Preliminary and Incomplete

Why Do Some Mutual Fund Families Pick Stocks for the Competition?

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I. Introduction

The U.S. mutual fund industry, with approximately $9 trillion in assets under management, serves the investment needs of 54 million, or 48%, of American households. The importance of this industry has prompted much academic research, traditionally focused on the performance of individual mutual funds. More recently, the literature has recognized the need to understand more about the firms that provide mutual funds to investors. The decisions these firms, or fund families, make have important consequences for mutual fund investors. Examples of fund family decisions that have been studied in the literature include the decision to merge or liquidate funds, to start up new funds, or to replace the fund's portfolio manager.

The focus of this paper is on a fund family's decision to outsource the portfolio management to an outside firm, rather than the traditional practice of having the family's own employees manage all of their funds. For example, the Dreyfus family offers a large line-up of funds to investors, most of which are managed by Dreyfus employees. However, the $4.4 billion Dreyfus Appreciation Fund is managed by an outside firm through a sub-advisory contracting agreement. Some families practice a more extreme version of outsourcing, and have chosen to sub-advise all of the funds in the family to outside firms. For example, in 2002 Frank Russell funds had $13 billion in retail mutual fund assets, all of which was outsourced to sub-advisors.

In this paper, we study the economic forces behind a family's decision to outsource portfolio management and document two industry trends. First, using a unique hand-collected dataset of sub-advisory contracts in all mutual funds in 1996 and in 2002,

we show that the practice of sub-advising has grown from 7% of all funds in 1996 to 12% in 2002. The growth in sub-advising in actively-managed domestic equity mutual funds, an asset class we study in more detail, is more pronounced, as 16% of these funds are managed by a sub-advisor in 2002. Second, we document a large shift from 1996 to 2002 in the type of sub-advisor hired. In 1996, fund families primarily contracted with institutional managers, defined as firms that invest on behalf of pension plans and foundations and endowments, but do not offer their own retail mutual funds. By 2002, the majority of sub-advisory contracts involved fund families contracting with other fund families. Specifically, 34% of sub-advised funds in 1996 were managed by a sub-advisor with their own family of retail mutual funds, whereas the corresponding number is 52% in 2002. Further analysis of start-ups of new funds suggests that this trend accelerated, as approximately 65% of fund start-ups in 2001 and 2002 hired mutual fund families as sub-advisors.

The first part of the paper lays out the economic motivations for a fund family to outsource portfolio management and documents the trends in sub-advising from 1996 to 2002. We then turn to the analysis of the fund families that rent out their portfolio management expertise for other fund families to sell. It is not immediately obvious why these sub-advisors are not already serving these same investors via their own offerings, or, whether sub-advising for others cannibalizes sales of their own investment products. In short, why would sub-advisors choose to 'pick stocks for the competition'? One possible explanation is that mutual fund families and their sub-advisors are not competitors in the traditional sense. Perhaps they are not targeting the same pool of clients or offering the same bundle of services. A thorough investigation of this issue

involves constructing a measure of overlap in products and target investors, a task we turn to in the next draft of the paper. In this version, we provide some preliminary statistics on the mutual fund families that sub-advise for other families.

There are three related papers that analyze a family's decision to outsource portfolio management (but not the decision to offer sub-advisory services to others). Chen, Hong, and Kubik (2006) study the decision of a mutual fund family to outsource, and how outsourced funds differ in performance from those managed internally. They hypothesize that families have less of an ability to monitor and incent the fund manager in an outsourced fund, and that performance will suffer as a result. They find empirical support for this hypothesis. Cashman and Deli (2006) analyze a 2002 cross-section of mutual funds and also analyze the decision of the family to outsource and the consequent effect on fund performance. They conclude that the performance of outsourced funds is better than it would be if those same funds were managed in-house. Finally, Kuhnen (2007) studies the decision of which sub-advisor to hire, conditional on the family deciding to outsource the portfolio management. She finds that families are more likely to choose a sub-advisor if the family's board of directors has more business connections to the sub-advisory firm.

II. Background on the Economic Foundations of Sub-advisory Relationships

A. Why hire a sub-advisor?

A mutual fund can be thought of as a bundled product of investment services that includes portfolio management, recordkeeping, distribution, investment advice, etc. A fund family ultimately provides this bundle to investors but is not constrained to produce

all of these services in-house; each fund family can choose, on a fund-by-fund basis, to outsource one or more of these services by contracting with external firms. In this paper, we are specifically interested in the decision to outsource the portfolio management, or stock-picking, function to a hired sub-advisor. A fund family that uses its own employees as portfolio managers can be termed 'vertically integrated' or 'internally managed.' In practice, among families choosing to contract with sub-advisors we observe a broad spectrum of their use ranging from outsourcing the portfolio management of every fund in the family, to outsourcing a single fund in a large family of internally managed funds.

There are several competing theories in the industrial organization literature of these make-or-buy decisions predicting when a firm will choose to outsource production rather than remain fully integrated. Outsourcing may be more profitable than in-house production in the case of cost-asymmetries (when the sub-contractor can provide the good or service at a lower cost) or when it raises the willingness to pay on the part of retail customers due to some additional surplus created by the interaction of the two firms (e.g., the sub-contractor may have high name recognition or reputation with the final product's customers). The division of these profits is typically resolved through bargaining between the firms, influenced by the competitiveness of the markets for both the input and the final product. (See figure 1).

One advantage to studying portfolio management as the potentially outsourced production is that the nature of this service avoids some of the issues that commonly complicate the make-or-buy decision. For example, studies of outsourcing components in the computer or automobile manufacturing industries are complicated by the classic

'hold-up' problem that prevents firms from outsourcing production to a supplier that can produce the input more cheaply. Computer or automobile parts are often built to exacting specifications that make them much less valuable in alternative uses. Thus, otherwise profitable sub-contracting may not be undertaken because the sub-contractor is unwilling to invest in the specific assets that improve the bargaining position of the other firm. In the mutual fund industry, the liquidity of portfolio assets implies that the potential for 'hold up' problems when hiring a sub-advisor is virtually nonexistent. In short, the mutual fund industry setting more cleanly predicts that the outsourcing decision hinges on a cost savings or an enhanced ability to offer a truly differentiated product.

In the mutual fund context, the most obvious factors driving a cost asymmetry between a fund family and an outside sub-advisor are fixed costs and economies of scale. For example, if a mutual fund family does not currently offer a particular investment style, there may be large fixed costs associated with the start-up of such a fund. These costs include hiring new portfolio managers, developing new risk evaluation and monitoring procedures, obtaining new sources of equity research, extensive testing of the portfolio strategy, as well as the opportunity costs associated with accomplishing all of these tasks. Perhaps the clearest example of potentially high fixed costs occurs when a family wants to offer an international fund, but does not currently have any expertise in this area.

For a new fund start-up with relatively modest assets under management, these fixed costs imply that the family's average cost per dollar invested for producing this fund is very high. In contrast, an asset manager with processes and employees already in place servicing existing portfolios could achieve lower average cost if hired as a sub-

advisor. When portfolio assets are small, the existence of economies of scale and the cost advantages to outsourcing to an established manager with excess capacity is uncontroversial. However, it is not clear whether these economies extend to larger portfolios. There is very little empirical evidence as to whether the average cost per dollar invested of managing a $500 million portfolio is higher than the cost of a $1 billion portfolio. Warner and Wu (2006) provide evidence that large changes in fund assets are followed by decreases in management fees, suggestive of economies of scale. Other studies argue or assume the opposite, that there are actually diseconomies of scale (e.g., Berk and Green (2004)). For our purposes, the potential for economies of scale is important to keep in mind, and we can test whether sub-advising practices appear to be consistent with their existence.

