Competition and Conflicts of Interest the U.S. Mutual Fund Industry*

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Abstract

Mutual fund investors desire high risk-adjusted performance at low cost, which may not necessarily be the objective of fund families. Fund families want to maximize assets under management (i.e., their market share) and the resulting management fees. This paper studies the extent to which conflicts of interest are mitigated by competition in the mutual fund industry using the universe of U.S. mutual fund families over the period 1979-1998. During this period, industry assets increased by a factor of twenty, the number of active fund families tripled, and the average market share of a family declined by two thirds. We find that price competition is important in the industry. Families that charge lower fees relative to the competition gain market share, but only if these fees are above average to begin with. Low-cost families do not lose market share by charging higher fees. On the other hand, loads and fees charged explicitly for marketing and distribution (12b-1 fees) have a positive or negligible impact on market share. We find no evidence that investors derive any benefits from these expenses. Product differentiation strategies are also effective in obtaining market share. Families that perform better, and start more funds relative to the competition (a measure of innovation) have a higher market share. Innovation is rewarded more if the new fund is more differentiated from existing offerings and is in a less crowded objective. Finally, market share within an investment objective is driven primarily by a family's policies within that objective, but there are important performance spillover effects from other funds in the family. Our findings are robust to various tests for endogeneity of the explanatory variables.

1. Introduction

Mutual fund investors generally desire high risk-adjusted performance at low cost. But that may not necessarily be the objective of mutual fund families who want to maximize assets under management, and the associated fees. In this paper, we analyze the extent of these potential conflicts of interest, and the role of industry competition in mitigating these conflicts. In particular, we study whether fund families have been able to follow strategies that enhance their fee income but may not appear to be in the best interest of fund shareholders. Mutual fund fees have come under increased scrutiny recently, in part because of the allegation made by Freeman and Brown (2001) that fund management fees are too high. In fact, Freeman has testified on these allegations before Congress [see Freeman (2004)] and the Office of the Attorney General of New York State (2004) has made statements supporting these allegations. Moreover, the recent market timing and late trading scandals have subjected the fund industry to an elevated level of scrutiny.

We study the importance of price and non-price competition in the U.S. fund industry over a period of 20 years from 1979 to 1998. By ending the sample in 1998, our analysis is not affected by the recent increase in regulatory scrutiny caused by various late trading scandals and market timing problems. Examining price competition is especially relevant in light of previous findings suggesting that price competition does not play a significant role in the industry.[1] Such evidence would suggest that fund management companies can increase fees with little consequence for the level of assets under management.

Given the characteristics of the fund industry, existing evidence on the lack of price competition seems surprising. The industry has experienced tremendous growth in the last three decades and is characterized by low barriers to entry and perhaps little opportunity to achieve product differentiation. In fact, the number of families offering mutual funds has more than tripled over the last twenty-five years. In addition, some families have succeeded in achieving a pre-eminent status in the industry, while others

[1] Sirri and Tufano (1993) find no relation between changes in market share and fees charged by the largest 20 fund families, Freeman and Brown (2001) argue that fund management companies fail to pass along economies of scale benefits to their shareholders, and Barber, Odean, and Zheng (2005) find no relationship between fund expense ratios and asset inflows.

have either struggled to maintain market share or lost market share. For example, in 1979, Fidelity controlled less than 6% of the market and Vanguard controlled a little over 2%. At the end of 1998, the market shares of the two families were over 14% and 9% respectively. In 1979, two other families, Dreyfus and Kemper had market shares similar to Fidelity and Vanguard, respectively. By the end of 1998, Dreyfus' market share had declined to under 2%, while Kemper's share was below 1%. The goal of this paper is to understand the strategies pursued by fund families and how investor response to these strategies has affected their relative positions in the industry. Our unit of observation is not an individual fund, but the fund family, because the decision on the number of funds offered and the price charged for fund management rests with the family.[2]

Research at the level of the fund family has started to gain prominence only recently. Most of the early work on mutual funds is at the fund level and focuses on various aspects of their performance [see, for example, Grinblatt, Titman, and Wermers (1995), Brown and Goetzmann (1995), Elton, Gruber, and Blake (1996), Gruber (1996), Wermers (2000)]. Work at the family level includes Khorana and Servaes (1999)[3] who study the decision by families to open new funds and Nanda, Wang, and Zheng (2004) and Ivkovich (2002) who examine performance spillover effects across funds within a family. Massa (2003) studies the relation between the performance of the fund family and the degree of differentiation of the objectives in which the fund family operates. Gasper, Massa, and Matos (2006) document that fund families strategically transfer superior performance to their more valuable funds by demonstrating favoritism in IPO allocations. From an investor perspective, Elton, Gruber, and Green (2007) find that mutual fund returns within a family tend to be highly correlated, which limits the benefits of portfolio diversification for investors with exposure to a single fund family.

The variable of interest for our study is the market share of a fund family. Market share is the

[2] The process of negotiating fund fees is managed by the fund's board, which is generally chosen by the sponsor who establishes the fund in the first place [see Tufano and Sevick (1997) and Kuhnen (2006) for more details].

[3] To illustrate the potential conflicts of interests, Khorana and Servaes (1999) study the relation between a family's decision to initiate a fund opening and the fee schedule of existing funds. They find that families open new funds in an objective when a greater proportion of existing funds in that objective are in the low range of the staggered fee schedule. Under a staggered fee schedule, the percentage management fees on additional investments declines as assets under management reach pre-specified threshold levels. A fund opening allows the family to reset its fees to higher levels and hence counteract the effect of declining management fees.

culmination of all the decisions made by fund families and the investor's response to those decisions. It is the ultimate reflection of the choices made by investors, i.e., the revealed preferences of investors.

We examine the determinants of market share both at the aggregate industry level as well as in different investment objectives. As we mention at the outset, market share is an important variable to study because the revenues of mutual funds families are a function of assets under management. In addition, evidence presented by Baumol, Goldfeld, Gordon, and Koehn (1980) indicates that there are economies of scale and scope in the U.S. mutual fund industry. This implies that family size has an important effect on profitability. Our findings are not only of interest to fund families, but also to regulators and consumers. Regulators, in particular, are concerned about the impact of fees on market share, especially in light of recent allegations that fees are too high.[4]

To examine the importance of pricing in determining investor choice, we study the effect of fund expenses and loads on market share. Fund expenses include expenses for marketing, distribution, and trading activities, as well as fees charged by the mutual fund advisors. These expenses are incurred on an annual basis. Loads, on the other hand, are charged when investors increase their investment (front-end load) or decrease their investment (back-end load) in a fund. The presence of back-end loads can act as a deterrent for investors to vote with their feet. We also examine whether the effect of expenses is asymmetric, i.e., do investors behave differently when expenses are high or low relative to other funds in the same objective?

To examine whether fund families can gain market share by focusing on aspects other than price, we study a large number of family-specific characteristics, including prior performance, Morningstar ratings, the degree of asset concentration across funds and objectives, the level of active management within the family, various measures of product innovation, and marketing costs. We also control for the family's experience in the industry, the number of funds offered by the family, and the degree of media attention received.

We address these questions by examining the *universe* of all open-end mutual fund families (both

[4] In fact, The Division of Investment Management of the Securities and Exchange Commission prepared a report in

active and inactive) in the United States over the 1979-1998 period. Our results indicate that investors pay attention to fees in their asset deployment decision across fund families. Specifically, we find that families have a higher market share when they charge lower objective-adjusted fees relative to other families. This result holds after controlling for the potential endogeneity of fees. In addition, families whose expense ratios are more sensitive to fund size, also have higher market share. The greater sensitivity to fund size could be partly attributable to families passing along economies of scale benefits to their shareholders. Expenses related to marketing and distribution (12b-1 fees), on the other hand, do not have an adverse impact on market share. Levying fees on existing shareholders to market a fund to new investors appears to be a conflict of interest between the mutual fund investor and the fund advisor. We examine whether such actions could be justified because they lower search costs for new investors or because funds with high marketing fees have lower non-marketing-related expenses. However, we do not find evidence that this is the case.

When total expenses are decomposed into regular expenses and loads, we continue to find a negative relationship between expenses and market share, but the relationship between loads (both back-end loads and front-end loads) turns positive. We do not find any evidence to suggest that investors benefit from the loads through lower expenses. In fact, the sensitivity of expenses to size is smaller in funds with back-end loads. Moreover, holding fund size constant, funds with back-end loads exhibit higher expense ratios.

We also find that the effect of expenses is asymmetric: families whose expenses are above the mean can enhance their market share via expense reduction. This is not the case for low-expense families, which suggests that consumers are more concerned with fees relative to a benchmark than with fees per se. Low-cost families could potentially benefit from this asymmetry by shifting their fees closer to the average. We confirm that this is the case by showing that the market share of low-cost families is not adversely affected when they increase their fees.

We also study the impact of non-price competition on a family's ability to attract additional assets. This analysis is important to understand the broader context of competition in the industry. First, families

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December 2000, partly to ascertain whether the level of fees and expenses in the industry is appropriate and whether

that outperform the competition have a higher market share, especially if one of their funds is a top performer. This effect has become stronger since 1992 when the Morningstar ratings were introduced. When we include both returns and Morningstar ratings in the same model, the effect of the ratings dominates. Second, innovation as measured by new product introductions, also leads to higher market share, especially if the portfolio characteristics of the new funds differ more from the existing offerings in the marketplace. Very high levels of innovation, however, have an adverse impact on market share. These findings indicate that the cannibalization of existing funds is not a significant problem at moderate levels of innovation, and that funds investors are sophisticated enough to understand the subtle differences in product offerings. Third, families with a more diversified product offering also have higher market share, even after controlling for potential reverse causality. However, this result is mainly caused by small fund families.

Empirical tests at the objective level yield results similar to those at the family level. Both price and non-price strategies are effective in attaining market share. Market share at the objective level is driven mainly by a family's policies within that objective, but there are also important family spillover effects. In particular, families are able to increase their market share in an objective when they perform very well in their other objectives. There is some evidence that this effect is related to a reduction in investor search costs since it is stronger for small fund families. There is no evidence, however, of spillover effects in marketing and distribution expenses.

The remainder of the paper is organized as follows. Section 2 discusses the hypotheses. Section 3 describes the data and methodology used for the analysis. Section 4 contains the results and Section 5 concludes.

2. Hypotheses

In general, consumers purchase a product at a certain price because the underlying product features increase their expected utility. The market share of fund families is the based on the outcome of these

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further disclosure of expenses should be mandated.

individual consumer decisions. Holding the actual or perceived features of the product constant, the price charged for the product is an important aspect of competition. However, firms will try to differentiate their product, partly to lessen the importance of price competition. In this section, we outline how pricing and different aspects of product differentiation influence competition and investor choice, and whether fund families can make decisions to enhance market share that may not be in the best interests of fund shareholders.

2.1. Price competition

One could argue that mutual funds are very much like standard commodities. Consistent with this notion, various studies have demonstrated that most fund managers are unable to beat standard performance benchmarks on a risk-adjusted basis (see, for example, Carhart (1997)). Moreover, all funds are required by law to provide standardized services such as record keeping and the provision of liquidity. Hence, to gain a competitive advantage, the price charged for the services rendered may be the most significant determinant of a family's ability to attract additional capital. If this is the case, we expect to find an inverse relationship between a family's market share and the fees charged to investors.

Berk and Green (2004) provide a counterargument to the above view. They argue that the lack of excess performance or performance persistence is what one would expect in a competitive market for asset management services, if we assume that the ability of a fund manager to outperform the benchmark declines with fund size. Managers with excess performance will attract enough new funds such that expected excess performance, net of fees, is zero. However, this argument still implies a negative relationship between fees and assets under management. Higher fees will lead to lower net-of-fees performance, and consequently lower assets under management.

The existing evidence on the importance of fees is mixed. Wilcox (2003) provides experimental evidence, which indicates that consumer pay close attention to fees when selecting mutual funds. On the other hand, Capon, Fitzsimons, and Prince (1996) present survey evidence to suggest that only about one quarter of mutual fund investors consider management fees to be important in selecting funds. The

remainder of the investors care more about performance and other services offered by the fund families. Evidence presented by Sirri and Tufano (1993), Freeman and Brown (2001), and Barber, Odean, and Zheng (2005) also suggests that price competition is not important in the industry, and Elton, Gruber, and Busse (2004) report that investors in S&P500 index funds do not necessarily choose the fund with the lowest expenses. Finally, in experimental work, Choi, Laibson, and Madrian (2006) find that 85% to 95% of individuals do not choose the lowest cost S&P500 index funds.

It is important to recognize that two facets of price competition are at work here: (1) the extent to which fund families pass along potential economies of scale benefits to their shareholders and (2) the extent to which investors respond to fund fees. The market share of a fund family is the final outcome of the responses of both the fund families and its investors. It may be in the interest of fund families not to pass along lower costs to shareholders. However, if the shareholders themselves are responsive (by redeploying their mutual fund assets) to the degree to which any cost reductions in fund management lead to lower fund fees, then the external market forces will act to mitigate these potential conflicts of interest between fund companies and investors.

