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BROKER INCENTIVES AND MUTUAL FUND MARKET SEGMENTATION

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ABSTRACT

We study the impact of investor heterogeneity on mutual fund market segmentation. To motivate our empirical analysis, we make two assumptions. First, some investors inherently value broker services. Second, because brokers are only compensated when they sell mutual funds, they have little incentive to recommend funds available at lower cost elsewhere. The need for mutual fund families to internalize broker incentives leads us to predict that the market for mutual funds will be highly segmented, with families targeting either do-it-yourself investors or investors who value broker services, but not both. Using novel distribution channel data, we find strong empirical support for this prediction; only 3.3% of families serve both market segments. We also predict and find strong evidence that mutual funds targeting performance-sensitive, do-it-yourself investors will invest more in portfolio management. Our findings have important implications for the expected relation between mutual fund fees and returns, tests of fund manager ability, and the puzzle of active management. Furthermore, they suggest that changing the way investors compensate brokers will change the nature of competition in the mutual fund industry.

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To assess the competitiveness of the mutual fund industry, academics and regulators focus on the relation between mutual fund fees and returns. For example, assuming that the market for retail mutual funds is competitive, Malkiel (1995) and Gil-Bazo and Ruiz-Verdu (2009) predict a positive relation between total mutual fund fees and *before-fee* returns. Contrary to this prediction, they find that actively managed equity funds charging higher total fees earn lower *before-fee* returns. Similarly, Bergstresser, Chalmers, and Tufano (2009) find that mutual funds sold through brokers charge higher fees and earn lower *before-distribution-fee* returns than funds marketed directly to investors. Gil-Bazo and Ruiz-Verdu (2008, 2009) argue that these patterns are consistent with a model of strategic fee setting, in which funds with lower expected returns use higher fees to extract surplus from unsophisticated investors.

An alternative explanation for the lack of a positive relation between total fees and before-fee returns is that higher fees reflect the higher costs associated with providing services that investors value but which are unrelated to portfolio management and performance. In particular, investors who value personalized financial advice can choose to invest in mutual funds through a broker; these funds then charge higher fees to compensate brokers for providing this service. However, while Hortascu and Syverson (2004) and Coates and Hubbard (2007) argue that demand for costly broker services by mutual fund investors can explain dispersion in mutual fund fees, neither study explains why mutual funds bundled with broker services should earn lower *before-fee* returns.

The goal of this paper is to fully consider a rational alternative to strategic fee setting that can also potentially explain lower before-fee returns in broker-sold funds. Our alternative is that competition for investors who value broker services leads broker-sold funds to invest more in costly-to-provide investor services and less in portfolio management. While Elton, Gruber, and

Busse (2004) and Bergstresser, Chalmers, and Tufano (2009) acknowledge this possibility, attempts to explicitly test for substitution between broker services and portfolio management are hindered by the facts that broker services are largely unobservable, and that traditional mutual fund fee data do not reliably distinguish the cost of portfolio management from firm profits, or the cost of providing broker services.[1]

Our approach to shedding light on the nature of mutual fund competition—despite the unobservability of investments in broker services—is to first lay out a full set of economic arguments and necessary assumptions for our alternative, and then provide a variety of internally consistent evidence to support the assumptions and predictions. Our argument that heterogeneity in the demand for broker services can drive market segmentation and cause differences in before-fee returns rests on three assumptions. First, whereas all investors value higher after-fee returns, some investors also value interacting with a broker for reasons that go beyond maximizing risk-adjusted fund returns. For example, investors may value outsourcing decisions about asset allocation and rebalancing to a broker, or derive peace of mind from having someone to call during extreme market conditions. Second, because brokers have no incentive to recommend mutual funds that investors can purchase at lower cost online or through another broker, mutual fund families cannot simultaneously serve both investor types.[2] Third, investments in portfolio management generate higher expected *before-fee* returns, while investments in other services do not.[3]

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[1] Although mutual fund investors pay more than $10 billion annually in 12b-1 distribution 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 (see, for example, footnote 13 in Elton, Gruber, and Busse (2004), footnote 8 in Bergstresser, Chalmers, and Tufano (2009), Zweig (2009), and the SEC roundtable on 12b-1 fees dated June 19, 2007).

[2] Telser (1960) argues that when consumers can obtain product information from high service, high price retailers but buy those same products from low service, low price retailers, retail competition will reduce sales effort and reduce access to information that is valuable but costly to provide. Bork (1966) argues that by entering into exclusive territory agreements with downstream firms, upstream firms minimize intrabrand price competition and, thereby, maximize the effort put into selling their products. For an overview, see chapter 4 in Tirole (1993).

[3] In a world with costly information acquisition and processing, the relation between investments in portfolio man-

Embedding our assumptions into Massa's (2003) model of competition between mutual fund families leads us to predict that the market for retail mutual funds will be segmented.[4] Mutual fund families must choose whether to compete for investors in the do-it-yourself segment who only value after-fee performance, or for investors who also value broker services. Mutual fund families then internalize the preferences of their target investors. Since do-it-yourself investors only value after-fee returns, mutual fund families competing for these investors invest the most in portfolio management (e.g., software that improves trade execution or hiring skilled analysts), and little in other costly-to-provide services. And, since investors in broker-sold segments value both broker services and portfolio management, families competing for these investors invest more in their brokers (e.g., hiring client service personnel dedicated to supporting broker inquiries) and less in portfolio management. Because of their additional investments in portfolio management, mutual fund families targeting performance-focused investors should earn higher before-fee returns, on average, than families in other market segments. Under the additional assumption that greater investments in portfolio management cost relatively less than personalized broker services, and profits are constant across channels, we will also observe a negative relation between total fees and before-fee returns.

To justify our key assumptions and to test our predictions, we combine data on mutual fund distribution strategies with data from the subadvisory market, through which fund families can outsource portfolio management to other firms. To identify potential market segments, we use data from Financial Research Corporation from 1996 to 2002 to classify each mutual fund into one of seven distribution channels: *direct, captive, bank, insurance, wholesale, institutional,*

agement and before-fee returns should be positive (Grossman and Stiglitz (1980)).

[4] Massa (2003) models competition between mutual fund families when some investors value the option to freely switch between funds in a family, but there is an assumed tradeoff between fund variety and fund returns. We contrast his assumptions and predictions with our own in section I.

and *other*.[5] We find strong evidence that these distribution channels capture important differences in investor preferences. When we test our assumption that do-it-yourself investors are the most focused on after-fee returns, we find that monthly net flows in the *direct* channel are the most sensitive to extreme positive and negative after-fee returns. More generally, we find stark evidence of significant market segmentation. In 2002, the average mutual fund family distributes 92.6% of its assets through its primary distribution channel, and 59.1% of families distribute 100% of their assets through a single channel. Even among the 25 largest fund families, for whom the financial barrier to entering a new distribution channel should be relatively low, 85.8% of assets are distributed through the family's primary distribution channel.

To shed light on why distribution is concentrated, we study the propensity of mutual fund families to distribute assets through different pairs of distribution channels. Consistent with our assumption that brokers compensated through mutual fund distribution fees will not provide costly personalized services to investors who can easily access the same funds at lower cost in another channel, we find that only 3.3% of families distribute funds simultaneously through the *direct* channel and any of the broker channels (*wholesale*, *captive*, *bank*, and *insurance*), or through multiple broker channels (e.g., through both *wholesale* and *captive*). The fact that Janus closed its *direct* platform to new investors in July 2009, after a lengthy and costly entry into the *wholesale* channel, is also consistent with our assumption because Janus deliberately chose not to distribute simultaneously through the *direct* and *wholesale* channels, despite having operated in the *direct* channel for decades.[6]

[5] Mutual funds in the *direct* channel are marketed directly to do-it-yourself investors, those in the *captive*, *bank*, *insurance* channels are sold by brokers who represent a single mutual fund family, those in the *wholesale* channel are sold by brokers with access to numerous mutual fund families, and those in the *institutional* channel are sold through 401(k) plans. We provide more details on these channels, and the *other* channel, in Section II. We thank FRC for sharing their disaggregated distribution channel data with us.
[6] See Janus' 3/16/09 press release at janus.com. We provide additional anecdotal evidence in Section II.C..

Given our evidence that investors in the direct channel are the most sensitive to fund performance, we predict that mutual fund families in the *direct* channel will invest the most in fund performance. We provide a variety of supportive evidence that direct channel families cater to a performance-sensitive clientele. First, by studying the negotiated fee schedules in a comprehensive sample of subadvisory contracts in 2002, we are able to estimate the value that mutual fund families place on portfolio management. Importantly, the subadvisory fee isolates the portion of the management fee used to pay for the portfolio management function. For example, Vanguard charges its investors a management fee of 37 basis points for the Vanguard PRIMECAP fund, and from this pays PRIMECAP Management Company a 25 basis point subadvisory fee to do the stock-picking. Using two different proxies, we find that mutual fund families in the *direct* channel are willing to pay significantly higher fees to skilled or reputable subadvisors.

Second, motivated by Chevalier and Ellison's (1999) finding that managers who attend undergraduate institutions with higher average SAT scores earn higher risk-adjusted returns, we analyze the educational backgrounds of the managers of actively managed equity mutual funds in 2002. Such managers should be more attractive to mutual funds with performance-sensitive investors, but also more expensive to hire and retain. We find that mutual fund families in the *direct* channel are significantly more likely to employ mutual fund managers who attended the 25 most selective U.S. colleges and universities (30.7 percent versus 21.5 percent). Finally, we find robust evidence that actively managed funds in the *direct* channel earn annual risk-adjusted before-fee returns more than one percent higher than those earned by comparable funds in other channels. While Bergstresser, Chalmers, and Tufano (2009) find a similar difference in before-fee returns, our analysis of alternative performance measures supports our interpretation that this difference arises from differential investments in portfolio management. Furthermore, when we look within the *direct* channel, we find no evidence that actively managed funds underperform index funds. Because this comparison focuses on those actively managed funds with the greatest incentive to invest in portfolio management, and holds the bundle of other investor services constant, we view it as a more powerful test of the puzzle of active management (Gruber (1996)).

Our findings have implications for future mutual fund research. The fact that families in the *direct* channel invest more in performance suggests that more powerful tests for managerial skill should focus on this channel. Also, while it is common in studies of mutual fund flows to assume that every mutual fund family competes with every other family, our evidence suggests that competition should be strongest between families in the same distribution channel. In the absence of the market segmentation that we document, the fact that mutual fund families enter into subadvisory contracts with other 'competitor' mutual fund families would be quite puzzling.

More importantly, by providing evidence that broker incentives drive market segmentation and differences in before-fee returns, we provide empirical support for a model in which mutual fund families compete on more than portfolio management. Because investors in this model are willing to tradeoff broker services and after-fee returns, it is welfare reducing to move investors with a revealed preference for interacting with brokers to lower-fee funds in the *direct* channel that lack these services. Whether our model better captures the nature of mutual fund competition than the model in Gil-Bazo and Ruiz-Verdu (2008) is an important open question that researchers will not be able to answer until we can overcome the inherent unobservability of broker services, or until there are significant changes in how investors compensate brokers.[7]

The remainder of our paper is organized as follows. In section I, we use insights from Massa's (2003) model to link our assumptions to our main predictions. In section II, we describe our distribution channel data, and use these data to show that mutual fund market segmentation is

[7] In the conclusion we discuss changes in the structure of broker compensation currently underway in the industry.

driven by both investor heterogeneity and broker incentives. In section III, we use data from subadvisory contracts and portfolio manager educational backgrounds to show that families targeting performance-sensitive investors invest more in portfolio management, and then show that *direct* channel funds outperform comparable funds in other channels. We also show that actively managed funds earn the same risk-adjusted returns as index funds within the *direct* channel. In section IV, we use data from subadvisory contracts to provide additional evidence on broker incentives and investor heterogeneity. In section V, we conclude.

