Have Mutual Funds Lost Their Information Advantage? Reversal of Returns to Mutual Fund Trades.

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Abstract

This paper documents a reversal in the performance of the trades of actively managed mutual funds. Prior to 2001 and consistent with Chen et al. (2000), stocks purchased by funds have significantly higher returns than stocks they sell. However, we find an opposite pattern after 2001 – stocks purchased by funds have lower returns than stocks sold. The difference in the performance of the trades (buys minus sales) portfolio across the two periods amounts to 1.45% per quarter. We find that this is more likely to be due to a decreasing information advantage rather than deteriorating performance of liquidity motivated trades. The effect is stronger for the largest funds, is present in both skilled and unskilled funds, and is concentrated among the most widely held stocks. Our results further indicate that limiting selective access to firm information, following the implementation of Regulation Fair Disclosure in 2001, is likely to contribute to the decrease in the information advantage of fund managers.

1 Introduction

Despite the apparent confidence of investors in actively-managed mutual funds, the academic literature has found mixed evidence whether fund managers can beat their benchmarks. Starting from Jensen (1968), a large body of literature studying mutual fund returns has found that mutual fund managers underperform passive benchmarks.[1] However, studies using portfolio holdings are able to identify fund managers who can systematically pick stocks that have superior future performance.[2] Using quarterly reported data on mutual fund holdings, Chen et al. (2000) investigate the aggregate trades of actively-managed mutual funds and find that stocks bought by funds outperform stocks sold by them. Their findings suggest that mutual fund managers have an information advantage and can systematically pick stocks.

In this paper, we investigate changes in the information advantage of actively-managed mutual funds over time. We follow the approach of Chen et al. (2000) and examine the future performance of stocks traded by mutual funds in the aggregate. This method provides us with a powerful test for detecting managerial skill, for two main reasons. First, the active decision to trade a stock represents a stronger opinion than the passive decision to hold it. Second, trades of fund managers in the aggregate represent the consensus opinion of the entire fund industry about the future performance of stocks. As a result, if fund managers can systematically identify under/over-valued stocks, we should be likely to observe this in the performance of the aggregate mutual fund trades.

We document diminishing returns to the trades of the actively-managed mutual fund industry. For the 1980 to 2000 period, we find results consistent with Chen et al. (2000). Stocks widely bought by mutual funds significantly outperform stocks widely sold over the next quarter. The difference is 0.59% on a risk-adjusted basis. However, between 2001 and 2010 the risk-adjusted difference in performance between the aggregate buys and sales among the mutual fund industry amounts to -0.86% in the following quarter. The latter result, although of high economic

[1] See also Malkiel (1995), Carhart (1997), and Fama and French (2010), among others.

[2] See, for instance, Grinblatt and Titman (1993), Wermers (1999), Wermers (2000), Daniel et al. (1997), Cohen et al. (2005), Kacperczyk et al. (2005), Alexander et al. (2007), Jiang et al. (2007), Kacperczyk and Seru (2007), Cremers and Petajisto (2007), and Baker et al. (2010).

magnitude, is statistically indistinguishable from zero, probably due to the low number of observations after 2001. Nevertheless, the difference of 1.45% of the trades (buys minus sells) between the two periods is statistically significant and is an economically substantial effect. We further examine the cumulative return of one dollar invested in the portfolio of mutual fund trades and find that by the end of 2010, all of the return due to the positive performance of the mutual fund trades prior to 2001 is offset by the negative performance following 2001.

We further show that most of the dynamics in the performance of the aggregate mutual fund trades is due to the purchasing decisions of fund managers. Prior to 2001, mutual fund buys have a significantly positive performance of 0.44% per quarter. After 2001, the effect size is similar, but with the opposite sign – -0.43% per quarter, albeit statistically not different from zero. The difference of 0.88% is marginally statistically significant and economically substantial. There are also diminishing returns to the performance of the sales of mutual funds, although the magnitude of the change in performance across the two periods is smaller (0.57% per quarter). The aggregate effect is concentrated among the stocks most widely held by mutual fund managers – large and growth stocks. We also find that the reversal in the return of the trades is monotonically increasing in stocks' ownership by mutual funds and in the stocks' analyst coverage.

To understand what drives these results, we investigate the performance of the aggregate trades conditional on several fund characteristics. We show that fund size is an important determinant of our findings – the reversal in the performance of both quarterly buys and sales is most pronounced for the largest funds. We further investigate the performance of trades, conditional on managerial skill. We use two proxies for skill – past risk-adjusted performance and the return gap measure of Kacperczyk et al. (2008). Our findings point to an economically comparable decrease in the performance of the trades across both skilled and non-skilled funds. These findings suggest that our main results are not solely driven by a decreasing informational advantage among skilled fund managers.

We distinguish between two channels that may potentially drive the results. On the one hand, the stock-picking skills of fund managers might have decreased over time. On the other hand, mutual fund managers might suffer increasingly more

from the price impacts of rebalancing their portfolios, for example after very high redemptions. We follow Alexander et al. (2007) and use fund flows as an identification mechanism for distinguishing information from liquidity driven trades. According to this approach, fund purchases (sales) when there are heavy outflows (inflows) are likely to be motivated by the belief that the stocks are undervalued (overvalued). On the other hand, purchases (sales) concurrent with investor inflows (outflows) are more likely to be made due to portfolio rebalancing needs and hence not related to future stock performance. We find no evidence for deteriorating performance of the liquidity motivated trades. However, we find an economic decrease in the valuation motivated trades, although statistical significance is weak.

We provide a further test for a potential liquidity-based explanation for our main findings. We investigate whether the performance of the trades of funds with volatile flows have worsened over time. If increasing costs of portfolio rebalancing are responsible for the diminishing returns to trades, we should find stronger effects among funds with more volatile flows. Our results do not indicate any significant changes in the performance of the trades among funds with volatile flows. Moreover, the main economic effects of diminishing returns to trades is not concentrated among such funds. Thus, we overall do not find support for the conjecture that the reason for the diminishing returns to the trades of actively managed mutual funds is increased cost of their liquidity driven trades.

Next, we take a closer look at the information-based hypothesis for the decrease in the performance of the aggregate mutual fund trades. We investigate the impact of a regulatory change, likely to decrease the private information of fund managers. Regulation Fair Disclosure (Reg FD), effective August 2000, limited the privileged access to firm information enjoyed by analysts and fund managers. Bhojraj et al. (2012) show that the effect of Reg FD is most pronounced for funds belonging to large fund families, since they are most likely to establish strong firm relations and command privileged access to information. Consistent with this hypothesis, we find that the drop in the performance of the aggregate purchases of mutual funds is driven by funds belonging to the largest fund families. However, we find a reversal in the performance of the sales only for funds belonging to medium-sized families. Consequently, we find that the decrease in the performance of the aggregate trades is significant for both fund belonging to large and medium sized

families. Thus, it appears that Reg FD can at best only partially explain the diminishing returns to mutual fund trades.

This study builds on a large stream of literature studying the information content of mutual fund holdings and trades. Wermers (2000) uses mutual fund holdings to decompose fund returns into various components and finds that funds pick stocks which outperform their benchmarks, but this outperformance does not translate into superior investor returns due to fees and transaction costs. Baker et al. (2010) show that stocks traded by mutual funds positively predict future earning surprises. Kacperczyk et al. (2005), Kacperczyk and Seru (2007), Kacperczyk et al. (2008), and Cremers and Petajisto (2007), among others, construct managerial skill proxies using fund holdings data. Wermers et al. (2012) and Jiang et al. (2012) further show that there is predictability in stock returns based on information from fund holdings.

