Do Funds Mask Distribution Fees as Brokerage Commissions?

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Abstract

SEC's prohibition of the use of brokerage commissions to finance fund distribution does not seem to be effective in resolving the conflicts of interest of investment advisors. Focusing on the period after the prohibition, I find strong evidence of investment advisers allying with their selling brokers: selling brokers exert greater effort to sell the fund and, in return, advisors reward these brokers by directing funds' portfolio transactions to them and by paying them higher brokerage commissions. Funds pay 25 bp higher brokerage commissions to their trading brokers who are also fund distributors, thus rewarding them with more than double the commissions paid on average to non-selling brokers. When a selling broker is also used for trade execution, fund flows are insensitive to low performance, but the flows are sensitive for funds that do not use selling brokers for trade execution. I find that selling brokers charge lower 12b-1 fees for these funds. I further find that if investment advisors use their affiliated brokers for portfolio transactions, funds pay 15 bp higher brokerage commissions, which is an increase of 1.5 times over the average brokerage commission paid to non-affiliated brokers.

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1. Introduction

Every year, mutual funds pay enormous amount of money as brokerage commissions. In 2013 alone, domestic equity funds paid around $6.3 billion in brokerage commissions.[1] Table 1 provides estimates of brokerage commissions paid by US equity and non US equity mutual funds each year from 1996 to 2013. Although mutual funds have been paying billions in brokerage commissions every year, there is very little research to investigate how these commissions are structured and whether mutual fund investors are getting value commensurate with the amount paid. Livingston and O'Neal [1996] use brokerage commission data for 240 mutual funds and find that the average brokerage commissions paid by funds is higher than the average execution-only commissions paid by large institutional traders. They suggest that fund brokerage commissions include soft dollar payments for research. Goldstein, Irvine, Kandel, and Wiener [2009] use a proprietary dataset of institutional trades and find that past commissions predict future commissions better than trade characteristics. They suggest that the execution cost is not negotiated trade by trade and that the commissions paid are bundled payments for trade execution and other services. They conjecture that brokers and their institutional clients enter into long-term agreements about the services to be provided by the broker and the total payment for those services. These payments are made by sending an amount of trade sufficient to meet the negotiated payment to the brokers.

In 1981, the SEC allowed funds to consider fund sale as a factor in broker selection, but only subject to the best execution. Funds were allowed to use their selling brokers for trade execution as long as they followed a disclosed policy about it. However, at that time, the SEC did not explicitly prohibit the use of brokerage commissions to pay for fund distribution. This changed with an amendment in 2004, which prohibited this practice. This amendment prohibits funds from compensating a broker for fund sale by directing funds' brokerage

[1] I calculate from NSAR data that in 2013, domestic equity funds paid 0.13% TNA as brokerage commission. I calculate from Morningstar data that total asset invested in 2013 in US equity funds was 4.8 Trillion.

transaction to the broker. The SEC still allows funds to use their selling brokers for trade execution, but only if the funds have policies approved by the board of directors in place to ensure that the fund distribution did not affect which broker was chosen for the transaction.[2]

Investors usually know about fund loads and expense ratios, but not about the brokerage commissions that the funds pay from their assets. Investors trust that their investment advisors would choose brokers who provide the best trade execution. The SEC too requires investment advisors to use brokers who provide the best execution. The SEC notes that fund brokerage is an asset of the fund and it must be used for the fund's benefit.[3] The question that I ask here is: Do investment advisors always act in the best interest of fund investors and choose the broker that provides best trade execution?

Investment advisors can use brokerage commissions to reward their selling brokers for an aggressive selling effort. However, in this situation, the investment advisors and brokers may benefit at the investor's expense. Fund investment advisors prioritize flows while brokers prioritize commissions (including distribution fee). Brokers who put more effort in selling the fund increase fund inflows, thereby benefiting the fund's advisor. If the advisor then uses the investor's money to compensate the selling brokers for their efforts, it is beneficial for both advisors and brokers - but not for investors. Having a high brokerage commission from funds provides a strong incentive for brokers to sell funds more aggressively. As suggested by Bergstresser, Chalmers, and Tufano [2009] and Christoffersen, Evans, and Musto [2013], higher efforts from selling brokers lead to higher inflows. Both studies find higher inflows for funds with higher distribution fees, where distribution fees are proxies for sales effort. Brokers could directly charge a higher distribution fee for a more aggressive selling effort, but a higher distribution fee would discourage investors from investing. An easier and an indirect channel could be to use brokerage commissions since most selling brokers also have

[2]The next section provides more details on the SEC's rules regarding the use of selling brokers.

[3]"Fund brokerage is a valuable fund asset and thus should be used in the manner that most benefits the fund and its shareholders." See SEC17CFR-Part270 [2004]

a trade execution business. Brokers can put more effort to attract more inflows, and advisors can offer the brokers trade execution for the fund, thereby allowing the brokers to charge higher than usual commissions.

Most investment advisors also have other lines of business, such as brokerage. The SEC allows mutual funds to use their affiliated brokers for trade execution as long as the broker's commission does not exceed the usual brokerage commission. However, the imprecision inherent in determining appropriate brokerage fees means that funds are able to choose their affiliated broker instead of the broker that provides best trade execution. Although 99% of the funds state that they considered the broker that provided the best trade execution, more than 20% of funds also report broker affiliation as a consideration while selecting the broker.[4]

Funds report brokerage commissions to the SEC on a semi-annual basis on form NSARs, but these commissions are aggregated for all the funds registered under same the registrant or trust. Form NSARs ask for the top ten brokers that received the highest brokerage commission from the registrant during the reporting period and the total commission paid to each of them. Even though they report the total sales and purchases for each fund during the reporting period, they do not report the amount of trade that went through each broker. Lack of information and aggregated data make it hard to check if a fund over-payed a broker.

Although data on individual transactions is not available, I use the information reported on form NSAR and additional data on broker affiliates to test if funds, on average, pay a higher brokerage commission when they use affiliated brokers or their selling brokers for trade execution. I find that funds pay around 15bp higher brokerage commission(as percentage of fund TNA) when their affiliate broker executes trades, and they pay 25bp higher brokerage commission when their selling broker executes trades compared to the brokerage commission paid to non-affiliated and non-selling brokers. Also, funds that employ their selling broker

[4]The next section provides more details on the SEC's rules regarding the use of affiliated brokers.

for trade execution have a significantly lower 12b-1 fee, but the overall marketing and distribution fee does not differ significantly between the funds that use their selling brokers for trade execution and the funds that do not.[5] When the selling broker is also given the trade execution business, fund flows are insensitive to low performance i.e., flows increase with high performance but do not decrease with low performance.

These results suggest that investment advisors have an informal agreement with their selling brokers. Selling brokers sell the fund more aggressively by making it insensitive to low performance, and the fund advisors reward these brokers by giving them the fund's trade execution business and by paying them a higher brokerage commission. Surprisingly, funds have continued to pay high brokerage commissions to their selling brokers even after the SEC's prohibition on the use of brokerage commissions to finance fund distribution. The SEC's ruling that the board of directors must approve policies and procedures around the selection of selling brokers may not be effective because of the ties between investment advisors and fund directors. As shown by Kuhnen [2009], investment advisors and fund directors hire each other preferentially based on the intensity of their past relationship. This suggests that members of the board of directors, including so-called independent directors, may not actually be independent.

