Does Motivation Matter When Assessing Trade Performance? An Analysis of Mutual Funds

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We are grateful to Editor Joel Hasbrouck, an anonymous referee, Luca Benzoni, Bing Han, John Kareken, Ross Levine, Rajdeep Singh, Pervin Shroff, Wanda Wallace, Andy Winton, and seminar participants at Barclays Global Investments, College of William & Mary, Cornell University, Financial Management Association 2004 Conference, American Finance Association 2005 Conference, University of Minnesota, and University of Montana for their insightful comments. All errors are our responsibility.

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Abstract

We relate the performance of mutual fund trades to their motivation. A fund manager who believes that a stock is significantly mispriced will want to trade in its shares. However, heavy investor outflows will constrain the manager by forcing him or her to control liquidity by selling stocks. Similarly, heavy inflows will compel the manager to work off excess liquidity by buying stocks. Our results support the hypotheses that managers possess a greater ability to value stocks than previously observed and that trade motivation matters when assessing this ability. When managers made purely valuation-motivated purchases, they beat the market by a substantial margin. In contrast, when managers were compelled to invest excess cash from investor inflows in stocks, they were unable to beat the market. A similar, but weaker, pattern is found for stocks that are sold by funds.

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Managers of actively managed mutual funds buy and sell stocks for different reasons. Chief among their motivations is to generate trading profits based on valuation beliefs. However, the structure of open-end funds also leads fund managers to trade for other reasons. First, unanticipated investor flows force fund managers to continually rebalance their portfolios in order to control liquidity.[1] Second, a desire to minimize taxable distributions creates incentives for fund managers to sell losers heading into their tax year-end.[2] Finally, aspiring to impress investors, fund managers may window-dress their portfolios by buying recent winners and selling recent losers just before reporting dates.[3] In a rational expectations framework, trades primarily motivated by reasons other than valuation beliefs place fund managers in the role of noise traders who should experience losses to informed investors.[4] Under the presumption that fund managers possess the ability to value stocks, these liquidity, tax, and window-dressing trades should thus underperform valuation-based trades.

In this paper, the performance of mutual fund trades is related to their motivation. By segmenting trades based on the motivation for making them, we make a contribution to the literature that examines fund structures by comparing the subsequent performance of valuation- and liquidity-motivated trades. Chordia (1996), Edelen (1999), and Nanda, Narayanan, and Warther (2000) argue that open-end fund investors receive not only

[1] See, e.g., Chordia (1996); Edelen (1999); and Nanda, Narayanan, and Warther (2000).
[2] See, e.g., Gibson, Safieddine, and Titman (2000); and Huddart and Narayanan (2002).
[3] See, e.g., Haugen and Lakonishok (1988); Lakonishok, Shleifer, Thaler, and Vishny (1991); Musto (1999); and O'Neal (2001).
[4] See, e.g., Grossman (1976); Grossman and Stiglitz (1980); Hellwig (1980); and Verrecchia (1982).

valuation expertise, but also diversified equity positions with, particularly for no-load funds, low direct costs for liquidity. This provision of liquidity, however, imposes significant indirect trading costs on open-end funds due to their structure. Fund managers must trade in response to unanticipated investor flows, forcing them to engage in trading in order to control liquidity that acts as a drag on performance. In providing evidence on the relative performance of liquidity- and valuation-based trades, we illustrate the importance of fund structures that are designed to limit the need for liquidity trading.

We also make a contribution to the literature that examines the abilities of fund managers to value stocks. If trade motivation matters, then a more accurate indicator of fund managers' stock-selection abilities should be based only on trades motivated by valuation beliefs and not by other reasons. Previous studies of fund managers' ability to value stocks evolved in an effort to increase the power of tests, shifting the focus of analysis from fund returns to fund security holdings and, most recently, to fund trades.[5] Our contribution to this literature is to present a more powerful test of fund managers' ability to value stocks that attempts to control for the motivation of trades.

Our efforts to separate trades based on their motivation makes use of both fund trades and investor flows. We argue that a fund manager who believes that a stock is significantly mispriced will want to trade in its shares. However, heavy investor outflows will constrain the manager by forcing him or her to control liquidity by selling stocks. Similarly, heavy investor inflows will compel the manager to work off excess liquidity by buying stocks. Accordingly, we condition fund trades on the direction and magnitude of

[5] See, e.g., Jensen (1968), Lehman and Modest (1987), Ippolito (1989), Grinblatt and Titman (1989, 1992, 1993), Malkiel (1995), Gruber (1996), Carhart (1997), Daniel, Grinblatt, Titman, and Wermers (1997), Wermers (1999), Chen, Jagadeesh, and Wermers (2000), Wermers (2000), Kothari and Warner (2001), and Pinnuck (2003).

investor flows. If, for example, a fund experiences heavy net outflows but aggressively buys certain stocks, we argue that these buys are likely to be valuation-motivated. Alternatively, if a fund experiences heavy net inflows and adds modestly across a large number of its existing stock holdings, a significant proportion of these buys are likely to be liquidity-motivated. The same logic applies to stocks that fund managers sell. Aggressive sales contemporaneous with heavy net inflows are more likely to be valuation-motivated, whereas modest sales of a large number of stocks contemporaneous with heavy net outflows are more likely to be liquidity-motivated.

We apply our trade-categorization rules to quarterly portfolio holdings and net investor flows of 1,400 actively managed U.S. equity funds from January 1980 to December 2003. For each fund in each quarter, we form separate value-weighted portfolios of stocks bought and sold. For each fund, we then divide its buy portfolios into quintiles based on the direction and magnitude of net investor flows. This creates, on one extreme, portfolios of stock purchases made concurrently with heavy outflows and, at the other extreme, portfolios of stock purchases made concurrently with heavy inflows. We follow the same categorization algorithm to condition the sell portfolios on investor flows. Within each buy and sell portfolio, we then split trades into quintiles based on their dollar value. We reason that large (i.e., high dollar value) buys that occur contemporaneously with heavy outflows are dominated by valuation-motivated buys, whereas small buys that occur contemporaneously with heavy inflows are dominated by liquidity-motivated buys. The same reasoning, with reversed flow direction, holds for stock sales. Annual, semiannual, and quarterly benchmark-adjusted returns are then determined for all these portfolios.

The hypothesis that fund managers possess the ability to value stocks finds strong support. Valuation-motivated buys (i.e., large buys concurrent with heavy outflows) significantly outperformed their benchmarks by an average 2.79% in the following year whereas valuation-motivated sells (i.e., large sells concurrent with heavy inflows) insignificantly underperformed by an average of 0.66%. The 3.45% differential between buys and sells is economically and statistically significant. These results indicate that when fund managers make purely valuation-motivated trades, they beat the market by a substantial margin that is notably greater than the margin for all trades, particularly on the buy side.

The hypothesis that motivation matters when assessing trade performance also finds strong support. In sharp contrast to valuation-motivated buys, liquidity-motivated buys (i.e., small buys concurrent with heavy inflows) underperformed their benchmarks by an insignificant 0.41% in the following year, implying that fund managers were unable to beat the market when compelled to invest excess cash from investor inflows. Further evidence that flow-induced liquidity-motivated trades act as a drag on fund performance is found in fund sales. Again in sharp contrast, liquidity-motivated sells (i.e., small sells concurrent with heavy outflows) significantly outperformed their benchmarks by an average of 1.55%. Recognizing that these trades are liquidity-motivated, we interpret this superior performance as consistent with stock-picking ability. If fund managers possess such picking ability, then stocks held by funds ought to outperform on average. Thus, if fund managers are forced to raise cash by selling stocks they (correctly) preferred to continue holding based on valuation beliefs, liquidity-motivated sales ought to outperform, which is what we find.

We also use a second method for identifying a fund's valuation-motivated trades that focuses only on buys of stocks not currently held in the portfolio and sells that terminate existing positions. We reason that a fund manager who has excess cash to invest from inflows will add incrementally across a large number of the stocks already held in the portfolio. Hence an initiating buy is likely based on a positive valuation belief of the stock being added. Conversely, a fund manager who needs to raise cash to meet outflows will sell incrementally across the portfolio, suggesting that a terminating sale is likely motivated by a negative valuation belief of the stock being sold.[6]

We find that initiating buys significantly outperformed their benchmarks by an average of 0.80% in the year after the trade, whereas terminating sales significantly underperformed by an average of 0.98%. The 1.78% differential is both economically and statistically significant, providing confirming evidence that fund managers possess the ability to value stocks.

Our research is closely related to Edelen's (1999) study of the relation between investor flows and the returns that fund investors receive. Edelen finds a statistically significant negative relation between investor flows and fund returns that he attributes to the cost of liquidity-motivated trading. Our study supports Edelen's argument with direct evidence that liquidity-motivated trades are detrimental to fund performance.

Our research also adds to recent evidence that fund managers possess the ability to value stocks. Chen, Jegadeesh, and Wermers (2000) argue that increased power for tests of fund managers' ability to value stocks is attainable by studying trades as opposed to holdings because trades reflect current valuation beliefs whereas holdings represent

[6] By negative valuation we really mean a *neutral or negative* valuation. In the quest for "positive alpha" stocks, those that were purchased earlier but have reached their fair value will either be sold if such positive alpha stocks are available, or held if none are available.

past decisions. Supporting their argument, they find that stocks widely held by funds do not outperform other stocks, but that stocks fund managers buy have an abnormal return greater than the abnormal return of those that they sell. We find similar results, with all buys outperforming all sales in our sample by 1.06% in the subsequent year. We extend the insight of Chen, Jegadeesh, and Wermers by controlling for trade motivation. Conditioning on investor flows and trade size in our sample, we find that information-motivated buys significantly outperformed information-motivated sales by 3.45% in the subsequent year, a substantial increase from the 1.06% unconditional buy-versus-sell differential. The increased power of our tests adds to the growing evidence that fund managers have the ability to value stocks.

The remainder of the paper is organized in four sections. Section 1 describes the data and sample composition. Section 2 explains the methodology used to condition trades on investor flows; empirical results are also presented and interpreted. Section 3 describes the design of the initiating-buys and terminating-sales tests, and then presents and interprets the results. Concluding remarks are made in Section 4.

1. Sample

A. Construction and Characteristics

Portfolio holdings data from January 1980 to December 2003 for funds classified as U.S. equity funds were obtained from Thomson/CDA. For a given date and fund, the database provides the name and identifier of each security held, number of shares held, and fund advisor's abbreviated name. Although funds are mandated to publicly report

holdings only semiannually, some funds voluntarily reported holdings to Thomson/CDA quarterly.[7]

We merge Thomson/CDA with the CRSP mutual fund database using WRDS' MFLINK, a dataset which links Thomson/CDA fund identifiers with those from the CRSP mutual fund database. Both databases are free of survivorship bias. To be included in our sample, a fund must: (1) be in the MFLINK linked set, (2) have more than four holdings reports that were preceded by another report in the previous quarter, and (3) have a Thomson/CDA-specified investment objective of either aggressive growth, growth, or growth and income. Balanced funds are classified as U.S. equity funds but are not included as some of their trades are made for asset allocation purposes. These filter rules produce a total of 1,400 actively managed equity funds.