In addition to potential cost efficiencies from managing more assets in a particular investment style, there may also be further gains to specialization in portfolio management. While this is an empirical question, we suggest that many asset management firms specialize in a particular style of investing (e.g., small-cap or value), and that this results in their being able to achieve lower average costs in this style. Analyzing the sub-advisors who we observe to be attractive to families in particular investment styles can provide evidence consistent with gains from specialization in portfolio management style.

Labor markets for portfolio managers might also play a role in driving cost asymmetries and tilting the decision toward outsourcing relative to internal management. It is relatively common for a talented portfolio manager employed by a mutual fund family to venture out and start her own advisory firm. In these cases, the fund family

could hire the manager as a sub-advisor, providing continuity for the fund and minimizing both the explicit costs of hiring a new manager and the consequent portfolio turnover costs. Alternatively, it may be the family's geographic location that raises the cost of attracting and retaining talented managers; mutual fund families far from financial centers may find it cheaper to hire sub-advisors than to pay in-house portfolios managers a premium to entice them to live in that locale.

Another motivation to sub-advise arises if a mutual fund family can increase demand for their services by offering a fund that investors perceive to be of higher quality than what they could produce internally. Perceived quality could relate to investment performance, or to some form of reputation or brand name for which investors are willing to pay a premium. Some very well-known asset managers, such as Tom Marsico, Mario Gabelli, or Bill Miller, could not be hired as employees of a mutual fund family to run a portfolio (i.e., the cost would be so high as to be effectively infinite). However, if a family believes investors value the ability to invest in a portfolio run by one of these managers, a sub-advisory arrangement is the profitable way to implement this offering. In this case, the sub-advisor is providing access to their brand name reputation in addition to their portfolio management services, increasing the profitability of the fund offering above what the mutual fund family could achieve on its own.

The regulatory requirements for families that choose to outsource portfolio management are not much different from those that manage internally. The SEC requires that the fund disclose pertinent details of the contract between the family and the sub-advisor, including portfolio management fees. Although the fund must disclose any change in sub-advisor or change in contract terms to investors, the SEC exempts most

families from the requirement for fund shareholders to vote on the matter. Thus, changing sub-advisors, or going from internally-managed to sub-advised is not much more onerous than changing portfolio managers within the family's own employees.

B. Why sub-advise for mutual funds?

Outsourcing agreements must be beneficial to both parties: the mutual fund family and the sub-advisor. Because sub-advisors are paid a percentage of the assets under management, it would seem that as long as fund families are willing to pay fees above the sub-advisor's cost, sub-advising additional assets is a profit increasing strategy. The less obvious issue to be addressed is why these sub-advisors are not already serving these same investors, or, whether sub-advising for others cannibalizes sales of their own investment products. In short, why would sub-advisors choose to 'pick stocks for the competition'?

If mutual fund families and their sub-advisors were true competitors, serving the same target pool of clients with the same set of fund offerings, then we would not expect to see much sub-advising in this industry.[1] Thus, one possible explanation for observing an active sub-advisor market is that mutual fund families and their sub-advisors are not truly competitors. This is easiest to see if we consider the case of an institutional sub-advisor, a label we define as a firm that has institutional clients (separate account business) such as pension funds and endowments, but does not offer retail mutual funds. Institutional sub-advisors can expand their pool of assets and clients by sub-advising

[1] The theoretical industrial organization literature suggests that horizontal sub-contracting (the analog to mutual fund sub-advising) can occur in oligopolistic industries with and without collusion. However, these models are not directly applicable to the large, competitive asset management market studied here.

retail mutual funds, without concern for losing existing or potential clients to the mutual fund family.

In fact, the decision by an institutional asset manager to offer sub-advisory services to mutual fund families can be viewed analogously to the families' decision to hire a sub-advisor. In this case, we can think of the inputs being outsourced as the distribution and marketing, record-keeping, and regulatory compliance functions. There are certainly large economies of scale in the production of most of these services that gives an established fund family a production cost advantage over an institutional manager with no current mutual fund offerings. Sub-advising for mutual fund families can be thought of as the low-cost way to access a large pool of retail investors through a distribution channel that was previously unavailable or prohibitively costly to access. Rather than expend resources on developing a mutual fund infrastructure, sub-advising allows the institutional manager to specialize in portfolio management, and thereby reap any resulting gains in reputation, performance, or efficiency.

The trend over the last two decades whereby corporations switched from defined-benefit to defined-contribution 401k plans likely fueled sub-advisory activity. During this time, management of retirement assets migrated away from institutional managers toward the retail mutual fund market. Participating in the sub-advisory market has allowed institutional firms to regain some of this lost market share without incurring the high cost of retail distribution. Here, we could think of the fund family as having economies of scale in distribution, and a solid reputation with retail investors that would be too costly or take an inordinately long time for the sub-advisory firm to build.

The more puzzling motivation to sub-advise for others involves sub-advisors that clearly have their own access to, and reputation among, retail investors, namely sub-advisors with their own mutual fund family. For example, in 2002 Janus Capital offered 26 equity mutual funds to investors under their own family name and an additional 12 equity mutual funds as sub-advisor to eight different mutual fund families. Clearly these sub-advisors must be benefiting from participation, but the source of the value in renting out portfolio management services for other fund families to sell is less obvious. One possible explanation follows the same logic as the case of the institutional sub-advisor, that the two parties are not truly competitors. This might occur if the two families have little overlap in the primary distribution channels they use to market their funds to the public.

For example, if the fund family is an insurance company that uses an exclusive set of brokers to distribute its products while the sub-advisor's family directly markets to individual investors in a no-load structure, then there is little risk of cannibalizing sales to their target investors. In other words, the insurance company's clients are not likely to be potential clients for the no-load family, as this client base typically demands the financial planning and insurance advice that is not available in the direct, do-it-yourself investor channel. In general, we do not expect to observe mutual fund families sub-advising for their close competitors, including those families that operate through the same distribution channel, target the same clients, or offer a similar bundle of investor services.

This implies that many mutual fund families, as long as they are not direct competitors, are potential sub-advisors for other fund families. Observing which mutual fund families are actually hired as sub-advisors can also reveal the extent to which

economies or diseconomies of scale in portfolio management are important. For example, if economies of scale exist within an investment style we would expect to see the hired sub-advisory families to have large assets under management in the style in which they sub-advise. Their size would give them a cost advantage over other potential sub-advisors. Similarly, if it is economies of scale at the fund family level that largely affect costs, then we expect to see large families sub-advising, even if they have relatively low assets under management in that particular style.

III. Data

Our data on sub-advisory relationships are hand-collected from filings available on the SEC's EDGAR database at two points in time, 1996 and 2002. Specifically, we conduct text searches of all N-30D filings for variants of the word 'sub-advisor' or sub-advisory' to identify the relevant filings. Within these, we identify the name of all funds in that filing that outsource the portfolio management to an outside sub-advisory firm. In some cases, the filing will identify that a sub-advisor manages the portfolio, but also discloses that the sub-advisor is an affiliate of the family, typically indicating that the sub-advisory firm is legally a subsidiary, or has a common owner. We distinguish affiliated sub-advisors from independent, unaffiliated sub-advisors, and present statistics for the two types separately. Because the affiliated sub-advisory agreements do not reflect the same economic decision or market forces described above, we focus our analysis on the sample of unaffiliated sub-advisors.

The list of sub-advised funds is then linked with the CRSP Survivorship-free mutual fund database. Any fund that we did not identify as being sub-advised is assumed

to be managed in-house by employees of the family.[2] In sum, in 1996 and 2002 we assign all funds in the CRSP mutual fund universe to one of three categories according to who manages the fund: sub-advised, sub-advised by an affiliate of the fund family, and in-house.

