The Impact of UK Manager Changes on Fund Performance and Fund Flows

Andrew Clare[1] (a.clare@city.ac.uk),

Svetlana Sapuric[2] (s.sapuric@city.ac.uk)

and

Natasa Todorovic[3] (n.todorovic@city.ac.uk)

The Faculty of Finance,
Cass Business School,
106, Bunhill Row,
London EC1Y 8TZ, United Kingdom.

ABSTRACT

Using our unique database of UK fund manager changes and event study methodology, we examine the impact of such changes on fund performance and fund flows to establish whether this impact varies depending upon whether the fund manager is male or female; whether the fund is a developed or emerging market; and depending upon the fund's style, that is, growth, value or small capitalisation. Our results show clearly across different categories of funds that a change in fund manager can have a significant impact on fund performance, at least in the first year following the event. Additionally, we find greater persistence in performance of the bottom performing funds compared with the top performing funds. Finally, our evidence proves that managers' gender, the market or the type of asset they invest in do not influence the level of fund flows, however the change of the fund manager and the past performance do.

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[1] Professor of Asset Management; [2]Doctoral student; and [3]Senior Lecturer in Investment Management.

1. Introduction

In recent years, studies on investment styles and fund manager performance have become wide-spread. In particular, studies by Chevalier and Ellison (1999) and Wermers et al. (2004) focused on the characteristics of fund managers, such as experience and education, and found evidence that fund performance is positively correlated with manager education and experience. However, there has been little evidence devoted to the influence of gender on fund management or fund flows. For example Niessen et al. (2006) look at the different management styles between male and female fund managers in the US market, and found significant differences between them: while men are more aggressive, women appear to be more methodological and risk averse in their investment choices. However, most of the studies on gender of fund mangers tend to assess the behavioural issues rather than look at the manger performance which is if essence to investors. There has been little attention devoted to the fund manager tenure and its relationship to performance of a fund and additionally, most of the research in this area has been focusing on the US market. In addition, although the literature shows that higher fund returns are followed by higher fund flows, as in Agarwal et. Al. (2004), there is no evidence that shows how fund flows are related to the change of a fund manager or whether flows are affected by manager's gender or investment style.

The objective of this paper is to examine the performance of mutual funds and in particular, to study how the performance of a fund is affected when its fund manager leaves. In addition, we assess if such a change in the fund manager influences the level of fund flows. Using our unique database of UK fund manager changes in recent history (2002-2005), we examine whether the impact of a change is more pronounced among male or female managed funds, emerging or developed market funds and weather the persistence of performance depends on fund's style, i.e. growth, value or small cap. We also examine the persistence of the top performing funds compared with the bottom performing funds pre- and post management change. Further, we assess if manager change, type of fund, gender of the manager and past performance are playing a role in determining flows of funds. This study attempts to fill the gap in the literature by offering a comprehensive study of fund manager changes and gender influences in different types of funds in the UK managed fund industry and to highlight the effect a fund manager change (replacement) has on the performance of a fund and its fund flows. This paper presents the first evidence of the effect of fund management changes in the UK's fund management industry.

2. Literature Review

Although mutual funds have stated investment objectives, the fund manager normally has a significant impact on the selection of the individual securities in a fund's portfolio and, therefore, the risk and return characteristics of the portfolio. It would be logical to assume that there is a direct correlation between fund performance and portfolio manager experience, age, education and even gender. If a fund has experienced persistently positive performance, investors often assume that positive performance to continue as long as the same manager is associated with a particular fund or vice versa. That, in turn, leads us to believe that there may be a change in the fund flow after the manager leaves the fund.

2.1. Does Gender Matter?

As it will be discussed in the sections that follow, some studies show evidence that performance can persist. But how much of this performance persistence is accountable by female managers? It is a known fact that women and men behave differently and this may affect fund manager performance. Apart from characteristics such as fund's size (flow), structure and expenses, the age tenure, educational level and compensation of the manager that can influence performance of a fund, the issues such as turnover and risk profile of the fund are key differentiating characteristics between male and female managed funds. It is a known fact that women view money, risk and investing differently to men. This may not have been a major issue in the past as the fund management industry has traditionally been male dominated, however, nowadays there are more women managing money on behalf of others. Furthermore, with women being more risk averse would imply that they prefer lower levels of portfolio volatility, individual stock volatility, beta and size.

Atkinson et al. (2003) compare the performance and investment behaviour of female and male fixed-income mutual fund managers. They find that there is no significance difference between the two groups of managers in terms of performance, risk, and other fund characteristics. Their results suggest that differences in investment behaviour often attributed to gender may be related to investment knowledge and wealth constraints. In addition, despite the similarities between male and female managers, there is evidence that gender influences the decision-making of mutual fund investors.

A recent study by Niessen et al. (2006) investigated gender differences between US equity mutual fund managers. Their results indicate that women seen to take moderately less

unsystematic risk and less small firm risk, while the total risk does not differ. Higher idiosyncratic risk taken by male fund managers implies that they trade more actively then the female fund managers. Furthermore, authors report that female fund managers follow less extreme investment styles and that their styles are more stable over time. However, they conclude that although the differences in behaviour between female and male fund managers are apparent, the differences in abnormal returns between the two are not significantly high. Bliss and Potter (2002) find that both US and international female fund managers obtain higher raw returns than male. They do not find that women are more risk averse then men as suggested by some of the previous studies and find that both men and women managers have the same turnover ratio in US funds, while men have higher turnover in international funds. Additionally, according to traditional performance measures such as Sharpe ratio and Alpha, their findings suggest that women outperform men in US funds but not in international ones.

2.2 Does Style of investing matter?

Chevalier and Ellison (1999) find that the older managers use momentum strategies. However, in given that they also report that older managers are out performed by the younger managers, this finding is somewhat contrary to the findings of Carhart (1997) and Daniel, Grinblatt, Titman and Wermers (1997), who showed that momentum strategies are the main reason for performance persistence. Subsequently, the MBA managers showed a statistically significant tendency to purchase 'glamour' stocks (stocks with lower book-to-market ratios). Gallagher's (2003) findings indicate that better performance is achieved by fund managers who follow stock picking approach.

2.3. Is there persistence in mutual fund performance?

Past studies on performance persistence have shown mixed evidence that performance actually persists. Blake and Timmerman (1998) formed portfolios of high and low alpha funds and evaluated that performance did persist for a holding period of up to two years. Allen and Tan (1999) verified that performance persisted even after adjusting for risk and for holding periods of up to two years among 131 UK funds. Quigley and Sinquefied (1998) find that underperforming funds continue to under perform, while outperforming funds do not continue to outperform. Keswani and Stolin (2004, 2006) suggest that performance persistence differs between sectors, and conclude that it is not the sector characteristics that explain the different levels of persistence, but the differences in

securities invested. Similarly to Hendriks at al. (1993), Elton et. al. (1996) report that past 'winner' funds outperform past 'loser' funds in short term periods and also for longer periods of three years. Goetzman and Ibbotson (1994) find that two-year performance is predictive of performance over the successive two years. They report evidence of relative performance persistence, particularly for underperforming funds. Moreover, Malkiel (1995) found that performance persists in the 1970s but does not continue in the 1980s. The evidence of non-persistence can be found in Carhart (1997) and Daniel et al. (1997) for example.

2.4. Are fund flows related to performance?

Most studies agree that mutual funds, as well as hedge funds, that exhibit higher returns are followed by higher net flows (see for example Ippolito (1992), Chevalier and Ellison (1997), Goetzmann and Peles (1997), Gruber (1996), and Agarwal et al. (2004)). Warther (1995) on the other hand finds a positive relation between flows and subsequent returns in the weekly data, however, documents the evidence of a negative relation between returns and subsequent flows in the monthly data. Further, several studies examine if the fund flows depend on the competition among the peer group of funds (Kempf and Ruenzi (2004)). In addition to this, Berks and Tonks (2007) study the relationship between return persistence and fund flows in the worst performing mutual funds and show that the observed persistence in the returns of the worst performing funds can be attributed to funds that do not have a strong flow of funds-performance relation. However, funds in the worst performing decile that do show evidence of a strong flow of funds-performance relation do not have persistent returns. Finally, the literature looks at some other factors that may affect fund flows such as fund name change (see Cooper et al. (2004)) or expenses (Barber et al. (2002), Jain and Wu (2000) and Sirri and Tufano (1998) for example).

Given the evidence form prior literature which suggests that there is performance persistence in the short run and that investment strategies of a fund depend largely on managers themselves and their characteristics, this paper will examine how the change of a fund manger in a fund impacts its performance and weather different conclusions apply to different types of funds. Further, we assess if fund flows are influenced by such a manager change and whether the level of the flow depends on the past performance, gender of the fund manager, market or asset type the fund invests in.

3. Data and Methodology

3.1. Assessing the impact of manager change on the performance of funds

We use an event study methodology to examine the relationship between mutual fund performance in the pre and post managerial turnover. We apply steps suggested by Campbell, Lo and MacKinlay (1997):

1.   **Event definition**: Our event is the managerial turnover, which is defined as the event that occurs when a fund manager is replaced/resigned from the fund. The event date is the month of the management change. Standard event studied use daily data, however, we believe that 1) using a month of managers' change as an event date is sufficient to capture the effect of the change and 2) the data on mangers' changes is only available on month-to-month basis. We measure the performance of the fund three years before the event date and three years after the event date[2], which constitutes our event window of 36 month prior to the event and 36 months after the event. We require this pre-event time period as Khorana (2001) in his paper advocates that funds which experience a management turnover have at least two years of performance history before the management replacement month. Furthermore, Hendricks et al. (1993), Goetzmann et al. (1994) and Brown et al. (1995) all find evidence of performance persistence in mutual funds over a horizon of one to three years. In addition, to a certain extent, this will also enable us to determine the reason of replacement. Some of the reasons to which fund manager changes occur are retirement, poor performance of the fund manager or good performance. In the latter case, good performance can give rise of opportunities to the fund manager where s/he moves to a better job position or is simply taken by another fund management company.

2.   **Selection criteria for managers and data sources:** Our sample of managers and their corresponding fund performance originates from our primary data source of Citywire[3], and the Financial Express Database. Both databases cover UK mutual funds and provide information on fund management structures, investment objectives, fund benchmarks, fund managers' characteristics and other fund characteristics. Furthermore, the Standard & Poor's data source provides us with information of manager replacements from April 2002 to December 2005. Our sample data includes a total of 258 fund manager changes. The price data for the funds and their respective benchmarks is obtained form Datastream and covers period from April 1999 (36 months prior to the first manager change in our sample)

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[2] Where the manager has not managed the fund three years prior to the event, we apply a minimum data requirement of one year prior to the event date.

[3] Citywire is a UK data source providing information on UK fund managers and tracks their performance.

to June 2008 (36 months after the last manager change in our sample[4]). We concentrate our analysis on single-managed funds and exclude all manager changes that occur in team-managed funds. In a way, this will assist us to distinguish the differences in fund behaviour due to management structure (team- vs. single-managed) from differences that can be attributed to gender of the manager or investment strategy (value or growth, developed or emerging markets etc.) for example. In addition to this, the data for peer group benchmarks is obtained from Investment Management Association.

3. **Normal and abnormal performance:** To generalise our results across different groups of funds we group our funds according to the following categories: (1) male managed, (2) female managed, (3) emerging markets funds, (4) developed markets funds, (5) equity value funds, (6) equity growth funds, (7) equity small cap funds, (8) top 10 percent performing funds before the management change and (9) bottom 10 percent performing funds before the management change.