We use Thomson/CDA holdings data for the report date (RDATE) as it represents the date for which the holdings are valid (i.e., actually held by the fund). This date is used to link holdings with stock prices and returns from CRSP. We estimate quarterly fund trades for each fund by tracking changes in holdings from quarter to quarter.[8]

In Table 1 we report summary characteristics of the 1,400 funds in our sample and all funds in the CRSP mutual fund database. Panel A shows that the funds in our

[7] Prior to 1985 all funds were required to report their holdings quarterly. Although funds were required to report their holdings only semiannually after 1985, Wermers (1999) points out that the majority of funds choose to report holdings to Thomson/CDA on a quarterly basis. One possible incentive to provide these reports, suggested by Frank, Poterba, Shackelford, and Shoven (2003), is a clientele effect whereby some investors who value more frequent disclosure are willing to pay higher fees. Whatever the reason for more frequent disclosure, we consider the possibility that sample selection bias might influence our empirical tests. To examine whether our sample is overrepresented by poor- or well-performing funds, we compute average alphas for the sample and the universe of equity funds from CRSP using the one-factor capital asset pricing model. Monthly return data from January 1980 through December 2003 were obtained from the CRSP mutual fund database. The average monthly alphas for the sample and the fund universe of -0.016% and -0.023%, respectively, differ insignificantly from zero and from each other. Thus, the sample does not appear to be overrepresented by poor- or well-performing funds.

[8] We fully account for stock splits when computing quarterly fund trades by using the cumulative adjustment factors from the CRSP stock return file.

sample are larger, but are otherwise similar to other U.S. equity funds in terms of the number of stocks held, management expenses, and portfolio turnover rates. Panel B shows that our sample has a slightly higher proportion of aggressive growth and a slightly lower proportion of growth funds than the universe of U.S. equity funds.

****INSERT TABLE 1 ABOUT HERE****

B. Flow Estimation

Since quarterly holdings data is available, we match this data with quarterly fund flow data that is estimated from the CRSP Mutual Fund Database in three steps. First, we estimate monthly net flows for each fund share class according to the following formula:

$$FLOW_t^i = TNA_t^i - TNA_{t-1}^i \times (1 + RETURN_t^i) \quad (1)$$

where $FLOW_t^i$ denotes the net investor flow (inflow minus outflow) experienced by fund share class i during month t, TNA_t^i is the total net asset for fund share class i at the end of month t, and $RETURN_t^i$ is the return of fund share class i during month t.[9]

Second, monthly flows for all share classes belonging to a common fund are aggregated to compute a monthly flow figure for the fund as a whole. Third, we aggregate the flows of the corresponding months to come up with a quarterly flow figure.

C. Benchmarks

The benchmark portfolios used were created identically to the procedure detailed in Daniel, Grinblatt, Titman and Wermers (1997), henceforth referred to as DGTW. We start

[9] This method for estimating flows assumes they occur at the end of the month and has been used by, for example, Sirri and Tufano (1998) and Chen, Hong, Huang, and Kubik (2004). We obtained substantively identical results when flows were computed assuming they occur at the beginning of the month or halfway through the month.

with all stocks that have book equity values listed in Compustat for at least two years prior to portfolio formation, and market values in CRSP at the end of December and June prior to portfolio formation. We also require stocks to have at least six months of return data in CRSP before the portfolio formation date. At the beginning of July of each year, we rank the stocks in the NYSE, AMEX, and Nasdaq universe based on market capitalization as of the last day of June and assign them into size quintiles where the break points are based only on the NYSE firms. Within each size quintile, we further rank stocks into quintiles based on their book-to-market ratios. The book-to-market ratios are based on the book equity values as of the end of the fiscal year during the calendar year prior to portfolio formation date and the market equity value is based on the most recent end-of-December values.[10] This results in a total of 25 size and book-to-market sorted fractiles.

Finally, we rank each stock within each of the 25 size and book-to-market sorted fractiles based on its prior 12-month return, and then divide each fractile into quintiles. This results in a total of 125 fractile portfolios. The benchmark portfolio returns are then computed as the value-weighted buy-and-hold return for each of the 125 fractile portfolios over the next quarterly, semiannual, and annual holding period. The benchmark for each stock is the benchmark portfolio to which it belongs. The benchmark-adjusted return for each stock is its buy-and-hold return minus the buy-and-hold return of the appropriate benchmark over the same holding period.

[10] The book-to-market ratios are industry adjusted by subtracting the long-term industry average book-to-market ratio from each firm's ratio. The industry portfolios are formed using the 48 Fama-French industry classifications. See French's website, http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/.

2. Conditioning on Net Investor Flows and Trade Dollar Volume

A. Methodology

Our premise is that a fund manager who believes that a stock is significantly undervalued will want to buy its shares. However, heavy investor outflows will constrain the manager by forcing him or her to control liquidity by selling stocks. Similarly, heavy inflows will compel the manager to work off excess liquidity by buying stocks even if none are viewed as undervalued at the time. In an attempt to separate fund managers' various motivations for trading, we thus condition fund trades (i.e., quarterly ownership changes) on the direction and magnitude of concurrent net investor flows.

The ranking procedure we employ breaks possible serial and cross-sectional trading patterns (and correlations) that may be present in the data. A possible source of serial trading is the existence of stealth trading by institutions where multiple orders are used in an attempt to disguise their identity as shown by, for example, Chakravarty (2001). A possible source of cross-sectional trading is portfolio managers of different funds in the same fund family drawing on the same in-house research when making trading decisions as shown, for example, in Elton, Gruber, and Blake (2004). Our ranking procedure breaks these potential serial and cross-sectional trading patterns. For each fund i, we measure the change in the number of shares held in each stock j from the end of quarter $t - 1$ to the end of quarter t for each quarter in the sample period.[11] To ensure that our results are not influenced by fund managers' potential preferential access to IPO shares, as shown by Gasper, Massa, and Matos (2004), we include only stocks that

[11] We include only U.S. common stocks in our analysis, which is consistent with previous performance evaluation studies of fund holdings such as Daniel, Grinblatt, Titman, and Wermers (1997), Wermers (1999), and Chen, Jegadeesh, and Wermers (2000).

have traded for at least six months. For each fund *i*, we rank and sort the quarterly buy and sell portfolios into quintiles based on the *BF* and *SF* metrics, defined respectively as:

$$BF_t^i = \frac{BUYS_t^i - FLOW_t^i}{TNA_{t-1}^i}, \tag{2}$$

$$SF_t^i = \frac{SELLS_t^i + FLOW_t^i}{TNA_{t-1}^i}, \tag{3}$$

where $BUYS_t^i$ represents the total dollar value of stock purchases of fund i during quarter t, $SELLS_t^i$ represents the total dollar value of stock sales of fund i during quarter t, $FLOW_t^i$ is the net investor flow (inflow minus outflow) experienced by fund i during quarter t as estimated in equation (1), and TNA_{t-1}^i is the total net assets of fund i at the end of quarter $t-1$.[12] The *BF* metric assigns buy portfolios with high total stock purchases and high outflows to the top quintile, *BF1*, and buy portfolios with low total stock purchases and high inflows to the bottom quintile, *BF5*. Analogously, the *SF* metric assigns sell portfolios with high total stock sales and high inflows to the top quintile, *SF1*, and sell portfolios with low total stock sales and low inflows to the bottom quintile, *SF5*. Because we use the time-series observations for each fund separately to rank on *BF* and *SF,* by construction any serial or cross-sectional trading patterns in the data are broken.[13]

[12] Our ranking procedure places 'remainder' portfolios in *BF3* and *SF3*. Suppose that Fund A has a time series of 96 buy portfolios that were created every quarter of the 24-year sample period. In this example, 19 portfolios are placed in *BF1, BF2, BF4,* and *BF5* and 20 portfolios are placed in *BF3.*

[13] To illustrate how this ranking procedure breaks serial trading patterns, consider Fund A which has a time series of 96 buy portfolios. Our *BF* rankings place 19 of the buy portfolios in *BF1*, another 19 in *BF2*, and so on, in no particular time-series order. The portfolios in any of the quintiles are therefore not necessarily drawn from consecutive quarters. To illustrate how this procedure breaks cross-sectional trading patterns, consider Fund A and Fund B, which also has a time series of 96 buy portfolios. All of Fund A's *BF1* portfolios are aggregated with the independently created *BF1* portfolios of Fund B. Because ranking was done for each fund separately, the *BF1* portfolios of Funds A and B will most likely correspond to portfolios formed at different points in time. To confirm that the *BF1* (and other) portfolios were not

To illustrate the rationale behind the *BF* and *SF* metrics, consider a two-quarter scenario for a fund, t_1 and t_2, where the fund has total net assets of $100 million at the beginning of each quarter. During quarter t_1, the fund experiences outflows of $5 million and purchases $2 million worth of stocks. Presuming that the fund manager will only buy those stocks that are perceived to be notably underpriced despite a need to raise cash to meet investor outflows, we can infer that a large proportion of the fund's purchases were valuation-motivated trades. Now consider quarter t_2, when the fund experiences inflows of $5 million and purchases $3 million worth of stocks. Presuming that heavy net investor inflows will compel the fund manager to invest excess cash, we can infer that a smaller proportion of the fund's purchases during t_2 relative to t_1 were likely to have been valuation motivated. The *BF* metric captures this intuition by assigning higher scores to buy portfolios that are more likely comprised of larger proportions of valuation-motivated trades. Consistent with this intent, the *BF* metric assigns scores of [2 - (-5)]/100 = 0.07 and (3 - 5)/100 = -0.02 to quarters t_1 and t_2, respectively. Symmetrical intuition applies to the *SF* metric when used to rank the sell portfolios.[14]

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systematically drawn from the same quarters due to, for example, the presence of a common factor for flows, for each quarter we calculated the percentage of *BF1* portfolios as a percentage of all buy portfolios in that particular quarter. The median percentage for *BF1*, *BF5*, *SF1*, and *SF5* was 18.3%, 22.7%, 21.4% and 20.5%, respectively, indicating that none of these portfolios were systematically drawn from the same quarters.

[14] The results we obtained from the use of unexpected cash flows instead of actual cash flows to calculate the *BF* and *SF* metrics were slightly weaker for buys and notably weaker for sales. This could be due to significant noise in the expected flow estimation (which we modeled using fund-level lagged flows, lagged returns, and calendar-quarter dummies) or to quarterly data being too long a time period to meaningfully capture fund managers' adjustment of cash in anticipation of future expected flows. Fund managers who anticipate large inflows in the next quarter might like to buy equities in the current quarter but are limited by margin constraints. Conversely, they may be reluctant to build significant cash positions by selling equities if they anticipate large outflows given that their performance is judged relative to an equity index. Thus, we use actual flows, realizing that unexpected flows would provide a more precise trade categorization if more frequent data was available.

In an attempt to further refine trade categorization, we place each trade within each flow-categorized portfolio into a quintile based on its dollar value. Our rationale is that fund managers who strongly believe that a stock is significantly underpriced will buy a relatively large amount of that particular stock over the quarter, but fund managers who need to control liquidity will spread relatively smaller-size purchases across a number of stocks. A similar argument can be made on the sell side. Thus, large trades (in trade-size quintile *TS1*) are more likely to be valuation motivated, whereas the small trades (in trade-size quintile *TS5*) are more likely to be liquidity motivated.

