Changing Horses in Midstream:
The Causes and Effects of Changes in Investment Strategy Amongst Mutual Funds

By David Solomon

University of Chicago GSB

dsolomon@chicagogsb.edu

Abstract: This paper examines the performance of mutual funds surrounding changes in investment strategy, where portfolio holdings have changed sufficiently from one period to the next to indicate that the fund is investing according to different decision rules. Various types of strategy change tend to result in lower subsequent returns to funds, suggesting that such funds demonstrate negative timing ability. Extending on the Frazzini and Lamont (2006) 'dumb money' argument, these changes are driven in part by fund flows. The adverse timing ability of these funds also results in predictability in stock returns.

I would like especially like to thank my two curriculum paper advisors, Lubos Pástor and Andrea Frazzini, for their invaluable suggestions and advice. I would also like to thank Aroop Chatterjee, Mark Klebanov and Shastri Sandy, for their comments. All remaining errors are my own.

1. Introduction

Of the many qualities that mutual funds claim to possess in their advertisements, anecdotally one of the most frequently cited is 'discipline'. Mutual fund investors are apparently reassured by the prospect that their fund manager will continue to do exactly the same thing even in the face of changing circumstances. Financial academics may view this as somewhat puzzling. Even if the claims in advertisements were taken at face value, 'timing ability' would seem to be a more useful trait to have. While it is difficult to know exactly what part of 'discipline' appeals to the investor, it is perhaps a sense that the manager will continue to follow a solid underlying strategy rather than chasing the latest 'fad' currently experiencing high returns whose performance may not last.

In the case of the average mutual fund however, there is at best mixed evidence that the underlying investment strategy they follow will actually generate abnormal positive returns in the first place.[1] Thus it is unclear what effect a change of strategy might be expected to have. While Daniel, Grinblatt, Titman and Wermers (1997) find that the *average* mutual fund does not possess timing ability, if such ability exists amongst *some* funds then it might be expected that those funds would be changing strategy more frequently than the average in order to take advantage of such skill. Moreover, many funds may not have a mandate to change their loadings on risk characteristics such as size and book-to-market, so including them in a test of timing ability will bias the results towards finding no such ability. By examining the returns to funds that actually change strategy, one can test whether there is timing ability amongst the set of funds that appear to be making the largest effort to time the market.

[1] While debate continues on the matter, the general conclusion in the literature has been that the mutual funds on average do not earn abnormal returns before expenses, and earn negative abnormal returns after expenses (Carhart (1997)). This does not however preclude the possibility of individual funds having superior performance (Kosowski, Timmermann, Wermers and White (2006), Cohen, Coval and Pastor (2005)).

An alternative possibility, however, stems from the Frazzini and Lamont (2006) 'dumb money' hypothesis that investors put money into funds whose stocks will subsequently underperform, and thus they lose returns by incorrectly re-weighting' funds via flows[2]. Over and above such investor level mistakes, it is plausible that 'dumb money' flows have the additional corrupting effect of causing some fund managers facing outflows to alter their portfolios to resemble those funds receiving greater inflows, in an attempt to receive such inflows themselves. Since the shares purchased by such high flow funds tend to have lower subsequent returns, strategy changes may be associated with worse subsequent fund performance. I term this the 'adverse investor pressure' hypothesis. Moreover, Pomorski (2004) shows that fund flows are directed in part along style-level dimensions. The effect of flows may thus cause changes in fund investment decisions that are observable along such style dimensions.

In this paper I examine the effects of mutual fund investment strategies across a large range of stock variables. I use the term 'strategy' in this context to mean *a decision to only buy shares that have a certain value of a particular variable.* This imagines a world where funds have different views on which variables are relevant for determining future stock returns (or at least different appetites for risk across commonly agreed-upon relevant variables), and invest according to these beliefs. A fund follows a strategy with respect to a certain variable if the ratio of the standard deviation of that variable within the fund's portfolio to the standard deviation of the variable in the universe of stocks is less than some cutoff, k, for four consecutive quarters. Three types of change of strategy are considered – adopting (going from low concentration in a variable to high concentration, such as going from buying shares of any market capitalization to

[2] The 'dumb money' effect is a play on the 'smart money' effect originally claimed by Gruber (1996) and Zheng (1999), namely the fund flows go towards funds that experience higher subsequent returns. More recently, Wermers (2003) and Sapp and Tiwari (2004) argue that this is due largely to momentum, and does not persist after controlling for momentum. Unlike 'smart money', which is a relation between flows and fund returns, the 'dumb money' effect applies between flows and the shares purchased by high and low flow funds.

buying only small shares), abandonment (going from high concentration to low concentration, such as buying value and growth shares instead of just value shares) and switching (staying high in concentration, but altering the mean value from on quintile to another, such as going from buying only small shares to buying only large shares).

This paper presents a range of evidence broadly in support of the 'adverse investor pressure' view of the information content in strategy changes, namely that funds respond to flows by changing strategy, and this reduces their subsequent performance. While the majority of strategy changes are due to exogenous reasons, funds are nonetheless more likely to change their investment strategy after experiencing outflows, over and above the level of past returns themselves. In their choice of variables, funds tend to chase returns, switching into and adopting strategies that have performed well in the recent past, while abandoning those that have performed poorly.

The effect of such changes in strategy is to reduce subsequent performance. Strategy switches and strategy abandonment both lead to lower abnormal future returns, of –0.69% and –0.24% per quarter respectively over a five-factor model. This underperformance is concentrated in those funds that change strategy while experiencing outflows. Funds that abandon a strategy while facing high outflows earn abnormal returns of –1.06% per quarter themselves, they earn abnormal returns of -1.29% relative to funds than abandon a strategy while facing inflows, and they earn abnormal returns of –0.66% relative to funds that face the same outflows but do not abandon their strategy. Moreover, greater numbers of funds abandoning or switching out of shares of a given level of a particular variable (such as moving out of high leverage stocks) predicts higher future abnormal returns to stocks of that type. All of this evidence is consistent

with fund flows having a perverse effect on the investment decisions of fund managers. Discipline, it seems, may not be such a bad quality after all.

The concept of strategy used in this paper also adds to the literature that considers fund performance in terms of the components of the investment decision, often by examining the holdings of mutual funds. Daniel, et al. (1997) decompose fund performance into characteristic style, characteristic timing and average style, and find that funds exhibit some stock selectivity (the ability to pick stocks that beat benchmarks based on size, B/M and momentum), but not timing ability (the ability to choose styles with the highest return in that period). Other authors explain the factors that determine investment choices. Kacperczyk and Seru (2006) examine a fund's reliance on public information, measured by the R^2 for regressing changes of holdings on changes in analysts' recommendations. Kacperczyk, Sialm and Zheng (2005) examine a fund's industry concentration, as a proxy for informativeness and find that it predicts returns. Closer in spirit to this paper is Nagel (2005), who examines the effects of fund style in terms of which changes in share characteristics, out of a large number of potential variables, explain the probability of the fund selling that share. Strategy is somewhat different from the concept of fund *style* used in Daniel et al. (1997), which refers to a fund's average value across its portfolio of variables related to broad risk characteristics such as size, B/M and momentum. 'Strategy' considers a wider range of variables, as funds may not necessarily be investing primarily along dimensions of size, B/M etc. Further, it is restricted to cases where the fund actively appears to be investing according to that variable, whereas each fund is assigned a style regardless of how closely the fund pays attention to that variable when investing.

The remainder of the paper is organized as follows: Section 2 describes the data. Section 3 gives the definitions of fund strategy used in the paper. Section 4 examines the determinants of

strategy changes. Section 5 analyses fund performance around strategy changes using an event study methodology. Section 6 examines performance around changes using a calendar time portfolio approach. Section 7 examines the predictability of stock returns based on mutual fund strategy changes. Section 8 concludes.

2. Data

Monthly mutual fund returns and annual fund information on expenses, net assets, management information etc are obtained from the CRSP Mutual Fund Database. These are then matched with information on mutual fund share ownership from a fund's SEC 13f filings contained in the Thomson Financial Mutual Fund database. Funds are required to report at a semi-annual frequency, but roughly 60% report quarterly holdings. The link between these two files was kindly provided by Andrea Frazzini. Details of this link can be found in Frazzini (2006). Because the focus here is on actively managed equity mutual funds, other types of funds are excluded, such as balanced, bond, money market, sector, and international funds. A number of screens are applied to fund holdings to remove apparent data errors. These are described in the Data Appendix. After the match, there are 48824 fund quarters of holdings information for 3202 equity mutual funds, covering the period January 1980 to December 2003.

For the majority of this paper, returns and strategy questions are considered at a quarterly level. This is because there is substantial variation in the number of funds reporting holdings in each month – almost 85% of holdings are reported in March, June, September or December. Rather than use holdings based variables at a monthly level and attempt to deal with the month-to-month variation by taking moving averages or something similar, instead in several places fund holdings are aggregated to a quarterly level. In such cases, quarters are those ending in

March, June, September or December, and where appropriate, holdings from January and February are considered in the March measure etc.

The common stock holdings of each mutual fund are then matched with a number of attributes of the stock in question. A full list of these variables, their definitions, and the data sources they come from, is given in Table I Panel A. They include the factor loadings (using Carhart (1997)'s four factors plus Pastor and Stambaugh (2003)'s liquidity measure), a number of accounting ratios, attributes relating to trading activity, and measures from analysts forecasts. These variables are screened to exclude possible data errors, as described in the Data Appendix. For measures of concentration using raw variables, at each point in time the stock attributes are windsorized at a 1% level in each tail. Table I Panel B presents summary statistics for the stock attributes considered in this paper.

[Insert TableI Panel A and B here]

3. Definitions of fund strategy

The primary measure used to define a mutual fund's strategy with respect to a stock attribute is the 'relative dispersion' measure - the ratio of the standard deviation of the characteristic within the fund's portfolio to the standard deviation of that characteristic in the universe of stocks at that time. Specifically, a fund is said to be following a strategy with respect to characteristic *x* at time t if the inequality:

$$\frac{\sqrt{\sum_{i=1}^{M}(x_{i,t}-\bar{x}_{M,t})^2}}{\sqrt{\sum_{j=1}^{N}(x_{j,t}-\bar{x}_{N,t})^2}}=\frac{\sigma(x)_{M,t}}{\sigma(x)_{N,t}}\leq k \ ,$$

holds for at least time *t,t-1, t-2* and *t-3*, where *M* is the number of shares in the mutual fund's portfolio, *N* is the number of shares in the CRSP universe, and k=0.5 or 0.7 depending on how restrictive the definition is.

The lower the relative dispersion, the more the fund appears to care about the variable when choosing stocks, because they consistently choose portfolios that are unusually concentrated along this dimension. For example, if the standard deviation of book-to-market ratios in the market is 25, but the standard deviation of book-to-market ratios with shares owned by the fund is only 5, and this is true for four periods in a row, then the fund is deemed to be following a strategy with respect to book-to-market.

For funds that meet the requirements of relative dispersion for a particular variable, strategies are given in terms of which quintile (of that variable in stock universe) the mean value of the variable in the fund falls into. The above definitions are termed 'Broad' in the tables that follow, as they only require a fund to have a certain standard deviation of a variable. A more restrictive definition, termed 'Limited', requires additionally that the mean value of the variable within the fund be in the same quintile (amongst the universe of stocks at that time) for all four periods over which the broad strategy is defined. The main results of the paper are robust to using either definition of strategy.

Variables are measured in percentiles, as in Nagel (2005). This is done because the relative dispersion ratio is then more comparable across variables, as it is insensitive to monotonic transformations of the variable. When using raw values, the distributions of the ratio across funds are quite different between variables, whereas the percentile measures are more similar in shape. They are also less sensitive to data errors, which is a concern when dealing with 26 different stock attributes (it has only been possible to screen for obviously wrong values), and

given the sensitivity of the standard deviation measure to outliers. The results are similar but slightly noisier when using raw values.

[Insert Table II]

Table II shows the prevalence of strategies for each variable. It lists the percentage of fund quarters (out of 48,824 in total) for which the fund is following a strategy with respect to that variable. One noticeable trend in this table is a large percentage of funds following strategies with respect to variables that are correlated with a firm's market capitalization – dividend payout ratio, spread, and volatility. Similar numbers, not reported, were obtained for market capitalization itself. This is perhaps not surprising, as most funds tend to invest in larger securities due to the difficulty in investing large amounts of cash in small cap stocks, and thus are frequently concentrated along size-related dimensions.

