

Revisiting the Performance of Broker-Sold Mutual Funds*

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ABSTRACT

Del Guercio and Reuter (2014) find that broker-sold actively managed funds underperform both broker-sold index funds and direct-sold actively managed funds by 1.10% per year on a risk-adjusted basis. They argue that broker clients would be better off investing in broker-sold index funds, and puzzle over the fact that index funds manage less than 2% of broker-sold assets at the end of their sample period. Their estimates are based on distribution channel data that cover 1992-2004, and they give equal weight to each fund. In this paper, I revisit the performance of broker-sold funds using distribution channel data that cover 2003-2012, and I give greater weight to funds with more assets under management. Within the sample of broker-sold domestic equity funds, I find that actively managed funds underperform index funds by 0.64% per year (on a comparable risk-adjusted basis), and that the market share of broker-sold index funds remains below 3%. I also estimate return differences between broker-sold and direct-sold funds for the sample of actively managed non-specialized domestic equity funds, the sample of target date funds (TDFs), and a broad sample of actively managed funds. It is worth noting that the evidence of underperformance by broker-sold funds is much stronger among domestic equity funds and TDFs than it is within the broad sample of actively managed funds.

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I. Introduction

Bergstresser, Chalmers, and Tufano (2009) and Del Guercio and Reuter (2014) provide evidence that broker-sold mutual funds underperform their peers. Bergstresser, Chalmers, and Tufano show that broker-sold domestic equity funds and bonds funds underperform comparable direct-sold on a value-weighted, risk-adjusted basis—even after adding back distribution costs (as measured by 12b-1 fees). Del Guercio and Reuter focus on domestic equity funds and show that actively managed funds underperform passively managed funds within the broker-sold distribution channel by approximately 1% per year on an equal-weighted, risk-adjusted basis. They argue that broker clients would be better off investing in broker-sold index funds, and puzzle over the fact that index funds manage less than 2% of broker-sold assets at the end of their sample period. Both papers rely on distribution channel data from Financial Research Corporation (FRC) that end in 2004. My objective in this paper is to study the returns of broker-sold funds in more recent data, using distribution channel data from Lipper that cover 2003-2012. For comparison, I also summarize related findings in the two earlier papers. In future research, I plan to explore whether the incentives that different mutual fund families face to generate risk-adjusted returns (“alpha”) have changed over time.

II. Data and Summary Statistics

The simplest way to extend return comparisons to more recent data would be to obtain additional years of distribution channel data from FRC. Unfortunately, this was not possible. Following its acquisition by Strategic Insight in 2011, FRC appears not to have retained any historical fund distribution data.¹ Consequently, in this paper, I rely upon distribution channel data acquired from Lipper in November 2013. The unit of observation in the Lipper database is mu-

¹ When Yang Sun approached Strategic Insight in November 2014 about obtaining historical distribution channel data for her working paper on distribution channels and mutual fund fees (Sun (2014)), Strategic Insight arranged to have her receive the historical data from me.

tual fund share class i in December of calendar year t . The distribution channel data begin in 2003 and end in 2012. To obtain data on fees and performance, I merge the Lipper data onto a version of the CRSP Survivor-Bias-Free U.S. Mutual Fund Database that I downloaded in November 2013 (for use in a different research project).²

I summarize the merged database in Tables 1 and 2. Table 1 reports the number of share classes that are classified as “broker-sold,” “direct-sold,” “institutional,” or “unclassified.” It also reports the total assets under management (AUM) within each distribution channel. I assign share classes to these four distribution channels using the following mapping:

- **Broker-sold** when the distribution channel is “Bank Retail” (7.3% of the share class-year observations), “Broker/Dealer” (0.4%), “Captive” (1.3%), “Dealer” (31.8%), “Insurance” (2.4%) or “National Full Line” (3.6%);
- **Direct-sold** when it is “Direct” (9.5%);
- **Institutional** when it is “Bank Institutional” (4.7%) or “Institutional” (26.8%);
- **Unclassified** when it is “Affinity” (0.3%), “Employee” (0.1%), or missing (11.9%).³

Panel A focuses on the full range of investment categories in CRSP (i.e., all of the share classes).

Panel B focuses on the subset of investment categories that are commonly referred to by academics as non-specialized domestic equity (e.g., those classified by Lipper as small-cap value or large-cap growth).⁴ It is worth noting that although the academic literature tends to focus on

² I merged the Lipper data onto the CRSP data using the nine-digit CUSIP. The only observations that I drop from CRSP before the merge were funds identified by CRSP as ETFs. I include the AUM of municipal bond funds in the total and family-level statistics in Tables 1-4, but exclude them from the return comparisons in Tables 5-6.

³ In contrast, Figure 2 of Bergstresser, Chalmers, and Tufano (2009) classifies “Affinity”, “Employee”, and “Insurance” as institutional. Collectively, these account for 2.4% of the observations in Lipper.

⁴ The sample of non-specialized domestic equity funds is limited to those funds whose Lipper Class Name is “Equity Income,” “Extended U.S. Large-Cap Core,” “Large-Cap Core,” “Large-Cap Growth,” “Large-Cap Value,” “Mid-Cap Core,” “Mid-Cap Growth,” “Mid-Cap Value,” “Multi-Cap Core,” “Multi-Cap Growth,” “Multi-Cap Value,” “S&P 500 Index Objective,” and “Small-Cap Core,” “Small-Cap Growth,”

non-specialized domestic equity funds, these funds account for much less than half of the total AUM in the CRSP mutual fund database. The fraction is 37.3% (\$2.5 trillion of \$6.7 trillion) in 2003 and 28.0% (\$3.8 trillion of \$13.7 trillion) in 2012.

When I focus on AUM in non-specialized domestic equity, I see that the market share of broker-sold share classes declines from 40.9% in 2003 to 21.8% in 2012. During this same period, the market share of direct-sold share classes declines from 43.1% to 34.2%. These declines reflect an increase in the fraction of share classes classified by Lipper as institutional, as well as an increase in the fraction of share classes that I cannot classify as broker-sold, direct-sold, or institutional.⁵

Ideally, FRC and Lipper would assign the same share class to the same distribution channel. However, the market shares calculated in 2004 using Lipper data differ from those calculated using FRC data (as reported in Table IA.I of the Internet Appendix of Del Guercio and Reuter (2014)). Namely, FRC data imply lower market shares for broker-sold and institutional channels and higher market shares for the direct-sold channel. Because the FRC data used in Del Guercio and Reuter (2014) are merged to an older version of the CRSP mutual fund database, which uses a different set of fund identifiers, I have not been able to determine the source of these discrepancies. The fact that FRC data also imply fewer AUM (\$2.2 trillion versus \$2.9 trillion) suggests that FRC tracked distribution channels for fewer funds than does Lipper.