We argue that large buys (in *TS1*) that occur contemporaneously with heavy net investor outflows (in *BF1*) are characterized by the highest proportion of valuation-motivated buys, whereas small buys (in *TS5*) that occur contemporaneously with heavy net investor inflows (in *BF5*) are characterized by the highest proportion of liquidity-motivated buys. The same reasoning, with reversed flow direction, holds for fund sales.

Stocks bought or sold by fund *i* in portfolio-formation quarter *t* are grouped into separate value-weighted buy and sell portfolios.[15] We evaluate the subsequent buy-and-hold returns for each of the buy and sell portfolios for annual, semiannual, and quarterly holding periods. All benchmark-adjusted returns are measured for a period corresponding to the length of the holding period. Once the benchmark-adjusted returns are determined for each portfolio for each fund, these returns are averaged and analyzed across all portfolios that share a common characteristic such as *BF, SF,* or *TS.*

In our efforts to isolate valuation- and liquidity-motivated trades, we also account for the possibility that some trades may be motivated by tax or window-dressing reasons.

[15] As a robustness check, we evaluate the buy-and-hold returns for equal-weighted buy and sell portfolios. The results are not substantively different for the equal-weighted portfolios.

Given that tax-related sales typically occur just before funds' October 31 tax year-end and that a significant portion of window-dressing trades likely take place shortly before funds' fiscal year end, we exclude fourth-quarter trades.

B. Buy Results

In Table 2 we present performance results for buy portfolios categorized by net investor flows and trade size. Panels A, B, and C present benchmark-adjusted returns and associated *t*-statistics for annual, semiannual, and quarterly holding periods, respectively. Each panel has two sections. The left-hand section presents the results where the fourth quarter of every year is excluded from analysis whereas the right-hand section includes all quarter. The first three rows and three columns of each section within each panel report results from our two-way sort on investor flows and trade size. The fourth row and fourth column report results from a one-way sorting only on trade size and investor flows, respectively, while the fifth row and fifth column report the difference between the extreme investor-flow and trade-size quintiles, respectively. Finally, the sole entry in the sixth row reports the difference between the two most extreme portfolios based on both investor flows and trade size, and is the most powerful test that trade motivation matters.

****INSERT TABLE 2 ABOUT HERE****

Consider first the upper left-hand corner of panel A.1 where we find *BF1/TS1* (i.e., large buys concurrent with heavy outflows), the portfolio that should have the highest proportion of valuation-motivated buys. If fund managers possess the ability to value stocks, then *BF1/TS1* should exhibit a positive benchmark-adjusted return.

Consistent with having such ability, *BF1/TS1* shows a statistically significant 2.79% benchmark-adjusted return in the year following the portfolio formation quarter.

As we move down the rows and across the columns from *BF1/TS1*, the portfolios should be characterized by a decreasing proportion of valuation-motivated buys and an increasing proportion of liquidity-motivated buys. Thus, if motivation matters when assessing trade performance, we should observe generally decreasing returns as we move down the rows and across the columns. This pattern holds when trades are conditioned on flows. The overall difference between the high outflow and high inflow quintiles (*BF1-BF5*) is a statistically significant 2.81%. The difference between the high outflow and high inflow quintiles is also significant for each of the trade-size subgroups. When trades are conditioned on trade size, the only statistically significant difference between the large and small trade quintiles (*TS1-TS5*) is the 1.41% difference for the high outflow quintile (*BF1*).

As mentioned earlier, the most powerful test of whether trade motivation matters is achieved by comparing the two extremes: *BF1/TS1* (i.e., large buys concurrent with heavy outflows), which should have the highest proportion of valuation-motivated buys, and *BF5/TS5* (i.e., small buys concurrent with heavy inflows), which should have the highest proportion of liquidity-motivated buys. *BF1/TS1* outperforms *BF5/TS5* by a statistically significant 3.20% in the year following the portfolio formation quarter, providing strong support for the hypothesis that trade motivation matters.

Panels B.1 and C.1 tell the same qualitative story for semiannual and quarterly holding periods, respectively. The return magnitudes are smaller than for the annual

period, indicating the return patterns continue beyond one and even two quarters.[16] Furthermore, we observe the same general pattern of decreasing returns as we move down the rows and across the columns from *BF1/TS1*. Again consistent with trade motivation mattering, *BF1/TS1* outperforms *BF5/TS5* by a statistically significant 1.92% and 0.94% in the semiannual and quarterly holding periods following the portfolio formation quarter, respectively.[17]

Looking at the right-hand sections of these three panels indicates results that are also significant but of clearly smaller magnitude. This finding is consistent with the notion that there are at least some trades made in the fourth quarter that are motivated by tax and window-dressing reasons.

C. Sell Results

In Table 3 we organize results for the sell portfolios in the same way as for the buy portfolios. Consider first the upper left-hand corner of Panel A.1 where we find *SF1/TS1* (i.e., large sells concurrent with heavy inflows), the portfolio that should have the highest proportion of valuation-motivated sells. Assuming fund managers sell stocks that they hold but no longer believe are undervalued and cannot short sell stocks they believe are overvalued, then *SF1/TS1* should have roughly zero benchmark-adjusted

[16] Mutual funds are currently required to report portfolio holdings to the SEC twice per year: once halfway into the fiscal year and once at the end of the fiscal year. These reports must be filed within 60 days after the end of the semi-annual period. To the extent that reports are filed in a timely manner, the continuation of positive benchmark-adjusted returns for *BF1/TS1* beyond one quarter suggests a profitable trading rule. The return pattern suggests that when a fund makes a large purchases of several stocks in a quarter when it experienced heavy net investor outflows, buying and holding these stocks will yield, on average, an excess return of roughly 1.59% (i.e., the annual excess return of 2.79% less the quarterly excess return of 1.20%) over the next three quarters.

[17] The "All-All" results, found in row four of column four, indicate that on average, all buys have significantly positive annual, semiannual, and quarterly benchmark-adjusted holding-period returns of 0.70%, 0.49%, and 0.42%, respectively, consistent with the corresponding holding-period returns of 0.99%, 0.63%, and 0.44%, reported by Chen, Jegadeesh, and Wermers (2000, p. 353). These returns suggest that the trading profits on valuation-based buys exceed the trading losses on liquidity-based buys.

returns.[18] This is what is observed, as *SF1/TS1* has an insignificant benchmark-adjusted return of -0.66%. Importantly, it is significantly different from the 2.79% return for *BF1/TS1.*

****INSERT TABLE 3 ABOUT HERE****

As we move down the rows and across the columns from portfolio *SF1/TS1*, the portfolios should be characterized by a decreasing proportion of valuation-motivated and an increasing proportion of liquidity-motivated sales. Thus, if motivation matters when assessing trade performance, as we move down the rows and across the columns, we should observe increasing returns, as liquidity-motivated sales will involve stocks that the portfolio manager would prefer to hold but cannot do so due to the need to raise cash. In general this pattern holds, suggesting that trade motivation is related to performance. The overall difference between the high inflow and high outflow quintiles (*SF1-SF5*) is a statistically significant -1.70%, as is the -0.62% overall difference between the large and small trade quintiles (*TS1-TS5*).

When we reach *SF5/TS5* (i.e., small sales concurrent with heavy outflows), which should have the highest proportion of liquidity-motivated sales, we find a significant benchmark-adjusted return of 1.55%. One might initially interpret a positive return for stocks sold by funds as evidence against stock-picking ability and in support of the disposition effect. However, recognizing that these are liquidity-motivated sales, we

[18] Mutual fund managers typically face short-selling restrictions that prevent them from taking action when a particular stock is believed to be overvalued, unless it is currently owned. Thus, short-selling restrictions create an asymmetry in that fund managers can only take unfettered action when any stock (within their allowable realm) is believed to be undervalued. A second possible explanation for the sales results is that fund managers' selling decisions are distorted by behavioral effects such as the disposition effect, which is the behavioral tendency of investors to sell past winners too soon and ride past losers too long. Evidence of the disposition effect in the decisions of U.S. individual investors has been documented by Odean (1998); evidence for Finnish institutional investors and U.S. equity mutual fund managers is provided by Grinblatt and Keloharju (2001) and Cici (2005), respectively.

interpret the result as consistent with stock-picking ability. If fund managers possess such ability, then stocks held by funds ought to outperform on average. Thus, if fund managers are forced to raise cash by selling stocks that they (correctly) preferred to continue holding based on valuation beliefs, liquidity-motivated sales ought to outperform, which is what we find.

Again, the most powerful test of whether trade motivation matters is achieved by comparing the two extremes: *SF1/TS1* and *SF5/TS5*. Consistent with this hypothesis, *SF1/TS1* underperforms *SF5/TS5* by a statistically significant 2.21% in the year following the portfolio formation quarter.

The semiannual holding period returns reported in Panel *B* show a similar return pattern to the annual returns, but the return magnitudes are smaller. The quarterly holding period returns reported in Panel *C* are weaker still.[19] These results suggest that the patterns observed for the annual holding period occur over the entire year, not in just the first one or two quarters.[20]

Examining the right-hand sections of these three panels reveals results that are typically of the same sign as the left-hand side but notably weaker. As with buys, this finding is consistent with the notion that there are at least some trades made in the fourth

[19] The "All-All" results, found in row four of column four, indicate that on average, all sells have annual, semiannual, and quarterly holding period benchmark-adjusted holding-period returns of -0.36%, -0.06%, and -0.02%, respectively, consistent with the corresponding holding-period returns of -1.01%, -0.31%, and -0.14% reported by Chen, Jegadeesh, and Wermers (2000, p. 353). These returns suggest that the trading profits on valuation-based sells are roughly offset by the trading losses on liquidity-based sells.

[20] To the extent that reports are filed in a timely manner, the continuation of positive benchmark-adjusted returns beyond one quarter for *SF5/TS5* suggests a potentially profitable trading rule. The return pattern suggests that when a fund sells small amounts of several stocks in a quarter when it experienced heavy net investor inflows, buying and holding these stocks will yield, on average, an excess return of roughly 0.97% (i.e., the annual excess return of 1.55% less the quarterly excess return of 0.58%) over the next nine months. See footnote 15.

quarter that are motivated by tax and window-dressing reasons. Hence, from here on we focus only on the results that occur in the first three quarters of each fund's fiscal year.

D. Robustness Check: Alternative Benchmarking Methods

As a robustness check, we calculate returns for the two extreme buy portfolios (i.e., *BF1/TS1* and *BF5/TS5*) and sell portfolios (i.e., *SF1/TS1* and *SF5/TS5*) using alternative benchmarking methods. The first row in each panel of Table 4 reports raw returns. The second row reports market-adjusted returns, calculated by subtracting the buy-and-hold return on the market portfolio from the buy-and-hold return for each stock for the same period. The market portfolio used is the value-weighted portfolio of all NYSE, AMEX, and Nasdaq stocks. The third row reports Wermers-adjusted returns. This method controls for size, book-to-market, and momentum as does the DGTW method, but differs from DGTW in the way that industry-adjustment enters into the creation of benchmark portfolios.[21] The fourth row reports the DGTW-adjusted returns that are reported elsewhere in the paper. Finally, the fifth row reports the DGTW-adjusted returns when benchmark portfolios are updated every quarter instead of annually as done in the original DGTW (1997) paper.

