Mutual Fund Performance and the Incentive to Generate Alpha

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ABSTRACT

To rationalize the well-known underperformance of the average actively managed mutual fund, we exploit the fact that retail funds in different market segments compete for different types of investors. Within the segment of funds marketed directly to retail investors, we show that flows chase risk-adjusted returns, and that funds respond by investing more in active management. Importantly, within this direct-sold segment, we find no evidence that actively managed funds underperform index funds. In contrast, we show that actively managed funds sold through brokers face a weaker incentive to generate alpha, and significantly underperform index funds.

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The typical actively managed U.S. equity fund earns a negative after-fee alpha (Gruber (1996), French (2008), Fama and French (2010), and others). This well-documented underperformance gives rise to two important and related questions. Why do actively managed funds underperform? And, given this underperformance, why are the vast majority of mutual fund assets still invested in actively managed funds? The widely accepted answer to the first question is that efficient U.S. equity markets make it difficult for U.S. mutual fund managers to add value net of fees. The answer to the second question has been debated since Gruber (1996) first highlighted this puzzle in his AFA presidential address. He suggests that it might be driven by 'disadvantaged' investors who are either ignorant of the underperformance or behaving irrationally, a conclusion echoed most recently in Berk and van Binsbergen (2012).

Assessing the rationality of retail investor demand for active management is an area of ongoing research. The most common approach questions the use of positive unconditional alpha as the sole criterion for evaluating the desirability of actively managed funds.[1] For example, Glode (2011) argues that it is rational for investors to accept negative average alphas if active funds outperform in recessionary periods when marginal utility is high.[2] In this paper, we propose and test a different explanation for the underperformance of actively managed funds based on heterogeneity in investor preferences. The mutual fund literature typically assumes that retail funds compete for homogeneous investors within a single market. In reality, the market for retail funds is segmented, catering to two distinct clienteles. By explicitly recognizing that different funds compete for different types of investors, we are able to shed new light on the underperformance of actively managed funds. In addition, we show that a variety of strategic choices by mutual fund families are consistent with the revealed preferences of their target clienteles.

Motivated by the recent findings in Bergstresser, Chalmers, and Tufano (2009) and

Christoffersen, Evans, and Musto (2012), we hypothesize that retail mutual funds sold through intermediaries, or brokers, face a weaker incentive to generate alpha than mutual funds sold directly to retail investors, and that this disincentive helps to explain the underperformance of the average actively managed fund. Our explanation rests on the premise that mutual fund families will expend resources to generate alpha only to the extent that they expect the investments to increase investor flows. The lower the expected benefit associated with investing in active management—because, for example, investor flows are less responsive to alpha—the weaker the incentive to do so.

Evidence on the pricing and product characteristics of mutual funds sold through brokers versus those sold directly to investors supports our hypothesis that they serve investor clienteles with distinct preferences. Retail funds sold directly to investors offer unbundled access to portfolio management. Their investors neither receive, nor pay extra fees for, advice. In contrast, retail funds sold through brokers bundle portfolio management with financial advice. Del Guercio, Reuter, and Tkac (2010) show that fund families tend to sell their funds either directly to investors or through brokers, but rarely do both, suggesting a segmented market where the nature of competition differs across the two segments. Because experienced and knowledgeable investors are likely to self-select into direct-sold funds, flows in this segment are more likely to respond to risk-adjusted returns, giving direct-sold families a strong incentive to generate alpha. In contrast, the findings in Christoffersen, Evans, and Musto (2012) and Chalmers and Reuter (2012) suggest that competition in the broker-sold segment is likely to focus on characteristics other than alpha, such as the level of broker compensation. The weaker the sensitivity of investor flows to alpha, the weaker the incentive to generate alpha. Indeed, we find strong evidence that the underperformance of the average actively managed fund can be explained by variation

across market segments in the incentive that funds face to generate alpha.

We use data from Financial Research Corporation (FRC) to distinguish direct-sold retail mutual funds from broker-sold retail mutual funds. We begin our analysis by testing whether flows in the direct-sold segment are more sensitive to risk-adjusted returns than flows in the broker-sold segment. When we estimate regressions on the pooled sample of retail funds, we find the standard result that monthly flows respond to both raw and risk-adjusted performance (e.g., Gruber (1996), Sirri and Tufano (1998), and Del Guercio and Tkac (2002)). However, when we allow flow-performance sensitivities to vary across segments, we find that only self-directed investors chase alpha. We find no significant relation between flows into broker-sold funds and their alphas, but find instead a strong relation between flows and raw returns. Thus, direct-sold funds face a stronger flow-induced incentive to generate alpha than broker-sold funds, but a weaker incentive to compete for investors by increasing beta.

Since we cannot observe the actual dollars that funds invest in generating alpha, we test for differences across direct-sold and broker-sold funds in measures associated with successful active management. We use the return gap measure of Kacperczyk, Sialm, and Zheng (2008) to show that direct-sold funds create significantly more value through their "unobserved actions," and the active share measure of Cremers and Petajisto (2009) to show that direct-sold funds are significantly less likely to be closet indexers. We also find that direct-sold funds have lower estimated betas than comparable broker-sold funds. Consistent with Bergstresser, Chalmers, and Tufano (2009), we find that direct-sold funds have significantly higher alphas than broker-sold funds, on the order of 115 basis points per year. Because the pricing of small-cap equity may be less efficient than the pricing of large-cap equity, we test for and find that the differences in alpha, return gap, and beta are even larger when we focus on funds invested in small-cap equity.

To strengthen the evidence that direct-sold families respond to the incentives derived from their performance-sensitive clientele, we use a variety of data sources to test for behaviors shown in the literature to have a robust positive impact on alpha. For example, we find that families with direct-sold funds are significantly more likely to specialize in a narrower range of investment styles, less likely to outsource portfolio management to subadvisors, and more likely to hire portfolio managers from undergraduate institutions with higher average math SAT scores, than families with broker-sold funds.[3] Collectively, these findings suggest that direct-sold families make operational decisions intended to help them generate the risk-adjusted performance that their target clientele demands.

Finally, we revisit the relative performance of actively managed funds and index funds. Berk and van Binsbergen (2012) argue that actively managed funds should be benchmarked against the set of investable index mutual funds available to retail investors instead of against an after-fee alpha of zero. Their argument is strengthened by findings in Elton, et al. (1993) and Cremers, Petajisto, and Zitzewitz (2012) that factor models can generate significant non-zero alphas when applied to purely passive indices. Consistent with the broad literature, in pooled regressions of all retail funds we find that actively managed funds underperform investable index funds by 88 basis points per year, which is essentially the difference in expense ratios. However, our findings are markedly different when we compare the performance of actively managed funds and index funds available in the *same market segment*, and hence targeted at the same type of retail investor.

Within the direct-sold segment, we find that the after-fee alphas of actively managed funds are economically and statistically indistinguishable from those of index funds—the elusive equilibrium condition in Grossman and Stiglitz (1980) and Berk and Green (2004). In contrast,

within the broker-sold segment, actively managed funds underperform index funds between 112 and 132 basis points per year. These differences are robust to the inclusion of fund-level controls, and to sample restrictions based on fund age and ticker shown to eliminate incubation bias (Evans (2010)). Thus, the well-documented underperformance of the average actively managed fund is driven by the large number of underperforming broker-sold funds.

Our findings provide new answers to the two research questions raised above. Within the direct-sold segment, where the nature of competition better matches Berk and Green's (2004) model, we find strong support for their prediction that actively managed funds earn the same expected after-fee alphas as index funds. This highlights the need to consider incentives when evaluating mutual fund performance. It also challenges the view that the relative efficiency of U.S. equity markets prevents actively managed equity funds from recovering their fees. Instead, our findings are consistent with the view that the underperformance of the average actively managed fund arises from the interaction between relatively efficient equity markets and relatively weak incentives to identify and incentivize skilled managers.

The fact that the persistent underperformance of actively managed funds is limited to broker-sold actively managed funds helps to rationalize the continuing demand for direct-sold actively managed funds. At the same time, it challenges alternative explanations, like that in Glode (2011), to explain why underperformance is limited to the broker-sold segment.[4] The fact that the vast majority of the assets in the broker-sold segment are invested in underperforming actively managed funds is likely to reflect an agency conflict between brokers and their clients. In other words, consistent with Gruber's (1996) 'disadvantaged investor' hypothesis, the key to rationalizing investor demand for underperforming actively managed funds is rationalizing investor demand for brokers.

In Section I, we use differences in investor clienteles across retail market segments to argue that broker-sold funds face a weaker incentive to generate alpha than direct-sold funds, and we summarize our data. In Section II, we document across-segment differences in the sensitivity of fund flows to risk-adjusted, after-fee returns. In Section III, we use a variety of performance metrics and additional data sources to document that direct-sold funds choose to invest more in active management. In Section IV, we document across-segment differences in the relative performance of actively managed and passively managed funds. In Section V, we summarize our findings and discuss their implications for the puzzle of active management.

I. Heterogeneity in Retail Investor Preferences and the Market for Retail Mutual Funds

Most studies of retail mutual funds implicitly assume a homogeneous product market, where funds primarily compete on after-fee performance for homogeneous investors. Yet, the fees that retail mutual funds charge (expense ratios, including 12b-1 fees, plus any sales loads) can be used to provide investors with two distinct bundles of services. For example, investors who wish to buy one of the largest funds, the Investment Company of America fund offered by the American Funds family, can only do so through a financial advisor, as the fund is not sold directly to investors. Because the fund is sold only as a packaged bundle of portfolio management services and financial advice services, the fees that American Funds charges its investors are ultimately used to compensate both portfolio managers and financial advisers. In contrast, the Vanguard Windsor fund is sold directly to investors through Vanguard's website or through an intermediary, such as Charles Schwab. The crucial distinction is that the fees the investor pays directly to Vanguard are for portfolio management services only. If an investor wants to buy Vanguard mutual funds and receive advice on asset allocation or fund selection, he must pay separately for this advice.

More generally, retail mutual funds can be classified as providing either unbundled portfolio management services, or a packaged bundle of portfolio management and investment advice. Not surprisingly, the two types of funds are targeted at different types of investors. According to an Investment Company Institute (ICI) survey, 51% of mutual fund shareholders indicate that they have an ongoing relationship with a financial adviser. Of these investors, 98% indicate that they have had contact with their financial adviser in the prior 12 months, and that they have been receiving investment advice from this adviser for a median of 10 years. They reportedly use an adviser because they "need help with asset allocation decisions" and "want a financial professional to explain various investment options" and because it "gives them peace of mind about their investments." These surveys suggest that investors who use advisers value the face-to-face contact and long-term relationship with an adviser. In contrast, the 18% of investors who do not purchase mutual funds through a financial adviser state that they "want to be in control of own investments" and already "have access to resources needed to invest on my own."[5]

Chalmers and Reuter (2012) find similar evidence of investor heterogeneity when they study demand for full-service brokers within a defined contribution plan. Plan participants who choose to invest through a broker are younger, less highly educated, and less highly paid than self-directed investors, suggesting that they are less experienced investors. In addition, surveyed participants who choose to invest through a broker are more likely to rank access to face-to-face meetings as important or very important (70% versus 39%), more likely to state that they relied on the recommendation of a broker in determining their equity allocation (74% versus 45%), and less likely to state that they feel comfortable making changes to their allocation without consulting their broker (25% versus 44%).

Differences in investor preferences and experience across the direct-sold and broker-sold

market segments have important implications for the nature of competition within each segment. Specifically, we expect competition in the broker-sold segment to focus much less on risk-adjusted returns, thereby reducing the incentive for broker-sold funds to expend resources to generate alpha. First, because broker-sold funds provide two distinct types of services, broker clients may rationally accept lower expected returns in exchange for the broker services they perceive as higher quality, such as the personal trust that comes from repeated face-to-face contact (Gennaioli, Shleifer, and Vishny (2012)). Second, to the extent that broker clients are less experienced investors, they may be less likely to appreciate the difference between raw and risk-adjusted returns.[6] Finally, payments to brokers have been repeatedly shown to provide powerful incentives, suggesting that broker-sold funds can effectively compete for flows by paying higher fees to brokers rather than making greater investments in active management (Bergstresser, Chalmers, and Tufano (2009), Christoffersen, Evans, and Musto (2012), Chalmers and Reuter (2012), and Anagol, Cole, and Sarkar (2012)). For these reasons, we begin our empirical analysis by testing whether investor flows in the broker-sold segment are less sensitive to alpha than investor flows in the direct-sold segment.

A. Data on Distribution Channel

We use data from Financial Research Corporation (FRC) to distinguish direct-sold retail mutual funds from broker-sold retail mutual funds.[7] These data cover 1992 to 2004, and were first analyzed by Bergstresser, Chalmers, and Tufano (2009).[8] Although FRC distinguishes institutional funds from retail funds, we choose to exclude institutional funds from our analysis. While FRC data do allow us to cleanly identify retail funds targeted at different types of retail investors, they do not allow us to identify institutional funds targeted at different types of institutional investors.[9] (For completeness, we re-estimate our main tests on the sample including direct-sold, broker-sold, and institutional funds and report the results in the Internet Appendix.)

We obtain data on total net assets (TNA), monthly returns, annual expenses, and other fund characteristics from the *CRSP Survivor-Bias-Free U.S. Mutual Fund Database*. We merge the FRC and CRSP data at the share class level. When aggregating distribution (and other characteristics) to the fund level, we weight each share class in proportion to its TNA in the prior month. We classify a fund as being direct-sold or broker-sold when at least 75% of its assets are sold through share classes focused on that segment. Collectively, these funds manage 82.9% of the assets invested in nonspecialized domestic equity. Of the remaining assets, 8.4% are invested in institutional funds, and 8.7% are invested in funds that FRC does not classify.