We also examine whether the relationship between fees and market share is symmetric. It is possible that investors only pay attention to fees when they are particularly high relative to the universe of funds in the objective and care less about fees when they are below the objective norm.

As we discussed in the introductory section, the evidence presented by Baumol, Goldfeld, Gordon, and Koehn (1980) suggests that there are economies of scale in the fund industry. However, Freeman and Brown (2001) have argued recently that fund management companies pass few of the savings from these economies of scale on to their clients. To investigate this, we compute the relationship between fund fees and fund assets for each family over our sample period and examine whether families whose fees decline faster in relation to fund assets (i.e., those families who pass along more economies of scale benefits to the investors) have higher market share.

It has also been argued that the impact of fees depends on prior performance. In particular, Goldstein and Krutov (2000) argue that fees matter less when prior performance has been exceptional, because

consumers do not focus on the price paid when the fund performs better than expected. To examine this conjecture, we examine the interaction between fees and fund performance.

Due to the lack of data on management fees for the entire sample period, we use total fund expenses as a proxy for the price charged by a family for the services rendered. In addition, assuming a seven-year holding period, we increase the expenses by one seventh of the initial and/or back-end load to capture the sum of all possible expenses and fees paid by fund shareholders. To measure expenses relative to other families in the industry, we make adjustments for differences in these load-adjusted expenses across the various investment objectives. To determine whether loads have the same effect as non-load related expenses, we also study them separately. This allows us to examine Barber et al.'s (2005) argument that loads have a negative impact on fund inflows, but that the effect of expenses on inflows is basically neutral.

2.2. Product differentiation

2.2.1. Past performance

Notwithstanding the evidence discussed in the previous section that a large majority of fund managers underperform relative to standard performance benchmarks, there is some evidence in support of the "hot hands" phenomenon. Hendricks, Patel, and Zeckhauser (1993), Grinblatt, Titman, and Wermers (1995), Elton, Gruber, and Blake (1996), Chevalier and Ellison (1999), and Cremers and Petajisto (2006), among others, provide evidence that there is some persistence in the ability of managers to outperform or underperform the competition, while Gruber (1996) and Zheng (1999) document some ability on the part of mutual fund investors to pick winning managers, at least in the short run. This evidence suggests that families with superior performance should be able to attract more capital. The theoretical work by Berk and Green (2004) also shows that, in equilibrium, firms with superior performance attract more assets.

While performance is traditionally measured using abnormal returns, many investors pay attention to a fund's Morningstar rating. In fact, Del Guercio and Tkac (2004) demonstrate that changes in Morningstar ratings have an effect on fund flows, independent of the effect of abnormal returns. We therefore also

investigate whether fund ratings affect market share.

Ippolito (1992) and Sirri and Tufano (1998), among others, find that funds with positive abnormal performance attract more assets in subsequent years, while poor performers do not experience outflows of the same magnitude. This asymmetric response suggests that families can increase their market share, even if they are average performers as a whole, as long as they have one or more top performers in their portfolio of product offerings.[5, 6] In light of these arguments, one strategy followed by families could be to start multiple funds in an objective to increase the likelihood of having a top-performing fund. We discuss this possibility in more detail in our analysis of innovation.

In examining the determinants of market share in a particular objective, we include performance variables computed for the entire family as well as for the family's funds in each objective. Therefore, if family performance affects market share in an objective, it would suggest that superior performance in one objective has important spillover effects for the other objectives as well. Any evidence of spillover effects in market share would be consistent with two interpretations: (1) consumers are irrational; (2) the publicity generated by the star performers reduces the investor's search costs for all funds in the family and/or investors use it as a signal of family quality.[7] To examine the possibility of these two interpretations, we subdivide the sample into large and small families, since investor search costs are likely to be lower for large families. The presence of a relation between the magnitude of the spillover effects and family size would be consistent with the search cost based interpretation.

2.2.2. Product innovation

There are three reasons why families may want to open new funds. First, a family may offer a new fund with a variation on an existing product line that may appeal to new investors. Mamaysky and Spiegel (2002) argue that the characteristics of new funds should differ as much as possible from those of

[5] The experimental evidence reported by Wilcox (2003) indicates that past performance is an important determinant of investor choice. Interestingly, however, he finds that long-run performance is more important than short-run performance, while the evidence on performance persistence indicates that this is a short-term phenomenon.

[6] See Lynch and Musto (2003) for a rational model of portfolio management in which an asymmetric relation between fund flows and performance emerges.

[7] See Hortaçsu and Syverson (2004) for a model of search costs and product differentiation applied to the mutual

existing funds, both across families and within the family. To explicitly examine whether the degree of differentiation of new funds affects market share, we construct a variety of measures. We expect investors to respond more favorably towards families that offer a differentiated product rather than a small variation on an already existing product, albeit that the recognition of these subtle differences requires a great deal of sophistication from investors. We also investigate whether the impact of fund starts on market share is less significant in an already crowded segment.

Innovation does not necessarily increase market share, however. The new funds may simply cannibalize existing funds in the family, either because the new funds appear to be a better investment option, or because marketing efforts and allocations of shares with expected superior performance are directed to the new funds (see Gasper, Massa, and Matos (2006)). It is also possible that the introduction of additional funds creates confusion in the mind of the potential customer, who may prefer to invest with a more focused family.

The second reason why families may open new funds is not to be innovative per se, but to increase the likelihood of having a top-performing fund as discussed in the subsection on performance. In our sample, two thirds of the families with more than 20 funds in 1998 have at least one fund in the top 5% in terms of performance (within a particular investment objective), compared to only one fifth of families with 20 funds or less.

Finally, families may open new funds because their current funds have done poorly and fail to attract new asset inflows. Again, this motivation is unrelated to innovation per se and reflects the market reality that inflows are higher in funds that have performed well in the past. However, if new funds are started for this reason, we still expect families to attain higher market share subsequently, after controlling for prior performance.

At the individual fund level, we also investigate whether existing investors are adversely affected by new fund openings. It is possible that more of the family's resources are dedicated to the new funds, which may reduce the performance of the existing offerings.

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fund industry.

2.2.3. Marketing and distribution

Resources employed for marketing and distribution can reduce the search costs for potential investors, hence, creating an opportunity to increase market share. To examine whether firms can enhance market share through increased marketing expenses, we examine the effect of 12b-1 fees and loads charged by the family. Marketing and distribution (12b-1) fees are charged directly to the assets of the fund. However, the 12b-1 fees are also a component of the expenses that both existing and new investors have to bear, and therefore, they could have a negative impact on market share similar to other fees charged. By considering 12b-1 fees separately, we ascertain whether this component of expenses has a differential impact on market share. Charging existing investors fees for marketing a fund to new investors appears to be a direct conflict between the fund family and its investors, where new investors might benefit at the expense of existing shareholders. However, it might be justified under the following circumstances: (1) investors treat these fees as they treat other fund expenses and take them into consideration in making their investment decisions; (2) funds with higher 12b-1 fees have lower management fees; this may be because the fund is larger and can exploit potential economies of scale in fund management; (3) 12b-1 fees lower search costs for new investors; (4) there are spillover effects from 12b-1 fees to other funds.[8] With regard to the last point, if one fund in the family charges 12b-1 fees, this may attract new capital in the rest of the family. This justification for levying 12b-1 fees makes sense if the spillover effects result in tangible benefits for the fund investor. This could be via lower management fees on other funds, or lower search costs for other funds in the family. The arguments discussed above also apply to front-end and back-end loads (which are also fees charged for fund distribution), and are empirically examined in the paper.

2.2.4. Degree of family focus

There exists a significant degree of heterogeneity in both the total number of funds and the types of funds offered by fund families. Some families are extremely focused in terms of the types of funds

[8] Some 12b-1 fees may be employed to compensate advisors for past sales of the fund, and not to attract new

offered (for example, Centennial Capital Corporation only offers money market funds), whereas other families compete by offering a plethora of funds in different investment objectives.

A priori, we do not know whether a more diversified family possesses a greater ability to attain market share relative to a more focused fund family. Mamaysky and Spiegel (2002) develop a theory of mutual fund design, which suggests that fund families should diversify across investment styles to enhance investor welfare. The objective of such a strategy is to impose few restrictions on investors in terms of their ability to adjust their asset allocation over time.[9] Alternatively, more focused families may possess a greater ability to develop expertise, and economies of scale in a particular investment style or asset class, and hence attain higher market share via actual or perceived superior performance. Siggelkow (2003) provides evidence to support this notion: funds that are a part of more focused families are able to deliver higher returns. Massa (2000) evaluates the trade-off between diversification (category proliferation) and focus, in his model of mutual fund starts. According to Massa (2000), category proliferation improves risk-hedging because it makes the portfolio of the mutual fund family more diversified. Focus, on the other hand, allows the company to obtain economies of scale from "learning-by-doing". We examine investor response to these strategies by analyzing their impact on the market share of fund families.

In examining market share within each investment objective, focus may become more important. A family may have a high overall market share because it operates in many different objectives, but this lack of focus may have a negative impact on the market shares within each objective in which the family operates.

We employ two measures to examine how the diversity of product offerings affects the overall market share of the family: (1) the Herfindahl index computed at the objective level within the family and (2) the Herfindahl index computed at the fund level within the family. In studying market share within each objective, we use the fraction of the family's assets invested in that objective as a measure of focus.

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investors. If that is the case, there is no immediate conflict between the fund management company and the fund investors. Data on the exact use of 12b-1 fees are not available.

[9] Böckem (1994) and Wolinsky (1986) develop models to examine the optimal level of product differentiation. However, both papers focus on differences in product differentiation across industries, not across firms within a particular industry. One implication of Wolinksy's work, which applies directly to this paper, is that firms become more specialized as their industry becomes more competitive. This is not consistent with our findings of an increase

2.2.5. Active versus passive management

There is a significant variation in the degree to which families pursue active portfolio management strategies. A measure of the degree to which funds are actively managed is the level of portfolio turnover. Some families, in particular Vanguard, are well known for their low portfolio turnover approach to fund management, mainly because many of their funds track standard stock market indices. The relation between market share and the degree of active management could be either positive or negative. On one hand, high portfolio turnover could be perceived by a certain group of investors as an indicator of the quality of fund management. In fact, Wermers (2000) suggests that high-turnover equity funds have superior stock picking ability. On the other hand, given the earlier evidence that active managers have underperformed standard benchmarks (after adjusting for expenses), investors may be attracted to the index-based approach associated with lower portfolio turnover.

As a measure of the degree of active management in a fund family, we adjust the level of turnover in a fund for the average turnover in the investment objectives in which the family operates and average this across all funds in the family. We construct a similar measure at the family-objective level.

2.3. Control variables

2.3.1. Media attention

One would expect that fund families that receive greater media attention have higher market share, because they lower investor search costs. We gather this information on a year-by-year basis for the families in our sample. Our goal is not to infer causality from this analysis, but to simply employ media attention as a control variable.

2.3.2. Experience

We include the level of industry experience a control variable. Families with greater experience are likely to have a more established track record of performance, which could lead to higher market share.

in the scope of a family's product offerings over time (reported in Section 3 of the paper).

We measure experience as the number of years that the family has been in existence. Similarly, we measure family-objective experience as the number of years a family has been offering funds within each objective.

2.3.3. Number of funds offered

We control for the number of funds offered by the family in all regression models. This is important to ensure that results on fund starts and top-performing funds are not spurious. That is, families that offer more funds are also more likely to introduce new funds and to have top-performing funds. These families are also likely to be larger. It is therefore necessary to include the number of funds offered as a control variable.

3. Data, methodology, and sample description

3.1. Data

In our empirical analysis, we use the CRSP Mutual Fund database which is free of survivorship bias. The database contains the entire population of all open-end mutual funds (active and inactive) from 1961 onwards. Information is available at the individual fund level and includes the fund name, the family name, the investment objective, monthly total returns, net asset values, total assets in the fund, expenses, portfolio turnover, load structure, the date on which the fund started and ceased to exist, and a variety of other data items. Our analysis covers the 1979-1998 period and includes funds in *all* investment objectives. The database contains several classifications of investment objectives for each fund. We employ the most detailed level of classification available, but we aggregate multiple objectives into broader categories.[10] For example, all money market mutual funds are grouped together into a single objective and so are all municipal bond funds. Note that the 12b-1 fees and back-end loads are available on the CRSP database only since 1992. Our analysis of 12b-1 fees is therefore limited to a shorter sample

[10] The following objective categories are used in our sample: Aggressive growth, Balanced, Convertible bond, Corporate bond, Asia, Canada, Global equity, Emerging equity, European equity, Latin American equity, Specialty environment, Specialty finance, Specialty gold, Specialty healthcare, Specialty natural resources, Specialty real estate, Specialty utilities, Principal returns, Flexible-Global, Global bond, Government bond, Government mortgage,

period. For back-end loads in the period before 1992, we use the difference between total loads and maximum front-end loads.

We combine the above information with data from the Morningstar Ondisc and Principia CDs, which are available from 1992 onwards. From Morningstar, we gather information on a fund's characteristics (employed to compute the degree of differentiation of new funds), and its star rating. We also obtain data on management fees from the Financial Research Corporation (FRC), for the last year in our sample.