I. Model of Investor Heterogeneity, Broker Incentives, and Market Segmentation

To motivate our study, we adopt Massa's (2003) model of competition between mutual fund families, but change two key assumptions. Massa studies a mutual fund family's decision regarding the scope of its fund offerings. He assumes that all investors value after-fee returns, but that investors with short or uncertain investment horizons also value the option to freely switch between funds in a family. Given this investor heterogeneity, offering funds in more asset classes and investment styles makes families more attractive to investors who value fund variety. However, because he also assumes that families with broad fund offerings earn lower returns on their investments in portfolio management (i.e., diseconomies of scope in the coproduction of fund variety and fund performance), offering funds in more asset classes and investment styles makes families less attractive to investors who only value performance.

Combining investor heterogeneity with diseconomies of scope, Massa's model yields two predictions about the nature of mutual fund competition. The first prediction is that the market will be segmented, with different mutual fund families offering bundles of fund and family characteristics valued by different types of investors. One segment will consist of large mutual fund families that compete for investors who value variety by offering a wide variety of asset classes and investment styles.[8] The other segment will consist of focused mutual fund families that compete for performance-sensitive investors by offering a much narrower range of asset classes and investment styles. Without diseconomies of scope there would be no cost to providing fund variety and, therefore, no demand for focused mutual fund families. Without a significant number of investors who value fund variety, there would be no demand for large fund families.

The second prediction is that mutual funds belonging to focused families will outperform comparable funds belonging to large, unfocused families. Investors willing to tradeoff variety and returns self-select into large families, which invest in fund variety at the expense of fund performance, while investors who only value after-fee returns self-select into focused families. Consistent with both predictions, Massa (2003) and Siggelkow (2003) find that funds in focused families earn higher after-fee returns.

To apply Massa's (2003) model to the provision of investor services, we need to assume that different types of investors demand different bundles of portfolio management and investor services, and that mutual fund families are limited in their ability to simultaneously provide different bundles. Our first assumption is that some investors only value after-fee fund returns, while other investors value access to brokers for reasons that go beyond maximizing after-fee returns. Although demand for broker services may be negatively correlated with financial literacy, our predictions do not depend on investors who value broker services being less sophisticated than do-it-yourself investors; they depend only on the existence of two types of investors with different preferences. Our second assumption is that, because brokers are only compensated when their clients buy and hold recommended mutual funds, brokers will not recommend

[8] For example, Siggelkow (2003) argues that growth and value investing require different types of research and different trading strategies, resulting in distinct, incompatible cultures. In this case, diseconomies of scope in the co-production of fund variety and fund performance implies that, everything else equal, a mutual fund family earns lower after-fee returns by offering both growth and value funds than by specializing in either growth or value.

funds that investors can purchase at lower cost elsewhere, for fear that they will not be compensated for time spent developing relationships and formulating personalized fund recommendations (Telser (1960)).[9]

Combining our two assumptions leads us to predict that the market will be segmented. As in Massa (2003), some mutual fund families will compete for performance-sensitive, do-it-yourself investors. At the same time, other families will compete for investors who also value broker services. If we add the assumption that investments in portfolio management increase *before-fee* returns, we also predict that mutual fund families targeting performance-sensitive investors will invest more in portfolio management, and earn higher before-fee returns.[10]

Importantly, if the additional investments in portfolio management in the performance-sensitive segment cost less than the additional investor services demanded in other market segments, we can explain a negative relation between total fees and before-fee returns without assuming different profits in different channels. In other words, our application of Massa's model provides an alternative to the model of strategic fee setting in Gil-Bazo and Ruiz-Verdu (2008). In the rest of this paper, we provide empirical support for predictions that broker incentives drive market segmentation, and that families targeting do-it-yourself investors invest more in portfolio management.

[9] Our implicit assumption is that while some investors value the stream of broker services they receive through time, other investors primarily value the broker services provided at the beginning of the relationship, when brokers exert the effort required to determine the initial asset allocation. The recognition that *some* investors would take advantage of being able to buy the broker-recommended mutual funds on their own drives the broker incentives. The same intuition applies to the sale of goods that need to be auditioned, such as high-end audio equipment. To prevent consumers from spending hours auditioning audio equipment at a local dealer, but then buying their favorite audio equipment over the internet, many manufacturers prohibit internet sales in states served by dealers.

[10] In Massa (2003), predictable differences in performance arise because diseconomies of scope in the co-production of fund variety and fund returns force families to choose between fund variety and fund returns. In our setting, the negative impact of costly investor services on fund returns drive performance-sensitive investors to fund families that provide fewer (or less costly) investor services, giving these families a greater incentive to invest in portfolio management. At the same time, families targeting investors who are willing to trade investments in portfolio management for investments in investor services, invest more in their broker network and less in portfolio management.

II. Do Broker Incentives Drive Market Segmentation?

A. Mutual Fund Distribution Channels

Prior studies emphasize the link between the services that investors receive and the channel through which retail mutual funds are distributed (e.g., Hortascu and Syverson (2004) and Coates and Hubbard (2007)). The normal distinction is between do-it-yourself investors, who purchase (no-load) funds directly from mutual fund families like T. Rowe Price, and investors who pay sales commissions to purchase funds from brokers. However, as Bergstresser, Chalmers, and Tufano (2009) and Christoffersen, Evans, and Musto (2009) emphasize, there are a variety of broker arrangements from which investors can choose. For example, Waddell and Reed distribute mutual funds exclusively through a *captive* sales force of 2,300 financial advisors who "offer one-on-one consultations that emphasize long-term relationships through continued service" (Waddell and Reed's 2008 10-k filing). Similarly, investors who value both broker services and the convenience of one stop shopping can purchase mutual funds through their insurance agent or banker. In contrast to these captive broker arrangements, families like American Funds and Putnam distribute funds through independent brokers with access to a large number of families in the *wholesale* channel.

We obtain data on distribution channels for 1996 to 2002 from Financial Research Corporation (FRC). FRC assigns each mutual fund share class to one of five distribution codes: *direct, captive, bank, wholesale,* and *institutional.* (Mutual funds in the *institutional* channel are typically only available to 401(k) plan participants or investors with more than $500,000 to invest.) Because FRC also includes distribution codes used by Lipper, we create two additional distribution codes: *insurance* and *other*. We classify share classes as being in the *insurance* channel when Lipper indicates that they are sold through an insurance company. In other words, *captive*, *bank*, and *insurance* are three distinct channels utilizing captive brokers, *wholesale* utilizes independent brokers, and *direct* targets do-it-yourself investors. The *other* category is reserved for share classes for which the FRC and Lipper classifications differ (e.g., FRC assigns the share class to *direct* but Lipper assigns it to *institutional*), and is included for completeness. We obtain data on total net assets (TNA), and most other fund-level and family-level variables, including data on which mutual funds belong to each mutual fund family, from the CRSP Survivor-Bias Free Mutual Fund Database.

Our tests assume that mutual fund families distributing funds through different channels invest in different bundles of services.[11] To compete for investors in the do-it-yourself distribution channel, mutual fund families must invest in advertising and the online tools valued by investors who require readily available fund information and ease of use in conducting their transactions.[12] To compete for investors in broker-sold distribution channels, however, mutual fund families must compete for broker recommendations. Families in the *captive*, *bank*, and *insurance* channels must invest in their dedicated sales forces, while those in the *wholesale* channel must invest in tools that help independent advisors manage client portfolios.[13] In short, we assume that mutual funds are a homogeneous bundle of services within distribution channel and differentiated products across channels. We will show that distribution channels better capture the differences in these bundles of services than a comparison of load and no-load funds.

To determine each mutual fund family's primary distribution channel, we aggregate the

[11] Our FRC distribution channels are consistent with the descriptions in publicly-traded asset management firms own annual reports. For example, Janus' 2008 form 10-k states that it distributes through the "retail intermediary" (wholesale) and "institutional" channels. "Each distribution channel focuses on specific investor groups and the unique requirements of each group."

[12] For example, Fidelity's Center for Applied Technology conducts R&D activity on social networking, virtual environments, data visualization, behavioral economics, and decision theory, to better serve do-it-yourself investors (see http://fcat.fidelity.com).

[13] For example, Janus launched a redesigned website "that reflects our commitment to partner with advisors and help them build their businesses" by "providing smart, relevant and productive information and tools designed to help them better serve their clients" (quotes taken from Janus press release 7/8/2009 referring to the launch of janus.com/advisor). Janus also developed *Janus Labs*, a web portal that "helps [advisors] hone their sales skills in the hope that they will pick Janus products" (*Institutional Investor* June 2007).

assets within each channel across all of a family's share classes and select the channel that contains the highest percentage of family assets. Repeating this process using only actively managed domestic equity (ADE) fund assets, we obtain the family's primary ADE distribution channel. Because our primary interest is in testing for differences in investments in portfolio management across distribution channels, we focus on the universe of ADE funds throughout the paper, and thereby eliminate index funds.

In total, we have distribution channel data for 524 of the 547 families in the mutual fund industry in 2002, and for 452 of the 473 families that offer at least one ADE fund. For tests that require distribution channel data at the fund level, we aggregate the assets within each channel across all of the fund's share classes and assign each fund a distribution channel category when at least 75% of its assets are sold through that channel.

In Table I, we report the number of families, aggregate industry ADE assets distributed through that channel, and the top three families ranked by ADE assets, for each of the seven distribution channels. The *direct* channel has the largest number of families (169) and the largest ADE assets under management ($632.9 billion), representing 48.1% of industry ADE assets. This channel contains well-known mutual fund families like Fidelity, Vanguard, and Janus, which invest heavily in advertising. The wholesale broker-sold channel is the next largest channel, with 76 families and $418.3 billion, representing 31.8% of industry ADE assets. Some of the largest families in the wholesale channel are also well known: American Funds, Putnam, and AIM/Invesco. At the other extreme, the *bank*, *captive*, and *insurance* channels have 23, 17, and 16 families respectively, and a combined total of $122.9 billion in ADE assets.

B. Heterogeneity in Investor Demand for Brokers Services

To generate the prediction that direct channel funds will invest more in portfolio management, we assume that investors in the *direct* channel seek to maximize after-fee (risk-adjusted) returns, while investors in other channels also inherently value broker services. We obtain the same prediction, however, if we allow do-it-yourself investors to value fund characteristics other than returns (such as whether the fund was featured in the *New York Times*, whether the fund manager is famous, and how much the fund advertises), so long as do-it-yourself investors place relatively more weight on after-fee returns.[14] To support the validity of this assumption, we test for differences in the flow-after-fee-performance relation across the seven FRC distribution channels using the sample of actively managed domestic equity funds operating at any point between January 1996 and December 2002.[15] We expect investor flow to be most strongly related to after-fee performance in the *direct* channel.

Table II contains the regression results where the dependent variable is the monthly net flow of fund *i* in month *t*. Focusing on monthly flows allows us to test for differences across clienteles in their response to short-term performance. The independent variables of interest are fund *i*'s monthly net return in month *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 Morningstar investment style.[16] The two dummy variables allow us to capture non-linearities in the flow-performance relation. Other fund-level control variables include fund *i*'s monthly net flow in month *t-1* (which captures the effect of longer-term performance), a dummy variable indicating whether fund *i* charges a sales load, fund *i*'s lagged expense ratio and 12b-1 fee, the natural loga-

[14] For evidence that no-load fund investors value media mentions and named fund managers, see Reuter and Zitzewitz (2006) and Massa, Reuter, and Zitzewitz (2010), respectively. For evidence that fund investors respond to advertising, see Reuter and Zitzewitz (2006) and Gallaher, Kaniel, and Starks (2007).