****INSERT TABLE 4 ABOUT HERE****

Panel *A* reports results for the two extreme buy portfolios: *BF1/TS1* with the highest proportion of valuation-motivated buys and *BF5/TS5* with the highest proportion of liquidity-motivated buys. For all of the benchmarking methods, the difference between the two extreme buy portfolios is positive regardless of the length of the holding

[21] See Wermers (2003) for details. We would like to thank Russ Wermers for providing his benchmark portfolio returns, available at http://www.smith.umd.edu/faculty/rwermers/ftpsite/Dgtw/coverpage.htm.

period. All of these positive differentials are significant except for the quarterly holding periods with DGTW-quarterly adjusted benchmarks. Not surprisingly given the documented tendency for funds to engage in momentum trading on the buy side, the market-adjusted returns for *BF1/TS1* and *BF5/TS5* are considerably larger than the Wermers- and DGTW-adjusted returns.[22] This was confirmed, as we found that *BF1/TS1* and *BF5/TS5* are characterized by stocks with positive stock price momentum which is controlled for with the Wermers and DGTW methods but not with the simple market-adjustment method. More specifically, for *BF1/TS1* the DGTW-adjusted return (*t*-statistic) during the six months prior to the formation date was 8.86% (19.81). For *BF5/TS5*, the DGTW-adjusted return during the prior six months was 4.06% (10.94).

Panel *B* reports results for the two extreme sell portfolios: *SF1/TS1* with the highest proportion of valuation-motivated sales and *SF5/TS5* with the highest proportion of liquidity-motivated sales. For all of the benchmarking methods, the difference between the two extreme sell portfolios is negative regardless of the length of the holding period. All of these negative differentials are significant except for the quarterly and semiannual DGTW-adjusted returns. As with buys, the market-adjusted returns for *SF1/TS1* and *SF5/TS5* are larger than the returns adjusted against the Wermers and DGTW benchmarks. Perhaps surprisingly, we found positive stock price momentum for both portfolios, particularly for *SF1/TS1*, which is controlled for with the Wermers and DGTW methods but not with the simple market-adjustment method.[23] Specifically, for *SF1/TS1* the DGTW-adjusted return (*t*-statistic) during the six months prior to the

[22] For evidence of momentum trading by mutual funds, see Grinblatt, Titman, and Wermers (1995).
[23] Strong positive stock price momentum for *SF1/TS1* is consistent with managers selling stocks that have reached their full fundamental values due to recent price increases. Since Grinblatt, Titman, and Wermers (1995) do not find evidence that funds systematically sell stocks with negative price momentum, our result does not conflict with their results.

portfolio formation date was 13.51% (20.70). For *SF5/TS5*, the DGTW-adjusted return during the prior six months was 1.34% (3.29).[24]

E. Robustness Check: Using an Alternative Portfolio Creation Method

We also analyzed the *BF* and *SF* portfolios using an alternative portfolio creation method as a robustness check. This method involves aggregating by market value all the *BF1/TS1* portfolios that exist for a given quarter into a single composite portfolio for that quarter.[25] Thus, not all mutual funds are represented in a given quarter in the portfolio for that quarter since its flows might have been such that the fund's buys resulted in the fund having either a *BF2*, *BF3*, *BF4*, or *BF5* classification for that quarter. Similarly, all *BF5/TS5* portfolios that exist for a given quarter were aggregated into a single composite portfolio. These single composite portfolios are then evaluated in terms of their DGTW-adjusted returns over the subsequent annual, semiannual, and quarterly holding periods. A similar procedure was followed to create single composite *SF1/TS1* and *SF5/TS5* portfolios. We refer to the method of portfolio creation as the *time-series method* in comparison to the previously described *panel method.*

****INSERT TABLE 5 ABOUT HERE****

Table 5 presents the results of the time-series method, along with those of the panel method from Tables 2 and 3 for comparison. Panel A.1 shows that in all cases the size of the economic results for stock purchases are stronger when the time-series method

[24] Not only are the *BF* and *SF* stocks characterized as having positive price momentum, they also tend to be large capitalization stocks, consistent with Falkenstein (1996). More specifically, using the NYSE-based market capitalization quintiles, on the buy side 41.0% of the stocks are in the top quintile and 63.2% are in the top two quintiles. Similarly, on the sell side 37.2% of the stocks are in the top market capitalization quintile and 61.8% are in the top two quintiles.

[25] Given that purchases across funds of a particular stock in a particular quarter are aggregated, the use of a single composite portfolio controls for possible herding (see Wermers (1999)).

is used to form portfolios in comparison to the panel method. The statistical significance of the return difference between the extreme buy portfolios is consistently weaker, however, perhaps due to reduced power, as the time-series method utilizes only one observation per quarter. The reduced power of tests involving the time-series method is particularly evident in the subperiod results.

Panel B.1 shows that the results for stock sales are in general somewhat weaker when the time-series method is used to form portfolios. For example, the annual holding period results for the time-series method are of the same sign but smaller in magnitude than the panel method results, as the *SF1/TS1- SF5/TS5* difference is an insignificant -1.16% in comparison to a significant -2.21%.

F. Subperiod Analysis

Table 5 also presents subperiod results for 1980-1991 and 1992-2003 using both the panel and time-series methods. Both methods produce results on the purchase side in panels A.2 and A.3 that are consistent with the overall results but are clearly stronger in the second subperiod. Similarly, the overall results for stock purchases, shown in panels B.2 and B.3, are typically attributable to the second subperiod.

G. Portfolio Performance Around Earnings Announcements

Baker, Litov, Wachter, and Wurgler (2005) measured the stock picking skills of fund managers by examining the returns on stocks that they hold and trade around their subsequent earnings announcements. Interestingly, they observe that stocks bought have significantly higher returns than those they sell during the three-day period surrounding

the first earnings announcement after these trades were made. They observe an annualized difference of 0.41%, which translates to 0.10% for the three-day difference between a typical purchase and sales transaction.[26]

****INSERT TABLE 6 ABOUT HERE****

We performed similar analysis for our extreme portfolios, and display the results in Table 6. Interestingly, the three-day abnormal return differential between the extreme valuation buy and sell portfolios, *BF1/TS1 – SF1/TS1*, is a significant 0.28%. In contrast, the difference between the extreme liquidity buy and sell portfolios, *BF5/TS5 – SF5/TS5*, is much smaller and insignificant, although its magnitude of 0.11% is in line with the results of Baker, Litov, Wachter, and Wurgler (2005). These results thus reinforce the previous results that motivation matters when assessing trade performance.

H. Funds Categorized by Investment Objective

To assess how trade motivation affects funds with differing investment objectives, we separately examine aggressive growth, growth, and growth and income funds in Table 7. Consistent with the vigorous pursuit of capital appreciation, aggressive growth funds exhibit the highest expense ratios and portfolio turnover rates. Consistent with a greater emphasis on generating return through holding high-yield stocks, growth and income funds exhibit the lowest expense ratios and portfolio turnover rates.

****INSERT TABLE 7 ABOUT HERE****

Table 8 reports the performance of stock trades for funds categorized by investment objective. For each objective, panel *A* shows that *BF1/TS1* outperforms *BF5/TS5*, suggesting that buy motivation is related to performance. Focusing on annual

[26] See Table 4 of Baker, Litov, Wachter, and Wurgler (2005).

holding periods, the results are strongest for aggressive growth funds, with *BF1/TS1* outperforming benchmarks by a statistically significant 3.75% and *BF5/TS5* by a significant 5.56% over the following year. The return magnitudes are less for growth funds, with *BF1/TS1* outperforming benchmarks by a significant 3.32% and outperforming *BF5/TS5* by a significant 3.42%. The return magnitudes are lesser still for growth and income funds, with *BF1/TS1* outperforming benchmarks by a significant 1.14% and outperforming *BF5/TS5* by an insignificant 1.35%. As for the entire sample, the same qualitative story holds for semiannual and quarterly holding periods, with return magnitudes that are smaller than for annual holding periods.

****INSERT TABLE 8 ABOUT HERE****

In comparison, panel *B* shows that *SF1/TS1* underperforms *SF5/TS5* over annual holding periods for each of the investment-objective sub-groups, suggesting that sell performance is related to motivation. As with the return pattern for buys across investment objectives, the magnitude of the return differential between *SF1/TS1* and *SF5/TS5* is greatest for aggressive growth at -3.03%, smaller for growth at -2.45%, and smaller still for growth and income funds at -1.49%. The return differential, however, is only statistically significant for growth funds. Again the return magnitudes are smaller for semiannual and quarterly holding periods than for annual holding periods, with semiannual and quarterly holding-period return differentials being positive for growth and income funds.

3. Initiating Buys and Terminating Sells

A. Methodology

As an alternative test of a fund manager's ability to value stocks that does not utilize flow data, we examine the performance of buys that initiate a position and sells that fully liquidate a position from the portfolio. Suppose that a fund manager does not believe that any stocks are currently underpriced by an amount sufficient to justify their purchase. We reason that if this fund manager is saddled with excess cash from investor inflows, he or she will add incrementally across a large number of the stocks already held in the portfolio. Hence an initiating buy, defined as the purchase of a stock not currently held, is likely to be based on a strongly positive valuation belief of the stock being added. Conversely, absent the belief that any currently held stock is overvalued, a fund manager who needs to raise cash to meet investor outflows will sell incrementally across the portfolio. This suggests that a terminating sell, defined as the sale of the entire position in a currently held stock, is likely motivated by a negative valuation belief of the stock being sold.[27] Thus, if fund managers possess the ability to value stocks, then we should observe significantly positive benchmark-adjusted returns for portfolios initiating buys, negative returns for portfolios of terminating sells, and a significant difference in their benchmark-adjusted returns.

As before, for each fund i we measure the change in the number of shares held in each stock j from the end of quarter $t - 1$ to the end of quarter t for each quarter in the sample period, and focus on the results that exclude the fourth quarter of each year in order to avoid window-dressing and tax-motivated trades. Also as before, we include only stocks that have traded for at least six months to ensure that our results are not

[27] See footnote 6.

influenced by fund managers' potential preferential access to IPO shares. In addition, we exclude delistings from our terminating sales. Buys that initiate positions and sells that terminate positions for fund *i* in portfolio-formation quarter *t* are then grouped into separate value-weighted initiating buy and terminating sell portfolios. To clarify, we form one initiating buy portfolio and one terminating sell portfolio (when possible) for each fund in each quarter. Each of these initiating buy and terminating sell portfolios are treated as separate observations. Again as before, we evaluate buy-and-hold benchmark-adjusted annual, semiannual, and quarterly holding period returns by using DGTW's methodology. The benchmark-adjusted returns for the individual initiating buy and terminating sell portfolios are separately averaged and analyzed.

B. Results

Table 9 presents benchmark-adjusted returns and associated *t*-statistics for annual, semiannual, and quarterly holding periods for all initiating buy and terminating sell portfolios. The results in section 1 of panel *A* show that initiating buy portfolios significantly outperformed their benchmarks by an average of 0.80% in the year after the trade, whereas terminating sell portfolios significantly underperformed by an average of 0.98%. The 1.78% differential is both economically and statistically significant, suggesting that fund managers possess the ability to value stocks. Furthermore, these results increase with the length of the holding period, indicating that the abnormal return behavior occurs over the entire annual holding period.