Table 2 decomposes the total AUM in Table 1 into those that are actively and passively managed. Del Guercio and Reuter (2014) find that broker-sold index funds outperform broker-

and “Small-Cap Value.” For the purposes of calculating category-adjusted returns, I reclassify “Extended U.S. Large-Cap Core” and “S&P 500 Index Objective” as “Large-Cap Core.”

⁵ Note that a majority of the unclassified share classes are those for which CRSP reports the “Fund is a variable annuity underlying fund.” The significant increase in these types of funds in CRSP between 2003 and 2012 largely explains the significant increase in the fraction of unclassified share classes and AUM. For example, in Panel B, the number of “variable annuity underlying fund” share classes increases from 9 in 2003 to 1,517 in 2013 and the total AUM invested in these share classes increases from \$0.5B to \$481.4B.

sold actively managed funds, but that the market share of broker-sold index funds remains below 2% between 1992 and 2004. I continue to find very low market shares using the Lipper data; it is below 3% in 2012. More generally, the market shares of index funds within the broker-sold, direct-sold, and institutional channels in 2004 are approximately the same whether I focus on Lipper or FRC (1.7% versus 1.8%, 20.6% versus 16.1%, and 33.5% versus 32.4%).⁶

The most puzzling patterns in Table 2 are the changes in actively managed broker-sold and direct-sold AUM between 2007 and 2012. Between 2007 and 2008, broker-sold AUM declined by 44.8% and direct-sold AUM declined by 42.8%. Since the S&P 500 index declined by 38.5% over this same period, these declines are likely to reflect both negative fund returns and outflows. However, between 2008 and 2012, broker-sold AUM increased by 14.0%, direct-sold AUM increased by 31.3%, and the S&P 500 index increased by 57.9%. The smaller increases in broker-sold AUM may reflect lower returns earned in these funds, larger outflows from these funds into other asset classes, or a differential reclassification of broker-sold funds to institutional or unclassified.

Table 3 identifies the largest families within the broker-sold and direct-sold channels. Each month, I calculate the total AUM within each channel for each mutual fund family. I classify families as broker-sold families when the largest fraction of their AUM are in the broker-sold channel, and I classify families as direct-sold families when the largest fraction of their AUM are in the direct-sold channel. I report the names and total AUM of the top five families within each channel at the end of 2003, 2006, 2009, and 2012. There are three things to note. First, there is relatively little turnover in the identities or classification of the market leaders, especially in the direct-sold channel. However, between 2009 and 2012, based on Lipper data,

⁶ The FRC statistics for 2004 come from Table IA.I from the Internet Appendix for Del Guercio and Reuter (2014); http://www2.bc.edu/jonathan-reuter/research/JF_IA_Del%20Guercio%20and%20Reuter.pdf.

Ameriprise is reclassified from “broker-sold” to “unclassified” and Barclays is reclassified from “broker-sold” to “institutional”. (The performance differences that I document below are based on the raw Lipper distribution channel data; I have not made any effort to clean or standardize these data.) Second, the top ten broker-sold and direct-sold families control the majority of all mutual fund assets, with American Funds, Fidelity, and Vanguard remaining significantly larger than the other market leaders. In fact, between 2003 and 2012, the market share of these three families increased from 30.2% to 33.4%. These changes in concentration imply that the largest families are earning higher returns or larger net flows than their competitors. Third, banks like Goldman Sachs, JP Morgan, Nations, Northern Trust, US Bancorp, and Wells Fargo tend to be classified by Lipper as “institutional.”

Table 4 reports how the average fraction of AUM held in different channels changes between 2003 and 2012 for broker-sold and direct-sold families. It reveals that the average fraction of AUM held in the primary distribution channel is similar in the FRC and Lipper data in 2004 (92.2% versus 91.7% for broker-sold and 96.5% versus 94.9% for direct-sold). It also reveals that both types of families are slowly diversifying out of their primary channel and into the institutional channel. Although the changes are about twice as large for broker-sold families as for direct-sold families, the average broker-sold family still distributes 85.5% of its AUM through the broker-sold channel in 2012.⁷ In other words, it does not appear to be the case that Lipper is systematically reclassifying broker-sold or direct-sold funds as institutional funds.

III. Performance Differences

Before presenting my updated estimates, it is helpful to review the existing literature.

⁷ The main difference is the number of mutual fund families classified as belonging to each channel by Lipper and FRC. This difference may reflect less coverage of distribution channels by FRC (which would help explain the lower AUM in 2004 using FRC data) or it may reflect noisier mutual fund family names in the newer version of the CRSP mutual fund database.

Bergstresser, Chalmers, and Tufano (2009) were the first to compare the returns of broker-sold and direct-sold funds. Their distribution channel data come from FRC and cover 1992-2004. They calculate equal-weighted and value-weighted return differences, across four broad investment categories. When they focus on the four-factor alphas earned by domestic equity funds, they find that broker-sold funds underperform by 0.93% per year on an equal-weighted basis and 0.77% per year on a value-weighted basis.⁸ Their preferred return measures add back the 12b-1 fees that broker-sold funds use to pay for distribution. This is reasonable except to the extent that conflicts of interest lead brokers to recommend funds that charge higher 12b-1 fees in order to pay higher commissions. The authors conclude that “Relative to direct-sold funds, broker-sold funds deliver lower risk-adjusted returns even before subtracting distribution costs.” However, it is worth noting that the relative performance differs across asset classes. For foreign equity funds, broker-sold funds underperform by 2.08% per year on an equal-weighted basis but *outperform* by 1.83% per year on a value-weighted basis. For bond funds, broker-sold funds underperform by 0.45% on an equal-weighted basis and underperform by 0.90% on a value-weighted basis. For money market funds, broker-sold funds underperform by 0.08% per year on a equal-weighted basis but outperform by 0.04% on a value-weighted basis. In other words, while there is consistent evidence of underperformance on an equal-weighted basis between 1992 and 2004, the evidence of underperformance on a value-weighted basis is limited to domestic equity funds and bond funds.

Del Guercio and Reuter (2014) find that actively managed broker-sold funds underperform both passively managed broker-sold funds and actively managed direct-sold funds by ap-

⁸ These estimates are from the columns in Table 3 of their paper that includes index funds. When index funds are excluded from the sample of funds, the differences are 0.96% and 0.53%, respectively.

proximately 1.10% per year.^{9,10} Their distribution channel data also come from FRC and cover 1992-2004. Because one of their goals is to explain differences in behavior across funds, they focus entirely on differences in equal-weighted returns. Because another of their goals is to rationalize the well-documented underperformance of actively managed domestic equity funds relative to index funds, they focus on this sample of funds.