My paper is closely related to literature on brokerage commissions, broker sold funds, and ties and agency conflicts. In relation to brokerage commissions, Edelen, Evans, and Kadlec [2012] study the effect of commission bundling on fund returns and find that these opaque payments affect fund returns more negatively than expensed payments. Edelen, Evans, and Kadlec [2007] find evidence that fund trading costs are the primary source of diseconomies to scale. My paper provides evidence that investment advisors pay higher brokerage commissions to their affiliated brokers and also to their selling brokers. I also find evidence of aggressive fund sale efforts by selling brokers when the advisors direct fund

[5]Marketing and distribution fee is defined as sum of 12b-1 fee and one seventh of the front-end load fee, assuming a seven years holding period for the fund.

brokerage transactions to them. These two results together suggest that the fund advisors may be compensating the selling brokers through brokerage commissions.

The literature on broker-sold funds indicates that selling brokers have a conflict of interest since the brokers get paid for selling funds and, hence, have an incentive to sell those funds that pay them more, as opposed to funds which are beneficial to the investors (O'Neal [1999], Bergstresser, Chalmers, and Tufano [2009], Anagol, Cole, and Sarkar [2012] and Christoffersen, Evans, and Musto [2013]). My study additionally shows how payments from investment advisors in the form of higher brokerage commissions may bias the selling brokers' recommendations to investors.

My paper also contributes to the literature on ties, favoritism and agency conflicts. Some previous research finds evidence that ties influence important decisions, while others do not find any such evidence. Reuter [2006] studies underwriter-fund ties and finds evidence of preferential IPO allocations. Cohen and Schmidt [2009] find evidence of overweighting 401(k) client firms' stocks. Kuhnen [2009] studies subadvisor and director appointments and finds evidence of preferential hiring based on the intensity of past interactions. Cohen, Frazzini, and Malloy [2008] study social connections and find evidence of information transfer. Davis and Kim [2007] study the effect of ties between corporations and funds that manage their corporate benefit plans on proxy votings by the funds and do not find evidence that proxy votings are influenced by ties. I study the ties between investment advisors and brokers and find that funds pay their affiliated brokers 1.5 times and their selling brokers twice the brokerage commission paid on average to non-affiliated and non-selling brokers. Selling brokers, in return, seem to sell these funds more aggressively. Funds lose 15bp to 25bp per year in these commissions.

The remainder of this paper is organized as follows: Section 2 provides information on related the SEC Regulations. Section 3 details the data sources used and the sample construction. Section 4 discusses the results. Section 5 provides robustness tests and Section

6 concludes the paper.

2. The SEC Regulations

2.1. The Use of Affiliated Broker for Portfolio Transactions

Section 17 of the Investment Company Act 1940 allows investment advisors to use their affiliated brokers as long as the commission does not exceed the usual brokerage commission charged, or 2% of the sale price if the sale was effected on secondary distribution, or 1% of the purchase or sale price otherwise.[6]

2.2. The Use of Selling Broker for Portfolio Transactions

Until 1975, brokerage commission rates were fixed. Although brokers received discounts for high trade volumes, they could not pass on this discount to funds. Since funds could not negotiate for cheaper commissions, they gave the trade execution business to their selling brokers to compensate for the sale effort. This practice led to the beginning of directed brokerage: even though the selling broker does not execute the trade, the fund could direct the executing broker to share the brokerage commission with the selling broker. Until 1980, Section 12(b) prohibited the use of fund assets to pay for fund distribution. However, in 1980, the SEC adopted Rule 12b-1, which created an exemption under Section 12(b) that

[6]The relevant section of the Act is as follows: "Nothing contained in this subsection shall be deemed to preclude any affiliated person from acting as manager of any underwriting syndicate or other group in which such registered or controlled company is a participant and receiving compensation therefor. It shall be unlawful for any affiliated person of a registered investment company, or any affiliated person of such person acting as broker, in connection with the sale of securities to or by such registered company or any controlled company thereof, to receive from any source a commission, fee, or other remuneration for effecting such transaction which exceeds (A) the usual and customary brokers commission if the sale is effected on a securities exchange, or (B) 2 per centum of the sales price if the sale is effected in connection with a secondary distribution of such securities, or (C) 1 per centum of the purchase or sale price of such securities if the sale is otherwise effected unless the Commission shall, by rules and regulations or order in the public interest and consistent with the protection of investors, permit a larger commission."

allowed funds to pay for their sale if the board of directors approves.

In 1981, the SEC further noted that it was not inappropriate for investment advisors to promote the sale of their fund through placement of brokerage without incurring any additional expense. Hence, the SEC permitted fund advisors to consider fund distribution as a factor when selecting brokers for portfolio transactions, but subject to best execution. At the same time, NASD also amended its Conduct Rule 2830(k) (Anti-Reciprocal rule) to allow NASD members (brokers and dealers) to sell shares of the funds that follow a disclosed policy of considering fund distribution as a factor when selecting brokers for trade execution, subject to best execution. This reversed part of the NASD Anti-Reciprocal rule, which had previously prohibited NASD members from making fund selling efforts conditional on the receipt of brokerage commissions from the fund.

In Oct 2004, the SEC adopted amendments to 12b-1 prohibiting the use of brokerage commission to finance fund distribution. The amendment, Rule 12b-1(h)(1), prohibits funds from trading brokerage commissions for fund distribution.[7] But Rule 12b-1(h)(2) permits funds to use their selling broker to execute portfolio transactions if the fund's advisor has implemented policies and procedures to ensure that the fund distribution did not affect the consideration of broker for effecting the transaction.[8] The compliance date for this

[7]"Rule 12b1(h)(1) prohibits funds from compensating a broker-dealer for promoting or selling fund shares by directing brokerage transactions to that broker. The prohibition applies both to directing transactions to selling brokers, and to indirectly compensating selling brokers by participation in stepout and similar arrangements in which the selling broker receives a portion of the commission. The ban extends to any payment, including any commission, mark-up, mark-down, or other fee (or portion of another fee) received or to be received from the funds portfolio transactions effected through any broker or dealer." See FederalRegister / Vol. 69 [2004]

[8]"Rule 12b1(h)(2) permits a fund to use its selling broker to execute transactions in portfolio securities only if the fund or its adviser has implemented policies and procedures designed to ensure that its selection of selling brokers for portfolio securities transactions is not influenced by considerations about the sale of fund shares. These procedures must be approved by the funds board of directors, including a majority of the independent directors, and must be reasonably designed to prevent: (i) The persons responsible for selecting broker-dealers to effect transactions in fund portfolio securities transactions (e.g., trading desk personnel) from taking into account, in making those decisions, broker-dealers promotional or sales efforts, and (ii) the fund, its adviser and principal underwriter from entering into any agreement or other understanding under which the fund directs brokerage transactions or revenue generated by those transactions to a broker-dealer to pay for distribution of the fund shares."FederalRegister / Vol. 69 [2004]

amendment was Dec 2004. At this time, the SEC approved an additional amendment to NASD Rule 2830(k) by eliminating the provision in the Anti-Reciprocal Rule that allows its members to sell shares of the funds that follow a disclosed policy of considering fund distribution as a factor when selecting brokers for trade execution. The SEC also prohibited NASD members from selling shares or acting as underwriters for investment advisors who may have an agreement that would direct brokerage execution to dealers in consideration of their fund distribution efforts. In 2016, the SEC adopted this as FINRA Rule 2341.