To examine the relation between media attention received by a fund family and its market share, we employ the Lexis-Nexis Database.

3.2. Research design

The variables of interest for our study are (1) a fund family's industry market share and (2) family market share within a particular investment objective. We compute market share at the end of each year as the sum of all assets under management by each family divided by all assets under management in the industry. The market share at the objective level for each family is computed in a similar manner.

We estimate several specifications of the following cross-sectional time-series regression models:

Market share of family *i* in year *t* =

$$\alpha_0 + \beta_1 (\text{family expenses})_{i,t-1} + \beta_2 (\text{family performance})_{i,t-1} + \beta_3 (\text{family innovation})_{i,t-1}$$
$$+ \beta_4 (\text{family focus})_{i,t-1} + \beta_5 (\text{family turnover})_{i,t-1} + \beta_6 (\text{number of funds offered by family})_{i,t-1}$$
$$+ \beta_7 (\text{family media attention})_{i,t-1} + \beta_8 (\text{family experience})_{i,t-1}$$

Market share of family *i* in objective *j* in year *t* =

$$\alpha_0 + \beta_1 (\text{family-objective expenses})_{i,j,t-1} + \beta_2 (\text{family expenses})_{i,t-1}$$
$$+ \beta_3 (\text{family-objective performance})_{i,j,t-1} + \beta_4 (\text{family performance})_{i,t-1}$$
$$+ \beta_5 (\text{family-objective innovation})_{i,j,t-1} + \beta_6 (\text{family innovation})_{i,t-1}$$
$$+ \beta_7 (\text{fraction of family assets in objective})_{i,j,t-1} + \beta_8 (\text{family-objective turnover})_{i,j,t-1}$$
$$+ \beta_9 (\text{family turnover})_{i,t-1} + \beta_{10} (\text{number of funds offered by family in objective})_{i,j,t-1}$$
$$+ \beta_{11} (\text{number of funds offered by family})_{i,t-1} + \beta_{12} (\text{family media attention})_{i,t-1}$$
$$+ \beta_{13} (\text{family-objective experience})_{i,j,t-1} + \beta_{14} (\text{family experience})_{i,t-1}$$

Growth and Income, Growth, Municipal bond, Option Income, Money market, Small stock, and Foreign currency.

We employ three measures of *family performance*. The first measure captures the objective-adjusted return earned by the family, and is computed as follows:

$$\text{Family Abnormal Return} = \sum_{i=1}^{N} \left\{ w_i \left[R_i - \sum_{j=1}^{M} w_j R_j \right] \right\}$$

where w_i = weight of a fund within the family

w_j = weight of a fund within the investment objective

R_i = return of the fund for which the objective-adjusted return is being computed

R_j = return of the fund in the objective, which is employed to compute the weighted average objective return

M = number of funds in the objective employed to compute the weighted average objective returns

N = number of funds in the family

The computation of this measure requires three steps. First, we compute the value weighted average return within each investment objective, where the weight is the relative size of the fund within that objective (w_j). Second, we subtract this average objective return from the return earned by each fund in the family with that objective. Third, we compute the weighted average of these objective-adjusted returns across all funds within the family, where the weight is the relative size of the fund within the family (w_i). This variable measures abnormal family performance.[11]

The second performance measure is similar to the first, except that we replace the return with the Morningstar rating, expressed numerically from 1 to 5. Thus, this measures the objective-adjusted star rating, averaged across all funds in the family.[12] These data are available from 1992 onwards.

The third performance measure captures the presence of a top-performing fund within a family. We define a top-performing fund as any fund that performs in the top 5% of all funds in an objective in a given year, and construct a top 5% dummy which equals one if at least one fund in the family meets this

[11] We compute abnormal returns using the fund's objective as a benchmark, rather than a benchmark based on a multi-factor model because there is little guidance as to what factors should be used for funds other than domestic equity funds. Other papers that use multi-factor models limit their analysis to domestic equity funds while we study all funds in the U.S mutual fund universe.

[12] The star ratings are based on risk-adjusted performance in an investment objective. See Blume (1998) and Del Guercio and Tkac (2004) for a more detailed discussion of the construction of the star ratings.

criterion. This variable is designed to incorporate the fact that funds with superior performance may serve as a catalyst for new inflows into the entire family. We recognize that families with more funds are more likely to have a top performer; such families are also likely to be larger, implying reverse causality. That is, larger families are simply more likely to have a top-performing fund. To control for this possibility, we include the number of funds offered by the family in all regression specifications. The top 5% dummy therefore captures the effect of having a top-performing fund, after taking into account the positive relationship between family size and the number of funds offered.

We also compute the performance measures at the objective level for each family. We measure family-objective performance as the weighted average abnormal return computed across all of the family's funds in an objective. Family-objective star ratings are computed in a similar fashion. In addition, we include an indicator variable, which we set equal to one if the family has at least one top 5% fund in the objective, and zero otherwise. Again, we control for the number of funds offered by the family in a particular objective.

Our measure of *expenses* includes regular expenses as well as front-end and back-end loads charged by the family. To spread the load over time, we assume a seven-year investment horizon.[13] Thus, total expenses are measured as: Regular expenses + Total load/7. Expenses are also adjusted for the average in each objective and then averaged across all of the funds in the family. This procedure mimics the procedure used to compute family abnormal performance. When we study market share at the objective level, we average abnormal expenses across all of the family's funds in the objective. In some specifications, we decompose loads and expenses and examine them separately.

It is possible that expenses are actually a function of the size of the fund complex, because larger funds may benefit from economies of scale. To incorporate this possibility in our empirical analysis, we also compute an alternative measure of expenses. This measure is constructed by estimating annual regressions of the expense ratio at the fund level on the logarithm of fund size and objective-dummies, and extracting the residual from this regression equation. This residual represents that part of expenses not

[13] We obtain similar results for horizons ranging from four to ten years.

explained by fund size and objective. We then perform our analyses using this transformed variable.[14]

We also study the extent to which fund families pass along economies of scale benefits to fund investors (to the extent that they exist), in the form of lower fees, and the response of investors to such actions. To measure this, we estimate the following regression model using fund-level data for each fund family:

$$\text{Fund expenses} = \beta_1 \text{ Log(Fund assets)} + \text{Year dummies} + \text{Objective dummies}$$

Assets are inflation-adjusted. The coefficient on the logarithm of fund assets (β_1) measures the extent to which expenses, including management fees, decline with fund assets. This measure is employed in our analysis to estimate fund economies of scale: negative (positive) values of β_1 suggest that fund expenses decline (increase) with fund size. We estimate the above equation for each family starting in 1979 up to the year preceding the one for which family market share is being analyzed. Only families with at least 20 fund-year observations are employed in the estimation. We set a dummy variable equal to one if the coefficient on fund assets is negative, and zero otherwise. If families that pass along economies of scale to investors gain market share, we expect the coefficient on the "economies of scale" dummy to be positive.

Turnover is also adjusted for the average level of turnover in each investment objective and averaged across all of the funds in the family. This procedure is the same as for returns and expenses.

As mentioned in the previous section, we employ Herfindahl indices computed across all objectives in the family and across all funds in the family as a measure of *focus.* For the objective market share regressions, we use the fraction of the family's assets invested in the objective to measure focus. Of course, it is not clear that focus drives market share; larger families may simply have a more diversified product line. To control for this effect, we construct an alterative measure of focus. Specifically, we regress the Herfindahl index on contemporaneous market share and use the residual of this regression as an explanatory variable in the market share regressions for the following year.

We construct several measures to capture the effect of *innovation* on market share. First, we simply

[14] Our results are very similar if we control for both fund size and family size in these regressions or if we estimate separate regression by year and by investment objective.

count the total number of funds started by the family in a given year.[15] As mentioned previously, we include the squared term of the innovation measure in our regression specifications to capture non-linearities and potential adverse consequences of starting a large number of new funds. We do not adjust the level of innovation for the upward time trend in the number of new funds started in the industry because our regression models include year dummies. Of course, large families are expected to start more funds, but the inclusion of the number of funds as a control variable ensures that funds starts only measure innovation unrelated to the number of existing funds.

Second, we develop measures of the extent to which new funds can be differentiated from existing funds. We do this based on three characteristics for stock funds: price-to-book ratio, earnings growth, and the median market capitalization of the stocks in which the fund is invested, and three characteristics for bond funds: the average price, maturity and coupon rate of the bonds in which the fund is invested. We compute the number of standard deviations that each fund characteristic is away from the mean based on: (1) the entire universe of funds, (2) the funds in the family, and (3) the funds in the family-objective. We then sum these three standard deviations (one for each characteristic) to compute an aggregate distance measure for each new fund, and sum them across all fund openings in the family in that year. Hence, this measure of differentiation can be large because a family starts many new funds, and/or the new fund is truly a differentiated product offering. We therefore control for the number of funds started in our specifications to isolate the impact of differentiation. As a final measure of differentiation, we compute the number of starts as a fraction of the number of existing funds in the objective, and sum these fractions across all objectives in the family. This allows us to test whether fund initiations in an already crowded objective have a smaller impact on market share.

The 12b-1 fees, which are employed to measure *marketing and distribution expenses*, are adjusted for the objective mean, and averaged across all funds in the family, in a similar manner as returns, expenses,

[15] In recent years, many fund families have introduced different share classes of the same fund. These classes differ only in the fees charged. For example, the A class usually charges a front-end load, while the B class charges a back-end load. We do not consider the introduction of an additional share class to be an innovation. Moreover, we first aggregate all share classes into a single observation before computing the number of funds, economies of scale, and various measures of family focus.

and turnover.[16] Using the above approach, we also compute 12b-1 fees within each family-objective. When we include loads separately, we use the same type of adjustment as described above.

To control for the *media attention* received by a fund family in our models, we search the Lexis-Nexis Database for the entire 1979-1998 period. On a year-by-year basis, we count the number of popular press articles in 14 major periodicals and journals[17] with a mention of each of the fund families in our sample. We employ the natural log of one plus this measure as a control variable in our models.

Experience is measured as the total number of years the family has been in existence. At the family-objective level, we measure how long the family has been offering funds in a particular objective.

We estimate the family market share model for the unbalanced panel of families active in the industry over the 1979-1998 period, using a clustered ordinary least squared approach, where the family is defined as the cluster. This method increases standard errors because it takes into account the lack of independence in the market share observations for the same family across time. All models include year dummies.

In the second set of regressions where the market share within each objective is the dependent variable, we include both year and objective dummies. We also estimate annual regression models for family market share to determine how the effect of increased competition affects our findings and to analyze their robustness (not reported in a table). We employ one-year lagged values of all explanatory variables in our regression specifications. While further lags of the explanatory variables are often statistically significant, their economic significance is very small and there is virtually no improvement in the explanatory power of the regressions.

We take the natural logarithm of the market share and employ this transformed variable as the dependent variable. We believe that this transformation is important for two reasons. First, using a log specification facilitates the interpretation of our results in that the changes in the explanatory variables have the same percentage impact on market share. Such a specification is more realistic since policy

[16] Our results are qualitatively similar when we compute performance, expenses, turnover, and 12b-1 fees using equally-weighted averages instead of value-weighted averages.

[17] The major newspapers/magazines covered by Lexis-Nexis include Business Week, Consumer Reports, Fortune, Money, The Economist, U.S. News and World Report, Financial Times, Los Angeles Times, St. Louis Post-

changes within a fund family that affect the explanatory variables are likely to have a smaller impact on the level of market share of smaller families. For example, we do not expect a reduction in expenses to have the same absolute effect on the market share of a family with a market share of 0.01% compared to a family with a market share of 1%. Second, the error term of the log specification is better behaved in that it does not violate normality assumptions, compared to the level specification.

A potential concern with our approach is that families could gain market share without attracting any new funds if they happen to specialize in asset classes that exhibit superior performance, and if investors do not rebalance their portfolios [see, for example, Ameriks and Zeldes (2004)]. While this increase in market share still leads to higher management fees, given that fees are based on assets under management, we want to isolate the effect of returns from the effect of additional inflows. To do this, we compute inflows for all funds, and subdivide the increase in fund size into an inflow and return component. We then remove the return component from fund size and compute market shares based on this alternative size measure. This alternative measure of market share is highly correlated with the measure employed in the paper (ρ=0.95). When we repeat all our tests based on this new measure, our findings are very similar. We therefore report only the results based on the unadjusted market share measure.

3.3. Sample description

Table 1 contains summary statistics on the evolution of the mutual fund industry over the 1979-1998 period. We document a strong increase in the number of families competing in the industry from 167 in 1979 to 525 in 1998. Over the same time period, total assets under management increase from $98.3 billion to $2.1 trillion (in constant 1979 dollars). As a result, the size of an average (median) fund family increases from $589 million ($83 million) to $4.08 billion ($275 million).

We also document that the level of innovation as measured by the average number of new funds opened increases from 0.26 in 1979 to 3.99 in 1994, but declines to 0.73 in 1998. Notice that the median family does not start any new funds in a given year.

Dispatch, The Boston Globe, The New York Times, The Washington Post, USA Today, and Wall Street Journal.