Based on their reviews of the academic literature, the Council of Economic Advisers (CEA) and Department of Labor (DOL) estimate the cost of conflicted advice to IRA investors to be 1% per year. During the public hearing at the DOL in August 2015, however, the Investment Company Institute claimed that the performance differences between broker-sold and direct-sold funds are smaller in more recent data, especially when fund returns are value-weighted instead of equal-weighted. I examine these claims in Tables 5 through 8.

Table 5 reports annual return differences for two samples of funds. Within the sample of actively managed, non-specialized domestic equity funds, I focus on four measures of performance. “Net return” is the after-fee monthly return reported by CRSP. “Net Alpha” is the Carhart (1997) four-factor alpha, estimated using the prior 24 after-fee monthly returns. “Net return + 12b-1” and “Net Alpha + 12b-1” add back $1/12^{\text{th}}$ of the fund’s asset-weighted lagged annual 12b-1 fee. These are the performance measures emphasized in Bergstresser, Chalmers, and Tu-

⁹ The estimated coefficient on the “Broker-sold dummy (t) * Index fund (t)” in column (3) of Table VI implies that actively managed broker-sold funds underperform passively managed broker-sold funds by 9.3 basis points per month (significant at the 5-percent level). The dependent variable is the after-fee four-factor alpha. The specification does not include any fund-level controls. When I add the lagged 12b-1 fee back to the four-factor alpha, the estimated level of underperformance is 8.2 basis points per month (5-percent level). The implied annual return differences are 1.12% and 0.98%, respectively.

¹⁰ The estimated coefficient on the “Direct-sold fund dummy (t)” in column (1) of Table III Panel A implies that broker-sold funds underperform direct-sold funds by 9.6 basis points per month (significant at 1-percent level). The dependent variable is the after-fee four-factor alpha and the set of fund-level controls includes the lagged 12b-1 fee. The level of underperformance is 8.5 basis points per month (1-percent level) when I exclude any control variables and 6.0 basis points per month (1-percent level) when I replace the four-factor alpha with the four-factor alpha plus the lagged 12b-1 fee. The implied annual return differences are 1.15%, 1.02%, and 0.72%, respectively.

fano (2009). I also consider a larger sample of actively managed funds that excludes only municipal bond funds (which should not be held inside tax-deferred retirement accounts). Rather than estimate more elaborate risk-adjustment models within this larger sample of funds, I focus on the two performance measures based on net returns.

Panel A reports return differences on an equal-weighted basis while Panel B reports return differences on a value-weighted basis (weighting each fund based on its AUM at the end of the previous month). Before calculating these averages, I calculate the performance of fund i relative to its peers by subtracting off the value-weighted return of funds with the same Lipper investment category in the same month. I do not impose any filters with respect to fund size, monthly returns, or the level of expense ratios or 12b-1 fees. The category-month returns are calculated using all broker-sold, direct-sold, institutional, and unclassified funds which are actively managed and for which I observe a non-missing performance measure and lagged AUM.

There are three findings in Table 5. First, within the sample of domestic equity funds, the equal-weighted return differences are significantly smaller than those estimated by Bergstresser, Chalmers, Tufano (2009) and Del Guercio and Reuter (2014) using older data. The differences are approximately 0.30% per year when focusing on the net returns and net alphas, and approximately 0.05% per year when focusing on annualized net returns and alphas plus lagged 12b-1 fees. These changes suggest that the average broker-sold fund has become more competitive with the average direct-sold fund. Additional research is required to determine whether this reflects changes in the behavior of existing broker-sold families, new broker-sold families, broker-sold funds being offered by non-broker-sold families, or some combination thereof.

Second, the value-weighted return differences are significantly larger than the equal-weighted differences, but still below prior estimates. They are between 0.65% and 0.70% per year when focusing on net returns and alphas and between 0.37% and 0.42% when adding back

lagged 12b-1 fees. The fact that value-weighted return differences are larger than equal-weighted return differences is inconsistent with brokers steering their clients to the better performing funds within each domestic equity asset class. To the extent that brokers steer their clients towards funds that pay higher-than-average distribution costs (as found by Christoffersen, Evans, and Musto (2013) and Chalmers and Reuter (2015)), the actual level of underperformance likely falls between 0.37% and 0.70%. This is the relevant range for young investors, whose portfolios will tilt largely toward equity.

Third, within the larger sample of actively managed funds, the annual differences are between 0.22% and 0.45% when I focus on equal-weighted returns and between 0.18% and 0.40% when I focus on value-weighted returns. In other words, the value-weighted underperformance in the larger sample is driven by the value-weighted underperformance of non-specialized domestic equity funds. Again, to the extent that brokers steer their clients towards funds that pay higher-than-average distribution costs, the actual level of underperformance likely falls between 0.18% and 0.40%. This is the relevant range for a mutual fund investor whose portfolio weights equity, debt, and money market funds in proportion to their overall market shares.

In Table 6, I test whether broker-sold funds underperform direct-sold funds using equal-weighted and value-weighted regressions. The specifications are similar to those estimated in the Internet Appendix of Del Guercio and Reuter (2014) in that I limit the sample of broker-sold, direct-sold, and institutional funds. By including category-by-month fixed effects, I am comparing the return of fund i in category j in month t to the contemporaneous returns of its peer funds. I estimate OLS regressions that give equal weight to each fund-month and I estimate WLS regressions that give greater weight to fund-months with greater AUM at the end of the previous month. Panel A focuses on actively managed non-specialized domestic equity funds; Panel B focuses on the broader sample of actively managed funds.

I begin by estimating regressions using return data from 2003 and 2004. Focusing on the net returns of domestic equity funds, I find that broker-sold funds underperform direct-sold funds by 0.86% per year on an equal-weighted basis and 1.04% per year on a value-weighted basis. The fact that the equal-weight difference is quantitatively similar to that estimated between 1992 and 2004 using FRC distribution channel data is indirect evidence that FRC and Lipper distribution channels are highly correlated in 2003 and 2004. When I switch to net return plus lagged 12b-1 fee, the value-weighted underperformance is 0.64%. While this estimate is economically significant, it is not statistically significant at conventional levels within this two-year sample period.¹¹ The value-weighted differences are significantly smaller in Panel B.

The remaining specifications are estimated on the full sample period, 2003-2012. Not surprisingly, the value-weighted estimates are similar to those obtained in Table 5. Broker-sold domestic equity funds underperform by 0.71% per year when I focus on net returns (significant at the 1-percent level) and by 0.39% per year when I focus on net returns plus lagged 12b-1 fees (10-percent level).¹² Within the larger sample of funds, the differences in net returns shrink to 0.47% (1-percent level) and 0.20% (insignificant at conventional levels).

