of the risk characteristics of the advertising-based portfolio and those of the default fund. I find several economically important differences between the two portfolios. First, although the allocation to equities in the default fund is quite high, the advertising-based portfolio is almost an all-equity portfolio with 98.9% in stocks. Second, only 0.4% of the advertising-based portfolio is in index funds. Third, the advertising-based portfolio is tilted towards investments in “hot” sectors, with 60.5% of the money in technology stocks. Finally, there is a substantially larger home bias in the advertising-based portfolio: 81.2% is invested in local stocks.

Taken together, my findings suggest that basing a portfolio on fund advertising can have economically large effects on individual investors’ expected returns (through effects on fees) as well as the risk characteristics of the chosen portfolios. Of course, the size of these economic effects depends critically on the specific assumptions made, in particular how much of the effects that can ultimately be attributable to fund advertising.

6. Conclusion and Extensions

I show that fund advertising affects portfolio choices although it provides little direct or indirect information. These results are not consistent with traditional models in economics emphasizing advertising’s information role. Nor do they seem consistent with theories arguing that advertising is a compliment to the advertised product (Becker and Murphy (1993)). Under their view, the same “favorable notice” would be equally effective for all funds (or any other product). However, this is inconsistent with the emphasis on the content of advertising. My results seem more consistent with individuals’ investment choices being determined by a mix of cognition and emotions. In particular, fund advertising can arouse certain key positive emotions in investors, which make their attitudes towards a fund more favorable.

My findings have important implications for the design of pension system reform, and for policy making in the mutual fund industry. The objective of funds is to sell fund shares to maximize profits for their shareholders, not necessarily to maximize retirement savers' pensions or investors' wealth. The effects of conflicts of interest in the money management industry have recently been recognized in finance research. For example, Bergstresser, Chalmers and Tufano (2005) compare broker-distributed and directly-distributed funds, and find that brokerage customer pay higher fees than those who buy directly-placed funds, although brokerage-distributed funds do not seem to come with any additional benefits. My results show that with the use of advertising, funds can differentiate themselves and therefore charge investors higher fees than the lowest-cost supplier in the industry.

Several important research questions remain unanswered. First, do my results apply to other countries and institutional settings as well? Second, advertising is only one promotional tool in funds' total marketing mix. Do tools such as selling efforts by financial advisors and direct mailing have similar effects on people's investment choices? Finally, does the content and effects of advertising vary over time? One recent and important contribution is a study by Mullainathan and Shleifer (2005), who show that the content of fund advertising is tilted towards what people have in mind at the moment, e.g., funds were more likely to use a performance cue after the market had gone up during the Internet boom. The findings in my paper suggest that more energy should be devoted to analysis of marketing and persuasion in financial markets.

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Appendix

Examples of fund advertising with different cues

Panel A: Fund ad with fee cue



Om priset på mjölk går upp.
Blir den godare då?

Högt pris och hög kvalitet är inte alltid samma sak. Faktum är att vissa saker bara blir bättre och bättre ju mindre du betalar. Så är det för oss.
Många råkar gå till det mest billiga bara för att det är billigare.
Vi satsar bara med pensioner – ingenting annat. Det gör att du blir enklare och billigare än de andra.
Dessutom är vi en liten effektiv organisation, samlat under ett och samma tak.
Så du kan ge dig mer pengar när det är dags att gå i pension.
Så enkelt är det.

Main text: “If the price of milk goes up, does it then taste better?”

Panel B: Fund ad with performance cue



★★★★★
SPARA FEMSTJÄRNIGT!

Vår IT-fond, Sverigefond och Hjärt-Langfond har fått högsta betyg; fem stjärnor av fem möjliga.
De har i konkurrens med alla andra svenska fonder tagit hem 3 av de 25 ätråvärda femstjärniga platserna på Fondstars* lista. Det betyder att fonderna har haft en mycket gynnsam utveckling under de tre senaste åren.

Och en lönsam historia skvallrar om goda förutsättningar för framtiden.
* Fondstar betygätter fonder som frans att köpa på den svenska fondmarknaden. Bedömningen sker enligt en metodik utarbetad av det amerikanska fondinformationsföretaget Morningstar. Morningstar Rating är en internationell standard för presentation av objektiv fondfakta. www.fondstar.se
SalusAnsvar Öhman Fonder kan lika lite som andra fondbolag garantera framtida avkastning. Fullständig informationsbroschyr kan beställas från fondbolaget på tel 020-52 53 00 eller via www.salusansvarohman.se

Main text: “A five-star investment!”