3. Data

The data for this study is collected from multiple sources: Form NSAR from the SEC's EDGAR, Broker reports from Financial Industry Regulatory Authority (FINRA), and Morningstar

3.1. NSAR

I gather principal underwriter, affiliated broker-dealers, fee, trades, broker and brokerage related information from form NSARs. The SEC requires mutual funds to file form NSAR on a semi-annual basis. On these forms, along with other fund related information, funds are required to report their principal underwriters, loads they charged, 12b-1 fee collected, dollar amount of trades, and also the list of the top ten brokers who received the highest commissions from the fund during the reporting period. Usually, funds are organized under trusts, and these trusts are registered with the SEC and are identified by a unique CIK number. A trust may have one or more funds. Generally, funds with similar objectives are grouped together under the same CIK. Form NSAR is filed by these trusts, and each trust has one or more series. Each series represents a fund. Most filings with the SEC, including form NSARs, are done under these CIKs.

Principal underwriters are fund distributors who have the responsibility to sell fund shares. They sell funds to the public either themselves or through affiliated brokers and dealers. Item 8 on form NSAR identifies the principal underwriter for each fund within the trust. It provides the name and the SEC number for each principal underwriter for the fund. Item 14 asks funds to list the broker-dealers affiliated with them. For each fund and filing, I match this list of affiliated broker-dealers with the fund's principal underwriter and the top ten executing brokers to identify funds with affiliated principal underwriters and funds that used their affiliate broker for trade execution. Around 66% of the funds use affiliated underwriters and 13% use their affiliate broker for trade execution. To identify if a fund used its selling broker for trade execution, I match the list of the principal underwriter's affiliates with the fund's trading brokers[9]. To separate the effect of using an affiliate broker from using a selling broker that is not affiliated, I set the Selling Broker Use indicator to 0 if the principal underwriter is affiliated to the fund. The Selling Broker Use indicator is 1 only if the principal underwriter is not affiliated to the fund but is affiliated to fund's trading broker. Around 15% of the funds that use unaffiliated principal underwriters use selling brokers who are affiliated to their principal underwriters for trade execution.

NSAR item 28 requires funds to report monthly new sales and total sales that charged front-end load. In item 30, funds report the front end load collected along with the minimum and maximum loads. Item 71 gives the dollar value of purchases and sales for each fund. Item 20 requires the funds to report the names, IRS numbers, and brokerage commissions received by the top ten brokers who received the highest commissions from all of the funds within the trust. As previously noted, this information is reported at the CIK level instead of at the fund level. I allocate the total brokerage between the funds in a trust based on the trades for each fund. Ideally, I would want to test my hypotheses at broker level, but, for broker level analysis, I would need the amount of trade that went through each broker.

[9]I search for broker reports for each principal underwriter from FINRA and parse it to obtain the list of its affiliates

Unfortunately, funds do not report this information. Hence most of my tests are at the fund level. This would understate the effect of affiliated and selling broker use on brokerage commissions. Hence, to estimate the extra brokerage commission paid to an affiliated or selling broker, I consider a sample of funds that employed only one broker for the reporting period. I download form NSARs from the SEC's EDGAR for the period of Jan-1996 to June-2014 and parse them to collect all this information.

3.2. FINRA Broker Reports

I obtain principal underwriter, affiliated broker, and executing broker information for funds from their form NSARs and use affiliates information from FINRA's broker reports to check if each fund's principal underwriter is affiliated to any of the top ten brokers that received brokerage commissions from the fund. FINRA provides broker reports that contain the list of firms affiliated to the broker along with other broker related information. The information in these reports comes from brokers' registration process with FINRA, and also from other broker filings. I download these broker reports from FINRA's BrokerCheck website and parse them to collect the list of firms with which each broker is affiliated. FINRA's Broker reports provide only the latest affiliation information. The affiliation information does not account for mergers and acquisitions. Using the latest affiliate list may lead to misclassification of connection between the selling broker and the broker that executes trades for the fund in cases where an underwriter (selling broker) and a broker that executes trades for the fund (trading broker) may appear to be affiliated to each other now, but were probably not affiliated at the time of filing or vice versa. Such mis-classifications of affiliation may only lead to weaker connection effects in the data. Hence, if I find significant impact of connections, I might actually be understating the actual impact of connections due to mis-classifications.

3.3. Morningstar

I use data on fund objectives, investment style, Total Net Asset (TNA), and returns from the Morningstar database. I consider all US equity funds from 1996 to 2014 that have a TNA of more than 2M.

3.4. Sample Construction

The SEC's electronic disclosure system, EDGAR, provides access to firm and fund filings. After an initial trial phase, companies began filing electronically using EDGAR beginning in 1995. EDGAR has form NSARs available for all funds from 1996. Hence, the sample period for the study is Jan-1996 to Jun-2014. Since mutual funds are required to file form NSAR semi-annually, I have the broker, underwriter, brokerage commission, and other NSAR variables at semi-annual frequency. Therefore, for most of the tests, I structure the data at a 6 month frequency. Starting with 125,097 semi-annual filings[10], I match the brokers in NSAR data to the broker affiliates data from FINRA using broker name, SEC file number and IRS number. I classify funds as using selling brokers for trade execution if the principal underwriter is an affiliate of any of the top ten brokers whom the fund listed in the form NSAR as receiving brokerage commission for the filing period.

Other fund related variables, such as fund objectives, TNA, date of inception, percentage of institutional ownership, etc., are available in the Morningstar data. I match the data from NSAR with the Morningstar data on CUSIP, Ticker, monthly flows and name. For 12,452 of the funds from NSAR, including 4,801 US equity funds, I was able to match Morningstar data, leaving me with 253,613 semiannual observations.

I create two measures for brokerage commissions: brokerage commission as percentage of trade volume and brokerage commission as percentage of TNA. The second measure is

[10] 432,895 semiannual observations for 27,314 funds. Each filing has one or more funds

more relevant to investors since it is comparable to expense ratios and other fees. Trade volume is defined as the sum of dollar volume of purchases and sales executed for the fund during the reporting period. Following Edelen, Evans, and Kadlec [2012], I define broker Herfindahl as the sum of the square of the proportion of the total brokerage commission paid to each broker during the reporting period. I identify the primary broker for a fund during the reporting period as the broker receiving the highest brokerage commission from the fund during that period. Broker size is defined as the dollar amount of brokerage commission a broker received during the period. In the final sample, I exclude funds with TNA less than $2MM, brokerage commission more than 1% of trade or more than 3% of fund TNA, and funds with trading volume more than 2000% of their TNA. This leaves me with 72,423 semiannual observations for 4,508 funds.

3.5. Descriptive Statistics

Table 2 Panels A and B provide the characteristics of the final sample. The mean (median) semi-annual brokerage commission is 9bp (8bp) measured as percentage of trade volume and 12bp (7bp) measured as percentage of fund TNA. Around 13% of the funds use their affiliated brokers for trade execution. Around 15% of the funds whose principal underwriter is not affiliated use their selling broker for trade execution. 13% of funds charge either load or 12b-1 fee.