B. Active Versus Passive Within the Broker-Sold Distribution Channel

Following Del Guercio and Reuter (2014), Table 7 compares the performance of actively managed and passively managed domestic equity funds between 2003 and 2012. The regressions are similar to those estimated in Table 6 except that I include dummy variables indicating whether fund i is broker-sold and actively managed, broker-sold and passively managed, or direct-sold and passively managed. Direct-sold and actively managed is the omitted category.

¹¹ As discussed in footnote 9, the estimated equal-weighted level of underperformance in Del Guercio and Reuter (2014) is 0.72% when the dependent variable is the net alpha plus 12b-1 fees. This difference, based on monthly return data between 1992 and 2004, is statistically significant at the 1-percent level.

¹² The differences are quantitatively similar when I focus on four-factor alphas and four-factor alphas plus lagged 12b-1 fees: 0.73% (significant at 1-percent level) and 0.42% (10-percent level).

Across the four performance measures, broker-sold actively managed funds underperform broker-sold index funds by between 0.56% and 0.82% per year (with all differences statistically significant at the 5-percent level).¹³ My preferred estimate is 0.64% per year, which is the difference in the four-factor alphas. On the one hand, all of these differences are uniformly lower than the 1.10% estimated in Del Guercio and Reuter (2014) or the 1.00% assumed by the CEA and DOL. On the other hand, they remain economically significant, renewing questions about why broker-sold index funds manage less than 3.0% of the assets in the broker-sold market segment. The fact that return differences shrink between 0.05% and 0.07% when I add back lagged 12b-1 fees implies that actively managed broker-sold funds are charging slightly higher 12b-1 fees than passively managed broker-sold funds.

More generally, the estimated coefficients reveal the following patterns: direct-sold actively managed funds underperform direct-sold index funds by between 0.80% and 0.92% per year, direct-sold actively managed funds earn returns that are statistically indistinguishable from those earned by broker-sold index funds, and both types of funds tend to significantly outperform broker-sold actively managed funds. (The differences in the returns of the two types of actively managed funds are similar to those estimated in Panel B of Table 5.) The weaker performance of direct-sold actively managed funds in these data than in the older data analyzed by Del Guercio and Reuter (2014) likely helps to explain why the market share of direct-sold index funds reaches 33.0% in 2012. It is broadly consistent with research by Robert Stambaugh and co-authors arguing that the decline in direct equity investing by households combined with increased competition between active managers collectively have driven down the alphas of actively managed

¹³ Because these regressions include category-by-month fixed effects, I am comparing the four-factor alphas of active and passive funds with the same category in the same month. In unreported regressions, I add family-by-category-by-month fixed effects, so that comparisons are being made within mutual fund family. I find that the estimated level of underperformance increases to 1.04% when I focus on net alphas and 1.07% when I add back 12b-1 fees (both differences significant from zero at the 10-percent level).

mutual funds (e.g., Stambaugh (2014) and Pastor, Stambaugh, and Taylor (2015)). It is my hope that future iterations of this paper will contribute to this branch of the academic literature.

C. Target Date Funds

I conclude by comparing the performance of broker-sold and direct-sold target-date funds (TDFs). Following the Pension Protection Act of 2006, TDFs have become increasingly popular investment options within ERISA-covered defined contribution retirement plans. Balduzzi and Reuter (2015) document significant heterogeneity in the risk-taking and returns of TDFs, and conclude that this heterogeneity reflects, at least in part, strategic risk-taking by entrants. In Table 8, I test for differences in TDF returns across distribution channels. The regressions are similar to those estimated in Table 6. However, because TDFs typically invest in international equity (when the target retirement date is distant) and fixed income (when it draws near), I supplement the four equity factors in Carhart's (1997) model with the excess return on the MSCI EAFE international equity index and the excess return on the Barclay's Global Aggregate fixed income index, and I emphasize differences in these six-factor alphas. By this measure, broker-sold TDFs underperform comparable direct-sold TDFs by between 0.68% and 0.74% per year. These differences are statistically significant at the 1-percent and 5-percent levels, respectively. They are also similar in magnitude to the risk-adjusted return differences between actively managed domestic equity funds and passively managed domestic equity funds that I find in the broker-sold channel.

IV. Conclusion

My goal in this short paper has been to revisit the performance of broker-sold funds using more recent data on fund performance and distribution channels. Although there appears to be an increase in the market share of institutional (and variable annuity-related) funds between 2003

and 2012, additional research is required to determine the extent to which this increase reflects changing market structure (that result in changing incentives) versus changing variable definitions. For now, I simply take the Lipper distribution channel data as given.

Within the samples of domestic equity funds and TDFs, I estimate that broker-sold funds underperform by between 0.64% and 0.74% per year. These value-weighted estimates are economically significant, and likely to apply to a large fraction of retirement account portfolios, but also lower than the 1.00% point estimate used by the CEA and DOL. Within the broader sample of actively managed funds, the evidence of underperformance is weaker. The difference is 0.47% if I focus on category-adjusted after-fee returns and 0.20% (but statistically insignificant) if I add back 12b-1 fees. To the extent that conflicts of interest lead brokers to recommend funds with higher-than-average 12b-1 fees (as performance differences between active and passive broker-sold funds suggest), the actual performance difference within the broader sample of actively managed funds is likely to fall between 0.47% and 0.20%. The more closely a retirement account portfolio resembles the aggregate asset allocation of U.S. mutual funds (excluding municipal bond funds), the more relevant these lower estimates are likely to become.

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Table 1. Assets Under Management Across Distribution Channels