Another feature of the table is that the percentage of funds following each strategy does not change much as the requirements for a strategy become stricter. In particular, the 'limited' and 'broad' measures are similar in their frequency amongst funds, indicating that funds that are concentrated in a variable for multiple periods also tend to stay in the same quintile. There is also a reasonably large overlap between the k=0.5 and k=0.7 measures. Together, these indicate that funds that meet the broader criteria tend to be very concentrated in that variable, consistent with the measure of strategy picking up conscious decisions by portfolio managers.

One possible concern with strategy as measured by relative dispersion is whether it may be capturing concentration that occurs by chance. However the nature of the strategy definition makes it extremely unlikely that a fund choosing stocks randomly across a variable would ever be assigned a strategy on that variable. This is because it would require a sample standard deviation that is very different from the population standard deviation when choosing at random

across uniform random variables, a necessarily rare event. To demonstrate this, 100,000 simulations were performed of choosing *n* stocks at random out of a universe of 10,000 stocks with uniformly distributed values of an attribute variable, as under a percentile measure. For picking 10 stocks (the minimum allowable number to be assigned a strategy, and the number most likely to have spurious assignment of strategies), the relative dispersion ratio was less than 0.7 in 4916 out of 100,000 cases and less than 0.5 in 348 cases. Because of the requirement of 4 consecutive periods of concentration, however, these produced not a single spurious strategy, which is not surprising as 0.04916 ^ 4 *100000 = 0.58 expected spurious strategies out of 100,000 samples, when using the broadest definition of strategy used in this paper.

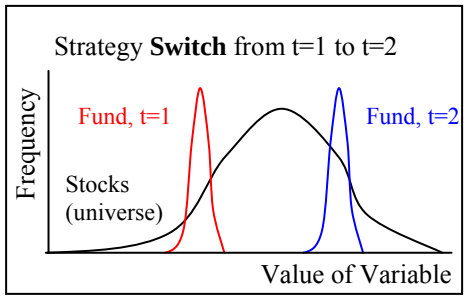
A more serious concern is the correlation between variables when considering strategy. In particular, there is the possibility that a fund may be following a strategy with respect to one variable, and this causes its portfolio to be concentrated in another variable correlated with the first, even though the fund is not paying attention to the second variable. In the first place, this would only affect the variable-level analysis in Table V and VIII, since most of the time aggregate changes are considered – if a fund switches strategy for any variable in a given period, that period is counted as switching strategy. Thus counting a single strategy multiple times, or counting an omitted variable only via some other variable that proxies for it, should not greatly affect the results. For the variable-level results I account for the possibility in two ways. First, more stringent definitions of strategy should reduce the number of cases where the correlated variable is also assigned as a strategy. Second, the analysis is repeated for a smaller set of possible strategy variables for which for which corr(x,y) < 0.5 amongst the universe of stocks for all combinations of x and y. This list is indicated in Table I Panel A. All of the main results are

robust to both more stringent definitions of strategy, and to less correlated sets of strategy, indicating that correlation between variables does not appear to be driving the main results.

Strategy Changes

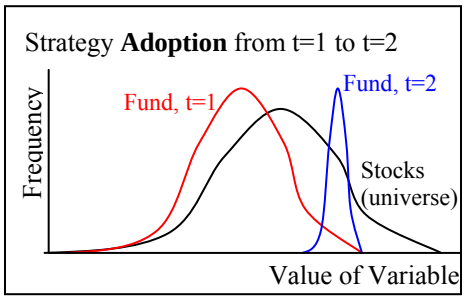
One major advantage of the current definition of strategy over other possible definitions of is that because the measure is formed at each point in time, it allows one to say when a fund appears to have *changed* its investing strategy. By contrast, the regression framework of Kacperczyk and Seru (2006) or Nagel (2005) produces only a single measure of fund strategy over the whole period, because the data available is insufficient for measuring changes in regression loadings. In this paper, I consider three types of strategy changes.

A fund *switches* strategy at time *t* when $\frac{\sigma(x)_{M,t}}{\sigma(x)_{N,t}} \leq k$ for both *t-1*to *t-4* and *t*, but the mean value changes from one quintile to another between time *t-1* and *t.*



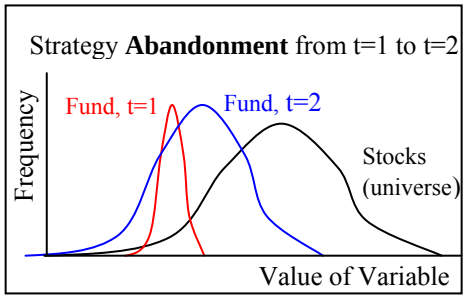
An example of this would be a fund moving from investing in only growth shares to only value shares.

A fund *adopts* a strategy at time *t* if $\frac{\sigma(x)_{M,t-1}}{\sigma(x)_{N,t+1}} > k$, and $\frac{\sigma(x)_{M,t+i}}{\sigma(x)_{N,t+i}} \leq k$ for i =0 to 3.



An example of this would be a fund moving from investing in both value and growth shares to only investing in value shares

A fund *abandons* a strategy at time t if $\frac{\sigma(x)_{M,t-i}}{\sigma(x)_{N,t-i}} \leq k$ for i=1 to 4, but $\frac{\sigma(x)_{M,t}}{\sigma(x)_{N,t}} > k$.



An example of this would be a fund moving from investing in only value shares to investing in both value and growth shares.

The diagrams at the right of the page represent the three types of changes.

Table III presents the number of strategy changes by each type of variable. Unsurprisingly, the size-related variables that are over represented in strategy use are also over represented in strategy changes. Table III also indicates that strategy switches appear to be more rare than either adoption or abandonment, and to also exhibit more variation in their frequency across variables.

As a check on robustness, more restrictive definitions of each of the three types of changes are also considered. Under the restricted definition:

- For a fund switch from quintile a to quintile b at time t, the mean value of the variable in the fund must not be *a* for any of t+1 to t+4. (To eliminate cases where a fund is merely oscillating between two quintiles)

- For a fund adoption, the quintile must be the same for all four subsequent periods (the fund must be a dedicated growth fund for four quarters, rather than moving from concentrated growth to concentrated value)

- For fund abandonment, $\frac{\sigma(x)_{M,t+i}}{\sigma(x)_{N,t+i}} > k$ must hold for all four subsequent periods (to exclude cases where a fund only reduces concentration in one period, but this causes the strategy to not be present for 4 quarters).

All the main results are robust (and in several cases more pronounced) under the restricted definition.

4. Determinants of Strategy Changes

The first question examined is the determinants of strategy changes amongst mutual funds. If the 'adverse investor pressure' hypothesis is present, then fund changes should be related to past flows, over and above the level of returns. To answer this question, Table IV shows the results of logit regressions of strategy changes on past fund returns and flows. The equation being fitted is:

$$Change_{i,t} = \alpha + \mu_t + \gamma * Numstrats_{i,t-1} + \beta X_{i,t} + \varepsilon_{i,t}$$

for funds i=1…N and time periods t=1…T, where the vector of fund characteristics, *X*, includes quarterly after-expenses fund returns from the previous 4 quarters, and fund flows from the previous three quarters, defined as $Flow_{i,t} = \frac{TNA_{i,t} - TNA_{i,t-1} * (1 + R_{i,t})}{TNA_{i,t-1}}$.

The dependent variable, $Change_{i,t}$, is a dummy variable that equals one if the fund has changed strategy during that period for any of the variables considered (variously as adoptions, abandonment and switches), and zero otherwise. Controls are also included for the number of strategies being followed in the previous quarter, *Numstrats*, as this will have a mechanical effect on the probability of changes (a fund cannot abandon or switch out of a strategy unless it was following the strategy to begin with, for instance), as well as time fixed effects, μ_t.

[Insert Table IV here]

Table IV indicates that funds do indeed respond to investor outflows by changing strategy. For strategy switches (columns 1 and 2) and abandonment (columns 5 and 6) higher flows reduce the chances of a fund switching or abandoning a strategy. This effect is consistent across different lags of flows, but is more pronounced for the k=0.7 case in both switching and abandonment. The magnitude and significance of this relationship is also largely unaffected by the addition of lagged fund returns, as shown by the second column for each strategy/k combination. Unlike switching and abandonment, strategy adoption however appears shows no clear pattern of dependence on fund flows, with different lags and k values showing different signs.

In terms of the magnitude of the flow/strategy change relationship, while the effects are highly statistically significant, the marginal impact of changes in flows on the probability of changing is not especially large. When all other variables are taken at their median values, a move from the 25th percentile of fund flows to the 75th percentile of fund flows decreases the chances of abandonment at k=0.7 from 19.36% to 19.18% next quarter, and from 19.48% to 18.98% in two quarters time. For switches at k=0.7, moving from the 25th to the 75th percentile of flows decreases the changes of a switch from 18.47% to 18.19% next quarter, and from 18.51% to 18.12% in two quarters time. Adoption at k=0.7 shows the inconsistent pattern between different lags – moving from the 25th to the 75th percentile of flows increases the chance of adoption from 22.04% to 22.11% next quarter, but decreases it from 22.16% to 21.89% in two quarters. The interpretation of these magnitudes is that the largest determinants of the decision to change are the number of strategies being followed and the fixed effects, in essence the other reasons for changing over and above flows and past returns.

The evidence of the effects of past fund returns on the chance of changing strategy, once flows are controlled for, is less clear. The rough pattern in coefficients is that of significantly negative values at early lags and significantly positive coefficients at later lags, although this is not uniform. Moreover, without a plausible explanation for this it is difficult to say with any confidence that it is not simply due to chance.

This pattern between the three types of changes above for fund flows is one that will be observed several times throughout the paper – strategy adoption appears to have both different causes and different effects from either switching or abandonment. While the possible reasons for this will be discussed later, at this stage it suffices to note that adoption does not fit well into the adverse investor pressure argument, whereas switching and abandonment are more consistent.

A further question arises as to what causes a fund to change into or out of a particular variable, over and above the broad decision to change *some* aspect of strategy. While one may expect that funds change into strategies that have performed well in the recent past, it is possible that funds follow a contrarian approach, investing according to variables that have not done as well recently. The question of how funds choose to change strategies based on past stock returns is explored in Table V. A logit regression framework is used, similar to Table IV, but the dependent variable, $Change_{i,v,q,t}$ is now a dummy variable for strategy changes of each variable/quintile combination (for instance, whether the fund adopted a strategy based on shares in book leverage quintile 5). The equation being fitted is

$$Change_{i,v,q,t} = \alpha + \mu_t + \gamma * Numstrats_{i,t-1} + \beta X_{i,v,q,t} + \varepsilon_{i,t}$$

for funds i=1…N, variables v, quintiles q=1…5 and time periods t=1…T.

The vector of characteristics $X_{i,v,q,t}$ includes lagged fund returns, lagged fund flows, and lagged returns of portfolios of shares of the variable/quintile combination upon which the strategy change is defined. Details of the formation of these stock portfolios are given in the data appendix. The relevant portfolio depends on the type of change considered – for strategy adoption, it is the returns to the variable/quintile in the period of adoption (ie shares of the type being adopted), for abandonment it is the variable/quintile in the period prior to abandonment Iie shares of the type being abandoned), and for switches it is the variable/quintile in the period of the switch (ie shares of the type being switched into).

Table V presents evidence on the determinants of variable-level strategy changes. Firstly, the role of fund flows and lagged fund returns across all types of changes is similar to Table IV, indicating that the previous results hold for variable-level changes as well. In terms of the impact of the stock portfolio returns, funds on the whole chase returns across different strategies. The positive coefficients on lagged portfolio returns for strategy switches and adoptions indicate that funds tend to change into variable/quintile combinations that have experienced high returns in the recent past, whereas the negative coefficients for abandonment mean that funds are more likely to change out of variable/quintile combinations that have experienced low returns in the recent past. The evidence for switches is statistically significant and consistent across different lags, whereas both adoption and abandonment have one coefficient (out of 8 in total, 4 lags each for two values of k) statistically significant of the opposite sign – R_{t-1} for abandonment at k=0.7, and R_{t-3} for adoption at k=0.5. On the other hand, 7 out the 8 coefficients for adoption have a positive sign, and 6 out of 8 for abandonment have a negative sign. This seems to support an inference, albeit weaker than for switching, that funds chase returns across variables and

quinitiles. The addition of variable fixed effects, not reported, weakens somewhat the role of past returns for adoption and abandonment, but leave switches unchanged.

5. Fund Returns Surrounding Changes of Strategy – Event Study Methodology

The primary question surrounding the informativeness of strategy changes is whether they improve or worsen a fund's subsequent returns. If as hypothesized earlier funds change strategy as a result of uninformed investor pressure through flows, subsequent fund performance is likely to be worse. If on the other hand decisions to change strategy are informed, they will tend to result from things like funds correctly picking changes in future stock returns, identifying new profitable strategies, or learning from past mistakes, and thus improve subsequent returns.