The average family increases the mean (median) number of funds offered from 3.80 (2.00) to 15.43 (5.00); there is a corresponding increase in the mean (median) number of objectives offered by a family from 2.61 (2.00) to 5.53 (4.00). It is interesting to note that the median family offers few funds in any given objective. Families have also become less focused, both in terms of the number of funds offered and the number of investment objectives in which they operate. For example, the mean (median) Herfindahl index across funds declines from 0.69 (0.80) in 1979 to 0.49 (0.41) in 1998.

The industry has become more fragmented over time; the average (median) market share of a family declines from 0.60% (0.08%) to 0.19% (0.01%). Interestingly, the market share of the five largest families remains relatively constant at approximately 35%. There appears to be a slight decrease in average expenses over time, from 1.40% in 1979 to 1.19% in 1998 while median expenses remain virtually unchanged. Marketing and distribution (12b-1) fees are small for the median family, but the average figure indicates that some families have marketing and distribution fees that are substantial.

Notwithstanding the popularity of index funds in recent years, there has been an upward trend in the average level of portfolio turnover over the sample period, but the trend is less dramatic for the medians. Wermers (2000) documents a similar trend in the turnover of equity mutual funds from 1975 to 1994. He argues that this increased turnover is partly due to a decline in trading costs. However, there appears to be a small decline in portfolio turnover over the last four years in the sample; the mean (median) portfolio turnover declines from 100.8% (66.5%) in 1994 to 88.0% (63.1%) in 1997.[18]

4. Results

4.1. Determinants of family market share

Table 2 contains the results of several specifications of the family market share regressions. In this table, we focus on the hypotheses that can be examined for all sample years. Models (i) and (ii) contain our basic measures of expenses which includes one seventh of the load and family focus as explanatory variables, while models (iii) through (v) contain only the fraction of expenses including loads that cannot

[18] We report turnover for 1997 because data on turnover are not available in the database for 1998.

be explained by fund size (residual expenses) and the degree of focus that cannot be explained by family size (residual Herfindahl).

Our results indicate that both price and non-price competition have an important effect on the market share of mutual fund families. Competing on price is an effective way of obtaining market share. The coefficient on industry-adjusted expenses is negative and highly significant in models (i) and (ii), while the coefficient of residual expenses is significant in models (iii) and (iv). The economic effect of the coefficient is also large: based on the coefficients reported in model (i), increasing abnormal expenses from the 25th percentile of the distribution (-0.22%) to the 75th percentile of the distribution (0.42%) leads to a 30% decline in market share.[19] This effect is reduced to 20% in model (iii), where we take into account that larger funds have lower expenses to begin with (i.e., residual expenses), but it continues to remain economically large. The fact that expensive families lose market share is encouraging in that external market forces (i.e., investors redirecting assets away from more expensive families) help mitigate the potential conflicts of interest in the industry. In fact, consumers do pay attention to price and it does not appear that fund families can exploit fund investors by charging higher fees.

We also investigate whether families that pass along potential economies of scale benefits have higher market share. As illustrated in model (v) of Table 2, the coefficient on the "economies of scale" dummy is positive and highly significant, suggesting that families which potentially experience economies of scale benefits and pass them on to investors have a higher market share. The economic effect of this variable is also substantial. Moving the economies of scale dummy from 0 to 1 increases market share by 55%. Also note that inclusion of this variable has little effect on the coefficient on the expense variable, which indicates that both measures capture distinctly different aspects of a family's fee structure. The coefficients on the other explanatory variables are also similar, with one exception: the coefficient on the residual Herfindahl index becomes positive and significant. This change is caused by the restriction that we require at least 20 fund-year observations for each family to estimate the economies of scale effect and indicates that the focus result does not appear to be very stable.

[19] Note that this is a percentage change, not a change in percentage points. For example, a firm with a market share

Differentiation strategies are also important determinants of market share. Both performance measures, i.e., industry-adjusted performance and the presence of a top-performing fund, have a positive and significant impact in all model specifications. For example, a performance improvement from the 25th (-3.31%) to the 75th percentile (1.25%) results in an increase in market share of 17%. Based on model (i), the effect of having a top 5% fund on family market share appears to be the strongest of all explanatory variables. After controlling for the number of funds in the family, we find that increasing the top 5% dummy from 0 to 1 increases market share by 77%.

The first four regressions provide evidence to suggest that more focused families tend to have lower market share. Clearly, any potential benefits of specialization are outweighed by the ability to attract new money through the diversity of product offerings. Note, however, that the coefficients on the Herfindahl indices decline substantially when we control for the effect of market share on focus (referred to as "residual HI") in models (iii) and (iv). Moreover, the coefficient on focus changes sign when we estimate the model for families with more than 20 funds available in prior years (model (v)). This suggests that the negative effect of focus on market share only applies to small fund families.

Innovation, as measured by the number of new funds started, has a positive effect on market share for virtually all of the families in our sample. For example, an increase in the number of new fund openings from the 25th percentile (0) to the 75th percentile (1) adds almost nine percent to a family's market share. The negative coefficient on the squared term indicates that the positive effect of additional fund starts becomes smaller and actually turns negative for high levels of innovation. However, only 31 families are on the downward slope of the curve, which begins at 36 new fund starts (based on model (i)). Only eight families open more than 72 funds in a given year, which is the point where the effect of innovation becomes negative. Of course, this does not imply that it is optimal to start a large number of funds because the startup costs are likely to be substantial. In subsequent tests we study the effect of innovation on market share in greater detail by employing more refined measures of innovation.

There is no evidence that families with high industry-adjusted turnover have a lower market share.

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of 10% would experience a reduction in market share to 7% (a decline of 30%).

Not surprisingly, all of our control variables: media attention, family experience, and number of funds offered, are positively related to market share.

Overall, the results presented in Table 2 highlight the presence and importance of price competition in the fund industry. Families that charge lower fees and pass along economies of scale benefits to fund investors have higher market share. From a policy perspective, these findings suggest that there is no immediate need for more fee disclosures or explicit regulation of fund fees. Next, we turn to a more detailed analysis of the various components of fees.

4.2. Breaking up the expense ratio

Fees paid by fund shareholders consist of three broad components: (1) fees charged when investing in the fund (front-end loads) or redeeming money from the fund (back-end loads), (2) fund operating expenses including management fees, and (3) 12b-1 fees, which are fees charged explicitly for marketing and distribution. We now investigate the effect of these components separately. As in the previous analyses, all measures are objective-adjusted and summed across all funds in the family. That is, we compute the asset-weighted average objective-adjusted fee for each fund and average it across all funds in the family.

Our findings are reported in Table 3. Models (i) and (ii) of Table 3 focus on loads. Therefore the loads are no longer included in the expense ratio. In model (i), we include objective-adjusted expenses (excluding loads) and the Herfindahl index, while in model (ii) we include the residual expense ratio and residual Herfindahl index. The coefficient on expenses remains negative and significant. However, the coefficients on the load variables are positive in all model specifications, suggesting that families which charge higher loads have higher market share. The economic significance of the variable is also substantial. For example, increasing the objective-adjusted front-end load from its 25^{th} percentile (-2.12%) to its 75^{th} percentile (0.55%) leads to an increase in market share of 27.8% (based on model (ii)).

In models (iii) and (iv) of Table 3, we further divide the expense ratio into distribution and marketing expenses (12b-1 fees) and other expenses. Hence, the measure of expenses used in these specifications is

a fund's expense ratio minus 12b-1 fees. In column (iv) we only include the fraction of other expenses that cannot be explained by fund size (residual expenses minus 12b-1 fees). Note that the number of observations is smaller in these models because 12b-1 fees are only available starting in 1992. While the coefficients on regular expenses (excluding 12b-1 fees) are negative and significant in both models, the effect of 12b-1 fees on market share is essentially neutral. Hence, fees charged *explicitly* for recouping marketing and distribution expenses do not have a negative impact on market share while expenses in general tend to have an adverse effect.

The above findings indicate that investors respond differently to various types of fees: the effect of loads on market share is positive, the effect of 12b-1 fees is neutral, and the effect of other expenses is negative. Loads are often used to support fund distribution, while 12b-1 fees are *explicitly* earmarked for fund distribution and marketing. This finding suggests the possibility of a potential conflict of interest between fund families and investors: marketing related fees are paid directly by fund investors, but they actually increase assets under management for the family. It is important to recognize that the fees for marketing and distribution are charged to existing investors partly with the prospect of attracting new investors into the fund. Thus, while 12b-1 fees may help attract new shareholders to the fund, one way for existing shareholders to benefits from these fees would be a possible reduction in subsequent expenses charged as a result of operating a larger fund. Next, we investigate whether this is the case and examine other potential benefits from charging loads and 12b-1 fees.

First, perhaps families levying loads and 12b-1 fees have lower other (non-marketing and non-distribution related) expenses, and looking at the impact of loads and 12b-1 fees on market share, while holding other expenses constant, may paint the wrong picture. To investigate this, we estimate the following regression model at the *fund* level:

$$\text{Expenses} = \beta_1 (\text{Log fund assets}) + \beta_2 (\text{Front-end load}) + \beta_3 (\text{Back-end load}) + \beta_4 (\text{12b-1 fee})$$

In this specification, expenses do not include loads because our goal is to determine whether loads affect other expenses. Moreover, when 12b-1 fees are included as an explanatory variable, they are excluded from the dependent variable. All models also include objective dummies and year dummies. The goal of

this analysis is not to ascribe causality, but simply to ascertain whether different aspects of a fund's fee structure are related. Table 4 contains the results of our analysis. Model (i) shows that the relationship between front-end loads and expenses is not significant. However, there is a significant positive relation between back-end loads and expenses. For every percentage point increase in back-end loads, expenses increase by 11 basis points. In model (ii) we split expenses into 12b-1 fees and other expenses. In this specification, the front-end load variable is marginally significant, while the back-end load is not. Moreover, the economic significance of the loads is small. However, we do find that expenses are negatively related to 12b-1 fees, albeit that the offset is not complete: other expenses are only reduced by 27 basis points for every percentage point increase in 12b-1 fees. This implies that the total expense ratio (including 12b-1 fees) of funds that charge 12b-1 is higher than for funds that do not charge 12b-1 fees. The lack of economic significance of loads in model (ii) compared to model (i) indicates that the relationship between loads and expenses is driven by 12b-1 fees. Model (iii) confirms that this is the case. Funds with higher loads have significantly higher 12b-1 fees as well.

It is also possible that the benefit of loads and 12b-1 fees does not result in lower fees per se, but that they allow funds to enjoy greater economies of scale and to pass them along to fund investors. To investigate this possibility, we re-estimate the previous models, but include interaction terms between the logarithm of funds assets and three dummies. The dummies capture whether or not the fund has a front-end load, a back-end load, or charges 12b-1 fees. Model (iv) of Table 4 investigates economies of scale for load versus no-load funds. Front-end loads do not affect the relationship between expenses and fund size. However, the effect of back-end loads on the expenses-size relationship is positive, which indicates that funds with back-end loads pass on *fewer* economies of scale to fund investors. This interpretation is consistent with the view that back-end loads can act as an effective lock-up mechanism, potentially limiting the ability of fund investors from voting with their feet. As a result, fund families may be able to charge higher expenses, as illustrated in model (ii), and not pass along potential economies of scale benefits. The economic significance of the results is also substantial. If we increase fund size from its 25th percentile ($11.34 million) to its 75th percentile ($150.1 million), fund expenses decline by 68 basis points

for funds with no loads, but only 37 basis points for funds with back-end loads. These effects disappear when we separate out 12b-1 fees from expenses, as illustrated in model (v). Overall, the evidence in Table 4 provides no evidence that investors benefit from loads or 12b-1 fees through lower other expenses or through better fund economies of scale. If anything, back-end loads are related to higher, not lower fees.[20]

The second potential benefit of loads and 12b-1 fees would be a reduction in search costs for new investors. Of course, this is not necessarily in the best interest of current shareholders, especially because we just pointed out that loads do not lower other expenses, nor do they lead to improved economies of scale. Nevertheless, we study whether the effect of 12b-1 fees and loads is more significant for smaller families (market share below the sample median). These are families for whom search costs are likely to be higher [see Sirri and Tufano (1998)]. The effects are quite interesting (not reported in a table). The positive effect of loads on market share is entirely due to the small families in the sample. In addition, the effect of 12b-1 fees on market share is also positive for small families, while it is insignificant for the overall sample. For large families, the effect of loads is negative and marginally significant for front end-loads (p-value = 0.11), but highly significant for back-end loads (p-value=0.02), while the impact of 12b-1 fees is not significantly different from zero. These results are consistent with the search cost argument. Hence, 12b-1 fees are beneficial for small fund families, but there is no evidence to suggest that they benefit the fund investor.

Finally, it is possible that there are spillover effects from 12b-1 fees and loads to other funds in the family. We investigate this possibility in our analysis of market share within each objective.

The results reported up to this point do not provide any concrete evidence to suggest that current or future fund investors benefit from loads or 12b-1 fees.

4.3. Detailed analysis of innovation

The results discussed in Section 4.1. suggest that families gain market share when they start new funds, unless the number of starts is extremely high. In this section, we analyze innovation in more detail.