PANEL A. ALL ASSET CLASSES								
	Number of Share Classes				Total AUM (Billions)			
	Broker	Direct	Institutional	Unclassified	Broker	Direct	Institutional	Unclassified
2003	10,216	1,995	4,571	1,549	\$2,567.1	\$2,183.4	\$1,741.7	\$166.7
2004	10,605	2,075	4,785	1,673	\$2,798.3	\$2,499.1	\$1,828.2	\$189.9
2005	10,348	1,991	5,224	2,148	\$2,958.8	\$2,683.9	\$2,021.7	\$412.9
2006	10,740	2,111	5,946	1,665	\$3,420.2	\$3,223.6	\$2,587.2	\$267.4
2007	10,562	2,079	6,858	2,019	\$3,750.0	\$3,588.0	\$3,474.4	\$277.9
2008	11,289	2,309	8,377	3,906	\$2,621.9	\$2,709.3	\$3,604.6	\$907.4
2009	10,845	2,272	8,209	3,728	\$2,973.7	\$3,271.2	\$3,972.4	\$1,169.6
2010	10,981	2,306	8,802	3,794	\$3,155.3	\$3,485.3	\$4,440.8	\$1,419.5
2011	10,920	2,396	9,385	3,847	\$2,958.3	\$3,405.5	\$4,594.1	\$1,308.4
2012	10,975	2,362	10,132	3,821	\$3,213.8	\$3,795.1	\$5,356.9	\$1,367.6
2003	55.7%	10.9%	24.9%	8.5%	37.6%	32.0%	25.5%	2.5%
2012	40.2%	8.7%	37.1%	14.0%	23.4%	27.6%	39.0%	10.0%
PANEL B. NON-SPECIALIZED DOMESTIC EQUITY FUNDS								
	Number of Share Classes				Total AUM (Billions)			
	Broker	Direct	Institutional	Unclassified	Broker	Direct	Institutional	Unclassified
2003	3,735	794	1,663	67	\$1,022.9	\$1,078.2	\$368.9	\$16.2
2004	3,877	828	1,763	68	\$1,167.8	\$1,250.1	\$453.6	\$18.1
2005	3,613	746	1,735	192	\$1,209.2	\$1,309.6	\$509.4	\$58.0
2006	3,667	792	1,942	167	\$1,323.3	\$1,480.4	\$608.6	\$64.2
2007	3,606	841	2,492	459	\$1,316.5	\$1,530.6	\$768.1	\$45.1
2008	3,791	933	2,883	1,841	\$726.7	\$906.9	\$524.4	\$409.4
2009	3,532	891	2,677	1,710	\$857.9	\$1,178.2	\$759.9	\$515.7
2010	3,423	879	2,766	1,675	\$916.9	\$1,280.6	\$984.2	\$586.5
2011	3,253	871	2,855	1,626	\$808.4	\$1,189.4	\$1,036.1	\$487.6
2012	3,028	827	2,937	1,563	\$838.9	\$1,313.1	\$1,192.1	\$500.3
2003	59.7%	12.7%	26.6%	1.1%	40.9%	43.1%	14.7%	0.7%
2012	36.2%	9.9%	35.2%	18.7%	21.8%	34.2%	31.0%	13.0%
2004 (\$, FRC)					\$779.0	\$1,174.2	\$231.2	
2004 (% , FRC)					35.7%	53.8%	10.6%	
2004 (% , Lipper)					40.7%	43.5%	15.8%	

Notes: This table reports the number of share classes and aggregate assets under management in three distribution channels: broker-sold, direct-sold, and institutional. I begin with all of the shares classes in the CRSP mutual fund database, drop ETFs, and then merge on share-class-level distribution segment data acquired from Lipper (using 9-digit CUSIP). Panel A focuses on all asset classes. Panel B focuses on non-specialized domestic equity funds (i.e., those with Lipper classifications like "Mid-Cap Core Funds"). AUM is measured at the end of each calendar year. The growing fraction of share classes for which we lack distribution channel data is driven by the growing number of share classes for which the "Fund is a variable annuity underlying fund." During the entire sample period, they account for 70.3% (88.2%) of the unclassified share classes and 84.1% (89.6%) of the unclassified AUM in Panel A (Panel B). In Panel B, I report total AUM statistics for 2004 from Table IA.I from the Internet Appendix for Del Guercio and Reuter (2014). Those statistics are based on distribution channel data from FRC instead of Lipper.

Table 2. Assets Under Management Across Distribution Segments: Active versus Passive Funds

PANEL A. ALL ASSET CLASSES

	Active				Passive				% Passive			
	Broker	Direct	Inst.	Uncl.	Broker	Direct	Inst.	Uncl.	Broker	Direct	Inst.	Uncl.
2003	\$2,546.0	\$1,890.4	\$1,595.1	\$162.3	\$21.1	\$293.1	\$146.6	\$4.4	0.8%	13.4%	8.4%	2.7%
2004	\$2,774.4	\$2,140.0	\$1,633.9	\$188.8	\$24.0	\$359.1	\$194.3	\$1.0	0.9%	14.4%	10.6%	0.5%
2005	\$2,935.6	\$2,288.3	\$1,797.6	\$399.2	\$23.3	\$395.6	\$224.1	\$13.7	0.8%	14.7%	11.1%	3.3%
2006	\$3,396.6	\$2,725.0	\$2,300.0	\$260.3	\$23.6	\$498.6	\$287.2	\$7.1	0.7%	15.5%	11.1%	2.6%
2007	\$3,725.0	\$3,035.5	\$3,125.8	\$267.0	\$24.9	\$552.6	\$348.5	\$10.9	0.7%	15.4%	10.0%	3.9%
2008	\$2,605.2	\$2,292.0	\$3,350.4	\$850.8	\$16.7	\$417.3	\$254.2	\$56.6	0.6%	15.4%	7.1%	6.2%
2009	\$2,951.2	\$2,715.0	\$3,643.8	\$1,080.8	\$22.5	\$556.3	\$328.6	\$88.8	0.8%	17.0%	8.3%	7.6%
2010	\$3,118.2	\$2,814.2	\$3,991.9	\$1,299.8	\$37.1	\$671.1	\$448.9	\$119.7	1.2%	19.3%	10.1%	8.4%
2011	\$2,917.8	\$2,734.5	\$4,087.0	\$1,175.6	\$40.5	\$671.0	\$507.1	\$132.7	1.4%	19.7%	11.0%	10.1%
2012	\$3,170.5	\$2,968.1	\$4,724.2	\$1,227.3	\$43.3	\$827.0	\$632.7	\$140.3	1.3%	21.8%	11.8%	10.3%

