The Economics of Mutual-Fund Brokerage: Evidence from the Cross Section of Investment Channels

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This Draft: May 20, 2005

Very Preliminary—Please do not cite without permission

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*Christoffersen gratefully acknowledges financial support from IFM2. The authors also wish to thank the Q-group for their financial support of this project. Extensive research assistance was needed in matching databases from Eric Turner, Jerome Grenier, John Bromley, and Thibault Webanck. Any remaining errors are our responsibility. Contact: David K. Musto, musto@wharton.upenn.edu, Phone (215) 898-4239, FAX 215-898-6200, Finance Department, 3620 Locust Walk, Philadelphia PA, 19104-6367..

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ABSTRACT

Retail investors often lack investment expertise. Mutual-fund brokers can help, but their incentives are mixed so it is an empirical question what value they add. A new database of funds inflows, redemptions and payments to different broker types shows independent brokers, rather than fund-affiliated brokers, charging more and delivering more value, not through purchases but through redemptions. From their affiliated brokers, funds get stickier assets, more likely to remain after poor performance, and this is true at the fund and fund-family levels. Also, while flows through the no-load channel exhibit significant convexity in their relation to performance, flows through load channels exhibit less or none.

1. Introduction

U.S. consumers may be poorly prepared for the investment choices they must make. Few have any training in the area, but the rise in household wealth gives them more to invest, while the rise in life expectancy and the decline in traditional pensions raise the stakes for their choices. It seems odd, in this context, that consumers do not choose to buy average performance for almost nothing, via index funds, but even this simple approach requires expensive education to appreciate, and few provide such education below cost. Education *is* available from mutual-fund brokers, but they expect adequate compensation, and like all brokers, they can have responsibilities and incentives on both sides of the transactions they facilitate. In this paper we look at the role of mutual-fund brokers from both sides: from the investor side, as sources of good advice, and from the fund side, as sources of profitable new accounts. A new database lets us address the question, does the value of brokers to investors and funds depend on their incentives to deliver for them?

The new database is the history of electronic filings by U.S. funds. In these filings we see not only monthly inflows and redemptions, but also the loads arising from the inflows, broken down by who gets them: captive brokers, unaffiliated brokers, or the underwriter – i.e., the fund family itself. The distinction between captive and unaffiliated brokers is the key, as it separates two potentially disparate qualities of advice, the former potentially skewed toward the interests of the fund family, away from the investor. To these two investment channels we add a third by including no-load funds, representing investment decisions made without either kind of broker. With this novel data the value

that brokers add is examined by analyzing how and why inflows and redemptions through these channels differ.

For an investor, the important difference is likely to be performance. Is performance good after money flows in? And similarly, is performance bad after money leaves? The question of redemptions is particularly interesting from the funds' perspective, considering the evidence (Gruber, 1996, Zheng, 1999, Christoffersen and Musto, 2002) of 'sleeping' investors, those who remain in funds with poor prospects while others leave. An investor's broker is in position to 'wake up' such an investor, and may profit from doing so if he has a better prospect for the investor to trade into. The incentive is likely to be weaker for captive brokers, since the fund family likely prefers for the investor to keep sleeping, and absent altogether for the no-load channel, where investors are on their own. Thus, we establish empirically how performance after inflows and outflows varies across these investment channels.

In addition to the quality of the advice they receive, investors presumably care about the price of the advice as well. This is another area where our database can contribute significantly, because while existing databases (such as CRSP) report the maximum loads that investors could pay, our database shows the average loads that investors actually pay. The correlation between the two turns out to be small. Our principal question for this data is whether, considering the limited range of captive brokers, investors pay as much for their advice as for the advice of unaffiliated brokers.

Looking at the same data from a fund's point of view, a key question we can address is how a fund's choice of investment channel affects the relation it faces between net new investment and recent performance. This relation is important not only to the

duration, and therefore profitability, of assets under management, but also - as a growing literature (.e.g. Brown, Harlow and Starks, 1996, Chevalier and Ellison, 1997, Carhart et al, 2002) observes – to the fund's own investment decisions. The historical convexity of this relation (Ippolito, 1992, Sirri and Tufano, 1998, Goetzmann and Peles, 1996) is one of the fundamental stylized facts of the literature. However, the relation faced by a given fund hinges on the sensitivity and rationality of its investor base (as in Lynch and Musto, 2002, and Berk and Green, 2004), and these can depend in turn on the advice, or lack thereof, the investor base receives. The value that the broker adds is addressed by comparing the slope and convexity of the flow/performance relation for each channel.

Like investors, funds presumably care what they pay their brokers. Where investors want performance for their money, funds want inflows that don't flow right back out but rather stick around, paying fees. The question of what funds get for their payments to unaffiliated brokers has had a high profile in the press recently but this discussion has focused exclusively on gathering, rather than retaining, inflows. We can explore both directions by relating inflows and outflows separately to the compensation of unaffiliated brokers, and we can compare what we find with analogous results from captive brokers, who are not as likely to be paid to favor one fund over another.

Family-level concerns can be important at the fund level, particularly as regards inflows and redemptions (e.g., Nanda, Wang and Zheng, 2004a). One of the main concerns is whether flows into a fund cannibalize flows into the rest of the family, and conversely, whether flows out of a fund remain nonetheless in the family. These questions relate directly to the choice of investment channel, since captive brokers have only the family's funds to offer. To draw this comparison, we aggregate flows within

families so we can relate flows in and out of the family to the performance of one of its funds.

What we find are incentive differences across channels with strong economic implications in both directions. The key lesson of our results, which are summarized in the conclusion, is the importance of redemptions. What distinguishes captive brokers more than anything else is the insensitivity of redemptions to past performance, and to future prospects. The reason unaffiliated flows perform better than captive flows is not timing funds on the way in, but on the way out. Unaffiliated brokers' customers pay more upon investment, but the extra value they get is in the continuing relation to the broker. By the same token, captive brokers deliver for their families with lower redemptions in situations when money would normally flow out. And when it does flow out, the other funds in the family recapture at least some of it.

These results build on the recent work by Bergstresser, Chalmers and Tufano (2004), who document a generally negative experience investing through brokers. We extend this research by distinguishing brokers by their incentives, distinguishing flows by their direction, and also by calculating loads directly from dollars paid. Thus, we can add to their findings that unaffiliated brokers' customers pay higher loads to buy a service, which manifests later when prospects dim.

The paper is in five sections. Section 2 describes the data, Section 3 provides an overview of flows, Section 4 contains the main empirics and Section 5 summarizes and concludes.

2. Data

To assess the value of a channel both to the investor and to the fund family, we need data that separates investors' inflows from their outflows and that identifies the channel through which the money arrives. Account-level databases such as those employed by Barber, Odean and Zheng (2004) and Johnson (2004) are possibilities but they contain limited, non-random samples of investors and funds. These data also end in the late 1990s when returns were at their peak, so they do not reveal investors' behavior in a market downturn. Instead, we use publicly available data from the SEC N-SAR electronic filings from the period 1994 to 2002. We match these filings to the CRSP database which gives us a majority of funds in this time period, including both the bull and bear markets. Reuter (2004) also matches CRSP with N-SAR files but does not analyze the disaggregated flow data we consider here. O'Neal (2004) analyzes purchases and redemptions of *annual* flows using data from the Form 485-B but he does not have information on the payments to broker channels and focuses on the 200 largest equity funds.

For this paper, we use the N-SAR semi-annual reports. In 1994, the SEC started to make this filing a requirement for a subsample of the funds and by 1996 the reporting was mandatory for all funds. In its report, each fund lists its individual monthly inflows and outflows over the past six months along with answers to various other questions about the fund operations over the same period.[1] The other questions we focus on for this study concern the loads paid to brokers. Unlike other data sources, these files indicate the actual dollar value of loads paid by investors. In addition, if a front load is paid, we are

[1] An example of the N-SAR file questionnaire is available at http://www.sec.gov/about/forms/formn-sar.pdf. The individual data on inflows and outflows is provided in Question 28 (a)-(h). The load data we use is in Questions 29-38.

able to determine how much is allocated to the principal underwriter (or management company) and how much is paid to a captive sales force or unaffiliated broker to distribute the fund. This type of data has not been used before and we exploit it in this paper to determine whether flows vary by the distribution channel. In particular, we are able to differentiate between captive and unaffiliated broker channels which have been aggregated together (see Bergstresser, Chalmers, and Tufano (2004) and O'Neal (2004)) even though the incentives of the two differ.