To examine the effects of a change in strategy, fund returns surrounding such changes are examined using an event study methodology. Quarterly fund cumulative abnormal returns (CARs) are formed on a market-adjusted basis, from the fund return minus the market return in that period. CARs are examined for 2 years before and after a change of strategy, in Figures 1 and 2. Panel A and B are for strategy switches, Panel C and D are for adoptions, and Panels E and F are for abandonment. Figure 1 shows returns after expenses, while Figure 2 shows returns before expenses. CARs are calculated separately for the period before the change and afterwards, so that points before t=0 are the CARs since the beginning of the t-7 period (all periods measured in quarters before and after the strategy change), the t=0 return is the abnormal return in the quarter that the strategy changed, and points after t=0 are the CARs since t=0. In each case, Panels A, C and E are the cumulative abnormal returns, and Panels B, D and F are the t-statistics associated with those CARs. The changes are for definitions using k=0.5 and broad requirements for a change.

[Insert Figures 1 and 2 here]

In Figures 1 and 2, Panel A indicates that when funds switch strategy, they tend to earn lower returns afterwards. For after-expenses returns in funds that switch strategy, the CAR before t=0 is only significantly negative by t-1, at –1.02%, with most of this being driven by the t-1 return itself. The return in the period of the change is significantly negative (0.56%), and the CAR is significantly negative thereafter (-2.63% after one year, and -4.38% after two years.) Pre-expenses cumulative abnormal returns in Figure 2 are positive before expenses prior to the switch, but negative thereafter. Thus funds that switch strategy tend to actively select underperforming stocks, rather than simply failing to cover their expenses. Results are directionally similar and statistically significant but weaker for k=0.7.

In Figures 1 and 2, Panel C shows returns surrounding strategy adoptions. Strategy adoptions actually appear to somewhat improve fund performance, although the magnitude of this change is smaller than that around switches. Funds that adopt new strategies seem to do better, but only enough to cover their expenses. Funds earn a statistically significant negative CAR of –0.90% prior to switching, positive but insignificant returns of 0.25% after the first year, and then negative and significant returns of –0.87% after 2 years. The pattern of improvement is more evident in before expenses returns, where funds earn a statistically significant CAR of 0.83% between t-7 and t-1 (driven largely by the t-1 return), 1.56% after the first year, and 1.91% after 2 years. Both sets of results are directionally similar and stronger for k=0.7.

In Figures 1 and 2, Panel E shows CARs surrounding strategy abandonment. Strategy abandonment tends to result in lower future performance, although with a magnitude closer to adoption than switching. After expenses, funds have a negative statistically insignificant CAR of –0.54% between t-7 and t-1, a negative significant CAR of –1.16% after 1 year, and a negative

significant CAR of –1.92% after two years. Before-expenses returns are positive in both periods, although after abandonment they are not statistically significant until t+3. The results are slightly weaker for k=0.7, but directionally similar and statistically significant.

Taken together, these provide some evidence that changes of strategy reduce subsequent fund returns, at least for the changes of abandonment and switching. This evidence is more illustrative than definitive, due to the well-known problems of the event study methodology for horizons of this length (see for instance Fama (1998)), where the rough way of market-adjusting returns for risk becomes more important at longer horizons.

6. Fund Returns Surrounding Changes of Strategy – Calendar Time Portfolios

To further examine the effect of changes in strategy on fund returns, a calendar time portfolio approach is used, as in Loughran and Ritter (1995), Brav and Gompers (1997) and others. This reduces some of the bad model problems inherent in estimating long run returns, as t-statistics are based on quarterly returns rather than 2 year returns, and the method also explicitly controls for the role of factors that determine the cross section of returns, size as size, book-to-market, momentum and liquidity. Each quarter, value-weighted portfolios are formed of the returns of those funds that changed strategy one, two three and four quarters ago. The calendar time portfolio is formed by taking the average of these four portfolios, weighted by the total net assets of all funds in the quarter portfolio. The additional re-weighting of the quarter portfolios is necessary because the number of funds reporting each quarter is not uniform, and thus equally weighting the four portfolios would over represent the months of March and September, when fewer funds report. I use only funds reporting in March, June, September and

December to form quarterly returns, due to the fact that frequently the other months will have no strategy changes of a particular type.

These calendar time portfolios are then regressed on 3-factor, 4-factor, and 5-factor models (Fama French 3 factors, Momentum, and Pastor and Stambaugh (2003)'s valued weighted liquidity factor). In evaluating the performance of funds surrounding strategy changes, a number of benchmarks are considered. Firstly, there is the obvious measure of raw abnormal returns before and after expenses. This indicates whether fund returns after a change are higher or lower than could be obtained by a combination of factor portfolios such as SMB, HML etc. Of more interest is the question of whether strategy changes themselves affect the level of abnormal returns, over and above whether such abnormal returns are on the whole positive or negative.

In this regard, the returns of fund after a change of strategy can be compared with two idealized benchmarks. First, the previous returns of the fund, adjusted for the different market conditions. This will answer the question of whether the strategy change makes the fund perform worse than it was before, which is relevant since strategy changes are observable the next business day after the 13f filings of fund holdings with the SEC, and investors could use this to predict higher or lower returns for the fund. Second, the returns the fund would have obtained but for the change of strategy. This is relevant since it measures whether the fund managers' timing decisions are improving or worsening returns. While the two measures are related, they are separate concepts – for instance, funds may change strategy more frequently before the market as a whole performs worse, or they may change into something bad at the point that what they were in previously was about to perform even worse - in both cases subsequent returns would be lower than before but the fund would not be better off if it had not changed. These two benchmarks are examined in Tables VI and VII respectively.

6.1 Fund Returns Before and After Strategy Changes

Table VI examines the question of whether funds perform worse after changes then they were before. To compare fund performance after a strategy change with performance before the change, a calendar time portfolio is constructed in the same manner as described above of funds that *will change* their strategy over the next four quarters. Those funds that will change strategy in a year's time are a good proxy for what funds changing strategy today were like one year ago, but they face today's market conditions rather than last year's. While the portfolio of funds that will change strategy is obviously not one that can be implemented ex ante, the comparison serves to indicate whether a change of strategy (which *is* observed) predicts lower future abnormal returns for the fund relative to those in the past.

[Insert Table VI here]

Table VI examines the quarterly abnormal returns to calendar time portfolios before and after strategy changes. Panel A examines strategy switches, Panel B examines strategy adoptions, and Panel C examines strategy abandonment. In each case, 'After' indicates the portfolio returns to funds that have previously changed strategy (ie returns after a strategy change), 'Before' indicates the returns to funds prior to changing strategy (ie returns before a strategy change), and 'After – Before' is the portfolio formed on the difference between the two. Strategy changes are considered at an aggregate level, so for a change of a given type in any of the variables counts the fund as a change of strategy of the given type in that period.

A comparison of the 3, 4 and 5-factor alphas after strategy changes shows that the relative patterns in abnormal returns between types of strategy change are similar to the market adjusted returns in the event study. After a strategy switch, the after-expenses α measures are all

of a negative sign but statistically insignificant (except for the 3 Factor α after expenses for k=0.5, which is marginally significant). After adoption, funds earn significantly positive returns before expenses for k=0.5, and marginally significant positive returns after expenses. Returns after abandonment are all statistically insignificant, and of magnitudes smaller than either adoption or switching.

The results for the 'After-Before' difference portfolios measure whether funds perform worse after strategy changes. They indicate that subsequent abnormal performance is indeed worse after changes. For k=0.5, a portfolio that is long in funds that have already switched strategy and short in funds that will switch strategy would earn abnormal returns of –0.69% per quarter relative to a 5-factor model, or 2.79% per year. Similarly, for k=0.7 the 'After – Before' portfolio earns abnormal returns of –0.27% per quarter around strategy adoption and –0.24% per quarter around strategy abandonment, both relative to a 5-factor model. The adoption results are noteworthy, as despite the positive abnormal returns in the 'after' portfolio for k=0.5, the difference portfolio earns insignificant abnormal returns for k=0.5 and negative significant returns at k=0.7. This indicates that while funds that adopt strategies appear more informed, the adoption itself could nonetheless signal worse future performance. As in the event studies, the evidence of underperformance after strategy changes is strongest for strategy switches, in terms of the magnitude of the effect and the consistency across different measures of strategy.

These results confirm fairly strongly the conclusion from the event study section that strategy changes result in worse subsequent performance.

6.2 Fund Returns After Strategy Changes vs Returns 'But For' the Change

The second benchmark for evaluating the success of strategy changes is the returns the fund would have obtained if it did not change strategy. There are a number of possible ways to approximate this, although all of them are necessarily problematic because it is not possible to construct the exact counterfactual of what the fund would have done without the change. One could compare the returns on the shares held prior to the change with those of the fund, although this presumes that if the fund didn't change strategy it would have left its entire portfolio untouched. One could use funds with similar characteristics to compare performance, analogous to Daniel et al (1997). In this context however, strategy is considered over a large combination of variables, and many combinations of strategies followed by funds will have few (if any) other funds with the same strategies to use as a comparison.

Instead, because the focus here is on the effect of fund flows and past returns on the decision to change, a benchmark of funds is constructed that are in the same quintile of fund flows in the previous quarter. This in effect compares funds that changed with those that faced similar pressure to change through their levels of past flows. Obviously this approach does not control for different loadings on risk factors directly, but it is well placed to examine the effect of investor-level pressure on strategy changes. Moreover, if fund returns are efficient with respect to the factor models in question (this assumption is of course controversial), then the factor model should still be able to control for the eventual loadings of the difference portfolio on the risk factors.

Specifically, fund are classed according to their level of past flows - 'In' is funds in the highest quintile of flows in the previous quarter, while 'Out' is the lowest (most negative) quintile of fund flows. Calendar time portfolios are then formed based on the intersection of the past flows and whether a change occurred, and are used to compare:

a) High outflow funds that changed with high outflow funds that didn't (under the 'adverse investor pressure' hypothesis, the former should perform worse)
b) High inflow funds that changed with high inflow funds that didn't (because strategy changes in this case are not the result of immediate investor pressure, the adverse investor pressure hypothesis makes no specific prediction about the information content in the strategy change, and thus the likely return)
c) High outflow funds that changed with high inflow funds that changed (the adverse investor pressure hypothesis suggests that the former should perform worse, because the changes in the former are motivated by 'dumb money' pressure).

Table VII presents the results of regressions of the quarterly returns to these portfolios on 3, 4 and 5 factor models. Panel A shows strategy switches, Panel B shows strategy adoption and Panel C shows strategy abandonment. In the 'Change' column, 'Y' indicates funds that did change strategy, and 'Y-N' is the difference portfolio of between funds that did and didn't change strategy for that level of investor pressure. 'Flows' indicates which quintile of lagged flows is being considered, with 'In' being the quintile with the highest flows, 'Out' being the quintile with the lowest flows, and 'Out – In' being the difference between the two. For brevity, only the intercepts and t-statistics for the regression are shown.

The predictions of the adverse investor pressure hypothesis are largely borne out. The most supportive for the adverse investor pressure hypothesis is the abandonment results. These show that funds that abandon a strategy while facing outflows earn significant abnormally negative returns of up to –1.06% per quarter over a 5 factor model (the 'Y'/'Out' row), whereas funds that abandon while facing inflows have insignificant abnormal returns (the 'Y/'In' row). Additionally, high outflow funds that change strategy do significantly worse than high outflow

funds that don't by up to –0.66% per quarter over a 5 factor model (the 'Y-N'/'Out' row), whereas high inflow funds that change do not do significantly better than high inflow funds that don't (the 'Y–N'/'In' row). Moreover, there is marginally significant evidence that high outflow funds that change do worse than high inflow funds that change (the 'Y'/'Out – In' row). These results strongly support the adverse investor pressure hypothesis, as changing strategy under pressure is worse than not changing while under pressure, and is also worse that changing while not under pressure.

The results for the other types of changes are less conclusive. For switches, none of the portfolios considered earns abnormal returns, although they are directionally consistent with the abandonment results. Funds that switch while facing outflows have directionally lower abnormal returns than those who switch while facing inflows for both k=0.5 and k=0.7 (the 'Y'/'Out-In' row). The k=0.5 results also show that directionally, high outflow funds that change have lower subsequent returns than high outflow funds that don't (the 'Y–N'/'Out' row), although this does not hold for the k=0.7 results. The less significant results for switches are somewhat at odds with the results in Tables IV, V and VI where switches show large effects, but may be influenced by the fact that there are fewer funds switching strategy at any point than adopting or abandoning, so to split the sample into subgroups has a greater effect on the noisiness of the switching results versus the other changes.