For the sub-sample of actively managed domestic equity funds we also collect Morningstar style categories, which puts funds into one of nine investment style categories (e.g., large-cap value). We use Morningstar's categorization rather than CRSP objectives because they are closer to that used by institutional investors to choose and evaluate portfolio managers. We obtain data on fund distribution channels studied in Bergstresser, Chalmers, and Tufano (2006), originally from Financial Research Corporation (FRC).[3] These distribution codes are originally at the share-class level and as a result we use an asset-weighted measure that aggregates the codes to the fund level. FRC assigns each share class to one of nine codes, which reflect the primary distribution channel for a particular share class, as a share class may be distributed through several channels simultaneously. Finally, for the sub-sample of domestic equity funds managed by an unaffiliated sub-advisor, we collect additional detailed information on the contractual sub-advisory relationship from the Statement of Additional Information (485BPOS filings). Specifically, we collect the sub-advisory firm name(s) and for 1996, we collect the beginning date of the sub-advisory relationship.[4]

[2] Alternative methods identified some additional observations. For example, a small percentage of funds use a term other than 'sub-advisor' to identify outsourced managers. A well-known example fits in this category. Vanguard does not use the term 'sub-advisor' in their annual report (they refer to the sub-advisors as advisors), and thus are not picked up by our text search algorithm. However, a careful reading of their filings clearly indicates which of their funds are sub-advised, and thus we include this information in assigning funds to sub-advised versus in-house.

[3] We thank these authors and FRC for providing us with the distribution code data.

[4] We are in the process of collecting this information for 2002.

A. Summary Statistics

In this section, we present some general statistics on the prevalence of outsourcing in the mutual fund industry in 1996 and 2002. Table 1 contains fund-level statistics on the percentage of funds managed in-house versus sub-advised by broad fund investment objective. In 1996, 84.6% of 4,698 mutual funds are managed in-house, 8.2% by affiliated sub-advisors, and 7.2% by unaffiliated sub-advisors. In 2002, 79% of 5,810 mutual funds are managed in-house, 8.1% by affiliated sub-advisors, and 12.2% by unaffiliated sub-advisors. Sub-advised funds represent $330 billion in 1996 and $692 billion in 2002, which is approximately 14% and 19% of mutual fund industry assets in 1996 and 2002 (not reported).

The highest incidence of sub-advised funds is in the global category. Here, only 74% of global funds use in-house managers in 1996, falling further to 71% in 2002. As described in the earlier section, it may be cheaper to buy than to make when it comes to the additional knowledge and infrastructure needed for international portfolio management. Focusing on the unaffiliated sub-advisor columns, the biggest growth in contracting with unaffiliated sub-advisors is in the domestic equity objective. In 1996 only 106 funds, or 7.3% of domestic equity funds, are sub-advised, while in 2002 there are 375 funds (16.1%), indicating that the rate of sub-advising among domestic equity funds more than doubled over this period. In the remainder of the paper, we focus exclusively on actively-managed domestic equity funds. In addition, any further references to sub-advisors pertain solely to unaffiliated sub-advisors.

Table 2 contains family-level statistics on the use of sub-advisors for families offering one or more domestic equity funds. Panel A shows that in 1996, 48 fund families, or 11.6%, sub-advise at least one domestic equity fund, while 96 or 21.1% sub-advise in 2002. In both years, larger families are more likely to sub-advise their funds than are smaller families. The average family TNA is about twice as large among families that sub-advise than in families that manage all of their funds internally. Panel B reports the percentage of the families' funds sub-advised by equally-sized family TNA quintiles. Only 3.6% of families in the smallest quintile outsource their funds in 1996, versus 16.9% of families in the largest quintile. The corresponding numbers for 2002 show that the percentage of families outsourcing increased from 1996 in every size quintile, but the largest increase is among the largest families. Specifically, 40.7% of families in the largest quintile outsourced at least one domestic equity fund in 2002.

IV. Evidence on why families hire sub-advisors

As stated earlier, there are two main economic motivations for a fund family to outsource portfolio management to a sub-advisor: cost-savings or because it provides an efficient way to offer a differentiated product. In this section, we present evidence consistent with families choosing to outsource for these two reasons.

A. Cost asymmetries

While it makes intuitive economic sense that a fund family will choose to sub-advise if it is the lower cost alternative, we are not able to observe and compare their costs if they sub-advise relative to their costs if they were to internally manage that same

portfolio (the counterfactual). However, applying economic logic does allow us to narrow the sample of sub-advised funds to those most likely to reflect cost asymmetries between the fund family and the lower cost provider of the portfolio (sub-advisor).

1. Cost asymmetries: new entrants to the mutual fund industry

The most extreme version of a sub-advising strategy is to outsource all (or nearly all) of the portfolio management to outside firms via a sub-advisory contract. The entire business model of these 'virtual families' is to specialize in the distribution, marketing, and manager selection aspect of the mutual fund business. Defining a virtual family as one that outsources more than 80% of their actively-managed domestic equity funds to sub-advisors, we find 18 families in 1996 and 37 families in 2002 that fit this definition. This strategy is a nontrivial portion of sub-advisory activity, representing 38% and 39% respectively of the full sample of families that sub-advise at least one fund. See Appendix A for a list of these families.

Complete outsourcing of the portfolio management to outside firms makes intuitive sense if the families' comparative advantage lies in the other functions necessary to profitably operate a mutual fund business. For example, some families that fit this profile entered the mutual fund business as an outgrowth of the other financial products they already offer. Examples include American Skandia (ASAF funds) and ING, both of which primarily offer insurance products, and through this business have a large set of customers who can now be offered mutual fund products as well. Other examples of this type include AFBA funds and the USAA funds, both of which are exclusively distributed to the military. These firms clearly have a comparative advantage in distribution and

already serve a well-established set of clients, implying that they have the client servicing, record-keeping, and similar services in place. In other cases, the comparative advantage lies in the manager selection function. Examples include SEI and Frank Russell, both of which had well-established consulting businesses in monitoring, evaluating, and selecting institutional portfolio managers prior to their entry into the retail mutual fund market. Finally, some families' comparative advantage lies in a unique understanding of marketing to a highly specialized clientele, such as the socially-responsible Calvert Funds and the Women's Equity Fund. The common element to these cases is that entry into the mutual fund market was aided by outsourcing the portfolio management capabilities that they lacked in their primary business.

Given the high fixed costs and potential economies of scale of starting up a portfolio management operation from scratch, hiring sub-advisors is quite reasonably the cost-effective solution for these families.[5] In short, sub-advising portfolio management might be thought of as mechanism for removing a barrier to entry. The next case we consider is an analogous, but much less extreme example of such a barrier---families that wish to offer a fund in an investment style for which they do not currently have in-house expertise.

2. Cost asymmetries: new entrants to an investment style category

The most common sub-advising strategy among mutual fund families is to outsource the portfolio management of only a few funds out of a large line-up of

[5] An alternative strategy for banks and insurance companies wanting to enter the mutual fund business is to acquire an asset management firm. Anecdotal evidence in the business press suggests that these mergers often fail due to the cultural clash between conglomerate banks and insurers and entrepreneurial asset managers. For example, see *American Banker* 12/9/98.

internally managed funds. For example, in 2002 the Glenmede Funds outsourced the Glenmede Small Cap Growth fund and managed its six other stock and bond funds internally. Table 3 shows that a large percentage of the families that sub-advise fit the profile of the Glenmede funds. Fifty out of the 96 (52%) families that sub-advise at least one domestic equity fund outsource less than 60% of their domestic equity offerings and manage the rest internally. In terms of the average number of sub-advised funds per family, these families typically outsource 2 to 3 domestic equity funds in the family.