We identify nonspecialized domestic equity funds as those for which the Standard & Poor's investment objective in CRSP is listed as aggressive growth (AGG), mid-cap growth (GMC), growth and income (GRI), growth (GRO), income and growth (ING), or small-cap growth (SCG). For 1996 to 2002, we also possess data on Morningstar investment objectives, which capture variation in market capitalization and style (e.g., small-cap value versus large-cap growth). Because Morningstar investment objectives better capture differences in how funds invest, we use them to measure family-level investment style specialization.

B. Summary Statistics

In Table I Panel A, we provide evidence on the relative sizes of the direct-sold and broker-sold market segments. Total assets under management in domestic equity mutual funds increase from $311.2 billion in 1992 to $1,967.8 billion in 2004. During this period, the market share of direct-sold funds increases from 52.2% to 59.7%. The market share of index funds increases from 2.8% to 10.4%. Notably, the increased demand for index funds is driven by the direct-sold segment. Within the broker-sold segment, the fraction of assets invested in index funds remains below 2.0%.

Table I Here

We also provide evidence that the typical mutual fund family serves a single segment of

the retail market. Following Del Guercio, Reuter, and Tkac (2010), we aggregate from the share class level and calculate the fraction of assets that each family distributes through the direct-sold and broker-sold segments. We then classify a family as being direct-sold, for example, if it distributes the largest fraction of assets through the direct-sold segment. Between 1992 and 2004, the average fraction of assets that direct-sold families sell through the direct-sold segment declines slightly from 98.1% to 96.5%. The decline in the fraction of assets distributed through the broker-sold segment is larger for broker-sold families (99.7% to 92.2%), but still modest.[10] (In both segments, the median fraction distributed through the primary distribution segment remains constant at 100%.) The fact that many mutual fund families focus on either the direct-sold segment or the broker-sold segment reinforces the idea that families need to invest in different bundles of services to compete for different types of investors.[11]

We report fund-level summary statistics in Table I Panel B. The unit of observation when calculating means and standard deviations is fund *i* in month *t*. We note several interesting differences across the two market segments. While there are significantly more actively managed funds available in the broker-sold segment (615.7 versus 440.2), the average broker-sold fund manages significantly fewer assets ($840 million versus $1.4 billion). Broker-sold funds also have significantly lower portfolio turnover, a difference that may reflect less active management, less volatile investor flows, or both.

The difference in average expense ratios of direct-sold and broker-sold actively managed funds (1.29 versus 1.57) is essentially equal to the difference in average 12b-1 fees (0.09 versus 0.40), which are the fees that the SEC allows funds to charge for distribution. However, funds in the two segments are unlikely to invest the same proportion of their non-12b-1 fees in active management because broker-sold funds commonly use management fees to pay for distribu-

tion.[12] Consequently, it is not possible to measure what funds pay for inputs like skilled managers, analysts, and trading desks using the fee categories that the SEC requires funds to disclose. For this reason, we need to rely on alternative measures to test for differential investments in active management.

Panel B also shows that broker-sold index funds are more expensive than direct-sold index funds. This is sensible because broker-sold index funds need to compensate brokers for providing financial advice. In other words, some of the price dispersion studied by Elton, Gruber, and Busse (2004) and Hortacsu and Syverson (2004) is driven by the different bundles of investor services provided in the different market segments.

When we focus on average monthly after-fee returns, we see that direct-sold actively managed funds appear to outperform broker-sold actively managed funds (92 basis points versus 80 basis points). On an annualized basis, the difference is 144 basis points, which is much bigger than the 31 basis point difference in 12b-1 fees. The fact that broker-sold funds underperform by more than the difference in 12b-1 fees is the key finding in Bergstresser, Chalmers, and Tufano (2009). Interestingly, direct-sold actively managed funds also appear to outperform all other categories, including the index funds in both segments. However, unlike the return regressions that we estimate later, these averages do not control for differences in risk exposure or differences in the returns earned across asset classes and time.

II. Flow-Performance in the Direct-Sold Segment Creates the Strongest Incentive to Generate Alpha

Because mutual fund fee revenues increase with assets under management, mutual funds have a strong incentive to provide the services that attract new investor dollars. Above, we hypothesized that competition in the broker-sold segment is less focused on risk-adjusted returns,

reducing the incentive for broker-sold funds to generate alpha. Here, we test for differences in the flow-performance relation across the direct-sold and broker-sold segments using data on actively managed domestic equity funds that covers January 1993 to December 2004.[13] Table II contains the regression results. The dependent variable is the monthly net percentage flow of fund *i* in month *t*. Focusing on monthly flows allows us to test for across-segment differences in investor sensitivity to short-term performance. In Panel A, we test for differential sensitivity to raw versus risk-adjusted performance measures. In Panel B, we allow for non-linearities in the sensitivity of flows to raw returns. The independent variables of interest are fund *i*'s monthly net return in month *t-1*, fund *i*'s monthly 4-factor alpha in *t-1*, and dummy variables that indicate whether fund *i*'s net return in month *t-1* was in the top 20% or the bottom 20% of funds with the same CRSP investment objective. We estimate fund *i*'s 4-factor alpha in month *t* using its after-fee monthly returns over the prior 24 months and the factors available for download on Ken French's website.[14] We also include fund *i*'s monthly net flow in month *t-1* to capture the effect of longer-term performance. Other fund-level control variables include a dummy variable indicating whether fund *i* charges a sales load, fund *i*'s lagged expense ratio and 12b-1 fee, the natural logarithm of fund *i*'s TNA, the natural logarithm of its family's TNA, and fund *i*'s age.

Table II column (1) reports the results of a pooled regression relating net flows in month *t* to performance in month *t-1*. This regression ignores the fact that different retail mutual funds are targeted at different types of retail investors, but it includes month-objective fixed effects to control for monthly shocks to aggregate demand within each investment objective, each month. Columns (2) and (3) report the results when we allow for differential sensitivity to lagged performance between the two segments. The coefficients are estimated in a single pooled regression in which each of the independent variables and month-objective fixed effects is interacted

Table II Here

with a direct-sold segment dummy variable. Thus, the coefficients in columns (2) and (3) are identical to those obtained by estimating a separate regression for each segment. To allow for the possibility that flows are correlated both within mutual fund family and within time period, we cluster standard errors on both family and month. For brevity, we report the coefficients on the control variables in an Internet Appendix table.

While the pooled sample regression confirms the well-known finding that both raw and risk-adjusted performance help to explain cross-sectional variation in fund flow (e.g., Gruber (1996), Sirri and Tufano (1998), and Del Guercio and Tkac (2002)), it also masks significant heterogeneity in the flow-performance relation across market segments. Consistent with our hypothesis, when we contrast the results in columns (2) and (3), we find that fund flows in the direct-sold segment are significantly more sensitive to risk-adjusted returns than fund flows in the broker-sold segment. Specifically, while the estimated coefficients on lagged alpha are positive in both segments, the estimated coefficient in the direct-sold segment is larger (0.176 versus 0.021), significantly different from zero (*p*-value of 0.000), and significantly different from the coefficient in the broker-sold segment (*p*-value of 0.001). These coefficients imply that a one-standard deviation increase in alpha will increase fund size over the next 12 months by approximately 6.18% in the direct-sold and 0.59% in the broker-sold segments, or in terms of dollars, by $86.9 million and $5.0 million respectively.[15] Since the typical actively managed fund's management fee is approximately 75 basis points, this implies incremental annual revenue to the fund of $651,660 for the average direct-sold fund and only $37,445 for the average broker-sold fund. Thus, if families in the direct-sold segment could invest in the managers, analysts, or trading infrastructure that would generate this increase in alpha at lower annual cost than $651,660 they would presumably do so, whereas families in the broker-sold segment have a much weaker

incentive to make alpha-generating investments.

When we instead focus on the sensitivity of flows to lagged raw returns, the pattern is reversed. The estimated coefficient in the broker-sold segment is larger (0.135 versus 0.040), significantly different from zero (*p*-value of 0.000), and significantly different from the coefficient in the direct-sold segment (*p*-value of 0.032). Regardless of whether the lower estimated sensitivity of flows to risk-adjusted returns in the broker-sold segment is driven by the preferences of brokers or their clients, it should reduce the incentive for broker-sold funds to generate alpha.

The estimates in Panel B confirm that flows in the direct-sold segment remains most sensitive to risk-adjusted performance, even when we control for abnormally high and low raw returns. The estimates also reveal that flows in the direct-sold segment are the most sensitive to extreme performance. For example, net flows into the top performing funds and out of the bottom performing funds in each investment objective are around three times larger in the direct-sold segment than in the broker-sold segment. More generally, we can reject the hypothesis that the coefficient on the top 20% dummy variable in the direct-sold segment is equal to that of the broker-sold segment with a *p*-value of 0.003. For the bottom 20% dummy variable, the *p*-value is 0.026.[16] The fact that direct-sold funds are penalized more for poor performance reinforces their incentive to invest in skill, and may also reduce their incentive to bear systematic risk.

Two other papers compare the relation between flow and past performance in the direct-sold and broker-sold segments. To test whether brokers attenuate the behavioral biases of their clients, Bergstresser, Chalmers, and Tufano (2009) test for differences in return chasing behavior, and find that the sensitivity of flows to raw returns is similar in both segments. Their evidence is not directly comparable to ours because they report results based on annual flows and do not include risk-adjusted performance measures in their regressions. We show in the Internet

Appendix that when we more closely match their specification, but simultaneously control for raw returns and 4-factor alphas, we again find that the sensitivity to 4-factor alphas is limited to the direct-sold segment. Keswani and Stolin (2012) use disaggregated monthly flow data in the United Kingdom to test for differential sensitivities to risk-adjusted and raw returns across different distribution channels. Their finding that direct-sold investor flows are the most sensitive to risk-adjusted returns matches our finding for the U.S., suggesting that the incentive to generate alpha is likely to vary across market segments in the U.K. as well.

III. Do Families in the Direct-sold Segment Invest More in Active Management?

The across-segment differences in fund flows generate two predictions. Because monthly flows into direct-sold funds are more sensitive to risk-adjusted returns, direct-sold funds have a stronger incentive to generate alpha through investments in active management. At the same time, because monthly flows into broker-sold funds are more sensitive to raw returns, funds in the broker-sold segment have a stronger incentive to bear systematic risk, in the hopes of realizing higher raw returns. While we can test the latter prediction directly, we cannot directly observe the inputs to generating alpha, such as the dollar investments in trading infrastructure or skilled personnel, nor can we observe the incentive structures internal to the fund. We can, however, use those measures of mutual fund behavior from the literature that have been shown to be robustly consistent with funds seeking to generate alpha. In this section, we use a variety of data sources to test both predictions.

A. Are Direct-sold Funds More Actively Managed?

In Table III, we test for differences in 4-factor alpha, the return gap measure of Kacperczyk, Sialm, and Zheng (2008), the active share measure of Cremers and Petajisto (2009), and systematic risk. Because we are testing for evidence of differential investments in active management, we exclude index funds.

Table III Here

All of the regressions in Table III include investment style-by-month fixed effects, so that each performance measure is relative to other actively managed funds with the same investment style, operating in the same month. The main variable of interest is a dummy variable indicating that at least 75% of the fund's TNA is distributed through the direct-sold segment; broker-sold funds are the omitted category. We also include in each regression the same set of fund-level controls as Table II (reported in the Internet Appendix). In addition, we include lagged portfolio turnover and the standard deviation of net flows over the prior 12 months to control for the fact that more volatile investor flows may be associated with lower performance (Edelen (1999)). Standard errors are clustered on both mutual fund family and month. Panel A contains the full sample of actively managed funds, while Panel B restricts the sample to small cap growth funds. To the extent that pricing of small cap stocks is less efficient than pricing of large cap stocks, the returns to investing in active management should be higher among small cap growth funds.

Column (1) of Table III shows that direct-sold funds earn higher risk-adjusted, after-fee returns than broker-sold funds. The estimated difference is 9.6 basis points per month, statistically significant at the 1% level. Panel B, however, shows an even more dramatic difference among small-cap growth funds. We find that direct-sold small-cap growth funds outperform their broker-sold peers by 17.4 basis points per month (p-value of 0.001). The fact that direct-sold funds earn relatively higher returns when investing in small stocks is our first new piece of evidence that direct-sold funds invest more in active management than broker-sold funds.

In column (2), we focus on the return gap measure of Kacperczyk, Sialm, and Zheng (2008), which is the difference between fund i's actual gross return and the gross return implied by the fund's lagged reported holdings. This measure captures unobservables such as the value added by skilled managers or favorable IPO allocations, or the value destroyed by poor trade

executions or agency costs. We find that the majority of the difference in the returns of direct-sold and broker-sold funds can be explained by differences in return gaps. Within the full sample of actively managed funds, the difference in the return gaps of direct-sold and broker-sold funds is 6.1 basis points per month. Within the subsample of small cap growth funds, the difference is 12.0 basis points per month. Both differences are significant at the 1% level.

In column (3), we focus on the active share measure of Cremers and Petajisto (2009), which is the fraction of fund *i*'s assets that would need to be traded to obtain a portfolio that mirrors fund *i*'s benchmark. Because Cremers and Petajisto find evidence that funds that have both high active share and high tracking error outperform their peers, the dependent variable in column (3) is a dummy variable that identifies funds with above-median measures of both active share and tracking error (where we allow the median value to vary across investment objective-year pairs).[17] Because active share and tracking error are positively correlated, the dependent variable equals one for 40.9% of the funds in the full sample, and 38.6% of the funds in the small cap growth fund sample.

We find strong evidence that direct-sold funds are more actively managed than broker-sold funds. Within the full sample, direct-sold funds are 9.8 percentage points (*p*-value of 0.002) more likely to have above-median values of both active share and tracking error than broker-sold funds. Within the sample of small cap growth funds, the difference grows to 10.4 percentage points (*p*-value of 0.038). Both differences are economically significant, suggesting that direct-sold actively managed funds are more likely to be stock pickers than their broker-sold peers.