The paper closest to ours is by Chen et al. (2000). We follow their methodology and study changes in the performance of the aggregate mutual fund trades. Having a sample ending in 1995, Chen et al. (2000) find that stocks purchased by mutual funds outperform stocks they sell. Based on this evidence, they conclude that trades reveal important information about the presence of stock-picking skills in the actively-managed mutual fund industry. Our main contribution is to show that mutual funds appear to have lost the informational advantage. We further contribute by investigating the driving factors behind this finding. We show that the most likely explanation for this is limitation of selective access to firm information, following the implementation of Reg FD in 2001. Even though Reg FD may not fully explain the reversal in the performance of aggregate trades, our findings suggest that a large part of the informational advantage of active fund managers, documented in previous studies, may be driven by selective access to firm information.

2 Data Selection and Summary Statistics

This study combines a number of commonly used databases - Thomson Financial/CDA S12 equity holdings database, CRSP Mutual Fund Database, and the

CRSP monthly stock files. The Thomson Financial/CDA database covers quarterly/ semi-annual holdings of mutual funds, as reported to the SEC or voluntarily reported by the funds. We select funds with an investment objective code of growth, aggressive growth, and growth and income. We further exclude all index funds. We link the Thomson Financial/CDA database to the CRSP Mutual Fund Database using the MFLINKS tool provided by WRDS. From the CRSP Mutual Fund Database we select active equity mutual funds only. Our final dataset covers funds included in both mutual fund databases, for which we have two consecutive quarterly reports in Thomson Financial/CDA. Since most actively managed US equity funds offer different share classes to investors, we sum the net assets over different share classes and take asset-weighted share class averages of different attributes such as returns and expense ratios. More details on the merging process and sample selection are available in Appendix A.

The summary statistics of the sample are reported in Table 1. We provide summary statistics separately for three subsamples of 10 years, as well as for the whole period. In total, our analysis is based on 1674 mutual funds, most of which were present in our sample between 1991 and 2000. The number of stocks in the portfolios of fund managers has been rising over time, with a mean of 109 and a median of 71. Similarly, funds have been growing in size over time and the mean size value is more than 4 times higher than the median. Means are higher than medians due to the presence of a few extremely large funds. We observe that net fund returns are much smaller in the last decade, which is driven by the crisis period after 2007. We investigate fund performance in greater details in Table 2. Despite the growth of the fund industry over time, average flows are on average negative after 2001. We further note an increase in the turnover and expenses charged by mutual funds from the 80s to the 90s, which remain on similar levels after 2001.

We analyze the performance of quarterly mutual fund trades. Similarly to Chen et al. (2000), we use benchmark-adjusted stock returns in the spirit of Daniel, Grinblatt, Titman, and Wermers (1997, henceforth DGTW). In the DGTW methodology, at the end of each June stocks are allocated to five size quintiles based on their market capitalization. Within each size quintile, stocks are further ranked in five quintiles based on their book-to-market ratios, yielding a total of 25 size

and book-to-market sorted portfolios. Next, stocks within each of the 25 portfolios are further subdivided in 5 additional portfolios, based on their prior 12 month return. This procedure results in 125 stock portfolios. The benchmark returns are then computed as the returns of the 125 portfolios in the next 12 months, after which the portfolios are updated. The procedure is further explained in Daniel et al. (1997) and Wermers (2004). We obtain the stock allocation and the returns of the benchmark portfolios from Russ Wermers' webpage[3] and calculate benchmark-adjusted stock return as stock returns in excess of the return of their respective benchmark portfolio.

Summary statistics regarding individual fund performance are reported in Table 2. As in Table 1, we document that fund net returns are much lower in the last decade of our sample. However, it is interesting to see that risk-adjusted performance is also much lower after 2001. To calculate fund alphas, we first estimate a four factor model including the Excess Return on the Market, SMB, HML, and Momentum for each fund over a 12 month interval prior to the period when we compute the return of the funds' trades. Next, we calculate monthly alphas over the next three months subtracting the estimated coefficients times the respective realizations of the risk factors from the fund's excess return. This way we make sure we report alphas and calculate benchmark-adjusted trades returns over the same period. We document a mean alpha of -0.12% per month after 2001, while the average over the whole sample is -0.01%. This result, albeit descriptive, is the first evidence that the performance associated with stock-picking of fund managers might have decreased with time.

Next, we investigate the average holdings return. It is computed as the quarterly benchmark-adjusted return of each stock held, where the weights are based on the dollar amount of stock owned by the fund. Results are similar. Both the mean and median values have decreased in the last decade. The magnitude of the decrease is substantial: the mean benchmark-adjusted return has decreased with 0.39%, while the median one has decreased by 0.14%. We further look at the average benchmark-adjusted returns of the stocks traded by mutual funds. Buys (sales) at times t are stocks for which a fund increased its stock holdings between two

[3]The DGTW benchmarks are available via `http://www.smith.umd.edu/faculty/rwermers/ftpsite/Dgtw/coverpage.htm`.

consecutive quarters. We calculate benchmark-adjusted returns separately for the buys and sales portfolios, where we weigh the stocks using the dollar volume traded. We define dollar volume traded as the change in stock holdings times the share price at the end of quarter t. In Table 2 we report the average fund difference between the buys and sales portfolios, which we label trades. Again, we find a pronounced decrease in both the mean and median values. The difference in the mean (median) quarter-ahead performance between the 00s and the 90s amounts to 0.39% (0.33%) per quarter.

Overall, the descriptive statistics indicate that there is a sharp decrease in the performance of individual funds after 2001. The effect is substantial both for net and risk-adjusted performance, as well as for before and after-fee performance. In the rest of the paper, we investigate the stock-picking trades of fund managers by focusing on their aggregate quarterly trades.

3 Changes in the Performance of the Aggregate Mutual Fund Trades

This paper investigates the performance of stocks bought and sold in the aggregate by mutual funds. Prior to 2004, mutual funds were required to disclose the composition of their portfolios on a semi-annual basis, although most of them reported voluntarily every quarter. Starting from May 2004, all funds are required to disclose the composition of their portfolios on a quarterly basis. Since we do not observe any actual trading decisions, we use the disclosed portfolio holdings in order to approximate the aggregate buys and sales of mutual funds. We define "buys" ("sales") in quarter t as stocks for which there is an increase (decrease) in the aggregate holdings among the funds included in our sample for which we have a holdings report in quarters t and $t-1$.

We compute quarter $t+1$ benchmark-adjusted returns where we weigh again the stocks in the buys and sales portfolio using the dollar volume traded. This way we give higher weight to stocks for which there is a stronger trading consensus among mutual funds, represented by the difference among the buying and selling volume in those stocks (the aggregate change in holdings times the per share stock price).

We define the "trades" portfolio as the difference between the "buys" and "sales" portfolios. This is the same procedure used for reporting descriptive statistics in Table 2, where buys, sales, and trades are calculated on an aggregate level.

We report the performance of the buys, sales, and trades portfolios over different time periods in Table 3. Over the whole sample period, the consensus buying and selling actions of the mutual fund industry do not add value. Panel A shows that the average benchmark-adjusted return of the trades portfolio is 0.14% per quarter, which is not statistically different from zero. However, these results miss important dynamics in the performance of the aggregate trades. In Panel B we report values for the 1980–2000 period and find results consistent with the study of Chen et al. (2000). The spread portfolio produces a significant abnormal return of 0.59% per quarter and the effect is driven by the buying decisions of fund managers. Chen et al. (2000) further show that the outperformance of the aggregate fund trades persists for one year. Thus, in the first two decades of our sample, changes in the portfolios of mutual fund managers were dominated by value-enhancing trades.