The adoption results are directionally consistent with the adverse investor pressure argument, but more interestingly also shed some light on the results in Table VI and Figures 1 and 2 as to why funds that adopted a strategy earned higher returns subsequently. Whereas high inflow abandonment and switches have negative but insignificant abnormal returns, high inflow adoptions have slightly positive after-expenses returns, significant under a 3-factor model but not

under a 4- or 5-factor model (in the 'Y'/'In' and 'Y–N'/'In' rows). Funds that adopt while facing outflows have negative but insignificant returns (in the 'Y'/'Out' and 'Y–N'/'Out' rows). In other words, the positive returns surrounding adoption are largely confined to the discretionary, high-inflow cases, while funds that adopt strategies during outflows are directionally more similar to the other adverse investor pressure cases.

6.3 Interpreting the Calendar Times Results

Taken together, the calendar time results in Tables VI and VII provide reasonably strong evidence that strategy changes have an adverse affect on fund performance, and that this is concentrated amongst funds that change while experiencing outflows. This is consistent with the adverse investor pressure hypothesis, as fund managers who respond to the negative timing ability of individual investors suffer in terms of future returns. The evidence is also hard to reconcile with other competing explanations of the information content of strategy changes. One alternative hypothesis is that strategy changes are the symptom of a broader lack of skill – in other words, fund managers who don't know what they are doing are more likely to guess at random, and hence strategy changes will be associated with poor performance even though the change itself is not the cause of this. This would explain the relation between strategy changes and outflows (because unskilled funds would be likely to both guess strategies and lose money through outflows) but would not explain the results in Table VI which show that fund performance actively gets worse after the change, rather than simply being bad all along. A second alternative is that funds simply have negative timing ability, and exogenously choose to change at bad times. Obviously this cannot be true for all funds, because Table VII shows that the effect is concentrated in high outflow funds. But even if outflows were just the symptom of

the negative returns associated with lack of skill, this would not explain the results in Table IV and V. If funds that change are simply unskilled, past returns ought to be a better measure of this lack of skill than past flows, but no clear relation is observed between past returns and the tendency to change.

7. Predictability of Stock Returns from Mutual Fund Strategy Changes

A further test of the informativeness of mutual fund strategy changes relates to the predictive power they have over future abnormal stock returns. In particular, this also provides an alternative test of the 'but for the change' tests in Table VII, as the types of shares the fund used to purchase before the change are a good measure of what kind of returns it might have otherwise received Rather than consider the previous portfolio holdings directly, portfolios of stocks that share the variable/quintile combination of the strategy change in question are considered. These are then examined to determine whether the abnormal returns to these stock portfolios are predictable based on previous strategy changes. If funds change out of shares that will subsequently perform well, or into shares that will perform poorly, this is evidence that the fund would have obtained higher returns but for the change.

As independent variables, lagged values of the proportion of mutual funds in the mutual fund universe at that time changing strategy with respect to that variable/quintile combination are employed. Fund changes are used as proportions to correct for the large increase in number of mutual funds over the sample period. Two measures of the aggregate level of strategy are considered. First, the proportion of funds exiting that variable/quintile strategy, which is the sum of the number of funds that quarter that abandoned strategies of the variable/quintile and the number that switched out of strategies on that variable/quintile, divided by the total number of

funds that quarter. Second, the net proportion entering that variable/quintile. This is the difference between the number of funds entering strategies of that variable/quintile (from adoption or switching in) and the number of funds exiting strategies of that variable/quintile (from abandonment or switching out), all divided by the number of funds that period. The reason for considering exit and (entry – exit) separately is to evaluate the possibility from Figures 1 and 2 and Table IV and V that funds exiting (comprised of abandonment and switching) contain different information than the number entering (which is dominated by adoptions, as seen in Table II).

As dependent variables, I take the abnormal returns that period from a 4 or 5-factor model, similar to the method used in Brennan, Chordia and Subrahmayam (1998). This is formed from the sum of the intercept and the residual from regressions of the stock portfolio returns on a 4 or 5-factor model respectively. This allows one to examine the predictive power of fund changes over abnormal stock returns, rather than predictability of the factors themselves. The regression is a fixed effects panel regression, with the cross section being abnormal returns to stock portfolios formed on each combination of the 5 quintiles and 26 variables. Thus the equation being fitted is:

$$R_{abnormal,v,q,t} = \alpha + \mu_t + \eta_{v,q} + \beta_1 Prop_{v,q,t-1} + \beta_2 Prop_{v,q,t-2} + \varepsilon_{v,q,t}$$

for the case of fitting fixed effects for both quarter and variable/quintile, and *Prop* is the proportion of funds either exiting or entering in net respectively.

[Insert Table VIII here]

Table VIII presents the results of these regressions. Broadly, the results support the conclusion that funds would earn higher abnormal returns if they did not change strategy, although the magnitude of the stock predictability is relatively small. In Panel A, if 10% of funds

exit a particular variable/quintile portfolio at a k=0.5 definition (which would be a highly extreme event in this sample), that portfolio will earn abnormally returns of –0.80% the following quarter, and –0.65% the quarter afterwards. The effect for exiting strategies is nonetheless fairly robust across 4 and 5-factor models, value of k, and the inclusion of time fixed effects.

A comparison of the predictive power of exiting (in Panel A) with net entry (in Panel B) indicates that the predictive power of strategy changes is much lower for strategy entry. Adding in entry (which is primarily including cases of strategy adoption) decreases the coefficient on the lagged proportions (the mean value of the net entry proportion is also significantly lower than the exit proportion), and reduces the statistical significance. Nonetheless, for cases where the strategy exits results are strongest, the (entry – exit) measure retains explanatory power. In other words, strategy adoptions do not on the whole predict stock returns, and adding them to the abandonment/switching measure increases the noise in the predictions.

These results support the hypothesis that funds would be better off if they did not change strategy, as the stocks that they change out of exhibit abnormally positive returns. Moreover, the pattern in predictability of entry/exits is suggestive of the role of flows in determining adverse strategy changes, with the same pattern between switching and abandonment on the one hand, and adoption on the other, being reflected stock return predictability, the effect of flows, and the subsequent returns to the funds themselves.

8. Conclusion

This paper presents evidence that when mutual funds change their investment strategy their performance suffers. When a fund switches between values of a variable they were

investing in or abandons previously strict investment criteria on a variable, they reduce their abnormal performance relative to funds that will change in the future. Funds that switch or abandon earn negative abnormal returns of up to -0.69% per quarter and –0.24% per quarter compared with funds that will change in the future.

Changes in strategy are driven in part by investor flows, with mutual funds responding to outflows of cash by changing their investment strategy from what it was previously. And while such changes explain only a small proportion of fund changes, they have a large impact on the subsequent returns obtained. For instance, funds that abandon a strategy earn while facing high outflows earn abnormal returns of –1.06% per quarter themselves, they earn an abnormal return of -1.29% relative to funds than abandon a strategy while facing inflows, and they earn an abnormal return of –0.66% relative to funds that face the same outflows but do not abandon their strategy. Such adverse performance also results in predictability in stock returns. Across a large range of share characteristics, when funds shift their portfolios away from shares with a particular value of a characteristic, stocks of that type subsequently exhibit higher returns.

These results add further weight to the conclusions of Daniel et al (1997) that the average mutual fund does not have timing ability, because most of the strategy changes result in negative subsequent returns. One caveat to this however is the results on strategy adoptions, particularly discretionary adoptions, which exhibit some abnormally positive returns. This result emphasizes the importance of the point made in the introduction, namely that in order to meaningfully test for the existence of timing ability, it is necessary to examine those funds that actually appear to be trying to time the market. The simple choice dichotomy between high inflow changes and high outflow changes has a large affect on the subsequent returns, suggesting that an

examination of more carefully considered criteria may identify timing ability amongst certain groups of funds in particular situations, even if the average fund does not exhibit such ability.

This paper also adds to the literature on the effect of fund flows on fund performance. As Frazzini and Lamont (2006) note, 'it is hard for a manager to be smarter than his clients'. From the results of this paper, it is nonetheless apparent that managers who *try* to be smarter than their clients can still do better than managers who respond to the pressure that 'dumb money' flows create. In this context, fund flows not only cause investors to incorrectly allocate money between funds, as Frazzini and Lamont (2006) find, but appear to actively distort the investment decisions of some fund managers.

The somewhat ironic impact of this is that if a fund starts experiencing poor performance and outflows, the investors with the least faith in the fund's strategy will probably tend to remove their money first, whereas those with more faith in how the fund is being run will leave their money in. Unfortunately, the actions of those investors who leave can cause the fund to change its investment strategy. In such a case, the negative effects of the new strategy are borne by the very investors that indicated a faith in the original strategy. That is of course unless they are in the habit of examining their fund's quarterly holdings.

One result in this paper that has been largely unexplored is why decisions to adopt a strategy variable appear qualitatively different in both cause and effect to decisions to abandon a strategy variable or switch between different values of that variable. One (admittedly ad hoc) explanation for this may lie in the different rules of thumb that could lead to such changes. In particular, a fund facing extensive outflows is likely to need to make speedy decisions about how to stem the loss of cash. In such cases, it is noteworthy that abandonment and switching correspond very roughly to the rules of thumb of 'Stop doing whatever you're doing' and 'Do

the opposite of whatever you're doing', which may spring readily to mind in times of crisis. Adoption, by contrast, is closer to 'Do something completely different from what you are doing'. This necessitates greater consideration of exactly what that 'something different' is going to be, since one still has to decide amongst the many possible variables exactly which one to adopt a strategy with respect to. Viewed in this light, it is possible that funds facing outflows resort to the first two rules rather than the third, and these rash decisions cause subsequent returns to suffer.

Data Appendix

Stock Attributes

The sources and definitions of each of the stock attributes are listed in Table I Panel A. Variables are screened to remove cases that are due to missing data or data errors. These are:

Variable	Missing If:
booklev	booklev < 0
mktlev	mktlev < 0
currrat	currrat < 0
cashrat	cashrat < 0
assetturn	assetturn < 0
peratio	peratio = 0
spread	spread < 0
relspread	relspread < 0
qtstdev	qtnumest=1
yrstdev	yrnumest=1
ltstdev	ltnumest=1

where qtnumest, yrnumest and ltnumest are the number of analysts estimating qtstdev, yrstdev and ltstdev respectively for that quarter.

For the remaining sample of attributes, the raw variable measures are all then windsorized at a 1% level in each tail based on the distribution of that variable amongst the universe of stocks in that month.

Merging CRSP stock returns, Compustat data and I/B/E/S forecasts

Compustat quarterly accounting data is merged by PERMNO with the CRSP monthly stock returns by matching each month's returns with the most recent accounting information for which the fiscal quarter end date (fqenddt) is earlier than the start of that month's returns. The resulting database is then merged with the I/B/E/S Analysts forecasts (summary file). The most recent I/B/E/S forecast for a given month is matched to the month of the stock return, first by CUSIP, and where this does not produce a match, by matching the I/B/E/S ticker with the CRSP

ticker, and where that still does not produce a match, by matching the I/B/E/S ticker with the Compustat ticker

Merging CRSP Mutual Fund Returns with Thomson Financial Mutual Fund Holdings

CRSP Mutual Fund Returns (fund attributes from the annual file and monthly returns from the monthly file) are merged with the Thomson Financial Mutual Fund Holdings via the link kindly provided by Andrea Frazzini. Details of this link are available in Frazzini (2006). Following Frazzini (2006), a particular holding is excluded if

a) The reported number of shares of a stock held by a given fund is greater than the reported number of shares outstanding in that stock.

b) The value of the fund's holding in a particular share is greater than the reported value of the fund's total net assets (Thomson value) at that time.

c) The reported number of shares outstanding is zero.

d) The number of matched holdings is less than 10 for that fund in that period.

e) The Total Net Assets as reported by CRSP is more than twice as large as the Total Net Assets as reported by Thomson, or vice versa.

Because of the possibility that the Total Net Asset data still contained errors (a possibility raised by some spurious looking values of flows), the quarterly flows are also windsorized at a 1% level in each tail at each point in time.

Because I am interested in actively managed equity funds, a fund is excluded if investment objective information indicates that it is of some other type (balanced, bond, money market, international etc.). Thus a fund record (holdings and fund returns) is excluded if it has the following objectives:

- ioc (Thomson) = 1, 5, 6, 7 8.