In regressions that we report in the Internet Appendix, we restrict the sample to funds for which we observe Morningstar investment styles, a Morningstar rating, and a NASDAQ ticker. Although these filters eliminate 43.2% of our fund-month observations, they serve several useful

purposes. When constructing style-by-month fixed effects, the nine Morningstar investment styles allow for finer comparison groups than the six Standard & Poor's investment styles available in CRSP. They also make it easier to identify the full set of funds that invest in small cap equity. Most importantly, requiring that fund *i* has a Morningstar rating (which requires that it is at least three years old) and a ticker helps to ensure that our findings are not being driven by incubation bias (Evans (2010)). Within the full sample of funds, differences in returns are similar to those reported in Panel A. Within the sample of small cap funds, differences in returns are even larger than those reported in Panel B. The difference in the 4-factor alphas of direct-sold and broker-sold funds increases from 17.4 to 22.5 basis points per month (*p*-value of 0.020), and the difference in return gaps increases from 12.0 to 27.5 basis points per month (*p*-value of 0.000).

In the last column of Table III, we test for differences in systematic risk. We measure sensitivity to systematic risk as the beta on the market portfolio in the standard one-factor model. We find that direct-sold funds have lower betas than broker-sold funds. The difference is 0.042 within the full sample (*p*-value of 0.050) and 0.106 within the sample of small-cap growth funds (*p*-value of 0.012). Because flows into broker-sold funds are more sensitive to raw returns, and because higher betas are likely to generate higher raw returns, these across-segment differences in beta are broadly consistent with funds responding to the incentives implied by investor flows. However, within the subsample of funds with Morningstar data and a ticker, neither estimated difference in beta is statistically significant, suggesting that the tilt toward higher betas in the full sample might be driven by the incubation of broker-sold funds.

To provide additional evidence that differences in investor preferences drive differential investments in active management, we exploit two additional sources of variation in investor

preferences. In Panel C, we restrict the sample to direct-sold funds and replace the direct-sold dummy variable with the fraction of family assets that are distributed in the direct-sold segment. Because families tend to focus their distribution on a single retail segment, this fraction has a mean of 91.5%. However, it also has a standard deviation of 18%, allowing us to exploit variation in the relative importance of direct-sold investors to fund families.

We find that direct-sold funds offered by families more squarely focused on serving the direct-sold segment have higher performance measures. A one standard deviation increase in the fraction of family assets in the direct-sold segment is predicted to increase a direct-sold fund's 4-factor alpha by 2.6 basis points per month, return gap by 3.0 basis points per month, and the probability of having above-median active share and tracking error by 2.7 percentage points, each significant at the 10% level or better. In contrast, the effect on beta is neither economically nor statistically significant. In other words, our findings based on variation within the direct-sold segment are broadly consistent with our findings based on variation across segments.

Another potential source of variation in investor preferences comes from changes in the distribution strategies of fund families. No families switch from broker-sold distribution to direct-sold distribution during our sample period, but three families switch from direct-sold distribution to broker-sold distribution: Columbia Funds and Scudder Funds in January 2002, and Strong Funds in January 2001. These three families manage 32 actively managed domestic equity funds in 2001 and 49 funds in 2002, representing between 3.2% and 4.4% of our sample. To be consistent with our earlier evidence, we predict that families switching into the broker-sold segment will internalize their weaker incentive to generate alpha. We also predict that families are more likely to leave the direct-sold segment when they have underperformed comparable direct-sold funds.

To test these predictions in Panel D we replace the direct-sold fund dummy variable in Panel A with a dummy variable that is equal to one if the fund is direct-sold during the entire sample period (stable distribution). For the three families that switch distribution, we include a dummy variable that is equal to one in the months before the switch to broker-sold, and a dummy variable that is equal to one in the months during and after the switch to broker-sold. To the extent that families are slow to change their investments in active management, we are likely to underestimate the magnitude of these changes. Despite this caveat and our modest sample size, our findings are broadly consistent with our predictions. Switchers' funds have lower alphas and lower return gap than direct-sold funds after the fund switches to broker-sold. In both cases, we can reject the hypothesis that the coefficient on the post-switch dummy variable is equal to the coefficient on the direct-sold funds with stable distribution dummy at the 1% level. Perhaps helping to explain why they switch distribution, switchers' funds are also significantly less actively managed than other direct-sold funds before the switch, with higher average betas.

B. Are Families more Specialized by Investment Style in the Direct-sold Segment?

Mutual fund families must decide how many distinct investment styles to offer. Mutual fund investors who value "one-stop shopping" may prefer to invest with a large fund family that offers a variety of investment styles.[18] On the other hand, Siggelkow (2003), Massa (2003), and Ciccotello, Miles, and Walsh (2006) show empirically that investors pay for this convenience with lower risk-adjusted returns. Massa (2003) argues that this lower performance arises from diseconomies of scope in the co-production of fund variety and fund performance, so that families must choose whether to target investors who value variety or investors who value performance.

Given the greater sensitivity of investors in the direct-sold segment to risk-adjusted re-

turns, we expect direct-sold families to offer a narrower range of investment styles. To test this prediction, we use data on Morningstar investment styles between 1996 and 2002. Specifically, we compare two measures of style specialization for direct-sold families versus broker-sold families: the number of Morningstar styles offered by the family and the percentage of actively managed assets in the family's investment specialty.[19] We report statistics in Table IV for 1996 to 2002, and separately for 2002 (to match the sample period of data available for later tests).

For each family, we define its investment specialty as the Morningstar category in which it manages the most assets, and compute the percentage of actively managed domestic equity assets in this specialty style. On average in 2002, direct-sold families have 84.4% of their actively managed assets invested in their investment specialty Morningstar category versus 71.0% for broker-sold families (differences statistically significant at the 1% level). Further, direct-sold families offer funds in 2.2 different Morningstar style categories, versus 3.5 different categories for broker-sold families (differences statistically significant at the 1% level). Recognizing that larger fund families tend to offer more styles and are less concentrated by style, Table IV also reports comparisons of the family style focus measures after controlling for family size. We find that in both 2002 and the full sample period, direct-sold families are significantly more specialized by investment style than broker-sold families. These differences are consistent with direct-sold families making organizational decisions that help them better compete for investors who value alpha.

Table IV Here

Finally, we test for changes in the extent of specialization among the three families that switch from direct-sold to broker-sold. In column (4), we find that switchers are less concentrated than the typical direct-sold family both before and after the switch to the broker-sold segment (*p*-values of 0.022 and 0.000), but we cannot reject that the coefficients are equal before

and after the switch (*p*-value of 0.416). In column (8), we find that switchers offer more styles than the typical direct-sold family both before and after the switch (*p*-values of 0.000 and 0.000). In this case, we can reject that the coefficients are equal before and after the switch (*p*-value of 0.006). In other words, not only do we find that the three families that switch market segments are less specialized than the typical direct-sold family before the switch, but we also find some evidence that these families become even less specialized after the switch.

C. Are Direct-sold Funds Less Likely to Outsource Portfolio Management?

A mutual fund family can choose to manage a fund's portfolio in-house, using its own employees as portfolio managers, or it can choose to outsource portfolio management to an unaffiliated asset management firm via a subadvisory contract. For example, while the John Hancock II Value Fund is marketed and distributed to investors by John Hancock, the portfolio is managed by Invesco, an asset management firm with its own brand of in-house funds. Chen, Hong, and Kubik (2012) find that subadvised funds underperform in-house funds by 50 to 72 basis points per year, and conclude that it is more difficult to extract effort from subadvisors than from in-house managers. Duong (2010) and Chuprinin, Massa, and Schumacher (2011) find that subadvised funds underperform the subadvisor's own brand of in-house funds by 90 to 127 basis points per year, and conclude that the underperformance arises from cross-subsidization. Regardless of the mechanism, the fact that subadvised funds earn lower risk-adjusted returns than their peers should make subadvisors less attractive to direct-sold funds than to broker-sold funds. We test this prediction.

The SEC requires mutual funds to disclose to investors whether the portfolio is managed by a subadvisor. To identify the subset of actively managed domestic equity funds that hire (unaffiliated) subadvisors, we conduct text searches of all N-30D annual report filings in the SEC's EDGAR database in 2002 for variants of the word 'subadvisor' or subadvisory'.[20] In columns

(9) and (10) of Table IV, we estimate linear probability models predicting whether fund *i* employs a subadvisor in 2002. We find that direct-sold families are about half as likely to hire subadvisors as broker-sold families. Specifically, approximately 22% of broker-sold funds have a subadvisor versus approximately 12% of direct-sold funds (*p*-values of 0.047 and 0.055). This difference is consistent with direct-sold families being more likely to recognize the adverse effects of outsourcing on manager incentives and fund performance, and being less willing to sacrifice performance in order to meet other family objectives, such as expanding fund offerings to include investment styles outside of the family's current expertise.

D. Do Direct-sold Funds Employ Managers With Different Educational Backgrounds?

In this section, we exploit data on the educational backgrounds of mutual fund managers across a sample of actively managed domestic equity mutual funds in 2002. Our motivation is Chevalier and Ellison's (1999) finding that managers who attend undergraduate institutions with higher average student SAT scores earn higher risk-adjusted returns (see also Christoffersen and Sarkissian (2009) and Li, Zhang, and Zhou (2011)). To the extent that managers from these schools have greater ability and/or professional networks (or better outside options), they should cost more for mutual fund families to hire and retain. At the same time, these managers should be the most attractive to actively managed mutual funds with performance-sensitive investors, like those in the direct-sold segment. These considerations lead us to predict that direct-sold funds will be the most likely to employ analysts and managers from "better" undergraduate institutions. Because families have direct control only over the portfolio manager assigned to their in-house funds, we exclude subadvised funds from our tests.

We possess Morningstar data on the educational backgrounds of 654 actively managed domestic equity in-house fund managers working in 2002.[21] These managers attended 239 different undergraduate institutions. Of the 232 schools located in the United States, we are able to

obtain acceptance rates for 223, and the interquartile range of student math SAT scores for 206. Our source for these data is the U.S. Department of Education National Center for Education Statistics College Navigator website. Because these data reflect student characteristics in 2007, our maintained assumption is that acceptance rates and SAT scores have been relatively stable over time. We construct three dummy variable proxies for manager ability. The first dummy variable identifies if the manager has an undergraduate degree from one of the 25 colleges and universities with the lowest acceptance rates within our sample (ranging from 8.8% for Harvard to 24.5% for Notre Dame). To capture the quantitative nature of portfolio management, the other two dummy variables indicate whether the manager's degree is from a school with a mid-point math SAT score in the top quartile (above 650) or the bottom quartile (below 560) of the schools in our sample.

We test our prediction in Table V. The unit of observation is actively managed domestic equity fund *i* in 2002. For funds with multiple named managers, we equally weight our proxies for manager skill. For example, the dependent variable in columns (1) and (2) is the fraction of managers who attended a top 25 undergraduate institution. Because larger families may have the scale required to hire better managers, we report specifications that control for the natural log of family assets under management. We cluster standard errors on mutual fund family.

Table V Here

While we estimate that direct-sold funds are more likely to hire managers with degrees from the 25 most selective institutions relative to broker-sold fund, the difference is not significantly different from zero (*p*-value of 0.478). However, we do find that direct-sold funds are significantly more likely to employ managers from top-quartile math-SAT schools (61.1% versus 51.1%; *p*-value of 0.072), and significantly less likely to employ managers from bottom-quartile math-SAT schools (7.6% versus 15.2%; *p*-value of 0.030). While we recognize that these

school-level measures are noisy proxies for differences in manager ability, our findings are nevertheless consistent with funds in the direct-sold segment investing more in skilled portfolio managers. Inferences are unchanged when we control for family size.

Educational data also allow us to explore whether average differences in market risk across segments are related to average differences in manager education. When Chevalier and Ellison (1999) study the impact of MBA degrees on fund performance, they conclude that "the higher returns achieved by MBAs are entirely attributable to their greater holdings of systematic risk" (p. 877). Furthermore, Li, Zhang, and Zhou (2011) find no relation between a hedge fund's alpha and whether its manager has an MBA degree. Because direct-sold fund flow responds to risk-adjusted returns, if managers with MBA degrees are more expensive to hire, direct-sold funds should be less likely to hire them. Indeed, we find that funds in the direct-sold segment are less likely to hire managers with MBAs (54.1% versus 63.4%; *p*-value of 0.039), and more likely to hire managers with an advanced degree other than an MBA, such as a Ph.D. or JD (16.5% versus 11.4%; *p*-value of 0.083).

IV. There is no Puzzle of Active Management in the Direct-sold Segment

We conclude our empirical analysis by documenting that the persistent underperformance of actively managed funds is driven by broker-sold funds, which face (and internalize) a weaker incentive to generate alpha. The dependent variable in each regression in Table VI is fund *i*'s 4-factor alpha in month *t*. As in our earlier return regressions, we include a separate fixed effect for each investment objective-month pair, and we cluster standard errors on both month *t* and mutual fund family *j*.

We begin with a pooled regression that ignores the distinction between direct-sold and broker-sold funds. The independent variable of interest is a dummy variable indicating whether fund *i* is an index fund. To the extent that actively managed funds earn the same risk-adjusted,

Table VI Here

after-fee returns as index funds, the coefficient on the index fund dummy variable will be zero. This is the equilibrium condition implied by Grossman and Stiglitz (1980) and Berk and Green (2004). In contrast, we find that index funds outperform actively managed funds by 7.3 basis points per month (*p*-value of 0.049). The implied underperformance of 87 basis points per year is slightly higher than the 65 basis points estimated by Gruber (1996) and the 67 basis points estimated by French (2008), but quite close to the 83 basis point average difference in expense ratios within our sample. Therefore, when we ignore heterogeneity in the bundles of non-portfolio management services that retail investors receive, actively managed funds appear unable to earn back any of their incremental fees—a finding that is consistent with Malkiel (1995).