Panel C, for the period Jan 2005 to Jun 2014, compares the sample characteristics for funds that employ affiliated or selling broker for trade execution with funds that do not employ affiliated or selling broker for trade execution. Funds that use their selling broker for trade execution are on average smaller than the funds that do not. The average brokerage commission paid by funds that use affiliated broker for trade execution is slightly higher than the funds that do not. However, if we consider only single broker funds, we observe that these funds pay their affiliated brokers almost double the average rate. Since most funds

use multiple brokers, the actual brokerage commission rates that affiliated or selling brokers charge may be much higher than the average brokerage commission paid by the fund (the average brokerage commission paid by a fund aggregates all the brokers that a fund employs). Hence, funds that employ only one broker give a better estimate of brokerage commissions charged by affiliated or selling brokers. Funds that used their selling brokers to execute trades paid 2bp (5b) higher semi-annual brokerage commissions measured as percentage of trade (TNA) compared to the funds that did not. The results from funds that employ a single broker suggest that the selling brokers charge more than double the commission charged by other brokers. Overall, this suggests that affiliated and selling brokers charge much higher brokerage commissions than others. I test this hypothesis in the next section.

4. Results

Descriptive statistics suggest that funds that use affiliated brokers as well as those using selling broker for trade execution pay higher brokerage commissions, both as percentage of trade and as percentage of TNA. To test the effect of affiliate broker use on brokerage commissions, I regress brokerage commission rates on the factors that affect brokerage commissions and an indicator variable for affiliate broker use. Similarly, to test the effect of brokerage commissions on selling broker use, I separately regress brokerage commission rates on the factors that affect brokerage commissions and an indicator variable for selling broker use. Specifically, I estimate the following regression:

$$BrokerageCommission_{it} = \alpha + \beta * BrokerTypeIndicator_{it} + \gamma * Controls + \epsilon_{it} \qquad (1)$$

Controls include fund investment style, trade volume, broker Herfindahl, primary broker size, fund size, fund family size, indicator variable for load/12b-1 fee, index fund indicator,

and institutional percentage of TNA. I use both brokerage commission as percentage of trade and brokerage commission as a percentage of TNA as measures for brokerage commission rates.

4.1. Brokerage Commission - Affiliated Broker Use

Investment advisors may direct some of the fund portfolio transactions to their affiliated brokers and charge higher brokerage commissions. To test this hypothesis, I estimate regression (1) with an affiliated broker use dummy and controls. Table 3 provides the results for this regression. Funds that use investment advisors' affiliated brokers pay significantly higher brokerage commissions. They pay 0.7bp (1bp) higher in brokerage commissions (semi-annual) when measured as percentage of trade volume (TNA). Also, consistent with the findings of Livingston and O'Neal [1996] and Edelen, Evans, and Kadlec [2012], brokerage commissions are negatively related to fund TNA and fund family TNA. Brokerage commission as percentage of trade is negatively related to trade, suggesting economies of scale, while brokerage commission as percentage of TNA is positively related to trade. Index funds pay lower commissions. Concentrating the trades to fewer brokers leads to lower commissions. Standard errors are clustered by funds.

For these regressions, I use fund level measures of brokerage commissions that aggregate commissions across all the brokers employed by the fund. Hence the results provide estimates of the extra commission paid by the funds that use affiliated brokers along with other non-affiliated brokers, and not the extra commission charged by affiliated brokers. The amount of extra brokerage commission charged by affiliated brokers may be higher than this. Getting an estimate of the extra commission charged by affiliated brokers would require broker level commission rates. There are 1,513 fund filings in my sample that used only one broker for the reporting period. I use this sample to estimate the difference in brokerage commissions charged by affiliated brokers and brokerage commissions charged by non-affiliated brokers.

Table 4 provides the results for the regression of brokerage commissions on the Affiliated Broker Use indicator and other controls for single broker funds. Unaffiliated brokers on average charge 8bp (10bp) semi-annually measured as percentage of trade (TNA), while affiliated brokers charge 6bp (6.3bp) higher brokerage commission (semi-annual) measured as percentage of trade (TNA). Hence, affiliated brokers charge more than 1.5 times the commissions charged by unaffiliated brokers.

4.2. Brokerage Commission -Selling Broker Use

In this section, I study whether the selling brokers charge higher brokerage commissions when they effect portfolio transactions. I estimate regression (1) with a selling broker use dummy along with other control variables. As mentioned in the data description, to separate the effect of selling broker use from affiliated broker use, the selling broker use dummy is set to 0 if the fund's principal underwriter is affiliated to the fund. The results are presented in table 5 for both the full sample period (Jan-1996 to Jun-2014) as well as in the period after the SEC prohibition on the use of brokerage commission to finance distribution (Jan-2005 to Jun-2014). Standard errors are clustered by funds.

For both the sample periods, funds that employ selling brokers for trade execution pay a higher brokerage commission both as a percentage of trade volume and as a percentage of their TNA. Even after the SEC's ban on the use of brokerage commissions to finance distribution, funds paid 1.15bp (1.43bp) higher semi-annual brokerage commissions as percentage of trade volume (TNA) when the selling broker is one of the executing brokers.

These are the estimates of extra brokerage commission relative to trade volume and TNA that a fund pays when it employs its selling broker for trade execution along with other brokers. The amount of extra brokerage commission charged by selling brokers may be higher than this. To get an estimate of the extra brokerage commission charged by

selling brokers, I use the sample of funds that used a single broker during the reporting period. The results presented in table 6 are striking. Selling brokers charge 9.9bp (11.6bp) higher brokerage commissions as percentage of trade volume (TNA) compared to the other brokers. Given that on average a non-affiliated non-selling broker charges 8bp relative to trade volume (10bp relative to TNA, semi-annually), the selling brokers charge more than double the non-selling and non-affiliated brokers. This provides strong evidence of usage of brokerage commissions by investment advisors to reward selling brokers. In the next section, I provide evidence of aggressive fund sale efforts by selling brokers if these brokers also execute the portfolio transactions for the fund.

After showing the effect of using affiliated and selling brokers in independent tests, I test the effects by using the dummies for both affiliated and selling brokers in the same regression. Tables 7 and 8 provide results for all funds and for funds with a single broker during the reporting period, respectively. The results are very similar to what I found in previous tests.

4.3. Fund Distribution Fee - Selling Broker Use

Results in the previous section suggest that selling brokers charge higher brokerage commissions when investment advisors use them for trade execution as well. This suggests that fund advisors may be rewarding the selling brokers for their aggressive selling efforts through trade execution business and allowing the brokers to charge higher commissions, even though the advisors should be selecting the broker that provides best execution for the trades.

One way the selling broker can attract fund flows would be by agreeing to lower distribution fee. In this section I test if the funds that employ selling broker for trade execution charge lower front-end loads and 12b-1 fee compared to the funds that do not. To test this I regress the measures of distribution fee on fund related variables and selling broker use indicator. Specifically, I estimate the following regression in three specifications using three

measures of distribution cost: Front-end Loads, 12b-1 fee rate, and marketing and distribution fee defined as the sum of 12b-1 fee and one seventh of the front end load (assuming average holding period for a mutual fund is seven years):

$$DistributionFee_{it} = \alpha + \beta * SellingBrokerUse_{it} + \gamma * Controls + \epsilon_{it} \quad (2)$$

Controls include fund investment style, fund size, fund family size, fund age, index fund indicator, and institutional percentage of TNA.

Results are presented in Table 9. The first column suggests that funds that use selling brokers for trade execution charge significantly lower 12b-1 fee compared to those that do not. The second column suggests that funds that use selling brokers for trade execution charge loads similar to the funds that do not. The overall marketing and distribution fee for funds that use selling broker for trade execution does not differ significantly from the ones that do not.

Consistent with the findings in Tufano and Sevick [1997] and Gil-Bazo and Ruiz-Verd [2009], larger funds have smaller marketing and distribution fee while funds from bigger fund families have higher marketing and distribution fee. Index funds and funds with higher institutional ownership have lower fee. Also, marketing and distribution fees are negatively related to past fund performance, better performing funds have lower distribution fee.