In analyzing the underlying motivation to outsource versus internally manage a portfolio we take the families' desire to offer a fund of a particular investment style as given. Khorana and Servaes (1999), Mamaysky and Spiegel (2001), and Massa (2003) study the incentives of fund families to start new funds in a variety of investment styles. We suggest that the ability to outsource portfolio management to a sub-advisor allows families to accomplish this goal in a cost-effective manner. For example, if managing small-cap portfolios requires research, personnel and expertise that substantially differ from those involved in managing large-cap portfolios, then a mutual fund family with only large-cap offerings might rationally seek out a sub-advisor to manage their small-cap fund. If there are indeed large style-specific costs in the production of portfolio management, families will sub-advise to cost-effectively fill the gaps in their stable of fund offerings, where a gap is defined as a Morningstar style category for which a family does not offer any funds. Consistent with a 'gap-filling' motivation, we find that 78% of sub-advised funds are in Morningstar style categories where the family does not also offer an internally-managed fund as well.

We find that families that sub-advise offer a greater variety of investment styles to their investors than families than manage all of their funds internally. For example, in 2002, 51% of families that sub-advise at least one actively-managed domestic equity fund offer 5 or more different categories of Morningstar fund styles to investors. In contrast, only 13% of families that do not sub-advise any of their funds offer 5 or more different style categories of funds. Another statistic similar in spirit is that 74% of families that sub-advise at least one fund offer a global equity fund to their investors, versus 29% of families that do not sub-advise any funds. This is at least suggestive that a common motivation to sub-advise is for families to fill gaps in their fund line-up.

B. Product Differentiation

Some fund families are primarily motivated to employ sub-advisors not because of potential cost-savings, but to strategically differentiate their mutual fund offerings from their more established competitors. These families rely on the uniqueness of their offerings to attract clients, often marketing their funds as providing retail mutual fund investors with privileged access to otherwise unavailable institutional managers. An aptly named family with this strategy is the Undiscovered Managers family of funds. In these cases, the fund family's role is to provide retail investors with a differentiated product of professional management normally only available to clients with $5 million or more to invest. Similarly, 'manager of manager' funds are marketed as the retail investor's version of what defined benefit plan sponsors have been doing for decades, namely delegating their assets among the 'best' portfolio managers across the industry in every style, rather than rely on one firm to invest all of the assets. Examples of families with this strategy are the Masters Select Funds and SEI Institutional Funds.

Another group of funds objectively fit under the product differentiation motivation as well. Fund families that simultaneously offer an internally managed fund and a sub-advised fund in the same Morningstar style category do not logically fit the profile of a family sub-advising for cost reasons. If sub-advising is the cheaper alternative in this investment style, then why is the family not hiring sub-advisors for both of the portfolios they offer? Of the 432 sub-advised funds with non-missing Morningstar style categories in our data, we identify 95 (22%) in which the fund family has both internally-managed and sub-advised funds in the same style category.

Upon close inspection of funds with this characteristic, we find suggestive evidence that a product differentiation motive is likely. For example, two families with multiple 'duplicate' offerings are SunAmerica Funds and AXP Funds. In both cases, they offer an entire line of sub-advised funds to complement their internally managed offerings, and signal that they are different from their in-house funds by using a different name: SunAmerica Focused Funds and AXP Partners Funds. Similarly, Vanguard offers two Large-Cap Blend funds, but one carries only the Vanguard moniker, Vanguard Growth and Income Fund, while the other uses the name of the sub-advisor in the fund name, Vanguard PRIMECAP fund. Thus, in most of these cases we can observe an objective characteristic of a product differentiation strategy, a fund name that is distinct from other funds in the family.

C. Cost-asymmetry versus Product Differentiation Classification

In practice, a family might very well have both cost-savings and product differentiation motivations behind the decision to outsource portfolio management and as

a result, the motivations might best be viewed as a spectrum. At one end, families that have no in-house expertise in portfolio management, either in the family as a whole or in a particular investment style, can most easily be classified as having a cost motivation for sub-advising. At the other extreme, we can logically classify all sub-advised funds with an internally managed fund in the same investment style category as motivated by product differentiation.

As illustrated in Figure 2, some cases fall somewhere in the middle. For example, although virtual families likely choose to outsource portfolio management to overcome a fixed cost barrier to entry, some of these families specifically market their funds as having unique access to institutional managers. As a result, these families are potentially better classified as primarily motivated by product differentiation.

D. Evidence that families increasingly hire sub-advisors who also manage their own retail mutual funds

Table 4 contains summary statistics of the use of sub-advisors in our full sample across nine Morningstar investment styles in 1996 and 2002. This table shows that the growth in sub-advising extends to every investment style, and that in 2002 the percentage of sub-advised funds is quite similar across styles, with large-cap growth and small-cap growth having somewhat higher values. Another trend over this period is evident in the bottom row of the table, a shift in the type of sub-advisor that families hire. When a family outsources portfolio management to a sub-advisor, they can choose to either hire an institutional sub-advisor or a sub-advisor who also offers their own retail mutual funds. The bottom row of Table 4 suggests a shift over this period from hiring institutional managers toward hiring sub-advisors with their own retail fund family.

Specifically, the percentage of sub-advised funds with a mutual fund sub-advisor increased from 34.1% of funds in 1996 to 51.6% in 2002. Across style categories in 2002, the tendency to hire mutual fund sub-advisors is strongest in large-cap and mid-cap growth funds.

Table 5 contains additional evidence on the trends toward greater amounts of outsourcing and greater use of sub-advisors who have their own retail mutual fund families. Here we identify all new start-up funds over the 1997 to 2002 period and calculate the percentage of funds that outsource portfolio management, and the percentage of outsourced funds that hire a mutual fund family as sub-advisor.[6] Table 5 Panel A confirms that these trends accelerated in recent years. In 2000 to 2002, the percentage of sub-advised funds ranges from 23% to 37% of all new funds, and the percentage of these funds that hire mutual fund families as sub-advisors ranges from 64% to 70%. Panel B reveals that the tendency to hire mutual fund families as sub-advisors is most pronounced in large-cap and mid-cap growth funds.

E. Evidence on the performance and flow of sub-advised funds

In this section, we turn to the measurable outcomes of this contracting between the buyers and sellers of sub-advisory services, the performance and fund flow of sub-advised funds. Because a majority of this contracting is between mutual fund families (versus between a mutual fund family and an institutional manager), in concept, we can compare the performance of sub-advised funds relative to the funds that the sub-advisor

[6] We only have information on whether or not a fund is sub-advised in 1996 and in 2002. Thus, in Table 5 we assume that a fund that is sub-advised in 2002, but started up in 1997, was sub-advised from inception. This will be a false assumption whenever a fund began as an internally-managed fund and is only later switched to a sub-advised fund. We are in the process of collecting the start date of the sub-advised status for each fund.

offers to investors in its own fund family. What we would like to capture, for example, is the performance of funds Janus manages for other families relative to Janus' own internally-managed funds.

Table 6 contains a series of pooled cross-sectional regressions based on monthly fund data for 1996 and 2002. Columns (1), (2), and (3) focus on monthly net returns, columns (4) and (5) focus on monthly risk-adjusted returns and fund factor loadings on the market portfolio (both based on the four-factor model of Carhart (1997)), and column (6) focuses on monthly net inflows. In each case, we restrict our sample to actively-managed domestic equity funds with a non-missing Morningstar investment objective category.

In addition to a dummy variable indicating whether fund i employs a sub-advisor at the beginning of the calendar year, we consider several additional measures intended to quantify some of the observed diversity in sub-advisor relationships across funds and families. We begin by decomposing the sub-advised fund dummy into three dummy variables: one that indicates whether the fund hires a single institutional sub-advisor, one that indicates whether the fund hires a single mutual fund sub-advisor, and one that indicates whether the fund hires two or more sub-advisors (e.g., manager of manager funds). We also create a dummy variable that equals one if the fund name contains the name of the sub-advisor (e.g., the ASAF Marsico Capital Growth Fund).