The results for the 2001–2010 period, presented in Panel C, indicate sizable reversals in the performance of the aggregate trades. Whereas prior to 2001 stocks widely bought by mutual fund outperformed their benchmark by 0.44% in the following quarter, they underperform by a similar amount after 2001 – -0.43%. A similar effect is present in the aggregate sales of mutual funds. This underperformance, however, is not statistically different from zero, possibly due to the small sample size (only 10 years). Yet, the change in performance between the two periods is statistically significant. In Panel D we report a very large economic magnitude in the reversal in the subsequent performance of the trades portfolio, which amounts to 1.45% per quarter. These results indicate that mutual funds may have lost the informational advantage they previously possessed.

We visualize the reversals in performance in Figure 1, where we plot the cumulative benchmark-adjusted return of 1 dollar invested in the buys, sales, and trades portfolios in 1980 during our sample period. The figure documents that the reversals in the performance of the cumulative aggregate trades portfolio start around year 2001. The peak in the hypothetical cumulative benchmark-adjusted

return of the trades portfolio occurs in 1999. However, after 2001, we observe a clear downward trend. By 2008, all of the profits from the value-enhancing trades of the mutual fund industry have evaporated due to value-destroying trades.

In Table 4 we report changes in the performance of aggregate trades, conditional on several stock characteristics. We first examine stock size in Panel A. At the end of each June, we rank all NYSE, AMEX, and NASDAQ stocks having at least two years of book value of equity data in Compustat and stock return and market capitalization data in CRSP in 5 quintiles, using NYSE size quintile breakpoints. We keep the stock quintile allocation until the next June, when we repeat the ranking procedure. We do the ranking every June in order to remain consistent with the DGTW methodology. Using quarterly holdings data from quarters t and $t-1$, we identify the portfolios of buys, sales, and trades separately for each size bucket as identified at the end of quarter $t-1$, and track their benchmark-adjusted performance in quarter $t+1$. Note that this implies that the number of stocks in each quintile differs, since we base portfolio breakpoints on NYSE stock data while mutual funds have a preference for holding large stocks. We find that in the pre-2000 period managers had an information advantage among both large and small stocks – all but the smallest size quintile have a positive benchmark-adjusted trades. After 2000, the trades among the most widely held stocks, the ones with the largest size, have significantly negative returns. However, we find that the difference in the trades portfolio is significantly negative for the three largest size quintiles. Moreover, the magnitude of the reversal in performance between the two periods is increasing in fund size.

We perform a similar analysis using stocks' book-to-market ratio. Instead of conditioning on stock size, at the end of quarter $t-1$ we sort stocks based on industry-adjusted book-to-market ratio, where we follow Wermers (2004) and allocate each to stock to a book-to-market quintile at the end of June.[4] We report results in Panel B of Table 4. Again, we find that the decrease in the trades performance is concentrated among the most preferred stocks by fund managers – growth stocks. More specifically, we find significantly different change in the performance of the two portfolios with the lowest book-to-market ratio, and the

[4]Note, however, that in contrast to Wermers (2004) and the DGTW methodology, we do not first rank funds based on firm size, since we are interested in capturing only the book-to-market dimension.

economic effect is decreasing with the book-to-market ratio.

The next stock characteristic we examine is momentum. We perform a similar analysis where in the first step we rank stocks at the end of quarter $t-1$ based on their past 12 month return calculated at the end of previous June. Again, the reason why we keep the June rankings is to remain consistent with the DGTW methodology. Then, we proceed with computing the quarterly buys, sales, and trades portfolios. Results are reported in Panel C of Table 4. Our results point to a significant decrease in the performance of the aggregate mutual funds for three out of the five deciles, although there does not seem to be a more pronounced pattern among either past losers or winners.

We next investigate the performance of mutual fund trades, conditional on mutual fund ownership. At the end of quarter $t-1$ we sort stocks in 5 portfolios based on the number of mutual funds owning the stock. We drop stocks that are not owned by any mutual fund in our sample. Next, using quarterly holdings data from quarters t and $t-1$, we identify the portfolios of buys, sales, and trades separately for each bucket as identified at the end of quarter $t-1$, and track their benchmark-adjusted performance in quarter $t+1$. We report results in Panel D of Table 4. We find that the reversal in the performance of aggregate trades is monotonically increasing in stock ownership. This result is not surprising – our analysis on stock size and book-to-market ratio points that the decrease in the informational advantage of funds is increasing in fund size and decreasing in book-to-market ratio.

The last stock characteristic we investigate is analyst coverage. Similarly to the stock ownership analysis in Panel D, we sort stocks at the end of quarter $t-1$ base on the number of analysts covering them. The data comes from IBES. Then, we proceed with calculating the buys, sales, and trades portfolios in quarter t separately for each quintile and investigate their benchmark-adjusted returns in quarter $t-1$. Results are summarized in Panel E of In Table 4. We find that the reversals in the performance of aggregate trades are concentrated month the stocks with the highest analyst coverage. Only quintile 5 has significant changes in the performance of the buys between the two periods.

The results in this section point to a statistically significant and economically

substantial reversal in the performance of the aggregate mutual fund trades. The effect is most pronounced among the most widely held stocks by mutual funds. This raises the possibility that after 2001 actively managed mutual funds might have lost the information advantage they previously had. In the next section we explore this finding in greater detail and suggest a few potential explanations.

4 Explanations for the Decrease in the Performance of the Aggregate Fund Trades

To better understand the driving factors behind the reversal in the trades of mutual fund managers, we examine the performance of the trades, conditional on several fund characteristics. We fist look at fund size. Chen et al. (2004) point that larger funds have higher liquidity costs that their smaller counterparts and note that organizational diseconomies may further drag the performance of large funds. Another often put argument why larger funds may perform worse than smaller funds is that managers of larger funds spread their informational advantages "too thin" (see, for example, Berk and Green (2004)). Therefore, investigating the impact of fund size on the performance of the aggregate trades can help us to better understand what drives the decrease in the informational advantage documented in the previous section.

We again use a portfolio sorting approach, according to which we first rank the funds in our sample in five buckets based on their size at the end of quarter $t-1$. Next, we identify the portfolios of buys, sales, and trades separately for each bucket, based on quarterly holdings data from quarters t and $t-1$, and track their benchmark-adjusted performance in quarter $t+1$. This procedure allows to investigate the consensus opinion about the performance of stocks separately for each size category of mutual funds.

Results are summarized in Table 5. We find that prior to 2001 the stock purchases among most size groups generated positive risk-adjusted returns. Interestingly though, during that period only the largest funds have a significantly positive value of their trades. This pattern completely reverts after 2000, where we document that the trades among the largest funds perform the worst. Even though

there are economically seizable decreases in the returns of the trades among all fund size groups, the reversals are strongest among the quintile containing the largest funds – 1.50% per quarter on a risk-adjusted basis. Sales among portfolios 2 and 4 have positive future benchmark-adjusted performance, indicating that managers are selling stocks in quarters before they appreciate in value. Overall, the findings in Table 5 suggest that the pattern of decreasing returns to mutual fund trades is mainly driven by the largest funds.

4.1 Managerial Skill

Some papers document the presence of (short-term) persistence in performance among both skilled and unskilled mutual fund managers.[5] One possibility for our findings is worsening performance among the least skilled funds. Under this conjecture we should still find positive returns to the trades amongst the most skilled funds and a widening gap between skilled and less skilled funds. Alternatively, the decrease in the trades performance documented in the previous section might be attributable to the most skilled funds losing their competitive edge. Thus, to better understand the driving factors behind our main findings, we investigate the aggregate performance of quarterly trades among groups composed on the basis of proxies for managerial skill.