Because the N-SAR codes are not linked to CRSP, these two databases are matched by hand. This initial procedure correctly matches 82% of the funds by name. The matched database is then subjected to a number of filters. These filters are used to 1) double-check that the correct match with CRSP is made, 2) ensure at least two years of trailing data is available for the analysis and 3) remove data subject to entry-error.[2] The final sample contains 1324 funds. It is important to note that our definition of a fund

[2] Three filters are applied to the sample: NAV matching, a two-year continuous reporting requirement and data-entry error filters for both flows and loads. First, NAV numbers reported in the SEC filing are compared to the NAV reported in CRSP. The N-SAR asks for NAV for two different share classes (without specifying which classes they report for) and we try to match these NAV numbers with those reported in CRSP. Matching names by hand and then matching NAV through an automated procedure leaves us with a sample where we are confident that CRSP and the N-SAR data have been matched exactly. Unfortunately it may also remove valid data points where the NAVs differ slightly. Second, most of the analysis required at least 2 continuous years of historical information. As a result, funds that don't survive for longer than two years and funds that miss filing an N-SAR for one period are removed from the sample. Third, the instructions for filing the N-SAR forms clearly indicate that fund families should report the flow and load data in thousand's of dollars. However, comparing fund flows and loads with the size of the fund provided in the N-SAR it was clear that funds often fail to report this information correctly. To address the failure of some fund families to correctly scale their N-SAR responses, scaling filters are employed. Two such filters are employed: (1) the reported monthly redemptions or inflows were on average more than 100% of the total net assets for the entire time period and (2) the reported monthly redemptions or inflows in one month over the entire time period were more than 200% of total net assets. This removes about 5% of the sample. Errors in scaling also arise with the reporting of dollar loads collected. Dollar values of loads are observed where the calculated percentage loads is larger percent than the reported maximum load. Again this is a problem of reporting in the wrong units. To address this issue, we remove an observation if the percent collected in loads divided by the total dollars of inflows subject to a load is greater than the maximum load. In the case of back loads, we consider it as a percent of redemptions. The maximum load cutoffs are 8.5%, 6%, and 3% for front loads, back loads, and redemption fees.

aggregates across all shareclasses for that fund. In CRSP for this time period, there are 6951 individual funds by shareclasses listed. When aggregating across shareclasses, this reduces to 3342 separate funds, so we are reporting about 40% of the CRSP sample.

The matched sample of data we are reporting on in this paper only includes funds that are classified as aggressive growth (AG), large-cap growth (LG), and growth and income (GI). Because we collect data as it is reported, this data does not suffer from survivorship bias as we capture all the funds that reported after 1995 even if they ceased to report in later periods.

3. Descriptive Analysis

Table 1 summarizes the filtered dataset. We focus primarily on transactions in shares, rather than dollars, because this associates purchases and redemptions more directly. Net flows in dollars and shares (Graphs 1 and 2) rise to 2000 then fall to about zero by 2002. The fund industry's shrinkage over this period was thus due not to high redemptions, but rather just the market's decline. The average redemption rate was about 3-4% of total net assets monthly and this increased quite significantly from 1996 to 1999. The increase indicates a decrease in investors' investment horizons, and accords with the recent statement by John Bogle that the average redemption rate is up to 41% per year.[3]

Panel B of Table 1 summarizes flows by month. The main point of interest here is the absence of a seasonal pattern, except for the spike in reinvestment in November and especially December, reflecting the seasonality of funds' dividend payments.

[3] Discussion by Bogle on the stewardship quotient and shareholder stability. http://www.vanguard.com/bogle_site/sp20040105.html

Table 2 summarizes investors' load payments. The key result here is that these load payments bear little resemblance to the *maximum* loads that are widely reported and used in research. Loads are both negotiable and subject to volume discounts, and these factors, and not maximum loads, are apparently the major determinants of investors effective loads .[4] What Panel B shows is that, in a comparison across all funds of maximum loads to the actual load payments we see (first row), the correlations of Front and Back loads are 48% and 38%, respectively, and in a comparison of load funds only (second row), the correlations are just 9% and 13%. Results are even weaker for redemption fees. So while maximum loads identify what small investors pay and help identify shareclasses and no-load funds (see Zheng, Nanda, and Wang (2004b), O'Neal (1999), and Livingston and O'Neal (1998)), they relate weakly to the money actually being paid.

Panel A of Table 2 shows about 15-20% of fund inflows subject to loads, where the total amount paid is around 45bp in 1995, dropping to 28bp by 2002. The average effective load for load-fund investments works out to 2.54%, much smaller than the average maximum front-end load of 4.73% reported concurrently by CRSP. Dollar-weighting these actual loads paid gives an even lower average load paid.

The main goal of the paper is to compare investment through three main channels: captive brokers, unaffiliated brokers and no-load investment. Captive brokers are brokers representing only one family, whereas unaffiliated brokers in principle represent no particular family, and no-load investment comes in with no broker. We execute this

[4] "Typical breakpoint discounts apply to purchases at $50,000, $100,000, $250,000, $500,000 and $1 million, although some funds provide a breakpoint at $25,000." Quoted from the March 2003, Joint SEC/NASD/NYSE Report of Examinations of Broker-Dealers Regarding Discounts on Front-End Sales Charges on Mutual Funds http://www.sec.gov/news/studies/breakpointrep.htm.

comparison by using the NSAR's decomposition of load payments to sort funds into the three buckets.

The NSAR data decompose load income by its destination: captive brokers, unaffiliated brokers, and the underwriter. We use this decomposition to identify funds that use only captive brokers, and funds that use only unaffiliated brokers. Many funds use both, but these are less useful for our purposes because their redemptions are problematic to interpret. That is, we can estimate from the broker payments how much of their inflows came from captive vs. unaffiliated brokers, we have no guidance for estimating the brokerage channel associated with their redemptions. Payments to the underwriter are essentially payments to the fund family, typically payments to a distribution affiliate of the management company. These may represent the fund family's profit on the sale, but they could also cover other marketing expenses so they are too ambiguous for our purposes. Therefore, for the remainder of the paper we will define funds as follows. A fund is CAPTIVE if loads are paid to captive but not unaffiliated brokers, UNAFIL if loads are paid to unaffiliated but not captive brokers, and NOLOAD if no loads are paid at all. All other funds are OTHER. The magnitudes of investment through these categories are summarized in Table 3.

We can relate our database to those of earlier work by replicating (as in O'Neal, 2004) the flow/performance analysis of Ippolito (1992), Sirri and Tufano (1998) and others. The advantage of our database, relative to the earlier work, is the disaggregation of flows into purchases, redemptions and reinvestment. We rank funds by their returns for each ICDI objective category (AG, GI, LG) in the current year (Graph 3) and in the prior year to their annual flows (Graph 4). The monthly purchases, redemptions, and

reinvestments are divided by total net assets for each month and multiplied by 12 to annualize the percentage change in flows. These graphs make an important point. While inflows are convex in performance, redemptions are U-shaped, with the net effect of much less convexity than the earlier studies find. It might seem from the earlier studies that investors are reluctant to sell losers, but what we find is that *inflows* make little distinction between bad and very bad performance, but *outflows* do make a significant distinction. This raises the possibility that convexity has waned due to increased sensitivity of bottom-funds' current investors, a trend that would result from investors trending toward intermediation that wakes up sleeping investors.

4. Empirical Analysis

The remainder of the paper analyzes the role of intermediaries and how they may alter an investor's behavior, measured by the flow-performance relationship. O'Neal (2004) and Bergstresser, Chalmers, and Tufano (2004) are most closely related to our paper in that they also consider whether brokers provide a value-added to investors. The real divergence of our paper with these is our ability to separate brokers by their affiliation, captive versus unaffiliated, as well as identify the amounts paid to these channels. In Section 4.A, we discuss how our results compare to those found in these papers. Sections 4.A and 4.B focus on what the investor gets from the intermediary in terms of advice while sections 4.C and 4.D consider what benefits the mutual fund gets through each channel.