Limiting the sample to a single market segment allows us to hold constant the bundle of non-portfolio management services that retail investors receive. We start with the direct-sold segment, where differences in the fees charged by actively managed and index funds are likely to reflect differential investments in active management. In column (2), the index fund dummy variable measures the returns of direct-sold index funds relative to direct-sold actively managed funds with the same investment objective in the same month. The estimated coefficient on the index fund dummy variable is statistically indistinguishable from zero (*p*-value of 0.607). And, the estimated underperformance of 1.8 basis points per month is much smaller than the 6.9 basis point per month difference implied by the higher average expense ratios of actively managed funds (not reported). In other words, the average direct-sold actively managed fund appears to earn back its investment in active management, just as the models in Grossman and Stiglitz (1980) and Berk and Green (2004) predict.

The evidence of underperformance is different when we restrict the sample to the broker-sold segment. In column (3), among funds that bundle investments in portfolio management

with investments in broker services, active funds underperform by 9.3 basis points per month (*p*-value of 0.017). Interestingly, the estimated underperformance is even larger than the 5.7 basis points per month difference in average expense ratios, just as in Malkiel (1995) and Gil-Bazo and Ruiz-Verdu (2009). To the extent that broker-sold funds are investing their management fees in active management, they are doing so less successfully than comparable direct-sold funds.[22] However, to the extent that broker-sold funds are instead using their management fees to pay for distribution, we should not be surprised that higher fees drag down after-fee returns.

Note that these across-segment performance differences are robust to alternative specifications (reported in the Internet Appendix). When we estimate separate Fama MacBeth regressions for each market segment, the estimated underperformance of actively managed funds relative to index funds is 0.3 basis points per month in the direct-sold segment (*p*-value of 0.931) versus 10.1 basis points per month in the broker-sold segment (*p*-value of 0.011). When we restrict the sample to funds with tickers, Morningstar ratings, and Morningstar investment objectives (which limits the sample period to the years 1996 to 2002), the estimated underperformance of actively managed funds is 0.6 basis points per month in the direct-sold segment (*p*-value of 0.914) versus 11.0 basis points per month in the broker-sold segment (*p*-value of 0.064).

In the remaining columns of Table VI, we estimate pooled regressions that distinguish between actively and passively managed funds available in the two market segments. Excluding fund-level control variables, the estimated coefficients on the three dummy variables measure average risk-adjusted, after-fee performance relative to the average broker-sold actively managed fund (which is the omitted category). In column (4), we see that direct-sold actively managed funds outperform actively managed broker-sold funds by 8.5 basis points per month (*p*-value of 0.000). Moreover, the performance of direct-sold actively managed funds is statistically indis-

tinguishable from that of the index funds available in both segments. Finally, in column (5), when we control for the full set of fund characteristics, we find that direct-sold actively managed funds outperform broker-sold actively managed funds by 9.1 basis points per month (*p*-value of 0.002). We even find mild support for direct-sold actively managed funds outperforming direct-sold index funds (*p*-value of 0.068) and broker-sold index funds (*p*-value of 0.064). In contrast, we find no performance differences between broker-sold actively managed funds and any of the index funds. The implication is that broker-sold actively managed funds earn the average after-fee alphas one would expect given their (high) fees and other fund characteristics, whereas direct-sold actively managed funds significantly outperform.

V. Conclusion

While most mutual fund studies implicitly assume a homogeneous product market serving homogeneous investors, we demonstrate that the retail mutual fund market is more accurately described as a segmented market catering to two distinct types of investors. One segment serves self-directed investors focused on maximizing after-fee risk-adjusted performance, while the other segment caters to investors who are uncomfortable making investment decisions without the advice of their broker. The across-segment differences in investor and fund behavior that we document allow us to shed new light on both the underperformance of the average actively managed retail mutual fund and the continuing demand by retail investors for active management.

The direct-sold segment resembles the world of Berk and Green (2004). Investor dollars flow to direct-sold funds with higher after-fee alphas, direct-sold funds respond to these flow-based incentives by making a wide variety of operational decisions shown to increase alpha, and there is little evidence that actively managed funds underperform index funds. These findings underscore the need for mutual fund researchers to take mutual fund incentives into account

when studying mutual fund performance. In particular, estimates based on the full cross-section of mutual funds may lead researchers to overstate both the efficiency of financial markets and the deadweight costs of active management. In addition, because direct-sold funds have the strongest incentive to hire and incentivize skilled managers, tests for manager skill will be most powerful when they focus on the direct-sold segment.

The fact that underperformance is limited to the broker-sold segment helps to rationalize demand for active management in the direct-sold segment. But, it begs the question of why virtually all the assets in the broker-sold segment remain actively managed. Since retail investors who seek investment advice from brokers are likely ignorant of the underperformance (being the `disadvantaged' investors in Gruber (1996)), the question becomes why brokers continue to recommend that their clients invest in broker-sold actively managed funds, which provide the same bundle of portfolio management and advice as broker-sold index funds, but earn significantly lower after-fee returns. Findings from a burgeoning literature suggest that the most likely answer is an agency conflict between brokers and their clients.[23] However, given the discomfort that many investors reportedly face making financial decisions and bearing risk, it is unclear whether clients would be better off investing without their brokers. Regardless, our findings imply that the demand for investment advice from brokers is being transformed into demand for underperforming actively managed funds. Gaining a more complete understanding of investor welfare under different models of broker compensation is an important goal for future research.

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Table I. Summary Statistics

Panel A. Distribution of Domestic Equity Mutual Fund Assets across Market Segments (1992 and 2004)

The table below uses distribution channel data at the share class level from Financial Research Corporation (FRC) and data on TNA from the *CRSP Survivor-Bias-Free U.S. Mutual Fund Database* in 1992 and 2004. The first three columns report aggregate total net assets (TNA) in domestic equity mutual fund share classes from two major retail fund market segments: direct-sold and broker-sold, with each segment divided into actively managed funds and index funds. We exclude funds in CRSP that cannot be classified as direct-sold or broker-sold, which collectively represent 17.1% of assets invested in domestic equity funds over our sample period (8.4% are invested in institutional funds and the other 8.7% are invested in funds that are unclassified by FRC). We define domestic equity funds as those with a Standard and Poor's investment objective of aggressive growth (AGG), mid-cap growth (GMC), growth and income (GRI), growth (GRO), income and growth (ING), or small-cap growth (SCG). Market share within Segment is the percentage of aggregate TNA within the segment (direct-sold or broker-sold) that is actively managed versus passively managed, and should be read across the row. For each fund family, we define a family's primary segment as the segment with the largest percentage of family assets distributed through that segment. Number of Families is the number of families in the CRSP database that have at least one domestic equity mutual fund that are in that row's primary segment. For example, in 1992, 97 families have the direct-sold channel as their primary segment because this is segment through which they distribute the most TNA. Average % TNA in Primary Segment is the average across families of the % of family TNA that is distributed through the family's primary distribution segment.

	Aggregate TNA in Domestic Equity Mutual Funds ($Billions)			Market Share within Segment			Number of Families	Average % TNA in Primary Segment
	Active	Passive	Total	Active	Passive	Total		
1992								
Direct-sold	$154.1	$8.4	$162.4	94.8%	5.2%	100%	97	98.1%
Broker-sold	$148.4	$0.4	$148.8	99.7%	0.3%	100%	133	99.7%
Total	$302.4	$8.8	$311.2	97.2%	2.8%	100%	230	
2004								
Direct-sold	$984.6	$189.6	$1,174.2	83.9%	16.1%	100%	192	96.5%
Broker-sold	$779.0	$14.6	$793.7	98.2%	1.8%	100%	153	92.2%
Total	$1,763.6	$204.2	$1,967.8	89.6%	10.4%	100%	345	

Panel B. Fund-level Summary Statistics for Domestic Equity Mutual Funds (1992-2004)

This panel provides the mean and standard deviation of fund-level variables from CRSP. The unit of observation is domestic equity mutual fund *i* in month *t*. The sample begins in January 1992 and ends in December 2004, and is restricted to those funds that distribute at least 75% of their assets through either the direct-sold or broker-sold market segment.

	Num funds Per Year	Fund size ($Millions)		Expense ratio (%)		12b-1 fee (%)		Turnover (%)		After-fee Monthly Return (%)	
	Mean	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Actively Managed Funds											
Direct-sold	440.2	1,404.1	4,923.9	1.29	0.74	0.09	0.17	139.3%	517.6%	0.92	5.92
Broker-sold	615.7	839.5	3,279.3	1.57	1.29	0.40	0.27	89.1%	80.2%	0.80	5.46
Index Funds											
Direct-sold	26.3	3,637.8	12,211.6	0.44	0.36	0.02	0.07	25.0%	57.6%	0.78	5.02
Broker-sold	16.5	353.0	514.7	0.86	0.45	0.31	0.29	24.4%	31.3%	0.64	4.82

Table II. Monthly Flow-Performance Sensitivity Across Market Segments, Actively Managed funds (1993-2004)

These panels report coefficients from panel regressions where the dependent variable is monthly net percentage fund flow, using the standard definition of flow, the growth in TNA less capital appreciation. The unit of observation is actively managed domestic equity fund *i* in month *t*. All regressions include the following fund-level control variables, the coefficients of which are not reported: lagged expense ratio, lagged no-load fund dummy, lagged 12b-1 fee, lagged log of fund TNA, lagged log of family TNA, and current fund age measured in years. Column (1) contains all retail funds in either the direct-sold or broker-sold segments. The regression in column (1) contains investment objective-by-month fixed effects. The coefficients in columns (2) and (3) are from a single regression, where the coefficients in column (2) correspond to variables interacted with a direct-sold dummy, which is equal to one if 75% or more of fund *i*'s TNA is distributed through the Direct-sold channel. The regression in columns (2) and (3) include distribution market segment-by-investment objective-by-month fixed effects. Panel B adds dummy variables that indicate whether fund *i*'s net return in month *t-1* was in either the top or bottom 20% of funds within the same Standard and Poor's investment objective (but across segments), but otherwise is the same specification as Panel A. Observations where the absolute value of net flow is greater than 100% are deleted (less than 1% of the sample fit this definition). Standard errors are clustered on both fund family and month and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

Panel A. Base specification

	(1)	(2)	(3)
Dependent variable:	Net flow (t)	Net flow (t)	
Sample:	Both segments	Direct-sold	Broker-sold
Net flow (t-1)	0.206***	0.189***	0.229***
	(0.033)	(0.048)	(0.026)
Net return (t-1)	0.077**	0.040	0.135***
	(0.034)	(0.045)	(0.023)
4-factor Alpha (t-1)	0.107***	0.176***	0.021
	(0.032)	(0.049)	(0.020)
H_0: Coefficient on lagged net flows is equal to Direct			0.459
H_0: Coefficient on lagged net return is equal to Direct			0.032**
H_0: Coefficient on 4-factor alpha is equal to Direct			0.001***
Include fund-level controls?	Yes		Yes
Include fund-level controls by segment?	No		Yes
Include Investment-objective-by-month fixed effects?	Yes		Yes
Include Investment-objective-by-month-by segment fixed effects?	No		Yes
Sample size	122,111		122,111
R^2	0.0784		0.0887

Panel B. Specification that allows for non-linearities in sensitivity to raw returns

	(1)	(2)	(3)
Dependent variable:	Net flow (t)	Net flow (t)	
Sample:	Both segments	Direct-sold	Broker-sold
Net flow (t-1)	0.206***	0.188***	0.229***
	(0.027)	(0.049)	(0.026)
Net return (t-1)	0.019	-0.037	0.101***
	(0.041)	(0.052)	(0.030)
Net return (t-1) in Top 20%	0.591***	0.910***	0.266***
	(0.127)	(0.208)	(0.096)
Net return (t-1) in Bottom 20%	-0.343***	-0.522***	-0.177**
	(0.094)	(0.142)	(0.085)
4-factor Alpha (t-1)	0.092***	0.153***	0.014
	(0.029)	(0.043)	(0.020)
H_0: Coefficient on lagged net flows is equal to Direct			0.448
H_0: Coefficient on lagged net return is equal to Direct			0.008***
H_0: Coefficient on Top 20% Dummy is equal to Direct			0.003***
H_0: Coefficient on Bottom 20% dummy is equal to Direct			0.026**
H_0: Coefficient on 4-factor alpha is equal to Direct			0.001***
Include fund-level controls?	Yes		Yes
Include fund-level controls by segment?	No		Yes
Include Investment-objective-by-month fixed effects?	Yes		Yes
Include Investment-objective-by-month-by segment fixed effects?	No		Yes
Sample size	122,111		122,111
R^2	0.0794		0.0900

Table III. Monthly Fund Performance of Actively Managed Funds Across Market Segments (1993-2004)

The table below reports coefficients from panel regressions of fund *i*'s monthly performance on fund and family characteristics. The sample is restricted to non-specialty actively managed domestic equity funds operating between January 1993 and December 2004 for which we possess fund-level distribution channel data from FRC. The performance measure in column (1) is fund *i*'s 4-factor alpha estimated from net returns over the prior 24 months, while in column (2) it is fund i's return gap measure (i.e., the difference between fund i's gross returns and the gross returns predicted based on its lagged holdings, as calculated in Kacperczyk, Sialm, and Zheng (2008)). The dependent variable in column (3) identifies those funds with above-median values of active share and tracking error as calculated in Cremers and Petajisto (2009), where we allow the median value to vary across investment objective-year pairs. The fact that data on active share and tracking error are only available in those months that mutual funds disclose their holdings explains the smaller number of observations in column (3). In column (4), we measure a fund's 1-factor beta as the beta on the market portfolio in the one-factor model. All regressions in all panels include investment objective-by-month fixed effects and the following fund-level control variables: lagged expense ratio, lagged no-load fund dummy, lagged 12b-1 fee, lagged log of fund TNA, lagged log of family TNA, current turnover, current fund age measured in years, net flows into fund *i* between month *t-12* and *t-1*, and the standard deviation of net flows over this same period. The direct-sold fund dummy variable is equal to one if 75% or more of fund *i*'s TNA is distributed through the direct-sold segment, and zero otherwise. Thus, the omitted category is the funds distributed through the broker-sold segment. Panel B restricts the sample to actively managed small-cap growth funds, but is otherwise identical to Panel A. Panel C restricts the sample to direct-sold funds and replaces the direct-sold dummy variable with the fraction of family assets that are distributed in the direct-sold segment. Panel D contains the same funds as Panel A, but extends the distribution-related dummy variables to capture the fact that three mutual fund families switch from direct-sold to broker-sold distribution during our sample period (Strong, Columbia, and Scudder), and no families switch from broker-sold to direct-sold. Thus, Direct-sold with Stable Distribution dummy is equal to one for funds in families that remain direct-sold over the entire sample period. The Switcher when Direct-Sold dummy equals one in the months before the switch to broker-sold distribution, while the Switcher when Broker-sold dummy equals one in the months after the switch to broker-sold distribution. Columbia and Scudder switch to broker-sold distribution in January 2002, while Strong switches in January 2001. These three families manage 32 funds in 2001 (about 3.2% of all funds) and 49 funds in 2002 (4.4% of all funds). Standard errors are clustered on both fund family and month, and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