We use two proxies for managerial skill. The first one is four-factor alpha. Even though past alpha is affected by luck and may not predict future performance very well, it contains a noisy signal about managerial skill (see, for example, Berk and Green (2004) and Huang et al. (2007)). Consequently, we perform similar tests as in Table 5, but instead of sorting funds on fund size, we sort funds on their past alpha, estimated from 12 month of returns where we use Excess Market Return, SMB, HML, and Momentum as risk factors.

We report results in Panel A of Table 6. In the pre-2001 period we find some evidence for return persistence. The benchmark-adjusted performance of the trades of funds belonging to the top quintile trades amounts to 1.34% in the following quarter. In the post-2001 period the return of the trades among funds with best past performance is still positive, but statistically not significantly different from

[5]See, for example, Hendricks et al. (1993), Gruber (1996), and Bollen and Busse (2005).

zero. During that period there is a negative benchmark-adjusted performance of the trades of funds belonging to the lowest three quintiles. In terms of statistical significance, there is a decrease among the return to trades for four out of the five groups. Nevertheless, the decrease in the performance of the trades is economically most substantial among the funds with worse past performance and is largest for the funds in quintile one – -1.67%.

The second proxy for managerial skill we use is the return gap measure of Kacperczyk et al. (2008). It compares the actual fund return with the hypothetical return of the fund's most recently disclosed holdings. The measure captures the impact of unobserved managerial actions. Kacperczyk et al. (2008) show that the return gap captures a persistent skill component and funds with past high return gap outperform their benchmarks in the future. Empirically, we sort funds on the basis of their past 4 quarter cumulative return gap values in quarter $t-1$, construct the buys, sales, and trades portfolios using holdings data in quarters t and $t-1$ separately for each portfolio, and track their benchmark-adjusted performance in quarter $t+1$.[6]

Results are reported in Panel B of Table 6. Prior to 2001 and consistent with Kacperczyk et al. (2008), we find evidence that the return gap is related to skill. We report a significantly positive return to the buys of funds in quintile five and the trades of funds in quintile 4. However, there are economically large and statistically significant reversals in the post 2001 for all but the two lowest quintiles. The magnitude of the reversals among the top three return gap buckets range between 0.99% and 1.11% per quarter on a risk-adjusted basis. The results in Panel B imply that skilled fund managers might have lost their competitive edge.

However, the overall evidence in this section is mixed. Our analysis using the two proxies of managerial skill does not provide consistent results. When we proxy skill with past performance, we find uniform decreases among both funds with good and bad past performance. Moreover, the deterioration in the returns of the trades seems to be strongest for the worst performing funds. However, proxying skill with the return gap measure of Kacperczyk et al. (2008), we find that reversals are strongest among the most skilled funds, both in terms of statistical significance

[6]We construct quarterly return gaps the same way as in Kacperczyk et al. (2008)

and economic magnitude.

4.2 Liquidity vs Information

Broadly speaking, there are two reasons for mutual fund managers to trade. First, fund managers may have information about the future performance of stocks. A number of papers provide results consistent with the notion that managers possess stock-picking skills. For example, Baker et al. (2010) find that mutual fund trades predict earnings surprises. However, a large portion of the trades may be liquidity driven, for example due to portfolio rebalancing following fund flows. Coval and Stafford (2007) and Lou (2012) point that liquidity motivated trades have the potential to move prices away from fundamentals. Consequently, in order to better understand what drives our main results, we separate the trades of the mutual fund managers based on whether they are information or liquidity driven.

Our approach follows Alexander et al. (2007). According to their identification strategy, buys concurrent with heavy investor outflows are likely to be motivation driven. On the other hand, mutual fund purchases happening when there are heavy inflows are more likely to be liquidity driven. A similar argument can be made about investor sells. For each fund in each point in time calculate the portfolios of buys and sells. Next, we calculate the following metrics:

$$BF_t^i = \frac{Buys_t^i - Flow_t^i}{TNA_{t-1}^i} \tag{1}$$

$$SF_t^i = \frac{Sells_t^i + Flow_t^i}{TNA_{t-1}^i} \tag{2}$$

where i indexes funds and t indexes time. $Flow_t^i$ is the investors flow for fund i in quarter t and TNA_{t-1}^i stands for fund i's total net assets at the end of quarter $t-1$. All three variables are measured in dollar terms. According to this procedure, buy portfolios with a high (low) BF score are characterized with high (low) stock purchases when there are high outflows (inflows). Similarly, the ranking procedure assigns high (low) SF scores to sell portfolios with high (low) stock sells when there are high inflows (outflows). Alexander et al. (2007) show that high BF

buys outperform low BF buys. This happens because high BF portfolios consist of purchases happening at the same time with heavy outflows are thus likely to be valuation driven. On the other hand, low BF portfolios consist of purchases concurrent with heavy inflows which are more likely to be driven by the need to work off excess liquidity. Their results on the sell side is weaker, potentially due to the short-sell constraints imposed on mutual fund managers.

We investigate whether our main results are driven by a decreasing informational advantage or by a deterioration in the performance of liquidity driven trades using the approach of Alexander et al. (2007). For each fund we sort the quarterly buy and sell portfolios into quintiles based on the BF and SF metrics and examine their performance in the next quarter. We do this separately for the pre-2001 and post-2001 periods. The results are summarized Table 7. Consistent with Alexander et al. (2007), we find that the information-motivation purchases of mutual fund managers outperform those driven by liquidity needs. The effect is stronger in the pre-2001 sample. We find that the information-motivated purchases in quintile 1 generate 0.45% risk-adjusted return per quarter before 2001 and 0.29% after 2001, both of which are statistically different from zero. The difference of 16bp, however, does not reach conventional levels of statistical significance. We further don't find evidence for a deteriorating performance of the liquidity motivated trades in quintile 5 – there is in fact a small improvement of 0.10% per quarter, albeit statistically not different from zero. Keeping in mind the caveat of low statistical significance, these results point in the direction of decreasing informational advantage rather than a deterioration in the performance of the liquidity driven trades.

To further investigate whether the liquidity driven trades of fund managers have decreased over time, we analyze the performance of fund trades, conditional on the volatility of their flows. Funds experiencing volatile flows are likely to have a larger number of potentially value-destroying non-informational trades. To test this conjecture, we sort on the standard deviation of the fund's flows over the previous 12 months. Results are reported in Table 8. We find that prior to 2001 funds with the least volatile flows produced the best performing purchases, while those with the most volatile flows had the best performing sales. If deteriorating performance among the liquidity driven trades drive the changes in the performance of the aggregate mutual fund trades, we should observe a

negative change in the performance of the trades of the funds with most volatile flows. The results do not offer support for this hypothesis. We find no statistically significant changes in the performance of the trades of funds with most volatile flows in quintile five, although we do find a statistically significant change in the performance of the trades of funds in quintile four. Moreover, the only funds with a statistically significant deterioration in purchases are the ones with the least volatile flows.

4.3 Reduction in Selective Access to Firm Information

The results in Section 4.2 indicate that the reversal in the performance of the trades of mutual funds is probably due to a decrease in their informational advantage rather than a deterioration in their liquidity driven trades. Pinning down a particular event that has directly decreased the private information fund managers use when making investment decisions can potentially better support the conjecture that the deteriorating returns to mutual fund trades are due to a decreasing information advantage. In particular, we investigate whether a major regulatory reform – Regulation Fair Disclosure (Reg FD) , has decreased the information content in the trades of fund managers.

The SEC promulgated Regulation Fair Disclosure (Reg FD) in August 2000. Prior to the institution of Reg FD, there were concerns that analysts and fund managers had unjustly benefited from selective access to firm information. The purpose of Reg FD was to limit the privileged access that institutions and analysts enjoyed and thus prevent parties with selective access to information from making profits at the expense of those left in the dark. Reg FD has negatively affected the accuracy of analysts' forecasts and increased the dispersion in their forecasts, consistent with the notion that they had benefited from privileged access (see Bailey et al. (2003); Gintschel and Markov (2004); Groysberg et al. (2008)).