Section 2 of panel *A* presents similar but slightly weaker results when all four quarters are included. This is as expected, due to the possible window-dressing and tax-motivated trades occurring during the fourth quarter.

****INSERT TABLE 9 ABOUT HERE****

C. Robustness Check: Trades by Funds with Same Advisor

In this section, we account for the possibility that managers of different funds with the same advisor, perhaps by drawing on the same in-house research, made similar investment decisions for the same stocks in the same quarter. With our algorithm for creating the initiating buy and terminating sell portfolios, cross-sectional dependence of portfolio returns could be created by funds with the same advisor trading together, potentially biasing our test statistics. To address this concern, we aggregate in each quarter all the common initiating buys and terminating sells of funds having the same advisor. For example, if three funds with the same advisor initiate a position in a particular stock in the same quarter, then only one initiating buy is recorded for the advisor. Our final sample is comprised of 794 fund advisors (versus 1,400 individual funds).

Panel *B* of Table 9 presents benchmark-adjusted returns and associated *t*-statistics for annual, semiannual and quarterly holding periods for the initiating buy and terminating sell portfolios of fund advisors. Initiating buy portfolios significantly outperformed their benchmarks by 1.02% in the year after the trade, and terminating sell portfolios significantly underperformed by 1.05%. Our results also show that there was a significant difference in the benchmark-adjusted returns of initiating buy and terminating

sell portfolios of 2.07%. Once again, the abnormal return behavior persists over all three holding periods as these results increase with their length. In sum, this robustness check confirms our earlier findings (both with and without the fourth quarter being excluded) and indicates that accounting for cross-sectional dependence does not yield substantively different results.

****INSERT TABLE 10 ABOUT HERE****

D. Subperiod Analysis

As in Table 5, we present subperiod results for 1980-1999 and 1992-2003, along with the overall results from Table 9 for comparison purposes, in Table 10. Surprisingly, the results for initiating buys are much stronger in the second subperiod, whereas the results for terminating sales are much stronger in the first subperiod. Nevertheless, the difference is positive and significant in both subperiods, albeit slightly larger in the first subperiod.

E. Robustness Check: Alternative Benchmarking Methods

As a robustness check, we calculate returns for the initiating buy and terminating sell portfolios using alternative benchmarking methods as in Table 4. The first row in each panel of Table 11 reports raw returns, the second row reports market-adjusted returns, the third row reports Wermers-adjusted returns, the fourth row reports the DGTW-annual adjusted returns, and the fifth row reports the DGTW-quarterly adjusted returns. For all of the alternative benchmarking methods, the difference between the

initiating buy and terminating sell portfolios is positive and significant regardless of the length of the holding period.

****INSERT TABLE 11 ABOUT HERE****

F. Funds Categorized by Investment Objective

To assess the effect of differing investment objectives, we separately examine initiating buy and terminating sell portfolios by investment objective.[28] For aggressive growth funds, initiating buy portfolios significantly outperformed their benchmarks by 1.07% in the year after the trade, and terminating sell portfolios significantly underperformed by 3.22%. The average difference in the benchmark-adjusted returns of these two portfolios is a significant 4.29%. Similar to the earlier results in Table 8, the return magnitudes are smaller for growth funds, and smaller still for growth and income funds. For growth funds, initiating buy portfolios significantly outperformed by 0.90% and terminating sell portfolios significantly underperformed by 0.97%, with the differential a significant 1.88% in the year after the trade. For growth and income funds, initiating buy portfolios significantly outperformed by 0.59%, but the terminating sell portfolios' return of 0.37% and the differential return of 0.22% are both insignificant. Similar to the earlier results, the same qualitative story holds for semiannual and quarterly holding periods, with return magnitudes that are smaller than for the annual holding period.[29]

[28] The results are not displayed in a table in order to save space, given they are similar to those shown in Table 8.

[29] The quarterly results for the initiating buy and *BF1* portfolios could be due to the selective release of analysts reports; see Irvine, Lipson, and Puckett (2004).

4. Concluding Remarks

Our results are consistent with the hypotheses that fund managers possess the ability to value stocks and that motivation matters when assessing trade performance. Conditioning on the size of trades and net investor flows, we find that valuation-motivated buys outperformed their benchmarks by a statistically significant 2.79% in the following year. In contrast, liquidity-motivated buys underperformed by a statistically insignificant 0.41%, suggesting that fund managers were unable to beat the market when forced to invest excess cash from investor inflows. The evidence from stocks sold by fund tells a similar story. Valuation-motivated sells underperformed their benchmarks by an insignificant 0.66%. In contrast, liquidity-motivated sells outperformed by 1.55%, suggesting that fund managers were compelled to sell stocks they would have (correctly) preferred to hold longer based on valuation beliefs. These results are found to be robust to alternative methods of portfolio creation and benchmarking.

Alternative tests that focus on initiating buys and terminating sells support these results. Specifically, initiating buy portfolios outperformed their benchmarks by an average of 0.80% in the following year whereas terminating sell portfolios underperformed by 0.98%, providing additional evidence that fund managers possess the ability to value stocks.

Our research has policy implications for recent SEC deliberations on requiring more frequent public reporting of the holdings of mutual fund portfolios.[30] Our evidence that fund managers have the ability to value stocks is supportive of Wermers (2001), who argues that professional investors would potentially use more frequent reporting to front-run and free-ride on the information gathering and analysis efforts of the funds. Such

[30] See Investment Company Institute (2001) and U.S. Securities and Exchange Commission (2002).

actions by outside investors would reduce fund managers' incentive to pay for these costly efforts, perhaps making capital markets less efficient.

Our research also has implications for the structural design of mutual funds. Our evidence indicates that when fund managers trade for valuation reasons, particularly on the buy side, they perform well. However, as Chordia (1996), Edelen (1999), and Nanda, Narayanan, and Warther (2000) point out, the structure of open-end funds sometimes forces fund managers to trade for liquidity reasons. Our results show that such liquidity-motivated trading by fund managers not only results in transaction costs, but also significant trading losses. The benefits of liquidity to investors must be carefully weighed against its costs when considering front-end loads, back-end loads, redemption fees, delayed withdrawals, and other fund features that are designed to limit the need for liquidity-motivated trading.

Finally, our research relates to the recent allegations of late trading and market timing abuses by sophisticated institutional investors. Fund investors who buy and hold for the long term not only suffer "dilution" losses, but also trading losses when fund managers are forced to respond to flows that are caused by late trading and market timing investors. While the SEC has proposed Rule 22c-2 aimed to stop these abuses by placing a 2% fee on short-term in-and-out trading, it has a secondary effect in that it will make it easier for funds to manage liquidity.[31] In turn, this should, arguably, lead to improved performance.

[31] See U.S. Securities and Exchange Commission (2004). Zitzewitz (2003) documents the presence of market timing and late trading and analyzes various regulatory proposals aimed at preventing such abuses.

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Table 1

Fund Characteristics

This table reports summary characteristics of the 1,400 funds in our sample and the actively managed U.S. equity funds that appear in the CRSP mutual fund database from January 1980 to December 2003. Panel *A* reports the mean and median total assets, number of stocks held, management expenses, and portfolio turnover rate. Panel *B* reports fund investment objectives. The number of securities held and investment objectives are from the Thomson/CDA database and all other data is from the CRSP mutual fund database.

A. Fund Characteristics

	Mean		Median	
	Sample Funds	Fund Universe	Sample Funds	Fund Universe
Total Assets	$349 million	$228 million	$58 million	$30 million
Number of Securities Held	99	90	66	60
Expense Ratio	1.50%	1.45%	1.40%	1.36%
Portfolio Turnover Rate	87%	105%	70%	74%

B. Fund Investment Objectives

	Aggressive Growth	Growth	Growth & Income
Sample Funds	16.65%	60.30%	23.05%
Fund Universe	10.97%	67.24%	21.79%

Table 2
Performance of Stock Purchases

This table reports performance results of stock purchases for buy portfolios categorized by net investor flows and trade size. Panels *A*, *B*, and *C* present benchmark-adjusted returns and associated *t*-statistics for annual, semiannual, and quarterly holding periods, respectively, that are measured from the date of the portfolio's formation; parts 1 and 2 of each panel show the results when the fourth quarter of each year is excluded and when it is included, respectively. The first three rows and three columns of numbers in each part in a given panel report results from our two-way sort on investor flows and trade size. The fourth row and fourth column report results from a one-way sorting only on trade size and investor flows, respectively. The entry in the fourth row of the fourth column represents all stock purchases. The fifth row and fifth column report the difference between the extreme trade-size and investor-flow quintiles, respectively. Finally, the entry in the sixth row of the sixth column represents the difference in returns between the two most extreme portfolios based on investor flows and trade size. Returns are adjusted against the benchmarks of Daniel, Grinblatt, Titman, and Wermers (1997), and *t*-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A. Holding Period = Annual											
					Dollar Volume of Trades						
	1. Fourth Quarter Excluded					*2. All Quarters*					
Net Flow	TS1	TS2 to TS4	TS5	All	TS1-TS5	TS1	TS2 to TS4	TS5	All	TS1-TS5
BF1	2.79***	1.98***	1.37***	2.50***	1.41**	2.32***	2.09***	1.55***	2.38***	0.78
	(6.51)	***(7.06)***	***(3.19)***	***(8.80)***	***(2.33)***	***(6.65)***	***(8.72***	***(4.24)***	***(9.98)***	***(1.54)***
BF2 to BF4	0.49**	0.58***	0.52**	0.56***	-0.03	0.17	0.45***	0.64***	0.39***	-0.48*
	(2.28)	***(4.11)***	***(2.30)***	***(4.18)***	***(-0.09)***	***(0.89)***	***(3.70)***	***(3.26)***	***(3.35)***	***(-1.76)***
BF5	-0.46	-0.16	-0.41	-0.30	-0.06	-0.49	-0.21	-0.06	-0.37	-0.43
	(-1.23)	***(-0.56)***	***(-0.93)***	***(-1.17)***	***(-0.10)***	***(-1.45)***	***(-0.85)***	***(-0.16)***	***(-1.63)***	***(-0.84)***
All	0.67***	0.67***	0.46***	0.70***	0.20	0.43***	0.60***	0.6***	0.59***	-0.19
	(4.00)	***(5.93)***	***(2.61)***	***(6.56)***	***(0.84)***	***(3.00)***	***(6.16)***	***(4.02)***	***(6.33)***	***(-0.88)***
BF1-BF5	3.25***	2.14***	1.78***	2.81***		2.81***	2.30***	1.61***	2.75***	
	(5.70)	***(5.32)***	***(2.90)***	***(7.29)***		***(5.78)***	***(6.63)***	***(3.05)***	***(8.35)***	
BF1/TS1-BF5/TS5					3.20***					2.39***
					(5.22)					***(4.62)***