4.4. Fund Flows

To test if the selling brokers sell a fund more aggressively when the fund advisors offer them trade execution as well, I investigate whether the flow sensitivity to performance differs for funds that use selling brokers for trade execution. If the selling brokers sell funds more aggressively, we would expect the flows to be less sensitive to performance when the fund

under-performs. I regress flows on Low, Mid and High performance measures, which are created as in Sirri and Tufano [1998], the interaction of selling broker use indicator with these performance measures, and other control variables. Table 10 provides the results. As expected, fund flows are positively related to performance. Flows increase with high performance and decrease if funds perform poorly. Interaction between the Low performance measure and selling broker use indicator is significantly negative and similar in magnitude to the coefficient on Low performance measure, making the flow for funds that use their selling brokers for trade execution insensitive to performance when the fund under-performs. This provides the evidence that, when selling brokers are offered portfolio transactions as well, they put more effort in selling the fund by making the fund's flows insensitive to low performance.

4.5. Economic impact

Table 11 gives an estimate of money lost in brokerage commissions when funds use affiliated or selling brokers for trade execution. Funds with single brokers lose 13bp to 15bp a year when they use affiliated brokers and 23bp to 25bp when they use their selling brokers for trade execution.

5. Robustness

5.1. Selling Brokers

One might argue that a principal underwriter may not sell the fund itself or through its affiliate brokers, but may sell it only through unaffiliated brokers. Even in those cases, principal underwriters can influence the selling brokers to put more effort, but if we assume that they cannot do so, I would need information on retail selling brokers to test my hypothesis.

Hence for robustness, I use the data on retail selling brokers for mutual funds. Morningstar provides a list of selling brokers for each fund. This database only provides a snapshot of the latest list of brokers that sell the fund. I use this information with the assumption that selling brokers did not change over last 4 years. I combine this selling broker info with form NSAR data between 2012 to 2014 and identify the funds that used selling brokers for trade execution. I regress brokerage commission rates on the new selling broker use indicator and other controls. Results presented in table 12 are very similar to those presented in tables 5 and 6.

5.2. Fund Size

Smaller funds place smaller trades and have lower bargaining power with brokers. Hence, one may expect smaller funds to pay higher brokerage commissions. We saw in Table 3 that fund size is negatively related to brokerage commissions. To make sure that single broker funds that use affiliated brokers or selling brokers for trade execution are not paying a higher brokerage commission just because they are smaller than other funds, I split the sample of single broker funds into small, medium and large funds. Within each group, I investigate how the brokerage commission rates differ for funds that use affiliated broker or selling broker for trade execution from the ones that did not use affiliated broker or selling broker for trade execution. Table 13 provides the mean brokerage commission for each group and shows that for all fund size groups, funds that use affiliated brokers or selling brokers paid much higher brokerage commissions than the funds that did not use affiliated or selling broker. Hence the higher brokerage commissions paid by funds that used their affiliated broker or their selling broker cannot be attributed to fund size.

6. Conclusion

Mutual fund advisors have the responsibility to choose brokers that provide best execution for fund's portfolio transactions. These advisors face a conflict of interest when choosing brokers to effect portfolio transactions: they may favor their affiliated brokers and also the brokers that help them with greater inflows.

Investment advisers may have an informal agreement with their selling brokers under which selling brokers exert more effort to sell the fund and, in return, the advisor rewards the selling brokers by directing the funds' portfolio transactions to the broker and by allowing them to charge higher commissions. Although the SEC prohibited the use of brokerage commissions to finance fund distribution in 2004, the regulation does not seem to be effective in resolving the agency conflict here. Focusing on the period from 2005 to 2014, I find strong evidence of investment advisers allying with their selling brokers. I find that funds pay 23bp to 25bp higher brokerage commissions to their selling brokers when they use them for trade execution. This is more than double the commissions paid on average to non-selling brokers. When the selling broker is used for trade execution, fund flows are insensitive to low performance while they are sensitive for funds that do not use selling broker for trade execution, suggesting a higher selling effort by the selling broker. I also find lower 12b-1 fee for these funds but the overall marketing and distribution fee is not very different from the funds that do not use their selling broker for trade execution.

Examining the brokerage commissions paid to affiliated I find that funds pay 13bp to 15bp higher brokerage commissions to their affiliated brokers when they also use them to conduct their portfolio transactions. Thus, paying their affiliated brokers 1.5 times the average commission a fund pays a non-affiliated broker.

Requiring funds to disclose trade and brokerage commission details to the SEC when they use affiliated or selling broker for trade execution might help mitigate this conflict.

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Table 1: Brokerage Commissions Paid Each Year

Average brokerage commission rates computed for US Equity and Non US Equity mutual funds using commission data from form NSAR. Total Assets invested in US Equity and Non US Equity mutual funds for each year computed based on Morningstar data. Estimates of brokerage commission rates multiplied with the computed total assets to arrive at the estimates of brokerage commission paid each year.

Year	Brokerage commission for US Equity Funds	Brokerage commission for Non US Equity Funds
1996	2,938,771,000	3,426,189,520
1997	3,870,910,420	4,245,906,210
1998	5,591,799,390	5,185,678,120
1999	6,847,407,190	5,083,771,900
2000	7,271,231,630	5,981,393,400
2001	7,587,018,920	6,256,125,290
2002	8,717,563,830	7,684,514,100
2003	8,656,879,110	7,033,134,790
2004	9,339,436,970	7,214,258,260
2005	8,399,141,900	7,386,364,850
2006	9,011,034,310	8,158,326,500
2007	8,901,414,520	10,035,106,110
2008	8,890,340,060	10,656,696,670
2009	7,707,480,760	9,734,274,770
2010	6,768,174,540	10,558,738,190
2011	6,724,966,140	11,791,198,770
2012	6,358,543,870	11,691,326,470
2013	6,327,650,420	11,319,546,920

Table 2: Descriptive Statistics

For a sample of 72,423 semi-annual fund filings. All the measures except 12b-1 fee are semi-annual. 12b-1 Fee rate gives an annual measure.

Panel A: Sample Characteristics - 1996 to 2014

Variable	Mean	Median	Standard Deviation
Fund TNA ($MM)	928.65	203.89	1,914.12
Fund Family TNA ($MM)	77,161.21	14,106.27	204,612.09
Institutional % of TNA	24.77	0.00	37.39
Four factor alpha - 2years	-0.04	-0.06	0.43
Load charged (%)	2.84	2.88	2.01
12b -1 Fee rate (%)	0.19	0.14	0.18
Turnover (%)	58.99	41	56.44
Trade as % of TNA	132.92	92.82	133.77
Brokerage Commission as % of Dollar trade	0.09	0.08	0.06
Brokerage Commission as % of TNA	0.12	0.07	0.16
Brokerage Commission as % of Dollar trade - Single Broker Funds	0.10	0.06	0.10
Brokerage Commission as % of TNA - Single Broker Funds	0.10	0.03	0.19
Broker Herfindahl	0.20	0.13	0.18
Primary Broker Size ($MM earned)	129.13	43.46	185.27

Panel B: Indicator Variables - 1996 to 2014

Variable	Percent
Affiliated broker executed trades	12.59
Selling broker executed trades	15.28
Load/12b-1 fee charged	74.28
Index fund	6.62