Bhojraj et al. (2012) argue that the privileged access to firm information was more pronounced for funds belonging to larger fund families. The reason is that funds belonging to larger fund families constitute a larger portion of the existing and potential investor base of the firm and could therefore command preferential treatment. Bhojraj et al. (2012) provide evidence consistent with their hypothesis

that funds belonging to larger families experienced a larger decrease in performance following the implementation of Reg FD.

To test the reduction in privileged information hypothesis, we condition the analysis on fund family assets under management. We rank the funds in our sample in five buckets based on their fund family size in quarter $t-1$, identify the portfolios of BUYS, SALES, and TRADES separately for each bucket, based on quarterly holdings data from quarters t and $t-1$, and track their benchmark-adjusted performance in quarter $t+1$.

The results in Table 9 show that the purchases of funds belonging to the largest family size quintile have the highest decrease in performance between the two periods. The difference amounts to 1% per quarter and statistically different from zero. This evidence is consistent with the hypothesis that Reg FD is responsible for the aggregate results since the reversals in performance are strongest for group of funds that most likely benefited most from the privileged access to firm information. Moreover, the promulgation of Reg FD roughly coincides with the breakpoint in the cumulative performance of the trades portfolio, documented in Figure 1. Table 9 further points that there is a significantly positive change among the sales of funds belonging to the middle portfolio, indicating that there are probably additional dynamics that are not captured by Reg FD. Thus, our results suggest that although Reg FD may be responsible for the decrease in the performance of the aggregate purchases of the actively managed mutual funds, it may not fully explain the reversal in the trades portfolio.

5 Conclusion

This paper studies the performance of the aggregate trades of actively managed mutual funds in the USA. We find evidence for a deterioration in the performance of the trades of mutual fund managers. Prior to 2001 and consistent with Chen et al. (2000), stocks purchased by mutual funds have significantly higher returns than stocks they sell. However, after 2001, mutual funds buy stocks which have significantly lower returns than stocks the sell. The effects we document are economically large. Prior to 2001, the purchases of mutual funds have a significantly

positive risk-adjusted performance of 0.44% per quarter. After 2001, we find an effect size of similar magnitude, but an opposite sign – -0.43%. The difference of 0.88% is marginally significant and economically substantial. We further report a reversal in the performance of the aggregate sales, although the magnitude is smaller and the effect is statistically not different from zero. As a result, the difference in the performance of the trades (buys minus sales) portfolio across the two periods amounts to 1.45% and is statistically different from zero. The effect is most pronounced among large and growth stocks and stocks with high institutional ownership and analyst coverage.

We differentiate two potential channels for the above results. On the one hand, funds might have lost their competitive edge and consequently decreased their ability to pick stocks. On the one hand, there may be an increase in the costs associated with liquidity driven trades. Following Alexander et al. (2007), we use fund flows to identify whether trades are liquidity or information driven. Our finds are consistent with a decreasing information advantage rather than a deterioration in the performance of the liquidity driven trades.

We further propose a particular regulatory reform which might be responsible for the reversal of the returns to the mutual fund trades. Prior to 2001, some institutional investors could command a privileged access to firm information and consequently trade on it. Regulation Fair Disclosure (Reg FD), effective 2001, aimed at limiting such selective access. Our results suggest that Reg FD is likely to contribute to the decrease in the informational advantage of fund managers. However, our results also point that Reg FD may not be the sole driving factor for our main results.

Further research is needed to unveil the rest of the contributing factors for the reversal in the trades. For instance, Chordia et al. (2008) show that liquidity is positively related to market efficiency which in turn may leave less scope for value-enhancing trades. The period after 2000 corresponds to a number of events, which have increased liquidity, such as the reduction in tick size in 2001 (see Bessembinder (2003)) and the rise in algorithmic trading (see Hendershott et al. (2011)). Consequently, improvements in market liquidity during the last decade are also likely to contribute to the decrease in the returns to trades. Dasgupta et al.

(2011) show that persistently sold stock by institutions outperform stock that they persistently buy. Thus, another possibility is that due to the increase in the size of the mutual fund industry, persistent institutional trading might have increased and hence reduced the performance of the aggregate trades. However, this is less likely to be the case since our results are concentrated among the largest stocks while the results of Dasgupta et al. (2011) are driven by stocks in the bottom size tertile.

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Appendices

Appendix A Database Construction and Sample Selection

We start by selecting all mutual funds from the Thomson Financial/CDA database with an investment objective code of either growth, aggressive growth, or growth and income between 1980 and 2010. We delete funds that have the strings 'INDEX', 'INDE', 'INDX', 'S&P", or 'MSCI' in their names. Next, from CRSP Mutual Fund Database we select all actively managed equity mutual funds between 1980 and 2010. To ensure that we cover the universe of domestic diversified equity funds, for which the holdings data is most reliable, we select in our sample only funds with one of the following objective codes, provided by Lipper, Wiesenberger, and Strategic Insight and available in the CRSP Mutual Fund Database:

- Lipper: 'EI', 'EIEI', 'EMN', 'FLX', 'G', 'GI', 'I', 'LCCE', 'LCGE', 'LCVE', 'LSE', 'MC', 'MCCE', 'MCGE', 'MCVE', 'MLCE', 'MLGE', 'MLVE', 'SCCE', 'SCGE', 'SCVE', 'SESE', 'SG'
- Wiesenberger:'SCG', 'AGG', 'G', 'G-S', 'S-G', 'GRO', 'LTG', 'I', 'I-S', 'IEQ', 'ING', 'GCI', 'G-I', 'G-I-S', 'G-S-I', 'I-G', 'I-G-S', 'I-S-G', 'S-G-I', 'S-I-G', 'GRI', 'MCG'
- Strategic Insight: 'SCG','GRO','AGG','ING','GRI','GMC'

We link the two mutual fund databases, using the MFLINKS database provided by WRDS. We select funds with two consecutive quarterly holdings data from Thomson Financial/CDA for which we have net asset and return data from CRSP. More information on how MFLINKS assigns a unique fund identifier to each fund in the two databases can be found in Wermers (2000). We manually check the MFLINKS databases for assigning reports from different Thomson Financial funds to the same fund in MFLINKS, and resolve such problems manually.

If a fund offers multiple share classes to investors, we aggregate fund information data across different share classes. For total net assets (TNA) under management, we sum the TNAs of individual shares. For funds's age, we select the age of the oldest share class. For the other fund attributes (net returns, expenses, turnovers,

etc.), we take the weighted average of the attributes of the individual share classes, where the weights are the lagged TNAs of the individual share classes.

Table 1: Sample Summary Statistics.

This table provides summary statistics of the characteristics of mutual funds in our sample.

Time-Period	# of funds	Stock holdings		Net Assets		Net Monthly Return		Monthly Flow		Yearly Turnover		Yearly Expense Ratio	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1980 - 1990	471	73	55	331	114	1.09	1.32	0.68	−0.02	78	59	1.15	1.00
1991 - 2000	1586	107	71	1088	188	1.42	1.58	3.08	0.24	90	68	1.30	1.21
2001 - 2010	1254	122	78	2017	382	0.23	0.82	−0.11	−0.56	87	67	1.32	1.21
1980 - 2010	1674	109	71	1394	237	0.85	1.19	1.37	−0.20	87	66	1.29	1.19

Table 2: Fund Performance – Summary Statistics.

This table provides individual fund performance summary statistics.