Table 2 -continued

B. Holding Period = Semiannual										
	Dollar Volume of Trades									
	1. Fourth Quarter Excluded					***2. All Quarters***				
Net Flow	TS1	TS2 to TS4	TS5	All	TS1-TS5	TS1	TS2 to TS4	TS5	All	TS1-TS5
BF1	1.90***	1.13***	1.11***	1.54***	0.79*	1.37***	0.95***	0.89***	1.22***	0.48
	(6.45)	***(6.13)***	***(3.67)***	***(8.38)***	***(1.88)***	***(5.64)***	***(6.13)***	***(3.50)***	***(7.92)***	***(1.37)***
BF2 to BF4	0.35**	0.36***	0.43***	0.37***	-0.08	0.12	0.28***	0.51***	0.26***	-0.40**
	(2.28)	***(3.59)***	***(2.61)***	***(3.90)***	***(-0.36)***	***(0.88)***	***(3.23)***	***(3.58)***	***(3.18)***	***(-2.04)***
BF5	0.02	0.07	-0.02	-0.03	0.04	-0.01	-0.02	0.12	-0.08	-0.13
	(0.08)	***(0.35)***	***(-0.06)***	***(-0.15)***	***(0.10)***	***(-0.04)***	***(-0.11)***	***(0.44)***	***(-0.51)***	***(-0.35)***
All	0.54***	0.43***	0.45***	0.49***	0.09	0.32***	0.34***	0.49***	0.37***	-0.17
	(4.52)	***(5.54)***	***(3.51)***	***(6.51)***	***(0.54)***	***(3.09)***	***(5.05)***	***(4.39)***	***(5.70)***	***(-1.12)***
BF1-BF5	1.88***	1.06***	1.13***	1.57***		1.37***	0.97***	0.77**	1.30***	
	(4.59)	***(3.96)***	***(2.63)***	***(6.06)***		***(3.97)***	***(4.21)***	***(2.08)***	***(5.86)***	
BF1/TS1-BF5/TS5					1.92***					1.25***
					(4.53)					***(3.44)***

C. Holding Period = Quarter										
	Dollar Volume of Trades									
	1. Fourth Quarter Excluded					***2. All Quarters***				
Net Flow	TS1	TS2 to TS4	TS5	All	TS1-TS5	TS1	TS2 to TS4	TS5	All	TS1-TS5
BF1	1.20***	0.72***	0.78***	1.01***	0.41	0.96***	0.66***	0.56***	0.85***	0.39
	(5.71)	***(5.59)***	***(3.78)***	***(7.57)***	***(1.41)***	***(5.52)***	***(6.05)***	***(3.19)***	***(7.68)***	***(1.59)***
BF2 to BF4	0.41***	0.31***	0.38***	0.35***	0.04	0.15	0.23***	0.35***	0.22***	-0.21
	(3.76)	***(4.41)***	***(3.28)***	***(5.12)***	***(0.23)***	***(1.54)***	***(3.81)***	***(3.50)***	***(3.79)***	***(-1.51)***
BF5	0.10	0.23*	0.25	0.18	-0.16	0.04	0.17	0.23	0.14	-0.19
	(0.48)	***(1.72)***	***(1.21)***	***(1.39)***	***(-0.53)***	***(0.23)***	***(1.49)***	***(1.27)***	***(1.27)***	***(-0.75)***
All	0.48***	0.36***	0.43***	0.42***	0.06	0.27***	0.28***	0.36***	0.31***	-0.09
	(5.69)	***(6.47)***	***(4.83)***	***(7.86)***	***(0.46)***	***(3.67)***	***(6.01)***	***(4.66)***	***(6.76)***	***(-0.88)***
BF1-BF5	1.10***	0.49***	0.53*	0.84***		0.91***	0.48***	0.33	0.71***	
	(3.78)	***(2.68)***	***(1.80)***	***(4.55)***		***(3.70)***	***(3.06)***	***(1.30)***	***(4.54)***	
BF1/TS1-BF5/TS5					0.94***					0.72***
					(3.19)					***(2.87)***

Table 3
Performance of Stock Sales

This table reports performance results of stock sales for sell portfolios categorized by net investor flows and trade size. Panels *A*, *B*, and *C* present benchmark-adjusted returns and associated *t*-statistics for annual, semiannual, and quarterly holding periods, respectively, that are measured from the date of the portfolio's formation; parts 1 and 2 of each panel show the results when the fourth quarter of each year is excluded and when it is included, respectively. The first three rows and three columns of numbers in each part in a given panel report results from our two-way sort on investor flows and trade size. The fourth row and fourth column report results from a one-way sorting only on trade size and investor flows, respectively. The entry in the fourth row of the fourth column represents all stock sales. The fifth row and fifth column report the difference between the extreme trade-size and investor-flow quintiles, respectively. Finally, the entry in the sixth row of the sixth column represents the difference in returns between the two most extreme portfolios based on investor flows and trade size. Returns are adjusted against the benchmarks of Daniel, Grinblatt, Titman, and Wermers (1997), and *t*-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A. Holding Period = Annual										
	Dollar Volume of Trades									
	1. Fourth Quarter Excluded					***2. All Quarters***				
Net Flow	TS1	TS2 to TS4	TS5	All	TS1-TS5	TS1	TS2 to TS4	TS5	All	TS1-TS5
SF1	-0.66	-1.27***	-0.41	-1.02***	-0.25	0.31	-0.58***	0.50	-0.21	-0.18
	(-1.46)	***(-4.82)***	***(-0.85)***	***(-3.99)***	***(-0.37)***	***(0.77)***	***(-2.47)***	***(1.10)***	***(-0.89)***	***(-0.30)***
SF2 to SF4	-0.29	-0.55***	0.33	-0.41***	-0.62	-0.35**	-0.53***	-0.14	-0.43***	-0.21
	(-1.17)	***(-3.64)***	***(1.06)***	***(-2.80)***	***(-1.55)***	***(-1.65)***	***(-3.99)***	***(-0.54)***	***(-3.42)***	***(-0.64)***
SF5	0.07	0.72**	1.55***	0.67**	-1.48**	-0.06	0.44	0.91*	0.36	-0.97
	(0.14)	***(2.05)***	***(2.74)***	***(2.07)***	***(-1.99)***	***(-0.14)***	***(1.51)***	***(1.93)***	***(1.36)***	***(-1.55)***
All	-0.29	-0.49***	0.33	-0.36***	-0.62**	-0.20	-0.39***	0.10	-0.27***	-0.30
	(-1.52)	***(-4.04)***	***(1.41)***	***(-3.09)***	***(-2.05)***	***(-1.18)***	***(-3.65)***	***(0.53)***	***(-2.73)***	***(-1.17)***
SF1-SF5	-0.73	-1.99***	-1.97***	-1.70***		0.37	-1.01***	-0.41	-0.57	
	(-1.10)	***(-4.54)***	***(-2.63)***	***(-4.09)***		***(0.64)***	***(-2.73)***	***(-0.63)***	***(-1.61)***	
SF1/TS1-SF5/TS5					-2.21***					-0.59
					(-3.06)					***(-0.96)***

Table 3 -continued

B. Holding Period = Semiannual											
	Dollar Volume of Trades										
	1. Fourth Quarter Excluded					***2. All Quarters***				
Net Flow	TS1	TS2 to TS4	TS5	All	TS1-TS5	TS1	TS2 to TS4	TS5	All	TS1-TS5
SF1	0.12	-0.48**	0.11	-0.23	0.01	0.31	-0.44***	0.30	-0.14	0.01
	(0.38)	***(-2.44)***	***(0.30)***	***(-1.20)***	***(0.03)***	***(1.08)***	***(-2.59)***	***(0.92)***	***(-0.81)***	***(0.02)***
SF2 to SF4	0.22	-0.30***	0.44**	-0.08	-0.23	-0.05	-0.35***	0.17	-0.21**	-0.22
	(1.16)	***(-2.77)***	***(2.02)***	***(-0.76)***	***(-0.78)***	***(-0.31)***	***(-3.81)***	***(0.95)***	***(-2.37)***	***(-0.92)***
SF5	-0.17	0.33	0.86**	0.28	-1.03**	-0.27	0.15	0.44	0.09	-0.70
	(-0.50)	***(1.39)***	***(2.22)***	***(1.24)***	***(-2.00)***	***(-0.95)***	***(0.76)***	***(1.32)***	***(0.47)***	***(-1.62)***
All	0.13	-0.24***	0.40**	-0.06	-0.27	-0.05	-0.30***	0.20	-0.17***	-0.24
	(0.94)	***(-2.72)***	***(2.43)***	***(-0.69)***	***(-1.23)***	***(-0.39)***	***(-4.09)***	***(1.41)***	***(-2.41)***	***(-1.33)***
SF1-SF5	0.29	-0.82***	-0.75	-0.51*		0.57	-0.59**	-0.14	-0.22	
	(0.62)	***(-2.63)***	***(-1.40)***	***(-1.72)***		***(1.43)***	***(-2.27)***	***(-0.30)***	***(-0.90)***	
SF1/TS1-SF5/TS5					-0.73					-0.13
					(-1.45)					***(-0.31)***

C. Holding Period = Quarter										
	Dollar Volume of Trades									
	1. Fourth Quarter Excluded					***2. All Quarters***				
Net Flow	TS1	TS2 to TS4	TS5	All	TS1-TS5	TS1	TS2 to TS4	TS5	All	TS1-TS5
SF1	0.33	-0.30**	0.15	-0.06	0.18	0.31	-0.28**	0.36	-0.06	-0.06
	(1.42)	***(-2.16)***	***(0.57)***	***(-0.42)***	***(0.50)***	***(1.54)***	***(-2.37)***	***(1.57)***	***(-0.53)***	***(-0.18)***
SF2 to SF4	0.17	-0.20**	0.29**	-0.05	-0.12	-0.08	-0.27***	0.14	-0.18***	-0.23
	(1.35)	***(-2.56)***	***(2.09)***	***(-0.63)***	***(-0.65)***	***(-0.79)***	***(-4.09)***	***(1.21)***	***(-2.85)***	***(-1.43)***
SF5	-0.09	0.18	0.58**	0.14	-0.67*	-0.26	0.04	0.21	-0.02	-0.47
	(-0.40)	***(1.09)***	***(2.05)***	***(0.90)***	***(-1.83)***	***(-1.29)***	***(0.26)***	***(0.86)***	***(-0.17)***	***(-1.48)***
All	0.14	-0.15**	0.28***	-0.02	-0.14	-0.07	-0.22***	0.16*	-0.14***	-0.23*
	(1.44)	***(-2.50)***	***(2.59)***	***(-0.39)***	***(-0.98)***	***(-0.81)***	***(-4.29)***	***(1.69)***	***(-2.87)***	***(-1.81)***
SF1-SF5	0.42	-0.48**	-0.43	-0.20		0.56**	-0.32*	0.15	-0.04	
	(1.29)	***(-2.22)***	***(-1.10)***	***(-0.95)***		***(2.00)***	***(-1.75)***	***(0.45)***	***(-0.24)***	
SF1/TS1-SF5/TS5					-0.25					0.10
					(-0.67)					***(0.30)***