In addition to the fund-level sub-advisor variables, we also create six family-level variables related to sub-advisor relationships. *Family hires any sub-advisors?* equals one if the family hires a sub-advisor for any of its actively-managed domestic equity funds in year y. Similarly, *Family hires any sub-advisors in this category?* equals one if the

family hires a sub-advisor for any of its actively-managed domestic equity funds within the same Morningstar category as fund i in year y. *Family internal and hire sub-advisors in this category?* equals one if the family offers a combination of internally managed and sub-advised funds within any of the nine Morningstar categories. Two other family-level variables indicate whether and where families choose to serve as sub-advisors to other mutual fund families. *Family sub-advises to others?* equals one if a family sells sub-advisory services to any other mutual fund family during the calendar year; *Family sub-advises to others in this category?* equals one if a family sells sub-advisory services to any other mutual fund family within the same Morningstar category as fund i. The final family-level variable is a dummy variable that equals one if family j is a virtual family, meaning that they hire sub-advisors for more than 80 percent of their actively-managed domestic equity funds.

We also include a number of standard fund-level and family-level control variables: the expense ratio and 12b-1 fee as reported by CRSP in December of the prior calendar year, fund age through the current calendar year (measured in years), the natural logarithms of fund and family TNA in the prior month, the continuously compounded net flow over the prior 12 months, the continuous compounded net return over the prior 12 months, and the continuously compounded net return over the prior 12 months squared. To control for differences in fund distribution, we use FRC data on fund distribution channels to calculate the fraction of a fund's assets distributed through the broker channel (mean of 40.5%), direct channel (28.4%), and institutional channel (18.7%). (The omitted category is "other," which has a mean of 12.4%.) Finally, we also include a separate fixed effect for each of the nine Morningstar categories, each month.

Consequently, we are testing for differences relative to the funds within the same Morningstar category and month. Since many of the variables are defined at the family-year level, all standard errors are clustered on family-year.

Column (1) contains a regression of a fund's net return in month m on a dummy variable that indicates whether the fund had one or more sub-advisors at the beginning of the calendar year. The regression includes a separate fixed effect for each Morningstar category-month pair but no other control variables. The coefficient on the sub-advisor dummy variable is -0.08 and is statistically significant at the 5-percent level. This result is consistent with Chen et al (2006) and Cashman and Deli (2006) and suggests that sub-advised funds underperform their peers by an economically significant 8 basis points per month. However, in column (2), when we add the standard set of fund-level and family-level controls, the coefficient on the sub-advisor dummy variable falls from -0.08 to -0.04 and is no longer statistically significant (the p-value rises from 0.04 to 0.28). Among the control variables, we find that net returns in month m are decreasing in the expense ratio and size of fund i, increasing in net returns over the prior 12 months, and significantly higher when funds are distributed directly to investors (a finding first documented in Bergstresser, Chalmers, and Tufano (2007), which also uses FRC data to study differences in flows and performance across distribution channels).

In column (3), we replace the sub-advisor dummy variable with three dummy variables indicating whether the fund hires a single institutional manager, a single manager affiliated with another mutual fund family, or multiple sub-advisors. We also include the six family-level variables of participation in the market for sub-advisors: four

that measure the families' use of sub-advisors and two that measure whether the family sub-advises for other mutual funds.

Of the four fund-level measures of sub-advising, only one is statistically significant. The coefficient on the single institutional manager dummy variable is 0.11 and statistically significant at the 10-percent level. In contrast, the coefficient on the single mutual fund manager is much smaller in magnitude and statistically indistinguishable from zero. While these results are consistent with the possibility that institutional managers generate higher returns when employed as sub-advisors than do other mutual fund managers, the p-value of the test that the coefficients on the single institutional manager dummy and single mutual fund manager dummy are different is 0.1246. The coefficient on the dummy variable indicating whether the sub-advisor name appears in the fund name is negative -0.04, but statistically indistinguishable from zero.

Of the six family-level measures, three are negative and statistically significant. The coefficient on the dummy variable indicating whether fund *i* belongs to a family that hires sub-advisors on any of its domestic equity funds is -0.11 and statistically significant at the 5-percent level. In other words, funds in families that hire sub-advisors appear to underperform funds in families that internally manage all of their funds by approximately 132 basis points per year. When the family hires a sub-advisor in the same category as fund *i*, the performance difference grows from -11 basis points to -14 basis points per month. The other statistically significant coefficient is on the dummy variable indicating whether fund i belongs to a category in which its family sells sub-advisory services. To the extent that families selling sub-advisory services within a category are relatively

skilled within that category, the expected sign on this coefficient is positive. However, we estimate the coefficient to be -0.05 and statistically significant at the 10-percent level.

The results in column (4), where the dependent variable is a fund's four-factor alpha in month *m* instead of its net returns, are qualitatively similar to those in column (3), but fewer of the variables are statistically significant. For example, the coefficient on the single institutional manager dummy variable remains 0.11 but the p-value falls from 0.052 to 0.126. Similarly, the coefficient of the dummy variable indicating whether the family hires any sub-advisors falls from -0.11 to -0.09 and the p-value falls from 0.011 to 0.064. The notable exception is the coefficient on the single mutual fund manager dummy, which rise from 0.00 to 0.14 and becomes statistically significant at the 10-percent level (although we still cannot reject the hypothesis that the coefficients on the single institutional manager dummy and single mutual fund manager dummy are equal).

The significant change on the coefficient on the single mutual fund manager dummy variable prompts us to ask, in column (5), how a fund's loading on the market portfolio in a four-factor model varies across sub-advisor types. Whereas the coefficients on the single institutional manager dummy and the multiple manager dummy are both 0.01 and statistically indistinguishable from zero, the coefficient on the single mutual fund manager is 0.06 and statistically significant at the 1-percent level.

In column (6), we turn our attention from monthly returns to monthly net inflows. Given how sub-advisor information is often buried in a lengthy SEC filing, we expect that the typical investor is not aware that the fund employs a sub-advisor, with the possible exceptions of funds that put the sub-advisor name in the fund name or funds that market themselves as "managers of managers." However, the coefficients on the dummy

variables indicating these fund types are both negative and statistically indistinguishable from zero. The only variables related to sub-advisor relationships that help predict monthly net flows are the family-level dummy variable indicating that the family hires any sub-advisors in the same category as fund *i* (coefficient of -0.18 statistically significant at the 5-percent level) and the family-level dummy variable indicating that the family offers both internally managed and sub-advised funds within at least one category. Interestingly, the coefficient on the dummy variable indicating whether the family sub-advises to other mutual fund families within the category is 0.14 with a p-value of 0.108. This constitutes (weak) evidence that these families are regarded as particularly skilled in these categories.

V. Who picks stocks for the competition?

As we showed earlier, the practice of hiring another mutual fund family to sub-advise a portfolio increased dramatically from 1996 to 2002. Perhaps not surprisingly, the number of mutual fund families selling their sub-advisory services increased as well, from 36 families in 1996 to 77 families in 2002. In this section we contrast the mutual fund families that offer their investment services to other families with those families that buy these services. As an additional comparison, we include mutual fund families in the CRSP database that offer at least one actively-managed domestic equity fund, but do not participate in the sub-advisory market as either a buyer or a seller.

Table 7 contains some summary statistics on family size in 2002. Approximately 34% of fund families participate as either a buyer or seller in the sub-advisory market, but only a handful of families participate in both sides of the market simultaneously.

Families that sub-advise for other families are relatively large families, but they are not much larger than families who buy sub-advisory services. The median family TNA is $3.8 billion for selling families and $2.0 billion for buying families. These two groups also have the same median number of actively-managed domestic equity funds, 6.5 funds per family. The stark contrast is instead when we compare both of these family types to those not participating in the sub-advisory market. Here, the median family has only 3 funds and $0.2 billion in assets under management.