Panel C: Sample Characteristics - 2005 to 2014

	Non Affiliated Non Selling brokers used	Affiliated broker used	Selling broker used
Variable	Mean	Mean	Mean
Fund TNA ($MM)	1073.54	848.50	453.16
Fund Family TNA ($MM)	105933.62	75551.24	12078.70
Institutional % of TNA	27.68	25.12	31.73
Four factor alpha - 2years	-0.06	-0.05	-0.07
Load charged (%)	2.69	2.65	3.48
12b -1 Fee rate (%)	0.16	0.16	0.12
Turnover (%)	54.27	57.26	57.91
Trade as % of TNA	127.12	128.49	142.02
Brokerage Commission as % of Dollar trade	0.08	0.08	0.10
Brokerage Commission as % of TNA	0.10	0.11	0.15
Brokerage Commission as % of Dollar trade - Single Broker Fund	0.06	0.13	0.19
Brokerage Commission as % of TNA - Single Broker Fund	0.07	0.12	0.19
Broker Herfindahl	0.02	0.21	0.20
Primary Broker Size ($MM earned)	127.85	133.53	105.34

Table 3: Impact of Using Affiliated Brokers on Brokerage Commissions (1996 to 2014)

Results for semi-annual regression of brokerage commission rates on affiliated broker use dummy and other control variables. Standard errors clustered by funds. t statistics in parentheses. $* \ p < 0.10$, $**$ $p < 0.05$, $* * * \ p < 0.01$

	Brokerage commission as % of trade	Brokerage commission as % of TNA
Affiliated Broker use	0.00678***	0.00992***
	(3.65)	(3.56)
Value	0.00434**	0.000151
	(2.12)	(0.06)
Blend	0.000450	-0.00291
	(0.26)	(-1.03)
Large Cap	-0.0185***	-0.0225***
	(-8.53)	(-7.23)
Mid Cap	-0.00743***	-0.00610
	(-2.77)	(-1.48)
Log Fund TNA	-0.00122***	-0.00183***
	(-2.91)	(-3.12)
Log Fund Family TNA	-0.00447***	-0.00599***
	(-12.17)	(-10.13)
Trade as % of TNA	-0.0000241***	0.000863***
	(-6.33)	(59.76)
Index fund	-0.0351***	-0.0216***
	(-16.78)	(-6.29)
Load/12b-1 fee charged	0.00463***	0.00667**
	(2.67)	(2.55)
Broker Herfindahl	-0.0162***	-0.0237***
	(-3.18)	(-2.99)
Institutional % of TNA	-0.0197***	-0.0226***
	(-11.15)	(-8.13)
Log Primary Broker Size	-0.00111***	-0.000798***
	(-6.89)	(-3.13)
Constant	0.211***	0.156***
	(32.20)	(15.90)
Observations	72,423	72,423
R^2	0.105	0.544

Table 4: Impact of Using Affiliated Brokers on Brokerage Commissions (1996 to 2014) - Single Broker Funds

Results for semi-annual regression of brokerage commission rates on affiliated broker use dummy and other control variables for the sample of funds that used only one broker during the corresponding NSAR reporting period. Standard errors clustered by funds. t statistics in parentheses. $* \ p < 0.10$, $** \ p < 0.05$, $*** \ p < 0.01$

	Brokerage commission as % of trade	Brokerage commission as % of TNA
Affiliated Broker use	0.0608***	0.0629**
	(4.26)	(2.58)
Value	0.0196	0.0278
	(1.14)	(1.06)
Blend	0.00856	0.0367*
	(0.82)	(1.68)
Large Cap	-0.0586***	-0.0810*
	(-2.71)	(-1.84)
Mid Cap	-0.0281	-0.0138
	(-1.09)	(-0.26)
Log Fund TNA	-0.0115***	-0.0126**
	(-3.21)	(-2.31)
Log Fund Family TNA	0.000876	0.00204
	(0.35)	(0.54)
Trade as % of TNA	-0.0000622**	0.000655***
	(-2.12)	(5.79)
Index fund	-0.0218	-0.0694***
	(-1.44)	(-2.61)
Load/12b-1 fee charged	0.0163	0.00690
	(1.53)	(0.33)
Institutional % of TNA	-0.0147	-0.0485
	(-0.59)	(-1.09)
Log Primary Broker Size	-0.00155	-0.00154
	(-1.20)	(-0.61)
Constant	0.234***	0.165**
	(6.01)	(2.17)
Observations	1,513	1,513
R^2	0.235	0.386

Table 5: Impact of Using Selling Brokers on Brokerage Commissions

Results for semi-annual regression of brokerage commission rates on selling broker use dummy and other control variables. Standard errors clustered by funds. t statistics in parentheses. $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$

	1996-2014		2005-2014	
	Brokerage commission		Brokerage commission	
	as % of trade	as % of TNA	as % of trade	as % of TNA
Selling Broker use	0.00461	0.0127***	0.0115***	0.0143***
	(1.54)	(2.60)	(2.95)	(2.60)
Value	0.00446**	0.000272	-0.00139	-0.00712***
	(2.18)	(0.10)	(-0.65)	(-2.61)
Blend	0.000433	-0.00290	-0.00135	-0.00726**
	(0.25)	(-1.03)	(-0.69)	(-2.30)
Large Cap	-0.0185***	-0.0224***	-0.0190***	-0.0256***
	(-8.49)	(-7.18)	(-7.98)	(-7.30)
Mid Cap	-0.00737***	-0.00595	-0.00823***	-0.0124***
	(-2.75)	(-1.44)	(-2.82)	(-2.80)
Log Fund TNA	-0.00121***	-0.00183***	-0.000112	-0.000121
	(-2.88)	(-3.11)	(-0.24)	(-0.18)
Log Fund Family TNA	-0.00443***	-0.00589***	-0.00487***	-0.00620***
	(-11.98)	(-9.97)	(-11.62)	(-9.26)
Trade as % of TNA	-0.0000238***	0.000863***	-0.0000173***	0.000759***
	(-6.23)	(59.82)	(-3.59)	(43.57)
Index fund	-0.0351***	-0.0216***	-0.0305***	-0.0183***
	(-16.67)	(-6.28)	(-13.45)	(-5.03)
Load/12b-1 fee charged	0.00494***	0.00714***	0.00610***	0.00681**
	(2.83)	(2.72)	(3.28)	(2.51)
Broker Herfindahl	-0.0152***	-0.0220***	-0.0298***	-0.0337***
	(-2.93)	(-2.73)	(-5.10)	(-4.21)
Institutional % of TNA	-0.0200***	-0.0231***	-0.0155***	-0.0167***
	(-11.33)	(-8.31)	(-7.74)	(-5.16)
Log Primary Broker Size	-0.00110***	-0.000780***	-0.00177***	-0.00153***
	(-6.82)	(-3.07)	(-8.15)	(-4.71)
Constant	0.210***	0.155***	0.202***	0.154***
	(31.86)	(15.62)	(25.42)	(13.29)
Observations	72,423	72,423	40,016	40,016
R^2	0.104	0.544	0.131	0.539

Table 6: Impact of Using Selling Brokers on Brokerage Commissions - Single Broker Funds

Results for semi-annual regression of brokerage commission rates on selling broker use dummy and other control variables for the sample of funds that used only one broker during the corresponding NSAR reporting period. Standard errors clustered by funds. t statistics in parentheses. $* \ p < 0.10$, $** \ p < 0.05$, $*** \ p < 0.01$