Table 4

Performance of Stock Purchases and Sales with Alternative Benchmarking Methods

This table reports performance results of stock purchases and sales (excluding those made in the fourth-quarter) categorized by net investor flows and trade size. Panel *A* reports results for the two extreme buy portfolios: *BF1/TS1* with the highest proportion of valuation-motivated buys and *BF5/TS5* with the highest proportion of liquidity-motivated buys. Panel *B* reports results for the two extreme sell portfolios: *SF1/TS1* with the highest proportion of valuation-motivated sales and *SF5/TS5* with the highest proportion of liquidity-motivated sales. The difference column in both panels represents the difference in returns between these two extreme portfolios. Raw and benchmark-adjusted returns using value-weighting and associated *t*-statistics for annual, semiannual, and quarterly holding periods that are measured from the date of the portfolio's formation are reported. The first row in each panel reports raw returns. The second row reports market-adjusted returns, calculated by subtracting the buy-and-hold return on the market portfolio from the buy-and-hold return for each stock for the same period. The market portfolio used is the value-weighted portfolio of all NYSE, AMEX, and Nasdaq stocks. The third row reports Wermers-adjusted returns (see Wermers (2003)). The fourth row reports the DGTW-adjusted returns (see Daniel, Grinblatt, Titman, and Wermers (1997)). Finally, the fifth row reports the DGTW-adjusted returns when benchmark portfolios are updated every quarter, instead of annually as is typically the practice. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A. Stock Purchases

Benchmarking	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarter		
Method	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference
Raw	15.24***	12.01***	3.23***	9.11***	4.94***	4.16***	5.26**	3.09***	2.16***
Returns	***(22.30)***	***(18.31)***	***(3.41)***	***(17.73)***	***(11.08)***	***(6.12)***	***(14.41)***	***(10.08)***	***(4.54)***
Market-Adjusted	9.14***	5.17***	3.97***	5.14***	2.27***	2.88***	2.66***	1.39***	1.26***
Returns	***(16.92)***	***(9.70)***	***(5.23)***	***(13.92)***	***(6.66)***	***(5.73)***	***(10.63)***	***(6.01)***	***(3.71)***
Wermers-Adjusted	3.10***	-0.01	3.11***	2.15***	0.17	1.98***	1.30***	0.29	1.01***
Returns	***(7.12)***	***(-0.02)***	***(5.12)***	***(6.84)***	***(0.55)***	***(4.57)***	***(5.72)***	***(1.36)***	***(3.28)***
DGTW-Annual	2.79***	-0.41	3.20***	1.90***	-0.02	1.92***	1.20***	0.25	0.94***
Adjusted Returns	***(6.51)***	***(-0.93)***	***(5.22)***	***(6.45)***	***(-0.06)***	***(4.53)***	***(5.71)***	***(1.21)***	***(3.19)***
DGTW-Quarterly	2.84***	-0.04	2.87***	1.71***	0.18	1.53***	0.91***	0.52**	0.39
Adjusted Returns	***(6.45)***	***(-0.08)***	***(4.66)***	***(5.75)***	***(0.58)***	***(3.60)***	***(4.42)***	***(2.45)***	***(1.32)***

Table 4-*continued*

B. Stock Sales

Benchmarking Method	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarter		
	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference
Raw Returns	7.91***	18.02***	-10.11***	4.43***	7.92***	-3.50***	2.40***	4.89***	-2.49***
	(11.62)	***(22.62)***	***(-9.13)***	***(9.80)***	***(15.16)***	***(-5.06)***	***(7.78)***	***(12.59)***	***(-5.02)***
Market-Adjusted Returns	2.55***	9.80***	-7.25***	1.86***	4.41***	-2.54***	0.91***	2.30***	-1.39***
	(5.07)	***(14.24)***	***(-8.52)***	***(5.45)***	***(10.09)***	***(-4.58)***	***(3.94)***	***(7.04)***	***(-3.47)***
Wermers-Adjusted Returns	-1.07**	2.89***	-3.97***	-0.22	1.07***	-1.28***	-0.13	0.63**	-0.76**
	(-2.49)	***(4.92)***	***(-5.44)***	***(-0.68)***	***(2.79)***	***(2.58)***	***(-0.58)***	***(2.16)***	***(-2.07)***
DGTW-Annual Adjusted Returns	-0.66	1.55***	-2.21***	0.12	0.86**	-0.73	0.33	0.58**	-0.25
	(-1.46)	***(2.74)***	***(-3.06)***	***(0.38)***	***(2.22)***	***(-1.45)***	***(1.42)***	***(2.05)***	***(-0.67)***
DGTW-Quarterly Adjusted Returns	-1.20**	2.84***	-4.04***	-0.16	1.46***	-1.62***	0.03	0.73**	-0.70*
	(-2.56)	***(4.32)***	***(-5.01)***	***(-0.48)***	***(3.54)***	***(-3.06)***	***(0.14)***	***(2.53)***	***(-1.90)***

Table 5

Performance of Stock Purchases and Sales with Alternative Portfolio Creation Methods

This table reports DGTW-adjusted returns for buy and sell portfolios by method of portfolio formation and by subperiod. The two subperiods are 1980-1991 and 1992-2003. We use two portfolio formation methods. The first one is the Panel Method which is the same as the method we use in all previous analysis. The second method we use is the Time-Series Method which creates time-series portfolios. Under this method, all extreme portfolios (e.g. portfolios in BF1/TS1) that were categorized as such using our methodology and that were created in quarter *t* were placed in a large portfolio. This portfolio was weighted by the dollar value of the buy or sell portfolios that belong to it. Portfolio updating takes place every period and the *t*-statistics are based on the time series of the returns of this portfolio. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A.1 Stock Purchases (1980-2003)

Portfolio Formation	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarterly		
Method	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference
Panel	2.79***	-0.41	3.20***	1.90***	-0.02	1.92***	1.20***	0.25	0.94***
	(6.51)	***(-0.93)***	***(5.22)***	***(6.45)***	***(-0.06)***	***(4.53)***	***(5.71)***	***(1.21)***	***(3.19)***
Time-Series	3.91***	-2.06*	5.98***	2.33**	-0.95	3.28***	1.23**	0.19	1.04
	(3.30)	***(-1.76)***	***(3.52)***	***(2.55)***	***(-1.18)***	***(2.65)***	***(2.16)***	***(0.26)***	***(1.23)***

A.2 Stock Purchases (1980-1991)

Portfolio Formation	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarterly		
Method	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference
Panel	1.14**	-1.05	2.19**	1.18***	-0.48	1.67***	0.40	-0.14	0.54
	(2.01)	***(-1.56)***	***(2.49)***	***(3.11)***	***(-1.00)***	***(2.71)***	***(1.48)***	***(-0.44)***	***(1.28)***
Time-Series	3.13***	0.13	3.01	1.42	0.33	1.09	0.54	0.50	0.05
	(2.96)	***(0.08)***	***(1.64)***	***(1.48)***	***(0.33)***	***(0.72)***	***(0.84)***	***(0.77)***	***(0.04)***

A.3 Stock Purchases (1992-2003)

Portfolio Formation	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarterly		
Method	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference
Panel	3.51***	-0.12	3.63***	2.22***	0.19	2.03***	1.55***	0.43	1.12***
	(6.23)	***(-0.21)***	***(4.58)***	***(5.68)***	***(0.50)***	***(3.70)***	***(5.59)***	***(1.63)***	***(2.91)***
Time-Series	4.53**	-3.78**	8.31***	3.05**	-1.95	5.01***	1.76**	-0.05	1.81
	(2.32)	***(-2.36)***	***(3.15)***	***(2.10)***	***(-1.65)***	***(2.72)***	***(2.01)***	***(-0.04)***	***(1.43)***

Table 5-continued

B.1 Stock Sales (1980-2003)

Portfolio Formation	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarter		
Method	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference
Panel	-0.66	1.55***	-2.21***	0.12	0.86**	-0.73	0.33	0.58**	-0.25
	(-1.46)	***(2.74)***	***(-3.06)***	***(0.38)***	***(2.22)***	***(-1.45)***	***(1.42)***	***(2.05)***	***(-0.67)***
Time-Series	-0.10	1.06	-1.16	-1.20	-0.15	-1.04	-0.22	0.38	-0.60
	(-0.05)	***(0.61)***	***(-0.44)***	***(-1.54)***	***(-0.15)***	***(-0.86)***	***(-0.33)***	***(0.50)***	***(-0.86)***

B.2 Stock Sales (1980-1991)

Portfolio Formation	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarter		
Method	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference
Panel	-2.19***	-0.11	-2.08*	-1.03**	-1.40**	0.37	-0.50	-0.84	0.34
	(-2.97)	***(-0.11)***	***(-1.72)***	***(-2.06)***	***(-2.34)***	***(0.47)***	***(-1.45)***	***(-1.96)***	***(0.61)***
Time-Series	-0.70%	-0.61	-0.09	-1.52	-1.01	-0.50	0.16	0.26	-0.09
	(-0.21)	***(-0.48)***	***(-0.02)***	***(-1.30)***	***(-1.17)***	***(-0.33)***	***(0.16)***	***(0.27)***	***(-0.13)***

B.3 Stock Sales (1992-2003)

Portfolio Formation	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarter		
Method	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference
Panel	0.05	2.26***	-2.20**	0.67	1.82***	-1.16*	0.72**	1.18***	-0.46
	(0.10)	***(3.25)***	***(-2.46)***	***(1.60)***	***(3.75)***	***(-1.81)***	***(2.38)***	***(3.29)***	***(-0.98)***
Time-Series	0.41	2.47	-2.06	-0.93	0.57	-1.50	-0.54	0.48	-1.03
	(0.23)	***(0.82)***	***(-0.57)***	***(-0.88)***	***(0.32)***	***(-0.81)***	***(-0.62)***	***(0.42)***	***(-0.91)***

Table 6

Performance Around Earnings Announcements

This table reports three-day returns for the extreme buy and sell portfolios around earnings announcements. As in Baker, Litov, Wachter, and Wurgler (2005), the extreme buy and sell portfolios include only those stocks that were followed by an earnings announcement within a 90-day window following the trade. For each earning announcement a DGTW-adjusted return was calculated for the window [-1, +1]. The earnings announcement returns were averaged across all stocks that were part of a buy or sell portfolio, then averaged across all funds and report dates in each year to come up with an average for each year. In all cases the fourth quarter was excluded from the analysis. The *t*-statistics reported in parentheses are based on the time-series averages of annual averages. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A. Stock Purchases

BF1/TS1	BF5/TS5	BF1/TS1- BF5/TS5
0.20***	0.09*	0.12
(3.33)	***(1.77)***	***(1.46)***

B. Stock Sales

SF1/TS1	SF5/TS5	SF1/TS1- SF5/TS5
-0.08	-0.02	-0.05
(-1.13)	***(-0.31)***	***(-0.50)***

C. Stock Purchases Compared to Stock Sales

BF1/TS1-SF1/TS1	BF5/TS5- SF5/TS5
0.28***	***0.11***
(3.07)	***(1.22)***

Table 7

Fund Characteristics by Investment Objective

This table reports the mean and median total assets, number of stocks held, management expenses, and portfolio turnover rate for funds categorized by Thomson/CDA as aggressive growth, growth, and growth and income. The number of securities held and investment objectives are from Thomson/CDA database and all other data is from the CRSP mutual fund database.