PANEL B. NON-SPECIALIZED DOMESTIC EQUITY FUNDS

	Active				Passive				% Passive			
	Broker	Direct	Inst.	Uncl.	Broker	Direct	Inst.	Uncl.	Broker	Direct	Inst.	Uncl.
2003	\$1,004.8	\$862.9	\$250.5	\$15.8	\$18.1	\$215.3	\$118.4	\$0.4	1.8%	20.0%	32.1%	2.7%
2004	\$1,148.0	\$992.9	\$301.5	\$17.6	\$19.9	\$257.2	\$152.0	\$0.5	1.7%	20.6%	33.5%	2.6%
2005	\$1,191.0	\$1,044.7	\$342.7	\$51.8	\$18.2	\$264.9	\$166.7	\$6.2	1.5%	20.2%	32.7%	10.6%
2006	\$1,305.6	\$1,139.4	\$408.1	\$61.1	\$17.7	\$341.0	\$200.5	\$3.1	1.3%	23.0%	32.9%	4.8%
2007	\$1,299.6	\$1,171.6	\$538.8	\$35.8	\$17.0	\$359.0	\$229.3	\$9.3	1.3%	23.5%	29.9%	20.7%
2008	\$717.3	\$670.1	\$359.7	\$362.7	\$9.5	\$236.8	\$164.7	\$46.7	1.3%	26.1%	31.4%	11.4%
2009	\$845.6	\$859.3	\$545.1	\$448.4	\$12.3	\$318.9	\$214.7	\$67.3	1.4%	27.1%	28.3%	13.0%
2010	\$900.3	\$911.7	\$707.0	\$503.4	\$16.6	\$368.9	\$277.2	\$83.1	1.8%	28.8%	28.2%	14.2%
2011	\$790.2	\$823.7	\$730.0	\$399.9	\$18.3	\$365.8	\$306.1	\$87.7	2.3%	30.8%	29.5%	18.0%
2012	\$817.7	\$879.5	\$832.4	\$412.9	\$21.2	\$433.6	\$359.7	\$87.4	2.5%	33.0%	30.2%	17.5%
2004 (FRC)	\$779.0	\$984.6	\$156.2		\$14.6	\$189.6	\$75.0		1.8%	16.1%	32.4%	

Notes: Table 2 decomposes the AUM in Table 1 into those held by actively managed funds and those held by index funds. In Panel B, which focuses on non-specialized domestic equity funds, I report comparable statistics for 2004 from Table IA.I from the Internet Appendix for Del Guercio and Reuter (2014). Those statistics are based on distribution channel data from FRC instead of Lipper.

Table 3. Top Five Broker-sold and Direct-sold Families Based on Total Assets Under Management

PANEL A. BROKER-SOLD FAMILIES								
	2003		2006		2009		2012	
1st	American Funds	\$494.5	American Funds	\$990.5	American Funds	\$1,044.3	American Funds	\$1,056.3
2nd	Templeton	\$197.3	Templeton	\$316.7	Templeton	\$334.0	Templeton	\$445.4
3rd	Putnam	\$136.4	Ameriprise	\$289.0	Ameriprise	\$279.2	Invesco AIM	\$191.9
4th	Invesco AIM	\$126.3	Oppenheimer	\$182.3	Barclays	\$215.2	Oppenheimer	\$186.2
5th	Merrill Lynch	\$124.1	Wells Fargo	\$122.7	Oppenheimer	\$144.0	MFS	\$147.9
PANEL B. DIRECT-SOLD FAMILIES								
	2003		2006		2009		2012	
1st	Fidelity	\$802.9	Fidelity	\$1,171.5	Fidelity	\$1,390.6	Vanguard	\$1,912.5
2nd	Vanguard	\$711.4	Vanguard	\$1,156.5	Vanguard	\$1,350.6	Fidelity	\$1,612.0
3rd	Schwab	\$139.3	T Rowe Price	\$231.4	T Rowe Price	\$285.3	T Rowe Price	\$438.7
4th	T Rowe Price	\$124.1	Schwab	\$187.2	Schwab	\$204.5	Schwab	\$210.6
5th	Janus	\$89.1	Dodge & Cox	\$136.5	Dodge & Cox	\$112.4	Dodge & Cox	\$121.8

Note: This table reports the top five broker-sold and direct-sold mutual fund families at the end of the calendar year in 2003, 2006, 2009, and 2012. I classify families as broker-sold families when the largest fraction of their assets are held in the broker-sold channel, and I classify families as direct-sold families when the largest fraction of their assets are held in the direct-sold channel. Total assets under management at the end of each calendar year are calculating by summing across all of the family's funds in CRSP, regardless of distribution channel.

Table 4. Trends in Distribution for Broker-sold and Direct-sold Mutual Fund Families, 2003-2012

	Broker-sold Family					Direct-sold Family				
	#	% Broker	% Direct	% Instl	% Uncl	#	% Broker	% Direct	% Instl	% Uncl
2004 (FRC)	133	92.2%				192		96.5%		
2003	204	93.4%	0.5%	4.9%	1.1%	255	1.9%	95.3%	2.3%	0.5%
2004	196	91.7%	0.7%	6.1%	1.4%	247	2.1%	94.9%	2.2%	0.8%
2005	185	89.6%	0.8%	7.7%	1.8%	240	1.9%	94.9%	2.4%	0.7%
2006	180	90.1%	1.6%	7.3%	1.0%	248	1.8%	95.4%	2.2%	0.6%
2007	167	88.9%	2.0%	7.9%	1.2%	235	1.9%	95.0%	2.1%	1.1%
2008	183	87.4%	1.8%	8.7%	2.0%	265	2.0%	94.4%	3.1%	0.4%
2009	173	87.0%	1.7%	9.2%	2.1%	269	2.3%	93.8%	3.4%	0.5%
2010	173	86.4%	1.9%	9.7%	2.0%	259	2.8%	92.4%	4.5%	0.4%
2011	207	85.0%	2.5%	10.9%	1.6%	258	2.9%	92.3%	4.4%	0.4%
2012	217	85.5%	2.0%	11.1%	1.4%	241	3.0%	91.3%	5.4%	0.3%
Average	188.5	88.5%	1.5%	8.4%	1.6%	251.7	2.3%	94.0%	3.2%	0.6%

Notes: This table reports the average fraction of family-level AUM that is broker-sold, direct-sold, institutional, or unclassified at the end of each calendar year. Among broker-sold families, there is a slight decline in the fraction of AUM in the broker-sold channel and a slight increase in the fraction of AUM in the other two channels. Among direct-sold families, the patterns are qualitatively similar, but even smaller.

Table 5. Annualized Differences in Category-Adjusted Performance of Actively Managed Mutual Funds, 2003-2012