[15] We use data for 1996 to 2002 because this is the period over which we possess both FRC distribution channel data and Morningstar investment style data. Note that 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 (2009) (captive broker vs. wholesale broker), James and Karceski (2006) (institutional and bank), Chen, Yao, and Yu (2007) (insurance), and Del Guercio and Tkac (2002) (separate account). Using data from the United Kingdom, Keswani and Stolin (2009) find that investors in the *direct* and *wholesale* channels are the most sensitive to fund performance.

[16] Although we obtain most of our data from the CRSP Survivor-Bias Free Mutual Fund Database, we obtain data on fund investment styles from Morningstar.

rithm of fund *i*'s TNA, the natural logarithm of its family's TNA, and fund *i*'s age. In addition, we include month-style fixed effects to control for monthly shocks to aggregate demand within each Morningstar investment style.

To allow for differences across distribution channels, each of the independent variables and fixed effects is interacted with channel dummy variables. In other words, although we estimate a single pooled regression, the coefficients in Table II are identical to those obtained by estimating a separate regression for each distribution channel. To allow for the possibility that flows are correlated within each family, we cluster standard errors on mutual fund family. For brevity, we do not report the coefficients on the control variables in the table.

In both the *direct* and *wholesale* channels, we find significant inflows into the top 20% of funds, significant outflows from the bottom 20% of funds, and little sensitivity to intermediate returns. However, consistent with our assumption that do-it-yourself investors are the most sensitive to after-fee returns, net flows into the top performing funds and out of the bottom performing funds are both approximately three times larger in the *direct* channel. Comparing the *direct* and *wholesale* channels, we can reject the hypothesis that the coefficients on the top 20% dummy variable are equal with a p-value of 0.020; for the bottom 20% dummy variable, the p-value is 0.083. When we estimate a specification comparing funds in the *direct* channel to all other funds, we can reject the hypotheses that the coefficients on the top 20% dummy variables are equal with a p-value of 0.003; for the bottom 20% dummy variable, the p-value is 0.001.[17] In contrast, in the other channels there is little to no benefit to being a top performer and relatively little punishment for posting bad performance.

[17] Although we only report one specification in Table II, the flow-performance relations are qualitatively unchanged when we constrain the coefficients on the fund-level controls to be equal across channels, exclude the fund-level controls entirely, omit lagged flows, or define lagged net return percentiles based on month-style-channel (instead of month-style).

The relative lack of sensitivity to after-fee performance in the broker-sold channels is consistent with other factors driving flows in these channels (e.g., one-on-one personal attention, or broker incentives to recommend certain funds). It is worth noting that, unlike in traditional brokerage accounts where broker compensation depends on the number of trades their clients make, brokers selling mutual funds have less incentive to churn; broker-sold mutual funds compensate brokers for selling their funds and, through the use of trailing loads (12b-1 fees), for keeping clients invested in these same funds.

C. Broker Incentives and Market Segmentation

Studies as early as Telser (1960) recognized that employees compensated via a sales commission have little incentive to provide the personalized services that come bundled with a product if the unbundled version is available more cheaply elsewhere.[18] Thus, firms are expected to internalize the incentives of their sales force by not offering the cheaper unbundled product at all. A recent *Wall Street Journal* article suggests that mutual fund families understand these incentives.

> Other fund companies that sell through advisers say they have no intention of making their load-waived shares available to do-it-yourselfers. Among them: Invesco Ltd.'s Invesco Aim unit. "It really undermines your relations with your advisers" if an investor can buy the same product through an adviser or on his or her own, says Robin Swope, a senior product-strategy manager. "The financial adviser is a critical part" of the investing process, she says, and "for us to offer our products directly would circumvent that."[19]

This reasoning underlies our assumption that fund families perceive that brokers have little incentive to expend effort recommending funds that investors can then purchase online at lower cost, which in turn leads to our prediction that funds distributed in broker-sold channels will not

[18] Consistent with this, Mullainathan, Noth, and Schoar (2009), in their audit study in which 'auditors' pose as clients to commission-based brokers, find that 30% of brokers are unwilling to provide any specific advice until the client transfers funds to the brokerage account.

[19] Damato, Karen. "Take a Load Off: Do-It-Yourself Investors Get More Fund Choices."*The Wall Street Journal* March 1, 2010, R1.

simultaneously be distributed in the *direct* channel. A similar argument suggests that funds distributed through one broker-sold channel will not simultaneously be distributed through another broker-sold channel, because captive brokers would have little incentive to recommend funds available through other brokers. These assumptions, combined with our assumption that product bundles differ across but not within distribution channels, lead us to predict that the market for mutual funds is highly segmented by distribution channel.

Consistent with our prediction, we show in Table III that the average family distributes 92.6% of its actively managed domestic equity (ADE) assets through its primary distribution channel in 2002, while the median is 100%. Looking across distribution channels, the average fraction ranges from 86.2% (*institutional*) to 96.5% (*direct*). Based on distribution channel codes from the Investment Company Institute for 2002, the average percentage of family ADE assets distributed through its primary channel is 94.5%, with a range from 88.3% (*institutional*) and 96.9% (*direct*).[20] For completeness, we also report the same statistics for a family's total net assets, including all asset classes and index funds. We find similar numbers in that the average family distributes 90.7% of its assets through its primary distribution channel in 2002. In other words, regardless of the primary distribution channel or asset class (or data source), the typical mutual fund family distributes the vast majority of its assets through a single channel.

To justify our assumption that market segmentation is driven by broker incentives we examine the propensity of families to operate in different pairs of channels simultaneously. In addition, we also consider the plausible alternative explanation that segmentation is driven by the fixed cost of entering a new channel and providing a new bundle of services (e.g., adding a sales force). There are several reasons to believe that fixed costs are not the primary driver of market

[20] We thank Brian Reid for providing ICI distribution codes for 2002. Because our FRC data cover more mutual fund families, over more years, we only use the ICI data to verify that the patterns in Tables III and IV are robust.

segmentation. First, the last row of Table III shows that even among the 25 largest families, the average fraction of ADE assets distributed through the primary channel is 85.8%, and the median is 94.1%. Second, consistent with findings in Bergstresser, Chalmers, and Tufano (2009) and Christoffersen, Evans, and Musto (2009), we find that a family's primary distribution channel is highly persistent.[21] In particular, between 1996 and 2002, we observe very little movement between the direct and broker-sold channels. Of the 116 families whose primary distribution channel was broker-sold in 1996, one transitions to *direct*. Of the 109 families whose primary distribution channel was *direct* in 1996, two transition to *wholesale*. Third, to the extent that families are entering new distribution channels, distribution through new channels is small relative to existing distribution. Between 1996 and 2002, the average fraction of ADE assets distributed through the primary distribution channel declines from 97.0% to 92.6%, but the median remains 100%.

In contrast, examining family distribution patterns supports the broker incentive explanation. In Panel A of Table IV, we report the number of families that simultaneously distribute assets through each possible combination of primary and secondary distribution channels. Consistent with our findings in Table III, the column labeled "None" indicates that 267 (59.1%) of the 452 mutual fund families in 2002 distribute 100% of their assets through a single distribution channel. This pattern is potentially consistent with both fixed costs and broker-imposed constraints. However, the other patterns in Panel A are strongly consistent with our hypothesis that broker incentives constrain mutual fund family distribution strategies.[22] Of the 301 families whose primary distribution channel is direct or broker-sold, only 10 (3.3%) distribute their funds

[21] Although neither study examines distribution channel persistence at the mutual fund family level, Christoffersen, Evans, and Musto (2009) report a high degree of distribution channel persistence at the fund level, while Bergstresser, Chalmers, and Tufano (2009) report a high degree of persistence at the share class level.
[22] Our inference is similar when we use ICI distribution codes to generate Table III.

through any of the secondary channels that we classify as creating a broker conflict. Within this same sample, 43 (14.3%) families distribute their funds through the institutional channel. Within the larger sample of 348 families whose primary or secondary distribution channel is direct or broker-sold, 10 (2.9%) distribute funds through pairs of channels that we classify as creating a broker conflict, while 75 (21.6%) distribute funds through the institutional channel. When we focus on the 185 families with both primary and secondary distribution channels, we find that 100 (54.1%) distribute assets through the institutional channel. Note that there should be no conflict between families simultaneously distributing through the *direct* and (potentially lower-cost) *institutional* channels, or through the broker-sold and *institutional* channels, because retail investors cannot freely access the *institutional* channel (because access requires the investor to be a 401(k) participant or to have more than $500,000 to invest).

Table IV Panel B contains the average percentage of family ADE assets distributed through the secondary channel for this subsample of 185 families. The average percentage of assets tends to be small in secondary channels that we classify as creating a broker conflict. For example, in 2002, the two families with primary distribution through the direct channel, Fidelity and Strong Funds, have an average of 6.2% distributed through the *wholesale* channel. The five mutual fund families that distribute primarily through the *wholesale* channel, however, have an average of 32% of assets distributed through the *direct* channel. Interestingly, several of these seven cases involve families transitioning between distribution channels. For example, Scudder Funds and Columbia Funds transitioned from *direct* to *wholesale* distribution before our sample period. These cases mirror the anecdote mentioned in the introduction about Janus' recent transition to *wholesale* distribution. Namely, each family continued to provide services to its former-direct channel investors, but closed the direct platform to new investors, suggesting that the decision to exit the *direct* channel was motivated more by broker incentives than by costs.[23]

In sum, it is rare for a family to distribute its funds simultaneously through the direct channel and any of the broker channels (*captive, bank, insurance*, or *wholesale*), or through multiple broker channels.[24] Anecdotal and large sample evidence supports our assumption that this segmentation reflects constraints imposed on mutual fund family distribution by broker incentives.

III. Do Families in the *Direct* Channel Invest More in Portfolio Management?

Because investors in the *direct* channel are the most vigilant in rewarding good recent performance with additional inflows and punishing poor recent performance with outflows, families distributing funds through this channel have the greatest incentive to invest in inputs that will enhance investment performance. We predict that mutual fund families serving the *direct* channel are the most willing to pay the price required to hire and retain skilled portfolio managers, relative to families in other channels.

A. Do Direct Channel Funds Pay More for Skilled Subadvisors?

Our first test of this prediction uses hand-collected data on contracts that mutual fund families enter into with subadvisors for portfolio management. The advantage of analyzing subadvisory contracts is that we can separately observe the component of the management fee specific to the portfolio management function.

[23] The Scudder and Columbia transitions to *wholesale* distribution were both motivated by a merger with a family that distributes through the *wholesale* channel. In all the cases mentioned here, the 485BPOS SEC filing reveals that after the transition, only "eligible investors" (previous investors) were allowed to transact through the direct platform. The other exceptions in Table IV Panel B are Capstone Funds and Tocqueville Funds that collectively manage only $275 million in assets, and John Hancock Funds, where 9% of assets are in a 'broker-conflict' channel.

[24] One firm that offers multiple broker channels is Waddell and Reed, a long-time captive channel firm. In 2002, they acquired another fund family that distributed in the *wholesale* channel, Ivy Funds. The same firm owns both groups of funds, but distributes Ivy funds through *wholesale* and exclusively distributes Waddell and Reed funds through the *captive* channel (Waddell and Reed 2008 10-k). Notably, the firm decided to keep both the Ivy and Waddell and Reed monikers, effectively marketing them as separate families (and they appear as separate families on the CRSP mutual fund database).