4.A. Flow-Performance Relation

Does the form of intermediation change investor behavior? Captive brokers are more constrained than unaffiliated brokers, but investors can know that, and as recent media attention emphasizes, unaffiliated brokers can be tilted toward particular families with financial incentives. So the practical significance of this distinction for investor behavior is an open question. And no-load investors are more sophisticated on important dimensions than load investors (e.g., Capon, Fitzsimmons and Prince, 1996, Alexander, Jones and Nigro, 1998), but they may not be as sophisticated as brokers, and must rely on themselves to look after their investments, something that investors can be psychologically unsuited to do (Goetzmann and Peles, 1996).

Our first empirical question follows up on graphs 3 and 4. We rank the past year's return for each objective category at each month and normalize the rank to be between zero and one. Using the same definitions of CAPTIVE, UNAFIL, and NOLOAD as defined in Section 3, we interact these dummy variables of broker channel with ranked return, RKRET, and regress on redemptions, new inflows, and net flows measured as a percent of total net assets of the fund for each month. Because the flows are monthly and regressed on annual returns, this regression suffers from overlapping data. We control for this by running 12 separate regressions for each month and then taking an average of the coefficients and providing a standard deviation of the average to calculate the t-statistics in all the remaining tables. To determine whether coefficients differ significantly, we difference the estimated coefficients and provide t-statistics based on the standard deviation of the average differences.

In the redemption equation, the coefficient on ranked returns for a captive sales force is much lower than any other broker channel, consistent with the hypothesis that a captive sales force is much less apt to move money out of bad performers without better alternatives in the complex. This contrasts strongly with the high sensitivity of redemptions to performance in the unaffiliated brokerage channel. No-load investors are seen to be in between, significantly more sensitive than captive-broker investors, but significantly (at 10%) *less* sensitive than unaffiliated-broker investors. The sensitivity of inflows, on the other hand, varies little across the channels. From a fund's perspective, the money in noload and unaffiliated channels is much more volatile and less reliable. On average, inflows and redemptions are significantly higher for these two channels compared to the captive sales force which is not as able to attract new money but is better at keeping it.

So what about convexity? Numerous papers have measured, analyzed, and tried to explain the convexity of mutual fund flows. Should it differ by broker channel? If investors are considered irrational by overreacting to past good performance and underreacting to past bad performance then possibly an advisor could help mitigate these biases. For instance, a broker may alter investor decisions by redirecting investments based on non-performance characteristics and as a result, the broker may reduce the sensitivity of investors to high performance. We can address this with a regression model in the tradition of the existing literature, allowing the model to fit a different slope among the top performers. Table 5 shows the redemptions, purchases, and net flows as a percent of total net assets for the fund as a function of lagged returns *and* lagged returns of funds

performing in the top 20% of their objective category each month, represented by RKRETHI defined as max(RKRET – 0.8, 0).

The key result is that convexity in net flows is significant for no-load funds, weak for unaffiliated funds, and absent for captive funds. Also, with weak significance, net flows are more convex for no-load funds than for either of the intermediated funds. Although inflows are convex in performance, this effect is significantly weaker in the CAPTIVE and UNAFIL channels where brokers may advise investors on factors other than past performance in choosing funds. Redemptions are also convex in performance so poorer returns result in people leaving a fund at higher rates. Put together, the flow-performance relation looks relatively linear for these two brokered channels and convex for the no-load investors. Going back to graphs 3 and 4, this result suggests that as the industry moves towards more third-party brokers, we should expect to see the convex relation in flows diminish as noted in Graphs 3 and 4. It also suggests that the risk-taking incentives outlined in Chevalier and Ellison (1997) and Brown, Harlow, and Starks (1996) may differ by distribution channels.

In comparison, O'Neal (2004) and Bergstresser, Chalmers, and Tufano (2004) find that the flow-performance relation is heightened when money is allocated through a broker channel. In further separating the affiliated and unaffiliated broker channels, we find that the story is even richer. While redemptions and net flows through unaffiliated brokers are more performance sensitive than noload flows, redemptions and net flows through the captive channel are not. We find that convexity in net flows is most pronounced the direct-marketed noload funds followed by unaffiliated brokers, while captive brokers show no convexity at all.

4.B Is money smart or are brokers smart?

The results of Tables 4 and 5 establish that flows through different channels relate differently to past performance, especially the redemptions of unaffiliated brokers' customers. This is consistent with unaffiliated brokers 'waking' sleepy investors, but it is also consistent with these brokers using poor performance as an inducement to sell just to get a commission, not because it is a good idea. Following on the Zheng (1999) and Gruber (1996) findings that net flows into funds in general predict performance, we ask whether flows through the different channels predict performance.

The empirical question is how future performance relates to today's flows through different channels. To address it we run a set of regressions where the dependent variable is a fund's six-month return, net of the average fund return, and the explanatory variables are indicators for the fund's distribution type interacted with a measure of percentage flows in the month just prior to the six month return. We run one regression each for redemptions, purchases and inflows. Results are in Table 6.

For investment through the no-load and unaffiliated-broker channel, we replicate the Gruber (1996) and Zheng (1997) results, with the coefficients on FLOWS*UNAFIL and FLOWS*NOLOAD entering significantly (at the 10% level) and positively. But investment through captive brokers is not so fortunate, entering significantly and negatively. Looking more closely, we find the important difference in the redemptions: redemptions through the captive channel predict significantly better future performance than do redemptions through the other channels. Thus, it appears that unaffiliated brokers use information about future prospects to switch investors out of the fund, whereas captive brokers do not. Redemptions of unaffiliated brokers also significantly

outperform those of no-load investors in this respect. Table 6 indicates that the benefit of unaffiliated brokers goes unnoticed if one looks only at purchases, because the real benefit is in redemptions. Captive brokers are in position to provide the same benefit but they do not deliver, consistent with their weak incentives to advise redeeming.

Captive brokers are agents of the mutual fund company so if there was an agency issue between the advisor and the investor, this would certainly be one channel where we'd expect to see it. Redemptions out of captive brokered accounts predict positive returns and don't seem to allocate new purchases to investments yielding positive returns. As a result, the agency conflict inherent in the captive broker-fund family affiliation seems to impede the advice offered to investors in addition to being more sluggish in advising investors to leave a poor performer. All in all it seems there is less value added for investors using the captive broker channel, than for investors using the unaffiliated broker channel, but is this reflected in their costs? Table 2 shows the effective load charged in the two samples. In almost all years, the investor pays captive brokers a lower effective load than they pay unaffiliated brokers. Across all years, the captive broker costs 2.28% while the unaffiliated broker costs 2.62% and the difference is significant with a t-statistic of 7.94.

4.C Flow-performance relation by management company

From the fund family's perspective, the first-order concern with fund flows is presumably their effect on total assets under management. We can zoom out to this perspective by relating percentage flows not to the fund, but, as in Nanda, Wang and Zheng (2004a), to all equity funds in the fund's complex. Intuitively, the salient

differences between the channels in this context are that, relative to the unaffiliated channel, inflows through the captive channel cannibalize flows of other funds in the family, and similarly, that outflows from the fund stay in the family. We can explore these possibilities by repeating the regressions of Table 4 with percentage flows to equity funds in the fund's family replacing percentage flows to the fund as the dependent variable. The results are in Table 7.

The main result in Table 7 is that for captive funds, redemptions from the *family* are not sensitive to the fund's performance, even though we saw in Table 4 that redemptions from the *fund* are sensitive. The difference between the Captive and Unaffiliated slopes is similar between the two tables, 12.6 vs. 14.3, but the former is in units of percentages of all equity funds in the family, not just the one equity fund, so this implies a much bigger monetary effect. This is consistent with the captive-broker channel keeping the money in the family, even as it exits the fund. For inflows the results are not significantly different from Table 4. As in Table 4, the sensitivity of inflows to past return is not significantly different between the Captive and Unaffiliated channels. So to summarize, a captive sales force appears to help a fund family retain flows from a poor performer, but not deflect inflows from a high performer to another constituent fund.

Because of the evidence that the convex flow/performance relation alters funds' investment behavior (Brown, Harlow and Starks, 1996, and Chevalier and Ellison, 1997), and because the investment behavior of a fund presumably depends, at least somewhat, on income to the fund family, the convexity of flows to the family is an important

empirical question to answer. We can answer it by repeating the tests of Table 5 with the family flows of Table 7 as the dependent variables. Results are in Table 8.