- weisenberger objective code ('obj' in CRSP) = BAL, CBD, CHY, ENR, FIN, GOV, GPM, HLT, IBD, MBD, MHY, MMF, MSS, MTG, TCH, TF M, TMM, UTL

- icdi objective ('icdi_obj' in CRSP) = BL, BQ, BY, GB, GE, GM, GS, IE, MF, MG, MQ, MS, MT, MY, PM, SF, UT

- detailed S & P objective code ('sp_obj_cd' in CRSP) =

BAL BGA BGE BGG BGN BGS CGN CHG CHY CIM CMQ CPR CSI CSM CVR ECH ECN EGG EGS EGT EGX EID EIS EIT EJP ELT ENV EPC EPX ERP ESC FIN GBG GBS GGN GIM GLD GLE GMA GMB GSM HLT IAZ ICA ICO ICT IFL IGA IHI IKS IKY IMA IMD IMI IMN IMT INC IND INJ INM INY IOH IOR IPA ISC ISD ITN ITX IVA IVT IWA IWV JPN LCA LFL LKY LMA LMD LMI LNC LNY LTN LVA MAL MAR MAZ MCA MCO MCT MDE MFL MGA MGN MHI MHY MIA MID MIL MIM MIN MIS MKS MKY MLA MMA MMD MME MMI MMN MMO MMS MMT MNC MND MNE MNH MNJ MNM MNY MOH MOK MOR MPA MPR MRI MSC MSD MSM MTN MTX MUT MVA MVT MWA MWI MWV NTR OPI PAC RLE SBA SBE SBP SBT SBY SCU SEC SIA SIE SIP SIT SIY SPE SPR SPY SUA SUT TAL TAZ TBG TCA TCT TEC TFG TFI TFL TGA TMA TMD TMI TMN TNC TNJ TNY TOH TPA TTN TTX TVA

Portfolios of stock returns

Value-weighted portfolios of quarterly stock returns are formed based on quintile levels of the 26 variables listed in Table 1. The portfolios are formed from the universe of CRSP stocks with non-missing values of the variable in question in the previous quarter and a valid quarterly return for the subsequent quarter. Breakpoints are formed on the whole sample of such stocks. The portfolios are rebalanced quarterly.

References

Brav, Alon, and Gompers, Paul, (1997), "Myth or reality? The long-run underperformance of initial public offerrings: evidence from venture and nonventure capital-backed companies", *Journal of Finance,* 52, pp1791-1821.

Brennan, Michael, Tarun Chordia and Avanidhar Subrahmanyam, (1998) "Alternative Factor Specifications, Security Characteristics and the Cross-section of Expected Returns", *Journal of Financial Economics*, 49, pp345-374

Carhart, Mark, (1997) "On Persistence in Mutual Fund Performance", *Journal of Finance*, 52, pp 57-82

Cohen, Randolph, Joshua Coval and Lubos Pástor, (2005), "Judging Fund Managers by the Company They Keep", *Journal of Finance*, 60, pp 1057-1096

Coval, Joshua, and Erik Stafford (2005) "Asset Fire Sales (and Purchases) in Equity Markets." Harvard Business School Working Paper, No. 05-077

Daniel, Kent, Mark Grinblatt, Sheridan Titman and Russ Wermers, (1997) "Measuring mutual fund performance with characteristic-based benchmarks" *Journal of Finance,* 52, pp 1035-1058

Fama, Eugene F. (1998), "Market Efficiency, Long-Term Returns, and Behavioral Finance", *Journal of Financial Economics*, 49, pp. 283-306.

Frazzini, Andrea and Owen Lamont, (2006) "Dumb Money: Mutual Fund Flows and the Cross-Section of Stock Returns , NBER Working paper w11526.

Gruber, Martin J., (1996), "Another Puzzle: The Growth in Actively Managed Mutual Funds," *Journal of Finance*, 51, pp. 783-810.

Kacperczyk, Marcin and Amit Seru, (2006), "Fund Manager Use of Public Information: New Evidence on Managerial Skills", *Journal of Finance*, Forthcoming.

Kacperczyk, Marcin, Clemens Sialm and Lu Zheng (2005), "On the Industry Concentration of Actively Managed Mutual Funds", *Journal of Finance,* 60, pp 1983-2012

Kosowski, Robert, Allan Timmermann, Russ Wermers, and Hal White (2006), "Can Mutual Fund "Stars" Really Pick Stocks? New Evidence from a Bootstrap Analysis", *Journal of Finance*, Forthcoming.

Loughran, Tim, and Jay Ritter, (1995), "The new issues puzzle", *Journal of Finance*, 50, pp23-51.

Nagel, Stefan (2005), "Trading Styles and Trading Volume", Stanford University Working Paper

Sapp, Travis and Ashish Tiwari (2004), "Does Stock Return Momentum Explain the 'Smart Money' Effect?', *Journal of Finance,* 59, pp 2602-2622

Wermers, Russ. (2003) "Is Money Really 'Smart'? New Evidence on the Relation Between Mutual Fund Flows, Manager Behavior, and Performance Persistence", University of Maryland, Working Paper, November 2003

Zheng, Lu (1999) "Is Money Smart? A Study of Mutual Fund Investors' Fund Selection Ability" Journal of Finance, 54, pp. 901-933.

Table I

Panel A - List of Variables Used to Define Strategies

Name	Variable	Definition Used	Source	In Limited Set?
Factor Loadings				
Alpha	intcpt	Intercept and Coefficients from regressions of last 5 years of monthly stock returns on 5 portfolios listed	Ken French	Yes
Rm-Rf	rmrf		Ken French	Yes
SMB	smb		Ken French	Yes
HML	hml		Ken French	Yes
UMD	umd		Ken French	Yes
P-S Liquidity	liq		WRDS	Yes
Accounting Ratios				
Book Leverage	booklev	Total Long Term Debt / Total Shareholders Equity	Compustat	Yes
Market Leverage	mktlev	Total Long Term Debt / Mkt Cap	CRSP, Compustat	No
Current Ratio	currrat	Total Current Assets / Total Current Liabilities	Compustat	Yes
Cash Ratio	cashrat	Cash and Equivalents / Total Current Liabilities	Compustat	No
Asset Turnover	assetturn	Net Sales / Total Assets	Compustat	Yes
Profit Margin	profitmargin	Income (Before EI) / Net Sales	Compustat	No
Return on Assets	roa	Operating Income (before Deprec.) / Total Assets	Compustat	No
Return on Equity	roe	Income (Before EI) / Stockholders Equity	Compustat	No
Price to Earnings Ratio	peratio	Price (unadjusted) / EPS (Basic, Before EI)	CRSP, Compustat	Yes
Dividend Payout Ratio	divratio	Sum of Dividends Paid in last 12 months / Income (before EI)	Compustat	No
Trading Characteristics				
Share Turnover	turnover	Volume (t-1) / Shares outstanding (unadjusted)	CRSP, Compustat	Yes
Bid Ask Spread	spread	Ask - Bid	CRSP	Yes
Relative Spread	relspread	(Ask - Bid) / ((Ask + Bid)/2)	CRSP	No
Volatility	volatility	Std Dev. Of Daily Returns for last 250 trading	CRSP	Yes
Analysts' Forecasts				
Median Earnings Growth (qt)	qtmedest	Median Analyst's EPS Forecast (qt)/ EPS	I/B/E/S, CRSP	No
Median Earnings Growth (ann)	yrmedest	Median Analyst's EPS Forecast (ann)/ EPS	I/B/E/S, CRSP	No
Median Earnings Growth (lt)	ltmedest	Median Analyst's Long Term EPS Growth Forecast	I/B/E/S	Yes
Std Dev. Earnings Growth (qt)	qtstdev	Standard Deviation of Analysts' EPS Estimates (qt)	I/B/E/S	No
Std Dev. Earnings Growth (ann)	yrstdev	Standard Deviation of Analysts' EPS Estimates (ann)	I/B/E/S	No
Std Dev. Earnings Growth (lt)	ltstdev	Standard Deviation of Analysts' Long Term EPS Growth Estimates	I/B/E/S	Yes

Table I

Panel B - Summary Statistics for Stock Attributes and Funds

Variable	N	Mean	Median	Std Dev	Min	Max	Coverage
intcpt	1387387	0.35	0.23	1.96	-7.28	10.09	0.62
rmrf	1387387	0.90	0.87	0.70	-2.36	4.29	0.62
smb	1387387	0.82	0.64	1.09	-2.33	6.45	0.62
hml	1387387	0.25	0.29	1.08	-4.62	6.13	0.62
umd	1387387	-0.11	-0.08	0.76	-3.82	2.99	0.62
liq	1387387	0.01	0.00	0.63	-3.04	3.22	0.62
booklev	1663900	0.77	0.28	1.54	0.00	16.3	0.74
mktlev	1700731	0.81	0.16	3.11	0.00	92.2	0.75
currrat	1447424	3.07	1.99	3.82	0.09	42.5	0.64
cashrat	1440465	1.48	0.31	3.57	0.00	40.7	0.64
assetturn	1733219	0.26	0.23	0.23	0.00	1.97	0.77
profitmargin	1737843	-0.37	0.04	2.23	-40.49	0.97	0.77
roa	1458256	0.01	0.02	0.06	-0.43	0.17	0.65
roe	1736425	-0.02	0.02	0.22	-2.65	1.79	0.77
peratio	1703107	44.6	39.8	135.2	-1876	1290	0.76
divratio	212769	4.30	1.30	19.2	-238	535	0.09
turnover	2125722	0.86	0.43	1.31	0.00	17.5	0.94
spread	2191657	2.22	1.31	3.07	0.02	90.6	0.97
relspread	2191657	0.18	0.14	0.15	0.01	1.20	0.97
volatility	2023831	0.00	0.00	0.00	0.00	0.04	0.90
ltmedest	710250	17.4	15.0	10.2	0.00	100.0	0.31
qtgrowth	650214	0.80	0.75	1.39	-52.0	17.5	0.29
yrgrowth	845720	3.21	2.75	6.67	-82.5	100.0	0.38
ltstdev	503452	4.22	2.99	4.37	0.00	86.1	0.22
qtstdev	487760	0.06	0.03	0.39	-21.0	11.0	0.22
yrstdev	686977	0.18	0.07	1.27	-10.5	20.0	0.30

Table I presents definitions of the variables used to define fund strategies and summary statistics for those variables, in Panel A and Panel B respectively. Attributes are matched to for CRSP publicly listed companies monthly between January 1980 and December 2003. 'Coverage' indicates the proportion of stock months for which there are observations for the variable in question.

Table II Summary Statistics for Fund Strategies

Percentage of Total Fund Quarters for which Fund is Following Each Strategy

k Variable Type Strat. Defn	0.5 Raw Broad	0.7 Raw Broad	0.5 Pctile Broad	0.7 Pctile Broad	0.5 Pctile Limited	0.7 Pctile Limited
intcpt	14.72	37.11	6.52	18.62	6.30	14.44
rmrf	9.38	33.04	6.11	14.84	6.05	11.68
smb	12.47	40.91	7.45	18.86	7.15	14.32
hml	8.10	23.22	6.18	9.07	6.08	8.01
umd	9.27	33.85	5.97	7.63	5.94	7.07
liq	9.15	35.12	6.00	7.98	5.97	7.32
booklev	14.88	22.04	5.96	11.42	5.88	10.32
mktlev	43.52	54.65	6.09	18.65	5.94	14.74
currrat	41.32	52.68	6.48	13.48	6.39	11.77
cashrat	44.87	54.24	6.21	11.36	6.18	10.16
assetturn	7.10	15.10	5.87	9.33	5.83	8.53
profitmargin	60.22	63.66	5.77	13.96	5.74	12.14
roa	38.97	62.91	6.35	13.52	6.20	10.85
roe	38.18	52.77	5.93	12.38	5.82	10.07
peratio	7.59	10.37	5.88	10.70	5.78	8.82
divratio	52.25	58.87	25.35	28.05	24.78	25.12
turnover	10.00	17.10	7.05	36.12	6.57	23.09
spread	5.75	6.28	21.55	57.40	19.51	37.77
relspread	10.02	22.62	5.69	10.26	5.64	8.16
volatility	67.64	73.80	20.47	59.88	15.78	44.46
ltmedest	21.39	39.33	7.59	21.61	7.00	17.59
qtgrowth	8.58	12.93	5.70	5.82	5.70	5.76
yrgrowth	9.50	15.54	5.79	5.96	5.79	5.86
ltstdev	11.68	25.42	5.93	7.04	5.92	6.69
qtstdev	13.72	21.91	5.93	8.58	5.92	7.56
yrstdev	16.31	25.87	5.89	9.94	5.87	8.50

Table II presents summary statistics for fund strategies used in this paper. A fund is following a strategy with respect to a variable at a given point (under the Broad definition) if the ratio of the standard deviation of that variable in the fund's portfolio to the standard deviation of that variable in the universe of stocks is less than *k* for 4 consecutive periods. (Hence lower values of k imply a more restrictive definition of strategy). In the Limited case, the mean value of the variable must be in the same quintile amongst the universe of stocks for the same four periods. 'Raw' considers the variables listed in unmodified form. 'Pctile' converts each to a percentile based on the distribution in the stock universe at that point. Strategies are considered quarterly from March 1980 to December 2003. The values in the table are the percentage of total fund quarters (48,824 fund quarters) for which the fund is following a strategy at that time.