Panel C: Fund ad with other cue



Harrison Ford kan ge dig en bättre pension.

På söndag 21.00 på TV4 kan du se Air Force. Där med Harrison Ford som hjältepresident, i januari, 21.55. Är du säker på alla dina pensionslagar. Är du fortfarande osäker på hur du ska välja, föredrar vi att du prövar projektet motom lönsamhet. Så kan du i högt och nu planera ditt pensionsval.

Main text: “Harrison Ford can give you a better pension.”

Table 1
Summary statistics

Panel A reports summary statistics for the data set on portfolio choices. The data come from the Premium Pension Authority, the government authority that administers the new individual savings accounts. Panel B reports summary statistics for the data set on fund advertising that took place during a two-year period prior to the launch of the new pension system reform. The data come from MarketWatch, a marketing research company. "Print advertisements" are fund ads that appear in more than 250 newspapers, in the popular press and professional journals, and outdoor ads on billboards and buses, and in subway stations, etc. "Commercials" are fund commercials from all major television and radio networks, and those that appear in the largest movie theaters. Panel C reports summary statistics for fund characteristics. The data are from Morningstar or have been hand-collected from funds' annual reports, and are from the quarter prior to the launch of the new pension system. All dollar figures are based on the exchange rate of 10.04 Swedish kronor per dollar on 10/30/2000, the date of the launch of the system.

Panel A: Data set on portfolio choices		
Total number of portfolio choices		4,388,105
Total dollar amount at stake		\$5.6 billion
<i>Account size (Stake)</i>		
Maximum		\$2,639
Minimum		\$10
Mean		\$1,265
Panel B: Data set on fund advertising		
	Print advertisements	Commercials
Number of observations	23,604	20,647
<i>Advertising expenditures</i>		
Total	\$44.6 million	\$49.8 million
Mean	\$1,888	\$2,413
Maximum	\$46,434	\$248,848
Minimum	\$1.1	\$72.2
<i>Physical size</i>		
Largest/Longest	Cover front of 34 storey office building	8 min. 20 s.
Smallest/Shortest	1 x 8 news paper lines	2 s.
<i>Media placement (%)</i>		
Newspapers and magazines	89.2%	N/A
Outdoor	10.8%	N/A
Television	N/A	91.6%
Radio	N/A	5.2%
Movie theaters	N/A	3.2%

Table 1, continued

Panel C: Characteristics of funds and managers			
Characteristic	Definition	Mean	St. dev.
Manager experience	Years in the fund industry	11.1	7.0
Manager tenure	Years of tenure with the current fund	2.2	3.0
Manager MBA	1 if the manager has an MBA; 0 otherwise	0.222	0.416
Specialized assets	1 if the fund is a pharmaceutical fund, a technology fund, or an emerging markets fund; 0 otherwise	0.101	0.302
New fund	1 if the fund was introduced <3 years ago; 0 otherwise	0.349	0.477
News articles	Number of new articles featuring or mentioning the fund during a one year pre-event period	177.8	192.1
Local fund	1 if the fund is registered in Sweden; 0 otherwise	0.530	0.500
Distance to fund	Flight time in minutes to fund's headquarter (all local funds have zero distance)	171.3	294.9
Distance to fund assets	Market value weighted flight time in minutes to fund's assets (all local assets are defined to have zero distance)	344.1	396.6
Log (Assets under management)	Log of assets under the fund's management	5.49	2.56
Log (Other employees)	Log of number of employees of fund complex other than portfolio managers and analysts	5.02	2.21
Fund industry share	Market share in the retail fund industry	0.037	0.085
Banking industry share	Market share in the retail banking industry	0.040	0.090
Insurance industry share	Market share in the retail insurance industry	0.034	0.079
Retail outlets	1 if the fund complex has retail outlets or branches; 0 otherwise	0.290	0.045
Past performance [-12, 0]	Past raw returns over 12 month period (%)	36.3	40.7

Table 2
Content analysis of fund advertising

The table shows representative examples of the content of fund advertising. I classify cues in ads into three categories: (i) Fee cue. An ad contains a “price,” i.e., fee, cue if it contains a reference to price, fees, charges, or expense ratios. (ii) Performance cue. An ad contains a performance cue if it contains the fund’s return over some period (e.g., past year, five years or the fund’s lifetime), Morningstar or other independent company’s ratings, or any other return comparison with an index or category, chosen by the advertising fund. (iii) Other cue. These are ads that do not contain a fee or performance cue. The data set of fund advertising is described in detail in section 3.