A.1. Data on Subadvisory Contracts

The SEC requires mutual funds to disclose pertinent details of the contract between the family and the subadvisor. We hand-collect a comprehensive set of subadvisory contracts in 2002 through searches of the SEC's EDGAR database. Specifically, we conduct text searches of all N-30D annual report filings for variants of the word 'subadvisor' or subadvisory' to identify the relevant filings. Within these, we identify the names of all funds in that filing that outsource the portfolio management to an outside subadvisory firm.[25] Matching the list of subadvised funds to the CRSP Survivor-bias Free Mutual Fund Database, we determine that 17.8% of all the actively managed domestic equity funds in CRSP in 2002 are subadvised.

We collect details of the subadvisory contracts, including the subadvised fund name, the parties to the contract (fund family and subadvisory firm names), and the subadvisory fee schedule, from the Statement of Additional Information (485BPOS filings). For each subadvisory firm, we identify whether or not they also offer retail mutual funds under their own brand name by matching to the family name and management codes in CRSP. For subadvisory firms not found in CRSP, we identify them as separate account managers and use the Mobius *M-Search* database to obtain assets under management and other investment product information. We use Mobius' management codes to aggregate products to the firm level.

A.2. Summary of Subadvisory Fees

In Table V, we summarize the subadvisory fees paid from fund families to subadvisors, as well as the management fees paid from fund investors to fund families. Fund investors do not explicitly pay fees to the subadvisor for their portfolio management services. Rather, the mutual

[25] 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.

fund family pays the subadvisory firm out of its management fee, reducing dollar for dollar the management fee revenue retained by the family. The subadvisory fee is defined as the dollar management fee paid to the subadvisor in fiscal year 2002 divided by fund average TNA in 2002. We obtain the management fee from CRSP, defined as the dollar management fee paid by fund investors in fiscal-year 2002 divided by fund average TNA in 2002. These data originally come from the Statement of Operations in the 485BPOS SEC filings. Because we calculate subadvisory and management fees based on stated fee schedules, they are gross of any potential fee waivers.

The sample consists of the 252 relationships between a family and single subadvisor for which we observe the subadvisory fee schedule, as well as the size, investment style, management fee, and distribution channel of the subadvised fund.[26] Across the full sample, the median management fee is 80 basis points and the median subadvisory fee is 40 basis points. While most mutual fund research uses the management fee as the price of portfolio management, it is worth emphasizing that only half of the management fee collected by the median fund in our sample is used to pay the subadvisor for portfolio management.

Looking across the nine investment styles, we see that subadvisor fees tend to be higher for small cap funds than for large cap funds. Also, within the mid-cap and small-cap styles, subadvisor fees tend to be higher for value funds than for growth funds. Both of these patterns are plausibly related to differences in the cost associated with different investment strategies. Deli (2002) finds similar patterns when he compares the management fees of funds in different asset classes. Importantly, we observe significant variation in the subadvisory fees paid within each investment style.

[26] In 153 of the 252 relationships, the subadvisory fee declines with assets under management, and we calculate the level of the fee using the size of the subadvised fund at the end of 2002. In the other 99 relationships, the subadvisory fee schedule is flat.

A.3. Evidence on Outcomes of Subadvisory Fee Negotiations

Given that *direct* channel funds must appeal to their performance-sensitive clientele, we predict that skilled subadvisors will enjoy the greatest bargaining power when negotiating subadvisory fees with *direct* channel funds, relative to those in other channels. To test this prediction, we use the hedonic pricing model introduced in Harding, Rosenthal and Sirmans' (2003) study of the real estate market. In a traditional hedonic pricing model, there is no role for bargaining power because the markets for underlying goods and services are assumed to be perfectly competitive. However, Harding, Rosenthal and Sirmans argue that as goods become more heterogeneous and markets for these goods become thinner, we should expect prices to reflect the relative bargaining powers of buyers and sellers. Because subadvisory contracts are heterogeneous and trade in thin markets, we model the subadvisory fees paid for portfolio management services as:

$$\mathbf{SF_{ijk} = a\ C_{ijk} + b\ D_{ijk} + e_{ijk}}$$

where $\mathbf{SF_{ijk}}$ is the subadvisory fee paid from advisor $\boldsymbol{i}$ to subadvisor $\boldsymbol{j}$ for fund $\boldsymbol{k}$, $\mathbf{C_{ijk}}$ is a vector of contract characteristics, $\mathbf{D_{ijk}}$ is a vector of family characteristics, subadvisor characteristics, and interaction terms, and $\mathbf{e_{ijk}}$ is a standard error term. The coefficients on contract characteristics are estimates of the implicit market prices for the underlying services, and correspond to the implicit market prices for managing different types of portfolios, independent of the identities of the firms involved. In contrast, the coefficients on family and subadvisor characteristics capture deviations from the subadvisory fees that we would expect based on contract characteristics alone, allowing us to test predictions related to subadvisor bargaining power.

Our proxy for subadvisor skill is a dummy variable that indicates whether the subadvisor specializes in the same investment style as the subadvised fund.[27] Siggelkow (2003) argues that different styles of investment (e.g., growth versus value) draw on different research and execution techniques and investment practices, resulting in distinct cultures that do not adapt well to alternative approaches, ultimately resulting in the deterioration in fund performance as the family offers more styles of funds. When Siggelkow compares the fund performance of families that specialize in few Morningstar investment styles to those with broad offerings across many styles, he finds that funds from more specialized families perform better on average. Similarly, Massa (2003) finds that funds from more focused families outperform funds from families that offer a large variety of styles. Given this evidence, families may perceive that subadvisors that specialize in managing assets in a particular style are likely to deliver the highest future returns in that style, thereby increasing the bargaining power that specialist subadvisors enjoy with funds that have performance-sensitive investors.[28]

For each subadvisor, we define its investment specialty as the Morningstar category in which it internally manages the most assets (within its separate accounts or mutual fund family), using the same nine-style categories as before. We are able to identify a subadvisor specialty in 226 of the 249 relationships for which we possess fee data (we lack asset data for 23 separate account firms). In 90 (39.8%) of these relationships, the subadvisor's specialty matches the investment style of the subadvised fund. In fact, in this subset of 90 funds, the average subadvisor has 74% of their ADE assets in the specialty style. To test whether skilled subadvisors enjoy

[27] A natural alternative measure of skill is the subadvisor's past risk-adjusted return within the investment style of the subadvised fund. Unfortunately, we lack return histories for 50% of the relationships that involve separate account subadvisors and 24% of the relationships that involve subadvisors with their own retail mutual funds. Moreover, only quarterly returns are available for separate account managers, and we often have less than two years of historical returns. Given these data limitations and the evidence in Siggelkow (2003) and Massa (2003), we prefer to rely on our binary proxy for subadvisor skill.

[28] Families with this belief may be the most likely to outsource portfolio management in the first place. The findings of Siggelkow and Massa imply that families can offer a variety of styles without sacrificing performance only if they specialize in certain styles in-house and outsource other styles to skilled subadvisors.

relatively more bargaining power with *direct* channel funds, we interact our proxy for subadvisor skill with a dummy variable indicating whether the subadvised fund is distributed in the *direct* channel. Because investors in the *wholesale* channel exhibit some sensitivity to extreme returns, we also interact our proxy for subadvisor skill with a dummy variable indicating whether the subadvised fund is distributed in the *wholesale* channel.

As a potential proxy for subadvisor reputation, we also include a dummy variable that indicates whether the subadvisor's name appears in the fund name. Because the identity of the subadvisor is otherwise buried in the Statement of Additional Information filing with the SEC, we assume that including the subadvisor in the fund name (e.g., the ASAF Goldman Sachs Mid-cap Growth Fund) indicates that the family wants to publicize the relationship to potential investors. Fund names include subadvisor names in 59 (26.1%) of the 226 relationships that we study. To the extent that the subadvisor's identity resonates with the fund's target investors, subadvisor bargaining power (and subadvisory fees) will be higher.[29] To capture differential effects in the *direct* and *wholesale* channels, we again include interaction terms.

Table VI presents regressions of subadvisor fees on contract and firm characteristics, where standard errors are clustered on both family and subadvisor.[30] The dependent variable is the observed subadvisor fee, reported as a percentage of total net assets, which represents the fraction of each marginal dollar under management that flows to the subadvisor. In each regression, we control for four characteristics of the fund for which portfolio management is being contracted. First, we include the management fee of the subadvised fund. The coefficient on this

[29] Starks and Yates (2008) provide evidence that mutual fund family reputations influence investors' decisions. Studying a discount brokerage supermarket where investors can easily choose funds from numerous families, they find that investors display a strong tendency to cluster their choices within a single family. Massa, Reuter, and Zitzewitz (2010) document higher demand for mutual funds that disclose the names of their fund managers. Because the effect is particularly strong among no-load funds, and return differences are modest, they interpret the higher demand as a marketing benefit.

[30] We thank Mitchell Petersen for providing code that clusters standard errors along two dimensions on his webpage, http://www.kellogg.northwestern.edu/faculty/petersen/htm/papers/se/se_programming.htm.

variable reveals how an incremental basis point of management fee is split between the subadvisor providing portfolio management and the family providing distribution services. The fact that it is consistently around 0.4, and often significantly different from 0.5 at the 10-percent level, is provocative evidence that control over fund distribution is more valuable than control over portfolio management. Second, because fees tend to decline with the assets under management, we include the natural logarithm of the total net assets of the subadvised fund.[31] The negative and significant coefficient on this variable implies that subadvisors are willing to provide a version of quantity discounts to secure the business of large funds. Third, to control for the different costs associated with different investment styles, we include a separate fixed effect for each investment style (except large-cap blend, the omitted category). Fourth, to control for differences in the costs associated with providing distribution services within a distribution channel, and the benefits associated with subadvising the average fund within a distribution channel, we include a separate fixed effect for each channel (except *other,* the omitted category).

Turning to our proxies for subadvisor skill and reputation, we find evidence that subadvisor bargaining power varies across distribution channels. Outside of the *direct* and *wholesale* channels, subadvisors that specialize in the fund's investment style do not earn higher fees; nor do subadvisors that allow their names to appear in the fund name. In contrast, the positive and significant coefficients on the *direct* channel interaction terms indicate that skilled subadvisors earn an additional 9.2-10.4 basis points when negotiating with families in the *direct* channel (*p*-values of 0.053 in column (1) and 0.111 in column (3)). Furthermore, when the subadvisor name appears in the *direct* channel fund name, the subadvisor earns a premium of 10.0-12.5 basis points (*p*-values of 0.005 in column (2) and 0.038 in column (3)). Interestingly, in all of these

[31] Because we restrict attention to funds with a single subadvisor, the size of the fund and the size of the portfolio managed by the subadvisor are identical. When funds hire multiple subadvisors, the level of assets that are allocated to each subadvisor is seldom disclosed.

cases the named subadvisor is an institutional separate account manager that is otherwise unavailable to retail investors, such as the Vanguard PRIMECAP Fund. Both premiums are economically significant relative to the median subadvisory fee of 40 basis points. The evidence that more skilled and reputable subadvisors enjoy greater bargaining power with funds in the *wholesale* channel is mixed; the coefficient on the proxy for subadvisor skill is 5.9-6.2 basis points but the coefficient on the proxy for subadvisor reputation is not significantly different from zero.