Table III Summary Statistics for Strategy Changes

Panel A - Percentage of Fund Quarters Changing Strategy						
Change Type	**Swt**	**Swt**	**Adp**	**Adp**	**Abn**	**Abn**
k	**0.5**	**0.7**	**0.5**	**0.7**	**0.5**	**0.7**
all	2.33	25.23	8.51	28.13	8.05	23.85
intcpt	0.17	2.88	1.29	3.58	0.61	2.35
rmrf	0.07	2.20	1.30	3.06	0.63	2.03
smb	0.16	2.75	1.57	3.14	0.82	1.85
hml	0.16	0.92	1.27	2.18	0.57	1.38
umd	0.05	0.62	1.00	1.74	0.34	1.01
liq	0.03	0.46	0.85	1.47	0.20	0.75
booklev	0.06	0.38	0.77	1.65	0.12	0.80
mktlev	0.07	1.07	0.83	2.90	0.18	1.62
currrat	0.03	0.65	0.85	1.99	0.17	1.03
cashrat	0.01	0.41	0.80	1.79	0.13	0.92
assetturn	0.02	0.32	0.76	1.51	0.11	0.74
profitmargin	0.01	0.72	0.77	2.73	0.14	1.87
roa	0.07	0.93	0.86	2.35	0.21	1.50
roe	0.05	0.95	0.82	2.40	0.19	1.56
peratio	0.03	0.77	0.79	2.12	0.16	1.34
divratio	0.24	1.40	3.56	4.20	1.83	2.29
turnover	0.17	5.03	1.20	5.04	0.48	2.46
spread	0.40	7.61	3.30	5.80	2.24	2.84
relspread	0.04	0.70	0.73	2.20	0.10	1.30
volatility	0.90	5.72	2.32	5.55	1.45	2.77
ltmedest	0.21	1.43	1.73	3.57	1.02	2.33
qtgrowth	0.00	0.02	0.72	0.78	0.09	0.15
yrgrowth	0.00	0.05	0.72	0.87	0.09	0.24
ltstdev	0.00	0.11	0.81	1.17	0.15	0.45
qtstdev	0.00	0.15	0.79	1.26	0.15	0.51
yrstdev	0.01	1.29	0.81	2.87	0.16	1.62

Panel B - Correlation Between Types of Strategy Change						
	Swt, 0.5	**Swt, 0.7**	**Adp, 0.5**	**Adp, 0.7**	**Abn, 0.5**	**Abn, 0.7**
Swt, 0.5	1	0.266	0.056	0.032	0.091	0.082
Swt, 0.7	0.266	1	0.070	0.050	0.210	0.221
Adp, 0.5	0.056	0.070	1	0.323	-0.001	0.000
Adp, 0.7	0.032	0.050	0.323	1	0.010	0.013
Abn, 0.5	0.091	0.210	-0.001	0.010	1	0.326
Abn, 0.7	0.082	0.221	0.000	0.013	0.326	1

Table III gives summary statistics for strategy changes across mutual funds between January 1980 and December 2003. Panel A gives the percentage of fund quarters (out of 48,824 in total) for which there is a strategy change of a given type for the particular variable in the left hand column. 'Swt' refers to switching strategy from one quintile to another within a given variable. 'Adp' indicates adoption of a strategy, while 'Abn' refers to abandonment, as defined earlier. Panel B gives the correlation between these types of changes amongst all variables (row 'all' in Panel A). Strategies in this case are broad strategies (that require only concentration to be high for consecutive periods), and variables are all in percentiles.

Table IV

Determinants of Aggregate Strategy Changes

Variable	0.5 Swt	0.5 Swt	0.7 Swt	0.7 Swt	0.5 Adp	0.5 Adp	0.7 Adp	0.7 Adp	0.5 Abn	0.5 Abn	0.7 Abn	0.7 Abn
Intercept	-3.85 ***	-3.87 ***	-1.49 ***	-1.50 ***	-1.47	-1.46	-3.23	-3.28	-2.52 ***	-2.45 ***	-1.43 ***	-1.41 ***
	(0.05)	(0.06)	(0.02)	(0.02)	(2.79)	(2.79)	(4.97)	(4.96)	(0.02)	(0.03)	(0.02)	(0.02)
Flow (t-1)	0.06	0.17	-0.22 **	-0.22 **	0.05	0.06	0.29 **	0.27 **	-0.12	0.02	-0.14	-0.08
	(0.23)	(0.23)	(0.09)	(0.09)	(0.08)	(0.09)	(0.13)	(0.14)	(0.14)	(0.14)	(0.09)	(0.09)
Flow (t-2)	-0.37	-0.47 *	-0.30 ***	-0.31 ***	-0.19 **	-0.21 **	-0.12	-0.23 *	-0.17	-0.10	-0.38 ***	-0.36 ***
	(0.24)	(0.25)	(0.08)	(0.08)	(0.08)	(0.08)	(0.12)	(0.13)	(0.12)	(0.12)	(0.08)	(0.09)
Flow (t-3)	-0.12	-0.08	-0.38 ***	-0.38 ***	0.04 ***	-0.06	0.00	-0.08	-0.44 ***	-0.32 **	-0.21 ***	-0.17 **
	(0.17)	(0.19)	(0.07)	(0.08)	(0.01)	(0.06)	(0.03)	(0.09)	(0.12)	(0.13)	(0.07)	(0.08)
Ret (fund, t-1)		-1.71 ***		-0.13		-0.07		-0.06		-0.77 **		-0.61 **
		(0.61)		(0.23)		(0.23)		(0.40)		(0.36)		(0.24)
Ret (fund, t-2)		0.48		0.57 **		0.01		0.87 **		-0.83 **		-0.64 ***
		(0.63)		(0.23)		(0.23)		(0.41)		(0.35)		(0.24)
Ret (fund, t-3)		0.85		-0.17		-0.36		0.17		-0.35		0.58 **
		(0.62)		(0.23)		(0.24)		(0.42)		(0.35)		(0.23)
Ret (fund, t-4)		0.80		0.56 ***		0.37		0.73 *		-0.51		0.60 ***
		(0.59)		(0.22)		(0.23)		(0.41)		(0.34)		(0.22)
Time FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Controls for Number of Strategies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	38767	38767	38767	38767	38767	38767	38767	38767	38767	38767	38767	38767

Table IV presents the results of logit regressions of strategy changes by mutual funds on the past returns and flows for that fund, for quarterly fund holdings and returns from 1985 to 2003. The dependent variable is a dummy variable that equals one if the fund has changed strategy across any of the variables considered that quarter, and zero otherwise. Strategy changes are either switches ('Swt'), adoptions ('Adp') or abandonment ('Abn'), as defined in the paper, for the concentration requirements *k* given in the top row. The dependent variables are after-expenses quarterly fund returns, and fund flows as a percentage of total net assets (both as decimals). In each row, the top value is the coefficient, the lower value in parentheses is the standard error, and *, ** and *** indicate significance at a 10%, 5% and 1% level respectively using a Wald Chi-Squared test.

Table V

Determinants of Strategy Changes by Variable

Variable	0.5 Swt		0.7 Swt		0.5 Adp		0.7 Adp		0.5 Abn		0.7 Abn	
Intercept	-12.46	***	-9.33	***	-7.07	*	-4.61	***	-10.77	***	-8.61	***
	(2.65)		(0.11)		(4.18)		(1.11)		(0.22)		(0.09)	
Flow (t-1)	-0.01		-0.04		0.25	**	0.01		-0.44	**	0.09	
	(0.27)		(0.08)		(0.10)		(0.06)		(0.20)		(0.08)	
Flow (t-2)	-0.87	***	-0.11		-0.15		-0.15	***	0.04		-0.09	
	(0.31)		(0.07)		(0.10)		(0.05)		(0.18)		(0.07)	
Flow (t-3)	-0.14		-0.21	***	-0.07		-0.03		-0.39	**	0.05	
	(0.24)		(0.07)		(0.06)		(0.03)		(0.17)		(0.06)	
Ret (fund, t-1)	0.09		0.23		0.66	*	-0.11		-0.71		-0.68	***
	(0.66)		(0.18)		(0.35)		(0.17)		(0.46)		(0.20)	
Ret (fund, t-2)	-0.03		-0.14		0.77	**	-0.06		-0.06		-0.97	***
	(0.62)		(0.18)		(0.35)		(0.17)		(0.42)		(0.19)	
Ret (fund, t-3)	1.73	***	-0.44	**	-0.02		-0.62	***	0.16		0.06	
	(0.57)		(0.18)		(0.34)		(0.17)		(0.41)		(0.19)	
Ret (fund, t-4)	-0.74		-0.59	***	0.24		-0.19		0.87	**	0.78	***
	(0.61)		(0.17)		(0.36)		(0.17)		(0.35)		(0.18)	
Ret (pf entered, t-1)	16.31	**	15.03	***	35.50	***	0.34					
	(7.21)		(1.65)		(3.99)		(1.96)					
Ret (pf entered, t-2)	2.61		5.96	***	33.74	***	14.87	***				
	(7.01)		(1.62)		(3.86)		(1.95)					
Ret (pf entered, t-3)	2.54		6.54	***	-12.08	***	7.78	***				
	(6.91)		(1.63)		(4.54)		(1.98)					
Ret (pf entered, t-4)	21.14	***	10.84	***	0.49		2.03					
	(6.68)		(1.62)		(4.34)		(1.98)					
Ret (pf exited, t-1)									1.74		5.65	***
									(4.27)		(1.73)	
Ret (pf exited, t-2)									-8.56	**	-1.57	
									(4.32)		(1.78)	
Ret (pf exited, t-3)									-4.75		-6.09	***
									(4.17)		(1.76)	
Ret (pf exited, t-4)									-5.17		-4.69	***
									(4.25)		(1.70)	
Time FE	Yes		Yes		Yes		Yes		Yes		Yes	
N	1007942		1007942		1007942		1007942		1007942		1007942	

Table V presents the results of logit regressions of strategy changes by mutual funds on the past returns and flows for that fund and the past returns of shares on which the strategy is defined, based on quarterly fund holdings and returns from 1985 to 2003. The dependent variable is a dummy variable that equals one if the fund changed strategy for a particular quintile of a particular variable in that quarter, and zero otherwise. Strategy changes are either switches ('Swt'), adoptions ('Adp') or abandonment ('Abn'), as defined in the paper, for the concentration requirements *k* given. Changes are considered separately for each quintile of each of the variables. The independent variables are after-expenses quarterly fund returns, fund flows as a percentage of total net assets (both as decimals), and the returns for the portfolio of stocks with the quintile value of the variable upon which the strategy change is defined. In each row, the top value is the coefficient, the lower value in parentheses is the standard error, and *, ** and *** indicate significance at a 10%, 5% and 1% level respectively using a Wald Chi-Squared test.