Panel A: Fund advertising with fee cue	
Content/message	Comments
“If the price of milk goes up, does it then taste better?”	The design of these ads was identical to that of the leading Swedish milk producer’s cartons.
“Compare our fees!”	The ad contained no information on other funds’ expense ratios.
“We just cut our fees by 40%”	N/A
“Higher pension thanks to our low fees”	N/A
“Call us if you are tired of high expense ratios”	N/A
Panel B: Fund advertising with performance cue	
Content/message	Comments
“A five-star investment!”	The ad displayed Morningstar’s 5-star rating.
“We have been Sweden’s best fund manager SIX times”	The number 6 (six) is sex in Swedish.
“Invest in this year’s best fund manager”	N/A
“Words are good. Performance figures are better”	N/A
“We are #1”	N/A
Panel C: Fund advertising with other cue	
Content/message	Comments
“Harrison Ford can give you a better pension”	In print ads and commercials between blocks at the TV premiere of the movie “Air Force One” (starring Harrison Ford).
“Absolut Strategi”	The fund associated itself with vodka brand Absolut. For this, the vodka producer sued. The parties settled, and the fund was renamed.
“Our fund is your choice”	N/A
“The right dose of medical competence and head for business”	Ad for pharmaceutical fund.
“At a small fund manager, decisions are quicker”	N/A
“Choose a large fund manager”	N/A
“Invest in companies with the heart in Norrland”	“Norrland” refers to counties in northern Sweden.
“Stefan Edberg about our funds: Before, I chose the best tennis racket and the best coach. Now I choose funds.”	Tennis pro Stefan Edberg endorses fund manager.

Table 3
Evidence on fund advertising as direct information

The table reports the proportion of advertising dollars attributable to fee, performance, and other advertising, respectively. I classify cues in ads into three categories: (i) Fee cue. An ad contains a “price,” i.e., fee, cue if it contains a reference to price, fees, charges, or expense ratios. (ii) Performance cue. An ad contains a performance cue if it contains the fund’s return over some period (e.g., past year, five years or the fund’s lifetime), Morningstar or other independent company’s ratings, or any other return comparison with an index or category, chosen by the advertising fund. (iii) Other cue. These are ads that do not contain a fee or performance cue. The data set of fund advertising is described in detail in section 3.

Category	All	Print advertisements	Commercials
Fee advertising	7.9%	13.5%	2.9%
Performance advertising	30.0%	43.2%	18.2%
Other advertising	62.1%	43.3%	79.0%

Table 4
Evidence on fund advertising as a signal of quality

The dependent variable is simple excess returns, i.e., a fund's annual return in percent minus the average annual return of all the funds in the fund's Morningstar category over a 12-month post-advertising period. Fund advertising is total fund advertising expenditures in thousands of dollars prior to the event. Performance advertising is fund advertising with a performance cue. I correct the standard errors for clustering at the fund category level. p-values are reported in parentheses.

	(1)	(2)	(3)	(4)
Fund advertising	-0.0051 (0.561)	-0.0138 (0.151)		-0.0061 (0.368)
(Fund advertising) ² / 1,000	0.0086 (0.177)	0.0077 (0.243)		0.0091 (0.107)
Fund advertising × Quartile 4 of Fund advertising		0.0086 (0.159)		
Performance advertising			-0.0398 (0.107)	
Fixed fund category effects	Yes	Yes	Yes	No
Adjusted R ²	0.260	0.264	0.301	0.009
N	455	455	455	455