What Table 8 shows is that, from the family's perspective, only no-load net flows are convex. Also, they are significantly more convex than the brokered flows. This is additional evidence that the convex flow/performance relation is not an unconditional influence on funds' investment strategies, but rather an influence primarily on no-load funds, and it would interesting to learn whether this is apparent in the difference between the investment strategies of no-load and other funds.

4.D. Broker Incentives

Finally, we can explore the idea, popular in the press recently, that unaffiliated brokers favor funds that pay them more. For example, PIMCO's distributor (PA Distributor) recently settled with California's Attorney General for $9 million. The legal suit alleged that PIMCO and the distributor engaged in a shelf-space arrangement whereby broker-dealers were required to "tout PIMCO mutual funds, via placement on intranet web sites or 'preferred' or 'recommended' lists."[5] Similarly, Eliot Spitzer was quoted as saying "fees, fees, fees are the next issue" where there are growing concerns that a broker's objective advice to a client is compromised as they are paid more.[6]

We have limited ability to pursue this theory, because we do not see how much any particular broker is paid for one fund vs. another. But we can see which funds pay unaffiliated brokers relatively more, and which pay captive brokers relatively more, and we can see whether this relates to the level of flows. The dependent variable is

[5] http://ag.ca.gov/newsalerts/2004/04-105.htm
[6] http://www.smh.com.au/articles/2003/12/04/1070351723857.html. And see also http://www.sec.gov/news/press/2003-159.htm for the Morgan Stanley case.

percentage flows to the fund, same as Table 4, and the new explanatory variables are HICAP, which is 1 for captive-broker funds paying more than the median captive-broker amount to their brokers, and HIUNAF, which is the analogous statistic for unaffiliated-broker funds. Results are in Table 9, captive brokers in Panel A and unaffiliated brokers in Panel B.

Both HICAP and HIUNAF do not enter for net flows, though both are associated with lower redemptions *and* lower inflows. This seems odd, but it would result naturally from these funds having smaller average investments, which would ramp up loads (due to the vanishing volume discounts) and shrink investment amounts. The interaction between HICAP and Rkret does not enter in any specification for captive brokers, but it enters strongly for unaffiliated brokers. The sensitivity of redemptions to returns shrinks, and the sensitivity of purchases grows when the brokers' commission is higher. The contrast between the captive channel, where one would not expect payment for favoritism, and the unaffiliated channel, where one might, is at least suggestive of a purchase of extra effort, both to bring flows into good performers and to keep them in poor performers.

5. Conclusion

Money flows in and out of mutual funds through different channels, and these channels represent different amounts and types of intermediation and advice. In this paper we explore the economics of the three main channels – captive brokers, unaffiliated brokers and the no-load, direct channel – to see what drives these flows, and what they accomplish for consumers. Our main findings are:

1) Compared to captive brokers, unaffiliated brokers time their customers' investments better, and this comes from exiting losers, rather than buying winners. Compared to no-load flows, unaffiliated flows are worse at buying winners but better by the same amount at exiting losers.
2) The loads consumers pay have little relation to the maximum loads usually referenced, and they are smaller for captive brokers than for unaffiliated brokers.
3) Captive flows are less sensitive to past performance, and this is due to lower sensitivity of redemptions, rather than inflows
4) The well-known convexity of flows in past performance applies primarily to no-load funds, and not at all to captive funds. This is true for flows to the fund and also to all equity funds in the fund's family
5) Captive brokers help funds retain outflows, but they do not cannibalize inflows from other funds in the family

We also find evidence that higher payments to unaffiliated brokers buys some amount of favorable treatment, both in attracting and in retaining funds.

Rational decision theory helps us understand consumers' mutual fund decisions only to a point, and that point is determined by both the rationality and incentives of the professionals they turn to for help. The results of this paper demonstrate the importance of understanding the incentives. Captive brokers may improve their customers' welfare from what they would have done – as Bergrstresser, Chalmers and Tufano (2004) observe, we don't know where that baseline is – but their misaligned incentives and limited fund menus significantly compromise their advice. Unaffiliated brokers deliver more – and charge more – and we see the importance of the continuing relation between

the broker and the customer. The extra value that unaffiliated brokers deliver comes not from the inflow but from the future redemption. The broker saves his customer from becoming a sleeping investor, either from inattentiveness or cognitive dissonance, and he does it because convincing the investor to make a new sale is in his interest.

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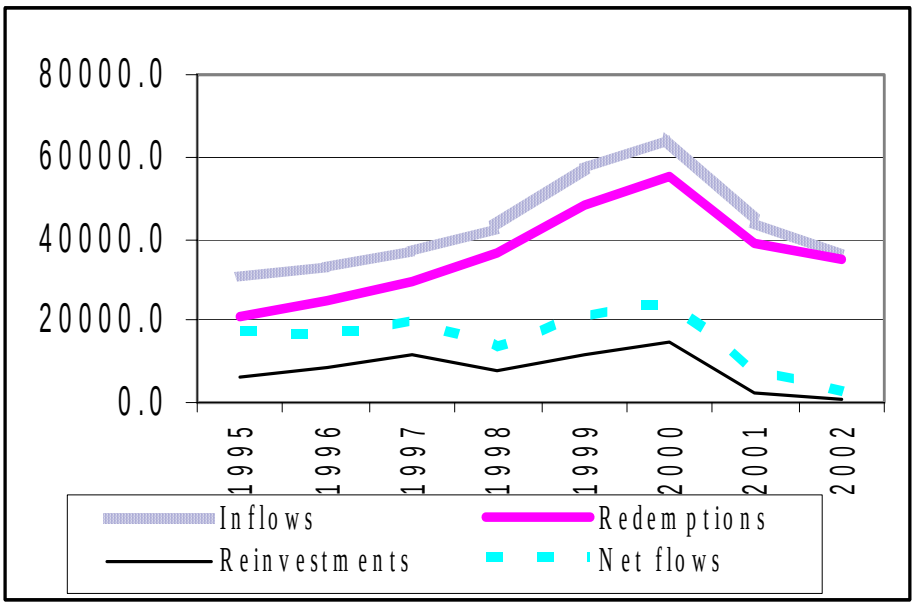
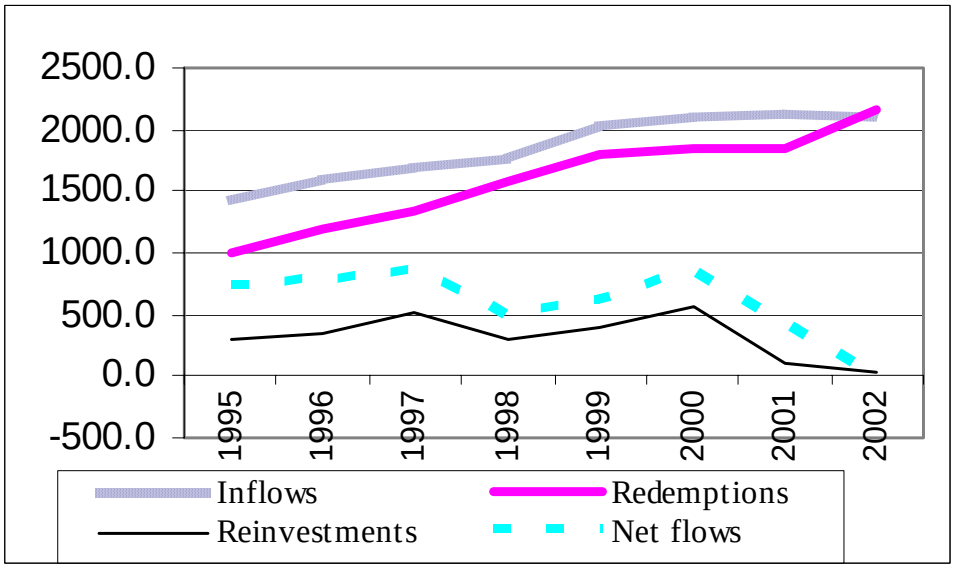
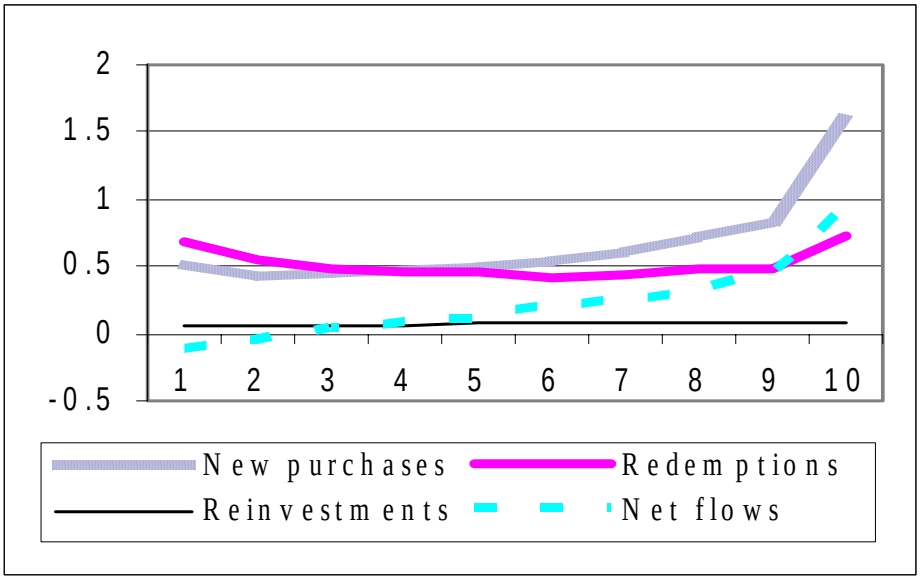