We measure the performance of the funds pre-and post- event date in three ways:

a) Performance using benchmark adjusted model:

The traditional event study methodology is using Market model, which is a statistical model, estimated through OLS regression, it relates fund i return to the market return and estimates parameters α_{it} and β_{it} that are used for calculation of abnormal returns. This implies that the estimation period for alphas and betas is needed. Since most of our funds have quite a short history prior to management change, we find that this method is not appropriate for our analysis. The alternative to use in such circumstances is the Market-adjusted model. Since the funds for which we analyse the impact of fund managers' changes are benchmarking their performance against benchmarks pre-defined in their investment objectives, we feel that it is more appropriate to calculate abnormal returns adjusted for benchmark returns, rather then the market (i.e. FTSE All Share Index) itself. Therefore, the benchmark adjusted return model we use can be treated as restricted Market model in which α_{it} is equal to zero and β_{it} is equal to one. According to Campbell et. al. (1997), since coefficients alpha and beta are pre-specified, an estimation period is not required and abnormal returns can be calculated as:

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[4] 28 funds in which the manager change occurred after June 2005 do not have the full 36 months post event history. This will be updated.

$$AR_{it} = R_{it} - R_{bt} \qquad (1)$$

Where AR_{it} is abnormal return of fund i in period t, R_{it} is the actual return of fund i in period t and R_{bt} is the actual return of the benchmark for fund i in period t. As a benchmark we use i) benchmark index defined by the investment objectives of a fund and ii) peer group benchmark.

Further, we calculate Average Abnormal Returns for each of the nine groups of funds:

$$\overline{AR_t} = \frac{1}{n} \sum_{i=1}^{n} AR_{it} \qquad (2)$$

Where n is the number of funds in which the change of a fund manager has occurred.

Additionally, typical event study methodology will assess the impact of the event by testing weather there is a difference between cumulative abnormal returns for fund i before and after the event, in our case the change of fund manager:

$$CAR_{it} = \sum_{t=-36}^{+36} ARi_t \qquad (3)$$

CAR_{it} gives us returns from investing in fund i from the start of the event horizon till the 36 months post event date.

For each of our group of funds we calculate Average Cumulative abnormal returns:

$$\overline{CAR_{it}} = \sum_{t=-36}^{+36} \overline{ARi_t} \qquad (4)$$

b)   Performance using mean adjusted model:

$$AR_{it} = R_{it} - \overline{R}_i \qquad (5)$$

Where $\overline{R}_i$ is the mean return of fund i for which the management change has occurred over the pre-event estimation period (in our case 36 months prior to the change of fund manager) as suggested by Campbell et al. (1997). Although this model appears to be the simplest out of the three, Brown and Warner (1980, 1985) state that it often gives similar results as the other more complex models.

In the same manner as in a), we calculate Average Abnormal Returns, Cumulative Abnormal Returns and Average Cumulative Abnormal Returns for the Mean Adjusted Model using equations (2), (3) and (4).

c)   Performance using information ratio:

$$IRi_{t<0} = \frac{\overline{Ri}_{t<0} - \overline{Rb}_{t<0}}{St.Deviation(Ri_{t<0} - Rb_{t<0})} \text{ and}$$

$$IRi_{t>0} = \frac{\overline{Ri}_{t>0} - \overline{Rb}_{t>0}}{St.Deviation(Ri_{t>0} - Rb_{t>0})} \tag{6}$$

Where $IRi_{t<0}$ ($IRi_{t>0}$) is the information ratio obtained by fund i before (after) the management change; $\overline{Ri}_{t<0}$ ($\overline{Ri}_{t>0}$) is the average return of fund i before (after) the event; $\overline{Rb}_{t<0}$ ($\overline{Rb}_{t>0}$) is the average return of the benchmark for the pre-event (post-event) period; and Standard deviation of $Ri_{t<0} - Rb_{t<0}$ ($Ri_{t>0} - Rb_{t>0}$) is taken as measure of total risk over the pre-event (post-event) period. The information on appropriate benchmarks for each fund is obtained from Citywire, S&P database or fund fact sheets. Note that we do not use peer-group performance as a benchmark for calculation of Information ratios but the benchmark which is defined by fund objectives.

Further, to avoid any fund-specific bias in our results, we calculate the average Information Ratio for each of our nine groups of funds as:

$$\overline{IR}_{t<0} = \sum_{i=1}^{n} IRi_{t<0} \quad \text{and} \quad \overline{IR}_{t>0} = \sum_{i=1}^{n} IRi_{t>0} \tag{7}$$

Where $\overline{IR}_{t<0}$ ($\overline{IR}_{t>0}$) is the average information ratio of n funds for each of our nine groups in the period prior to (after than) event.

4. Testing procedure: To test for significance of Average abnormal returns and Average cumulative abnormal returns in b) and c) we need to calculate the aggregate pre-event standard deviation of abnormal returns for each of the funds within each of the nine sample groups (brown and Warner (1985):

$$\sigma_{i,pre-event} = \sqrt{\frac{\sum_{t=-36}^{-1}(\overline{AR}_{it} - \overline{AR}_{pre-event})^2}{n-1}} \tag{8}$$

Where $\sigma_{i,pre-event}$ is the standard deviation of abnormal returns of fund i estimated from pre-event period, $\overline{AR}_{pre-event}$ is the average abnormal return of fund i in the pre-event period and n is the number of months in the pre-event period (in our case 36).

The aggregate standard deviations across all funds in each of the nine sample groups are calculated as:

$$\sigma_{N,pre-event} = \sqrt{\frac{\sum_{i=1}^{N}\sigma_{i,pre-event}^2}{N}} \tag{9}$$

Where N is the number of funds in the sample.

Using these standard deviations, we calculate T-test for ARs and CARs as:

$$\overline{ARt}_{T-test} = \frac{\overline{AR}_t}{\sigma_{N,pre-event}} \tag{10}$$

and

$$\overline{CARt}_{T-test} = \frac{\overline{CAR}_t}{\sigma_{N,pre-event}\sqrt{t_2 - t_1 + 1}} \tag{11}$$

Where t_1 is the first day and t_2 is the last day in the period over which we calculate cumulative returns.

3.2. Assessing the impact of manager changes and other determinants on fund flows

The monthly fund size or the total net assets for each fund was provided by Lipper. However, out of the initial 258 funds for which we assess manager change, the full fund flows data set over the sample period from April 1999 to June 2008 was identified for 207

funds. Due to data limitations, we do not observe inflows (outflows) into (out of) a fund directly. Instead, we employ the standard procedure to calculate the growth of fund i in month t and as in Sirri and Tufano (1998) and we define the fund flow over the period $t-1$ to t as:

$$\text{Fund Flow}_t = [\ \text{TNA}_t - (1+r_t)\ \text{TNA}_{t-1}\ ]\ /\ \text{TNA}_{t-1} \tag{12}$$

where $\text{TNA}t$ is a fund's total net assets at time t, and r_t is the fund's return at time t. Fund Flow reflects the percentage growth of a fund in excess of the growth that would have been earned had no new funds flows in, and had all dividends been reinvested. In particular, this measure reflects the growth of the fund that is not due to the rate of return earned on the assets under management, but due to new external money. Sirri and Tufano (1998) show that this assumption is robust throughout the results in their study. We assume that the new money flows in and out of each fund at the end of each month since we do not know the exact timing of cash flows.

In order to get an indication of how the fund flows are related to the change of mutual fund managers, we initially apply the event-study-style analysis, in which we assess the impact of the manager change on average abnormal flows and cumulative average abnormal flows 36 months before and 36 months after the change. Average abnormal fund flow for month t is calculated as:

$$\overline{AAF_t} = \frac{1}{n}\sum_{i=1}^{n} AF_{it} \tag{13}$$

where F_{it} is the flow of fund i in month t and n is the number of funds in the sample.

The cumulative average abnormal fund flow for month t is then:

$$CAAF_{it} = \sum_{t=-36}^{+36} AAFi_t \tag{14}$$

Furthermore, to test empirically whether there is an impact on fund manager change on individual abnormal fund flows, we run a panel least squared regression using a dummy variable which takes value of 0 before the manager change and value of 1 after that change. In addition, we include other fund characteristic variables such as Performance (i.e. the benchmark adjusted abnormal return of a fund in month t −1), gender (value of 0 if male and 1 if female), market (value of 0 for developed market funds and 1 for emerging market

11

funds) and type (value of 0 for equity funds and 1 for bond funds). The complete OLS model then reads:

$$\text{Fund Flow}_{i,t} = \alpha + \beta_1\text{Fund Manager Change}_{i,t} + \beta_2\text{Performance}_{i,t-1} + \beta_3\text{Gender}_{i,t} + \beta_4\text{Market}_{i,t} + \beta_5\text{Type}_{i,t} + \varepsilon_{i,t} \tag{15}$$

The model is tested for the individual funds using the cross-sectional panel least squares approach with 207 cross-sections and 12,043 total unbalanced panel observations. We implement an unbalanced approach due to the fact that some fund managers in our data sample were in control of the funds less than three years before and after the replacement. However, we did impose a restriction of a one year minimum period of running the fund before and after the event date.

4. Empirical Results

Analysis that follows shows that three alternative methods of measuring abnormal performance generate to some extent similar results. We report the results both for the overall sample of funds and by fund categories. Moreover, at the end of this section we present findings showing the impact of manager change, gender, market and fund characteristics on fund flows. Note that 104 out of 258 manager changes in this study occur in 2004 and 2005, so the 36 months post-event period includes the severe market downturn of 2007 and 2008. Therefore, we will analyse our results having the worsening market conditions in mind for those last two years on our sample. Appendix 1, 2 and 3 show the i) benchmark adjusted, ii) peer group adjusted and iii) mean adjusted average abnormal returns, cumulative abnormal returns and corresponding t-statistics for the full sample of funds respectively. In addition, Table 1, Panel A presents Information ratios (based on fund objectives benchmark), tracking errors, benchmark adjusted average abnormal returns and the sum of the benchmark adjusted average abnormal returns for the full sample period 36 months prior and 36 months after the event date, for total sample of funds and each of the fund groups separately. Panel B of Table 1 is the same as Panel A except that is covers only the first 12 months of the post event period to eliminate the effect of severe and prolonged equity market deterioration in 2007 and 2008.

4.1. Performance and manager change: All funds

According to the benchmark adjusted method, twenty-four months prior to the event date, the average abnormal returns are at their lowest and are more volatile during the pre-event period. Subsequently, the average abnormal returns for all the funds increase and continue to do so after the event date but the cumulative returns effect is still negative. Additionally, Panel A of Table 1 shows that the sum of the benchmark adjusted average abnormal returns 36 months before the event date (-0.0531) is lower than the sum of the average abnormal returns 36 months after the event date (-0.0403). Similar is found in Panel B of Table 1 covering only immediate 12 months after the manager change. This overall verifies that the change in managers has improved the performance of the funds, which are achieving higher abnormal returns; albeit still lower than the corresponding benchmarks.

-Insert Table 1 -

The benchmark adjusted cumulative abnormal returns shown in Figure 1 show a decrease in value during the pre-event period and from period *t-12* to *t+36* they are statistically significant. However, even though from the event date until *t+10*, the cumulative average abnormal returns continue to decrease in value at a decreasing rate, average abnormal returns after the event start to pick up and become positive. Around a year after the event date (t+12) the average abnormal returns show a large increase in value which has a positive impact on cumulative average abnormal. However, the performance of the funds deteriorates in the next two years, which we believe is largely influenced by the overall market downturn in 2007 and 2008.

- Insert Figure 1 –

Very similar pattern of cumulative abnormal returns is observed in the peer group adjusted performance, as seen in Figure 2.

- Insert Figure 2-

The sum of the peer group adjusted average abnormal returns before the event date (-0.0823) is lower than the sum of the average abnormal returns after the event date (-0.0367), and it can be seen in Appendix 2 that peer-adjusted average abnormal returns becoming positive after about a year of post-event performance, but they start deteriorating in year two and three after the event date.

Overall, the funds in our sample are exhibiting a persistent decrease in returns before the change in manager. Once a manager has been replaced, the returns and the overall performance of the funds show an improving trend but then decrease again due to

deteriorating market conditions that are part of our sample period. This can lead us to conclude that the performance of the fund managers from our sample was unsatisfactory leading to a replacement, but the replacement manager has around 10 months of the 'adjustment period' before the performance starts to improve. Although our results indicate that the performance of the funds deteriorates about twelve to eighteen months after the new fund manager takes over, the perfromance of the new fund manager in comparison to the previous manager still remains favourable.