Table VI
Fund Returns Before and After Changes of Strategy

Panel A - Strategy Switch

Pre/Post Expense	k	Before/After Change	3 Fac. Alpha	4 Fac. Alpha	5 Fac. Alpha	Rm-Rf	SMB	HML	UMD	LIQ	R2
Pre	0.5	After	-0.32	-0.14	-0.14	0.89	-0.15	0.20	-0.04	-0.02	0.900
			(-1.04)	(-0.42)	(-0.41)	(20.87)	(-2.50)	(3.64)	(-1.02)	(-0.52)	
Post	0.5	After	-0.54 *	-0.36	-0.36	0.89	-0.16	0.20	-0.04	-0.02	0.900
			(-1.77)	(-1.10)	(-1.08)	(20.94)	(-2.54)	(3.61)	(-1.01)	(-0.54)	
Post	0.5	Before	0.27	0.32	0.33	0.88	-0.13	0.18	0.01	-0.06	0.931
			(1.05)	(1.14)	(1.22)	(25.18)	(-2.63)	(3.84)	(0.31)	(-2.02)	
Post	0.5	After - Before	-0.81 ***	-0.68 **	-0.69 **	0.01	-0.02	0.03	-0.05	0.04	0.052
			(-3.26)	(-2.52)	(-2.57)	(0.41)	(-0.47)	(0.59)	(-1.56)	(1.39)	
Post	0.7	After - Before	-0.32 **	-0.21	-0.21	0.00	-0.04	0.04	-0.03	0.00	0.161
			(-2.47)	(-1.50)	(-1.48)	(-0.03)	(-1.75)	(1.51)	(-1.85)	(0.04)	

Panel B - Strategy Adoption

Pre/Post Expense	k	Before/After Change	3 Fac. Alpha	4 Fac. Alpha	5 Fac. Alpha	Rm-Rf	SMB	HML	UMD	LIQ	R2
Pre	0.5	After	0.29	0.68 ***	0.68 ***	0.94	-0.07	-0.01	-0.13	0.00	0.959
			(1.16)	(2.85)	(2.83)	(29.35)	(-1.45)	(-0.18)	(-4.03)	(-0.16)	
Post	0.5	After	0.09	0.47 *	0.48 *	0.94	-0.07	-0.01	-0.13	0.00	0.960
			(0.34)	(1.99)	(1.98)	(29.46)	(-1.44)	(-0.24)	(-4.01)	(-0.16)	
Post	0.5	Before	0.22	0.27	0.26	0.90	-0.02	0.02	-0.02	0.01	0.979
			(1.48)	(1.62)	(1.58)	(41.48)	(-0.73)	(0.82)	(-0.87)	(0.69)	
Post	0.5	After - Before	-0.14	0.21	0.22	0.03	-0.04	-0.03	-0.11	-0.02	0.257
			(-0.62)	(0.98)	(1.01)	(1.14)	(-1.05)	(-0.90)	(-3.82)	(-0.72)	
Post	0.7	After - Before	-0.54 ***	-0.30 **	-0.27 *	0.01	-0.03	0.08	-0.05	-0.04	0.492
			(-3.64)	(-2.02)	(-1.95)	(0.52)	(-1.09)	(3.57)	(-2.89)	(-2.76)	

Panel C - Strategy Abandonment

Pre/Post Expense	k	Before/After Change	3 Fac. Alpha	4 Fac. Alpha	5 Fac. Alpha	Rm-Rf	SMB	HML	UMD	LIQ	R2
Pre	0.5	After	0.16	0.24	0.25	0.88	-0.06	0.07	0.00	-0.05	0.974
			(0.97)	(1.29)	(1.41)	(39.08)	(-1.98)	(2.28)	(-0.04)	(-2.53)	
Post	0.5	After	-0.03	0.03	0.04	0.87	-0.06	0.07	0.00	-0.05	0.973
			(-0.21)	(0.17)	(0.24)	(38.95)	(-1.92)	(2.28)	(0.07)	(-2.53)	
Post	0.5	Before	0.16	0.35	0.36	0.89	-0.02	0.03	-0.05	-0.01	0.963
			(0.79)	(1.62)	(1.63)	(32.12)	(-0.60)	(0.83)	(-1.80)	(-0.60)	
Post	0.5	After - Before	0.59	0.81	0.83	0.87	0.10	-0.16	-0.10	0.08	0.870
			(1.21)	(1.55)	(1.59)	(12.41)	(1.03)	(-1.82)	(-1.57)	(1.41)	
Post	0.7	After - Before	-0.33 **	-0.26	-0.24 *	-0.01	-0.07	-0.01	0.01	-0.07	0.291
			(-2.29)	(-1.65)	(-1.75)	(-0.34)	(-2.57)	(-0.37)	(0.49)	(-4.55)	

Table VI presents the results of regressions of calendar time portfolios of mutual fund returns on 3, 4 and 5 factor models. Calendar time portfolios are formed for returns before and after strategy switches (Panel A), strategy adoption (Panel B) and strategy abandonment (Panel C), as defined in the body of the paper. 'k' indicates the required concentration to qualify as a strategy, with lower values being more restrictive. Calendar time portfolios are formed from value–weighted quarterly mutual fund returns, with a holding period of 12 months and rebalancing each quarter. 'After' is a portfolio of funds who have changed strategy within the past year, 'Before' is a portfolio of funds that will change strategy within the next year, and 'After – Before' is the difference between the two. Returns are given quarterly in percent, either before expenses ('pre') or after expenses ('post'). In each row, the top value is the coefficient, the bottom value in parentheses is the t-statistic, and *, ** and *** indicate significant at a 10%, 5% and 1% level respectively.

Table VII
Abnormal Fund Returns After Strategy Changes, Sorted By Level of Past Flows

Panel A - Strategy Switch																	
	k	**0.5**			**0.5**			**0.5**			**0.7**			**0.7**			**0.7**		
Change (Y/N)	**Flows (In/Out)**	**3 Fac. Alpha**			**4 Fac. Alpha**			**5 Fac. Alpha**			**3 Fac. Alpha**			**4 Fac. Alpha**			**5 Fac. Alpha**		
Y	In	-0.03			0.20			0.27			-0.14			-0.08			0.01		
		(-0.06)			(0.37)			(0.54)			(-0.48)			(-0.24)			(0.03)		
Y	Out	-0.77			-0.90			-1.00			-0.20			-0.14			-0.18		
		(-0.98)			(-1.06)			(-1.25)			(-0.73)			(-0.47)			(-0.61)		
Y	Out - In	-0.74			-1.10			-1.27			-0.05			-0.06			-0.18		
		(-0.73)			(-1.01)			(-1.33)			(-0.12)			(-0.12)			(-0.42)		
Y - N	Out	-0.50			-0.53			-0.60			0.00			0.21			0.19		
		(-0.75)			(-0.74)			(-0.85)			(0.02)			(0.95)			(0.86)		
Y - N	In	-0.07			0.03			0.05			-0.13			0.01			0.02		
		(-0.17)			(0.08)			(0.11)			(-0.66)			(0.07)			(0.10)		
Panel B - Strategy Adoption																			
	k	**0.5**			**0.5**			**0.5**			**0.7**			**0.7**			**0.7**		
Change (Y/N)	**Flows (In/Out)**	**3 Fac. Alpha**			**4 Fac. Alpha**			**5 Fac. Alpha**			**3 Fac. Alpha**			**4 Fac. Alpha**			**5 Fac. Alpha**		
Y	In	0.84	**		0.63			0.63			-0.14			-0.13			-0.08		
		(2.14)			(1.25)			(1.27)			(-0.50)			(-0.42)			(-0.28)		
Y	Out	-0.39			-0.51			-0.52			-0.04			-0.42			-0.44		
		(-0.69)			(-0.71)			(-0.73)			(-0.11)			(-1.25)			(-1.36)		
Y	Out - In	-1.24	*		-1.14			-1.14			0.11			-0.29			-0.37		
		(-1.79)			(-1.11)			(-1.15)			(0.20)			(-0.51)			(-0.70)		
Y - N	Out	-0.89			-0.20			-0.22			0.28			-0.08			-0.10		
		(-1.30)			(-0.31)			(-0.58)			(1.04)			(-0.30)			(-0.36)		
Y - N	In	0.88	**		0.73			0.73			-0.21			-0.05			-0.05		
		(2.05)			(1.58)			(1.56)			(-0.94)			(-0.21)			(-0.20)		
Panel C - Strategy Abandonment																			
	k	**0.5**			**0.5**			**0.5**			**0.7**			**0.7**			**0.7**		
Change (Y/N)	**Flows (In/Out)**	**3 Fac. Alpha**			**4 Fac. Alpha**			**5 Fac. Alpha**			**3 Fac. Alpha**			**4 Fac. Alpha**			**5 Fac. Alpha**		
Y	In	-0.63			-0.31			0.22			0.32			-0.01			0.10		
		(-1.40)			(-0.64)			(0.57)			(0.89)			(-0.03)			(0.30)		
Y	Out	-1.05	*		-1.66	***		-1.06	**		-0.36			-0.71	**		-0.74	**	
		(-1.99)			(-2.99)			(-2.28)			(-1.12)			(-2.09)			(-2.15)		
Y	Out - In	-0.43			-1.35	*		-1.29	*		-0.68			-0.70			-0.83		
		(-0.55)			(-1.68)			(-1.99)			(-1.31)			(-1.23)			(-1.57)		
Y - N	Out	-1.13	**		-1.29	**		-0.66	*		-0.09			-0.45			-0.54	*	
		(-2.29)			(-2.35)			(-1.93)			(-0.31)			(-1.26)			(-1.72)		
Y - N	In	-0.71			0.18			0.16			-0.31			0.11			0.33		
		(-1.59)			(0.43)			(0.53)			(-1.06)			(0.38)			(1.29)		

Table VII presents the results of regressions of calendar time portfolios of mutual fund returns on 3, 4 and 5 factor models. Calendar time portfolios are formed for value –weighted quarterly mutual fund returns (after expenses), after strategy switches (Panel A), strategy adoption (Panel B) and strategy abandonment (Panel C), as defined in the body of the paper. The 'Change' column indicates whether the portfolio is of funds who changed strategy ('Y') or the difference between those who did and those who didn't change strategy ('Y-N'). 'Flows' indicates whether the funds are those of the highest quintile of past flows (denoted 'In') or the lowest quintile of past flows (denoted 'Out'), or the portfolio of the difference between the two ('Out – In'). The holding period is 12 months with rebalancing each quarter. 'k' is the cutoff level to qualify as a strategy, with lower values being more restrictive. Returns are after expenses, quarterly in percent. In each row, the top value is the coefficient, the bottom value in parentheses is the t-statistic, and *, ** and *** indicate significant at a 10%, 5% and 1% level respectively.

Table VIII

Predictability of Stock Returns by Proportion of Funds Changing Strategy

Panel A - Proportion of FundsExiting Each Strategy								
k	**0.5**	**0.5**	**0.5**	**0.5**	**0.7**	**0.7**	**0.7**	**0.7**
Dependent Variable	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**
Prop (t-1)	0.076 ***	0.080 ***	0.022 *	0.023 **	0.022 *	0.025 **	0.003	0.004
	(2.91)	(3.08)	(1.92)	(2.01)	(1.81)	(2.02)	(0.55)	(0.72)
Prop (t-2)	0.069 **	0.065 **	0.012	0.012	-0.003	-0.003	0.000	0.001
	(2.37)	(2.26)	(0.93)	(0.92)	(-0.25)	(-0.24)	(0.05)	(0.21)
R2	0.043	0.044	0.819	0.820	0.041	0.043	0.819	0.820
Variable * Quantile FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	No	Yes	Yes	No	No	Yes	Yes
Panel B - Proportion of Funds Entering Each Strategy minus Proportion of Funds Exiting Each Strategy								
k	**0.5**	**0.5**	**0.5**	**0.5**	**0.7**	**0.7**	**0.7**	**0.7**
Dependent Variable	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**	**4 Fac. Exc. Ret**	**5 Fac. Exc. Ret**
Prop (t-1)	-0.038 **	-0.040 **	-0.011	-0.011	-0.004	-0.004	-0.001	-0.001
	(-2.01)	(-2.12)	(-1.29)	(-1.36)	(-0.41)	(-0.42)	(-0.29)	(-0.27)
Prop (t-2)	-0.035	-0.032	-0.005	-0.004	-0.003	-0.002	-0.002	-0.002
	(-1.74) *	(-1.62)	(-0.53)	(-0.50)	(-0.32)	(-0.22)	(-0.41)	(-0.40)
R2	0.042	0.043	0.819	0.820	0.041	0.043	0.819	0.820
Variable * Quantile FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	No	Yes	Yes	No	No	Yes	Yes

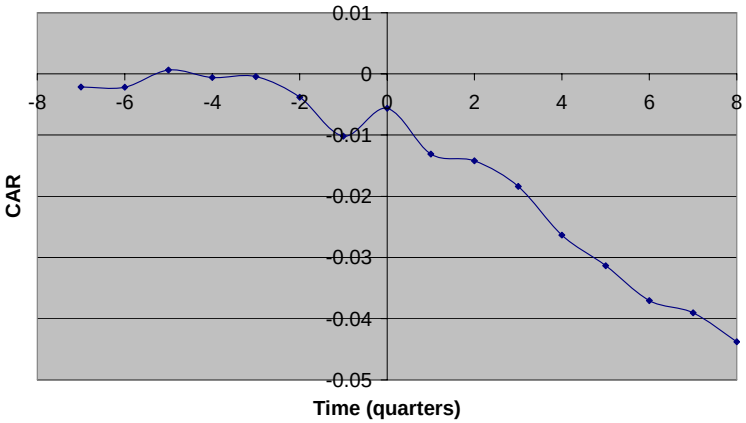
Table VII presents the results of fixed effects panel regressions. The dependent variable is abnormal returns from a 4 or 5-factor model for portfolios of CRSP stocks sorted into quintiles of 26 variables listed in Table 1 Panel A, quarterly from March 1985 to December 2003. The independent variables are lagged values the fraction of mutual funds changing out of strategies based on that variable/quintile combination (Panel A) or the difference between the fraction of funds changing into strategies of that variable/quintile combination and the proportion of funds changing out of those strategies. Time fixed effects and Variable/Quintile fixed effects are indicated at the bottom. The top value is the coefficient, the bottom value in parentheses is the t-statistic, and *, ** and *** indicate significance at the 10%, 5% and 1% level respectively.