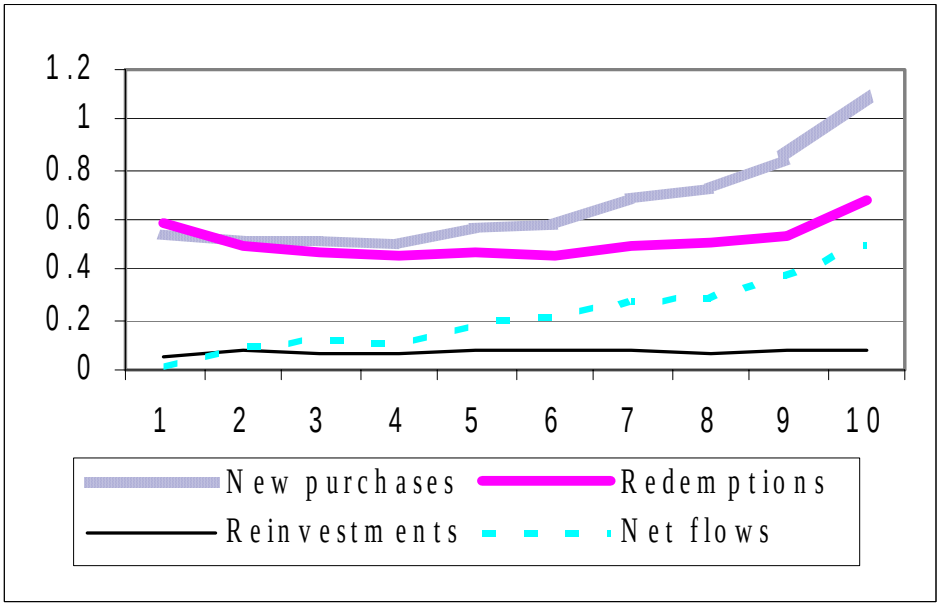
Graph 1. Annual dollar purchases, redemptions, reinvestments 1995-2002.
Units are evaluated in thousands of dollars annually are the average flows by fund.



Graph 2. Annual shares purchased, redeemed, reinvested 1995-2001. Units are evaluated as '000s of shares annually and are the average shares by fund.



Graph 3. Percentage new flows and current performance. This graph plots annual new inflows, redemptions, and reinvestments as a percent of total net assets by the concurrent performance decile. Performance is evaluated over the same year as inflows and ranked by objective category.



Graph 4. Percentage new flows and lagged performance. This graph plots annual new inflows, redemptions, and reinvestments as a percent of total net assets by the lagged performance decile. Performance is evaluated over the year prior to inflows and ranked by objective category.

Table 1. Descriptive Statistics

This table provides descriptive statistics of our matched sample of CRSP and N-SAR files from 1995 to 2002. Between 1995-2002, there are 49,278 fund/month observations. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. The purchases, redemptions, and reinvestments are based on information from Question 28 (a) – (h) in the NSAR file. Panel A provides the annual summary statistics while Panel B provides the monthly statistics for the same time horizon. All values are fund averages.

Panel A: Yearly summary statistics									
Variables	**Units**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Purchases	**($ '000)**	31125.5	33396.8	37641.8	42355.0	57436.7	64815.8	44312.7	36254.7
Redemptions	**($ '000)**	20602.8	25177.6	29846.4	36824.1	48496.0	55465.3	38814.8	35030.3
Reinvestments	**($ '000)**	6553.6	8182.4	11343.6	7551.8	11738.4	14393.1	2254.4	824.1
Net flows	**($ '000)**	17076.3	16401.6	19138.9	13082.8	20679.1	23743.5	7752.4	2048.5
Purchases	**Shares ('000s)**	1437.0	1599.9	1692.5	1773.4	2046.0	2117.3	2134.7	2104.1
Redemptions	**Shares ('000s)**	1006.3	1185.1	1349.1	1590.9	1808.2	1838.3	1836.9	2154.3
Reinvestments	**Shares ('000s)**	309.8	356.3	509.6	300.0	384.9	575.7	116.0	37.1
Net flows	**Shares ('000s)**	740.5	771.1	853.0	482.4	622.7	854.7	413.8	-13.1
Purchases	**% TNA**	6.256	5.343	5.715	5.500	4.729	5.882	5.675	5.056
Redemptions	**% TNA**	3.658	3.774	4.054	4.706	4.342	4.586	4.243	4.400
Reinvestments	**% TNA**	0.679	0.888	0.975	0.601	0.686	1.057	0.200	0.067
Net flows	**% TNA**	3.276	2.458	2.636	1.395	1.073	2.353	1.632	0.723
TNA	**$ millions**	906.69	965.86	1206.15	1400.70	1870.74	2071.08	1586.09	1314.31
Expenses	**%**	1.29	1.32	1.28	1.27	1.26	1.24	1.26	1.31
Month/Fund Obs		2530	3862	4940	5993	6786	7939	8523	8705
Panel B: Monthly summary statistics									
			1	**2**	**3**	**4**	**5**	**6**	
Shares purchased	**('000s)**		2207.62	1930.69	2193.69	1994.52	1897.41	1762.89	
Shares redeemed	**('000s)**		1773.41	1680.79	1937.43	1545.00	1504.27	1440.09	
Shares reinvested	**('000s)**		30.03	35.65	95.66	10.94	80.32	182.14	
Flow of shares	**('000s)**		464.25	285.55	351.92	460.46	473.46	504.93	
Observations			3204	3218	3215	3210	3226	3218	
			7	**8**	**9**	**10**	**11**	**12**	
Shares purchased	**('000s)**		1869.47	1858.06	1737.57	1883.33	1795.68	2073.80	
Shares redeemed	**('000s)**		1530.48	1606.62	1576.09	1579.84	1503.19	1877.08	
Shares reinvested	**('000s)**		19.49	94.95	123.76	80.93	336.12	3042.87	
Flow of shares	**('000s)**		358.47	346.39	285.24	384.42	628.61	3239.59	
Observations			3287	3321	3342	3434	3510	3570	

Table 2. Summary statistics on actual loads paid

This table provides descriptive statistics of our matched sample of CRSP and N-SAR files from 1995 to 2002. Between 1995-2002, there are 49,278 fund/month observations. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. The load information and its allocation by sales force is based on information from Question 28-38 in the NSAR file. Panel A provides the annual summary statistics while Panel B provides correlation between the actual loads collected that are reported on the N-SAR files and the maximum load charged which are reported in CRSP. Percent of inflows subject to a load is the percent of total dollars arriving into a fund subject to a load (Q28(h)) divided by the total dollars arriving into the fund (Q28(g)). The percent of inflows collected in front loads is the total dollars collected in front loads Q30(a) divided by Q28(g). The percent of inflows paid to the underwriter is the total dollars paid to an underwriter (Q31a) divided by the total inflows (Q28(g)). The percent of inflows paid to the unaffiliated broker is Q32 divided by Q28(g) while the percent of inflows to a captive sales force is Q33 divided by Q28(g). The percent of outflows subject to back loads is Q35 divided by the total outflows for the six month period given as part of the response to Q28(g). The percent received by brokers in a specific channel for a fund is the percent of dollars received in either the captive (Q33) or unaffiliated channel (Q32) divided by the dollars coming to that fund which are subject to a load (Q28(h)). The percent paid by individuals is the total front load dollars collected (Q30(a)) divided by the total inflows subject to a load, Q28(h). The conditional correlations condition on the front load, back load, and redemption fee being positive as reported in CRSP. Note that CRSP refers to a deferred contingent sales charge or back load as a rear load. CRSP also calls the redemption fee imposed on investors who trade within a short time frame as a deferred load. Filing an N-SAR report was not mandatory until 1996 so prior reporting was done on a voluntary basis.