	Aggressive Growth		***Growth***		***Growth and Income***	
	Mean	Median	Mean	Median	Mean	Median
Total assets	$473 million	$96 million	$320 million	$58 million	$553 million	$68 million
Number of stocks held	91	66	105	66	90	65
Expense ratio	1.62%	1.53%	1.50%	1.40%	1.36%	1.27%
Portfolio turnover rate	97%	86%	89%	71%	68%	59%

Table 8

Performance of Stock Purchases and Sales for Funds Categorized by Investment Objective

This table reports performance results for the entire sample of funds and separately for funds categorized by Thomson/CDA as aggressive growth, growth, and growth and income. Panel *A* reports results for the two extreme buy portfolios: *BF1/TS1* with the highest proportion of valuation-motivated buys and *BF5/TS5* with the highest proportion of liquidity-motivated buys. Panel *B* reports results for the two extreme sell portfolios: *SF1/TS1* with the highest proportion of valuation-motivated sales and *SF5/TS5* with the highest proportion of liquidity-motivated sales. The difference column in both panels represents the difference in returns between these two extreme portfolios. Benchmark-adjusted returns using value-weighting and associated *t*-statistics for annual, semiannual, and quarterly holding periods that are measured from the date of the portfolio's formation are reported. Returns are adjusted against the benchmarks of Daniel, Grinblatt, Titman, and Wermers (1997), and *t*-statistics are reported in parentheses. In all cases the fourth quarter was excluded from the analysis. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A. Stock Purchases

	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarter		
Fund Objective	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference	BF1/TS1	BF5/TS5	Difference
Aggressive Growth	3.75***	-1.81	5.56***	2.77***	-0.83	3.60***	1.42**	-0.10	1.52*
	(2.96)	***(-1.58)***	***(3.25)***	***(3.41)***	***(-0.93)***	***(2.99)***	***(2.54)***	***(-0.17)***	***(1.87)***
Growth	3.32***	-0.10	3.42***	2.23***	0.28	1.95***	1.46***	0.53*	0.94**
	(5.37)	***(-0.16)***	***(3.94)***	***(5.22)***	***(0.67)***	***(3.29)***	***(4.87)***	***(1.88)***	***(2.27)***
Growth and Income	1.14*	-0.21	1.35	0.78*	-0.12	0.91	0.45	-0.33	0.78
	(1.82)	***(-0.26)***	***(1.35)***	***(1.69)***	***(-0.24)***	***(1.29)***	***(1.28)***	***(-0.85)***	***(1.49)***
All Funds	2.79***	-0.41	3.20***	1.90***	-0.02	1.92***	1.20***	0.25	0.94***
	(6.51)	***(-0.93)***	***(5.22)***	***(6.45)***	***(-0.06)***	***(4.53)***	***(5.71)***	***(1.21)***	***(3.19)***

Table 8-*continued*

B. Stock Sales

	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarter		
Fund Objective	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference	SF1/TS1	SF5/TS5	Difference
Aggressive Growth	-3.28***	-0.26	-3.03	-1.23	0.26	-1.49	-0.67	0.51	-1.18
	(-2.73)	***(-0.16)***	***(-1.50)***	***(-1.49)***	***(0.27)***	***(-1.18)***	***(-1.01)***	***(0.72)***	***(-1.22)***
Growth	-0.42	2.03***	-2.45**	0.40	1.58***	-1.18*	0.43	0.95**	-0.51
	(-0.69)	***(2.59)***	***(-2.47)***	***(0.90)***	***(2.95)***	***(-1.68)***	***(1.39)***	***(2.39)***	***(-1.02)***
Growth and Income	0.19	1.68	-1.49	0.05	-0.25	0.30	0.38	-0.20	0.58
	(0.26)	***(1.58)***	***(-1.16)***	***(0.10)***	***(-0.36)***	***(0.35)***	***(1.07)***	***(-0.39)***	***(0.93)***
All Funds	-0.66	1.55***	-2.21***	0.12	0.86**	-0.73	0.33	0.58**	-0.25
	(-1.46)	***(2.74)***	***(-3.06)***	***(0.38)***	***(2.22)***	***(-1.45)***	***(1.42)***	***(2.05)***	***(-0.67)***

Table 9

The Performance of Initiating Buys and Terminating Sells

This table presents performance results for initiating buy and terminating sell portfolios. Panel *A* reports results where all fund transactions are evaluated separately. Panel *B* reports results where all fund transactions are evaluated at the fund advisor level. Benchmark-adjusted returns using value-weighting and associated *t*-statistics for annual, semiannual, and quarterly holding periods that are measured from the date of the portfolio's formation are reported. Returns are adjusted against the benchmarks of Daniel, Grinblatt, Titman, and Wermers (1997), and *t*-statistics are reported in parentheses. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

A. Initiating Buys and Terminating Sales by Fund

	1. Fourth Quarter Excluded			*2. All Quarters*		
	Holding Period			Holding Period		
Portfolios:	Annual	Semiannual	Quarter	Annual	Semiannual	Quarter
Initiating buys	0.80***	0.62***	0.52***	0.69*	0.47***	0.39***
	(5.31)	***(5.99)***	***(7.33)***	***(5.34***	***(5.30)***	***(6.36)***
Terminating sells	-0.98***	-0.53***	-0.30***	-0.96***	-0.65***	-0.36***
	(-5.29)	***(-4.13)***	***(-3.18)***	***(-5.97)***	***(-5.85)***	***(-4.52)***
Difference	1.78***	1.16***	0.82***	1.65***	1.13***	0.75***
	(7.46)	***(6.98)***	***(6.98)***	***(8.00)***	***(7.88)***	***(7.48)***

B. Initiating Buys and Terminating Sales by Advisor

	1. Fourth Quarter Excluded			*2. All Quarters*		
	Holding Period			Holding Period		
Portfolios:	Annual	Semiannual	Quarter	Annual	Semiannual	Quarter
Initiating buys	1.02***	0.66***	0.44***	0.94***	0.57***	0.36***
	(4.38)	***(4.39)***	***(4.46)***	***(4.82)***	***(4.40)***	***(4.26)***
Terminating sells	-1.05***	-0.43**	-0.24*	-1.06***	-0.60***	-0.30***
	(-4.72)	***(-2.54)***	***(-1.95)***	***(-5.49)***	***(-4.24)***	***(-2.91)***
Difference	2.07***	1.09***	0.68***	2.00***	1.17***	0.67***
	(6.43)	***(4.81)***	***(4.29)***	***(7.29)***	***(6.09)***	***(4.94)***

Table 10

The Performance of Initiating Buys and Terminating Sells by Subperiod

This table presents performance results for initiating buy and terminating sell portfolios by subperiod. The two subperiods are 1980-1991 and 1992-2003. All fund transactions are evaluated separately. Benchmark-adjusted returns using value-weighting and associated *t*-statistics for annual, semiannual, and quarterly holding periods that are measured from the date of the portfolio's formation are reported. Returns are adjusted against the benchmarks of Daniel, Grinblatt, Titman, and Wermers (1997), and *t*-statistics are reported in parentheses. In all cases the fourth quarter was excluded from the analysis. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Performance of Initiating Buys (IB) and Terminating Sales (TS) by Subperiod

	Holding Period = Annual			Holding Period = Semiannual			Holding Period = Quarterly		
	IB	TS	Difference	IB	TS	Difference	IB	TS	Difference
Overall Period:									
1980-2003	0.80***	-0.98***	1.78***	0.62***	-0.53***	1.16***	0.52***	-0.30***	0.82***
	(5.31)	***(-5.29)***	***(7.46)***	***(5.99)***	***(-4.13)***	***(6.98)***	***(7.33)***	***(-3.18)***	***(6.98)***
Subperiods:									
1980-1991	-0.06	-2.42***	2.36***	0.14	-1.30***	1.44***	0.19***	-0.76***	0.95***
	(-0.29)	***(-9.15)***	***(7.06)***	***(0.97)***	***(-7.01)***	***(6.18)***	***(1.90)***	***(5.72)***	***(5.71)***
1992-2003	1.23***	-0.30	1.53***	0.86***	-0.18	1.04***	0.69***	-0.08	0.77***
	(6.06)	***(-1.25)***	***(4.84)***	***(6.16)***	***(-1.03)***	***(4.72)***	***(7.25)***	***(-0.68)***	***(4.97)***

Table 11

Performance of Initiating Purchases and Terminating Sales with Alternative Benchmarking Methods

This table presents the performance of initiating buy and terminating sell portfolios with alternative benchmarking methods. IB denotes initiating buys and TS denotes terminating sales, with Difference being IB - TS. The first row reports raw returns. The second row reports market-adjusted returns, calculated by subtracting the buy-and-hold return on the market portfolio from the buy-and-hold return for each stock for the same period. The market portfolio used is the value-weighted portfolio of all NYSE, AMEX, and Nasdaq stocks. The third row reports Wermers-adjusted returns (see Wermers (2003)). The fourth row reports the DGTW-adjusted returns (see Daniel, Grinblatt, Titman, and Wermers (1997)). Finally, the fifth row reports the DGTW-adjusted returns when benchmark portfolios are updated every quarter, instead of annually as is typically the practice. Benchmark-adjusted returns using value-weighting and associated *t*-statistics for annual, semiannual, and quarterly holding periods that are measured from the date of the portfolio's formation are reported. In all cases the fourth quarter was excluded from the analysis. ***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

Benchmarking Method	***Holding Period = Annual***			***Holding Period = Semiannual***			***Holding Period = Quarter***		
	IB	TS	Difference	IB	TS	Difference	IB	TS	Difference
Raw Returns	12.96*** ***(54.87)***	10.47*** ***(37.01)***	2.49*** ***(6.75)***	6.20*** ***(36.92)***	4.29*** ***(23.40)***	1.92*** ***(7.71)***	3.47*** ***(29.83)***	2.40*** ***(17.32)***	1.07*** ***(5.92)***
Market-Adjusted Returns	6.90*** ***(37.26)***	4.73*** ***(20.10)***	2.17*** ***(7.24)***	3.56*** ***(29.31)***	1.53*** ***(9.75)***	2.03*** ***(10.25)***	1.86*** ***(23.51)***	0.57*** ***(5.49)***	1.30*** ***(9.96)***
Wermers-Adjusted Returns	1.24*** ***(8.70)***	-0.31 ***(-1.54)***	1.55*** ***(6.29)***	0.87*** ***(8.39)***	-0.42*** ***(-3.22)***	1.29*** ***(7.71)***	0.50*** ***(6.87)***	-0.38*** ***(-3.90)***	0.88*** ***(7.25)***
DGTW-Annual Adjusted Returns	0.80*** ***(5.31)***	-0.98*** ***(-5.29)***	1.78*** ***(7.46)***	0.62*** ***(5.99)***	-0.53*** ***(-4.13)***	1.16*** ***(6.98)***	0.52*** ***(7.33)***	-0.30*** ***(-3.18)***	0.82*** ***(6.98)***
DGTW-Quarterly Adjusted Returns	1.12*** ***(7.32)***	-0.37** ***(-1.85)***	1.50*** ***(5.90)***	0.71*** ***(6.83)***	-0.48*** ***(-3.65)***	1.20*** ***(7.09)***	0.44*** ***(6.18)***	-0.37*** ***(-3.91)***	0.81*** ***(6.82)***