In column (4), we replace our individual proxies for subadvisor skill and reputation with an index of subadvisor bargaining power that is the sum of these dummy variables. The summary index interaction reveals a similar premium of 9.2 basis points for *direct* channel funds (p-value of 0.015). In contrast, the coefficient on the index is statistically indistinguishable from zero for funds in other channels. Together, the findings in this section reinforce the idea that families are willing to pay a premium for subadvisors that possess qualities that attract their target clientele. Our evidence is consistent with investors in the *direct* channel valuing performance and access to managers otherwise unavailable to small investors, allowing subadvisors with these perceived qualities to negotiate higher subadvisory fees with *direct* channel families.

B. Do Direct Channel Funds Employ Managers from More Selective Colleges and Universities?

In this section, we test whether our finding from the subadvisory market that families in the direct channel invest relatively more in acquiring skilled managers extends to a more general sample. Specifically, we exploit data on the educational backgrounds of mutual fund managers across the full sample of ADE 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. To the extent that managers from these schools have greater ability (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* channel.

To test the prediction that *direct* channel funds will be more likely to employ managers from the most selective U.S. colleges and universities, we use Morningstar data on the educational backgrounds of 945 actively managed domestic equity fund managers working in 2002.[32] These managers come from 296 different undergraduate institutions. Of the 287 schools located in the United States, we were able to obtain (recent) acceptance rates for 274, and the interquartile range of (recent) student math SAT scores for 251. We use these data to construct three dummy variables related to ability. The first dummy variable identifies the 25 colleges and universities with the lowest acceptance rates within our sample (ranging from 8.8 percent for Harvard to 24.5 percent for Notre Dame). The other two variables indicate whether the mid-point of the school's math SAT scores is in the top quartile (above 650) or the bottom quartile (below 560) of the 251 schools in our sample. Although some managers are listed as the sole manager of multiple funds, and other managers are listed as working alongside co-managers, we give the undergraduate institution of each manager employed by the mutual fund family equal weight.

Consistent with our prediction, we find that mutual funds in the *direct* channel are significantly more likely to employ managers from the top 25 colleges and universities (30.7 percent versus 21.5 percent). The 9.2 percentage point difference is both economically and statistically significant (p-value of 0.012; standard errors clustered on family). In addition, we find that funds in the *direct* channel are more likely to employ managers from high math-SAT schools (60.3 percent versus 48.5 percent; p-value of 0.012), and less likely to employ managers from

[32] 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 the data for 2002.

low math-SAT schools (8.5 percent versus 13.1 percent; p-value of 0.028). While we recognize that our school-level measures are noisy proxies for differences in manager ability, our findings are nevertheless consistent with mutual funds in the *direct* channel investing more in skilled portfolio managers.[33] Interestingly, 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 3). In our sample, we find that funds in the *direct* channel are *less* likely to hire managers with MBAs (53.0 percent versus 59.3 percent; p-value of 0.084).

C. Are Returns Higher in the Direct Channel?

If families in the *direct* channel cater to their after-fee performance-sensitive clientele by investing relatively more in portfolio management, as our evidence above suggests, then we should also find that funds in the *direct* channel earn significantly higher net and risk-adjusted returns than similar funds in other channels. Although this test is similar in spirit to one performed by Bergstresser, Chalmers, and Tufano (2009), ours is motivated by a prediction on optimal family strategies given the preferences of the family's target investors. We extend their results by analyzing additional performance measures, as well as by comparing the typical proxy for distribution services, whether the fund charges a sales load, to our *direct* channel dummy.

Table VIII reports the coefficients from six panel regressions. The sample is limited to actively managed domestic equity funds between January 1996 and December 2002 for which we possess data on the fund's Morningstar investment style. The sample is further restricted to funds for which we possess fund-level distribution channel data. The dependent variables in

[33] Because Massa, Reuter, and Zitzewitz (2010) document that a significant fraction of the actively-managed mutual funds in 2002 are anonymously managed, we only observe manager educational data for a subset of the managers that each family employs. However, in 2002, *direct* channel mutual funds are slightly less likely to be anonymously managed (9.2 percent versus 12.0), suggesting that selective disclosure is unlikely to drive the differences in undergraduate institutions.

columns (1) through (5) are different measures of fund *i*'s return in month *t*. In column (1), we focus on fund *i*'s monthly net (after expense) return. In columns (2) and (3), we focus on four-factor alphas estimated from fund *i*'s net returns between *t*-36 and *t*-1. In column (4), we focus on four-factor alphas estimated from fund *i*'s gross returns (the monthly returns obtained by adding fund *i*'s average monthly expense back to its net returns). In column (5) 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. Finally, in column (6), 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 mirrored 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 (6) is a dummy variable that identifies funds with above-median measures of both active share and tracking error.[34] All regressions include investment style-by-month fixed effects, so that performance is measured relative to other funds with the same investment style, in the same month; they also include numerous fund-level controls. Standard errors are clustered on month; we obtain similar results when we instead cluster standard errors on fund i's mutual fund family.

In all five of the specifications that include the *direct* channel dummy variable, the estimated coefficient on this variable is positive and statistically significant, with *p*-values ranging from 0.000 to 0.028. It is also economically significant. When we focus on net returns, four-factor alphas based on net returns, or four-factor alphas based on gross returns, mutual funds in the direct channel outperform their peers in other channels by 8.0-8.5 basis points per month. (In unreported specifications that focus on one-factor and three-factor alphas, the estimated coeffi-

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

cients are 11.9 and 9.4, with *p*-values of 0.001 and 0.000.)[35] Interestingly, column (4) reveals that unlike Gil-Bazo and Ruiz-Verdu (2009), we find no relation between before-fee returns and fees. However, our sample period (1996-2002) overlaps with the period (1997-2005) for which their evidence is weakest.

When we focus on two measures of active management that were not studied by Bergstresser, Chalmers, and Tufano (2009), we find further support for our prediction that *direct* channel funds invest more in portfolio management. Testing for differences in return gaps, which measure the value created (or destroyed) by mutual fund manager and mutual fund family actions that we cannot directly observe, we find that approximately half of the superior performance of *direct* channel funds comes from more-positive return gaps. In column (6), we find evidence that actively managed *direct* channel funds are actually more actively managed. Specifically, we find that *direct* channel funds are 10 percentage points (p-value 0.000) more likely to have above-median values of both active share and tracking error. Since only 34 percent of ADE funds fall into this category, 10 percentage points is economically significant. If we redefine our dependent variable to identify funds with top-quartile values of both active share and tracking error, only 10.8 percent of funds fall into this category, but the (unreported) coefficient on the direct channel dummy variable is a statistically and economically significant 5.2 percentage points (*p*-value of 0.000).

When we exclude the *direct* channel variable in column (2), the coefficient on the no-load dummy variable is half as large (4.4 basis points) and only statistically significant at the 10-percent level (*p*-value of 0.067). Moreover, in the specifications that include the *direct* channel

[35] It is worth noting that the differences in performance that we document are unlikely to reflect differences in mutual fund survival rates across channels. When we use fund characteristics in year *t*-1 to predict the likelihood that fund *i* survives from year *t-1* to year *t*, we find that funds with lower performance are less likely to survive. However, we find no evidence that the survival rate of *direct* channel funds is different or more sensitive to performance.

dummy, the coefficient on the no-load dummy variable is essentially zero. In other words, the no-load dummy variable is a noisy proxy for whether a fund is distributed through the *direct* channel.

D. Revisiting the Puzzle of Active Management

Gruber (1996) finds strong demand for actively managed mutual funds despite their underperformance relative to index funds. The idea that some investors are willing to tradeoff portfolio management and broker services allows us to shed new light on this puzzle of active management. Brokers compensated through commissions have little incentive to recommend index funds, which are available at low cost in the *direct* channel. Indeed, we find that the fraction of assets invested in passively managed domestic equity funds in 2002 ranges from a high of 18.8% in the *direct* channel to lows of 4.9% in the *captive* channel and 1.4% in the *wholesale* channel. Therefore, demand for broker services becomes demand for actively managed funds. Moreover, it becomes demand for those actively managed funds available in broker-sold channels, which invest less in portfolio management than *direct* channel funds.

Because actively managed funds in the *direct* channel have the strongest incentive to invest in portfolio management, a more powerful test of the puzzle of active management is whether index funds in the *direct* channel outperform actively managed funds, also in the *direct* channel. We conduct this test in Table IX. In column (1), we regress fund i's four factor alpha on a dummy variable that indicates whether fund *i* is an index fund, and investment style-by-month fixed effects. The estimated coefficient is 0.000 with a p-value of 0.973. In column (2), when we control for the different characteristics of actively managed funds, the estimated coefficient on the index fund dummy is -10.8 basis points per month, but not statistically distinguishable from zero (p-value of 0.206). In other words, within the distribution channel with the strongest incentive to invest in portfolio management, we find no evidence that index funds outperform actively managed funds during our sample period.

In contrast, when we focus on the sample of actively managed and index funds outside the *direct* channel, we find that index funds outperform actively managed funds by as much as 8.9 basis points per month (in the specification without controls). Since index funds should have alphas near zero (especially since we are including investment style-by-month fixed effects), the underperformance of actively managed funds relative to index funds outside the *direct* channel is closely related to the underperformance we find in Table VIII. As such, it is another way to measure the tradeoff between investments in brokers and investments in portfolio management.

In the last two columns of Table IX, we include all of the distribution channels in a single regression, but include separate dummy variables for actively managed funds in the *direct* channel, index funds in the *direct* channel, and index funds outside the *direct* channel. In column (5), we find that all three types of funds outperform actively managed funds outside the *direct* channel (the omitted category) by 7.5-10.4 basis points per month; we cannot reject the hypothesis that the estimated coefficients on all three dummy variables are equal (p-value of 0.801). In column (6), when we control for the fund-level characteristics (like the higher expenses of actively managed funds), we once again find actively managed funds in the *direct* channel outperform actively managed funds in other channels.

IV. Family Response to Clientele-Induced Constraints

The subadvisory market is a useful setting in which to test for other behavior consistent with market segmentation. If families truly face broker-induced constraints in expanding distribution into new channels, we might expect them to pursue strategies to overcome these barriers. In addition, if investor preferences vary substantially by channel, families should make decisions with an awareness of the preferences of their target clientele. In this section, we argue that subadvisor decisions to participate in the market, and patterns in which particular pairs of firms enter subadvisory contracts, are consistent with our earlier findings.

A. Overcoming Barriers to Expand Distribution as a Motivation for Subadvising

While it is common to view subadvisory contracts from the perspective of a mutual fund family seeking to outsource portfolio management (Chen et al (2008), Kuhnen (2009), Cashman and Deli (2009), and Duong (2007)), we can also view them from the perspective of a subadvisor seeking to expand distribution. Subadvising allows firms to outsource the costly distribution services required by investors in different market segments. An intuitively appealing example of this is the case of separate account management firms that cater to the needs of purely institutional clients, such as pension funds and endowments. Participating in the subadvisory market allows these firms to gain retail distribution without the high fixed-costs of developing the regulatory infrastructure or additional services, such as daily NAV pricing. Subadvising also allows mutual fund families to relax broker-induced constraints on serving investors in multiple segments. For example, the hiring of Oppenheimer Capital as subadvisor for the Preferred Value Fund allows Oppenheimer to indirectly serve investors in Preferred's *direct* channel without providing an obvious lower-cost alternative to the Oppenheimer Quest Value Fund that their own brokers recommend in the *wholesale* channel. Although both funds invest in large-cap value stocks and have a monthly return correlation of 0.96, we assume—and our evidence is consistent with the hypothesis—that investors are unlikely to perceive them to be the same product. In Table AI, we show that 86 mutual fund families subadvise for other mutual fund families. Among families whose primary distribution channel is direct or broker-sold, 60.8% of the subadvised assets are in channels that broker-incentives prevent them from serving directly.