Panel A: Load Information	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Percent of inflows subject to loads	19.57	20.54	19.75	17.15	15.21	14.64	14.43	16.20
Percent of inflows collected in front loads	0.45	0.43	0.39	0.32	0.29	0.25	0.25	0.28
Allocated to underwriter (% inflow)	0.10	0.12	0.11	0.08	0.06	0.05	0.06	0.07
Allocated to captive salesforce (% inflow)	0.12	0.11	0.10	0.07	0.07	0.05	0.05	0.06
Allocated to unaffiliated broker (% inflow)	0.23	0.21	0.18	0.17	0.17	0.14	0.14	0.15
Percent of outflows collected in back loads	0.09	0.08	0.09	0.10	0.09	0.09	0.12	0.12
Percent of front loads allocated to								
Underwriter (% front load collected)	25.97	27.84	28.41	24.09	19.78	21.52	22.02	22.92
Captive Salesforce (% front load collected)	20.97	20.53	21.65	21.34	20.44	19.03	17.13	16.65
Unaffiliated broker (% front load collected)	53.06	51.63	49.94	54.57	59.78	59.45	60.85	60.43
Average load received by brokers								
Captive	1.70	1.69	1.38	1.33	1.48	1.31	1.65	2.10
Unaffiliated	2.63	2.21	2.14	2.20	2.20	2.23	2.17	2.03
Average load paid by investors								
Captive	2.56	2.72	2.27	1.91	2.08	1.81	2.18	2.75
Unaffiliated	3.02	2.70	2.75	2.70	2.58	2.63	2.55	2.42

Panel B: Correlations between NSAR actual loads and CRSP maximum loads			
	Front Load	Back Load	Redemption Fee
Unconditional	0.4771	0.3794	0.2256
Conditional on positive loads	0.0939	0.1326	-0.1665

Table 3. Total flows by distribution channel

This table provides descriptive statistics of our matched sample of CRSP and N-SAR files from 1995 to 2002. Between 1995-2002, there are 49,278 fund/month observations. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. We define a fund to be NOLOAD if no flows are subject to a load. We define a fund as having a CAPTIVE sales force if there is a positive amount of front load allocated to paying a captive sales force while none of the front load is allocated to an unaffiliated broker. We define a fund as distributing through an UNAFFILIATED broker if there is a positive amount of front load allocated to an unaffiliated broker while none of the front load is allocated to a captive sales force. OTHER funds include all remaining funds which either charge a back-load or allocated front loads to both unaffiliated and captive brokers.

	1995	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**
Total Dollars Redeemed ($bil)	52.1	97.2	147.4	220.7	329.1	440.3	330.8	304.9
Noload (%)	22.5	28.5	29.9	38.5	41.5	47.0	51.8	46.9
Only Captive (%)	10.1	9.4	10.9	7.2	8.2	7.0	4.3	3.7
Only Unaffiliated (%)	22.1	27.5	34.1	42.6	45.4	40.1	33.6	38.6
Other (%)	45.2	34.6	25.0	11.7	4.9	5.9	10.3	10.8
Captive (%)	19.8	20.6	17.2	12.0	11.8	9.2	6.1	6.1
Unaffiliated (%)	31.7	38.6	40.4	47.4	49.0	42.3	35.5	41.0
Brokered account (%)	41.9	48.1	51.3	54.6	57.2	49.3	39.7	44.7
Total Dollars Purchased ($bil)	78.7	129.0	186.0	253.8	389.8	514.6	377.7	315.6
Noload (%)	22.9	26.3	28.4	35.6	41.7	46.4	49.5	46.4
Only Captive (%)	8.8	9.1	9.5	6.8	6.2	4.9	4.2	3.5
Only Unaffiliated (%)	25.3	34.1	39.6	47.0	48.0	43.2	37.2	40.7
Other (%)	43.0	30.5	22.5	10.6	4.1	5.5	9.1	9.4
Captive (%)	15.8	18.5	14.7	11.1	9.2	7.1	5.9	5.3
Unaffiliated (%)	32.2	43.5	44.9	51.2	51.0	45.4	38.9	42.6
Brokered account (%)	41.0	52.6	54.4	58.0	57.2	50.3	43.1	46.1
Total Dollars Reinvested ($bil)	16.6	31.6	56.0	45.3	79.7	114.3	19.2	7.2
Noload (%)	22.1	23.2	42.5	36.9	33.5	44.3	38.0	59.1
Only Captive (%)	5.2	7.6	6.5	9.9	8.5	8.0	9.2	4.4
Only Unaffiliated (%)	33.6	28.3	29.1	48.8	54.6	42.7	41.5	27.6
Other (%)	39.0	40.9	22.0	4.5	3.4	5.0	11.3	8.9
Captive (%)	13.6	11.9	8.8	12.7	10.2	10.4	10.3	5.1
Unaffiliated (%)	42.0	32.5	31.3	51.6	56.4	45.1	42.6	28.3
Brokered account (%)	47.2	40.1	37.8	61.5	64.9	53.1	51.8	32.7

Table 4. Flow-performance by fund

This table provides regressions of percent changes in redemptions, inflows, and net flows on ranked returns. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. REDEMPTIONS are the dollar value of redemptions leaving a fund in a given month divided by the total net assets of the fund. INFLOWS are the dollar value of new money coming into the fund in a given month divided by the total net assets of the fund. NET FLOWS are the dollar inflows plus reinvestments less redemptions in a given month divided by the total net assets of the fund. We define a fund to be NOLOAD if no flows are subject to a load. We define a fund as having a CAPTIVE sales force if there is a positive amount of front load allocated to paying a captive sales force while none of the front load is allocated to an unaffiliated broker. We define a fund as distributing through an UNAFFILIATED broker if there is a positive amount of front load allocated to an unaffiliated broker while none of the front load is allocated to a captive sales force. OTHER funds include all remaining funds which either charge a back-load or allocated front loads to both unaffiliated and captive brokers. RKRET is the ranked return of a fund over the past 12 months where the ranking is done for every month and compares all the funds in the sample for that month ranking them from 0 to 1.