[20] Ferris and Chance (1987) also find that funds with 12b-1 fees have higher expense ratios. However, they do not

In particular, we address two questions. First, we investigate whether investors pay attention to characteristics of the new funds relative to existing product offerings. Second, we study whether new funds starts are detrimental to existing investors in the family. This might be the case if the fund family allocates more resources to the new funds at the expense of existing offerings.

Table 5 addresses the first question. In model (i) we study whether the degree of newness of fund openings affects market share. The measure employed in this model is the degree of newness relative to all existing funds, as described in section 3.2 (referred to as the "distance from existing funds"). We also include the number of starts in this model to make sure that the newness measure does not proxy for the number of funds started. There is a significant curvilinear relation between family market share and the distance measure. Market share first increases with distance, but decreases as the new fund characteristics deviate too much from the existing offerings (although there are only 43 observations in the downward sloping part of the curve).

The coefficients on the distance measures imply that if a family starts a fund whose sum of the deviations of fund characteristics is one standard deviation away from the universe of funds, it will result in an increase in market share of 17%. However, if this sum of deviations equals two, the increase would be 35%.[21] We re-estimate these models with the distance measure computed relative to other funds in the family and relative to other funds within the investment objective in the family (not reported in the table). However, these measures have no significant impact on market share. This indicates that fund investors are more concerned with differentiation relative to all available product offerings than with differentiation relative to the family's other offerings. These findings indicate that new investors are quite sophisticated, and suggest that simply adding new funds to the portfolio without examining how the funds compare to existing offerings in the marketplace is unlikely to lead to large gains in market share for the fund family.

Model (ii) examines whether fund starts have a differential effect on market share depending on the degree of crowdedness of the segment. The number of funds started as a proportion of the number of

document the exact magnitude of the relationship and focus on a relatively small set of funds. Walsh (2004) also concludes that benefits from 12b-1 fees accrue only to fund management companies.

[21] Note that the interpretation of economic significance is based on the joint effect of the number of starts and the distance measure.

existing funds in the objective, summed across all funds started by the family, is used to capture the degree of crowdedness. Again, the relation is curvilinear with almost all observations in the upward sloping part of the curve. The economic significance of the result is rather small, however. Based on model (ii), if a family opens a fund in an objective with the number of funds at its 25th percentile (119 funds), this leads to an increase in market share of 13%. If the number of funds in the objective is at its 75th percentile (534 funds), however, the increase in market share is only 10%.

We now investigate whether new fund starts have a detrimental impact on the performance of existing funds in the family. To do this we estimate a regression of objective-adjusted fund performance for existing funds as a function of the number if new funds started by the fund family in the previous year. This regression yields insignificant results in most specifications (not reported in a table). If we use the number of funds started in the same investment objective, the coefficient on starts is actually positive and significant. The economic effect is small, however: the performance of an existing fund increases by three basis points for every fund started in that same objective by the family in the previous year.

Overall, the analysis in this section suggests that investors are quite sophisticated in assessing new funds and tend to invest in them if the product is truly differentiated from existing offerings. This suggests that simply starting funds to attract additional assets is not rewarded in the marketplace. With respect to the effect of fund starts on the performance of existing funds, we find no evidence of any significant relationship. The bottom line is that innovation helps fund families (if newly launched funds are different from existing funds in the industry) but does not adversely affect fund investors.

4.4. Determinants of family market share over time

We also estimate models on a yearly basis, as well as for several subperiods to determine whether our findings change as the industry evolves and encompasses various phases in its life cycle (not reported in a table). Perhaps the most interesting trend we observe is the decrease in the effect of innovation, as proxied by fund starts, on market share. This evidence suggests that the industry is maturing. It also indicates that families may want to direct their efforts for achieving market share to other dimensions of competition.

These results substantiate the evidence provided by Khorana and Servaes (1999) that the market share captured by funds in existence for two years or less, i.e., relatively new funds, has declined since 1985. In addition, there is some evidence that the effect of past returns on market share has become more prominent in the latter part of the sample period. This coincides with the heightened media attention on performance, and the advent of the Morningstar rankings in 1992. In fact, when we divide our sample into the pre- and post-Morningstar periods, we find that the coefficient on returns has increased significantly. Economically, increasing returns from the 25th to the 75th percentile of its distribution increases market share by 8.7% in the pre-1992 period, but by 18.9% from 1992 onwards. We do not find evidence of a significant change in the other coefficients over time. In particular, from a "conflicts of interest" perspective, there have been no significant shifts in the relationship between the components of expenses (loads, 12b-1 fees, and other expenses) and market share.

For the post-1992 period, we also investigate whether Morningstar ratings have an independent effect on market share. Regressions, similar to our base case model, but with the inclusion of objective-adjusted Morningstar ratings, averaged across all funds in the family are presented in Table 6. Model (i) employs expenses and the Herfindahl index without making adjustments for reverse causality, while model (ii) uses the residual expense ratio and the residual Herfindahl index. The results are striking. The coefficient on the Morningstar rating is highly significant, both statistically and economically. Changing the family Morningstar rating from its 25th percentile (-0.95) to its 75th percentile (0.09) increases market share by 138%, based on the coefficients in model (ii). Also note that after including the Morningstar ratings, abnormal performance is no longer statistically significant. The effect of having a top-performing fund remains important, however.

4.5. Determinants of market share within investment objectives

In this section, we study market share within investment objectives. In particular, we investigate whether market share within investment objectives is mainly determined by objective level effects or whether family level variables also have an impact on market share. The results are reported in Table 7.

Again, we estimate clustered regression models, where the family is defined as the cluster.

The family level variables are the same as the ones employed in the family market share regression, with one exception. In the family regressions, we used the Herfindahl index computed across objectives as a measure of family focus. This variable does not capture the degree of family focus in a particular investment objective. In the family-objective regressions, we therefore use the fraction of the family's assets invested in the objective as a measure of family focus on the particular objective.[22]

Model (i) contains the basic regression models where we use total expenses as the explanatory variable, including one seventh of the loads, while in model (ii) we use the fraction of total expenses that cannot be explained by fund size. Both specifications yield findings similar to the family market share regressions. Families have a larger market share in a particular objective when they charge lower fees, which attests to the importance of price competition. This result also holds when we include the fraction of fees that cannot be explained by fund size. Only fees measured at the family-objective level are significant, which implies there are no spillover effects from fees charged in other objectives within the family. In addition, the prior performance of the family's funds in the objective has a positive effect on market share and, in particular, if one of the family's funds in the objective is in the top 5% of its category. The latter effect is not significant in model (i), however. We also find that family performance in other objectives affects market share and that this is especially the case if the family has a top-performing fund in another objective. This indicates that there are important family spillover effects.[23] In unreported models, we find a similar spillover effect for Morningstar ratings using data in the post-1992 period: families gain market share in an investment objective when they have high Morningstar ratings in other objectives.

To ascertain whether the spillover effect proxies for a reduction in search costs, we examine whether the importance of prior performance differs for small versus large families (not reported in a table). We find that the presence of a top-performing fund influences the market share of small families, but not large families (p-value for difference = 0.03). This is consistent with the search cost argument.

[22] The average fraction of family assets invested in an objective is 22.4% (median=7.05%).

Families also have a higher market share in a particular investment objective when they are more innovative (measured by new fund starts) and have more of their assets invested in that particular objective. Thus, while focus appears to have a negative impact on the family's overall market share, it enhances market share within each investment objective.

The control variables – the number of funds offered, media attention, and experience – are all significant with the expected signs.

The economic impact of our results is similar in magnitude to that of the overall market share regressions. An increase in objective-adjusted fees from the 25th percentile (-0.26%) to the 75th percentile (0.47%) leads to a decline in market share of 31% based on the coefficients reported in model (i). An increase in objective-adjusted performance from the 25th percentile (-3.70%) to the 75th percentile (1.85%) increases market share by 15%, compared to 17% in the family market share regressions.

In model (iii), we break up fees into regular fees and loads. The coefficient on fees doubles in this specification compared to model (ii) where fees include loads. This is because loads have a differential effect on market share compared to other expenses. Three of the four load variables are not significantly different from zero, while the coefficient on back-end loads is significantly positive. These results are partially consistent with the models estimated at the family level, where both front-end and back-end loads are positively related to market share. The lack of significance of the family load variables indicates that there is no spillover effect: funds in a particular investment objective do not benefit from loads in another objective.

In model (iv), we study the effect of marketing and distributions expenses (12b-1 fees) incurred at the family-objective level on market share. Thus, the measure of expenses employed in this model does not include 12b-1 fees. We do not study loads separately in this model because of the high correlation between loads and 12b-1 fees, and loads are therefore included in expenses. The effect of 12b-1 fees is not significant, compared to the negative effect of other fees (excluding both loads and 12b-1 fees). This reaffirms the analysis at the family level that 12b-1 fees can lead to potential conflicts between fund

[23] For papers that study spillover effects in more detail, see Ivkovich (2002), and Nanda, Wang, and Zheng (2004).

families and investors.

In summary, the evidence in Table 7 indicates that market share within an objective is mainly driven by the family's policies within that objective, but that there are important family performance spillover effects. Investors avoid family-objectives when expenses are high. On the other hand, 12b-1 fees and front-end loads are not related to market share, while back-end loads attract investors without other apparent benefits. This evidence highlights a divergence between the interests of fund families and fund investors.

4.6. Asymmetries in expenses and performance

In this section, we examine whether the negative effect of expenses on fees is linear, or whether there are asymmetries in the effect of expenses on market share. It is possible that investors may only be concerned about expenses if they are above a certain threshold; if they are below this level, further reductions may not have the same effect on market share. This could be the case because investors pay little attention to fees if they are deemed to be "reasonable."

To examine this possibility we allow the coefficient on objective-adjusted expenses to vary depending on whether they are above or below zero. We do not adjust expenses for the fact that larger funds may charge lower expenses to begin with because this analysis focuses on funds expenses as observed by the consumer, not the residual. We estimate this model using our initial measure of expenses, which includes one seventh of the loads. The model yields the following results (*p-values* are listed in parentheses):[24]

Family market share =

– 71.46 Expenses if above zero + 35.31 Expenses if below zero + 2.74 Performance
(0.00) (0.31) (0.00)

+ 0.82 Top 5% performance – 0.41 Residual Herfindahl index across objectives
(0.00) (0.11)

+ 0.18 Number of funds started – 0.002 Number of funds started^2 + 0.005 Turnover
(0.00) (0.00) (0.91)

+ 0.03 Number of funds offered + 0.34 Media attention + 0.04 Family experience
(0.00) (0.00) (0.00)

Model R-squared: 0.53 N=4291

[24] As is the case for all models reported in the paper, the explanatory variables are lagged one year.

The differential effect of expenses is quite dramatic. When objective-adjusted expenses are above zero, they have a negative and significant impact on market share. However, when expenses are below zero, the effect is insignificant. This has two implications for fund families: (1) reductions in fees only result in increased market share when fees are high and (2) when fees are low, families can increase fees (as long as they remain below zero on an objective-adjusted basis) without adversely affecting market share. Investors would clearly be adversely affected in the presence of such behavior on the part of fund families.

To examine the above result in more detail, we segregate fund families into four groups based on: (1) whether or not their objective-adjusted expenses during the current and previous year are below zero; (2) whether or not they increase their expenses from the previous year to the current year. Again, in this analysis, we include one seventh of the loads in our measure of expenses. If families have objective-adjusted expenses below zero in one year and above zero in the other year or vice versa, they are excluded from the analysis.[25] We then compute what fraction of families in each group experience an increase in market share and examine whether these fractions are significantly different across groups. These results are reported in Table 8, and they provide strong support for the earlier evidence that market share is not affected by fee changes for low-fee families. We document that 50% of all low fee families experience an increase in market share, but that this fraction is not significantly altered by the family's decision to increase (49%) or decrease (52%) its fees relative to the competition. On the contrary, high fee families are much more likely to increase their market share if they cut fees during the year (46%) than if they increase them (36%). This analysis provides evidence in support of the view that there can be potential conflicts between fund management companies and investors.

We also study the asymmetry in fees at the family-objective level and arrive at similar conclusions: market share in an investment objective is not sensitive to fees when they are below the industry average.

In addition, to asymmetries in fees, we also analyze whether there is any asymmetric impact of performance on market share. Specifically, we examine whether a certain magnitude of positive abnormal

performance increases market share to the same extent as negative abnormal performance decreases market share. We find no evidence in support of the asymmetric performance hypothesis.

Finally, Goldstein and Krutov (2000) argue that investors pay less attention to expenses when returns are above historical norms, because they care about fees relative to returns, not fees per se. We do not find evidence in support of this claim: market share is equally sensitive to fees when prior returns are high or low.

4.7. Additional tests

We conduct a series of additional tests to examine the robustness of our results and to provide further evidence on the effect of price and non-price competition on market share.

First, we examine whether the effect of price competition, documented in our previous regression models, is actually caused by differences in performance. It is possible that expenses are related to past performance or that they are indicative of future performance. However, we do not find a relation between past performance and current year's expenses. This is consistent with the theory of Berk and Green (2004), and evidence provided by Tufano and Sevick (1997), who study the relation between management fees and mutual fund board structure, and with Gruber (1996). However, we do find a positive relation between the current year's expenses and future returns, but only because returns are computed after expenses have been subtracted, and families that charge low fees at present are likely to continue this policy in the future. Once we add expenses to returns, the relationship becomes insignificant. This suggests that the effect of price competition documented in the paper is not caused by prior differences in performance.