Figure 1

Cumulative Abnormal Returns (After Expenses) and t-statistics around Strategy Changes

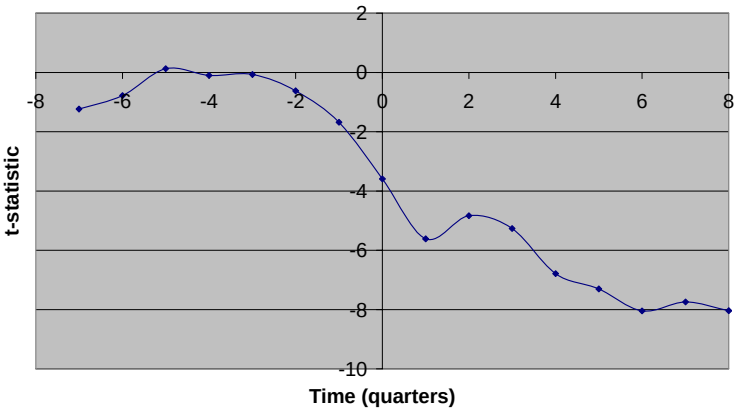
Panel A

Cumulative Abnormal Return after Strategy Switch
After Expenses (Pctile, Broad, K=0.5)



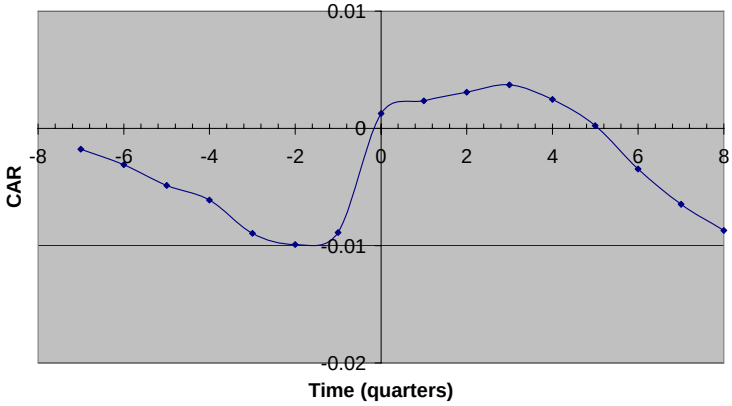
Panel B

t-statistic after Strategy Switch
After Expenses (Pctile, Broad, K=0.5)



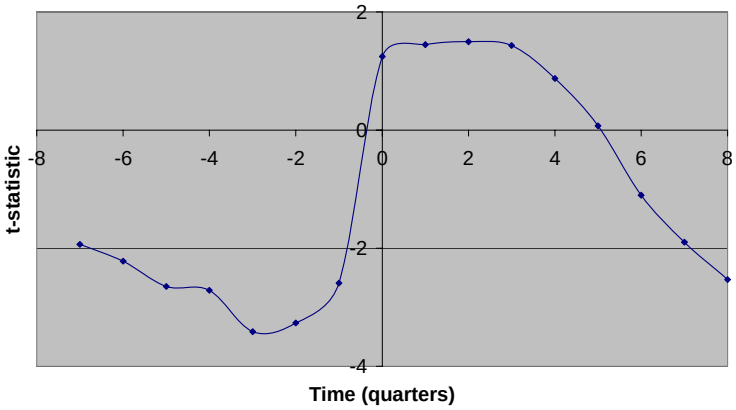
Panel C

Cumulative Abnormal Return after Strategy Adoption
After Expenses (Pctile, Broad, K=0.5)



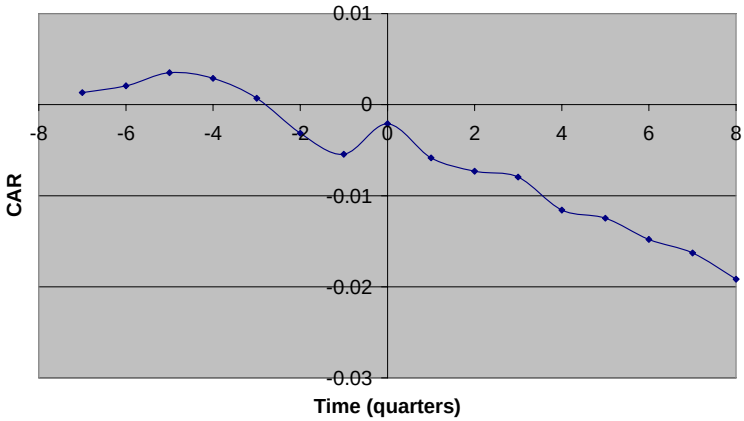
Panel D

t-statistic after Strategy Adoption
After Expenses (Pctile, Broad, K=0.5)



Panel E

Cumulative Abnormal Return after Strategy Abandonment
After Expenses (Pctile, Broad, K=0.5)



Panel F

t-statistic after Strategy Abandonment
After Expenses (Pctile, Broad, K=0.5)

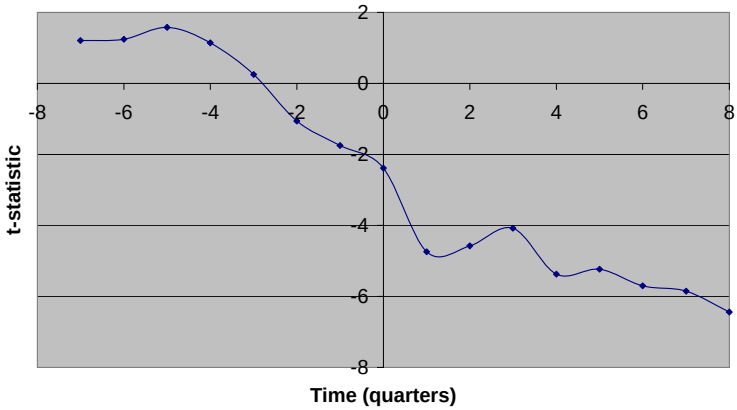
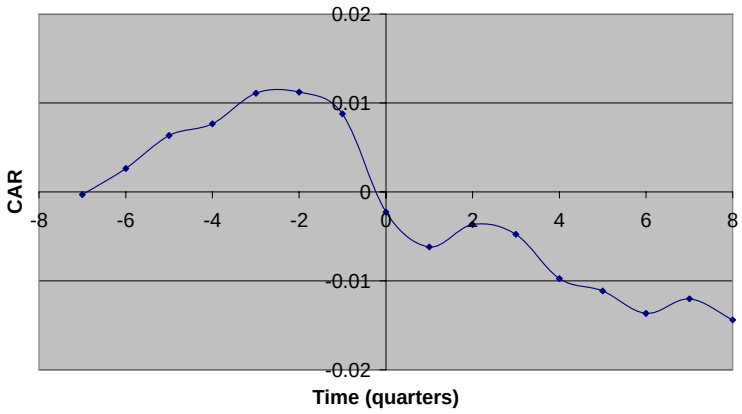


Figure 2

Cumulative Abnormal Returns (Before Expenses) and t-statistics around Strategy Changes

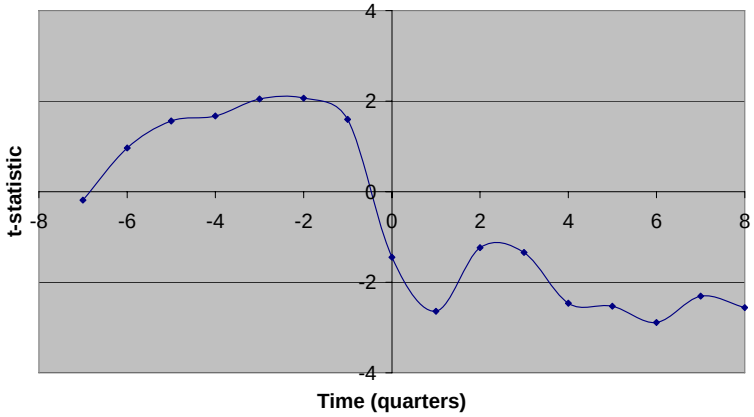
Panel A

Cumulative Abnormal Return after Strategy Switch Before Expenses (Pctile, Broad, K=0.5)



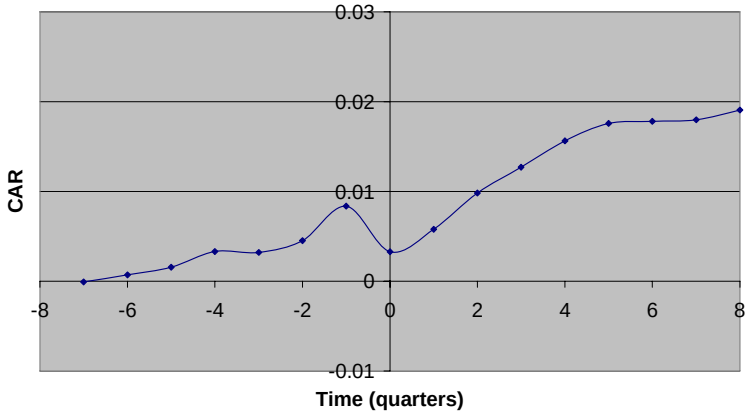
Panel B

t-statistic after Strategy Switch Before Expenses (Pctile, Broad, K=0.5)



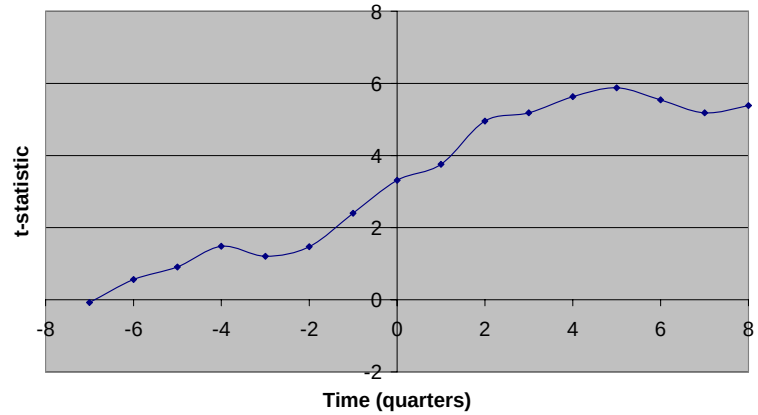
Panel C

Cumulative Abnormal Return after Strategy Adoption Before Expenses (Pctile, Broad, K=0.5)



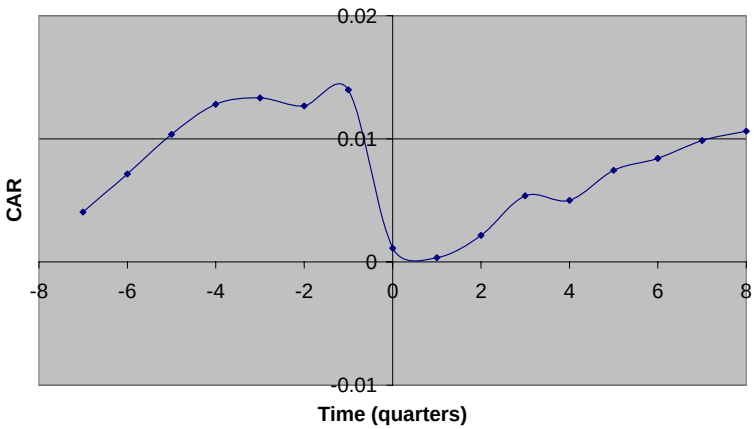
Panel D

t-statistic after Strategy Adoption Before Expenses (Pctile, Broad, K=0.5)



Panel E

Cumulative Abnormal Return after Strategy Abandonment Before Expenses (Pctile, Broad, K=0.5)



Panel F

t-statistic after Strategy Abandonment Before Expenses (Pctile, Broad, K=0.5)