The mean adjusted average abnormal returns, reported in Appendix 3, are statistically significant at periods *t-34*, *t-23*, *t-18*, and *t=0*. Nevertheless, the results are leading to the same conclusion as for benchmark adjusted returns. In particular, returns are at their lowest one year before the event while eight months after the change in fund manager the funds exhibit increase in cumulative abnormal returns, which continues in the succeeding months up to *t+18*. However, during the event date and two months after the fund manager leaves, the average abnormal returns decrease to negative values before they start increasing again. This implies that a new fund manager will take up to a few months before adjusting to a new position of running the fund. Mean adjusted cumulative average abnormal returns are shown in Figure 3.

- Insert Figure 3 -

To conclude, according to mean-adjusted method of performance, a change in fund manager does improve the funds' performance based on average abnormal returns and cumulative average abnormal returns after the event date. However, this outperformance does not persist in the long-run as the funds exhibit a decrease in return after a year and a half of the new fund manager taking over, which we believe is the result of the falling markets in 2007 and 2008.

Finally, we would expect to draw similar conclusions from the analysis of information ratios and benchmark adjusted method, as they are both benchmark-based performance measures. Table 1, Panel A, suggest that for the total sample of funds, the information ratio is lower for the post-event period (-0.092) in comparison to the pre-event period (-0.067). The same conclusion can be drawn from the information ratio in Panel B, Table 1. This implies that given the decrease in tracking error post event, the funds overall do not exhibit higher average abnormal returns relative to their corresponding benchmarks in the post-event period as a comparison to the pre-event period. Once a new fund manager takes over

the fund, s/he is more cautious which may explain the fall in the average standard deviation and decline in the risk preference taken. Overall, this risk-adjusted measure of performance shows that there is no improvement in performance after the new manager has taken over. Information ratios by fund category from Table 1 will be discussed in the sections that follow.

4.2. Performance and manager change: Male vs. Female Managed Funds

Two thirds of funds in our data sample are male managed. The sum of benchmark-adjusted average abnormal returns for the male managed funds shown in Panel A of Table 1 is only slightly higher for the pre-event period (-0.0487) than for the post-event period (-0.0450). The sum of the benchmark adjusted average abnormal a return for the female managed funds during the pre-event period is -0.0805, whereas the post-event period entails an improved negative sum of -0.0159[5]. This indicates that both male and female managed funds improve performance after the manager change but female managed funds improve more. Looking at benchmark-adjusted, peer group-adjusted and mean-adjusted cumulative abnormal returns in Figure 4, Figure 5 and Figure 6 respectively, one can conclude that i) the performance of those funds managed by women is more volatile during the pre and post event period ii) the returns of both male and female managed funds are following a decreasing trend pre-event, and iii) after the event that the performance of funds actually improves after a period of time, upto approximately t+12 months (depending on the method used to measure abnormal returns).

- Insert Figure 4-

- Insert Figure 5-

- Insert Figure 6-

In particular, according to benchmark-adjusted and peer adjusted return criteria, once the male fund manager is replaced, the cumulative average abnormal returns continue to decline until *t+10,* followed by an advance in performance until *t+12*. Indeed, during these last two months of our estimation, the previously male managed funds are generating abnormal returns above their benchmarks. For female managed funds the benchmark-adjusted (peer-adjusted) cumulative abnormal returns show an improvement in months *t+7* to *t+9* (*t+5* to *t+12* for peer adjusted) after the replacement of female fund manager. Mean adjusted cumulative average abnormal returns in Figure 6 show somewhat different picture:

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[5] The full set of results for AARs and CAARs for all individual groups of funds is available from the authors.

the replacement of both male and female managers leads to positive mean-adjusted cumulative returns.

According to all estimation methods, the average abnormal returns increase after the change in fund manager, generating abnormal returns. However, the improvement in performance is higher for the previously female managed funds for all three estimation methods.

In terms of information ratios, information ratio for male managed funds is lower in the post-event (-0.0889) compared to the pre-event (-0.0594) period, as shown in Panel A of Table 1 (Panel B leads to the same conclusion). On the other hand, female managed funds' average abnormal return, tracking error and information ratio all slightly improve in the post-event period, signalling better fund performance after the female fund manager has left. These information ratios are based on the benchmarks set and determined by funds' objectives and the findings are consistent with the ones we obtain using the benchmark adjusted method.

4.3. Performance and manager change: Emerging Markets vs. Developed Markets Funds

Although the majority of the funds in our data sample are developed markets funds, we identify 17 emerging markets funds which predominantly invest in the Asian markets. Analysing benchmark adjusted cumulative average abnormal returns from Figure 7 we find that emerging markets outperform their respective benchmarks generating positive cumulative average abnormal in the whole period, with the exception of months *t-33* and *t-32*. Emerging market funds are more volatile and more risky than the developed funds and the managers that are in charge of them take greater risk exposures. Nevertheless, although the returns are positive, the downward trend in emerging market benchmark adjusted abnormal returns is obvious from *t-14* to the event date. After the fund manager change, the emerging market funds continue to outperform, albeit not to the same extend as before the event date, showing greater improvement in performance and an upward trend from *t+8* onwards. Developed markets funds on the other hand continue to underperform their benchmarks before and after manager change, but they do show some improvement in performance. Specifically, Panel A and Panel B of Table 1 show that both average abnormal return and the sum of average abnormal return for developed markets slightly

improve in the post event period, while the corresponding values more substantially improve for emerging market funds.

- Insert Figure 7 -

Out of all different categories of funds we analyse, the results of the emerging market funds for the peer group-adjusted method show the most noticable difference to the results of the benchmark-adjusted method, while developed market funds show similar performance pattern based on both benchmark adjusted and peer adjusted methods, as seen in Figure 8. There is an obvious downward trend in peer-adjusted performance for both group of funds over the pre-event period. One should note that, although the overall trend continues to be negative after the event date, there is an improvement in performance for both emerging and developed markets funds upto about a year after manager change in that they both generate less negative peer adjusted cumulative average abnormal returns after the management change. This is particularly pronounced among emerging market funds, where we can identify an increasing cumulative abnormal returns pattern in the months immediately following manager change and towards the end of our sample period as well.

- Insert Figure 8-

When the mean-adjusted performance is taken into account, as in Figure 9, it can be seen that i) both types of funds have decreasing or negative returns trend prior to manager change, ii) both types of funds improve performance and start generating positive cumulative mean-adjusted returns after the manager change and iii) the cumulative mean-adjusted abnormal returns revert to a decreasing pattern around a year after the manager change in emerging market funds and after about 18 months in developed market funds. Overall, this is indicating a positive effect that a change has had on the mean-adjusted performance.

-Insert Figure 9-

The information ratio analysis for the full sample period suggests somewhat different conclusions. Particularly, after the event, the information ratio in Panel A of Table 1 for emerging markets funds worsens from -0.0052 to -0.0153. We believe that this is heavily influenced by extreme negative returns of many emerging market funds around time period t+12 and that is not a true reflection of performance of these funds in the post event period. Therefore, analysing information ratios in the post event period upto t+12 only, shown in Panel B of Table 1, we find that the information ratio for emerging market funds takes a positive value of 0.0205. However, for developed market funds, the information ratio worsens and remains negative regardless of whether we measure performance over 12

months or 36 months post event. This is leading us to conclude once again that there is a short-lived improvement in performance after the change of a fund manager for emerging market funds according to this indicator, but the same cannot be stated for developed market funds.

4.4. Performance and manager change: Growth Funds, Value Funds and Small Capitalization Funds

We divide the equity funds into style categories, specifically growth funds, value funds and small capitalization funds. Out of the entire sample of funds, 76 of them are equity growth, 27 are small cap and five funds follow value style. Figure 10 demonstrates the benchmark adjusted cumulative average abnormal returns for the growth, value and small capitalization funds.

-Insert Figure 10-

Benchmark-adjusted cumulative average abnormal returns before and after the event date are statistically significant for the growth funds (t-18 to $t+36$), value funds (t-33 to $t+36$) and small capitalization funds (t-15 to $t+36$). Value funds are the only ones that outperform the benchmark throughout the period based on their cumulative average abnormal returns. It can be noted that all three groups of funds show a decline in performance right before the manager change, which is consistent to the conclusions related to other group of funds analysed. After the manager change there is no extreme improvement in benchmark adjusted performance for any of the three groups of funds over the 36 month period. In particular, the figures in Panel A of Table 1 show that the value funds display positive benchmark-adjusted average abnormal returns before the event date, and that those fall just below zero after the event date as a stream of negative average abnormal returns after the manager change is generated. On the other hand, growth and small cap funds show improvement in average abnormal returns after the event, even though they are still negative in cumulative terms before and after the event date. In addition, the sum of the average abnormal returns for all three funds is negative after the event period for all funds, but small cap and growth funds exhibit improvement in those returns during the post-event period. However, if we take only the first 12 months after the manager change into account, as in Panel B of Table 1, the sum of average abnormal returns and average abnormal returns not only improve after the event for all three groups of funds, but are in fact positive for value funds and growth funds. This improvement in performance over the shorter period

18

after manager change followed by deterioration in returns is consistent to what we have observed in other fund groups that we analyse.

Peer group adjusted performance of all three styles of equity funds improves slightly in the first 12 months of the post-event period, with the growth funds and small capitalisation funds showing more improvement right after the manager change, as seen in Figure 11. Nevertheless, although cumulative returns are still negative for all three styles of equity funds, they all yield positive average returns above their peer benchmarks at the end of the post-event period.

- Insert Figure 11-

The first glance of mean adjusted cumulative abnormal returns suggests more striking findings to benchmark-adjusted and peer-adjusted methods. Particularly, as seen in Figure 12, in the several months leading to manager change all three groups of funds perform below their means. After the manager change, their performance increases significantly above their respective means, showing a great degree of improvement for all three groups of funds. The cumulative abnormal returns remain above the mean until approximately t+30, showing a decreasing trend from around t+20 onwards for all three groups of funds.

- Insert Figure 12 -

In terms of information ratios, values in Panel B of Table 1 show that in the first 12 months of post change period, all three fund categories exhibit increase in the information ratio, with value and growth funds having positive post-event information ratios of 0.1134 and 0.0337 respectively. However, if we take into account the full 36 months post event period, the information ratio in Panel A of Table 1of value funds decreases from 0.0622 in the pre event period to 0.0307 in the post event period, while growth funds and small cap funds' information ratios improve post event, however still remaining in the negative range taking values of -0.0272 and -0.0133 for growth and small cap funds respectively. The three groups of funds generate lower average tracking error in the post-event period. From this, one can conclude that the new fund manager is more vigilant with lower deviations from the benchmark's return.

Overall, regardless of the method used to assess the performance, all three groups of funds show improvement in performance after the manager change, with the greatest degree of improvement being for small cap and growth stocks. This holds particularly in the first year

after the manager change, at the time when the severe market downturn of 2007 and 2008 did not yet start influencing the performance of funds.

4.5. Persistence of Performance and Manager Change: Best Ten Percent vs. Worst Ten Percent Performing Funds

In this section we assess whether the performance of the funds in our sample persists. In particular, we examine whether the top performing funds, or the 'winners', continue to outperform, and whether the bottom performing funds, or the 'losers', persist on underperforming after the change in fund manager. In order to rank the performance of the funds, we use the pre-event information ratio for individual funds and select top 10% and bottom 10% of funds before the event. We examine the performance of those two groups of funds after the event to assess if there is any persistence in performance among the top or the bottom performers. Since the funds' information ratios are calculated using benchmark adjusted excess returns and tracking error based on those returns, we report in this section only benchmark adjusted cumulative average abnormal returns for top 10% and bottom 10% of the funds. This benchmark adjusted cumulative performance for top 10% of funds is presented in Figure 13.

-Insert Figure 13-

The rise in the cumulative average abnormal returns can be observed almost from the start of our analysis, from *t-36*, up to the event date, *t=0*. However, after the event date the cumulative average abnormal returns gradually start to decline until the end of the first year post event, *t+12*. From *t+12* up to the end of our analysis, *t+36*, the funds once again exhibit a gradual but not sharp increase in the cumulative average abnormal returns. From these results, we can conclude that the prior, or pre-event, winner funds do exhibit some degree of performance persistence in the post-event period. On observing individual funds within the 10% of top performers, we find that some of the funds after the change in fund manager continue to outperform, but only for a very short period (a month or two to three months) until performance starts to decline. This indicates that the manager's portfolio decisions continue to have a positive impact after they have left, but eventually this positive influence wanes and is generally not immediately replicated by the new management. The new management tends to pick up the increase in performance usually after a year after they start managing the fund. This leads us to conclude that the performance of the past winners does not persist immidiatelly after the manager change but tends to improve after a period of time.