PANEL A. EQUAL WEIGHTED

	Actively Managed Non-Specialized Domestic Equity Funds								All Actively Managed Funds (Except Muni Funds)			
	Net Return		Net Return + 12b-1		Net Alpha		Net Alpha + 12b-1		Net Return		Net Return + 12b-1	
	Broker	Direct	Broker	Direct	Broker	Direct	Broker	Direct	Broker	Direct	Broker	Direct
2003	-0.32%	0.95%	-0.10%	0.70%	-0.49%	0.73%	-0.30%	0.56%	-0.55%	0.91%	-0.31%	0.70%
2004	-0.22%	-0.02%	-0.05%	-0.19%	-0.20%	-0.14%	-0.02%	-0.31%	-0.25%	-0.08%	-0.04%	-0.24%
2005	-0.05%	-0.13%	0.12%	-0.29%	0.03%	-0.32%	0.20%	-0.46%	-0.10%	0.20%	0.06%	0.04%
2006	0.12%	-0.43%	0.28%	-0.58%	0.08%	-0.36%	0.23%	-0.50%	-0.11%	-0.03%	0.06%	-0.29%
2007	-0.04%	0.89%	0.12%	0.83%	0.00%	0.25%	0.16%	0.11%	-0.39%	0.13%	-0.14%	0.20%
2008	-0.46%	0.64%	-0.58%	0.45%	-0.57%	-0.40%	-0.50%	-0.49%	-0.52%	0.87%	-0.32%	0.59%
2009	0.12%	0.57%	0.31%	0.57%	0.01%	1.15%	0.13%	1.07%	0.20%	0.53%	0.25%	0.57%
2010	-0.19%	-0.59%	0.03%	-0.61%	-0.30%	-0.10%	-0.18%	-0.19%	-0.26%	-0.09%	-0.13%	-0.06%
2011	-0.40%	-0.02%	-0.43%	-0.17%	-0.49%	-0.01%	-0.46%	-0.13%	-0.71%	-0.22%	-0.65%	-0.41%
2012	-0.20%	-0.43%	0.06%	-0.40%	-0.23%	-0.11%	0.00%	-0.08%	-0.18%	-0.31%	-0.11%	-0.17%
Average	-0.16%	0.14%	-0.03%	0.03%	-0.21%	0.07%	-0.07%	-0.04%	-0.28%	0.17%	-0.14%	0.08%
Difference		0.31%		0.06%		0.28%		0.03%		0.45%		0.22%

PANEL B. VALUE WEIGHTED

	Actively Managed Non-Specialized Domestic Equity Funds								All Actively Managed Funds (Except Muni Funds)			
	Net Return		Net Return + 12b-1		Net Alpha		Net Alpha + 12b-1		Net Return		Net Return + 12b-1	
	Broker	Direct	Broker	Direct	Broker	Direct	Broker	Direct	Broker	Direct	Broker	Direct
2003	-0.21%	0.31%	-0.01%	0.11%	-0.32%	0.44%	-0.13%	0.24%	-0.11%	0.11%	0.05%	-0.05%
2004	-0.59%	0.74%	-0.41%	0.55%	-0.71%	0.83%	-0.53%	0.65%	-0.34%	0.36%	-0.19%	0.21%
2005	0.05%	0.01%	0.22%	-0.16%	-0.01%	0.12%	0.15%	-0.05%	-0.11%	0.13%	0.03%	-0.02%
2006	-0.24%	0.19%	-0.09%	0.03%	-0.38%	0.49%	-0.23%	0.33%	-0.11%	0.08%	0.02%	-0.05%
2007	-0.31%	0.58%	-0.16%	0.42%	-0.11%	0.32%	0.04%	0.17%	-0.18%	0.27%	-0.05%	0.14%
2008	0.08%	-0.57%	0.22%	-0.61%	-0.52%	0.11%	-0.40%	0.03%	-0.13%	-0.35%	-0.02%	-0.43%
2009	-0.50%	1.29%	-0.45%	1.08%	0.16%	0.00%	0.29%	-0.11%	-0.33%	0.78%	-0.31%	0.68%
2010	-0.50%	0.49%	-0.32%	0.42%	-0.02%	-0.07%	0.12%	-0.14%	-0.20%	0.25%	-0.09%	0.19%
2011	-0.83%	0.12%	-0.68%	0.05%	-0.92%	0.34%	-0.78%	0.24%	-0.37%	0.23%	-0.33%	0.09%
2012	-0.25%	0.58%	-0.14%	0.46%	-0.32%	0.78%	-0.23%	0.63%	-0.16%	0.14%	-0.12%	0.05%
Average	-0.33%	0.37%	-0.18%	0.24%	-0.32%	0.34%	-0.17%	0.20%	-0.20%	0.20%	-0.10%	0.08%
Difference		0.70%		0.42%		0.65%		0.37%		0.40%		0.18%

Notes: This table compares the performance of broker-sold and direct-sold funds within Lipper investment categories and across years. The sample is limited to actively managed mutual funds. I focus on both the full set of actively managed funds (excluding municipal bond funds) and the subset of non-specialized domestic equity funds. The unit of observation is fund *i* in month *t*. I consider four performance measures. "Net return" is the fund's after-fee monthly return. "Net Return + 12b-1" is the net return plus 1/12 of the fund *i*'s asset-weighted 12b-1 fee. "Net Alpha" is the Carhart (1997) four-factor alpha, estimated using the fund's prior 24 after-fee monthly returns. "Net Alpha + 12b-1" is the net alpha plus 1/12 of the fund's asset-weighted 12b-1 fee. For each performance measure, I focus on the performance of fund *i* in month *t* minus the value-weighted performance of actively managed funds in the same Lipper investment category and month, including those funds classified as "institutional" or "unclassified". In Panel A, I calculate the equal-weighted category-adjusted performance for each type of fund across the months in each calendar year. In Panel B, I calculate the value-weighted category-adjusted performance, where the performance of each fund is weighted by its AUM in the previous month. To obtain annualized differences, I multiply the resulting average monthly performance differences in each panel by 12.

Table 6. Annualized Differences in Monthly Returns of Actively Managed Funds

PANEL A. ACTIVELY MANAGED NON-SPECIALIZED DOMESTIC EQUITY						
Sample:	2003-2004			2003-2012		
	Net Return	Net Return	Net + 12b-1	Net Return	Net Return	Net + 12b-1
Dependent:						
Estimation:	OLS	WLS	WLS	OLS	WLS	WLS
Broker-sold fund?	-0.137 (0.260)	-0.254 (0.367)	0.115 (0.371)	-0.278 ** (0.116)	-0.350 * (0.196)	-0.094 (0.192)
Direct-sold fund?	0.719 ** (0.331)	0.790 (0.510)	0.750 (0.512)	0.118 (0.169)	0.355 * (0.212)	0.299 (0.213)
Difference in coefficients	0.856	1.044	0.635	0.396	0.706	0.392
P-value coefficients are equal	0.006 ***	0.057 *	0.255	0.023 **	0.003 ***	0.095 *
Category-month fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
N	50,861	50,861	50,142	246,553	246,553	241,066
Adjusted R2	0.838	0.893	0.893	0.906	0.932	0.933
PANEL B. ALL ACTIVELY MANAGED FUNDS (EXCEPT MUNICIPAL BOND FUNDS)						
Sample:	2003-2004			2003-2012		
	Net Return	Net Return	Net + 12b-1	Net Return	Net Return	Net + 12b-1
Dependent:						
Estimation:	OLS	WLS	WLS	OLS	WLS	WLS
Broker-sold fund?	-0.277 * (0.149)	-0.372 *** (0.142)	-0.127 (0.142)	-0.364 *** (0.087)	-0.412 *** (0.127)	-0.198 (0.126)
Direct-sold fund?	0.600 *** (0.213)	0.154 (0.162)	0.067 (0.163)	0.059 (0.128)	0.058 (0.142)	0.000 (0.146)
Difference in coefficients	0.877	0.526	0.194	0.422	0.469	0.198
P-value coefficients are equal	0.000 ***	0.012 **	0.368	0.001 ***	0.003 ***	0.200
Category-month fixed effects?	Yes	Yes	Yes	Yes	Yes	Yes
N	123,004	123,004	121,096	640,118	640,118	619,154
Adjusted R2	0.835	0.901	0.901	0.890	0.933	0.933