In the next version of the paper, we will consider the overlap in the investment styles of funds a sub-advisor offers to other families relative to the investment styles they offer to the investors in their own fund family. If sub-advising is driven in part by style-specific cost-asymmetries then we would expect the sub-advisors to specialize in the same investment styles in their own family of funds as they do when they sub-advise for other families. That is, we would expect them to sub-advise in only a few styles (not all nine) and that these styles would account for a large share of their own internally managed fund offerings (i.e., their specialty). We will also consider the extent to which the potential client pool is different across families that buy and sell sub-advisory services. We expect that buyers and sellers of sub-advisory services do not share the same distribution channels.

VI. Conclusion

Mutual fund families are increasingly outsourcing the portfolio management function to outside firms via sub-advisory contracts. In addition, fund families are increasingly turning to other fund families to provide this service. In 1996, only 34% of

sub-advised funds were outsourced to another fund family while in 2002 the corresponding number is 52%. We document trends in sub-advising in the mutual fund industry and provide the economic motivations behind this practice.

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TABLE 1
The Use of Sub-advisors Across Broad Mutual Fund Objectives

Using N-30D filings in 1996 and 2002, we conduct text searches on variants of the word "sub-advisor" to identify mutual funds that outsource portfolio management to sub-advisors. The N-30D discloses whether the sub-advisor is affliliated with the fund family via common ownership. We match each sub-advised fund to the CRSP mutual fund database, and assume that any fund that we do not identify as using a sub-advisor is managing the fund in-house.

	1996			2002		
Number of Funds (% in category)	No sub-advisors [internally managed]	Sub-advisors affiliated with family	One or more unaffiliated sub-advisors	No sub-advisors [internally managed]	Sub-advisors affiliated with family	One or more unaffiliated sub-advisors
US Equity	1,232 (85.0%)	112 (7.7%)	106 (7.3%)	1,770 (75.9%)	187 (8.0%)	375 (16.1%)
US Specialized Equity	145 (81.0%)	13 (7.3%)	21 (11.7%)	283 (81.8%)	28 (8.1%)	35 (10.1%)
US Debt	1,440 (88.6%)	117 (7.2%)	68 (4.2%)	1,240 (85.5%)	122 (8.4%)	89 (6.1%)
US Hybrid	273 (81.5%)	34 (10.1%)	28 (8.4%)	310 (78.3%)	39 (9.8%)	47 (11.9%)
Global	538 (74.2%)	86 (11.9%)	101 (13.9%)	645 (70.7%)	119 (13.0%)	148 (16.2%)
Missing objective	296 (91.1%)	19 (5.8%)	10 (3.1%)	287 (92.0%)	17 (5.4%)	8 (2.6%)
Total	3,924 (84.6%)	381 (8.2%)	334 (7.2%)	4,535 (78.9%)	512 (8.1%)	702 (12.2%)

TABLE 2
The Use of Sub-advisors Across Families Offering One or More Domestic Equity Funds

Panel A. Comparison of Families that Outsource with Families that Manage In-house

Using the classification of funds as outsourced to unaffiliated sub-advisors in Table 1, we use management company codes in the CRSP mutual fund database to aggregate by fund family. We only include families that offer one or more actively-managed domestic equity funds. Family TNA is the assets under management across all of the mutual funds the family offers, including funds that are not domestic equity. Similarly, number of funds in the family includes all mutual funds the family offers, including funds that are not domestic equity.

	1996			2002		
	Number of families (%)	Average Family TNA $Billions	Average Number of Funds in Family	Number of families (%)	Average Family TNA $Billions	Average Number of Funds in Family
Do not sub-advise any funds in family	367 (88.4%)	4.96	9.7	360 (78.9%)	5.93	9.1
Sub-advise at least one domestic equity fund in family	48 (11.6%)	8.45	18.0	96 (21.1%)	13.40	22.9

Panel B. The Use of Sub-advisors by Family Size (TNA) Quintile

	1996		2002	
Family TNA quintile	Average Family TNA $Billions	% Families with domestic equity sub-advised funds	Average Family TNA $Billions	% Families with domestic equity sub-advised funds
Quintile 1	0.02	3.6%	0.01	6.5%
Quintile 2	0.13	9.6%	0.10	9.9%
Quintile 3	0.52	14.5%	0.39	18.7%
Quintile 4	1.76	13.2%	2.00	29.7%
Quintile 5	24.40	16.9%	36.21	40.7%

TABLE 3
The Intensity of Use of Sub-advisors across Families that Sub-advise One or More Domestic Equity Funds in 2002

For the sub-sample of families that sub-advise at least one actively-managed domestic equity fund in 2002, this panel computes the fraction of the total number of actively-managed domestic equity funds that the family outsources to sub-advisors.

	2002			
Fraction of family's active domestic equity funds outsourced to sub-advisor:	Number of families	Average Number of funds per family	Average number of domestic equity funds per family	Average number of sub-advised domestic equity funds per family
> 0 but ≤ 20%	20	52.6	18.7	2.1
> 20% but ≤ 40%	16	18.9	7.5	2.1
> 40% but ≤ 60%	14	16.4	6.2	2.8
> 60% but ≤ 80%	9	24.6	8.6	5.9
> 80% Virtual Families	37	10.7	5.0	4.9
Total	96	22.9	8.8	3.6

TABLE 4

The Use of Sub-advisors in Actively-managed Domestic Equity Funds Across Investment Styles

The sample below includes actively-managed domestic equity funds. Morningstar style categories are from various Morningstar Principia CDs. There are 231 funds in 1996 and 254 funds in 2002 with missing style categories, 4 and 12 of these are sub-advised funds respectively. These are not reported separately in the table, but are included in the row containing the Total across categories. We categorize sub-advisors as either exclusively serving institutional clients (pension funds, endowments, foundations, high net-worth individuals), or also having their own retail mutual fund family. The percentage of funds hiring a mutual fund sub-advisor indicates the percentage of sub-advised funds in that style category that hire a sub-advisory firm that also has their own retail mutual fund family. In the case of funds that hire multiple sub-advisors, we assume that each sub-advisor manages 1/N of the fund, where N is the number of sub-advisors in that fund.

	1996				2002			
Morningstar Style Category	Number of funds	Number sub-advised	% Sub-advised	% Hire mutual fund sub-advisor	Number of funds	Number sub-advised	% Sub-advised	% Hire mutual fund sub-advisor
Large-cap Value	134	20	14.9%	22.5%	284	53	18.7%	41.8%
Large-cap Blend	275	19	6.9%	34.2%	379	54	14.3%	47.4%
Large-cap Growth	94	12	12.8%	29.2%	397	82	20.7%	63.8%
Mid-cap Value	85	5	5.9%	80.0%	92	16	17.4%	34.4%
Mid-cap Blend	123	9	7.3%	7.4%	88	14	15.9%	37.5%
Mid-cap Growth	158	13	8.2%	69.2%	239	38	15.9%	64.5%
Small-cap Value	101	5	5.0%	10.0%	97	17	17.5%	39.9%
Small-cap Blend	76	5	6.6%	30.0%	116	13	11.2%	51.9%
Small-cap Growth	116	10	8.6%	25.8%	228	47	20.6%	46.7%
Total	1393	102	7.3%	34.1%	2196	347	15.8%	51.6%

TABLE 5
New Fund Start-Ups (1997-2002)

Panel A. New fund starts by year

The sample below includes actively-managed domestic equity fund start-ups using the fund inception year from the CRSP database. Because we only have information on which funds are sub-advised in 1996 and 2002, we use the information from these years to infer whether the fund is sub-advised at fund inception. Thus, if a fund is internally managed at fund inception, but then switches to being sub-advised, we include it in the number sub-advised. We categorize sub-advisors as either exclusively serving institutional clients (pension funds, endowments, foundations, high net-worth individuals), or also having their own retail mutual fund family. The fraction of funds using mutual fund sub-advisors indicates the percentage of sub-advised funds in that style category that hire a sub-advisory firm that also has their own retail mutual fund family. In the case of funds that hire multiple sub-advisors, we assume that each sub-advisor manages 1/N of the fund, where N is the number of sub-advisors in that fund.