Panel A: Percent flows by Fund						
	Redemptions		Inflows		Net flows	
	Coef	t-stat	Coef	t-stat	Coef	t-stat
Rkret*Captive	-12.66	-2.34	28.09	8.79	42.16	7.85
Rkret*Unafil	-26.95	-13.23	29.55	9.80	58.73	17.83
Rkret*Noload	-21.32	-8.23	32.74	13.03	54.87	13.02
Rkret*Other	-13.35	-5.69	31.06	18.69	48.50	13.50
TNA	-6.16E-04	-30.75	-6.49E-04	-60.23	-3.83E-05	-1.51
Noload	54.71	23.75	28.78	24.12	-21.68	-6.64
Captive	39.33	20.17	19.81	15.01	-15.01	-4.49
Unaffiliated	54.88	36.02	31.41	23.68	-19.80	-8.47
Other	44.18	31.47	25.84	30.30	-15.32	-6.56
Panel B: Tests						
	Diff	t-stat	Diff	t-stat	Diff	t-stat
Rkret*Captive - Rkret*Unafil = 0	14.28	2.43	-1.46	-0.47	-16.57	-2.79
Rkret*Captive - Rkret*Noload = 0	8.65	1.34	-4.64	-1.80	-12.71	-1.97
Rkret*Unafil - Rkret*Noload = 0	-5.63	-1.85	-3.18	-1.07	3.86	1.61
Noload - Captive = 0	15.38	5.05	8.97	4.98	-6.68	-3.07
Noload - Unafil =0	-0.17	-0.07	-2.63	-1.44	-1.88	-1.13
Captive - Unafil =0	-15.55	-6.53	-11.60	-6.66	4.80	2.16

Table 5. Convexity in fund flows

This table provides regressions of percent of TNA in redemptions, inflows, and net flows on ranked returns of the fund allowing for a convex relation for top performing funds. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. REDEMPTIONS are the dollar value of redemptions leaving a funds in a given month divided by the total net assets of the fund. INFLOWS are the total dollar value of new money coming into a fund in a given month divided by the total net assets of the fund. NET FLOWS are the dollar inflows plus reinvestments less redemptions in a given month for a fund divided by its total net assets. We define a fund to be NOLOAD if no flows are subject to a load. We define a fund as having a CAPTIVE sales force if there is a positive amount of front load allocated to paying a captive sales force while none of the front load is allocated to an unaffiliated broker. We define a fund as distributing through an UNAFFILIATED broker if there is a positive amount of front load allocated to an unaffiliated broker while none of the front load is allocated to a captive sales force. OTHER funds include all remaining funds which either charge a back-load or allocated front loads to both unaffiliated and captive brokers. RKRETLO is the min(RKRET, 0.8) where RKRET is the ranked return of the fund over the past 12 months. Ranking is done for every month and compares all the funds in the sample for that month ranking them from 0 to 1. RKRETHI is max(RKRET-0.8, 0). The coefficients are average coefficients of the same regression repeated for each month. The t-stat represents the average coefficient divided by the standard deviation of the average of the 12 estimated coefficients.

Panel A: Convexity in flows by fund						
	Redemptions		Inflows		Net flows	
	Coef	t-stat	Coef	t-stat	Coef	t-stat
Rkretlo*Captive	-28.88	-10.11	15.57	3.86	44.83	9.97
Rkretlo*Unafil	-35.05	-11.66	16.15	4.98	53.51	11.10
Rkretlo*Noload	-37.82	-14.26	2.08	1.16	41.17	11.30
Rkretlo*Other	-21.67	-9.42	17.35	9.01	43.72	11.00
Rkrethi*Captive	173.24	2.05	180.32	8.40	18.79	0.24
Rkrethi*Unafil	46.24	4.14	150.23	9.87	105.49	4.72
Rkrethi*Noload	117.86	12.18	291.13	19.00	170.28	9.33
Rkrethi*Other	66.36	6.99	163.79	15.35	94.83	18.62
TNA	-5.72E-04	-29.47	-5.76E-04	-55.53	-9.20E-06	-0.40
Captive	44.33	30.80	23.66	13.97	-15.83	-4.56
Unafil	57.42	31.82	35.63	27.49	-18.15	-10.06
Noload	59.65	25.40	37.97	31.34	-17.58	-6.17
Other	46.61	36.21	29.83	35.53	-13.93	-5.91
Panel B: Tests						
Rkret*Captive - Rkret*Unafil = 0	6.16	1.42	-0.58	-0.16	-8.68	-1.86
Rkret*Captive - Rkret*Noload = 0	8.94	2.32	13.49	3.44	3.66	1.06
Rkret*Unafil - Rkret*Noload = 0	2.77	0.66	14.07	5.03	12.34	3.50
Rkrethi*Captive - Rkrethi*Unafil = 0	127.00	1.45	30.08	1.29	-86.70	-1.08
Rkrethi*Captive - Rkrethi*Noload = 0	55.38	0.65	-110.82	-4.34	-151.50	-1.82
Rkrethi*Unafil - Rkrethi*Noload = 0	-71.61	-4.40	-140.90	-6.86	-64.79	-2.57
Convexity of Captive	202.12	2.33	164.75	6.90	-26.05	-0.33
Convexity of Unaffiliated	81.29	6.00	134.08	8.30	51.97	2.01
Convexity of Noload	155.67	15.43	289.05	19.27	129.11	7.34

Table 6. Future returns as a function of flows and distribution channel

This table provides regressions of future six month excess returns on today's redemptions, purchases, and net flows into a fund. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. REDEMPTIONS are the dollar value of redemptions leaving a fund in a given month divided by the total net assets of the fund. INFLOWS are the total dollar value of new money coming into a fund in a given month divided by the total net assets of the fund. NET FLOWS are the dollar inflows plus reinvestments less redemptions in a given month for a fund divided by its total net assets. We define a fund as having a CAPTIVE sales force if there is a positive amount of front load allocated to paying a captive sales force while none of the front load is allocated to an unaffiliated broker. We define a fund as distributing through an UNAFFILIATED broker if there is a positive amount of front load allocated to an unaffiliated broker while none of the front load is allocated to a captive sales force. XSRET6M is the six month excess return for the six months after the current period where a fund's monthly excess return is the difference between the fund's return and the average return of all funds in that month. The t-stat represents the average coefficient divided by the standard deviation of the average of the 12 estimated coefficients.

Panel A: XS returns 6 mos ahead on the lagged redemption and purchase decision of investors						
DepVar = XS returns 6 mos ahead	FLOWS = %Redemptions		FLOWS=%Purchases		FLOWS=%Netflows	
	Coef	t-stat	Coef	tstat	Coef	tstat
FLOWS*Other	1.04E-05	0.36	3.21E-05	3.36	1.68E-05	0.45
FLOWS*Captive	1.84E-04	4.19	3.16E-05	1.15	-1.46E-04	-3.56
FLOWS*Unaffil	-1.25E-04	-7.73	-7.30E-05	-5.04	4.85E-05	1.70
FLOWS*Noload	-5.85E-05	-3.18	-7.92E-06	-0.28	4.44E-05	1.77
Captive	-8.63E-03	-5.72	-3.77E-03	-3.15	-2.10E-03	-3.28
Unaffiliated	2.99E-03	5.78	1.67E-03	1.77	-2.25E-03	-2.41
Noload	4.04E-03	4.99	1.90E-03	1.55	1.37E-03	6.63
Other	-5.90E-03	-7.02	-6.98E-03	-7.57	-5.82E-03	-6.13
Panel B: Tests						
FLOWS*Captive - FLOWS*Unafil=0	3.09E-04	7.60	1.05E-04	3.52	-1.95E-04	-4.79
FLOWS*Captive - FLOWS*Noload=0	2.42E-04	7.00	3.95E-05	1.70	-1.91E-04	-5.03
FLOWS*Unaffil - FLOWS*Noload=0	-6.64E-05	-2.74	-6.51E-05	-1.77	4.10E-06	0.12
Captive - Unaffil = 0	-1.16E-02	-6.48	-5.44E-03	-3.10	1.51E-04	0.12
Captive - Noload=0	-1.27E-02	-10.29	-5.67E-03	-4.22	-3.47E-03	-4.54
Unaffil - Noload=0	-1.05E-03	-0.94	-2.25E-04	-0.13	-3.62E-03	-3.79

Table 7. Flow-performance for funds in the same complex

This table provides regressions of percent changes in redemptions, inflows, and net flows for all funds operated by the same management company on ranked returns for a fund within the complex. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. REDEMPTIONS are the total dollar value of redemptions leaving all funds operated by the same management company in a given month divided by the total net assets of funds in our sample and in the complex. INFLOWS are the total dollar value of new money coming into a funds operated by the same management company in a given month divided by the total net assets of all funds in our sample and in the complex. NET FLOWS are the dollar inflows plus reinvestments less redemptions in a given month for funds with the same management company divided by their combined total net assets. We define a fund to be NOLOAD if no flows are subject to a load. We define a fund as having a CAPTIVE sales force if there is a positive amount of front load allocated to paying a captive sales force while none of the front load is allocated to an unaffiliated broker. We define a fund as distributing through an UNAFFILIATED broker if there is a positive amount of front load allocated to an unaffiliated broker while none of the front load is allocated to a captive sales force. OTHER funds include all remaining funds which either charge a back-load or allocated front loads to both unaffiliated and captive brokers. RKRET is the ranked return of a fund over the past 12 months where the ranking is done for every month and compares all the funds in the sample for that month ranking them from 0 to 1. The coefficients are average coefficients of the same regression repeated for each month. The t-stat represents the average coefficient divided by the standard deviation of the average of the 12 estimated coefficients.