Cumulative abnormal returns of bottom 10% of the funds according to pre-event information ratio have a different pattern which can be seen in Figure 14. In particular, as these are the pre-event 'loser' funds, their returns naturally decline prior to the event date. However, as the fund a manager is replaced, they persist to decline but at a lower diminishing rate.

-Insert Figure 14-

Therefore, the performance of the 'loser' funds does continue to persist in the post-event period as in the pre-event period, even if a new fund manager has taken over the funds. Consequently, the poor performance of the fund managers of the bottom ten percent performing funds may have led to their replacement. In other words, investors in these funds should not pin their hopes on a rapid turnaround in performance when their poorly performing manager leaves.

4.7. Impact of Manager Change and Other Determinants on Fund Flows

Cumulative average abnormal fund flows before and after manager change for the whole sample of funds are presented in Figure 15[6].

- Insert Figure 15-

There are two clear conclusions that can be drawn from Figure 15: 1) one of the reasons that led to manager replacement may have been the decrease in fund flows in the year before the replacement and 2) on average fund flows start deteriorating after the manager change and continue to do so until the end of our sample period. In particular, three years before the change of a fund manager, the level of fund flow improves substantially and continues to do so up to a year before the replacement date. Once a new fund manager takes over, the level of fund flow decreases considerably up to *t+36*. Due to the fact that 96 out of 207 manager changes happened in 2004 and 2005 period, the 36 months post-event period includes the severe market downturn of 2007 and 2008. Therefore, the obvious decrease in flow for our funds in the last two years of the post-event analysis may have been affected by the market crisis of 2007 and 2008. Our results coincide with those from our previous part of our study, where the performance or the return of the funds deteriorated during the same period.

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[6] Tables of Average fund flows, Cumulative average fund flows and corresponding t-tests showing significance of these results for all the funds in our sample are available from authors on request.

The fund flow literature has shown that investors base their fund purchase decisions on previous performance (Spitz (1970), Smith (1978), Warther (1995) and Chevalier and Ellison (1997)). In order to emphasise the extent of the relationship between performance and flow, we take into account only the top and bottom ten percent of the funds according to their information ratios, as in section 4.5. This allows us to examine the level of fund flows for those top and bottom ten percent funds during the pre- and post-event period. According to Figure 16, observing the top 10% of funds based on information ratios, the level of fund flow in the post-event period decreases as a comparison to the pre-event period.

- Insert Figure 16-

These specific funds exhibited the highest information ratios during the pre-event period and the positive fund flows during this period may be attributed to the superior performance of these funds, i.e. there is a positive relationship between fund flows and the return of these funds. Once a new fund manager takes over, we see deterioration in the level of fund flows, as we saw the deterioration in performance. Our results for the fund flows in the post-event period also highlight this trend where we see a substantial decrease in flow as a new fund manager takes over. Looking at this relationship over the longer period, the pre-event outperformance of the top ten percent funds according to returns had a negative impact on the flow of funds in the post-event period. Therefore, we see a negative relationship between fund flows and returns over longer period horizons and a positive relationship over shorter periods.

When taking into account the bottom ten percent of the funds, Figure 17 shows that two years before the event date the funds experience an increase in the level of flow, of about 36%, which may have been caused by the performance of the funds in the previous years.

-Insert Figure 17-

However, the level of flow into these funds deteriorates one and a half years before the change in fund manager and continues to decline up to the end of our analysis, month $t+36$. This is not surprising as these worst performing funds had the lowest information ratios during the pre-event period and their performance continued to persist even after the fund manager was replaced. As a result, the poor performance of these funds had lead to negative fund flows throughout the entire post-event period. Based on our results, we can conclude that there is a lagged positive relationship between performance and fund flow and that investors do base their purchase decisions on previous performance.

We further investigate this link between prior short-term historical performance as indicated above, gender of fund manager, type of fund, the market at which the fund invests on one hand and the fund flows on the other, by using the panel least squared model described in equation (15).

Table 2 reports the results for the panel least squares regression, which includes the abnormal mutual fund flows as the dependent variable and manager change, prior performance, gender, market and type as independent variables.
- Insert Table 2-
The results indicate that only the recent past performance and the manager change dummy variables are statistically significant at a 10% level. Therefore, when a manager change does occur, we expect the level of fund flows to decrease by approximately 1%. In addition, as expected, we find a positive relationship between one month lagged performance of the funds and their corresponding fund flows. However, observing the remaining three dummy variables, Gender, Market and Type, the high p-values associated with these variables imply that all three variables are not statistically different from zero. Consequently, neither the gender of the fund manager, the market our funds invest in (emerging or developed) nor the type of fund according to asset class (equity or bond fund) has an impact on the level of fund flows. From this we can conclude that it is only the replacement of the fund manager and the performance of the fund that affects the level of fund flows. [7]

5. Conclusion

The study examines how the performance and the fund flow of UK funds are affected when a fund manager leaves. In particular, we assess whether there is an impact of a manager change on funds' performance and whether this impact varies depending upon whether the fund manager is male or female; whether the fund is a developed or emerging markets fund; and depending upon the fund's style, that is, growth, value or small cap. In addition, we examine if there is persistence in performance across top and bottom performing funds after the manager change. Finally, we assess if the fund flows are influenced by the change in manager and in turn by the past performance, gender of the fund manager, the market in which the fund invests or the type of fund by asset class.

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[7] When testing these independent variables in univariate OLS regression models, the same conclusions were reached.

We construct a unique database for UK manager changes in the period April 2002 to December 2005 and use an event study methodology to assess performance and fund flows before and after management change. Specifically, we measure the performance using 1) benchmark adjusted returns, both in terms of i) benchmarks set by the objectives of a fund and ii) peer-group benchmarks; 2) mean-adjusted returns and 3) information ratios. Further, the impact of manager change on fund flows is assessed through both event study and panel least squared model which utilises other potential determinants of fund flows.

Our findings suggest that the performance of the funds in our sample broadly improves upto a year following a change in manager regardless of which method for assessing performance is used. However, in the second and the third year following managers' change, the performance starts descending largely, we believe, due to exceptionally bad conditions in financial markets during 2007 and 2008, which are the last two years of our data sample. We document evidence that suggests that the performance of those funds managed by women is more volatile during the pre-event period, and that the performance of the fund actually improves more after the female fund manager has been replaced rather than male. We find greater persistence in out-performance across emerging market funds, particularly upto 12 months after the change of manager. Further, small cap, value and growth equity funds improve their performance in the one year period following the manager change, but only growth and small cap funds manage to maintain that improvement in performance over the whole three years in our post event period. In addition, focussing on the prior performance of the funds in our sample, our results indicate that the ten percent of top performing funds before the change in fund manager continue to outperform in the longer run, but there is evidence that their performance slightly declines in the year following the change. This implies that there is no immediate persistence in performance in funds classified as 'winners' before the event date. We find however that the bottom ten percent of performers prior to the manager change makes little difference to their subsequent performance, so that underperformance persists at least for the following 36 months. Last, but not least, we show that fund flows substantially decrease after the manager leaves the fund. In addition, our results suggest that a good recent past performance causes increases in subsequent fund flows and vice versa, however, we find no evidence that the gender of the fund manager, the market in which the fund invests or the type of the fund plays any determining role for the size of the fund flows. This paper presents the first evidence of such phenomena in the UK's fund management industry.

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APPENDIX 1: Benchmark-Adjusted AARs and CAARs (*indicates significant at 5% level)

Event Time	AARs	*T-test*	CAARs	*T-test*	Event Time	AARs	*T-test*	CAARs	*T-test*
t-36	0.004314302	1.62	0.004314302	0.228	t+9	-0.001452885	-0.55	-0.058491	-3.093*
t-35	0.00053391	0.20	0.004848212	0.256	t+10	-0.002025754	-0.76	-0.060516	-3.200*
t-34	-0.001483869	-0.56	0.003364344	0.178	t+11	0.000237361	0.09	-0.060279	-3.188*
t-33	-0.006397176	-2.40*	-0.003032833	-0.160	t+12	0.002889389	1.09	-0.05739	-3.035*
t-32	0.003498183	1.31	0.000465351	0.025	t+13	-0.001644719	-0.640	-0.059186011	-3.152*
t-31	-0.000740737	-0.28	-0.000275387	-0.015	t+14	0.000749212	0.292	-0.0584368	-3.112*
t-30	-0.001028939	-0.39	-0.001304326	-0.069	t+15	-0.000228327	-0.089	-0.058665127	-3.124*
t-29	-0.000729925	-0.27	-0.002034251	-0.108	t+16	-0.000643316	-0.250	-0.059308443	-3.158*
t-28	0.000804434	0.30	-0.001229817	-0.065	t+17	-0.000801394	-0.312	-0.060109837	-3.201*
t-27	-0.003782734	-1.42	-0.005012551	-0.265	t+18	-0.001513557	-0.589	-0.061623394	-3.281*
t-26	0.001612215	0.61	-0.003400336	-0.180	t+19	-0.001348605	-0.525	-0.062971999	-3.353*
t-25	0.000307357	0.12	-0.003092979	-0.164	t+20	0.000249672	0.097	-0.062722327	-3.340*
t-24	-0.003227322	-1.21	-0.006320301	-0.334	t+21	-0.003013023	-1.173	-0.06573535	-3.500*
t-23	-0.00940271	-3.53*	-0.015723012	-0.832	t+22	-0.002243593	-0.873	-0.067978944	-3.620*
t-22	0.000872481	0.33	-0.014850531	-0.785	t+23	-0.001782029	-0.694	-0.069760973	-3.715*
t-21	-0.001113567	-0.42	-0.015964098	-0.844	t+24	0.000889805	0.346	-0.068871168	-3.667*
t-20	-0.006184065	-2.32*	-0.022148163	-1.171	t+25	-0.00217972	-0.849	-0.071050887	-3.783*
t-19	-0.001508671	-0.57	-0.023656834	-1.251	t+26	-0.001771217	-0.690	-0.072822104	-3.878*
t-18	-0.000617128	-0.23	-0.024273962	-1.284	t+27	-0.00176026	-0.685	-0.074582364	-3.971*
t-17	-0.001059697	-0.40	-0.025333659	-1.340	t+28	-0.001955399	-0.761	-0.076537763	-4.076*
t-16	-0.000662308	-0.25	-0.025995967	-1.375	t+29	0.000569326	0.222	-0.075968438	-4.045*
t-15	0.000226	0.08	-0.025769966	-1.363	t+30	-0.006310127	-2.457*	-0.082278565	-4.381*
t-14	-0.004162014	-1.56	-0.02993198	-1.583	t+31	-0.001172913	-0.457	-0.083451477	-4.444*
t-13	0.00058912	0.22	-0.02934286	-1.552	t+32	-0.00293104	-1.141	-0.086382518	-4.600*
t-12	-0.002976535	-1.12	-0.032319395	-1.709*	t+33	-0.00272091	-1.059	-0.089103427	-4.745*
t-11	-0.000976182	-0.37	-0.033295577	-1.761*	t+34	-0.002459054	-0.957	-0.091562481	-4.876*
t-10	-0.001596914	-0.60	-0.034892491	-1.846*	t+35	-0.00106135	-0.413	-0.092623831	-4.932*
t-9	-0.003816025	-1.43	-0.038708516	-2.047*	t+36	-0.001577722	-0.614	-0.094201552	-5.016*
t-8	-0.004110115	-1.54	-0.042818631	-2.265*					
t-7	-0.002069901	-0.78	-0.044888532	-2.374*					
t-6	-0.00184448	-0.69	-0.046733012	-2.472*					
t-5	-0.000287807	-0.11	-0.047020819	-2.487*					
t-4	-0.002677181	-1.01	-0.049698	-2.629*					
t-3	0.000226273	0.09	-0.049471727	-2.617*					
t-2	-0.003541863	-1.33	-0.05301359	-2.804*					
t-1	-0.000133914	-0.05	-0.053147504	-2.811*					
t=0	0.000331215	0.12	-0.052816	-2.793*					
t+1	-0.002278706	-0.86	-0.055095	-2.914*					
t+2	0.000361195	0.14	-0.054734	-2.895*					
t+3	-0.001062844	-0.40	-0.055797	-2.951*					
t+4	0.00032502	0.12	-0.055472	-2.934*					
t+5	-0.002018345	-0.76	-0.05749	-3.040*					
t+6	0.0006675	0.25	-0.056822	-3.005*					
t+7	-0.00087749	-0.33	-0.0577	-3.051*					
t+8	0.00066233	0.25	-0.057038	-3.016*					