Year of fund start-up	Number of start-up funds	Number sub-advised	% of start-ups sub-advised	% Hire mutual fund sub-advisor
1997	214	39	18.2%	54.3%
1998	203	30	14.8%	53.1%
1999	170	28	16.5%	67.9%
2000	194	45	23.2%	69.9%
2001	87	32	36.8%	64.1%
2002	36	11	30.6%	68.2%
Total	904	185	20.5%	62.5%

TABLE 5 (continued)
New Fund Start-Ups (1997-2002)

Panel A. New fund starts by Morningstar investment style

The sample below includes actively-managed domestic equity funds. Morningstar style categories are from various Morningstar Principia CDs. There are 231 funds in 1996 and 254 funds in 2002 with missing style categories, 4 and 12 of these are sub-advised funds respectively. These are not reported separately in the table, but are included in the row containing the Total across categories. We categorize sub-advisors as either exclusively serving institutional clients (pension funds, endowments, foundations, high net-worth individuals), or also having their own retail mutual fund family. The fraction of funds using mutual fund sub-advisors indicates the percentage of sub-advised funds in that style category that hire a sub-advisory firm that also has their own retail mutual fund family. In the case of funds that hire multiple sub-advisors, we assume that each sub-advisor manages 1/N of the fund, where N is the number of sub-advisors in that fund.

Morningstar Style Category	Number of start-up funds	Number sub-advised	% of start-ups sub-advised	% Hire mutual fund sub-advisor
Large-cap Value	96	24	25.0%	59.0%
Large-cap Blend	134	23	17.2%	63.0%
Large-cap Growth	167	47	28.1%	74.7%
Mid-cap Value	36	13	36.1%	42.3%
Mid-cap Blend	34	5	14.7%	55.0%
Mid-cap Growth	94	21	22.3%	69.0%
Small-cap Value	45	10	22.2%	50.0%
Small-cap Blend	51	19.6	19.6%	57.5%
Small-cap Growth	86	26.7	26.7%	50.0%
Total	904	185	20.5%	62.5%

TABLE 6
The Performance and Flows of Actively-managed Domestic Equity Funds

The table below contains regressions of monthly performance (net return and 4-factor alpha) and monthly flow on fund and family characteristics. Net return is unadjusted for risk, but net of expenses. 4-factor alpha adjusts for the four factors in Carhart (1997). Beta is the loading on the market factor in the 4-factor fund return regression. Flow is monthly percentage net flow (percentage change in fund TNA, adjusted for capital appreciation). Fund-months in 1996 and 2002 are pooled in the regressions, and Morningstar investment style-month fixed effects are included. P-values, reflecting robust standard errors corrected for family-year clustering, are in parentheses. ***, **, * indicate significance at the 1%, 5%, and 10% levels.

	Dependent variables:					
	Net return	Net return	Net return	Alpha	Beta	Flow
Independent variables:	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	-0.62***	-0.42***	-0.44***	-0.11	0.88***	0.02
	(.00)	(.00)	(.00)	(.26)	(.00)	(.95)
Fund sub-advised dummy	-0.08**	-0.04				
	(.04)	(.28)				
Sole sub-advisor is an institutional manager dummy			0.11*	0.11	0.01	0.13
			(.05)	(.13)	(.55)	(.66)
Sole sub-advisor is a mutual fund family dummy			0.00	0.14*	0.06***	-0.10
			(.97)	(.10)	(.01)	(.79)
Multiple sub-advisors dummy			0.03	0.08	0.00	0.20
			(.62)	(.21)	(.77)	(.45)
Sub-advisor name in fund name dummy			-0.04	-0.08	-0.02	-0.25
			(.59)	(.34)	(.74)	(.54)
Family hires sub-advisor for any domestic equity funds?			-0.11**	-0.09*	0.01	0.27
			(.01)	(.06)	(.47)	(.11)
Family hires sub-advisors in this category?			-0.03*	-0.01	-0.00	-0.18**
			(.06)	(.55)	(.94)	(.02)
Family both internally manages and sub-advises in same category?			-0.04	-0.05	-0.00	-0.31*
			(.43)	(.49)	(.90)	(.09)
Family sub-advises for other mutual fund families?			0.03	0.05	0.02	-0.12
			(.39)	(.26)	(.21)	(.46)
Family sub-advises for other mutual fund families in this category?			-0.05*	-0.03	0.00	0.14
			(.07)	(.34)	(.21)	(.11)
Virtual family dummy			0.07	0.07	0.03	-0.16
			(.13)	(.28)	(.15)	(.54)
% Fund TNA in broker channel		0.02	0.02	0.06	0.03*	-0.07
		(.47)	(.54)	(.24)	(.05)	(.72)
% Fund TNA in direct channel		0.10**	0.10**	0.07	-0.01	0.11
		(.02)	(.02)	(.17)	(.52)	(.58)
% Fund TNA in institutional channel		0.01	0.00	0.05	0.04***	0.06
		(.85)	(.90)	(.29)	(.01)	(.83)

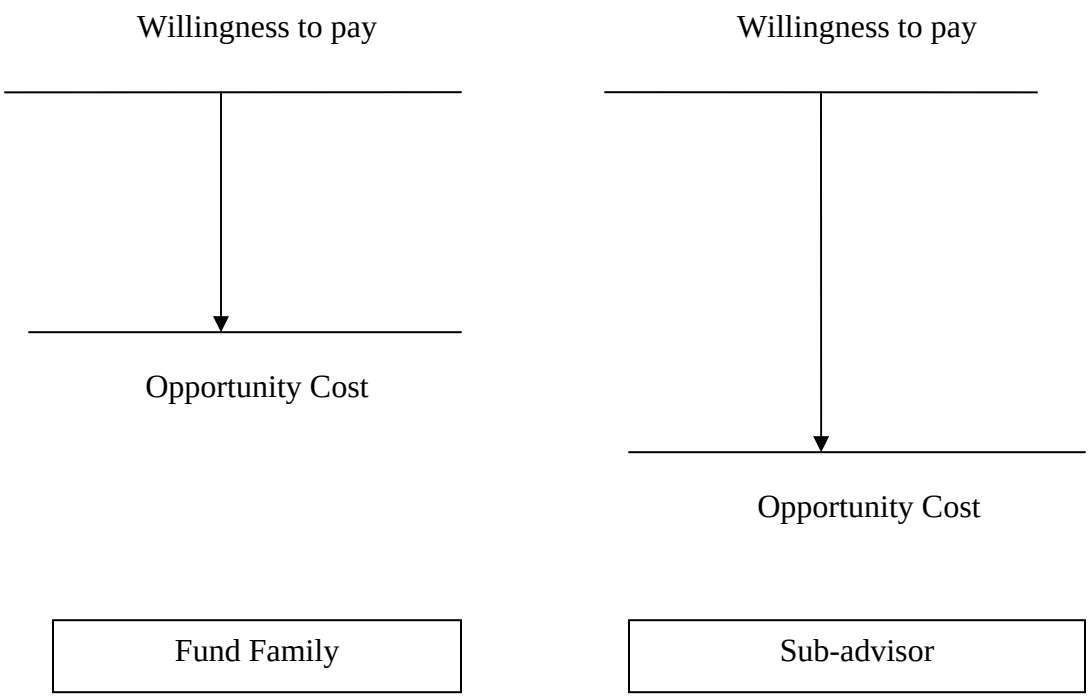
Expense ratio		-0.09***	-0.09***	-0.09***	-0.01	0.06
		(.01)	(.01)	(.03)	(.52)	(.63)
12b-1 fee		0.01	0.04	-0.01	0.02	-0.10
		(.88)	(.56)	(.95)	(.49)	(.79)
Ln (TNA)		-0.04***	-0.04***	-0.03***	0.00	-0.50***
		(.00)	(.00)	(.01)	(.94)	(.00)
Ln(Family TNA)		0.01	0.02**	0.01	0.01**	0.27***
		(.11)	(.01)	(.14)	(.02)	(.00)
Fund age		0.00	0.00	0.00	0.00	0.00
		(.73)	(.88)	(.17)	(.14)	(.44)
Ln (flow)		-0.02	-0.02	0.03	-0.02	2.45***
		(.56)	(.55)	(.49)	(.30)	(.00)
Ln (Net return)		3.63***	3.57***	-0.27	-1.00***	12.00***
		(.00)	(.00)	(.55)	(.00)	(.00)
Ln (Net return)^2		-0.50	-0.54	-0.54	0.80***	11.03***
		(.42)	(.39)	(.13)	(.01)	(.00)
	Morningstar investment category-month fixed effects included					
N	36666	31000	31000	29441	29441	30975