Panel A: Percent flows by Management Company						
	Redemptions		Inflows		Net flows	
	Coef	t-stat	Coef	t-stat	Coef	t-stat
Rkret*Captive	-2.67	-0.56	8.59	5.90	11.04	2.57
Rkret*Unafil	-15.28	-13.30	6.09	3.76	22.29	12.09
Rkret*Noload	-9.43	-5.18	25.07	15.56	35.13	13.10
Rkret*Other	-8.37	-3.99	13.32	7.99	25.27	8.69
TNA	-5.08E-04	-32.34	-5.25E-04	-46.21	-1.47E-05	-0.52
Noload	46.45	29.50	31.97	33.90	-10.21	-3.48
Captive	30.75	18.52	26.32	36.43	0.70	0.22
Unafil	44.42	39.41	38.83	47.35	-1.52	-0.60
Other	41.25	44.45	33.94	34.63	-3.87	-1.87
Panel B: Tests						
	Diff	t-stat	Diff	t-stat	Diff	t-stat
Rkret*Captive - Rkret*Unafil = 0	12.61	2.44	2.50	1.23	-11.25	-2.25
Rkret*Captive - Rkret*Noload = 0	6.75	1.32	-16.48	-11.04	-24.10	-4.63
Rkret*Unafil - Rkret*Noload = 0	-5.86	-2.61	-18.98	-10.77	-12.85	-9.50
Noload - Captive = 0	15.70	7.66	5.65	5.69	-10.90	-6.51
Noload - Unafil =0	2.03	1.36	-6.86	-6.50	-8.69	-7.07
Captive - Unafil =0	-13.67	-7.03	-12.52	-10.24	2.22	1.51

Table 8. Convexity in flows for funds within the same complex

This table provides regressions of percent of TNA in redemptions, inflows, and net flows for all funds with the same management company on ranked returns of the fund allowing for a convex relation for top performing funds. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. REDEMPTIONS are the total dollar value of redemptions leaving all funds operated by the same management company in a given month divided by the total net assets of funds in our sample and in the complex. INFLOWS are the total dollar value of new money coming into a funds operated by the same management company in a given month divided by the total net assets of all funds in our sample and in the complex. NET FLOWS are the dollar inflows plus reinvestments less redemptions in a given month for funds with the same management company divided by their combined total net assets. We define a fund to be NOLOAD if no flows are subject to a load. We define a fund as having a CAPTIVE sales force if there is a positive amount of front load allocated to paying a captive sales force while none of the front load is allocated to an unaffiliated broker. We define a fund as distributing through an UNAFFILIATED broker if there is a positive amount of front load allocated to an unaffiliated broker while none of the front load is allocated to a captive sales force. OTHER funds include all remaining funds which either charge a back-load or allocated front loads to both unaffiliated and captive brokers. RKRETLO is the min(RKRET, 0.8) where RKRET is the ranked return of the fund over the past 12 months. Ranking is done for every month and compares all the funds in the sample for that month ranking them from 0 to 1. RKRETHI is max(RKRET-0.8, 0). The coefficients are average coefficients of the same regression repeated for each month. The t-stat represents the average coefficient divided by the standard deviation of the average of the 12 estimated coefficients.

Panel A: Convexity in flows by management company						
	Redemptions		Inflows		Net flows	
	Coef	t-stat	Coef	t-stat	Coef	t-stat
Rkretlo*Captive	-13.89	-5.11	2.60	1.93	16.21	6.75
Rkretlo*Unafil	-19.56	-13.71	2.08	1.21	22.77	9.44
Rkretlo*Noload	-24.86	-13.92	-1.15	-0.76	24.89	9.58
Rkretlo*Other	-14.90	-5.92	4.18	1.89	24.00	6.85
Rkrethi*Captive	123.63	1.51	79.00	4.68	-45.50	-0.65
Rkrethi*Unafil	23.32	4.04	41.69	4.83	17.28	1.21
Rkrethi*Noload	120.73	14.75	246.09	21.83	121.39	8.95
Rkrethi*Other	54.27	4.33	103.46	9.59	38.79	3.46
TNA	-4.74E-04	-31.60	-4.74E-04	-46.80	-3.06E-07	-0.01
Captive	34.19	30.24	28.12	39.89	-0.91	-0.30
Unafil	45.74	36.63	40.04	48.14	-1.69	-0.79
Noload	51.08	31.51	39.84	37.05	-7.13	-2.72
Other	43.16	49.66	36.60	35.04	-3.51	-1.93
Panel B: Tests						
Rkret*Captive - Rkret*Unafil = 0	5.67	1.86	0.51	0.26	-6.56	-2.88
Rkret*Captive - Rkret*Noload = 0	10.97	3.82	3.75	1.73	-8.68	-3.28
Rkret*Unafil - Rkret*Noload = 0	5.29	2.11	3.23	1.99	-2.12	-1.30
Rkrethi*Captive - Rkrethi*Unafil = 0	100.30	1.20	37.31	1.85	-62.77	-0.87
Rkrethi*Captive - Rkrethi*Noload = 0	2.89	0.03	-167.09	-9.27	-166.89	-2.24
Rkrethi*Unafil - Rkrethi*Noload = 0	-97.41	-10.07	-204.41	-17.92	-104.12	-7.96
Convexity of Captive	137.52	1.63	76.41	4.38	-61.71	-0.86
Convexity of Unafil	42.89	6.55	39.61	4.35	-5.50	-0.35
Convexity of Noload	145.59	17.24	247.25	21.20	96.50	6.95

Table 9. Flows as a function of payment to captive and unaffiliated brokers

This table provides regressions of percent of TNA in redemptions, inflows, and net flows on ranked returns of the fund allowing for a convex relation for top performing funds. These only include equity funds classified as either AG, LG, or GI according to the ICDI objective categories in CRSP where one fund observation groups all shareclasses together. REDEMPTIONS are the dollar value of redemptions leaving a funds in a given month divided by the total net assets of the fund. INFLOWS are the total dollar value of new money coming into a fund in a given month divided by the total net assets of the fund. NET FLOWS are the dollar inflows plus reinvestments less redemptions in a given month for a fund divided by its total net assets. We define a fund as having a CAPTIVE sales force if there is a positive amount of front load allocated to paying a captive sales force while none of the front load is allocated to an unaffiliated broker. We define a fund as distributing through an UNAFFILIATED broker if there is a positive amount of front load allocated to an unaffiliated broker while none of the front load is allocated to a captive sales force. RKRET is the ranked return of a fund over the past 12 months where the ranking is done for every month and compares all the funds in the sample for that month ranking them from 0 to 1. HICAP is one of the amount paid to the captive sales force is above the median paid to captive brokers in that month and zero otherwise. HIUNAF is one if the amount paid to an unaffiliated broker is above the median paid to these agents for that month and zero otherwise. The t-stat represents the average coefficient divided by the standard deviation of the average of the 12 estimated coefficients.

Panel A: Flows by payment to captive brokers						
	FLOWS = %Redemptions		FLOWS=%Purchases		FLOWS=%Netflows	
	Coef	t-stat	Coef	tstat	Coef	tstat
Rkret	-11.1	-1.19	25.3	5.48	37.6	4.24
Rkret*HICAP	-9.3	-0.92	1.9	0.37	11.7	1.16
HICAP	-13.4	-3.96	-12.3	-4.81	1.1	0.26
Intercept	46.3	14.86	25.8	13.04	-16.0	-4.26
Panel B: Flows by payment to unaffiliated brokers						
DepVar	FLOWS = %Redemptions		FLOWS=%Purchases		FLOWS=%Netflows	
	Coef	t-stat	Coef	tstat	Coef	tstat
Rkret	-35.8	-7.96	12.6	2.48	51.0	12.30
Rkret*HIUNAF	15.9	2.58	30.8	6.13	14.1	3.63
HIUNAF	-25.8	-6.10	-23.4	-7.30	1.5	0.66
Intercept	66.7	20.55	42.3	15.10	-20.4	-8.20