APPENDIX 2: Peer group-Adjusted AARs and CAARs (*indicates significant at 5% level)

Event Time	AARs	*T-test*	CAARs	*T-test*	Event Time	AARs	*T-test*	CAARs	*T-test*
t-36	0.0024982	0.97	0.0024982	0.08	t+9	-0.000384	-0.15	-0.098795	-3.31*
t-35	0.0033135	1.29	0.0058117	0.19	t+10	-0.0017559	-0.68	-0.1005509	-3.37*
t-34	0.0011478	0.45	0.0069596	0.23	t+11	-0.0002982	-0.12	-0.1008492	-3.38*
t-33	-0.0007302	-0.28	0.0062294	0.21	t+12	0.0003781	0.15	-0.100471	-3.37*
t-32	-0.0012309	-0.48	0.0049985	0.17	t+13	0.003223315	1.280	-0.097168084	-3.257*
t-31	0.0006551	0.25	0.0056535	0.19	t+14	-0.000590134	-0.234	-0.097758218	-3.277*
t-30	0.0001156	0.04	0.0057691	0.19	t+15	-0.001352273	-0.537	-0.099110491	-3.322*
t-29	4.747E-05	0.02	0.0058166	0.19	t+16	0.000392705	0.156	-0.098717786	-3.309*
t-28	-0.0018646	-0.73	0.0039519	0.13	t+17	0.000172231	0.068	-0.098545555	-3.303*
t-27	-0.0047779	-1.86*	-0.0008259	-0.03	t+18	-0.001033288	-0.410	-0.099578843	-3.338*
t-26	-0.0015129	-0.59	-0.0023388	-0.08	t+19	0.000400605	0.159	-0.099178239	-3.325*
t-25	-0.0013643	-0.53	-0.0037032	-0.12	t+20	0.00061532	0.244	-0.098562919	-3.304*
t-24	-0.0040011	-1.56	-0.0077043	-0.26	t+21	-0.000308609	-0.123	-0.098871527	-3.314*
t-23	-0.0087974	-3.42*	-0.0165016	-0.55	t+22	-0.003328227	-1.321	-0.102199754	-3.426*
t-22	-0.0018048	-0.70	-0.0183065	-0.61	t+23	-0.001630325	-0.647	-0.103830079	-3.480*
t-21	0.0001759	0.07	-0.0181306	-0.61	t+24	-0.001197503	-0.475	-0.105027582	-3.521*
t-20	-0.0066853	-2.60*	-0.0248159	-0.83	t+25	-0.003408642	-1.353	-0.108436224	-3.635*
t-19	-0.0013391	-0.52	-0.026155	-0.88	t+26	-0.000784653	-0.312	-0.109220877	-3.661*
t-18	-0.0053819	-2.09*	-0.0315369	-1.06	t+27	-0.000980741	-0.389	-0.110201618	-3.694*
t-17	-0.0033707	-1.31	-0.0349076	-1.17	t+28	-0.000684991	-0.272	-0.11088661	-3.717*
t-16	-0.0018705	-0.73	-0.0367781	-1.23	t+29	-0.001171562	-0.465	-0.112058171	-3.756*
t-15	-0.0013032	-0.51	-0.0380813	-1.28	t+30	-0.006351595	-2.522*	-0.118409766	-3.969*
t-14	-0.0024492	-0.95	-0.0405305	-1.36	t+31	-0.000438275	-0.174	-0.118848041	-3.984*
t-13	-9.976E-05	-0.04	-0.0406302	-1.36	t+32	-0.000991083	-0.393	-0.119839124	-4.017*
t-12	-0.0049157	-1.91	-0.0455459	-1.53	t+33	-0.00043354	-0.172	-0.120272664	-4.032*
t-11	-0.0023913	-0.93	-0.0479372	-1.61	t+34	0.000562382	0.223	-0.119710282	-4.013*
t-10	-0.0023697	-0.92	-0.0503069	-1.69*	t+35	0.00091175	0.362	-0.118798532	-3.982*
t-9	-0.0064435	-2.51	-0.0567505	-1.90*	t+36	-0.000223058	-0.089	-0.11902159	-3.990*
t-8	-0.0033275	-1.30	-0.060078	-2.01*					
t-7	-0.0037072	-1.44	-0.0637852	-2.14*					
t-6	-0.0051587	-2.01	-0.0689439	-2.31*					
t-5	-0.0011815	-0.46	-0.0701254	-2.35*					
t-4	-0.0045155	-1.76	-0.0746408	-2.50*					
t-3	-0.0015018	-0.58	-0.0761427	-2.55*					
t-2	-0.0038788	-1.51	-0.0800215	-2.68*					
t-1	-0.0027911	-1.09	-0.0828126	-2.77*					
t=0	-0.0030751	-1.20	-0.0858877	-2.88*					
t+1	-0.001915	-0.75	-0.0878027	-2.94*					
t+2	-0.0021721	-0.85	-0.0899748	-3.01*					
t+3	-0.0022684	-0.88	-0.0922432	-3.09*					
t+4	-0.002442	-0.95	-0.0946852	-3.17*					
t+5	0.0002121	0.08	-0.0944731	-3.17*					
t+6	-0.0005209	-0.20	-0.094994	-3.18*					
t+7	-0.001269	-0.49	-0.096263	-3.23*					
t+8	-0.002148	-0.84	-0.098411	-3.30*					

APPENDIX 3: Mean-Adjusted AARs and CAARs (*indicates significant at 5% level)

Event Time	AARs	T-test	CAARs	T-test	Event Time	AARs	T-test	CAARs	T-test
t-36	0.003962612	0.711	0.003962612	0.252	t+9	0.002495207	0.448	-0.008752019	-0.556
t-35	0.005835099	1.048	0.009797712	0.622	t+10	0.003939521	0.707	-0.004812498	-0.306
t-34	-0.009191206	-1.650*	0.000606506	0.039	t+11	0.008711205	1.564	0.003898707	0.248
t-33	-0.002701489	-0.485	-0.002094983	-0.133	t+12	0.005995576	1.076	0.009894282	0.628
t-32	0.002294173	0.412	0.00019919	0.013	t+13	0.002538019	0.456	0.012432301	0.789
t-31	0.00136271	0.245	0.001561901	0.099	t+14	0.002641834	0.474	0.015074135	0.957
t-30	0.003005351	0.540	0.004567252	0.290	t+15	0.001969236	0.354	0.017043371	1.082
t-29	-0.002114628	-0.380	0.002452624	0.156	t+16	0.00031677	0.057	0.017360141	1.102
t-28	-0.004196414	-0.753	-0.00174379	-0.111	t+17	0.002620232	0.470	0.019980373	1.269
t-27	-0.001275579	-0.229	-0.003019369	-0.192	t+18	-0.001101098	-0.198	0.018879275	1.199
t-26	-0.002183666	-0.392	-0.005203035	-0.330	t+19	0.000853757	0.153	0.019733032	1.253
t-25	0.003302042	0.593	-0.001900993	-0.121	t+20	-0.001169067	-0.210	0.018563965	1.179
t-24	-0.008370063	-1.503	-0.010271056	-0.652	t+21	-0.001357021	-0.244	0.017206944	1.093
t-23	-0.017839078	-3.202*	-0.028110134	-1.785*	t+22	-0.004766143	-0.856	0.0124408	0.790
t-22	-0.000228192	-0.041	-0.028338326	-1.799*	t+23	0.000722835	0.130	0.013163636	0.836
t-21	-0.000583347	-0.105	-0.028921672	-1.836*	t+24	0.00285578	0.513	0.016019416	1.017
t-20	-0.004070244	-0.731	-0.032991917	-2.095*	t+25	-0.003795845	-0.681	0.012223571	0.776
t-19	0.006179442	1.109	-0.026812475	-1.703*	t+26	-0.008017928	-1.439	0.004205643	0.267
t-18	-0.010439704	-1.874*	-0.037252179	-2.365*	t+27	-0.001077314	-0.193	0.003128328	0.199
t-17	-0.004520818	-0.812	-0.041772997	-2.652*	t+28	-5.19017E-05	-0.009	0.003076426	0.195
t-16	0.001717994	0.308	-0.040055003	-2.543*	t+29	0.003556561	0.638	0.006632987	0.421
t-15	0.000941598	0.169	-0.039113405	-2.484*	t+30	-0.004746339	-0.852	0.001886648	0.120
t-14	0.001259382	0.226	-0.037854024	-2.404*	t+31	0.000395081	0.071	0.002281729	0.145
t-13	0.00812357	1.458	-0.029730453	-1.888*	t+32	-0.006096183	-1.094	-0.003814454	-0.242
t-12	-0.006294405	-1.130	-0.036024858	-2.287*	t+33	-0.000741726	-0.133	-0.004556181	-0.289
t-11	0.005400291	0.969	-0.030624567	-1.945*	t+34	-0.001465317	-0.263	-0.006021498	-0.382
t-10	0.005768379	1.036	-0.024856188	-1.578	t+35	-0.002618975	-0.470	-0.008640473	-0.549
t-9	-0.000939357	-0.169	-0.025795546	-1.638	t+36	0.000351958	0.063	-0.008288515	-0.526
t-8	-0.000879325	-0.158	-0.02667487	-1.694*					
t-7	-0.000566606	-0.102	-0.027241477	-1.730*					
t-6	0.001482796	0.266	-0.025758681	-1.636					
t-5	0.003886512	0.698	-0.021872169	-1.389					
t-4	0.00026774	0.048	-0.021604429	-1.372					
t-3	0.00889698	1.597	-0.012707449	-0.807					
t-2	0.004780539	0.858	-0.00792691	-0.503					
t-1	0.004646473	0.834	-0.003280436	-0.208					
t=0	-0.010551478	-1.894*	-0.013831914	-0.878					
t+1	-0.007977224	-1.432	-0.021809139	-1.385					
t+2	-0.000548169	-0.098	-0.022357307	-1.420					
t+3	0.000613161	0.110	-0.021744146	-1.381					
t+4	-0.00302301	-0.543	-0.024767157	-1.573					
t+5	0.006434297	1.155	-0.018332859	-1.164					
t+6	0.005161341	0.927	-0.013171519	-0.836					
t+7	-0.000628311	-0.113	-0.01379983	-0.876					
t+8	0.002552604	0.458	-0.011247226	-0.714					

Table 1

PANEL A: Information Ratio, Benchmark-Adjusted AARs and CAARs 36 months pre- and 36 months post-event							
	Average Tracking Error		**Average Information Ratio**		**Average Abnormal Returns**		**Sum Average Abnormal Return**	
	Pre-event	Post-event	Pre-event	Post-event	Pre-event	Post-event	Pre-event	Post-event
Total Sample	0.0248	0.0174	-0.0670	-0.0920	-0.0014	-0.0012	-0.0538	-0.0403
Male	0.0241	0.0175	-0.0594	-0.0889	-0.0014	-0.0012	-0.0487	-0.0450
Female	0.0279	0.0172	-0.1269	-0.1086	-0.0025	-0.0001	-0.0805	-0.0159
Emerging Markets	0.0271	0.0224	-0.0052	-0.0153	0.0001	0.0003	0.0032	0.0177
Developed Markets	0.0246	0.0171	-0.0715	-0.0975	-0.0017	-0.0012	-0.0588	-0.0451
Value	0.0313	0.0190	0.0622	0.0307	0.0033	-0.0005	0.1782	-0.0024
Growth	0.0273	0.0182	-0.0602	-0.0272	-0.0023	-0.0003	-0.0842	-0.0041
Small	0.0355	0.0263	-0.1239	-0.0133	-0.0067	-0.0024	-0.2105	-0.0743