Table 5
Further evidence on fund advertising and signaling

The dependent variable is a measure of excess returns. “Alpha” is the intercept from regressing a fund’s monthly percentage returns on the returns of the fund’s comparable Morningstar index over a 12-month post-advertising period. “Simple” is a fund’s annual return in percent minus the average annual return of all the funds in the fund’s Morningstar category over a 12-month post-advertising period. All other variables are defined in Panel C of Table 1. I correct the standard errors for clustering at the fund category level. p-values are reported in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Fund advertising	-0.0023	-0.0042	-0.0043	-0.0033	-0.0023	-0.0017	-0.0016	-0.0002
	(0.756)	(0.265)	(0.455)	(0.685)	(0.761)	(0.822)	(0.844)	(0.979)
(Fund advertising) ² / 1,000	0.0046	0.0036	0.0040	0.0091	0.0046	0.0043	0.0043	0.0035
	(0.505)	(0.165)	(0.409)	(0.121)	(0.503)	(0.532)	(0.555)	(0.653)
Fund advertising				-0.0041				
× Quartile 1 of Manager experience				(0.288)				
Fund advertising				-0.0002				
× Quartile 1 of Manager tenure				(0.958)				
Fund advertising				-0.0011				
× No Manager MBA				(0.654)				
Fund advertising					-0.0001			
× Specialized assets					(0.990)			
Fund advertising						-0.0015		
× New fund						(0.599)		
Fund advertising							-0.0062	
× Quartile 1 of News articles							(0.198)	
Fund advertising								-0.0087
× Foreign fund								(0.178)
Excess return measure	Alpha	Alpha	Simple	Simple	Simple	Simple	Simple	Simple
Post-advertising period (in months)	12	36	36	12	12	12	12	12
Fixed fund category effects	Yes							
Adjusted R ²	0.294	0.342	0.239	0.263	0.294	0.294	0.295	0.299
N	455	440	424	455	455	455	455	455

Table 6
Does advertising matter for investors' fund choices?

The dependent variable is the log of dollar allocation to a fund. All other variables are defined in Panel C of Table 1. Based on the coefficients in column (10), the “% Effect” column reports the effect on the dollar allocation to the average fund (in percent) of changing each continuous (dummy) variable one standard deviation (from 0 to 1). I correct the standard errors for clustering at the fund category level. p-values are reported in parentheses.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	% Effect
Fund advertising	0.0061 (0.000)	0.0118 (0.000)	0.0083 (0.000)	0.0052 (0.001)	0.0070 (0.000)	0.0083 (0.000)	0.0070 (0.000)	0.0052 (0.003)	0.0055 (0.000)	0.0037 (0.010)	1.31
(Fund advertising) ² / 1,000		-0.0654 (0.000)	-0.0041 (0.005)	-0.0021 (0.094)	-0.0032 (0.015)	-0.0043 (0.004)	-0.0033 (0.020)	-0.0022 (0.113)	-0.0019 (0.161)	-0.0015 (0.165)	0.08
Local fund				1.072 (0.000)						1.065 (0.000)	1.90
Distance to fund					-0.0014 (0.000)					-0.0004 (0.173)	0.12
Distance to fund assets					-0.0004 (0.360)					-0.0002 (0.577)	0.08
Log (Assets under management)						0.117 (0.002)				0.211 (0.000)	0.72
Fund industry share							2.110 (0.151)			0.872 (0.444)	0.08
Banking industry share							4.805 (0.004)			2.574 (0.060)	0.26
Insurance industry share							1.859 (0.001)			1.749 (0.119)	0.15
News articles								0.0034 (0.000)		0.0032 (0.015)	0.85
Past performance [-12, 0]									0.0182 (0.000)	0.0112 (0.010)	0.58
New fund									-0.075 (0.844)	-0.078 (0.687)	0.08
Fixed fund category effects	No	No	Yes								
Adjusted R ²	0.298	0.375	0.611	0.669	0.636	0.625	0.646	0.658	0.684	0.747	
N	455	455	455	455	455	455	455	455	455	455	

Table 7
Determinants of advertising and investors' fund choices

The dependent variable in column (1) is fund advertising. The dependent variable in column (2) is the log of dollar allocation to a fund. The coefficients in column (2) are estimated using a two-stage least squares procedure where lagged fund advertising is used as an instrument for fund advertising. Lagged fund advertising is total fund advertising expenditures in thousands of dollars during a period of 48 months to 24 months prior to the event. All other variables are defined in Panel C of Table 1. Based on the coefficients in column (2), the “% Effect” column reports the effect on the dollar allocation to the average fund (in percent) of changing each continuous (dummy) variable one standard deviation (from 0 to 1). I correct the standard errors for clustering at the fund category level. p-values are reported in parentheses.

	(1)	(2)	% Effect
Fund advertising		0.0042 (0.008)	1.59
Lagged fund advertising	0.792 (0.000)		
(Fund advertising) ² / 1,000	0.803 (0.000)	-0.0050 (0.028)	0.29
Local fund complex	47.51 (0.001)	1.114 (0.001)	2.05
Distance to fund	-0.030 (0.059)	-0.0003 (0.419)	0.09
Distance to fund assets	0.008 (0.606)	-0.0002 (0.567)	0.08
Log (Assets under management)	0.943 (0.505)	0.202 (0.000)	0.67
Fund industry share	-34.75 (0.652)	0.703 (0.655)	0.06
Banking industry share	-162.46 (0.040)	2.561 (0.083)	0.26
Insurance industry share	67.56 (0.218)	1.431 (0.195)	0.12
News articles	0.565 (0.000)	0.0034 (0.019)	0.65
Past performance [-12, 0]	2.462 (0.000)	0.0128 (0.009)	0.68
New fund	48.09 (0.098)	-0.104 (0.329)	0.11
Fixed fund category effects	Yes	Yes	
Adjusted R ²	0.922	0.701	
N	455	455	