Panel A. All Actively Managed Domestic Equity funds

	(1)	(2)	(3)	(4)
Dependent variable:	4-Factor Alpha	Return Gap	Above-Median Active Share & Tracking Error?	1-Factor Beta
Direct-sold fund dummy (t)	0.096***	0.061***	0.098***	-0.042**
	(0.028)	(0.024)	(0.031)	(0.022)
Sample size	118,552	94,424	21,876	118,552
R^2	0.1143	0.0261	0.1362	0.1355

Table III. Monthly Fund Performance of Actively Managed Funds Across Market Segments (continued)

Panel B. Sample Restricted to Actively Managed Small-Cap Growth Funds

	(1)	(2)	(3)	(4)
Dependent variable:	4-Factor Alpha	Return Gap	Above-Median Active Share & Tracking Error?	1-Factor Beta
Direct-sold fund dummy (t)	0.174***	0.120***	0.104**	-0.106**
	(0.052)	(0.046)	(0.050)	(0.042)
Sample size	22,450	18,489	4,463	22,450
R^2	0.1783	0.0198	0.1760	0.1330

Panel C. Sample Restricted to Direct-sold Active Domestic Equity Funds

	(1)	(2)	(3)	(4)
Dependent variable:	4-Factor Alpha	Return Gap	Above-Median Active Share & Tracking Error?	1-Factor Beta
Fraction Family Assets in Direct-sold (t)	0.146*	0.168***	0.148*	0.010
	(0.084)	(0.053)	(0.084)	(0.057)
Sample size	48,955	41,002	8,806	48,955
R^2	0.0977	0.0362	0.1962	0.0823

Table III. Monthly Fund Performance of Actively Managed Funds Across Market Segments (continued)

Panel D. Active Domestic Equity Funds Switching from Direct-sold to Broker-Sold

	(1)	(2)	(3)	(4)
Dependent variable:	4-Factor Alpha	Return Gap	Above-Median Active Share & Tracking Error?	1-Factor Beta
Direct-sold fund with Stable Distribution dummy (t)	0.096***	0.064**	0.088***	-0.040*
	(0.029)	(0.025)	(0.032)	(0.023)
Switcher when Direct-sold dummy (t)	0.013	0.042	-0.124**	0.027
	(0.045)	(0.095)	(0.057)	(0.032)
Switcher when Broker-sold dummy (t)	-0.021	-0.052	0.030	-0.001
	(0.036)	(0.046)	(0.084)	(0.029)
H_0: Before switch = After switch	0.418	0.192	0.096*	0.472
H_0: Before switch: Switcher =Direct	0.107	0.829	0.000***	0.029**
H_0: After switch: Switcher = Direct	0.001***	0.003***	0.495	0.216
Sample size	118,552	97,229	21,876	118,552
R^2	0.1143	0.0254	0.1372	0.1355

Table IV. Fund Family Specialization by Morningstar Investment Style and Use of Subadvisors Across Market Segments

This table contains regressions of measures of family specialization by Morningstar investment style on market segment dummies and on family TNA in actively managed funds. In columns (1) through (4) the dependent variable is the maximum fraction of family assets in a single Morningstar style. To compute this we aggregate the TNA of each actively managed domestic equity fund of a family for each of the nine Morningstar styles (small-cap growth, large-cap value, etc.) to compute the fraction of assets in each style. In columns (5) through (8) the dependent variable is the number of different styles offered by the family, which ranges from one to nine. The omitted category is a dummy variable equal to one if the family's primary market segment is broker-sold. The specifications in columns (4) and (8) mirror those in Table III Panel D. In columns (9) and (10) the dependent variable is a dummy variable equal to one if the portfolio management of the fund is outsourced to an unaffiliated asset management firm via a subadvisory contract. Columns (1), (2), (5), and (6) use only data from 2002 to match samples in columns (9) and (10). Columns (3), (4), (7), and (8) use data from 1996 to 2002, which is the period for which we possess data on Morningstar style categories. We include year fixed-effects whenever the sample period is more than one year. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Maximum fraction of assets in single Morningstar style				Number of Morningstar styles offered by the mutual fund family (ranges from 1-9)				Is the fund managed by a subadvisor?	
Sample period:	2002	2002	1996-2002	1996-2002	2002	2002	1996-2002	1996-2002	2002	2002
Direct-sold family dummy (t)	0.134***	0.098***	0.069***		-1.296***	-0.843***	-0.497**		-0.105**	-0.107*
	(0.027)	(0.024)	(0.017)		(0.256)	(0.185)	(0.131)		(0.053)	(0.055)
Direct-sold family with stable distribution dummy (t)				0.067***				-0.469***		
				(0.017)				(0.131)		
Switcher when direct-sold (t)				-0.117				1.369***		
				(0.079)				(0.465)		
Switcher when broker-sold (t)				-0.180***				2.978***		
				(0.020)				(0.393)		
Ln Family TNA in Active funds (t-1)		-0.045***	-0.044***	-0.044***		0.568***	0.533***	0.524***		-0.002
		(0.004)	(0.003)	(0.003)		(0.042)	(0.035)	(0.035)		(0.009)
Constant	0.710***	0.974***	1.030***	1.028***	3.500***	0.180	-0.421***	-0.398***	0.221***	0.235***
	(0.022)	(0.027)	(0.020)	(0.020)	(0.210)	(0.244)	(0.196)	(0.197)	(0.042)	(0.086)
Sample size	295	295	2,105	2,105	295	295	2,105	2,105	1,243	1,198
R^2	0.0788	0.3185	0.2925	0.2959	0.0855	0.5249	0.5130	0.5213	0.0190	0.0193

Table V. Mutual Fund Manager Educational Backgrounds Across Market Segments (2002)

This table uses Morningstar data on the educational backgrounds of actively managed domestic equity fund managers in 2002. For each of the 654 managers directly employed by a mutual fund family, we observe the name of the undergraduate college or university whether the manager later earned an MBA, or some other advanced degree (PhD, JD, MD). We obtain (recent) admissions rates for 243 of the 276 different undergraduate institutions from U.S. Department of Education's National Center for Education Statistics College Navigator website. We obtain the interquartile range of (recent) student math SAT scores for 251 undergraduate institutions. We classify schools as being in the top (bottom) quartile of math SAT scores when the midpoint of the interquartile range is above 650 (below 560). Each column is a separate regression and the omitted variable is a dummy variable indicating that at least 75% of the TNA of the fund is distributed through the institutional segment. The dependent variable in column (1) and (2) is the fraction of a fund's portfolio managers who attended one of the 25 most selective U.S. undergraduate institutions (based on admission rates). In columns (3) through (6) it is the fraction of the fund's managers that attended undergraduate institutions within the top and bottom quartiles of the math SAT score distribution. In Columns (7) and (8), it is the fraction of a fund's managers that obtained an MBA. In columns (9) and (10) it is the fraction of the fund's managers that report having an advanced degree other than an MBA (PhD, JD, M.A., M.S.). We cluster standard errors on mutual fund family, and report them in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	% Managers from Top 25 US School		% Managers from US School with Math SAT scores in Top Quartile		% Managers from US School with Math SAT scores in Bottom Quartile		% Managers that report having an MBA		% Managers that report having other advanced degree	
Direct-sold fund dummy	0.030	0.027	0.100*	0.094*	-0.066**	-0.062**	-0.093**	-0.096**	0.051*	0.050*
	(0.043)	(0.040)	(0.055)	(0.051)	(0.030)	(0.029)	(0.045)	(0.041)	(0.029)	(0.029)
Ln Family TNA in Actively managed funds		0.024***		0.044***		-0.022***		0.021**		0.004
		(0.007)		(0.010)		(0.007)		(0.009)		(0.006)
Constant	0.259***	0.061	0.511***	0.149*	0.152***	0.331***	0.634***	0.465***	0.114***	0.081
	(0.029)	(0.061)	(0.039)	(0.084)	(0.021)	(0.063)	(0.029)	(0.079)	(0.021)	(0.051)
Sample size	618	618	597	597	597	597	618	618	618	618
R^2	0.0014	0.0231	0.0116	0.0694	0.0117	0.0453	0.0110	0.0246	0.0067	0.0077

Table VI. Monthly Fund 4-Factor Alphas of Actively Managed and Index Funds Across Market Segments (1993-2004)

The table below reports coefficients from panel regressions of fund *i*'s monthly 4-factor alpha on fund and family characteristics in a sample of domestic equity funds operating between January 1993 and December 2004 for which we possess distribution channel data from FRC. Fund *i*'s 4-factor alpha is estimated from net returns over the prior 24 months. The Index fund dummy variable equals one if fund *i* is passively managed, and the Active dummy variables equal one if fund *i* is actively managed. The Direct-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the direct-sold channel. The Broker-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the Broker-sold channel. Column (1) contains all retail funds, while columns (2) and (3) are restricted to funds in the direct-sold or broker-sold segments. Columns (4) and (5) include funds from both segments. All regressions include CRSP Standard and Poor's investment category-by-month fixed effects. Column (5) also includes the following fund-level control variables: lagged expense ratio, lagged no-load fund dummy, lagged 12b-1 fee, lagged log of fund TNA, lagged log of family TNA, current turnover, current fund age measured in years, net flows into fund *i* between month *t-12* and *t-1*, and the standard deviation of net flows over this same period. Standard errors are clustered on both month and family and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)
Dependent variable:	4-Factor Alpha (t)				
Sample:	Both segments	Direct-sold	Broker-sold	Both segments	
Index fund dummy (t)	0.073**				
	(0.034)				
Active fund dummy (t)	*Omitted category*				
Direct-sold dummy (t) * Index fund (t)		0.018		0.114***	0.005
		(0.035)		(0.038)	(0.045)
Direct-sold dummy (t) * Active fund (t)		*Omitted category*		0.085***	0.091***
				(0.023)	(0.029)
Broker-sold dummy (t) * Index fund (t)			0.093**	0.093**	-0.002
			(0.039)	(0.040)	(0.042)
Broker-sold dummy (t)) * Active fund (t)			*Omitted category*	*Omitted category*	*Omitted category*
Fund level control variables?	No	No	No	No	Yes
Investment objective*Month fixed effects?	Yes	Yes	Yes	Yes	Yes
Sample size	122,833	51,469	71,364	122,833	122,833
R^2	0.1135	0.0974	0.1458	0.1137	0.1153

Internet Appendix for "Mutual Fund Performance and the Incentive to Generate Alpha"[*]

In Table AI, we replicate the summary statistics reported in Table I, except that we add the institutional segment. We classify a fund as being institutional when at least 75% of its assets are sold through share classes focused on that segment. Collectively, institutional funds manage a relatively small 8.4% of the assets invested in nonspecialized domestic equity. Notably, 26.9% of institutional assets are invested in passive index funds, and both actively managed and index institutional funds have the lowest average expense ratio of the three segments.

In Table AII, we replicate the panel regressions of monthly fund flow on past performance measures reported in Table II, except that we expand the sample to include the institutional segment. To establish the robustness of our findings in Table II, we also include specifications that omit lagged fund flows or fund-level controls. For each specification, the table reports the coefficients on the control variables that were included but unreported in Table II. In columns (8), (9), and (10), we find that fund flows in the institutional segment behave similarly to broker-sold funds in that they are significantly related to lagged raw returns, and insignificantly related to risk-adjusted returns. Like broker-sold funds, the coefficient on risk-adjusted returns is significantly different from the coefficient in the direct-sold segment (*p*-values of 0.029, 0.027, and 0.039 in columns (8), (9), and (10)). None of our earlier inferences on the broker-sold and direct-sold segments change.

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In Table AIII, we report the results of regressions intended to match the specification reported in Table VI of Bergstresser, Chalmers, and Tufano (2009), where they test for differences in return chasing behavior across the broker-sold and direct-sold segments. They regress flows in calendar year *t* on raw returns in calendar year *t* and calendar year *t-1*, and find that the sensitivity of flows to raw returns is similar in both segments. Their evidence is not directly comparable to ours because they report results based on annual flows and do not include risk-adjusted performance measures in their regressions. Specifications (2) and (4) are intended to match their specification as closely as possible, where they separately estimate flow sensitivity to positive performance. When we control only for raw returns in specifications (1) and (2), we also find that the sensitivity of flows to raw returns is similar in the direct-sold and broker-sold segments. When we simultaneously control for raw returns and 4-factor alphas in specifications (3) and (4), however, we find that sensitivity of flows to 4-factor alphas is limited to the direct-sold segment. Note that while the estimated sensitivity of flows to alpha in the direct-sold segment tends to be higher than the estimated sensitivity of flows to raw returns in the broker-sold segment, we cannot reject Bergstresser, Chalmers, and Tufano's finding that the overall tendency to chase past returns is at least as strong in the broker-sold segment. This is because a one-standard deviation increase in 4-factor alpha (2.56%) is smaller than a one-standard deviation increase in raw returns (5.61%).