Time-Period	Quarterly Net Return		Monthly Alpha		Benchmark-adjusted Holdings Return		Benchmark-adjusted Trades Return	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
1980 - 1990	3.72	4.62	0.05	0.04	0.23	0.13	0.00	0.07
1991 - 2000	3.54	3.36	0.10	−0.04	0.35	0.12	0.18	0.11
2001 - 2010	1.06	2.16	−0.12	−0.12	−0.04	−0.02	−0.21	−0.22
1980 - 2010	2.36	2.93	−0.01	−0.07	0.15	0.04	−0.03	−0.07

Table 3: The Performance of the Stocks Traded by Mutual Funds.

For each stock owned by mutual funds in our sample we calculate the change in fund ownership between quarters t and $t-1$. We define BUYS (SALES) as stocks for which there is an increase (decrease) in the aggregate stock ownership between quarters t and $t-1$. We calculate benchmark-adjusted returns for the BUYS and SALES portfolios for quarter $t+1$, where we weight the stocks using the change in the number of shares owned by mutual funds times the per share price at the end of quarter $t-1$. TRADES are defined as the difference between BUYS and SALES. We report results separately for 1980-2010 (Panel A), 1980-2000 (Panel B), 2001-2010 (Panel C). In Panel D we calculate the differences between the 2001-2010 and the 1980-2000 periods. Results are expressed in percentage points per quarter. * denotes statistical significance on the 10% level, ** denotes statistical significance on the 5% level, and *** denotes statistical significance on the 1% level.

Buys	Sales	Trades	Buys	Sales	Trades
A: 1980-2010			B: 1980-2000		
0.17	0.03	0.14	0.44**	−0.15	0.59*
(0.22)	(0.20)	(0.31)	(0.20)	(0.25)	(0.32)
C: 2001-2010			D: (2001-2010) - (1980-2000)		
−0.43	0.42	−0.86	−0.88*	0.57	−1.45**
(0.40)	(0.31)	(0.64)	(0.45)	(0.40)	(0.71)

Table 4: Stock Characteristics and Mutual Fund Trades

At the end of each quarter $t-1$ we sort stocks in 5 buckets, based on a stock characteristic. In Panel A we sort stocks on stock size. Stock size is defined using NYSE size breakpoints as of the latest June. This way we effectively keep the same stock allocation from July until the next June. In Panel B we sort stocks on stock industry-adjusted book-to-market ratio. We follow the definitions in Wermers (2004) when computing the industry-adjusted book-to-market ratio and use allocations as of the latest June. This way we effectively keep the same stock allocation from July until the next June. In Panel C we sort stocks on stock momentum. Momentum is defined as the past 12 month return as of the latest June. This way we effectively keep the same stock allocation from July until the next June. In Panel D we sort stocks on mutual fund ownership. Mutual fund ownership is defined as the number of funds owning the stock at the end of quarter $t-1$. In Panel E we sort stocks on the number of analysts covering the stock at end of quarter $t-1$. Next, we calculate the change in mutual fund ownership between quarters $t-1$ and t, separately for each stock in each bucket. We define BUYS (SALES) as stocks for which there is an increase (decrease) in the aggregate stock ownership between quarters t and $t-1$, separately for each bucket. We calculate benchmark-adjusted returns for the BUYS and SALES portfolios for quarter $t+1$, where we weight the stocks using the change in the number of shares owned by mutual funds times the per share price at the end of quarter $t-1$. TRADES are defined as the difference between BUYS and SALES. We report results separately for 1980-2000, 2001-2010, and the differences between the 2001-2010 and the 1980-2000 periods. Results are expressed in percentage points per quarter. * denotes statistical significance on the 10% level, ** denotes statistical significance on the 5% level, and *** denotes statistical significance on the 1% level.

	A: Size								
	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.26	1.34***	−1.07**	0.40	0.82*	−0.42	0.14	−0.51	0.65
	(0.35)	(0.49)	(0.44)	(0.49)	(0.50)	(0.56)	(0.60)	(0.70)	(0.72)
2	0.84**	−0.09	0.93***	0.98**	0.69	0.30	0.14	0.77	−0.63
	(0.33)	(0.37)	(0.35)	(0.39)	(0.46)	(0.40)	(0.51)	(0.59)	(0.53)
3	0.54	−0.11	0.65*	0.43	1.26***	−0.83	−0.11	1.37**	−1.48**
	(0.39)	(0.38)	(0.38)	(0.55)	(0.43)	(0.57)	(0.68)	(0.58)	(0.69)
4	0.98**	0.04	0.94**	0.46	0.74	−0.29	−0.52	0.71	−1.23*
	(0.39)	(0.35)	(0.40)	(0.69)	(0.46)	(0.63)	(0.79)	(0.57)	(0.74)
5 (high)	0.28	−0.58**	0.86***	−0.63	0.43	−1.07*	−0.91	1.02**	−1.93***
	(0.21)	(0.28)	(0.28)	(0.53)	(0.37)	(0.57)	(0.57)	(0.46)	(0.63)

Table 4 – continued from previous page

	B: Book-to-market								
	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.58	−0.66*	1.24***	−0.43	0.71	−1.14*	−1.01	1.37**	−2.38***
	(0.36)	(0.40)	(0.38)	(0.62)	(0.46)	(0.65)	(0.71)	(0.61)	(0.75)
2	0.53**	−0.06	0.60*	−0.49	0.76*	−1.25***	−1.02**	0.83	−1.85***
	(0.24)	(0.32)	(0.32)	(0.45)	(0.39)	(0.42)	(0.51)	(0.51)	(0.53)
3	0.37	0.35	0.03	−0.05	−0.23	0.18	−0.42	−0.57	0.15
	(0.41)	(0.32)	(0.36)	(0.84)	(0.49)	(0.76)	(0.93)	(0.59)	(0.84)
4	0.12	−0.96**	1.07***	0.45	−0.01	0.46	0.33	0.94	−0.61
	(0.29)	(0.48)	(0.40)	(0.89)	(0.66)	(0.69)	(0.94)	(0.82)	(0.80)
5 (high)	0.01	−0.16	0.17	2.15*	0.16	2.00*	2.14	0.32	1.82
	(0.53)	(0.44)	(0.53)	(1.26)	(1.24)	(1.03)	(1.37)	(1.32)	(1.16)
	C: Momentum								
	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.69	0.71	−0.03	−0.67	−0.01	−0.66	−1.35	−0.72	−0.63
	(0.59)	(0.75)	(0.67)	(1.24)	(1.02)	(0.87)	(1.37)	(1.27)	(1.10)
2	0.66**	−0.51	1.16***	−0.29	0.45	−0.74	−0.95	0.96	−1.91***
	(0.33)	(0.40)	(0.35)	(0.74)	(0.54)	(0.64)	(0.82)	(0.67)	(0.73)
3	0.55**	0.60*	−0.05	−0.75	0.90**	−1.65**	−1.30*	0.30	−1.59**
	(0.23)	(0.31)	(0.31)	(0.68)	(0.39)	(0.73)	(0.72)	(0.50)	(0.79)
4	0.33	−0.20	0.52	0.89*	0.24	0.65	0.57	0.44	0.13
	(0.25)	(0.37)	(0.36)	(0.49)	(0.50)	(0.60)	(0.55)	(0.62)	(0.70)
5 (high)	0.48	−0.18	0.66	−0.34	0.80	−1.15*	−0.83	0.98	−1.81**
	(0.39)	(0.45)	(0.47)	(0.63)	(0.85)	(0.64)	(0.74)	(0.96)	(0.80)