We find the expansion of distribution via subadvising to be economically significant. For the 86 subadvisory firms that already have their own retail distribution, we find that the average Herfindahl distribution channel index falls from 0.817 to 0.691 (the median falls from 0.858 to 0.724) when we account for the distribution channels that these families reach indirectly via subadvising, indicating that distribution becomes less concentrated after accounting for subadvising.[36] Similarly, the average number of distribution channels they sell through increases from 2.29 to 3.73 (the median increases from 2 to 4). In each case, the difference in means or medians is statistically significant at the 1% level. In terms of assets under management, the assets managed in new channels via subadvising account for 18.3% of the total assets managed by the average firm; for the median firm, the fraction is 5.8%, which is smaller, but still economically significant. In addition, all of the assets subadvised by separate account managers reflect increases in their retail distribution by definition. Together, our evidence suggests that overcoming barriers to expanding distribution provides an additional motivation for firms to participate in the subadvisory market.

B. Do Families in the Direct Channel Cater to Do-It-Yourself Investors? Evidence from Contracting Partners

To provide additional evidence that mutual fund families internalize the preferences of their target clienteles, we exploit data on subadvisor identities. To the extent that do-it-yourself investors face the lowest search costs, they are the most likely to try to invest directly with the subadvisor. Thus, we predict that families in the *direct* channel will be the least likely to hire subadvisors that distribute their own brand of mutual funds in the *direct* channel. Similarly,

[36] To compute a Herfindahl that accounts for subadvising, we add the TNA in the distribution channels for which they subadvise to the TNA in their own retail channel.

families in the *direct* channel will have a greater preference for subadvisors that manage separate accounts, since these investment vehicles are not otherwise accessible to retail investors.

In Table X, we compare the distribution channel of 252 subadvised funds with a single subadvisor to the primary distribution channels of their subadvisors (determined based on firm-level ADE assets) and find support for both predictions. Under the null hypothesis that the fraction of subadvisors from each distribution channel reflects the relative supply of firms in each channel, the expected number of subadvisors pairing with direct channel subadvised funds is 9.7. The observed number is 3, which is statistically significantly different at the 1-percent level.[37] Similarly, the expected number of separate account subadvisors (29.5), is statistically significantly different at the 1-percent level from the observed number of separate account subadvisors (46). In addition, we find that mutual funds distributed through the *direct* channel are statistically significantly more likely to hire institutional separate account managers as subadvisors than funds in other channels (82.2 percent versus 41.4 percent for the other 198 single-subadvisor funds distributed through other channels). We note that these results also hold if we consider the full sample of subadvised funds rather than the subsample of funds with a single subadvisor (not reported).

V. Summary and Conclusion

We study the impact of heterogeneous investor demand for broker services and portfolio performance on market segmentation and mutual fund family behavior. The interaction between investor heterogeneity and broker incentives to only recommend funds that investors cannot access more cheaply elsewhere leads us to predict that families will target performance-sensitive

[37] To determine the relative supply of subadvisors from each channel, we compare the observed number of subadvisors that come from each channel, excluding those on the diagonal. However, inferences are similar when we include the number of subadvisors within the diagonal elements or focus on the number of firms that operate in each channel (regardless of whether they serve as a subadvisor).

investors, or investors who value broker services, but not both. Using data on mutual fund distribution channels between 1996 and 2002, we find strong support for this prediction. We find that the market for retail mutual funds is highly segmented, with some mutual fund families serving do-it-yourself investors in the *direct* channel, and other families serving investors in one of the broker-sold channels. Flow-performance analysis confirms that investors in the *direct* channel are more performance sensitive, in that they are more likely to reward funds with inflows when lagged returns are high and punish them with outflows when lagged returns are low.

Our evidence suggests that fund families internalize the preferences of their target investors. We predict that mutual fund families targeting performance-sensitive investors in the *direct* channel will invest relatively more in portfolio management. Because traditional mutual fund fee data do not distinguish investments in portfolio management from investments in distribution services or profits, we hand collect fees paid by actively managed domestic equity funds to subadvisors for portfolio management in 2002. Consistent with the concern that management fees overstate investments in portfolio management, we find that the median management fee is 80 basis points, while the median subadvisory fee is only 40 basis points. To the question of differential investments, we find that mutual fund families in the *direct* channel pay a significant fee premium for skilled or reputable subadvisors. We also find that funds distributed through the *direct* channel are significantly more likely to hire managers who attended the most selective U.S. colleges and universities—managers who are likely to be more skilled, but are also more expensive to hire and retain. Finally, within the full sample of actively managed domestic equity funds in CRSP, we also find robust evidence that funds distributed through the *direct* channel outperform comparable funds distributed through other channels by one percent per year. We interpret these findings as evidence that mutual fund families in the *direct* channel do invest relatively more in portfolio management and reap the rewards of superior performance.

Overall, our findings are consistent with a model in which investor heterogeneity causes some mutual fund families to compete for investors on more than after-fee returns. Our evidence that families in the *direct* channel invest the most in performance implies that tests for fund manager skill should focus on funds distributed in this channel. More generally, market segmentation has important implications for the relation between mutual fund fees and returns. For example, Gil-Bazo and Ruiz-Verdu (2009) document a negative relation between mutual fund fees and before-fee returns, and argue that this relation reflects strategic price setting. Our evidence suggests an alternative explanation. Mutual funds in broker-sold channels charge higher total fees because they need to compensate brokers for servicing investors, and earn lower before-fee returns, because they invest less in portfolio management. Whether our alternative better reflects the nature of competition between mutual fund families than the model of Gil-Bazo and Ruiz-Verdu (2008) remains an open question. However, it is worth highlighting the different welfare implications of the two models. In Gil-Bazo and Ruiz-Verdu (2008), unsophisticated investors would benefit from being forced to invest in a low-cost index fund in the *direct* channel. In contrast, when mutual funds compete by offering different bundles of portfolio management and investor services, investors who value personalized advice and self-select into broker-sold channels are unlikely to benefit from being forced to invest in the no-broker-services *direct* channel, despite the higher after-fee returns.

The insight that some investors are willing to tradeoff portfolio management and broker services also motivates us to revisit the puzzle of active management (Gruber (1996) and French (2008)). Brokers compensated through commissions have little incentive to recommend index funds, which are available at low cost in the *direct* channel. Therefore, demand for broker services becomes demand for actively managed broker-sold mutual funds, which underperform. But, to the extent that investors are rationally trading off portfolio management and broker services, this underperformance is to be expected. A more powerful test of the puzzle of active management is whether index funds in the *direct* channel outperform actively managed funds in the *direct* channel. Within our sample, we cannot reject that active and passive mutual funds in the *direct* channel perform the same on average.[38]

Finally, awareness of the changing nature of mutual fund distribution will be important for future research. A recent *Wall Street Journal* article and Investment Company Institute publication both suggest that the broker incentives driving segmentation during our sample period are now in flux.[39] If payments to brokers for advice increasingly come directly from investors rather than via mutual fund families, the universe of funds that brokers are willing to recommend will likely expand, and competition is likely to focus more on after-fee returns. Understanding how market segmentation responds to changing broker and mutual fund family incentives will be important in future studies of investor and fund family behavior, and in tests for differences in fund performance.

Appendix: Who Participates in the Subadvisory Market?

Previous studies of the subadvisory market focus on a mutual fund family's incentive to outsource portfolio management to a subadvisor. For example, Chen, Hong, and Kubik (2008), Cashman and Deli (2009), and Duong (2007) study the performance of subadvised mutual funds relative to internally managed funds. Because we use the identities of both the advisors and the subadvisors in defining our variables of interest, in Table AI, we provide summary statistics on

[38] Gruber (1996), Glode (2009), Savov (2009), and Pastor and Stambaugh (2010) offer alternative explanations for the puzzle of active management.

[39] Damato, Karen. "Take a Load Off: Do-It-Yourself Investors Get More Fund Choices." *The Wall Street Journal* March 1, 2010, R1 and 2010 Investment Company Factbook, page 76.

the different participants in the subadvisory markets. Within each category, we also list the top five firms, ranked by assets under management in actively managed domestic equity portfolios. Overall, we find that 38% of the mutual fund families in the CRSP Survivor-bias Free Mutual Fund Database in 2002 participate as either a buyer or a seller of subadvisory services for active domestic equity funds.

The first row of Table AI contains mutual fund families that outsource portfolio management to outside firms—the sample studied by others. Buyers of subadvisory services include such familiar names as Vanguard and American Express. The average mutual fund families buying subadvisory services is relatively large, with $9.4 billion under management, although the median buyer has only $1.6 billion under management. The percentage of ADE funds outsourced by these families is substantial, with a mean of 62.5% and a median of 60%.

The second row contains statistics for 130 firms that sell subadvisory services, but do not have any retail funds of their own. Because firms like Capital Guardian Trust and Fayez Sarofim manage separate accounts for endowments and pension funds, they have established reputations in the institutional market, but are largely unfamiliar to retail investors.[40] Participating in the subadvisory market allows separate account managers to earn additional management fee revenues without having to invest in the investor services demanded by retail mutual fund investors (e.g., daily NAV pricing and individual recordkeeping). In other words, while subadvised funds benefit from outsourcing costly portfolio management services, separate account managers benefit from outsourcing costly distribution services. The typical separate account manager is roughly comparable to the typical buyer of subadvisory services in terms of total assets under manage-

[40] In some cases, separate account management firms are owned by a parent with a retail distribution network. For example, Capital Guardian Trust has common ownership with Capital Group, which also distributes the American Funds to retail investors. We use the entity specifically named in the subadvisory contract. If the firm markets their institutional arm as completely separate from their retail arm, we do not include those firms among the fund families with retail distribution.

ment, with a mean of $9.9 billion (versus $9.4 billion), but the median separate account manager is bigger ($2.9 billion versus $1.6 billion).

The final row contains sellers of subadvisory services that also distribute their own retail funds. This category consists of 86 mutual fund families, including well-known ones like Fidelity, Janus, and T. Rowe Price, that are somewhat larger than the other market participants in terms of family assets under management, with a mean of $16.8 billion and a median of $2.6 billion. The fact that mutual fund families “pick stocks” for other families has gone unnoticed in prior studies of the subadvisory market. However, as we discuss in Section IV.A., there are two ways for a mutual fund family to benefit from subadvising from another family. First, mutual fund families that subadvise for other families may benefit from outsourcing costly distribution services. Second, mutual fund families that subadvise may relax broker-induced constraints on distribution. For example, mutual fund families in the direct channel may be able to subadvise for families in broker-sold channels without impacting broker incentives to recommend funds.

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Table I. Distribution channels for families distributing retail mutual funds

The numbers in this table are computed at the family level. Families are placed in one of seven distribution channels based on the maximum percentage of actively managed domestic equity assets under management distributed through a particular channel according to 2002 data from the Financial Research Corporation (FRC). (TNA of share classes missing distribution channel data is ignored.) The table does not include the twenty families representing $300 million in assets that were dropped due to missing distribution channel data.