Table AIV replicates Table III, except that we include institutional funds, and include in the regression a dummy variable equal to one if the fund is institutional. The omitted dummy is the indicator variable for broker-sold funds. We also report the coefficients on the control variables that were included but unreported in Table III. None of our inferences on the broker-sold and direct-sold segments change. Regarding the institutional segment, we find that active share

is significantly lower than in the broker-sold segment. Both 4-factor alpha and active share are significantly higher in the direct-sold segment relative to the institutional segment (*p*-values of 0.000 in both cases), while return gap and 1-factor beta are not significantly different across the two segments.

Table AV replicates Table III Panels A and B, except that we restrict the sample to funds with a ticker, Morningstar rating (which ensures the fund is at least three years old), and Morningstar investment objective. This filter eliminates 43.2% of our fund-month observations, primarily because it limits our sample period to the years 1996 to 2002. This specification is intended to show that our results are not driven by incubation bias (Evans (2010)). The results are similar to those of Panels A and B of Table III, with only a few exceptions. In Panel B, within the sample of small cap funds, the difference in the 4-factor alphas of direct-sold and broker-sold funds increases from 17.4 to 22.5 basis points per month (*p*-value of 0.020), and the difference in return gaps increases from 12.0 to 27.5 basis points per month (*p*-value of 0.000). On the other hand, we do not find that the one-factor betas of direct-sold funds are significantly different from those of broker-sold funds. This suggests that the tilt toward higher betas in the full sample might be driven by the incubation of broker-sold funds.

Table AVI replicates Table VI, except that we report in column (4) the results of a regression where we restrict the sample to institutional funds. We also report the coefficients on the control variables that are included, but not reported, in Table VI. The dependent variable is fund *i*'s 4-factor alpha in month *t*, which we estimate using fund *i*'s after-fee returns over the prior 24 months. The independent variable of interest is a dummy variable indicating whether fund *i* is an index fund. In column (4), we find that the estimated difference in performance for institutional index funds is slightly smaller than in the full sample (5.5 basis points per month)

but also statistically indistinguishable from zero (p-value of 0.263). We note that the estimated difference in risk-adjusted after-fee returns is almost exactly equal to the 5.3 basis point difference in fees. In columns (4) and (5), we pool all of the observations, but distinguish between actively and passively managed funds available in the three different market segments.

Excluding fund-level control variables, the estimated coefficients on the five dummy variables measure average risk-adjusted, after-fee performance relative to the average broker-sold actively managed fund (which is the omitted category). In column (5), we see that the results on direct-sold actively managed funds relative to broker-sold funds are similar to those in Table VI. In column (5), the performance of direct-sold actively managed funds is statistically indistinguishable from the performance of the index funds available in all three segments. In addition, while we estimate that broker-sold actively managed funds underperform institutional actively managed funds by 2.3 basis points per month, this difference is not significant (p-value of 0.362). In column (6), we include control variables and find that inferences do not change from Table VI.

Table AVII repeats the analysis of Table VI, but using the methodology of Fama and MacBeth (1973), while Table AVIII restricts the sample to funds with a ticker, Morningstar rating, and Morningstar investment objective. In both tables, we find similar results to those in Table VI. In Table AVII, the estimated underperformance of actively managed funds relative to index funds is 0.3 basis points per month in the direct-sold segment (p-value of 0.931) versus 10.1 basis points per month in the broker-sold segment (p-value of 0.011). In Table AVIII, the estimated underperformance of actively managed funds is 0.6 basis points per month in the direct-sold segment (p-value of 0.914) versus 11.0 basis points per month in the broker-sold segment (p-value of 0.064). The one exception is in column (1) of Table AVIII, when we estimate a

pooled regression on. the smaller sample of funds with a ticker and Morningstar data. The estimated underperformance of actively managed funds relative to index funds matches the estimate of 6.6 basis points per month in Table AVII, but is not statistically significant (*p*-value of 0.155).

Table AI. Summary Statistics

Panel A. Distribution of Domestic Equity Mutual Fund Assets across Three Market Segments (1992 and 2004)

The table replicates the summary statistics in Panel A of Table I, and adds statistics for the institutional market segment. Panel below uses distribution channel data at the share class level from Financial Research Corporation (FRC) and data on TNA from the *CRSP Survivor-Bias-Free U.S. Mutual Fund Database* in 1992 and 2004. The first three columns report aggregate total net assets (TNA) in domestic equity mutual fund share classes from three major fund market segments: direct-sold, broker-sold, and institutional, with each segment divided into actively managed funds and index funds. We exclude funds in CRSP that cannot be classified as direct-sold, broker-sold, or institutional, which collectively represent 7.8% of assets invested in domestic equity funds. We define domestic equity funds as those with a Standard and Poor's investment objective of aggressive growth (AGG), mid-cap growth (GMC), growth and income (GRI), growth (GRO), income and growth (ING), or small-cap growth (SCG). Market share within Segment is the percentage of aggregate TNA within the segment (direct-sold, broker-sold, or institutional) that is actively managed versus passively managed, and should be read across the row. For each fund family, we define a family's primary segment as the segment with the largest percentage of family assets distributed through that segment. Number of Families is the number of families in the CRSP database that have at least one domestic equity mutual fund that are in that row's primary segment. For example, in 1992, 97 families have the direct-sold channel as their primary segment because this is segment through which they distribute the most TNA. Average % TNA in Primary Segment is the average across families of the % of family TNA that is distributed through the family's primary distribution segment.

	Aggregate TNA in Domestic Equity Mutual Funds			Market Share within Segment			Number of Families	Average % TNA in Primary Segment
	Active	Passive	Total	Active	Passive	Total		
1992								
Direct-sold	$154.1	$8.4	$162.4	94.8%	5.2%	100%	97	98.1%
Broker-sold	$148.4	$0.4	$148.8	99.7%	0.3%	100%	133	99.7%
Institutional	$10.6	$3.9	$14.5	73.1%	26.9%	100%	26	98.9%
Total	$313.0	$12.7	$325.7	96.1%	3.9%	100%	256	
2004								
Direct-sold	$984.6	$189.6	$1,174.2	83.9%	16.1%	100%	192	96.5%
Broker-sold	$779.0	$14.6	$793.7	98.2%	1.8%	100%	153	92.2%
Institutional	$156.2	$75.0	$231.2	67.6%	32.4%	100%	78	82.8%
Total	$1,919.8	$279.2	$2,199.0	87.3%	12.7%	100%	423	

Panel B. Fund-level Summary Statistics for Domestic Equity Mutual Funds in Three Market Segments (1992-2004)

The table replicates the summary statistics in Panel B of Table I, and adds statistics for the institutional market segment. This table provides the mean and standard deviation of fund-level variables from CRSP. The unit of observation is domestic equity mutual fund *i* in month *t*. The sample begins in January 1992 and ends in December 2004, and is restricted to those funds that distribute at least 75% of their assets through either the direct-sold, broker-sold, or institutional market segment.

	Num funds Per Year	Fund size ($Millions)		Expense ratio (%)		12b-1 fee (%)		Turnover (%)		After-fee Monthly Return (%)	
	Mean	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
Actively Managed Funds											
Direct-sold	440.2	1404.1	4923.9	1.29	0.74	0.09	0.17	139.3%	517.6%	0.92	5.92
Broker-sold	615.7	839.5	3279.3	1.57	1.29	0.40	0.27	89.1%	80.2%	0.80	5.46
Institutional	253.8	334.2	518.3	0.99	0.44	0.09	0.16	83.5%	67.2%	0.88	5.45
Index Funds											
Direct-sold	26.3	3637.8	12211.6	0.44	0.36	0.02	0.07	25.0%	57.6%	0.78	5.02
Broker-sold	16.5	353.0	514.7	0.86	0.45	0.31	0.29	24.4%	31.3%	0.64	4.82
Institutional	26.2	1543.0	4628.8	0.37	0.17	0.07	0.15	24.7%	36.8%	0.80	4.61

Table AII. Monthly Flow-Performance Sensitivity Across Three Market Segments, Actively Managed funds (1993-2004)

These panels replicate panel regressions reported in Table II. Columns (1), (2), and (5) below replicate columns (1), (2), and (3) in Table II, except that here we report the coefficients on the fund-level control variables. Columns (3) and (6) below are the same specification, except that we omit lagged net flow as an independent variable. Columns (4) and (7) below omit all control variables. Columns (8) through (10) contain the analogous results for the institutional market segment. In each column, the dependent variable is monthly net percentage fund flow, using the standard definition of flow, the growth in TNA less capital appreciation. The unit of observation is actively managed domestic equity fund *i* in month *t*. The regression in column (1) contains investment objective-by-month fixed effects. The regressions in columns (2) through (10) include distribution market segment-by-investment objective-by-month fixed effects. Panel B adds dummy variables that indicate whether fund *i*'s net return in month *t-1* was in either the top or bottom 20% of funds within the same Standard and Poor's investment objective (but across segments), but otherwise is the same specification as Panel A. Observations where the absolute value of net flow is greater than 100% are deleted (less than 1% of the sample fit this definition). Standard errors are clustered on both fund family and month and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

Panel A. Base specification

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Net Flow (t)	Net Flow (t)								
Sample:	All segments	Direct-sold	Direct-sold	Direct-sold	Broker-sold	Broker-sold	Broker-sold	Institutional	Institutional	Institutional
Net flow (t-1)	0.197***	0.189***		0.191***	0.229***		0.266***	0.156***		0.172***
	(0.026)	(0.048)		(0.048)	(0.027)		(0.026)	(0.018)		(0.018)
Net return (t-1)	0.079**	0.040	0.081	0.032	0.135***	0.167***	0.140***	0.068**	0.080**	0.073*
	(0.032)	(0.045)	(0.060)	(0.047)	(0.023)	(0.029)	(0.022)	(0.034)	(0.038)	(0.038)
4-factor Alpha (t-1)	0.101***	0.176***	0.174***	0.185***	0.021	0.022	0.032	0.053	0.045	0.060
	(0.030)	(0.049)	(0.052)	(0.050)	(0.020)	(0.024)	(0.021)	(0.037)	(0.044)	(0.043)
No-load fund?	0.056	0.101	-0.033		-0.202*	-0.242*		0.106	0.157	
	(0.095)	(0.240)	(0.332)		(0.119)	(0.149)		(0.156)	(0.180)	
Lagged expense ratio	0.034	-0.116	-0.031		0.029	0.117*		0.073	0.130	
	(0.037)	(0.114)	(0.132)		(0.041)	(0.063)		(0.134)	(0.162)	
Lagged 12b-1 fee	0.251	0.065	-0.355		0.245	0.237		1.330*	1.489	
	(0.190)	(0.488)	(0.719)		(0.232)	(0.293)		(0.808)	(0.908)	
Lagged Ln Fund TNA	-0.029	-0.041	-0.010		-0.080**	-0.052		0.018	0.061	
	(0.034)	(0.051)	(0.072)		(0.040)	(0.050)		(0.094)	(0.106)	
Lagged Ln Family TNA	0.067***	0.066*	0.071		0.108***	0.126***		-0.026	-0.042	
	(0.026)	(0.038)	(0.049)		(0.034)	(0.044)		(0.062)	(0.062)	
Fund Age in Years	-0.022***	-0.037***	-0.045***		-0.016***	-0.022***		-0.065***	-0.080***	

	(0.002)	(0.005)	(0.005)		(0.002)	(0.003)		(0.016)	(0.019)	
H_0: Coefficient on lagged net flows is equal to Direct					0.460		0.158	0.527		0.706
H_0: Coefficient on lagged net return is equal to Direct					0.033**	0.124	0.015**	0.583	0.983	0.463
H_0: Coefficient on 4-factor alpha is equal to Direct					0.001***	0.002***	0.001***	0.029***	0.027**	0.037***
Include Investment-objective-by-month fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Include Investment-objective-by-month-by segment fixed effects?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	149,607	149,607	150,039	169,254	149,607	150,039	149,607	149,607	150,039	169,254
R^2	0.0683	0.0853	0.0483	0.0835	0.0853	0.0483	0.0853	0.0853	0.0483	0.0835

Panel B. Specification that allows for non-linearities

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Dependent variable:	Net Flow (t)	Net Flow (t)								
Sample:	All segments	Direct-sold	Direct-sold	Direct-sold	Broker-sold	Broker-sold	Broker-sold	Institu-tional	Institu-tional	Institu-tional
Net flow (t-1)	0.197***	0.188***		0.190***	0.229***		0.266***	0.156***		0.172***
	(0.026)	(0.049)		(0.048)	(0.026)		(0.026)	(0.018)		(0.018)
Net return (t-1)	0.028	-0.037	-0.005	-0.044	0.101***	0.134***	0.109***	0.046	0.052	0.052
	(0.039)	(0.052)	(0.069)	(0.052)	(0.030)	(0.037)	(0.028)	(0.039)	(0.043)	(0.043)
Net return (t-1) in Top 20%	0.509***	0.910***	1.013***	0.896***	0.266***	0.276***	0.271***	0.160	0.204	0.218
	(0.115)	(0.208)	(0.224)	(0.182)	(0.096)	(0.107)	(0.095)	(0.139)	(0.140)	(0.140)
Net return (t-1) in Bottom 20%	-0.292***	-0.522***	-0.574***	-0.510***	-0.177**	-0.164*	-0.134*	-0.134	-0.162	-0.047
	(0.086)	(0.142)	(0.182)	(0.133)	(0.085)	(0.096)	(0.082)	(0.128)	(0.138)	(0.128)
4-factor Alpha (t-1)	0.087***	0.153***	0.150***	0.161***	0.014	0.016	0.026	0.047	0.038	0.055
	(0.027)	(0.043)	(0.045)	(0.044)	(0.020)	(0.024)	(0.021)	(0.036)	(0.044)	(0.043)
No-load fund?	0.049	0.089	-0.046		-0.201*	-0.241		0.104	0.155	
	(0.095)	(0.239)	(0.331)		(0.119)	(0.149)		(0.156)	(0.180)	
Lagged expense ratio	0.030	-0.121	-0.037		0.026	0.115*		0.073	0.129	
	(0.037)	(0.114)	(0.132)		(0.041)	(0.063)		(0.136)	(0.164)	
Lagged 12b-1 fee	0.256	0.086	-0.331		0.245	0.237		1.328*	1.488	
	(0.190)	(0.484)	(0.715)		(0.232)	(0.292)		(0.806)	(0.906)	
Lagged Ln Fund TNA	-0.029	-0.042	-0.011		-0.079**	-0.051		0.018	0.062	
	(0.034)	(0.050)	(0.072)		(0.040)	(0.050)		(0.094)	(0.106)	
Lagged Ln Family TNA	0.068***	0.068*	0.073		0.109***	0.126***		-0.026	-0.042	
	(0.026)	(0.038)	(0.049)		(0.034)	(0.044)		(0.062)	(0.062)	
Fund Age in Years	-0.022***	-0.036***	-0.045***		-0.016***	-0.022***		-0.065***	-0.080***	
	(0.002)	(0.005)	(0.005)		(0.002)	(0.003)		(0.016)	(0.019)	
H_0: Coefficient on lagged net flows is equal to Direct					0.448		0.154	0.543		0.726
H_0: Coefficient on lagged net return					0.008***	0.031**	0.002***	0.150	0.428	0.116

is equal to Direct										
H_0: Coefficient on Top 20% Dummy is equal to Direct					0.004***	0.002***	0.001***	0.001***	0.001***	0.002***
H_0: Coefficient on Bottom 20% dummy is equal to Direct					0.026**	0.030**	0.008***	0.039**	0.068*	0.015**
H_0: Coefficient on 4-factor alpha is equal to Direct					0.001***	0.001***	0.001***	0.035**	0.033**	0.056*
Include Investment-objective-by-month fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Include Investment-objective-by-month-by segment fixed effects?	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	149,607	149,607	150,039	169,254	149,607	150,039	149,607	149,607	150,039	169,254
R^2	0.0691	0.0863	0.0495	0.0844	0.0863	0.0495	0.0853	0.0863	0.0495	0.0844