PANEL B: Information Ratio, Benchmark-Adjusted AARs and CAARs 36 months pre- and 12 months post-event							
	Average Tracking Error		**Average Information Ratio**		**Average Abnormal Returns**		**Sum Average Abnormal Return**	
	Pre-event	Post-event	Pre-event	Post-event	Pre-event	Post-event	Pre-event	Post-event
Total Sample	0.0248	0.0175	-0.0670	-.0853	-0.0014	-0.0004	-0.0538	-0.0042
Male	0.0241	0.0176	-0.0594	-0.0789	-0.0014	-0.0004	-0.0487	-0.0054
Female	0.0279	0.0171	-0.1269	-0.1239	-0.0025	-0.0001	-0.0805	0.0013
Emerging Markets	0.0271	0.0177	-0.0052	0.0205	0.0001	0.0005	0.0032	0.114
Developed Markets	0.0246	0.0175	-0.0715	-0.0927	-0.0017	-0.0004	-0.0588	-0.0054
Value	0.0313	0.0158	0.0622	0.1134	0.0033	0.0009	0.1782	0.0254
Growth	0.0273	0.0189	-0.0602	0.0227	-0.0023	0.0013	-0.0842	0.0192
Small	0.0355	0.0239	-0.1239	-0.0789	-0.0067	-0.0013	-0.2105	-0.0181

Table 2: Determinants of Individual Mutual Fund Flows

Cross-sectional Panel Least Squares Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Constant	0.001326	0.004596	0.288567	0.7729
Manager Change	-0.010479*	0.005610	-1.867999	0.0618
Performance (AR(-1))	0.219969*	0.129527	1.698242	0.0895
Gender	-0.011137	0.008138	-1.368485	0.1712
Market	0.006374	0.011234	0.567356	0.5705
Type	-0.003381	0.007045	-0.479873	0.6313
R-squared	0.000699	F-statistic		1.682754
		Prob(F-statistic)		0.134950