Table 8
The role of performance vs. other fund advertising

The dependent variable is the log of dollar allocation to a fund. Performance advertising is fund advertising with a performance cue. Advertising with other cue is fund advertising with a cue than a performance or fee cue. All other variables are defined in Panel C of Table 1. All specifications include the same set of control variables (fund characteristics) as in column (10) of Table 6. Based on the coefficients in column (3), the “% Effect” column reports the effect on the dollar allocation to the average fund (in percent) of changing each continuous (dummy) variable one standard deviation (from 0 to 1). I correct the standard errors for clustering at the fund category level. p-values are reported in parentheses.

	(1)	(2)	(3)	% Effect
Performance advertising	0.0060 (0.024)		0.0063 (0.012)	0.52
Past performance [-12, 0]	0.0181 (0.000)		0.0160 (0.001)	0.92
Advertising with other cue		0.0035 (0.000)	0.0029 (0.000)	0.79
Performance advertising / 1,000 × Past performance [-12, 0]			0.224 (0.001)	0.83
Control variables	Yes	Yes	Yes	
Fixed fund category effects	Yes	Yes	Yes	
Adjusted R ²	0.728	0.672	0.758	
N	455	455	455	

Table 9
Fund advertising and fees

The dependent variable is a fund's annual expense ratio in percent. All other variables are defined in Panel C of Table 1. Based on the coefficients in column (4), the "b.p. Effect" column reports the effect on a fund's expense ratio (in basis points per year) of changing each continuous (dummy) variable one standard deviation (from 0 to 1). I correct the standard errors for clustering at the fund category level. p-values are reported in parentheses.

	(1)	(2)	(3)	(4)	b.p. Effect
Fund advertising	0.0023 (0.016)	0.0021 (0.025)	0.0021 (0.022)	0.0022 (0.011)	50
Log (Assets under management)		0.0035 (0.699)		0.0055 (0.571)	1
Log (Other employees)		0.0426 (0.006)		0.0425 (0.004)	9
Retail outlets			0.1038 (0.086)	0.1074 (0.095)	11
Fixed fund category effects	Yes	Yes	Yes	Yes	
Adjusted R ²	0.534	0.549	0.536	0.552	
N	455	455	455	455	

Table 10
Fund advertising on risk characteristics

The table shows a comparison of the risk characteristics of an advertising-based portfolio and those of the default fund. The advertising-based portfolio is constructed by investing in different funds in proportion to their levels of advertising expenditures. The default fund is the fund chosen for those who do not actively make a portfolio choice. “Other” refers to private equity and hedge fund (fund-in-funds). “Hot” sectors is defined as the industry that had the highest raw returns during a three-year pre-event period (technology stocks).

Risk characteristic	Advertising-based portfolio	Default fund
<i>Asset allocation</i>		
Equities	98.9%	82.0%
Fixed-income securities	1.1%	10.0%
Other	0%	8.0%
Indexing	0.4%	60.0%
“Hot” sectors	60.5%	30.1%
<i>Asset (equities) location</i>		
Sweden	81.2%	20.7%
Europe	2.9%	24.4%
Americas	13.2%	42.7%
Asia	2.7%	12.2%

Figure 1
Evidence on fund advertising recall ratios

The figure shows survey evidence on fund advertising recall ratios. A leading phone survey company (Sifo) did the survey of 1,083 retirement savers between the age of 20 and 62 (selected to be representative of the population) during the days immediately after investors' initial portfolio choices.