Note: This table reports the results of OLS and WLS regressions. The unit of observation is actively managed fund i in month t . The sample is limited to funds that I can classify as direct-sold, broker-sold, or institutional (based on the channel through which the fund distributes the largest percent of its assets). "Net return" is the fund's after-fee monthly return. "Net Return + 12b-1" is the net return plus 1/12 of the fund's asset-weighted 12b-1 fee. The independent variables of interest are dummy variables indicating whether fund i is broker-sold or direct-sold. Institutional funds are the omitted category. I report the difference in estimated coefficients along with p-values from the hypothesis test that the coefficient on the broker-sold dummy variable is equal to the coefficient on the direct-sold dummy variable. All specifications include category-month fixed effects, so that I am comparing returns of funds in the same category in the same month. Estimation via OLS gives equal weight to each fund-month observation, while estimation via WLS gives more weight to funds with larger AUM in the previous month. The three columns on the left focus on returns in 2003 and 2004, the two years that overlap with the sample period in Bergstresser, Chalmers, and Tufano (2009) and Del Guercio and Reuter (2014). The three columns on the right focus on returns between 2003 and 2014. Coefficients have been annualized so that 1.000 equals 1.000% per year. Standard errors are clustered on mutual fund family.

Table 7. Annualized Differences in Monthly Returns of Active and Passive Domestic Equity Funds, 2003-2012

Sample: Dependent: Estimation:	2003-2012			
	Net Return	Net + 12b-1	Alpha	Alpha + 12b-1
	WLS	WLS	WLS	WLS
Broker-sold fund? * Index fund?	0.109 (0.398)	0.366 (0.406)	-0.083 (0.274)	0.156 (0.256)
Broker-sold fund? * Active fund?	-0.710 *** (0.246)	-0.400 (0.245)	-0.719 *** (0.232)	-0.408 * (0.223)
Direct-sold fund? * Index fund?	0.799 ** (0.314)	0.790 ** (0.326)	0.919 *** (0.196)	0.906 *** (0.206)
Direct-sold fund? * Active fund?	---	---	---	---
Difference in broker-sold coefficients	0.820	0.766	0.636	0.564
P-value coefficients are equal	0.016 **	0.023 **	0.043 **	0.049 **
Category-month fixed effects?	Yes	Yes	Yes	Yes
Family-category-month fixed effects?	---	---	---	---
N	188,261	184,561	173,644	172,713
Adjusted R2	0.938	0.939	0.290	0.292

Note: This table reports the results of WLS regressions. The unit of observation is actively or passively managed domestic equity fund i in month t . The sample is limited to funds that I can classify as direct-sold or broker-sold (based on the channel through which the fund distributes the largest percent of its assets). "Net return" is the fund's after-fee monthly return. "Net Return + 12b-1" is the net return plus 1/12 of the fund's asset-weighted 12b-1 fee. "Net Alpha" is the Carhart (1997) four-factor alpha, estimated using the fund's prior 24 after-fee monthly returns. "Net Alpha + 12b-1" is the net alpha plus 1/12 of the fund's asset-weighted 12b-1 fee. The independent variables of interest are dummy variables indicating whether fund i is broker-sold and actively managed, broker-sold and passively managed, or direct-sold and passively managed. Direct-sold and actively managed is the omitted category. I report the difference in estimated coefficients for broker-sold funds along with p-values from the hypothesis test that the coefficient on the broker-sold dummy variables are equal. All specifications include category-month fixed effects, so that I am comparing returns of funds in the same category in the same month. Estimation via WLS gives more weight to funds with larger AUM in the previous month. Coefficients have been annualized so that 1.000 equals 1.000% per year. Standard errors are clustered on mutual fund family.

Table 8. Annualized Differences in Monthly Returns of Target Date Funds, 2003-2012

Sample: Dependent: Estimation:	2003-2012			
	Net Return	Net + 12b-1	Alpha	Alpha + 12b-1
	WLS	WLS	WLS	WLS
Broker-sold fund?	-0.658 ** (0.300)	-0.223 (0.365)	-0.544 * (0.277)	-0.164 (0.370)
Direct-sold fund?	0.470 (0.420)	1.309 *** (0.251)	0.196 (0.205)	0.516 ** (0.215)
Difference in broker-sold coefficients	1.128	1.532	0.739	0.680
P-value coefficients are equal	0.075 *	0.060 *	0.014 **	0.008 ***
Category-month fixed effects?	Yes	Yes	Yes	Yes
N	22,435	20,185	15,497	14,746
Adjusted R2	0.989	0.988	0.717	0.679

Note: This table reports the results of WLS regressions. The unit of observation is target-date fund i in month t . The sample is limited to funds that I can classify as direct-sold or broker-sold (based on the channel through which the fund distributes the largest percent of its assets). "Net return" is the fund's after-fee monthly return. "Net Return + 12b-1" is the net return plus 1/12 of the fund i 's asset-weighted 12b-1 fee. "Net Alpha" is a six-factor alpha, estimated using the fund's prior 24 after-fee monthly returns. I start with the four factors in the Carhart (1997) model and then add an international equity factor and a fixed income factor. "Net Alpha + 12b-1" is the net alpha plus 1/12 of the fund's asset-weighted 12b-1 fee. The independent variables of interest are dummy variables indicating whether fund i is broker-sold or direct-sold. Institutional funds are the omitted category. I report the difference in estimated coefficients along with p-values from the hypothesis test that the coefficient on the broker-sold dummy variable is equal to the coefficient on the direct-sold dummy variable. All specifications include target-date-month fixed effects, so that I am comparing returns of funds with the same target date in the same month (e.g., all 2050 funds in December 2010). Estimation via WLS gives more weight to funds with larger AUM in the previous month. Coefficients have been annualized so that 1.000 equals 1.000% per year. Standard errors are clustered on mutual fund family.