*Significant at 10% significance level

Figure 1: Benchmark-Adjusted Cumulative Average Abnormal Returns - All Funds
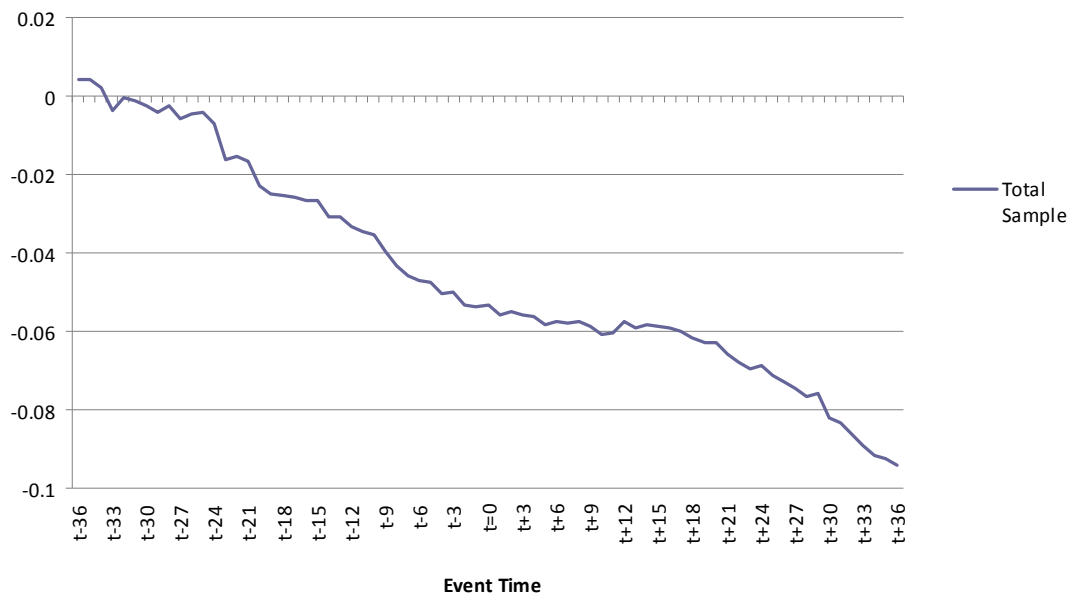
Figure 2: Peer Group-Adjusted Cumulative Average Abnormal Returns - All Funds
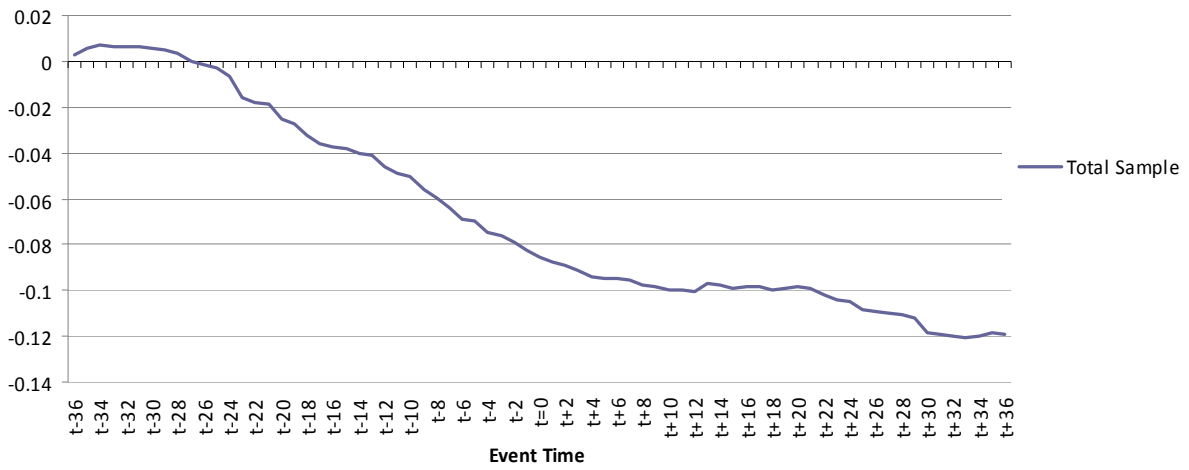
Figure 3: Mean-Adjusted Cumulative Average Abnormal Returns - All Funds
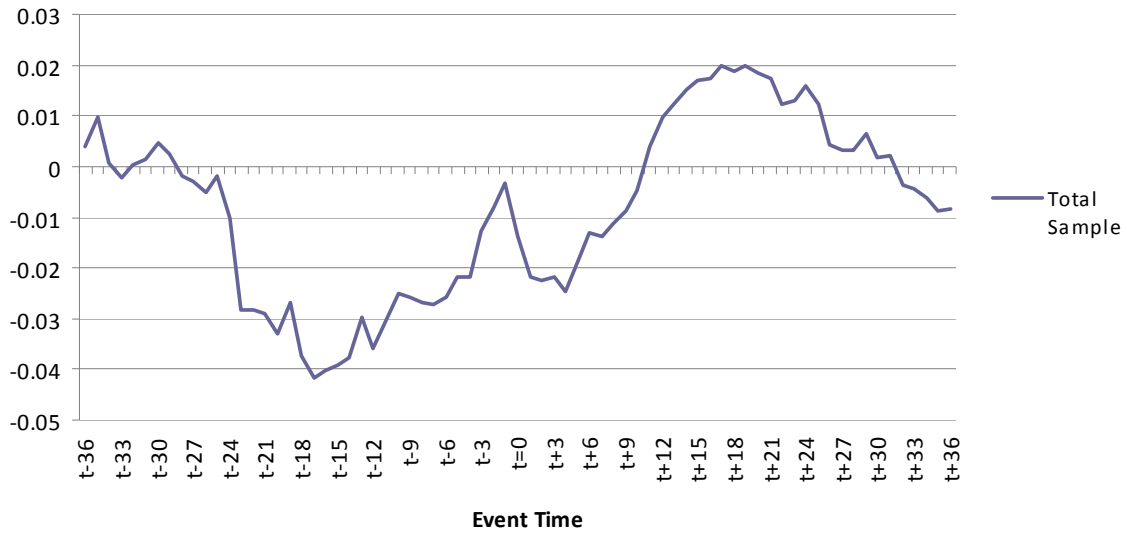
**Figure 4: Male vs. Female Managed Funds - Benchmark-Adjusuted
Cumulative Average Abnormal Returns**
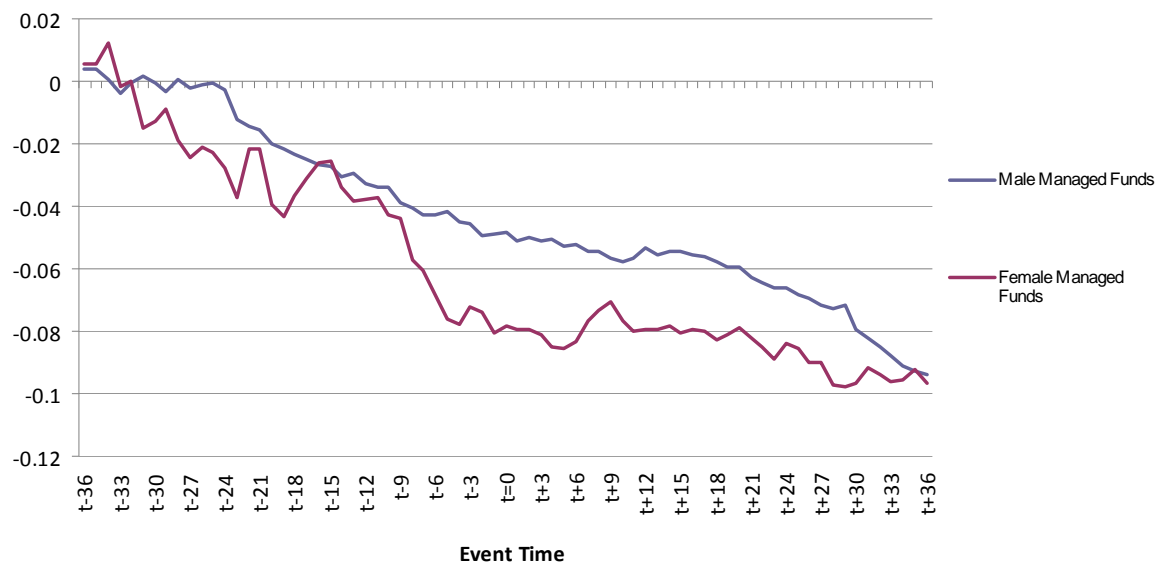
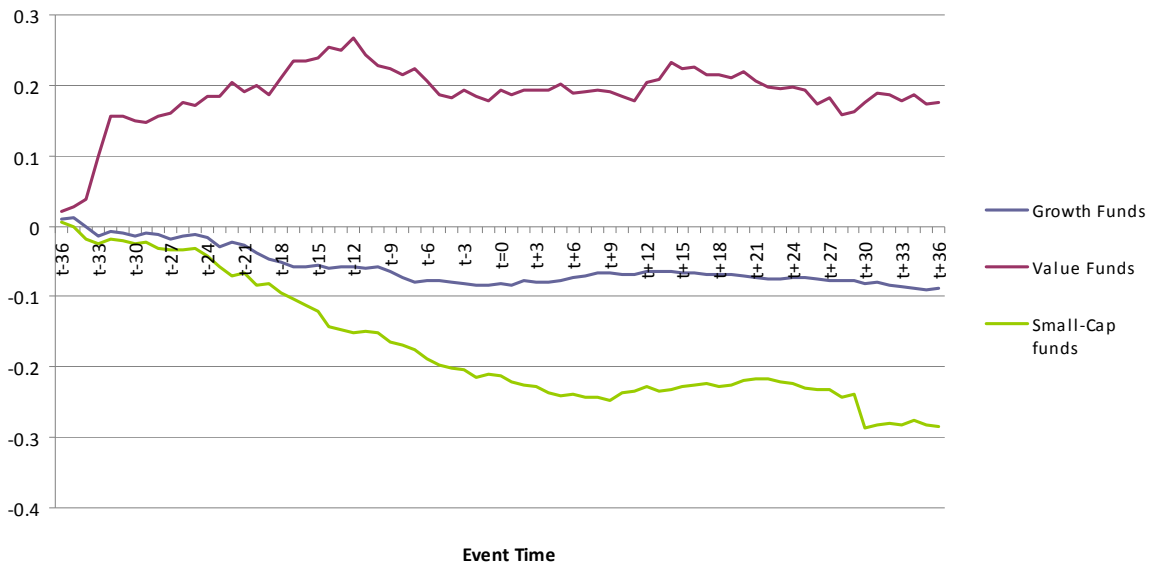**Figure 5: Male vs. Female Managed Funds - Peer Group-Adjusted Cumulative Average Abnormal Returns**
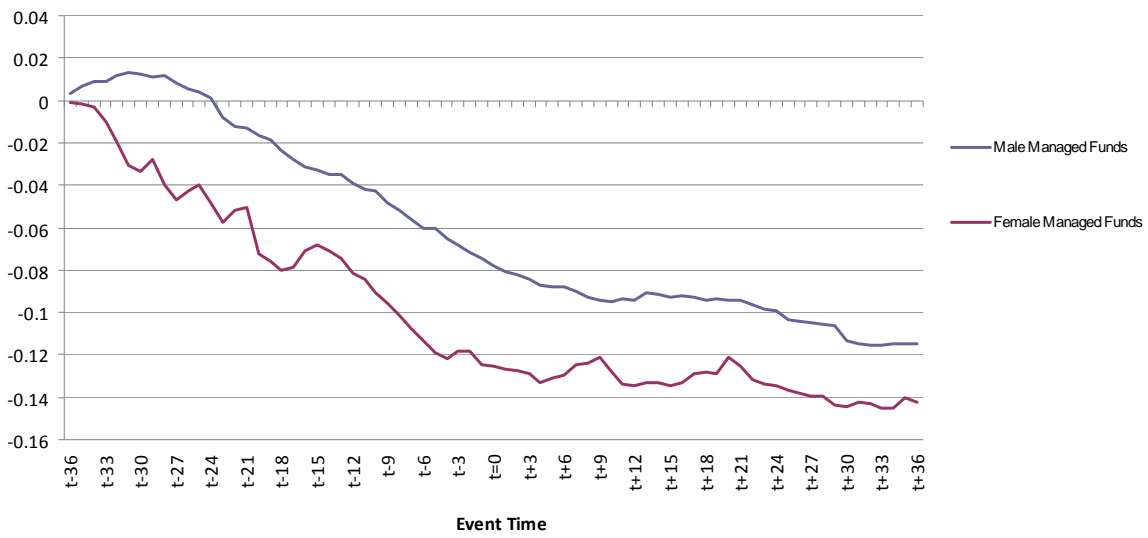
Figure 6: Male vs. Female Managed Funds - Mean-Adjusted Cumulative Average Abnormal Returns
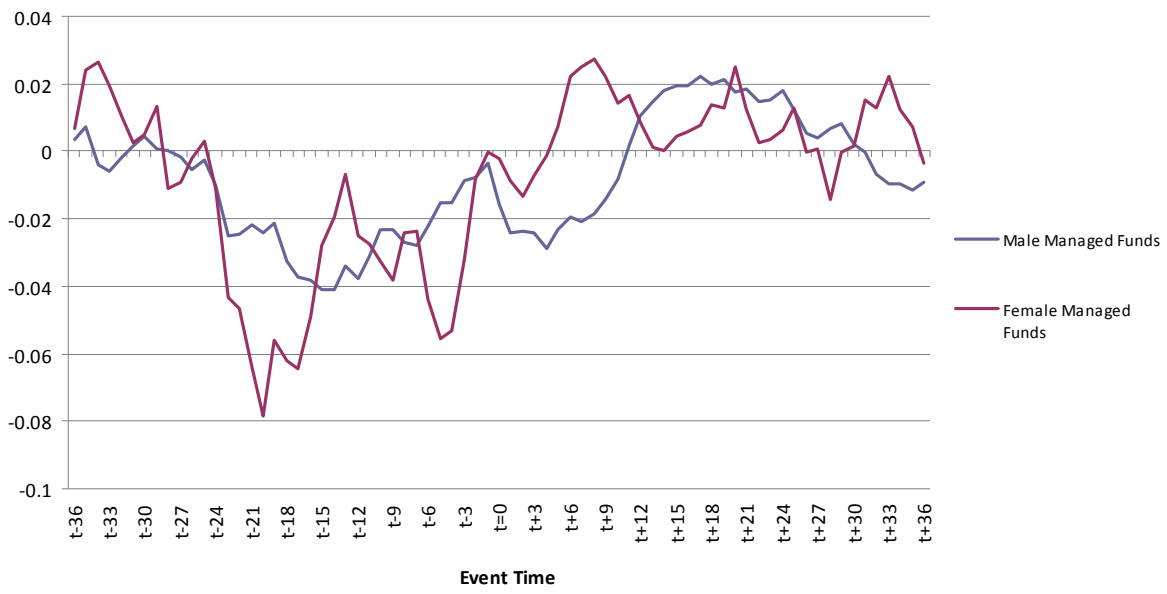
**Figure 7: Emerging vs. developed Market Funds - Benchmark-Adjusted
Cumulative Average Abnormal Returns**
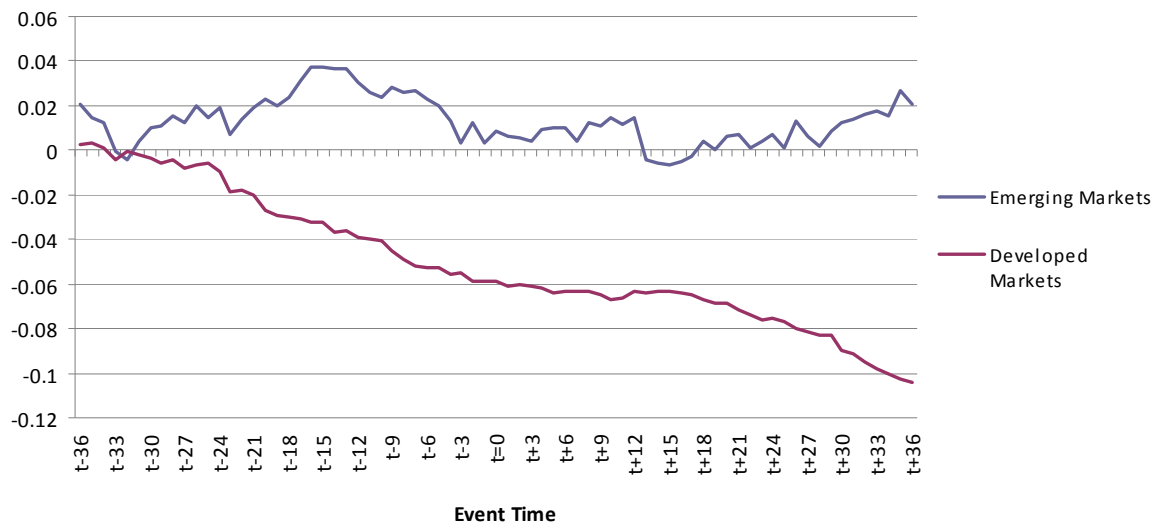
**Figure 8: Emerging vs. Developed Market Funds - Peer Group-Adjusted
Cumulative Average Abnormal Returns**
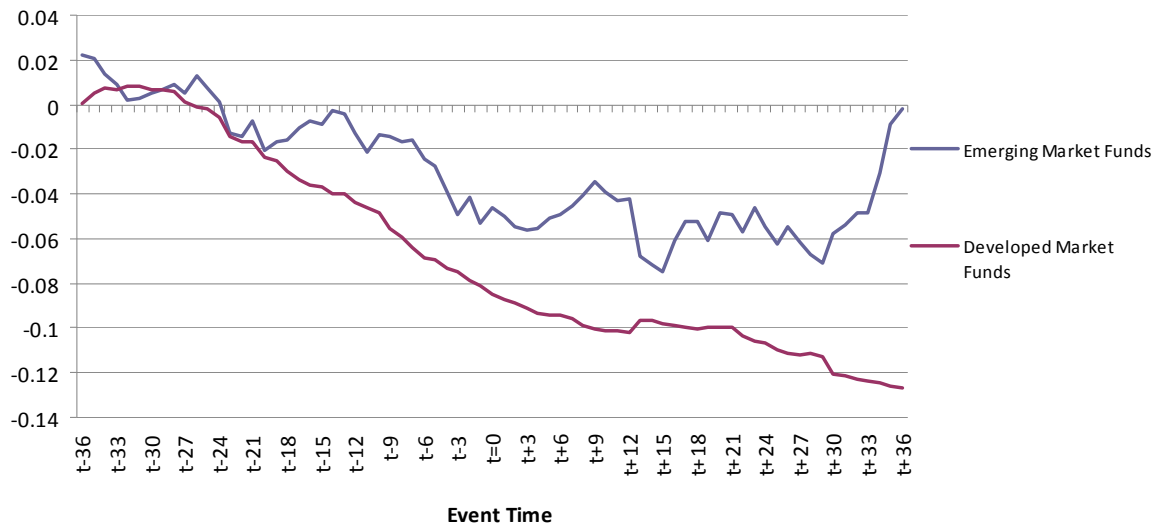
Figure 9: Emerging vs. Developed Market Funds - Mean-Adjusted Emerging Cumulative Average Abnormal Returns
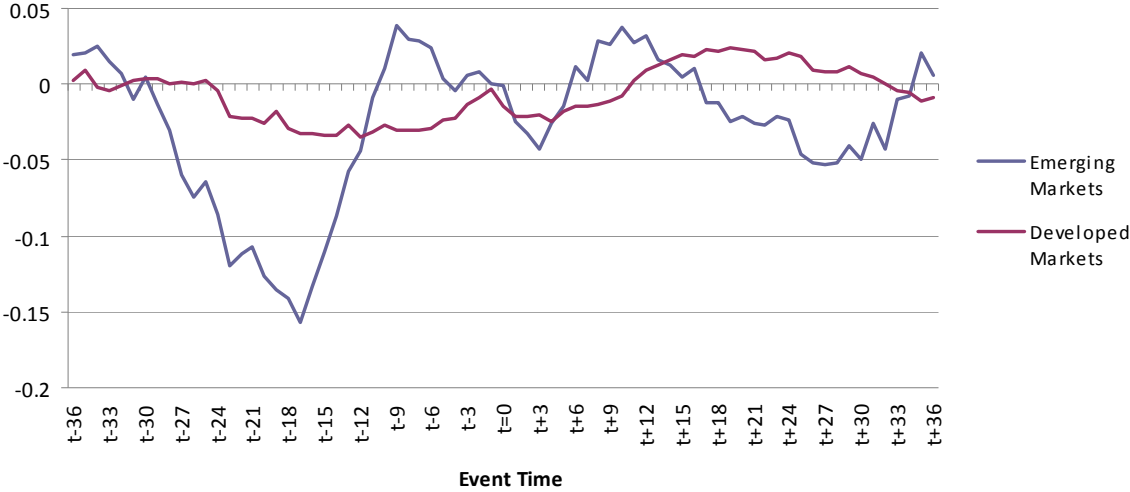
Figure 10: Growth , Value and Small-Cap Funds - Benchmark-Adjusted Cumulative Average Abnormal Returns