Table AIII. Monthly flow-performance sensitivity using specification in Bergstresser, Chalmers, and Tufano (2009)

This table reports panel regressions where the dependent variable is monthly net percentage fund flow, using the standard definition of flow, the growth in TNA less capital appreciation. The unit of observation is actively managed fund *i* in month *t*. All regressions include the following fund-level control variables interacted with market segment fixed effects, the coefficients of which are not reported: lagged expense ratio, lagged no-load fund dummy, lagged 12b-1 fee, lagged log of fund TNA, lagged log of family TNA, and current fund age measured in years. All regressions also include market segment-by-investment objective-by-month fixed effects. The specification is intended to match Table 6 of Bergstresser, Chalmers, and Tufano (2009), except that we use monthly flow instead of annual flow, and we exclude index funds. Standard errors are clustered on both fund family and month and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)		(2)		(3)		(4)	
Dependent variable:	Net flow (t)		Net flow (t)		Net flow (t)		Net flow (t)	
Sample:	Direct-sold	Broker-sold	Direct-sold	Broker-sold	Direct-sold	Broker-sold	Direct-sold	Broker-sold
Net flow (t-1)	0.188***	0.228***	0.187***	0.227***	0.188***	0.228***	0.187***	0.227***
	(0.048)	(0.026)	(0.048)	(0.026)	(0.048)	(0.026)	(0.048)	(0.026)
Net return (t-1)	0.114***	0.146***	0.025	0.132***	0.042	0.135***	0.027	0.120***
	(0.037)	(0.018)	(0.037)	(0.023)	(0.045)	(0.023)	(0.035)	(0.025)
Net return (t-1) * Net return (t-1) > 0?			0.134***	0.038			0.123**	-0.027
			(0.053)	(0.053)			(0.054)	(0.061)
4-factor Alpha (t-1)					0.174***	0.021	0.169***	0.028
					(0.048)	(0.020)	(0.056)	(0.025)
4-factor Alpha (t-1) * 4-factor Alpha (t-1) > 0?							0.005	-0.014
							(0.058)	(0.038)
H_0: Coefficients on lagged net return equal across segments?		0.370		0.069*		0.034**		0.013**
H_0: Coefficients on positive lagged net return equal across segments?				0.690				0.251
H_0: Coefficients on 4-factor alpha equal across segments?						0.001***		0.014**
H_0: Coefficients on positive 4-factor alpha equal across segments?								0.004***
Sample size		126,537		126,537		126,537		126,537
R^2		0.0870		0.0874		0.0885		0.0888

Table AIV. Monthly Fund Performance of Actively Managed Funds Across Three Market Segments (1993-2004)

The table below replicates the panel regressions in Panel A of Table III, except that the sample below also includes funds in the institutional market segment, and the regressions include a dummy variable indicating an institutional fund. We also report coefficients on the control variables that were not reported in Table III. The sample is restricted to non-specialty actively managed domestic equity funds operating between January 1993 and December 2004 for which we possess fund-level distribution channel data from FRC. The performance measure in column (1) is fund *i*'s 4-factor alpha estimated from net returns over the prior 24 months, while in column (2) it is fund i's return gap measure (i.e., the difference between fund i's gross returns and the gross returns predicted based on its lagged holdings, as calculated in Kacperczyk, Sialm, and Zheng (2008)). The dependent variable in column (3) identifies those funds with above-median values of active share and tracking error as calculated in Cremers and Petajisto (2009), where we allow the median value to vary across investment objective-year pairs. The fact that data on active share and tracking error are only available in those months that mutual funds disclose their holdings explains the smaller number of observations in column (3). In column (4), we measure a fund's 1-factor beta as the beta on the market portfolio in the one-factor model. All regressions include investment objective-by-month fixed effects. The distribution segment dummy variables are equal to one if 75% or more of fund *i*'s TNA is distributed through that segment. Standard errors are clustered on both fund family and month, and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

Panel A. All Actively Managed Domestic Equity funds

	(1)	(2)	(3)	(4)
Dependent variable:	4-Factor Alpha	Return Gap	Above-Median Values of Active Share & Tracking Error?	1-Factor Beta
Direct-sold fund dummy (t)	0.076***	0.068***	0.079***	-0.038*
	(0.028)	(0.025)	(0.030)	(0.022)
Institutional fund dummy (t)	-0.031	0.036	-0.051*	-0.009
	(0.021)	(0.022)	(0.030)	(0.017)
No-load fund?	-0.009	-0.005	0.037	0.023
	(0.027)	(0.018)	(0.029)	(0.016)
Lagged expense ratio	-0.101**	-0.021	0.240***	0.042***
	(0.040)	(0.032)	(0.030)	(0.009)
Lagged 12b-1 fee	0.040	0.097**	-0.141**	0.037
	(0.073)	(0.048)	(0.070)	(0.027)
Lagged Ln Fund TNA	-0.025***	-0.030***	-0.010	0.008**
	(0.010)	(0.006)	(0.008)	(0.005)
Lagged Ln Family TNA	0.009	0.029***	-0.030***	0.008**
	(0.007)	(0.005)	(0.007)	(0.004)

Lagged Portfolio Turnover	0.000*	0.000	9.190	5.830
	(0.000)	(0.000)	(0.000)	(0.000)
Fund Age in Years	-0.001	0.000	0.001	0.000
	(0.001)	(0.000)	(0.001)	(0.000)
Lagged Net Flow	0.001**	0.000	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Lagged Standard Deviation of Net Flow	-0.004	-0.001	0.012*	-0.010*
	(0.009)	(0.007)	(0.006)	(0.005)
Investment Objective-by-Month fixed effects?	Yes	Yes	Yes	Yes
Fund-level control variables?	Yes	Yes	Yes	Yes
Sample size	144,896	115,675	26,648	144,896
R^2	0.1246	0.0240	0.1387	0.1431
H_0: Direct-sold = institutional?	0.000***	0.153	0.000***	0.166

Table AV. Monthly Fund Performance Across Market Segments (using subsample of funds with ticker, Morningstar rating, and Morningstar investment objectives) (1996-2002)

The table below replicates the panel regressions in Panel A of Table III, except that in the sample below we require funds to have a ticker, Morningstar rating, and Morningstar investment objective. Panel B further restricts the sample to actively managed small-cap growth funds, but is otherwise identical to Panel A. Data availability for the Morningstar rating and investment objectives restricts the sample in both panels to the 1996 to 2002 period. The table below reports coefficients from panel regressions of fund *i*'s monthly performance on fund and family characteristics. The performance measure in column (1) is fund *i*'s 4-factor alpha estimated from net returns over the prior 24 months, while in column (2) it is fund i's return gap measure (i.e., the difference between fund i's gross returns and the gross returns predicted based on its lagged holdings, as calculated in Kacperczyk, Sialm, and Zheng (2008)). The dependent variable in column (3) identifies those funds with above-median values of active share and tracking error as calculated in Cremers and Petajisto (2009), where we allow the median value to vary across investment objective-year pairs. The fact that data on active share and tracking error are only available in those months that mutual funds disclose their holdings explains the smaller number of observations in column (3). In column (4), we measure a fund's 1-factor beta as the beta on the market portfolio in the one-factor model. All regressions include investment objective-by-month fixed effects. The direct-sold segment dummy variable is equal to one if 75% or more of fund *i*'s TNA is distributed through the direct-sold segment. Standard errors are clustered on both fund family and month, and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

Panel A. All Actively Managed Domestic Equity funds

	(1)	(2)	(3)	(4)
Dependent variable:	4-Factor Alpha	Return Gap	Above-Median Values of Active Share & Tracking Error?	1-Factor Beta
Direct-sold fund dummy (t)	0.079*	0.074**	0.070**	0.000
	(0.043)	(0.031)	(0.035)	(0.019)
No-load fund?	-0.011	-0.002	0.022	0.004
	(0.047)	(0.028)	(0.047)	(0.018)
Lagged expense ratio	-0.086***	-0.051	0.150***	0.031***
	(0.025)	(0.040)	(0.046)	(0.009)
Lagged 12b-1 fee	0.043	0.160***	-0.070	0.036
	(0.094)	(0.060)	(0.098)	(0.027)
Lagged Ln Fund TNA	-0.025*	-0.043***	-0.007	0.006
	(0.014)	(0.009)	(0.010)	(0.005)
Lagged Ln Family TNA	0.013	0.038***	-0.034***	0.000
	(0.009)	(0.009)	(0.009)	(0.004)
Lagged Portfolio Turnover	0.000*	0.000	-2.350	-5.310
	(0.000)	(0.000)	(0.000)	(0.000)

Fund Age in Years	-0.002	0.000	0.001	0.000
	(0.001)	(0.001)	(0.001)	(0.000)
Lagged Net Flow	0.002***	0.000	0.000	0.000
	(0.001)	(0.000)	(0.000)	(0.000)
Lagged Standard Deviation of Net Flow	-0.023	0.000	0.010	-0.006
	(0.009)	(0.010)	(0.007)	(0.007)
Investment Objective-by-Month fixed effects?	Yes	Yes	Yes	Yes
Fund-level control variables?	Yes	Yes	Yes	Yes
Sample size	67,375	60,261	12,248	67,375
R^2	0.2021	0.0458	0.1940	0.4505

Panel B. Sample Restricted to Actively Managed Small-Cap Growth Funds

	(1)	(2)	(3)	(4)
Dependent variable:	4-Factor Alpha	Return Gap	Above-Median Values of Active Share & Tracking Error?	1-Factor Beta
Direct-sold fund dummy (t)	0.225***	0.275***	0.100*	-0.043
	(0.086)	(0.075)	(0.055)	(0.030)
No-load fund?	-0.071	-0.075	-0.084*	0.009
	(0.095)	(0.078)	(0.046)	(0.029)
Lagged expense ratio	-0.104***	-0.081*	0.172**	0.026***
	(0.007)	(0.045)	(0.078)	(0.009)
Lagged 12b-1 fee	0.118	0.229**	-0.268**	0.081
	(0.193)	(0.116)	(0.131)	(0.051)
Lagged Ln Fund TNA	-0.072**	-0.041	-0.011	0.001
	(0.035)	(0.027)	(0.019)	(0.010)
Lagged Ln Family TNA	0.046**	0.049***	-0.061***	-0.005
	(0.020)	(0.019)	(0.014)	(0.007)

Lagged Portfolio Turnover	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Fund Age in Years	-0.004 (0.005)	-0.008** (0.003)	0.000 (0.003)	-0.002 (0.002)
Lagged Net Flow	0.002 (0.001)	0.000 (0.001)	0.000 (0.000)	0.000 (0.000)
Lagged Standard Deviation of Net Flow	-0.039 (0.030)	0.012 (0.027)	0.028** (0.013)	0.002 (0.007)
Investment Objective-by-Month fixed effects?	Yes	Yes	Yes	Yes
Fund-level control variables?	Yes	Yes	Yes	Yes
Sample size	14,800	13,490	2,792	14,800
R^2	0.1921	0.0477	0.2376	0.553

Table AIV. Monthly Fund 4-Factor Alphas of Actively Managed and Index Funds Across Three Market Segments (1993-2004)