Second, it is possible that we have not captured all factors that affect market share in our models. Some factors may be unobservable, but correlated with our explanatory variables. This could lead to a spurious relationship between market share and the explanatory variables we propose. To address this problem, we re-estimate our base case models including family-level fixed effects. The qualitative nature

[25] This requirement removes 683 family-years from the analysis.

of the results is similar to the models reported in the paper. In particular, the impact of expenses on market share continues to be negative, while the impact of loads on market share is either positive or insignificant.

Third, over time, there have been dramatic changes in both the type and number of distribution channels employed by families to sell their products to investors. In particular, Goldstein and Krutov (2000) point out that the advent of fund supermarkets has had a major impact on the industry. We therefore examine whether our findings persist after controlling for the impact of distribution channels in general, and fund supermarkets (Fidelity, Jack White, and Schwab) in particular, on market share. To do this, we use the fraction of a family's assets distributed via the major fund networks, together with the number of distribution channels, as control variables in our analyses. These data are obtained from Morningstar and are only available starting in 1992. While the distribution channel variables are positively related to market share, including them has little effect on the magnitude and significance of the other coefficients.

Fourth, up to this point we have focused on market share (based on assets under management) as the variable of interest. It is, of course, possible for fund families to be satisfied with a reduction in market share if they can charge higher fees on their existing assets. That is, families with a large share of assets may not necessarily have a large share of fee income. The market share of assets may thus be an imperfect measure of the fee-generating ability of the family. To address this concern, we re-compute market share based on the dollar amounts of fees received by fund families. That is, we compute total expenses charged by a fund family (including one seventh of the load) and divide it by the sum of expenses charged by all fund families active during the year.[26] The correlation between the two market share measures is 0.91. Nevertheless, there are some dramatic shifts at the top of the distribution. Based on 1998 data, Fidelity is the largest family in terms of assets and expense income, with an asset market share of 14.3% and an expense market share of 13.2%. However, the market share of Vanguard, the second largest family in terms of assets, drops from 9.8% to 3.0% when measured in terms of expenses instead of assets under

[26] Total expenses paid by fund investors have also grown dramatically over time, from $997 million in 1979, and

management. The second largest family in terms of expenses is Capital Research and Management with a 9.5% market share. We repeat our base case regression in model (i) of Table 9, but use the log of market share based on expense income as the dependent variable. Our results are similar to those that use market share based on assets under management. In particular, the coefficient on objective-adjusted expenses continues to be negative. This indicates that families with lower expenses are actually able to capture a *larger* fraction of the total dollar expenses paid by investors. However, the effect of expenses is only about a third as large as the market share effect documented in Table 2. While not surprising, this indicates that a family's incentive to lower fees in order to gain market share may not be as strong as initially perceived.

Fifth, in our analyses, we have used fund expenses to proxy for the fees received by the fund management company. Of course, fund expenses also include expenses incurred in running the fund. The proxy we employ is thus an imperfect measure of management fees earned. It would be useful to study management fees separately. Such data are not available on the CRSP database, but we were able to obtain management fee data from the Financial Research Corporation for 1998. For that year, we divide expenses into management fees and other expenses, and repeat our analysis. We normally lag our explanatory variables by one year, but since our sample period ends in 1998, we use contemporaneous management fees and other expenses. The results are presented in model (ii) of Table 9. The coefficients on both objective-adjusted expenses and management fees are significantly negative, but the effect of management fees is three times as large. Thus, the effect of price competition documented in the base case analyses is likely to be understated because management fees are combined with other expenses. Of course, from the investor's perspective, both sets of expenses have the same impact on net returns. It is therefore not obvious why management fees would play a more important role than other expenses. One possibility is that investors consider other expenses simply a cost of doing business and realize that the fund company may have little discretion over these costs, while management fees are more likely to be at the discretion of the fund company. Alternatively, other fees may proxy for the level of service received

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$5.1 billion in 1989 to $17.5 billion in 1998 (all in 1979 dollars).

by fund investors.

Sixth, we recompute our measure of the "extent of innovation" as the average difference between the new fund and each existing fund in the objective. We find similar results to those reported earlier in the paper, where we computed the difference between the new fund and the average fund in the objective.

Finally, we examine whether there are any interaction effects between our explanatory variables. We give two examples of why such effects may exist: (1) innovation may only result in higher market share when families have exhibited superior performance; and (2) the success of an innovation may depend on the number of funds currently offered by the family. This second finding would emerge if investors simply allocate their new investments equally across all of the family's funds. We find little evidence of such interaction effects. There is some evidence that fund starts have less of an impact on market share for families with a greater number of existing funds, but the effect is small economically.

5. Conclusion

This paper studies potential conflicts of interest between fund management companies and their investors. Fund managers want to maximize fee income, while fund investors generally want to maximize returns net of fees. Using the universe of all U.S. fund families that were active at some point during the period 1979-1998, this paper shows that competition helps mitigate these problems. Fund families that charge higher fees and fail to pass along potential economies of scale benefits to investors have lower market share. However, certain results suggest that families may be able to take advantage of investor behavior. First, we find a positive relationship between market share and loads, while fees charged directly for marketing and distribution (12b-1 fees) do not adversely affect family size. We perform several tests to determine whether this can be beneficial for the fund's current shareholders, in terms of a reduction in other fees or improved economies of scale, but do not find that this is the case. In fact, funds with back-end loads actually have lower economies of scale than funds without back-end loads. There is some weak evidence, however, that these fees reduce search costs for new investors, but this does not benefit existing investors. Second, we find no evidence to suggest any sensitivity of market share to fees

for low-cost families. Low-cost families can increase fees without losing assets under management, as long as the fee increase is not "too high". High fee families, on the other hand, are more likely to lose market share if they increase fees during the year.

Several aspects of product differentiation also have a positive effect on market share. First, various elements of performance enhance market share: (1) the industry-adjusted returns earned by the family; (2) the industry-adjusted Morningstar rating averaged across all funds in the family; and (3) the presence of a top performer in the family. Second, families that innovate more than the competition and introduce a more differentiated product are able to attract a larger share of the market. In addition, high levels of innovation have a detrimental impact on market share. The fact that investors pay close attention to the assets held in the new funds indicates that they are quite sophisticated, and that simply starting new funds that look like existing funds has less of an impact on market share.

When we study market share within different investment objectives, we find that the family characteristics measured specifically at the objective level are more important than the aggregate family level characteristics. Families have a higher market share within an objective when they charge lower fees, perform better, and innovate more than other families in that objective. Loads and marketing and distribution fees have no detrimental effect on market share. However, there are important spillover effects with regard to performance: families are able to increase their market share in a particular objective when other funds in the family perform well, have a high Morningstar rating, and especially when they have a top-performing fund in the rest of the family. There is no evidence of spillover effects in loads or in marketing and distribution costs.

In summary, our findings indicate that price competition and product differentiation strategies affect market share in the mutual fund industry, but certain aspect of the relationship between price and market share point to the potential for conflicts of interest between investors and fund management companies.

References

Ameriks, John, and Stephen Zeldes, 2004, How do household portfolio shares vary with age?, Working paper, Columbia University.

Barber, Brad M., Terence Odean, and Lu Zheng, 2005, Out of sight, out of mind: The effects of expenses on mutual fund flows, *Journal of Business* 78, 2095-2120.

Baumol, William J., Stephen M. Goldfeld, Lilli A. Gordon, and Michael F. Koehn, 1980, The economics of mutual fund markets: Competition versus regulation, Kluwer Academic, Boston.

Berk, Jonathan B. and Richard C. Green, 2004, Mutual fund flows and performance in rational markets, *Journal of Political Economy* 112, 1269-1295.

Böckem, Sabine, 1994, A generalized model of horizontal product differentiation, *Journal of Industrial Economics* 42, 287-298.

Brown, Stephen J., and William N. Goetzmann, 1995, Performance persistence, *Journal of Finance* 50, 853-873.

Capon Noel, Gavin J. Fitzsimons, and Russ Alan Prince, 1996, An individual level analysis of the mutual fund investment decision, *Journal of Financial Services Research* 10, 59-82.

Carhart, Mark M., 1997, On persistence in mutual fund performance, *Journal of Finance* 52, 57-82.

Chevalier, Judith and Glenn Ellison, 1999, Are some mutual fund managers better than others? Cross-sectional patterns in behavior and performance, *Journal of Finance* 54, 875-899.

Cremers, Martijn and Antti Petajisto, 2006, How active is your fund manager? A new measure that predicts performance, Working paper, Yale School of Management.

Choi, James J., David Laibson, and Brigitte C. Madrian, 2006, Why does the law of one price fail? An experiment on index mutual funds, Working paper, Yale School of Management.

Del Guercio, Diane and Paula A. Tkac, 2004, Star power: The effect of Morningstar ratings on mutual fund flows, Working paper, University of Oregon and Federal Reserve Bank of Atlanta.

Elton, Edwin J., Martin J. Gruber, and Christopher R. Blake, 1996, The persistence of risk-adjusted mutual fund performance, *Journal of Business* 69, 133-157.

Elton, Edwin J., Martin J. Gruber, and Jeffrey A. Busse, 2004, Are investors rational? Choices among index funds, *Journal of Finance* 59, 261-288.

Elton, Edwin J., Martin J. Gruber, and T. Clifton Green, 2007, The impact of mutual fund family membership on investor risk, *Journal of Financial and Quantitative Analysis*, forthcoming.

Ferris, Stephen P. and Don M. Chance, 1987, The effect of 12b-1 plans on mutual fun expense ratios: A note, *Journal of Finance* 42, 1077-1082.

Freeman, John P., and Stewart L. Brown, 2001, Mutual fund advisory fees: The cost of conflicts of interest, *The Journal of Corporation Law* 26, 609-673.

Freeman, John P., 2004, A law professor comments on the mutual fund fee mess, Statement before the Senate Governmental Affairs Subcommittee on Financial Management, the Budget, and International Security.

Gaspar, Jose-Miguel, Massimo Massa, and Pedro Matos, 2006, Favoritism in mutual fund families: Evidence on strategic cross-fund subsidization, *Journal of Finance* 61, 73-104.

Goldstein, Michael L., and Igor Krutov, 2000, The future of money management in America, (Bernstein Research, New York, NY).

Grinblatt, Mark, Sheridan Titman, and Russ Wermers, 1995, Momentum investment strategies, portfolio performance, and herding: A study of mutual fund behavior, *American Economic Review* 85, 1088-1105.

Gruber, Martin J., 1996, Another puzzle: The growth in actively managed mutual funds, *Journal of Finance* 51, 783-810.

Hendricks, Darryll, Jayendu Patel, and Richard Zeckhauser, 1993, Hot hands in mutual funds: Short-run persistence of relative performance, 1974-1988, *Journal of Finance* 48, 93-130.

Hortaçsu, Ali, and Chad Syverson, 2004, Product differentiation, search costs, and competition in the mutual fund industry: A case study of S&P 500 index funds, *Quarterly Journal of Economics* 119, 403-456.

Ippolito, Richard A., 1992, Consumer reaction to measures of poor quality: Evidence from the mutual fund industry, *Journal of Law and Economics* 35, 45-70.

Ivkovich, Zoran, 2002, Spillover in mutual fund families: Is blood thicker than water?, Working paper, University of Illinois.

Khorana, Ajay and Henri Servaes, 1999, The determinants of mutual fund starts, *Review of Financial Studies* 12, 1043-1074.

Kuhnen, Camelia M., 2006, Social networks, corporate governance, and contracting in the mutual fund industry, Working paper, Northwestern University.

Lynch, Anthony W. and David K. Musto, 2003, How investors interpret past fund returns, *Journal of Finance* 58, 2033-2058.

Mamaysky, Harry, and Matthew Spiegel, 2002, A theory of mutual funds: Optimal fund objectives and industry organization, Working paper, Yale University.

Massa, Massimo, 2000, Why so many mutual funds? Mutual fund families, market segmentation, and financial performance, Working paper, INSEAD.

Massa, Massimo, 2003, How do families affect fund performance? When performance-maximization is not the only game in town, *Journal of Financial Economics* 67, 249-304.

Nanda, Vikram, Z. Jay Wang, and Lu Zheng, 2004, Family values and the star phenomenon, *Review of Financial Studies* 17, 667-698.

Office of New York State Attorney General Eliot Spitzer, 2004, Statement by Attorney General Eliot

Spitzer regarding the Investment Company Institute's Mutual Fund Fee Report.

Siggelkow, Nicolaj, 2003, Why focus? A study of intra-industry focus effects, University of Pennsylvania, *Journal of Industrial Economics* 51, 121-150.

Sirri, Erik R. and Peter Tufano, 1993, Competition and change in the mutual fund industry, in S. L. Hayes III (ed.), *Financial services: Perspectives and challenges*, Harvard Business School Press, Boston, MA.