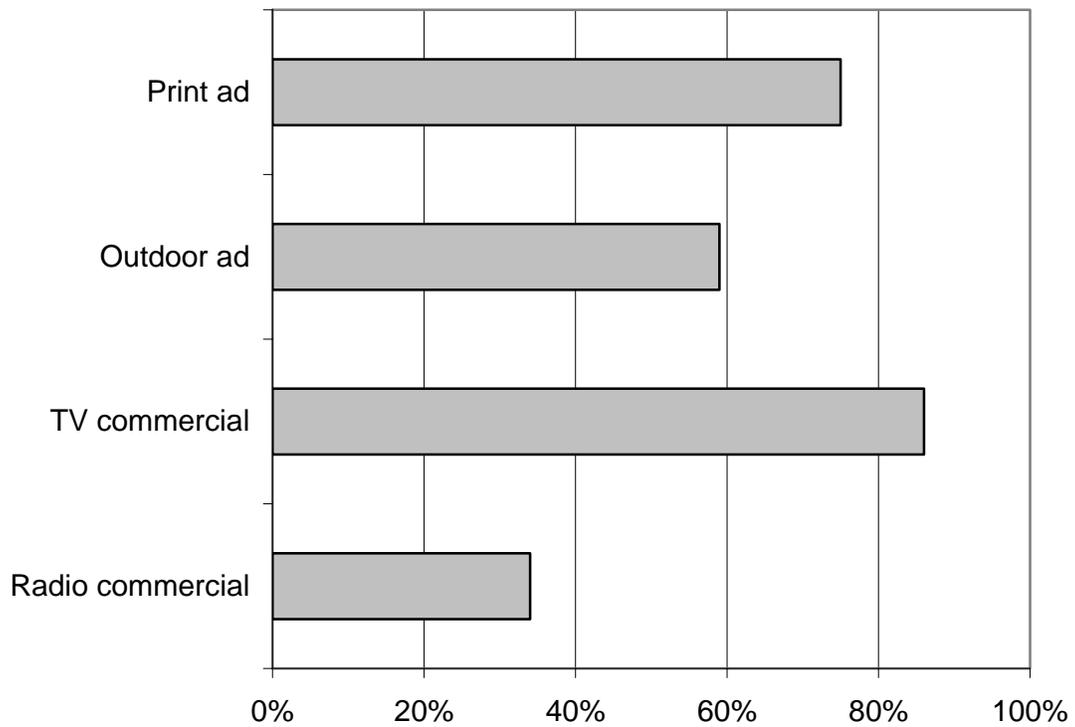


Figure 2
Fund advertising and active portfolio choices

The figure compares total advertising and percent active choices in 2000 and in subsequent years, 2001-2005. For year 2000, I focus on active choices among *young* investors (age < 22) to be able to compare with other years, when joining participants tend to be young individuals.

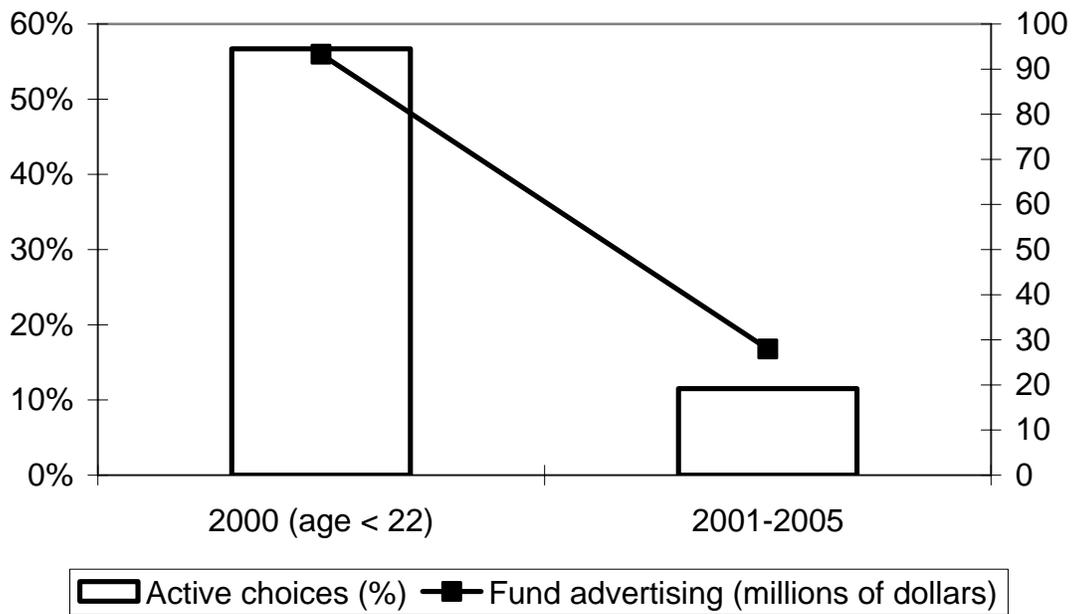


Figure 3
Fund advertising and fund choices

The figure illustrates the univariate relation between fund advertising and fund choices.