Distribution Channel:	Direct	Institutional	Captive	Bank	Insurance	Wholesale	Other	Total:
Number of families in channel	169	74	17	23	16	76	77	452
Aggregate ADE assets in channel ($Billions)	$632.9	$99.8	$88.7	$13.8	$20.4	$418.3	$40.5	$1,314.5
Top 3 families in channel ranked by ADE assets under management	Fidelity Vanguard Janus	SEI Investments Dimensional Fund Advisors Banc One	American Express Morgan Stanley Smith Barney	ABN AMRO US Trust of NY Northern Trust	Thrivent Eclipse (NYLife) State Street	American Funds Putnam AIM	General Electric Gabelli Asset Mgmt Goldman Sachs	Fidelity American Funds Vanguard

Table II. Monthly flow-performance sensitivity across distribution channels, ADE funds, 1996-2002

This table reports regressions where the dependent variable is monthly net percentage fund flow, using the standard definition of the growth in TNA less capital appreciation. The unit of observation is fund *i* in month *t*. All regressions include channel-by-style-by-month fixed effects and the following fund-level control variables, which are also interacted with channel: lagged no-load fund dummy, lagged expense ratio, lagged 12b-1 fee, lagged log of fund TNA, lagged log of family TNA, and current fund age measured in years. We also include 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 Morningstar investment style (but across channels). The sample consists of 115,918 observations. Standard errors are clustered on fund family; p-values are reported in parentheses.

	Direct	Institutional	Captive	Bank	Insurance	Wholesale	Other
Net flow (t-1)	0.222***	0.182***	0.248***	0.022	0.268***	0.313***	0.259***
* Channel dummies	(0.000)	(0.000)	(0.000)	(0.674)	(0.001)	(0.000)	(0.000)
Net return (t-1) in Top 20%	1.339***	0.135	-0.274	-0.038	0.137	0.393**	0.307
* Channel dummies	(0.000)	(0.521)	(0.208)	(0.934)	(0.560)	(0.020)	(0.231)
Net return (t-1)	-0.047	0.185***	0.176***	0.164*	0.092	0.050	0.112*
* Channel dummies	(0.586)	(0.000)	(0.000)	(0.076)	(0.132)	(0.189)	(0.052)
Net return (t-1) in Bottom 20%	-0.839***	0.489**	0.189	-0.305	-0.051	-0.328**	-0.293
* Channel dummies	(0.000)	(0.018)	(0.246)	(0.281)	(0.798)	(0.048)	(0.205)

H_0: Coefficient on lagged net flows are equal across channels	0.001***
H_0: Coefficient on lagged net return are equal across channels	0.069*
H_0: Coefficient on top 20% dummies are equal across channels	0.013**
H_0: Coefficient on bottom 20% dummies are equal across channels	0.000***

Table III. Segmentation by distribution channel for families distributing retail mutual funds

The numbers in this table are computed at the family level. Families are placed in one of seven distribution channels based on the maximum percentage of actively managed domestic equity assets under management distributed through a particular channel according to 2002 data from the Financial Research Corporation (FRC). (TNA of share classes missing distribution channel data is ignored.) The last column computes the mean percent of family assets distributed through each channel using family TNA in all asset classes. The table does not include the twenty families representing $300 million in assets that were dropped due to missing distribution channel data.

		% of family ADE assets in primary ADE channel				Mean % of family assets in primary channel
Distribution Channel:	N	Mean	25^{th} pctile	Median	75^{th} pctile	
Direct	169	96.5%	99.7%	100%	100%	94.8%
Institutional	74	86.2%	75.0%	92.2%	100%	85.7%
Captive	17	90.3%	82.8%	96.9%	100%	86.6%
Bank:	23	89.8%	79.2%	100%	100%	86.9%
Insurance	16	94.2%	90.5%	98.4%	100%	87.5%
Wholesale	76	91.1%	87.4%	100%	100%	89.6%
Other	77	92.8%	96.5%	100%	100%	90.3%
Total:	452	92.6%	90.5%	100%	100%	90.7%
25 Largest:	25	85.8%	75.6%	94.1%	97.8%	84.5%

Table IV. Primary and secondary distribution channels in 2002

The sample below includes the 452 families for which we have distribution channel data in 2002. The primary distribution channel is the channel through which the family distributes the largest percentage of actively managed domestic equity assets, and the secondary channel is the next largest percentage for each family. The column "None (%)" indicates that the number of mutual fund families that distribute 100% of ADE assets through a single distribution channel. The column "Broker Conflict (%)" indicates the number of families for which the primary and secondary distribution channels are broker incentive incompatible (direct and broker-sold, or captive broker-sold and wholesale broker-sold). It is not defined for families whose primary distribution channel is *Institutional* or *Other*.

Panel A. Number of Primary-Secondary Distribution Channel Pairs

Primary Distribution channel of fund family	Secondary Distribution channel of fund family									
	Direct	Institutional	Captive	Bank	Insurance	Wholesale	Other	None (%)	Total	Broker Conflict (%)
Direct	---	14	0	1	0	2	27	125 (74.0%)	169	3 (1.8%)
Institutional	3	---	1	21	0	7	19	23 (31.1%)	74	
Captive	0	7	---	0	0	0	4	6 (35.3%)	17	0 (0%)
Bank	0	4	1	---	0	0	6	12 (52.2%)	23	1 (4.3%)
Insurance	0	4	0	0	---	0	6	6 (37.5%)	16	0 (0%)
Wholesale	5	14	0	0	1	---	17	39 (51.3%)	76	6 (7.9%)
Other	6	6	1	1	1	6	---	56 (72.7%)	77	
Total	**14**	**49**	**3**	**23**	**2**	**15**	**79**	**267 (59.1%)**	**452**	**10 (3.3%)**

Panel B. Average fraction of Family ADE Total Net Assets in the Secondary Distribution Channel (for families in that cell in Panel A)

Primary Distribution channel of fund family	Secondary Distribution channel of fund family						
	Direct	Institutional	Captive	Bank	Insurance	Wholesale	Other
Direct	---	15.9%	0	5.3%	0	6.2%	10.6%
Institutional	23.6%	---	12.2%	14.4%	0	25.5%	19.6%
Captive	0	16.0%	---	0	0	0	7.8%
Bank	0	28.6%	11.4%	---	0	0	16.5%
Insurance	0	7.4%	0	0	---	0	8.3%
Wholesale	32.0%	8.9%	0	0	14.0%	---	15.3%
Other	10.5%	23.1%	9.9%	42.8%	3.5%	30.5%	---

Table V. Subadvisory and Management Fees for Retail Mutual Funds with a Single Subadvisor in 2002

The sample below includes 252 family-subadvisor pairs involving a single subadvisor for which we possess data on both the management fee and the subadvisory fee. The management fee come from the CRSP Survivor-Bias-Free US Mutual Fund Database and are defined as the dollar management fee paid in fiscal-year 2002 divided by fund average TNA in 2002. The subadvisory fee comes from the Statement of Additional Information within the 485BPOS SEC filing of the subadvised fund in 2002. It is the dollar fee paid to the subadvisory firm in fiscal-year 2002 divided by fund average TNA in 2002. The table below reports the 75th, 50th, and 25th percentiles of the management fee and subadvisory fee (in basis points) by Morningstar style category, and overall across the 252 pairs. The last three columns report the the 75th, 50th, and 25th percentiles of the percentage fee split, defined as the subadvisor fee divided by the management fee.

		Subadvisory fee (basis points)			Management fee (basis points)			Subadvisor fee / Management fee (fee split %)		
Morningstar Style Category	N	75th percentile	Median	25th percentile	75th percentile	Median	25th percentile	75th percentile	Median	25th percentile
Large-cap Value	37	45	33	23	80	74	55	53.3	44.2	40.0
Large-cap Blend	37	45	33	23	100	80	70	54.1	40.0	31.3
Large-cap Growth	67	50	40	30	90	80	70	60.0	52.3	41.4
Mid-cap Value	10	70	50	43	100	95	69	70.0	60.8	50.6
Mid-cap Blend	8	48	40	33	93	83	66	60.5	48.5	44.2
Mid-cap Growth	34	55	45	30	100	90	75	63.2	50.0	36.8
Small-cap Value	13	70	58	40	100	100	75	69.2	55.6	51.4
Small-cap Blend	9	65	50	35	100	85	70	60.0	50.0	50.0
Small-cap Growth	37	65	55	35	100	92	80	73.3	55.0	44.4
All styles	252	54	40	30	100	80	70	62.5	50.0	40.0

Table VI. The Relation between Subadvisor Fees and Contract, Family, and Subadvisor Characteristics (2002)

The table below contains the results of four OLS regressions. The dependent variable in each regression equals the subadvisory fee for the sub-sample of subadvised funds that hire a single subadvisor, and for which we possess data on all independent variables. Standard errors are clustered on both the family of the subadvised fund and the subadvisory firm; p-values are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
Specialist subadvisor hired dummy	0.019		0.018	
	(0.384)		(0.409)	
Specialist subadvisor hired dummy * Family in direct channel	0.104*		0.092	
	(0.053)		(0.111)	
Specialist subadvisor hired dummy * Family in wholesale channel	0.059*		0.062*	
	(0.068)		(0.055)	
Subadvisor name in fund name dummy		0.034	0.031	
		(0.183)	(0.213)	
Subadvisor name in fund name dummy * Family in direct channel		0.125***	0.100**	
		(0.005)	(0.038)	
Subadvisor name in fund name dummy * Family in wholesale channel		-0.033	-0.027	
		(0.503)	(0.539)	
Subadvisor bargaining power index				0.023
				(0.184)
Subadvisor bargaining power index * Family in direct channel				0.092**
				(0.015)
Subadvisor bargaining power index * Family in wholesale channel				0.016
				(0.611)
Management fee	0.410***	0.411***	0.405***	0.401***
	(0.000)	(0.000)	(0.000)	(0.000)
Natural log of subadvised fund assets (millions)	-0.024***	-0.022***	-0.023***	-0.024***
	(0.000)	(0.000)	(0.000)	(0.000)
Large-cap value dummy	-0.010	0.012	-0.003	-0.003
	(0.754)	(0.735)	(0.922)	(0.922)
Large-cap growth dummy	0.029	0.059*	0.036	0.035
	(0.280)	(0.055)	(0.187)	(0.190)
Mid-cap value dummy	0.114***	0.140***	0.111***	0.117***
	(0.001)	(0.000)	(0.002)	(0.001)
Mid-cap blend dummy	0.056	0.056	0.060	0.056
	(0.180)	(0.193)	(0.165)	(0.179)
Mid-cap growth dummy	0.054	0.057	0.059*	0.056*
	(0.118)	(0.115)	(0.083)	(0.095)
Small-cap value dummy	0.100**	0.116***	0.107***	0.104***
	(0.012)	(0.009)	(0.008)	(0.008)
Small-cap blend dummy	0.085*	0.096*	0.100**	0.098**
	(0.070)	(0.057)	(0.033)	(0.034)

Small-cap growth dummy	0.109***	0.123***	0.114***	0.112***
	(0.005)	(0.004)	(0.004)	(0.003)
Direct channel dummy	-0.043	0.004	-0.037	-0.039
	(0.374)	(0.926)	(0.460)	(0.430)
Institutional channel dummy	0.041	0.050	0.053	0.050
	(0.314)	(0.249)	(0.218)	(0.222)
Captive channel dummy	0.071*	0.072*	0.077*	0.077*
	(0.058)	(0.092)	(0.053)	(0.056)
Bank channel dummy	-0.003	-0.000	0.008	0.007
	(0.956)	(0.994)	(0.886)	(0.901)
Insurance channel dummy	0.007	0.005	0.007	0.007
	(0.811)	(0.861)	(0.882)	(0.805)
Wholesale channel dummy	-0.098***	-0.068	-0.088*	-0.090**
	(0.009)	(0.224)	(0.054)	(0.043)
Intercept	0.135**	0.108	0.119**	0.126**
	(0.020)	(0.115)	(0.044)	(0.031)
N	226	226	226	226
R^2	0.586	0.570	0.598	0.592
P-value test that coefficient on management fee = 0.50	0.093*	0.177	0.078*	0.063*
Standard errors clustered on family and subadvisor?	Yes	Yes	Yes	Yes

Table VII. Do Mutual Fund Managers in the Direct Channel Have Different Educational Backgrounds? (2002)

This table uses Morningstar data on the educational backgrounds of actively managed domestic equity fund managers in 2002. For each of the 945 managers directly employed by his mutual fund family, we observe the name of the undergraduate college or university and whether he later earned an MBA. We obtain (recent) admissions rates for 274 of the 296 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). Column (1) reports the fraction of managers that attended one of the 25 most selective U.S. undergraduate institutions (based on admission rates). Columns (2) and (3) report the fraction of managers that attended undergraduate institutions within the top and bottom quartiles of the math SAT score distribution. Column (4) reports the fraction of managers that obtained an MBA. Below each difference, we report two p-values. The first p-value (reported within parentheses) is from a t-test for a difference in means, where we cluster standard errors on mutual fund family. The second p-value (reported within brackets) is the p-value from the two-sample Wilcoxon rank-sum test.