Sirri, Erik R., and Peter Tufano, 1998, Costly search and mutual fund flows, *Journal of Finance* 53, 1589-1622.

Tufano, Peter and Matthew Sevick, 1997, Board structure and fee-setting in the U.S. mutual fund industry, *Journal of Financial Economics* 46, 321-355.

U.S. Securities and Exchange Commission, 2000, Report on Mutual Fund Fees and Expenses.

Walsh, Lori, 2004, The costs and benefits to fund shareholders of 12b-1 plans: An examination of fund flows, expenses, and returns, Working paper, Securities and Exchange Commission.

Wermers, Russ, 2000, Mutual fund performance: An empirical decomposition into stock-picking talent, style, transaction costs, and expenses, *Journal of Finance* 55, 1655-1695.

Wilcox, Ronald T., 2003, Bargain hunting or star gazing? Investors' preferences for stock mutual funds, *Journal of Business* 76, 645-664.

Wolinksy, Asher, 1986, The nature of competition and the scope of firms, *Journal of Industrial Economics* 34, 247-259.

Zheng, Lu, 1999, Is money smart? A study of mutual fund investors' fund selection ability, *Journal of Finance* 54, 901-933.

Table 1
Summary statistics for five sample years

Number of families is the total number of families in existence in a particular year. Assets under management are total assets managed by all open-end mutual fund families in a particular year (in millions of 1979 dollars). Family size is the total assets under management by a mutual fund family across all its funds (in millions of 1979 dollars). Number of funds started by existing families is the total number of new funds started by a family in a given year. Herfindahl index across funds is the sum of the squared fractions of each fund's share of total family assets. Herfindahl index across objectives is the sum of the squared fraction of each investment objective's share in total family assets, i.e., individual fund shares are aggregated within an objective before computing the Herfindahl index. Family market share is the ratio of assets managed by the fund family and all assets managed by the open-end mutual fund industry. Market share of top five families is the proportion of assets managed by the five largest mutual fund families in a given year. Total expenses is the weighted average expense ratio computed across all the family's funds, where the expense ratio includes one seventh of the front-end and back-end loads. 12b-1 fees are the weighted-average 12b-1 fees averaged across all funds in the family. Turnover is the asset weighted average portfolio turnover across all the family's funds. Family return is the asset weighted average return across all the family's funds. Families with top 5% fund is the proportion of families in a given year with a fund which is performing in the top 5% of all funds in its investment objective. Number of media cites is the number of times the fund family is mentioned in 14 national publications obtained from Lexis-Nexis. For all variables, mean values are reported along with median values in parentheses.

	1979	1984	1989	1994	1998
Number of families	167	246	404	479	525
Asset under management ($mm)	98,337	255,086	508,870	1,004,840	2,139,185
Family size ($mm)	589	1037	1449	2098	4075
	(83)	(92)	(110)	(190)	(275)
Number of funds started by existing families	0.26	0.94	0.78	3.99	0.73
	(0)	(0)	(0)	(0)	(0)
Number of funds per family	3.80	5.02	7.36	13.04	15.43
	(2.00)	(2.00)	(3.00)	(5.00)	(5.00)
Number of objectives per family	2.61	3.02	3.94	5.22	5.53
	(2.00)	(2.00)	(3.00)	(4.00)	(4.00)
Herfindahl index across funds	0.69	0.61	0.56	0.49	0.49
	(0.80)	(0.61)	(0.51)	(0.38)	(0.41)
Herfindahl index across objectives	0.72	0.67	0.65	0.59	0.59
	(0.84)	(0.80)	(0.66)	(0.53)	(0.53)
Family market share (%)	0.60	0.41	0.25	0.21	0.19
	(0.08)	(0.04)	(0.02)	(0.02)	(0.01)
Market share of top 5 families (%)	31.14	35.81	31.15	33.95	37.23
Total expenses (%)	1.40	1.23	1.28	1.23	1.19
	(1.10)	(1.00)	(1.00)	(1.00)	(1.00)
12b-1 fees (%)	-	-	-	0.14	0.15
				(0.01)	(0.05)
Turnover (%)	51.05	63.30	79.85	100.81	88.04
	(43.00)	(63.54)	(61.80)	(66.48)	(63.09)
Family return (%)	26.44	3.23	11.15	-1.29	10.32
	(21.20)	(5.60)	(9.80)	(-0.96)	(8.43)
Families with top 5% fund (%)	16.77	21.14	21.29	29.44	31.43
	(0)	(0)	(0)	(0)	(0)
Number of media cites	1.56	4.50	10.64	12.01	15.67
	(0)	(0)	(1)	(2)	(3)

Table 2
Determinants of family market share

This table reports clustered OLS regression results where the family is defined as the cluster. The natural logarithm of the market share of a fund family in a given year is the dependent variable. Total expenses are average objective-adjusted expenses computed across all funds in the family. Expenses include one seventh of the front-end and back-end loads. Residual expenses are computed by regressing expenses on fund size and objective dummies on a yearly basis, and taking the residual from this regression to subsequently compute objective-adjusted expenses. The "economies of scale" dummy is set equal to one if the relationship between expenses and assets under management is negative, and zero otherwise. Performance is measured as objective-adjusted family abnormal return. Top 5% performance is an indicator variable that equals one if a family has at least one fund that is performing in the top 5% of all funds in a particular investment objective. Herfindahl index across objectives is the sum of the squared fractions of each investment objective's share in total family assets, i.e., individual fund shares are aggregated within an objective before computing the Herfindahl index. Residual HI across objectives is computed as the residual of a regression of the Herfindahl Index across objectives on the logarithm of market share. Herfindahl index across funds is computed as the sum of the squared fractions of each fund's share of total family assets. Residual HI across funds is computed as the residual of a regression of the Herfindahl index across funds on the logarithm of market share. Number of funds started is the number of funds started by a family in a given year. Turnover is the average objective-adjusted turnover computed across all funds in the family. Media attention is the natural log of one plus the number of media cites received by the family in 14 major national publications. Family experience is the natural logarithm of the number of years a family has been in existence. All models include year dummies. The *p-values* are reported in parentheses.

	Model (i)	Model (ii)	Model (iii)	Model (iv)	Model (v)
Expenses $_{t-1}$ (including loads)	-49.16 (0.00)	-50.36 (0.00)			
Residual expenses $_{t-1}$ (including loads)			-31.47 (0.00)	-32.53 (0.00)	-45.43 (0.06)
Performance $_{t-1}$	2.86 (0.00)	2.93 (0.00)	3.33 (0.00)	3.41 (0.00)	3.47 (0.05)
Top 5% performance $_{t-1}$	0.57 (0.00)	0.37 (0.00)	0.84 (0.00)	0.83 (0.00)	0.69 (0.00)
Economies of scale dummy					0.44 (0.01)
Herfindahl index across objectives $_{t-1}$	-2.63 (0.00)				
Residual HI across objectives $_{t-1}$			-0.44 (0.09)		1.66 (0.00)
Herfindahl index across funds $_{t-1}$		-3.60 (0.00)			
Residual HI across funds $_{t-1}$				-0.58 (0.05)	
Number of funds started $_{t-1}$	0.09 (0.00)	0.06 (0.00)	0.11 (0.00)	0.11 (0.00)	0.15 (0.00)
(Number of funds started $_{t-1}$)^2	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.00)
Turnover $_{t-1}$	-0.01 (0.72)	-0.02 (0.55)	-0.01 (0.91)	-0.01 (0.89)	0.05 (0.37)
Number of funds in family $_{t-1}$	0.02 (0.00)	0.02 (0.00)	0.03 (0.00)	0.03 (0.00)	
Media attention $_{t-1}$	0.27 (0.00)	0.20 (0.00)	0.35 (0.00)	0.35 (0.00)	0.30 (0.00)
Family experience $_{t-1}$	0.03 (0.00)	0.03 (0.00)	0.04 (0.00)	0.04 (0.00)	0.03 (0.00)
Number of observations	4291	4291	4291	4291	1919
Adjusted R-squared	0.60	0.68	0.51	0.51	0.51

Table 3
The effect of different fee components on family market share

This model employs the same explanatory variables as in Table 2, except that different components of fees are studied separately. In models (i) through (iii), expenses do not include loads; in model (iv) expenses are further subdivided into 12b-1 fees and other expenses. All variables are objective-adjusted. In models (ii) and (iv), expenses are adjusted for the negative relationship between expenses and fund size before objective adjustments are made. The *p-values* are reported in parentheses.

	Model (i)	Model (ii)	Model (iii)	Model (iv)
Expenses $_{t-1}$ (excluding loads)	-82.40 (0.00)			
Residual expenses $_{t-1}$ (excluding loads)		-58.30 (0.00)		
Expenses – 12 b-1 fees $_{t-1}$ (excluding loads)			-74.74 (0.00)	
Residual expenses – 12 b-1 fees $_{t-1}$ (excluding loads)				-76.20 (0.00)
Front-end load $_{t-1}$	5.27 (0.05)	9.15 (0.01)	7.56 (0.05)	11.19 (0.01)
Back-end load $_{t-1}$	22.07 (0.00)	24.53 (0.00)	19.43 (0.05)	25.63 (0.02)
12b-1 fee $_{t-1}$			-27.84 (0.49)	-16.47 (0.70)
Performance $_{t-1}$	2.59 (0.00)	3.11 (0.00)	3.42 (0.00)	3.79 (0.00)
Top 5% performance $_{t-1}$	0.55 (0.00)	0.88 (0.00)	0.55 (0.00)	0.79 (0.00)
Herfindahl index across objectives $_{t-1}$	-2.37 (0.00)		-2.44 (0.00)	
Residual HI across objectives $_{t-1}$		-0.29 (0.28)		-0.29 (0.32)
Herfindahl index across funds $_{t-1}$				
Residual HI across funds $_{t-1}$				
Number of funds started $_{t-1}$	0.08 (0.00)	0.07 (0.00)	0.06 (0.00)	0.07 (0.00)
(Number of funds started $_{t-1}$)^2	-0.001 (0.01)	-0.001 (0.00)	-0.001 (0.02)	-0.001 (0.01)
Turnover$_{t-1}$	0.01 (0.69)	0.01 (0.74)	0.01 (0.75)	0.02 (0.70)
Number of funds in family $_{t-1}$	0.02 (0.00)	0.02 (0.00)	0.02 (0.00)	0.03 (0.00)
Media attention $_{t-1}$	0.26 (0.00)	0.36 (0.00)	0.28 (0.00)	0.37 (0.00)
Family experience $_{t-1}$	0.03 (0.00)	0.04 (0.00)	0.03 (0.00)	0.04 (0.00)
Number of observations	4291	4284	2471	2472
Adjusted R-squared	0.62	0.52	0.62	0.54

Table 4
Economies of scale at the fund level

This table contains regressions at the fund level of various components of expenses on fund assets and interactions between fund assets and facets of the fund's fee structure. Fund size is expressed in millions of dollars. The 12b-1 dummy is an indicator variable set equal to 1 if the fund charges 12b-1 fees. Front-end load dummy is an indicator variable set equal to 1 if the fund charges front-end loads. Back-end load dummy is a dummy set equal to 1 if the fund charges back-end loads. All models include year and investment objective dummies. The *p-values* are in parentheses.

	Dependent variable				
	Expenses (excl. loads)	Expenses – 12b1 fees (excl. loads)	12b-1 fees	Expenses (excl. loads)	Expenses – 12b1 fees (excl. loads)
	Model (i)	Model (ii)	Model (iii)	Model (iv)	Model (v)
Log (fund size)	-0.0005 (0.00)	-0.0004 (0.00)	-0.0001 (0.00)	-0.0006 (0.00)	-0.0003 (0.00)
Front-end Load	0.0058 (0.18)	0.0098 (0.07)	0.0236 (0.00)	-0.0039 (0.56)	0.0123 (0.23)
Back-end Load	0.1199 (0.00)	0.0163 (0.13)	0.1743 (0.00)	0.0910 (0.00)	0.0132 (0.29)
12b-1 fees		-0.2666 (0.00)			-0.2580 (0.00)
Log(fund size) * 12b-1 dummy					-0.00002 (0.70)
Log(fund size) * Front-end Load dummy				0.0001 (0.25)	-0.00004 (0.67)
Log(fund size) * Back-end Load dummy				0.0003 (0.00)	0.00005 (0.29)
Number of observations	50062	34161	35001	50061	34160
Adjusted R-squared	0.20	0.14	0.54	0.21	0.14

Table 5
The impact of innovation on family market share

This table reports clustered OLS regression results where the family is defined as the cluster. The natural logarithm of the market share of a fund family in a given year is the dependent variable. Residual expenses are computed by regressing expenses on fund size and objective dummies on a yearly basis, and taking the residual from this regression. This residual is objective adjusted and summed across all funds in the family. Expenses include one seventh of front-end and/or back-end loads. Performance is measured as objective-adjusted family abnormal return. Top 5% performance is an indicator variable that equals one if a family has at least one fund that is performing in the top 5% of all funds in a particular investment objective. Residual HI across objective is the residual of a regression of the Herfindahl index on the logarithm of market share. The Herfindahl index the sum of the squared fractions of each investment objective's share in total family assets, i.e., individual fund shares are aggregated within an objective before computing the Herfindahl index. Number of funds started is the number of funds started by a family in a given year. Distance from existing funds measures the extent to which new funds are differentiated from existing funds and is measured based on the following three characteristics for stock (bond) funds: price-to-book ratio, earnings growth, and the median market capitalization of the stocks in which the fund is invested (average price, maturity, and coupon rate). The number of standard deviations that each fund characteristic is away from the mean value for the entire universe of funds, is then computed. These standard deviations are summed to compute the aggregate measure of distance for each new fund and then summed across all fund openings in the family in a particular year. Funds started / Existing funds is the number of starts in an objective as a fraction of the number of existing funds in the objective; these fractions are then summed across all objectives in the family. Turnover is the average objective-adjusted turnover computed across all funds in the family. Media attention is the natural log of one plus the number of media cites received by the family in 14 major national publications. Family experience is the natural logarithm of the number of years a family has been in existence. All models include year dummies. The *p-values* are reported in parentheses.