Table 4 – continued from previous page

	D: Mutual Fund Ownership								
	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.15	0.01	0.13	0.00	−0.10	0.09	−0.15	−0.11	−0.04
	(0.40)	(0.37)	(0.44)	(0.73)	(1.06)	(0.84)	(0.83)	(1.12)	(0.95)
2	0.25	−0.29	0.53	0.40	0.57	−0.17	0.16	0.86	−0.70
	(0.34)	(0.45)	(0.40)	(0.54)	(0.68)	(0.58)	(0.64)	(0.82)	(0.71)
3	0.39*	−0.06	0.45	−0.43	0.04	−0.47	−0.82*	0.10	−0.92*
	(0.23)	(0.33)	(0.32)	(0.36)	(0.33)	(0.36)	(0.43)	(0.46)	(0.49)
4	0.58	0.35	0.23	0.36	1.19***	−0.83*	−0.22	0.83*	−1.06*
	(0.41)	(0.29)	(0.39)	(0.48)	(0.36)	(0.43)	(0.63)	(0.46)	(0.58)
5 (high)	0.45**	−0.26	0.70***	−0.55	0.35	−0.91*	−1.00*	0.61	−1.61***
	(0.19)	(0.25)	(0.24)	(0.57)	(0.32)	(0.55)	(0.60)	(0.41)	(0.60)
	E: Analsyt Coverage								
	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	−0.37	−0.03	−0.33	−0.91	0.00	−0.90	−0.54	0.03	−0.57
	(0.45)	(0.58)	(0.65)	(0.57)	(0.78)	(0.95)	(0.73)	(0.97)	(1.15)
2	−0.02	−0.20	0.18	−0.73	0.65	−1.39*	−0.72	0.85	−1.57
	(0.40)	(0.57)	(0.65)	(0.63)	(0.63)	(0.78)	(0.75)	(0.86)	(1.01)
3	0.01	−0.27	0.28	0.06	0.62	−0.56	0.05	0.89	−0.84
	(0.48)	(0.43)	(0.56)	(0.82)	(0.55)	(0.90)	(0.94)	(0.70)	(1.06)
4	0.38	0.69	−0.31	0.47	−0.19	0.66	0.08	−0.88	0.96
	(0.41)	(0.56)	(0.72)	(0.68)	(0.55)	(0.79)	(0.80)	(0.79)	(1.07)
5 (high)	0.43**	−0.28	0.71**	−0.63	0.50	−1.13	−1.06*	0.77*	−1.83**
	(0.20)	(0.27)	(0.34)	(0.61)	(0.34)	(0.77)	(0.64)	(0.44)	(0.84)

Table 5: Fund Size and Returns to Mutual Fund Trades

At the end of quarter $t-1$ we sort funds in our sample in 5 buckets based on their net assets under management. For each stock owned by mutual funds in our sample we calculate the change in fund ownership between quarters t and $t-1$, separately for each bucket. We define BUYS (SALES) as stocks for which there is an increase (decrease) in the aggregate stock ownership between quarters t and $t-1$, separately for each bucket. We calculate benchmark-adjusted returns for the BUYS and SALES portfolios for quarter $t+1$, where we weight the stocks using the change in the number of shares owned by mutual funds times the per share price at the end of quarter $t-1$. TRADES are defined as the difference between BUYS and SALES. We report results separately for 1980-2000, 2001-2010 and for the differences between the 2001-2010 and the 1980-2000 periods. Results are expressed in percentage points per quarter. * denotes statistical significance on the 10% level, ** denotes statistical significance on the 5% level, and *** denotes statistical significance on the 1% level.

	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.47**	0.22	0.25	0.22	0.26	−0.04	−0.25	0.04	−0.29
	(0.20)	(0.30)	(0.28)	(0.35)	(0.20)	(0.33)	(0.41)	(0.36)	(0.44)
2	0.32	0.19	0.13	0.37	0.38**	−0.02	0.04	0.19	−0.15
	(0.21)	(0.19)	(0.23)	(0.37)	(0.16)	(0.33)	(0.43)	(0.25)	(0.40)
3	0.46**	0.31	0.16	0.06	0.32	−0.26	−0.40	0.02	−0.42
	(0.22)	(0.19)	(0.23)	(0.32)	(0.22)	(0.29)	(0.39)	(0.30)	(0.37)
4	0.44**	0.03	0.41**	0.55	0.46**	0.09	0.10	0.42	−0.32
	(0.20)	(0.19)	(0.20)	(0.48)	(0.21)	(0.43)	(0.52)	(0.29)	(0.48)
5 (high)	0.42**	−0.18	0.59***	−0.53	0.37	−0.91**	−0.95**	0.55*	−1.50***
	(0.16)	(0.20)	(0.21)	(0.41)	(0.25)	(0.41)	(0.44)	(0.32)	(0.46)

Table 6: Managerial Skill and Returns to Mutual Fund Trades

At the end of quarter $t-1$ we sort funds in our sample in 5 buckets based on an estimate of managerial skill. In Panel A we proxy managerial skill with past 12 month alpha. The risk facrors we use include the Market Return, SMB, HML, and Momentum. In Panel B, we proxy managerial skill with past 12 month cumulative return gap. The return gap calculations follow Kacperczyk et al. (2008). Next, for each stock owned by mutual funds in our sample we calculate the change in fund ownership between quarters t and $t-1$, separately for each bucket. We define BUYS (SALES) as stocks for which there is an increase (decrease) in the aggregate stock ownership between quarters t and $t-1$, separately for each bucket. We calculate benchmark-adjusted returns for the BUYS and SALES portfolios for quarter $t+1$, where we weight the stocks using the change in the number of shares owned by mutual funds times the per share price at the end of quarter $t-1$. TRADES are defined as the difference between BUYS and SALES. We report results separately for 1980-2000, 2001-2010 and for the differences between the 2001-2010 and the 1980-2000 periods. Results are expressed in percentage points per quarter. * denotes statistical significance on the 10% level, ** denotes statistical significance on the 5% level, and *** denotes statistical significance on the 1% level.

	A: Sorting on Alpha								
	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.12	0.01	0.12	−1.45*	0.10	−1.55***	−1.57**	0.09	−1.67**
	(0.26)	(0.28)	(0.31)	(0.75)	(0.34)	(0.59)	(0.80)	(0.44)	(0.66)
2	0.10	0.02	0.08	−0.28	0.74**	−1.02***	−0.38	0.72*	−1.10**
	(0.21)	(0.24)	(0.24)	(0.39)	(0.31)	(0.35)	(0.44)	(0.40)	(0.43)
3	0.40**	−0.02	0.42*	−0.52	0.40*	−0.91***	−0.91**	0.42	−1.33***
	(0.18)	(0.25)	(0.23)	(0.42)	(0.24)	(0.33)	(0.46)	(0.34)	(0.41)
4	0.09	0.07	0.02	−0.10	0.19	−0.29	−0.19	0.12	−0.31
	(0.18)	(0.25)	(0.26)	(0.39)	(0.26)	(0.39)	(0.42)	(0.36)	(0.47)
5 (high)	1.00***	−0.34	1.34***	0.43	0.03	0.40	−0.58	0.37	−0.94*
	(0.27)	(0.34)	(0.29)	(0.53)	(0.34)	(0.41)	(0.60)	(0.48)	(0.51)