	(1)	(2)	(3)	(4)
	% 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 with MBA
Direct channel	30.7%	60.3%	8.5%	53.0%
All other channels	21.5%	48.5%	13.1%	59.3%
Difference	9.2%	11.9%	-4.7%	-6.3%
(p-value; t-test)	(0.012)**	(0.012)**	(0.028)**	(0.084)*
[p-value; Wilcoxon]	[0.002]***	[0.001]***	[0.041]**	[0.066]*

Table VIII. Monthly Fund Returns and the Direct Distribution Channel (1996-2002)

The table below reports coefficients from panel regressions of fund *i*'s monthly return on fund and family characteristics. The sample is restricted to non-specialty domestic equity funds operating between January 1996 and December 2002 for which we possess investment style data from Morningstar and fund-level distribution channel data from FRC. The return measures are fund *i*'s net return, fund *i*'s four-factor alpha estimated from net returns, fund *i*'s four-factor alpha estimated from fund i's gross returns (i.e., the monthly returns obtained by adding fund i's average monthly expense back to its net return), and 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 (6) identifies those funds with above-median values of active share and tracking error (as calculated in Cremers and Petajisto (2009)). 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 (6). All regressions include style-by-month fixed effects and the following fund-level control variables: lagged no-load fund dummy, lagged expense ratio, 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 independent variable of interest is the Direct Channel dummy variable, which equals one if 75 percent or more of fund *i*'s TNA is distributed through the *direct* channel. Standard errors are clustered on month; p-values are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:	Net return	Carhart Alpha, Net Return	Carhart Alpha, Net Return	Carhart Alpha, Gross Return	Return Gap	Above-Median Values of Active Share & Tracking Error?
Direct channel dummy (t)	0.080***		0.085***	0.085***	0.046**	0.100***
	(0.017)		(0.002)	(0.002)	(0.028)	(0.000)
No-load dummy (t-12)	-0.000	0.044*	0.013	0.012	0.013	-0.015**
	(0.986)	(0.067)	(0.575)	(0.595)	(0.418)	(0.033)
Expense ratio (t-12)	-0.091*	-0.080**	-0.084**	0.003	-0.045	0.156***
	(0.066)	(0.046)	(0.038)	(0.946)	(0.042)	(0.000)
12b-1 fee (t-12)	0.005	0.050	0.077	0.076	0.106*	-0.091***
	(0.944)	(0.494)	(0.312)	(0.321)	(0.056)	(0.000)
Ln Fund TNA (t-1)	-0.041***	-0.025**	-0.028***	-0.029**	-0.035***	-0.003*
	(0.000)	(0.030)	(0.015)	(0.012)	(0.000)	(0.090)
Ln Family TNA (t-1)	0.023**	0.011	0.012	0.011	0.031***	-0.024***
	(0.013)	(0.211)	(0.167)	(0.203)	(0.000)	(0.000)

Turnover (t-12)	-0.000	-0.000	-0.000	-0.000	-0.000**	0.000***
	(0.400)	(0.134)	(0.106)	(0.106)	(0.028)	(0.000)
Fund age (t)	-0.001	-0.001	-0.001	-0.001	-0.000	0.001***
	(0.297)	(0.342)	(0.298)	(0.384)	(0.425)	(0.000)
Net flow (t-12, t-1)	0.001	0.002***	0.002***	0.002***	0.000	-0.000***
	(0.532)	(0.004)	(0.004)	(0.004)	(0.619)	(0.000)
Standard deviation net flow (t-12, t-1)	-0.007	-0.014	-0.015	-0.015	-0.013	0.021***
	(0.686)	(0.178)	(0.133)	(0.149)	(0.872)	(0.000)
Morningstar style*Month fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	102,223	99,292	99,292	99,278	90,061	18,552

Table IX. Monthly Fund Returns of Actively and Passively Managed Funds, Inside and Outside of the Direct Channel (1996-2002)

The table below reports coefficients from panel regressions of fund *i*'s monthly return on fund and family characteristics. We combine the sample of actively managed domestic equity in Table VIII with passively managed domestic equity funds operating between January 1996 and December 2002 for which we possess investment style data from Morningstar and fund-level distribution channel data from FRC. The return measure fund *i*'s four-factor alpha estimated from net returns. The *Direct* channel dummy variable equals one if 75 percent or more of fund *i*'s TNA is distributed through the *direct* channel. The ADE dummy variables equal one if fund *i* is actively managed, and the Index dummy variable equals one if fund *i* is passively managed. Columns (1) and (2) are restricted to funds in the direct channel; columns (3) and (4) are restricted to funds in the other distribution channels; and columns (5) and (6) include funds from each of the seven distribution channels. All regressions include style-by-month fixed effects. Columns (2), (4), and (6) also include the following fund-level control variables: lagged no-load fund dummy, lagged expense ratio, 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 month; p-values are reported in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable:			Carhart Alpha, Net Return			
Sample:	Inside *Direct* channel		Outside *Direct* channel		All Channels	
Direct channel dummy (t) * ADE fund (t)					0.075*** (0.001)	0.086*** (0.002)
Direct channel dummy (t) * Index fund (t)	0.000 (0.973)	-0.108 (0.206)			0.104* (0.052)	0.025 (0.681)
(1 – Direct channel dummy (t)) * ADE fund (t)					---	---
(1 – Direct channel dummy (t)) * Index fund (t)			0.089* (0.074)	0.023 (0.651)	0.081 (0.110)	0.015 (0.766)
No-load dummy (t-12)		0.011 (0.837)		0.031 (0.240)		-0.015** (0.033)
Expense ratio (t-12)		-0.061 (0.508)		-0.085** (0.048)		-0.084** (0.037)
12b-1 fee (t-12)		0.085 (0.724)		0.099 (0.208)		0.078*** (0.302)
Ln Fund TNA (t-1)		-0.031** (0.048)		-0.025** (0.047)		-0.028** (0.012)

Ln Family TNA (t-1)		0.017		0.010		0.012
		(0.169)		(0.283)		(0.161)
Turnover (t-12)		-0.000*		-0.000		-0.000*
		(0.070)		(0.557)		(0.098)
Fund age (t)		-0.004**		0.000		-0.001
		(0.342)		(0.991)		(0.300)
Net flow (t-12, t-1)		0.002**		0.001**		0.002***
		(0.018)		(0.024)		(0.005)
Standard deviation net flow (t-12, t-1)		-0.013		-0.021**		-0.016
		(0.585)		(0.037)		(0.114)
Morningstar style*Month fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	31,514	31,514	72,923	72,923	104,437	104,437

Table X. Distribution Channels of Buyers and Sellers of Subadvisory Services

The sample below includes 252 subadvised fund-subadvisor pairs for which we have distribution channel data and the subadvised fund has exactly one subadvisor. The distribution channel of the subadvised fund is defined at the fund level. We aggregate the assets within each channel across all of a fund's share classes and assign each fund a distribution channel category when at least 75% of its assets are sold through that channel. Otherwise, we treat the distribution channel as missing. The subadvisor's distribution channel is defined as the channel that has the largest percentage of family ADE TNA distributed through it. The categories *direct*, *institutional*, *captive*, *bank*, *insurance*, *wholesale*, and *other* represents distribution channels within the mutual fund universe. Separate account subadvisory firms are defined as firms that do not have in-house retail fund distribution. There are 23 fund-subadvisor pairs with missing distribution channel data, and 25 pairs set to missing due to less than 75% of fund assets in one channel.

	Distribution channel of subadvisory firm (seller of subadvisory services)								
Distribution channel of subadvised fund	Direct	Institutional	Captive	Bank	Insurance	Wholesale	Other	Separate Account	Total
Direct	**3**	1	0	0	0	4	0	46	54
Institutional	6	**1**	2	0	0	7	3	14	33
Captive	2	3	**0**	0	0	6	2	1	14
Bank	1	1	0	**0**	0	4	1	7	14
Insurance	19	4	2	0	**1**	2	5	12	45
Wholesale	8	2	1	0	1	**9**	4	24	49
Other	6	1	1	0	1	6	**4**	24	43
Total	45	13	6	0	3	38	19	128	252
Total (%)	17.9%	5.2%	2.4%	0.0%	1.2%	15.1%	7.5%	50.8%	100%
% of sellers subadvising a fund in channel different than their own	93.3%	92.3%	100%	100%	66.7%	76.3%	78.9%	100%	92.9%

Table AI. Subadvisory market participants outsourcing distribution versus portfolio management, based on active domestic equity funds in 2002

We compute firm-level summary statistics for all asset management firms that either participate as a buyer or seller in the market for subadvisory services for actively managed domestic equity mutual funds. Firms are grouped into three categories: mutual fund families that buy subadvisory services (i.e., outsource portfolio management), separate account managers who sell subadvisory services (i.e., outsource 100% of their retail distribution), and mutual fund families that sell subadvisory services (i.e., outsource less than 100% of their retail distribution). Note that there are 13 mutual fund families that both buy and sell subadvisory services. For mutual fund families, we obtain data on assets under management and number of funds from the CRSP Survivor-Bias-Free US Mutual Fund Database. For separate account managers, we obtain data on assets under management and number of separate account products from the Mobius *M-search* database.

	N	Top five largest firms (families) in this category ranked by ADE assets under management	Average (median) family TNA in ADE funds ($billions)	Average (median) family TNA ($billions)	Average (median) number of ADE funds in family	Average (median) number of funds in family	Average (median) % of ADE funds outsourced to subadvisors	Average (median) number of ADE funds serve as subadvisor for others
Mutual fund families that **buy** subadvisory services (i.e., outsource portfolio management)	106	Vanguard AIM American Express Morgan Stanley Oppenheimer	3.1 (0.68)	9.4 (1.6)	8.1 (5)	21.2 (11.5)	62.5 (60)	0.4 (0)
Separate account managers that sell subadvisory services (i.e., outsource all retail fund distribution)	130	Wellington Management Jennison Associates Dresdner RCM Global Capital Guardian Trust Fayez Sarofim	5.8 (2.2)	9.9 (2.9)	3.4 (2)	5.6 (4)	0 (0)	2.2 (1)
Mutual fund families that **sell** subadvisory services (i.e., outsource some retail fund distribution)	86	Fidelity Janus Putnam T Rowe Price American Century	8.8 (1.6)	16.8 (2.6)	9.4 (6)	25.2 (11.5)	3.0 (0)	3.5 (2)