**Figure 11: Growth, Value and Small-Cap Funds - Peer Group-Adjsued Cumulative Average Abnormal Returns**
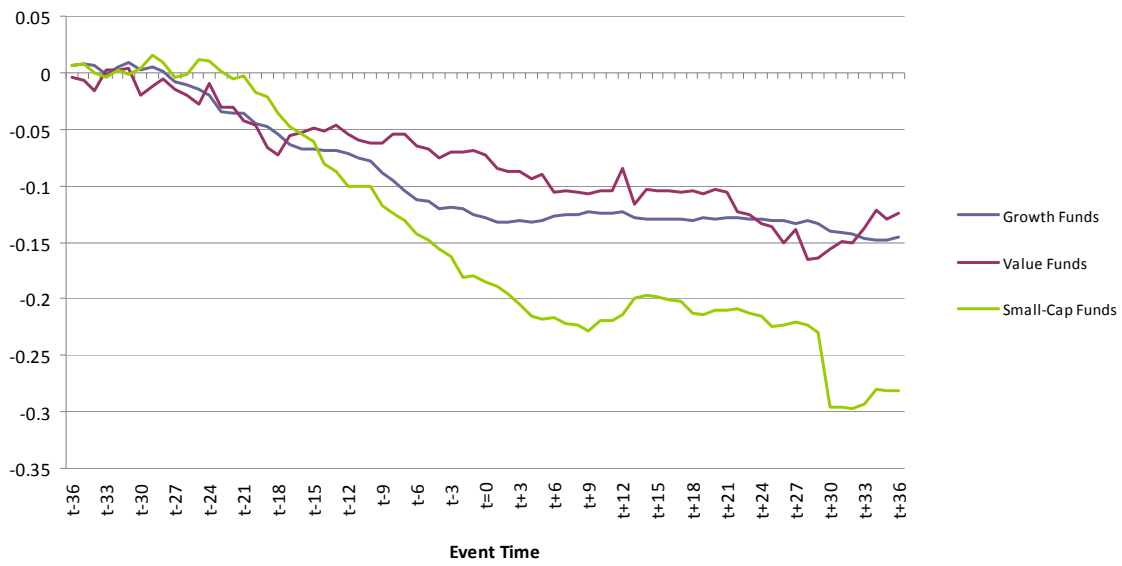
**Figure 12: Value, Growth and Small-Cap Funds - Mean-Adjusted Cumulative Average Abnormal Returns**
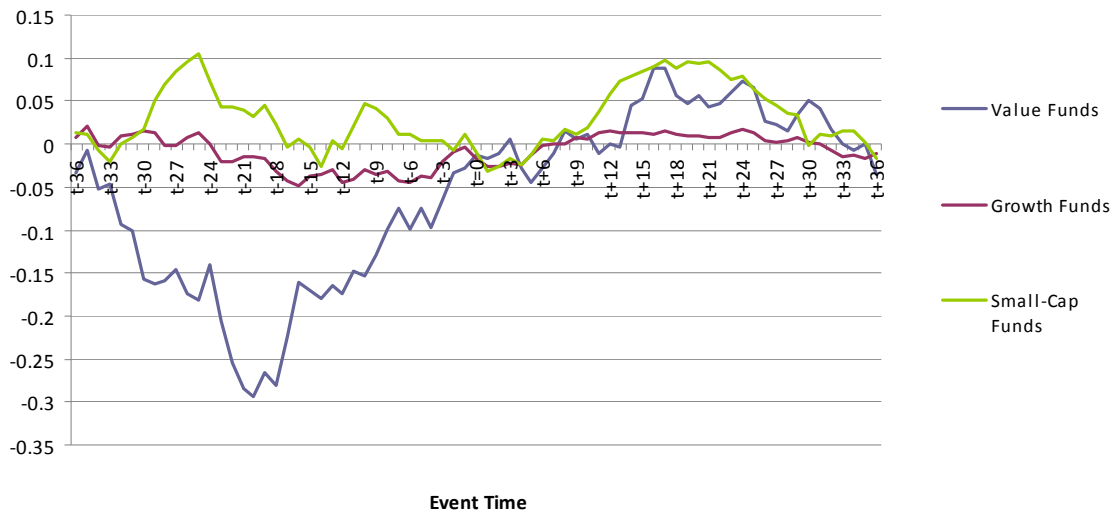
Figure 13: Benchmark-Adjusted Cumulative Average Abnormal Returns - Top 10% Funds according to pre-event IR
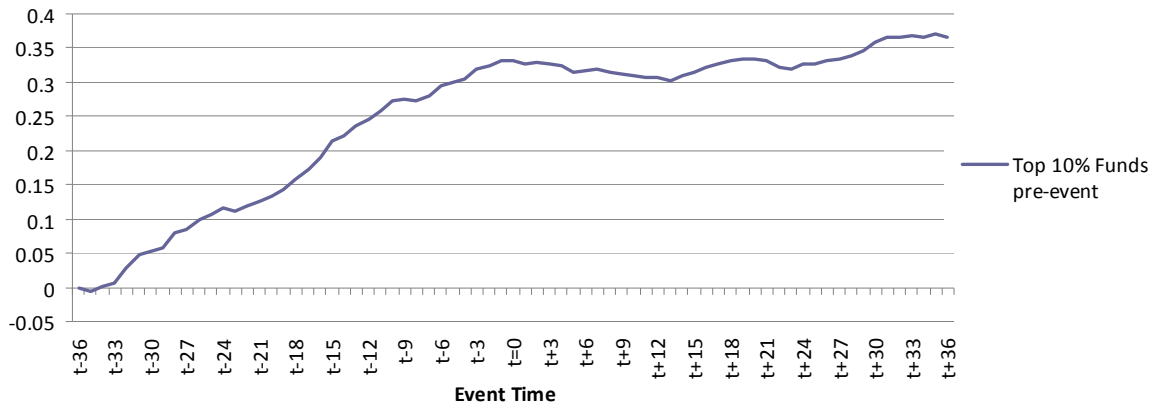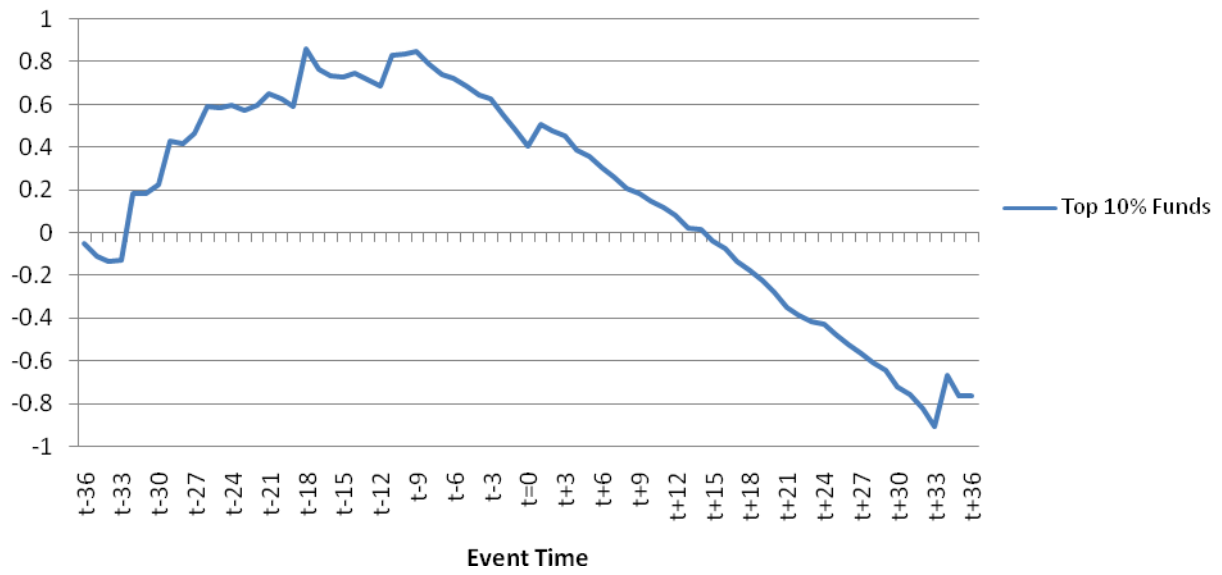
Figure 14: Benchmark-Adjusted Cumulative Average Abnormal Returns - Bottom 10% Funds according to pre-event IR
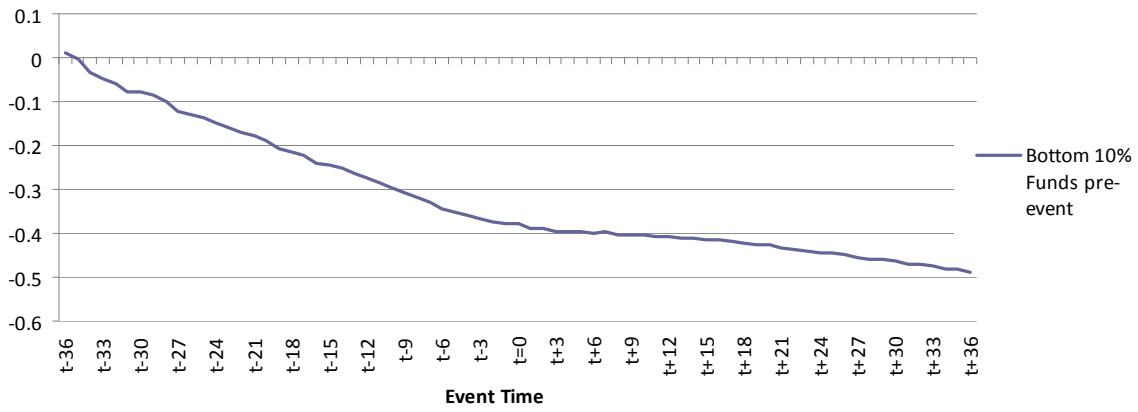
Figure 15: Monthly Cumulative Average Abnormal Fund Flow – All Funds
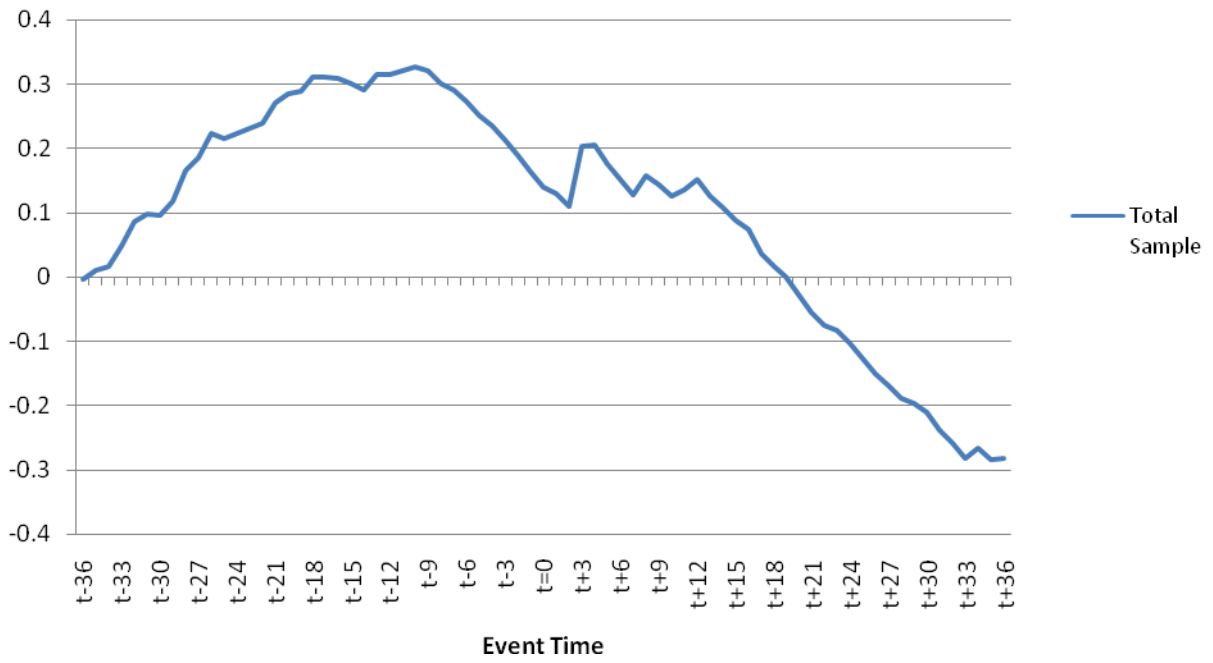
Figure 16: Cumulative Average Abnormal Fund Flows - Top 10% Funds according to IR Pre-Event

Figure 17: Cumulative Average Abnormal Fund Flows- Bottom 10% Funds according to IR Pre-Event