Table 6 – continued from previous page

	B: Sorting on Return Gap								
	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.37	0.17	0.20	0.33	−0.04	0.36	−0.04	−0.21	0.17
	(0.30)	(0.34)	(0.30)	(0.64)	(0.30)	(0.51)	(0.71)	(0.46)	(0.59)
2	0.36	−0.19	0.55	0.12	0.07	0.06	−0.24	0.25	−0.49
	(0.31)	(0.37)	(0.41)	(0.47)	(0.20)	(0.39)	(0.57)	(0.42)	(0.56)
3	0.15	0.32	−0.17	−0.64	0.64**	−1.28**	−0.79	0.32	−1.11*
	(0.25)	(0.28)	(0.29)	(0.61)	(0.27)	(0.53)	(0.66)	(0.39)	(0.60)
4	0.17	−0.37	0.54*	−0.30	0.31	−0.61*	−0.48	0.68*	−1.16***
	(0.28)	(0.30)	(0.30)	(0.36)	(0.20)	(0.33)	(0.45)	(0.36)	(0.44)
5 (high)	0.64**	0.18	0.46	−0.16	0.37	−0.53	−0.80	0.19	−0.99*
	(0.29)	(0.36)	(0.34)	(0.40)	(0.39)	(0.39)	(0.49)	(0.53)	(0.52)

Table 7: Information vs. Liquidity

For each fund in each quarter we calculate the change in fund ownership between two consecutive quarters. We define buys (sells) as stocks for which there is an increase (decrease) in the fund ownership between the two quarters. Next, we calculate the BF and SF metrics as in 1 and 2. For each fund we sort the quarterly buy and sell portfolios into quintiles based on the BF and SF metrics and calculate benchmark-adjusted returns in the following quarter. We report results separately for 1980-2000 and 2001-2010 periods and for the differences between the 2001-2010 and the 1980-2000 periods. Results are expressed in percentage points per quarter. * denotes statistical significance on the 10% level, ** denotes statistical significance on the 5% level, and *** denotes statistical significance on the 1% level.

	BF	SF	BF	SF	BF	SF
	1980 - 2000		2001 - 2011		(01 - 11) - (80 - 00)	
1 (low)	0.45***	−0.01	0.29***	0.04	−0.16	0.05
	(0.08)	(0.09)	(0.07)	(0.08)	(0.11)	(0.12)
2	0.27***	0.12	0.10	0.04	−0.17	−0.09
	(0.08)	(0.09)	(0.07)	(0.07)	(0.11)	(0.11)
3	0.28***	−0.14**	0.06	0.03	−0.22**	0.17*
	(0.07)	(0.07)	(0.06)	(0.06)	(0.09)	(0.09)
4	0.21**	−0.18**	0.14**	0.08	−0.07	−0.10
	(0.08)	(0.08)	(0.07)	(0.07)	(0.11)	(0.11)
5 (high)	−0.04	0.11	0.06	0.14**	0.10	0.03
	(0.09)	(0.08)	(0.07)	(0.07)	(0.11)	(0.10)

Table 8: Fund Flow Volatility and Returns to Mutual Fund Trades

At the end of quarter $t-1$ we sort funds in our sample in 5 buckets based on their monthly flow volatility during the preceding 12 months. For each stock owned by mutual funds in our sample we calculate the change in fund ownership between quarters t and $t-1$, separately for each bucket. We define BUYS (SALES) as stocks for which there is an increase (decrease) in the aggregate stock ownership between quarters t and $t-1$, separately for each bucket. We calculate benchmark-adjusted returns for the BUYS and SALES portfolios for quarter $t+1$, where we weight the stocks using the change in the number of shares owned by mutual funds times the per share price at the end of quarter $t-1$. TRADES are defined as the difference between BUYS and SALES. We report results separately for 1980-2000, 2001-2010 and for the differences between the 2001-2010 and the 1980-2000 periods. Results are expressed in percentage points per quarter. * denotes statistical significance on the 10% level, ** denotes statistical significance on the 5% level, and *** denotes statistical significance on the 1% level.

	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.53***	0.38	0.16	−0.21	0.05	−0.26	−0.74*	−0.33	−0.41
	(0.20)	(0.27)	(0.32)	(0.40)	(0.29)	(0.52)	(0.45)	(0.40)	(0.62)
2	0.21	0.08	0.13	−0.48	0.35	−0.83	−0.69	0.27	−0.96
	(0.24)	(0.20)	(0.32)	(0.63)	(0.31)	(0.68)	(0.67)	(0.37)	(0.75)
3	0.27	−0.08	0.36	0.05	0.14	−0.08	−0.22	0.22	−0.44
	(0.23)	(0.26)	(0.35)	(0.52)	(0.33)	(0.61)	(0.57)	(0.42)	(0.71)
4	0.42*	0.13	0.28	−0.21	0.82**	−1.03**	−0.63	0.69	−1.31**
	(0.24)	(0.35)	(0.42)	(0.42)	(0.36)	(0.44)	(0.48)	(0.50)	(0.61)
5 (high)	0.44	−0.61*	1.05***	0.48	0.05	0.43	0.04	0.67	−0.62
	(0.32)	(0.36)	(0.40)	(0.46)	(0.24)	(0.48)	(0.56)	(0.44)	(0.63)

Table 9: Fund Family Size and Returns to Mutual Fund Trades

At the end of quarter $t-1$ we sort funds in our sample in 5 buckets based on the net assets under management of their family. For each stock owned by mutual funds in our sample we calculate the change in fund ownership between quarters t and $t-1$, separately for each bucket. We define BUYS (SALES) as stocks for which there is an increase (decrease) in the aggregate stock ownership between quarters t and $t-1$, separately for each bucket. We calculate benchmark-adjusted returns for the BUYS and SALES portfolios for quarter $t+1$, where we weight the stocks using the change in the number of shares owned by mutual funds times the per share price at the end of quarter $t-1$. TRADES are defined as the difference between BUYS and SALES. We report results separately for 1992-2000, 2001-2010 and for the differences between the 2001-2010 and the 1992-2000 periods. Results are expressed in percentage points per quarter. * denotes statistical significance on the 10% level, ** denotes statistical significance on the 5% level, and *** denotes statistical significance on the 1% level.

	Buys	Sales	Trades	Buys	Sales	Trades	Buys	Sales	Trades
	1980-2000			2001-2010			(2001-2010) - (1980-2000)		
1 (low)	0.06	0.32	−0.25	0.32	0.05	0.27	0.26	−0.26	0.52
	(0.35)	(0.29)	(0.36)	(0.38)	(0.26)	(0.35)	(0.52)	(0.39)	(0.50)
2	0.30	0.07	0.23	0.24	0.61**	−0.37	−0.07	0.53	−0.60
	(0.42)	(0.36)	(0.50)	(0.42)	(0.24)	(0.38)	(0.59)	(0.43)	(0.63)
3	0.27	−0.38	0.65**	−0.23	0.51***	−0.73**	−0.50	0.89**	−1.39***
	(0.23)	(0.32)	(0.29)	(0.39)	(0.20)	(0.35)	(0.46)	(0.37)	(0.46)
4	0.21	−0.17	0.38	0.08	0.25	−0.17	−0.13	0.42	−0.55
	(0.40)	(0.29)	(0.45)	(0.44)	(0.16)	(0.37)	(0.60)	(0.33)	(0.59)
5 (high)	0.54**	0.06	0.47	−0.47	0.22	−0.68*	−1.00**	0.16	−1.16**
	(0.27)	(0.40)	(0.40)	(0.38)	(0.25)	(0.37)	(0.47)	(0.47)	(0.55)

Figure 1: Cumulative Return of the Aggregate Trades.

For each stock owned by mutual funds in our sample we calculate the change in fund ownership between quarters t and $t-1$. We define buys (sales) as stocks for which there is an increase (decrease) in the aggregate stock ownership between quarters t and $t-1$. We calculate benchmark-adjusted returns for the buys and sales portfolios for quarter $t+1$, where we weight the stocks using the change in the number of shares owned by mutual funds times the per share price at the end of quarter $t-1$. We further plot the difference between buys and sales. We plot the quarter $t+1$ cumulative benchmark-adjusted return of 1 dollar invested in the aggregate mutual funds buys, sales, and buys - trades portfolios in quarter t.