TABLE 7
Families that Buy and Sell Sub-advisory Services in 2002

	Number of families (%)	Average Number of Funds in Family	Average Number of Dom. Equity Funds in Family	Average Family TNA $Billions	Average Family TNA in Dom Equity $Billions	% of Family funds sub-advised
Sub-advise for at least one domestic equity fund (SELLER)	77 (16.9%)	26.6 [11]	10.1 [6.5]	$21.5 [$3.8]	$11.2 [$2.3]	3.8%
Do not sub-advise any funds in family or sub-advise for other families (NEITHER)	299 (65.6%)	6.8 [3]	2.7 [1]	$3.2 [$0.2]	$13.4 [$2.0]	0% [0%]
Sub-advise at least one domestic equity fund in family (BUYER)	96 (21.1%)	22.9 [13]	8.8 [6.5]	$13.4 [$2.0]	$4.6 [$1.1]	58.0% [50.0%]

Figure 1. The Value in Outsourcing Portfolio Management to Sub-advisors

A. Cost-savings motivation



B. Product differentiation motivation

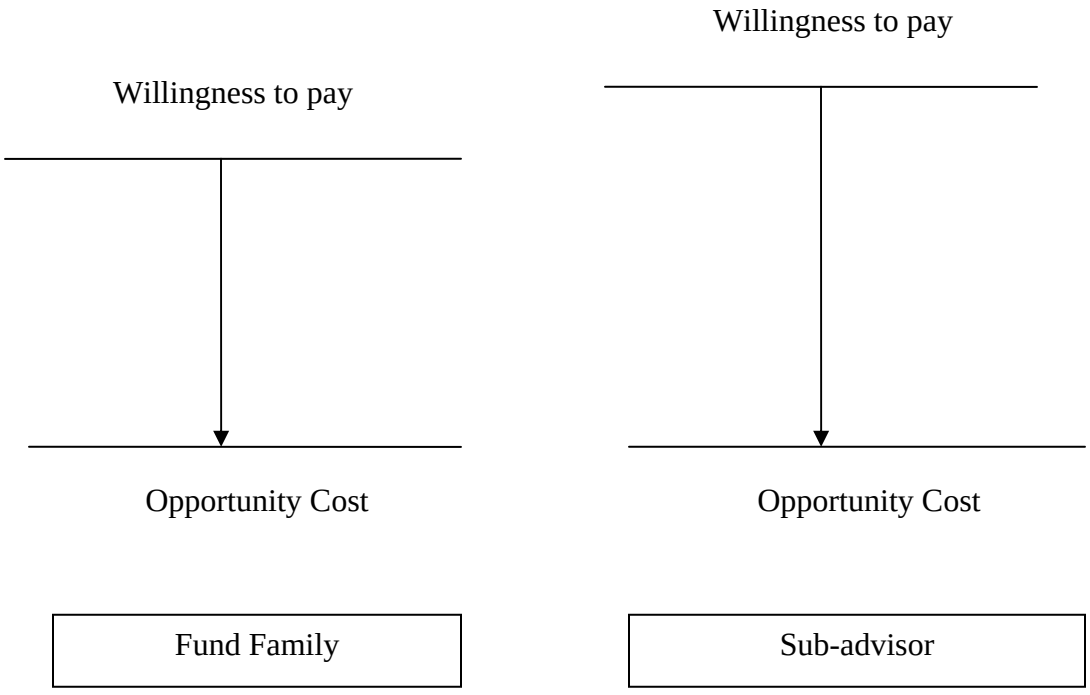


Figure 2. The spectrum of fund families' motivation to outsource portfolio management

PURE COST-SAVINGS MOTIVATION

No in-house portfolio management expertise

(in entire family or in particular investment style)

No in-house portfolio management expertise, but a differentiated product is entire business model (e.g., access to institutional managers)[7]

PURE PRODUCT DIFFERENTIATION MOTIVATION

Offer sub-advised funds in the same investment styles that have in-house expertise (i.e., offer both sub-advised and internally-managed funds in same investment style)

[7] This group is defined as virtual families that market themselves as providing mutual fund investors with access to institutional managers previously unavailable to retail investors. We identify these families by examining SEC filings, marketing materials, and/or family websites of all virtual families in our sample.

Appendix A. Listing of Virtual Families

We define a virtual family as a fund family with more than 80% of their actively-managed domestic equity funds outsourced to sub-advisory firms.

1996:

AMR INVESTMENT SERVICES
BENNINGTON CAPITAL MANAGEMENT
CENTRAL CAROLINA BANK & TRUST CO
EVALUATION ASSOCIATES CAPITAL MARKETS
GOLDEN OAK FUNDS / CITIZENS BANK
GRIFFIN FINANCIAL INVESTMENT ADVISERS
HARBOR CAPITAL ADVISORS
HEWITT ASSOCIATES
IDEX MANAGEMENT
INVESTORS MANAGEMENT GROUP
MANAGERS FUNDS
MANUFACTURERS AND TRADERS TRUST (M&T)
MICHIGAN NATIONAL BANK
NORTH AMERICAN FUNDS
NORTHSTAR INVESTMENT MANAGEMENT
SIGNATURE FINANCIAL GROUP
TIMOTHY PARTNERS
VIRTUS CAPITAL MANAGEMENT (SIGNET)

2002:

ACCESSOR CAPITAL MANAGEMENT
ACTIVA ASSET MANAGEMENT
AFBA FIVE STAR INVESTMENT MANAGEMENT
ALPHA ANALYTICS INVESTMENT GROUP
AMERICAN SKANDIA INVESTMENT SERVICES
BC ZIEGLER & CO
CALVERT ASSET MANAGEMENT
CATERPILLAR INVESTMENT MANAGEMENT
CCM ADVISORS
CIGNA INVESTMENTS
CONCENTRATED CAPITAL MANAGEMENT
ENTERPRISE CAPITAL MANAGEMENT
EQUITY ANALYSTS
FIDUCIARY MANAGEMENT
FRANK RUSSELL INVESTMENT
FRIEDMAN BILLINGS RAMSEY GROUP
FRONTEGRA ASSET MANAGEMENT
GOLDEN OAK FUNDS / CITIZENS BANK
HARTFORD INVESTMENT FIN SVC
IDEX MANAGEMENT
ING PARTNERS
INTRUST BANK
LITMAN/GREGORY FUND ADVISORS
MANAGERS FUNDS
MASSMUTUAL INSTITUTIONAL FUNDS
MEMORIAL INVESTMENT ADVISORS
PACIFIC LIFE INSURANCE
POLESTAR MANAGEMENT
PRO-CONSCIENCE FUNDS
QUANTITATIVE ADVISORS
RESERVE MANAGEMENT COMPANY
RYBACK MANAGEMENT
SEI FINANCIAL MANAGEMENT
UNDISCOVERED MANAGERS
USAA INVESTMENT MANAGEMENT
WILLAMETTE ASSET MANAGERS
WILSHIRE TARGET FUNDS