	1996-2014		2005-2014	
	Brokerage commission as % of trade	as % of TNA	Brokerage commission as % of trade	as % of TNA
Selling Broker use	0.0695***	0.0970	0.0987***	0.116*
	(2.99)	(1.02)	(6.43)	(1.81)
Value	0.0209	0.0291	0.0101	0.00694
	(1.16)	(1.07)	(0.72)	(0.35)
Blend	0.00916	0.0365*	0.00830	0.0318
	(0.89)	(1.81)	(0.75)	(1.58)
Large Cap	-0.0640***	-0.0867*	-0.0424	-0.0823*
	(-2.65)	(-1.86)	(-1.63)	(-1.88)
Mid Cap	-0.0401	-0.0271	-0.0123	-0.0330
	(-1.50)	(-0.51)	(-0.43)	(-0.66)
Log Fund TNA	-0.0125***	-0.0137**	-0.00590*	-0.00679
	(-3.50)	(-2.50)	(-1.84)	(-1.39)
Log Fund Family TNA	0.00209	0.00341	-0.00139	0.000668
	(0.78)	(0.85)	(-0.69)	(0.27)
Trade as % of TNA	-0.0000607**	0.000656***	0.00000901	0.000752***
	(-2.25)	(5.89)	(0.23)	(6.52)
Index fund	-0.0261*	-0.0730***	-0.0173	-0.103**
	(-1.69)	(-2.92)	(-0.69)	(-2.12)
Load/12b-1 fee charged	0.0266**	0.0168	0.00346	-0.00445
	(2.44)	(0.82)	(0.32)	(-0.23)
Institutional % of TNA	-0.00955	-0.0453	-0.0131	-0.0896**
	(-0.37)	(-1.00)	(-0.60)	(-2.36)
Log Primary Broker Size	-0.00395***	-0.00397	-0.00160	-0.00134
	(-3.11)	(-1.61)	(-1.05)	(-0.54)
Constant	0.254***	0.185**	0.179***	0.126*
	(6.25)	(2.26)	(4.73)	(1.90)
Observations	1,513	1,513	930	930
R^2	0.200	0.378	0.199	0.488

Table 7: Impact of Using Affiliated and Selling Brokers on Brokerage Commissions

Results for semi-annual regression of brokerage commission rates on affiliated broker use dummy and selling broker use dummy and other control variables. Standard errors clustered by funds. t statistics in parentheses. $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$

	1996-2014		2005-2014	
	Brokerage commission		Brokerage commission	
	as % of trade	as % of TNA	as % of trade	as % of TNA
Selling Broker Use	0.00462	0.0127***	0.0116***	0.0144***
	(1.56)	(2.61)	(2.96)	(2.60)
Affiliated Broker Use	0.00679***	0.00992***	0.00218	0.00189
	(3.65)	(3.57)	(0.99)	(0.69)
Value	0.00429**	0.0000347	-0.00146	-0.00718***
	(2.10)	(0.01)	(-0.69)	(-2.62)
Blend	0.000474	-0.00284	-0.00135	-0.00726**
	(0.27)	(-1.01)	(-0.69)	(-2.30)
Large Cap	-0.0185***	-0.0224***	-0.0190***	-0.0255***
	(-8.50)	(-7.19)	(-7.96)	(-7.29)
Mid Cap	-0.00738***	-0.00597	-0.00824***	-0.0124***
	(-2.75)	(-1.45)	(-2.82)	(-2.80)
Log Fund TNA	-0.00123***	-0.00185***	-0.000110	-0.000119
	(-2.93)	(-3.16)	(-0.23)	(-0.18)
Log Fund Family TNA	-0.00444***	-0.00591***	-0.00487***	-0.00620***
	(-12.05)	(-10.02)	(-11.64)	(-9.27)
Trade as % of TNA	-0.0000242***	0.000863***	-0.0000173***	0.000759***
	(-6.34)	(59.81)	(-3.60)	(43.56)
Index fund	-0.0350***	-0.0215***	-0.0306***	-0.0183***
	(-16.78)	(-6.29)	(-13.46)	(-5.04)
Load/12b-1 fee charged	0.00464***	0.00670**	0.00604***	0.00676**
	(2.67)	(2.56)	(3.26)	(2.50)
Broker Herfindahl	-0.0160***	-0.0231***	-0.0299***	-0.0338***
	(-3.14)	(-2.92)	(-5.17)	(-4.24)
Institutional % of TNA	-0.0198***	-0.0229***	-0.0154***	-0.0167***
	(-11.22)	(-8.21)	(-7.70)	(-5.14)
Log Primary Broker Size	-0.00111***	-0.000790***	-0.00177***	-0.00153***
	(-6.87)	(-3.10)	(-8.18)	(-4.72)
Constant	0.211***	0.155***	0.202***	0.154***
	(31.94)	(15.65)	(25.40)	(13.29)
Observations	72423	72423	40016	40016
R^2	0.105	0.544	0.131	0.539

Table 8: Impact of Using Affiliated and Selling Brokers on Brokerage Commissions - Single Broker

Results for semi-annual regression of brokerage commission rates on affiliated broker Use dummy and selling broker use dummy and other control variables for the sample of funds that used only one broker during the corresponding NSAR reporting period. Standard errors clustered by funds. t statistics in parentheses. $* \ p < 0.10$, $** \ p < 0.05$, $*** \ p < 0.01$

	1996-2014		2005-2014	
	Brokerage commission as % of trade	as % of TNA	Brokerage commission as % of trade	as % of TNA
Selling Broker Use	0.0722***	0.0998	0.0924***	0.111
	(2.80)	(0.98)	(6.03)	(1.56)
Affiliated Broker Use	0.0614***	0.0637***	0.0530***	0.0420*
	(4.36)	(2.65)	(3.89)	(1.76)
Value	0.0193	0.0275	0.00853	0.00572
	(1.14)	(1.06)	(0.61)	(0.29)
Blend	0.00625	0.0335*	0.00648	0.0304
	(0.62)	(1.69)	(0.59)	(1.53)
Large Cap	-0.0591***	-0.0816*	-0.0401	-0.0805*
	(-2.75)	(-1.85)	(-1.60)	(-1.88)
Mid Cap	-0.0307	-0.0174	-0.00551	-0.0276
	(-1.23)	(-0.35)	(-0.20)	(-0.57)
Log Fund TNA	-0.0116***	-0.0128**	-0.00562*	-0.00657
	(-3.26)	(-2.35)	(-1.71)	(-1.31)
Log Fund Family TNA	0.00119	0.00247	-0.00207	0.000134
	(0.47)	(0.65)	(-1.06)	(0.05)
Trade as % of TNA	-0.0000635**	0.000653***	0.00000180	0.000746***
	(-2.27)	(5.85)	(0.05)	(6.43)
Index fund	-0.0193	-0.0660***	-0.0149	-0.101**
	(-1.31)	(-2.61)	(-0.61)	(-2.07)
Load/12b-1 fee charged	0.0140	0.00376	-0.00329	-0.00980
	(1.34)	(0.20)	(-0.31)	(-0.53)
Institutional % of TNA	-0.0211	-0.0572	-0.0250	-0.0990**
	(-0.90)	(-1.23)	(-1.13)	(-2.42)
Log Primary Broker Size	-0.00138	-0.00131	0.000113	0.0000191
	(-1.09)	(-0.54)	(0.07)	(0.01)
Constant	0.233***	0.163**	0.170***	0.119*
	(6.02)	(2.14)	(4.60)	(1.85)
Observations	1,513	1,513	930	930
R^2	0.246	0.392	0.241	0.494