The table below replicates the regressions in Table VI, except that columns (4) through (6) reports results from a sample that also includes funds in the institutional market segment. We also report coefficients on the control variables that were not reported in Table VI. The table below reports coefficients from panel regressions of fund *i*'s monthly 4-factor alpha on fund and family characteristics in a sample of domestic equity funds operating between January 1993 and December 2004 for which we possess distribution channel data from FRC. Fund *i*'s 4-factor alpha is estimated from net returns over the prior 24 months. The Index fund dummy variable equals one if fund *i* is passively managed, and the Active dummy variables equal one if fund *i* is actively managed. The Direct-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the direct-sold channel. The Broker-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the Broker-sold channel. The Institutional dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through institutional channel. Column (1) contains all funds, while columns (2), (3), and (4) are restricted to funds in the direct-sold, broker-sold, and institutional segments respectively. Columns (5) and (6) include funds from all segments. All regressions include CRSP Standard and Poor's investment category-by-month fixed effects. Standard errors are clustered on both month and family and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:						
				4-Factor Alpha (t)		
	All segments	Direct-sold	Broker-sold	Institutional	All	All
Index fund dummy (t)	0.073**					
	(0.037)					
Active fund dummy (t)	*Omitted category*					
Direct-sold dummy (t) * Index fund (t)		0.018			0.108***	-0.005
		(0.035)			(0.039)	(0.044)
Direct-sold dummy (t) * Active fund (t)		*Omitted category*			0.085***	0.076***
					(0.023)	(0.027)
Broker-sold dummy (t) * Index fund (t)			0.093**		0.089**	-0.006
			(0.039)		(0.036)	(0.043)
Broker-sold dummy (t)) * Active fund (t)			*Omitted category*		*Omitted category*	*Omitted category*
Institutional dummy (t)) * Index fund (t)				0.055	0.108**	0.000
				(0.049)	(0.050)	(0.053)
Institutional dummy (t)) * Active fund (t)				*Omitted category*	0.023	-0.030
					(0.025)	(0.021)

Lagged expense ratio						-0.101**
						(0.039)
No-load fund?						-0.006
						(0.025)
Lagged 12b-1 fee						0.043
						(0.072)
Lagged Ln Fund TNA						-0.024***
						(0.009)
Lagged Ln Family TNA						0.009
						(0.007)
Lagged Portfolio Turnover						0.000*
						(0.000)
Fund Age in Years						-0.001*
						(0.001)
Lagged Net Flow						0.001**
						(0.000)
Lagged Standard Deviation of Net Flow						-0.004
						(0.009)
Investment objective*Month fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	151,674	51,469	71,364	28,841	151,674	151,674
R^2	0.1241	0.0973	0.1458	0.2304	0.1244	0.1257

Table AVII. Monthly Fund 4-Factor Alphas of Actively Managed and Index Funds Across Market Segments (1993-2004): Fama MacBeth Regressions

The table below reports the results of monthly Fama MacBeth regressions instead of the panel regressions of Table VI. The reported coefficients and R^2 are the average coefficients and R^2 across 143 months. Fund *i*'s 4-factor alpha is estimated from net returns over the prior 24 months. The Index fund dummy variable equals one if fund *i* is passively managed, and the Active dummy variables equal one if fund *i* is actively managed. The Direct-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the direct-sold channel. The Broker-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the Broker-sold channel. Column (1) contains all retail funds, while columns (2) and (3) are restricted to funds in the direct-sold or broker-sold segments. Columns (4) and (5) include funds from both segments. All regressions include CRSP Standard and Poor's investment category-by-month fixed effects. Standard errors are clustered on both month and family and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)
Dependent variable:					
Sample:	Both segments	Direct-sold	Broker-sold	Both segments	
Index fund dummy (t)	0.066*				
	(0.034)				
Active fund dummy (t)	*Omitted category*				
Direct-sold dummy (t) * Index fund (t)		0.003		0.105***	0.005
		(0.037)		(0.038)	(0.047)
Direct-sold dummy (t) * Active fund (t)		*Omitted category*		0.080***	0.103***
				(0.018)	(0.027)
Broker-sold dummy (t) * Index fund (t)			0.101**	0.095**	-0.022
			(0.039)	(0.039)	(0.044)
Broker-sold dummy (t)) * Active fund (t)			*Omitted category*	*Omitted category*	*Omitted category*
Lagged expense ratio					-0.146***
					(0.042)
No-load fund?					-0.039
					(0.024)
Lagged 12b-1 fee					0.103
					(0.065)
Lagged Ln Fund TNA					-0.025***

					(0.008)
Lagged Ln Family TNA					0.009 (0.006)
Lagged Portfolio Turnover					0.000 (0.000)
Fund Age in Years					-0.002** (0.001)
Lagged Net Flow					0.001*** (0.000)
Lagged Standard Deviation of Net Flow					-0.011 (0.011)
Investment objective*Month fixed effects?	Yes	Yes	Yes	Yes	Yes
Sample size	122,833	51,469	71,364	122,833	122,833
R^2	0.0001	0.0003	0.0001	0.0005	0.0021

Table AVIII. Monthly Fund 4-Factor Alphas of Actively Managed and Index Funds Across Market Segments (using subsample of funds with ticker, Morningstar rating, and Morningstar investment objectives) (1996-2002)

The table below replicates the panel regressions of Table VI, except that in the sample below we require funds to have a ticker, Morningstar rating, and Morningstar investment objective. Data availability for the Morningstar rating and investment objectives restricts the sample to the 1996 to 2002 period. Fund *i*'s 4-factor alpha is estimated from net returns over the prior 24 months. The Index fund dummy variable equals one if fund *i* is passively managed, and the Active dummy variables equal one if fund *i* is actively managed. The Direct-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the direct-sold channel. The Broker-sold dummy variable equals one if 75% or more of fund *i*'s TNA is distributed through the Broker-sold channel. Column (1) contains all retail funds, while columns (2) and (3) are restricted to funds in the direct-sold or broker-sold segments. Columns (4) and (5) include funds from both segments. All regressions include CRSP Standard and Poor's investment category-by-month fixed effects. Standard errors are clustered on both month and family and are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)
Dependent variable:					
Sample:	Both segments	Direct-sold	Broker-sold	Both segments	
Index fund dummy (t)	0.066				
	(0.046)				
Active fund dummy (t)	*Omitted category*				
Direct-sold dummy (t) * Index fund (t)		0.006		0.099**	-0.016
		(0.054)		(0.048)	(0.057)
Direct-sold dummy (t) * Active fund (t)		*Omitted category*		0.077***	0.077*
				(0.027)	(0.042)
Broker-sold dummy (t) * Index fund (t)			0.110*	0.103*	0.014
			(0.059)	(0.059)	(0.044)
Broker-sold dummy (t)) * Active fund (t)			*Omitted category*	*Omitted category*	*Omitted category*
Lagged expense ratio					-0.086***
					(0.025)
No-load fund?					-0.007
					(0.043)
Lagged 12b-1 fee					0.046
					(0.091)

Lagged Ln Fund TNA					-0.025*
					(0.013)
Lagged Ln Family TNA					0.013
					(0.009)
Lagged Portfolio Turnover					0.000*
					(0.000)
Fund Age in Years					-0.002
					(0.001)
Lagged Net Flow					0.002***
					(0.001)
Lagged Standard Deviation of Net Flow					-0.024
					(0.014)
Investment objective*Month fixed effects?	Yes	Yes	Yes	Yes	Yes
Sample size	69,573	31,169	38,404	69,573	69,573
R^2	0.2005	0.1925	0.2307	0.2006	0.2020

FOOTNOTES

[1] There are two explanations based on investor learning. Baks, Metrick, and Watcher (2001) show in a Bayesian framework that even investors that have skeptical priors over the existence of manager skill will optimally allocate some of their portfolio to an actively managed fund if the maximum posterior after-fee alpha is positive. Pastor and Stambaugh (2012) show that investment in active funds is rational when investors simultaneously learn about manager skill and about the extent to which decreasing returns to scale affects the performance of actively managed funds.

[2] Moskowitz (2000), Kosowski (2006), and Staal (2006) find empirical support for these arguments in that actively managed U.S. equity mutual funds have significantly better abnormal performance in recessions than in non-recessions. Related studies document the portfolio strategies that fund managers employ to produce the pattern of countercyclical abnormal fund performance (Wang (2010), Glode (2011), Kacperczyk, Van Nieuwerburgh, and Velkamp (2012a, 2012b)). However, de Souza and Lynch (2012) question whether the finding of countercyclical abnormal performance is robust to using only those conditioning variables known *ex-ante* to investors.

[3] We describe the literature that motivates these tests in Sections III.B, III.C, and III.D.

[4] For example, our findings would be consistent with Glode (2011) if investors in broker-sold funds value returns in bad times substantially more than do investors in direct-sold funds and if broker-sold actively managed funds outperform broker-sold index funds in bad times. We do not explore this possibility because our sample period contains very few recessionary periods.

[5] These surveys are from "Ownership of Mutual Funds, Shareholder Sentiment, and Use of the Internet, 2010," Investment Company Institute's *Research Fundamentals*, September 2010, page

14, and "Why Do Mutual Fund Investors Use Professional Financial Advisers?", Investment Company Institute's *Research Fundamentals,* April 2007, pages 5 and 6.

[6] Gennaioli, Shleifer, and Vishny's (2012) theoretical prediction that brokers will pander to investor biases finds empirical support in studies of fund flows by Bergstresser, Chalmers, and Tufano (2009) and Chalmers and Reuter (2012), and in audit studies by Anagol, Cole, and Sarkar (2012) and Mullainathan, Nöth, and Schoar (2012).

[7] Although FRC provides information on whether a fund is sold through a captive salesforce that exclusively sells a single family's funds, or through a wholesale salesforce that sells the funds of multiple families, we follow Bergstresser, Chalmers, and Tufano (2009) and combine both captive and wholesale salesforces into one broker-sold category. We are implicitly assuming that the advice services offered by wholesale brokers are not materially different from the advice services of captive brokers. See Christoffersen, Evans, and Musto (2012) for a detailed analysis of captive versus wholesale salesforce fund distribution, including the compensation arrangements between fund families and their salesforces.

[8] We refer interested readers to their paper for both a detailed description of the FRC data and an overview of mutual fund distribution. As an independent check of this data, we were able to obtain distribution codes from the Investment Company Institute (ICI) for 2002. We find that only 3.4% of funds that FRC classifies as direct-sold are classified by ICI as broker-sold (or vice-versa). We thank Brian Reid for providing these data.

[9] See James and Karceski (2006) for a comprehensive analysis of mutual funds that cater to institutional investors. Using fund prospectuses, they document substantial heterogeneity in the types of accounts within institutional funds (and share classes), such as 401(k) plan participants, foun-

dations and endowments, customers of a bank trust or custodial account, or investors with more than $100,000 to invest in the fund.

[10] The fraction of families that distribute *any* assets in both segments ranges from 1.3% in 1992 to 7.4% in 2004.

[11] Del Guercio, Reuter, and Tkac (2010) document that a family's primary distribution segment is highly persistent. Only three families switch their primary distribution segment during our sample period. We analyze the funds belonging to these families in Sections III.A and III.B.

[12] Although mutual fund investors pay more than $10 billion annually in 12b-1 fees, it is widely recognized that 12b-1 fees underestimate the total cost of marketing and distribution. For example, it is common for mutual fund families to use management fees to cover distribution costs in a practice known as revenue-sharing (see, for example, footnote 13 in Elton, Gruber, and Busse (2004), footnote 8 in Bergstresser, Chalmers, and Tufano (2009), Zweig (2009), Pozen and Hamacher (2011) page 259, and the SEC roundtable on 12b-1 fees dated June 19, 2007).

[13] We omit a review of the large literature on the fund flow-performance relation. However, papers that have specifically focused on the flow-performance relation within or across particular clienteles in the United States include Bergstresser, Chalmers, and Tufano (2009) (direct vs. broker-sold), Christoffersen, Evans, and Musto (2012) (captive broker vs. wholesale broker), James and Karceski (2006) (institutional and bank-sponsored), Chen, Yao, and Yu (2007) (insurance), and Del Guercio and Tkac (2002) (separate account).

[14] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

[15] Four-factor alpha has a standard deviation of 2.93% in the direct-sold segment and 2.36% in the broker-sold segment. Thus, a one-standard deviation increase in alpha, holding raw return

and other explanatory variables constant, implies an increase in annual flow of 6.18% in the direct-sold segment (0.176*2.93%*12) and 0.59% in the broker-sold segment (0.021*2.36%*12). Multiplying by the average actively managed fund size in the two segments reported in Table I implies $86.9 million in incremental flow in the direct-sold segment and $5.0 million in the broker-sold segment.

[16] Although we only report one specification in Table II, the Internet Appendix tables show that the flow-performance relations are qualitatively unchanged when we omit lagged flows or fund-level controls. In the Internet Appendix, we also report a specification where the performance measures match Bergstresser, Chalmers, and Tufano (2009).

[17] We thank Cremers and Petajisto for making their active share and tracking error measures available for download at www.petajisto.net/data.html.

[18] Investors might value one-stop shopping due to high personal search costs or due to an uncertain investment horizon and consequent desire to take advantage of the option to switch funds within a family at no explicit cost.

[19] An alternative summary measure is a Herfindahl index. We report the % of actively managed assets in the specialty style for ease of interpretation, but testing for differences in Herfindahl indices leads to the same inferences.

[20] In some cases, the filing will identify that a subadvisor manages the portfolio, but also discloses that the subadvisor is an affiliate of the family, typically indicating that the subadvisory firm is legally a subsidiary, or has a common owner. Because the affiliated subadvisory agreements do not reflect the same economic decision or market forces described above, we focus our analysis on the sample of unaffiliated subadvisors. We find that 8.6% of ADE funds on CRSP in

2002 are subadvised by an affiliate.

[21] Cohen, Frazzini, and Malloy (2008) use these data to study connections between mutual fund managers and the board members of the firms in which they invest. We thank them for sharing their data for 2002.

[22] In the Berk and Green (2004) model, the smaller funds of less-skilled managers earn the same after-fee risk-adjusted returns as the larger funds of more-skilled managers. Interestingly, broker-sold funds have lower average performance despite having, on average, fewer assets under management than direct-sold funds. Therefore, one interpretation for the underperformance is that, because flows into broker-sold funds respond to characteristics other than alpha, broker-sold funds manage more assets that they should, given the skills of their managers.

[23] See Gennaioli, Shleifer, and Vishny (2012) and Inderst and Ottaviani (2012) for theoretical models of the impact of brokers and bundled advice on investor welfare, and see Christoffersen, Evans, and Musto (2012), Chalmers and Reuter (2012), Mullainathan, Nöth, and Schoar (2012), and Anagol, Cole, and Sarkar (2012) for related empirical evidence.