	Model (i)	Model (ii)
Residual expenses $_{t-1}$ (including loads)	-53.87 (0.00)	-31.98 (0.00)
Performance $_{t-1}$	3.20 (0.00)	3.45 (0.00)
Top 5% performance $_{t-1}$	0.80 (0.00)	0.81 (0.00)
Residual HI across objectives $_{t-1}$	-0.35 (0.21)	-0.41 (0.11)
Number of funds started $_{t-1}$	0.08 (0.00)	0.08 (0.00)
(Number of funds started $_{t-1}$)^2	-0.001 (0.00)	-0.001 (0.01)
Distance from existing funds $_{t-1}$	0.09 (0.07)	
(Distance from existing funds $_{t-1}$)^2	-0.01 (0.04)	
Funds started / Existing funds $_{t-1}$		4.56 (0.00)
(Funds started / Existing funds $_{t-1}$)^2		-2.68 (0.00)
Turnover $_{t-1}$	-0.01 (0.76)	-0.01 (0.85)
Number of funds in the family $_{t-1}$	0.02 (0.00)	0.03 (0.00)
Media attention $_{t-1}$	0.40 (0.00)	0.35 (0.00)
Family experience $_{t-1}$	0.03 (0.00)	0.04 (0.00)
Number of observations	2235	4291
Adjusted R-squared	0.52	0.52

Table 6
The impact of Morningstar ratings on market share

This table reports clustered OLS regression results where the family is defined as the cluster. The natural logarithm of the market share of a fund family in a given year is the dependent variable. Total expenses are average objective-adjusted expenses computed across all funds in the family. Expenses include one seventh of the front-end and back-end loads. Residual expenses are computed by regressing expenses on fund size and objective dummies on a yearly basis, and taking the residual from this regression to subsequently compute objective-adjusted expenses. Performance is measured as objective-adjusted family return. Rating is the objective-adjusted Morningstar rating, averaged across all funds in the family. Top 5% performance is an indicator variable that equals one if a family has at least one fund that is performing in the top 5% of all funds in a particular investment objective. Herfindahl index across objectives is the sum of the squared fractions of each investment objective's share in total family assets, i.e., individual fund shares are aggregated within an objective before computing the Herfindahl index. Residual HI across objectives is computed as the residual of a regression of the Herfindahl Index across objectives on the logarithm of market share. Number of funds started is the number of funds started by a family in a given year. Turnover is the average objective-adjusted turnover computed across all funds in the family. Media attention is the natural log of one plus the number of media cites received by the family in 14 major national publications. Family experience is the natural logarithm of the number of years a family has been in existence. All models include year dummies. The *p-values* are reported in parentheses.

	Model (i)	Model (ii)
Expenses $_{t-1}$ (including loads)	-30.28 (0.00)	
Residual expenses $_{t-1}$ (including loads)		-27.65 (0.00)
Performance $_{t-1}$	0.77 (0.20)	0.80 (0.25)
Morningstar rating $_{t-1}$	0.78 (0.00)	0.83 (0.00)
Top 5% performance $_{t-1}$	0.39 (0.00)	0.61 (0.00)
Herfindahl index across objectives $_{t-1}$	-2.44 (0.00)	
Residual HI across objectives $_{t-1}$		-0.85 (0.00)
Number of funds started $_{t-1}$	0.06 (0.00)	0.07 (0.00)
(Number of funds started $_{t-1}$)^2	-0.001 (0.00)	-0.001 (0.00)
Turnover $_{t-1}$	0.01 (0.85)	0.01 (0.83)
Number of funds in family $_{t-1}$	0.02 (0.00)	0.02 (0.00)
Media attention $_{t-1}$	0.29 (0.00)	0.37 (0.00)
Family experience $_{t-1}$	0.02 (0.00)	0.03 (0.00)
Number of observations	2029	2029
Adjusted R-squared	0.66	0.59

Table 7
Determinants of family market share in different objectives

This table reports clustered OLS regression results where the family is defined as the cluster. The natural logarithm of the market share of a fund family in a given year in a given objective is the dependent variable. Expenses of family (in objective) are average objective-adjusted expenses computed across all funds in the family (in the family-objective). When loads are included in expenses (models (i), (ii), and (iv)), we add one seventh of the front-end and/or back-end loads to the expense ratio. Residual expenses are computed by regressing expenses on fund size and objective dummies on a yearly basis, and taking the residual from this regression in subsequent computations of objective-adjusted expenses. Front-end load of family (in objective) is measured as objective-adjusted front-end load averaged across all funds in the family (in the objective). Back-end load of family (in objective) is measured as objective-adjusted back-end load averaged across all funds in the family (in the objective). 12b-1 fees of family (in objective) are average objective-adjusted 12b-1 fees computed across all funds in the family (family-objective). 12b-1 fees are included in the expenses in all models, except for model (iv). Performance of family (in objective) is measured as objective-adjusted family (family-objective) return. Top 5% performance by family in objective is an indicator variable that equals one if a family has a fund that is performing in the top 5% of all funds in the investment objective under consideration. Top 5% performance of family is an indicator variable that equals one if a family has at least one fund that is performing in the top 5% of all funds in a particular investment objective. Fraction of family assets in the objective is the proportion of a family's assets invested in the objective. Number of funds offered by family in objective is the number of funds in the family-objective under consideration. Number of funds started by family (in objective) is the number of funds started by a family in a given year (in the objective). Turnover of family (in objective) is the average objective-adjusted turnover computed across all funds in the family (family-objective). Media attention received by family is the natural log of one plus the number of media cites received by the family in 14 major national publications. Family experience (in objective) is the natural logarithm of the number of years a family has been in existence (operating a fund in the objective). The variables computed at the family level exclude the objective under consideration. All models include year and objective dummies. Res. refers to the residual. The *p-values* are reported in parentheses.

	Model (i)	Model (ii)	Model (iii)	Model (iv)
Expenses of family in objective $_{t-1}$ (incl. loads)	-47.53 (0.00)			
Expenses of family $_{t-1}$ (incl. loads)	-4.24 (0.51)			
Residual expenses of family in obj. $_{t-1}$ (incl. loads)		-24.25 (0.00)		
Residual expenses of family $_{t-1}$ (incl. Loads)		-4.52 (0.41)		
Residual expenses of family in obj. $_{t-1}$ (excl. loads)			-45.31 (0.00)	
Residual expenses of family $_{t-1}$ (excl. loads)			-13.40 (0.26)	
Res (exp. – 12b-1 fees) of fam. in obj. $_{t-1}$ (incl. loads)				-59.79 (0.00)
Res (exp. – 12b-1 fees) of fam. $_{t-1}$ (incl. loads)				-3.30 (0.73)
Front-end load of family in objective $_{t-1}$			-1.28 (0.50)	
Front-end load of family $_{t-1}$			2.98 (0.34)	
Back-end load of family in objective $_{t-1}$			18.24 (0.00)	
Back-end load of family $_{t-1}$			5.02 (0.47)	
12b-1 fees of family in objective $_{t-1}$				25.81 (0.27)
12b-1 fees of family $_{t-1}$				-5.65 (0.85)
Performance of family in objective $_{t-1}$	2.19 (0.00)	2.17 (0.00)	2.05 (0.00)	2.76 (0.00)
Performance of family $_{t-1}$	1.03 (0.05)	1.18 (0.04)	1.13 (0.04)	1.41 (0.05)
Top 5% performance of family in objective $_{t-1}$	0.09 (0.11)	0.12 (0.05)	0.12 (0.05)	0.02 (0.74)
Top 5% performance of family $_{t-1}$	0.34 (0.00)	0.38 (0.00)	0.36 (0.00)	0.31 (0.00)
Fraction of family assets in the objective $_{t-1}$	1.97 (0.00)	2.04 (0.00)	2.10 (0.00)	2.28 (0.00)
Number of funds started by family in objective $_{t-1}$	0.06 (0.00)	0.08 (0.00)	0.07 (0.00)	0.09 (0.00)
(Number of funds started by family in objective $_{t-1}$)^2	-0.002 (0.01)	-0.003 (0.00)	-0.003 (0.00)	-0.003 (0.00)
Number of funds started by family $_{t-1}$	0.04 (0.00)	0.04 (0.00)	0.03 (0.01)	0.03 (0.02)
(Number of funds started by family $_{t-1}$)^2	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)
Turnover of family in objective $_{t-1}$	-0.01 (0.65)	-0.012 (0.55)	-0.003 (0.89)	-0.011 (0.59)
Turnover of family$_{t-1}$	0.05 (0.00)	0.05 (0.14)	0.06 (0.09)	0.04 (0.20)
Number of funds offered by family in objective $_{t-1}$	0.07 (0.00)	0.07 (0.00)	0.07 (0.00)	0.06 (0.00)
Number of funds offered by family $_{t-1}$	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)	0.01 (0.00)
Media attention received by family $_{t-1}$	0.21 (0.00)	0.22 (0.00)	0.22 (0.00)	0.21 (0.00)
Family experience in objective $_{t-1}$	0.05 (0.00)	0.05 (0.00)	0.05 (0.00)	0.06 (0.00)
Family experience $_{t-1}$	0.02 (0.00)	0.01 (0.01)	0.01 (0.07)	0.01 (0.00)
Number of observations	14551	14578	14577	10036
Adjusted R-squared	0.62	0.60	0.60	0.58

Table 8
The impact of changes in fees on market share

This table lists the fraction of families experiencing an increase in market share from year t-1 to year t for different subsamples. Families are divided into four groups based on: (a) whether or not their objective-adjusted expenses during year t and t-1 were below zero; (b) whether or not they increased their expenses from year t-1 to year t. If families have objective-adjusted expenses below zero in one year and above zero in the other or vice versa, they are excluded from the analysis. The p-value refers to the significance of a rank sum test of the equality of the two subgroups.

	Increase in fees from t-1 to t	Decrease in fees from t-1 to t	Total	P-value for difference
Low fee family in t-1 and t	0.492 (N=1527)	0.517 (N=729)	0.500 (N=2256)	0.26
High fee family in t-1 and t	0.360 (N=1509)	0.460 (N=1115)	0.402 (N=2624)	0.00
Total	0.426 (N=3036)	0.483 (N=1844)	0.448 (N=4880)	0.00

Table 9
Sensitivity tests on the dependent variable and the measure of expenses.

The dependent variable in model (i) is the logarithm of the market share of expenses of the family, computed as total expenses charged by the family during the year (including one seventh of the load) divided by the sum of all expenses charged by all family during the year. The explanatory variables employed in model (i) are the same as in Tables 2 and 3. Model (ii) is estimated for 1998 only. The dependent variable in model (ii) is the same as in Tables 2 and 3. The explanatory variables in model (ii) are the same as in Tables 2 and 3, except that expenses have been subdivided into management fees (mgt. Fee) and other expenses, and that these expense variables are measured contemporaneously instead of lagged one year.

	Dependent variable: market share of expenses	Dependent variable: market share of assets
	Model (i)	Model (ii)
Expenses (including loads) $_{t-1}$	-17.35 (0.00)	
Expenses (excluding loads) – mgt fee $_{t}$		-39.76 (0.00)
Management fee $_{t}$		-121.42 (0.00)
Front Load $_{t-1}$		0.03 (0.45)
Back-end Load $_{t-1}$		0.23 (0.01)
Performance $_{t-1}$	3.38 (0.00)	1.76 (0.00)
Top 5% performance $_{t-1}$	0.55 (0.00)	0.50 (0.01)
Herfindahl index across objectives $_{t-1}$	-2.59 (0.00)	-2.59 (0.00)
Number of funds started $_{t-1}$	0.11 (0.00)	0.06 (0.00)
(Number of funds started $_{t-1}$)^2	-0.001 (0.01)	-0.001 (0.01)
Turnover $_{t-1}$	0.00 (0.95)	-0.04 (0.62)
Number of funds in family $_{t-1}$	0.02 (0.00)	0.02 (0.00)
Media attention $_{t-1}$	0.25 (0.00)	0.29 (0.00)
Family experience $_{t-1}$	0.04 (0.00)	0.30 (0.00)
Number of observations	4221	388
Adjusted R-squared	0.58	0.68