Table 9: Distribution Fee (2005 to 2014)

Results for annual regression of 12b-1 fee, front-end load, and marketing and distribution Fee on selling broker use dummy and other control variables. Marketing and distribution fee defined as the sum of 12b-1 fee and one seventh of the front end load, assuming average holding period for a mutual fund is seven years. Standard errors clustered by funds. t statistics in parentheses. $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$

	12b1 Fee	Front-end Load	Marketing and Distribution Fee
Selling Broker Use	-0.0282**	0.0332	-0.0219
	(-2.53)	(0.17)	(-0.60)
Value	-0.00409	0.101	0.0114
	(-0.65)	(1.23)	(0.76)
Blend	-0.00569	0.0319	-0.000720
	(-0.98)	(0.43)	(-0.05)
Large Cap	0.0159***	0.164**	0.0390***
	(2.76)	(2.20)	(2.84)
Mid Cap	0.0164**	0.123	0.0340**
	(2.40)	(1.35)	(2.03)
Log Fund TNA	-0.00672***	-0.0465**	-0.0133***
	(-4.30)	(-2.47)	(-3.65)
Log Fund Family TNA	0.00719***	0.106***	0.0229***
	(6.55)	(7.39)	(8.44)
Index fund	-0.0452***	-0.646***	-0.137***
	(-5.65)	(-6.67)	(-7.12)
Institutional % of TNA	-0.0940***	-0.149**	-0.116***
	(-20.37)	(-2.06)	(-9.17)
Four factor alpha - 2years	-2.911***	-18.35***	-5.576***
	(-6.29)	(-3.43)	(-5.54)
fundage	-0.000232	0.00694**	0.000744
	(-1.11)	(2.32)	(1.37)
Constant	0.0930***	-0.279	0.0407
	(5.52)	(-1.29)	(0.98)
Observations	20,405	20,163	20,446
R^2	0.079	0.032	0.056

Table 10: Flow Performance Sensitivity

Results for Fama-MacBeth regressions of semi-annual fund flows on semi-annual performance measures created following Sirri and Tufano [1998] and other control variables. t statistics in parentheses. $* \ p < 0.10$, $** \ p < 0.05$, $*** \ p < 0.01$

	Fund Flow
Intercept	0.495***
	5.61
LOWPERF	0.207**
	2.74
MIDPERF	0.115***
	6.26
TOPPERF	0.702***
	8.39
SellingBrokerUse*LOWPERF (t-1)	-0.332***
	-3.81
SellingBrokerUse*MIDPERF (t-1)	0.001
	0.02
SellingBrokerUse*TOPPERF (t-1)	0.111
	0.71
Log TNA (t-1)	-0.026***
	-5.24
Objective category flow	0.725***
	7.4
Fund return volatility (t-1)	-1.15*
	-2.1
Observations	31,073

Table 11: Economic impact

Estimates of money lost annually as percentage of TNA, based on the coffecient estimates from tables 3, 4, 5 and 6.

Panel A: Affiliated Brokers - Jan-1996 to Jun-2014

	All Funds		Funds with Single Broker	
	Brokerage commission as % of trade	as % of TNA	Brokerage commission as % of trade	as % of TNA
Avg Semi-annual Trade as % of TNA	133.950		125.810	
Semi-annual loss in brokerage (%)	0.007	0.010	0.061	0.064
Lost in Brokerage Annually (as % of TNA)	0.018	0.020	0.154	0.127

Panel B: Selling Brokers - Jan-2005 to Jun-2014

	All Funds		Funds with Single Broker	
	Brokerage commission as % of trade	as % of TNA	Brokerage commission as % of trade	as % of TNA
Avg Semi-annual Trade as % of TNA	133.950		125.810	
Semi-annual loss in brokerage (%)	0.012	0.014	0.099	0.116
Lost in Brokerage Annually (as % of TNA)	0.031	0.029	0.248	0.232

Table 12: Impact of Using Selling Brokers on Brokerage Commissions - Selling Brokers from Morningstar

Results for semi-annual regression of Brokerage commission rates on selling broker use dummy and other control variables. Using fund filings from Jan-2012 to Jun-2014 and the latest selling brokers from the Morningstar database, assuming the selling brokers did not change since 2012. Standard errors clustered by funds. t statistics in parentheses. $* p < 0.10$, $** p < 0.05$, $*** p < 0.01$

	All Funds		Single Broker Funds	
	Brokerage commission as % of trade	as % of TNA	Brokerage commission as % of trade	as % of TNA
Selling Broker Use	0.00569***	0.00633**	0.0479**	0.0459
	(2.81)	(2.56)	(2.09)	(1.42)
Value	0.00268	-0.00234	0.00905	-0.00926
	(1.10)	(-0.88)	(0.49)	(-0.40)
Blend	0.00267	0.000526	0.0154	0.0177
	(1.18)	(0.18)	(1.22)	(1.09)
Large Cap	-0.0181***	-0.0168***	-0.0525*	-0.0898**
	(-6.66)	(-5.20)	(-1.94)	(-2.18)
Mid Cap	-0.00790**	-0.0108***	-0.0414	-0.0827*
	(-2.40)	(-2.82)	(-1.45)	(-1.93)
Log Fund TNA	0.000235	0.000205	-0.00410	0.000421
	(0.39)	(0.28)	(-0.94)	(0.08)
Log Fund Family TNA	-0.00483***	-0.00538***	-0.00367	-0.00723
	(-9.73)	(-8.21)	(-0.90)	(-1.36)
Trade as % of TNA	-0.00000691	0.000594***	0.0000474	0.000692***
	(-0.80)	(28.62)	(0.74)	(6.67)
Index fund	-0.0247***	-0.0214***	-0.123***	-0.243***
	(-9.02)	(-5.06)	(-4.34)	(-5.43)
Load/12b-1 fee charged	0.00567***	0.00246	-0.0114	-0.00873
	(2.82)	(1.04)	(-0.95)	(-0.54)
Broker Herfindahl	-0.0259***	-0.0315***		
	(-3.57)	(-3.91)		
Institutional % of TNA	-0.00993***	-0.00717**	0.0730***	0.00971
	(-4.03)	(-2.33)	(3.19)	(0.30)
Log Primary Broker Size	-0.00221***	-0.00142***	0.00460*	0.00667**
	(-7.05)	(-3.84)	(1.86)	(2.05)
Constant	0.178***	0.123***	0.141***	0.103*
	(17.19)	(10.39)	(3.39)	(1.80)
Observations	9,092	9,092	254	254
R^2	0.148	0.512	0.330	0.620

Table 13: Brokerage Commissions for Single Broker Funds - By Fund Size

Compares the brokerage commission rates for funds that used affiliated or selling broker with the funds that did not, in the sample of funds that used only one broker during the reporting period. Funds split into four size categories based on TNA and average brokerage commission rates for funds in each category reported.

	Non Affiliated Non Selling Brokers		Affiliated or Selling Brokers	
	Brokerage commission		Brokerage commission	
Fund Size	as % of trade	as % of TNA	as % of trade	as % of TNA
Less than 25M	0.092	0.100	0.173	0.199
25M to 50M	0.066	0.067	0.133	0.119
50M to 100M	0.055	0.043	0.144	0.140
Greater than 100M	0.041	0.024	0.166	0.097