

# The Impact of Mandatory Hedge Fund Portfolio Disclosure

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In this paper, we examine the use of hedge funds' 13(f) filings by market participants. While many argue disclosure of equity holdings in these filings could harm investment funds, we find hedge funds largely benefit from disclosure while providing little private information to the marketplace. We detect abnormal trading volume around disclosure dates and also find significant, positive abnormal returns immediately after disclosure, suggesting the presence of copy-cat traders. Fund companies have a period of time, usually up to 45 days after the end of the quarter, to announce their quarter end holdings. We find evidence of significant trading in the days leading up to the public announcement, which raises the possibility that some traders are taking positions in anticipation of the possible market impact of the 13(f) disclosure. Indeed, a long-short portfolio of these companies' expanded-contracted positions purchased prior to the disclosure date earns positive, significant abnormal returns through the disclosure period. Finally, we find no evidence disclosed holdings offer long-term investors access to profitable information.

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## Introduction

Investors have been attracted to the hedge fund industry for two primary reasons. Firstly, hedge funds allow high net worth and institutional investors, such as pension funds, to gain exposure to asset classes that was previously difficult to obtain. The second and more important reason is hedge fund managers' ability to generate superior risk adjusted performance, or alpha.<sup>2</sup> This alpha occurs even after the lucrative fees typical of the industry, averaging 1.5% of assets under management and 20% of any positive performance. Because of the difficulty of consistently generating alpha due to the possibility of efficient markets incorporating trading strategies into prices, hedge funds are notoriously secretive about all aspects of their operations.

Prior attempts to require disclosure of any information by the industry have been met with fierce opposition. For example, the 2004 Securities and Exchange Commission (SEC) ruling that would cause virtually all hedge funds to register as investment advisors was ultimately overturned by the U.S. District Court of Appeals after the SEC was sued by a member of the industry.<sup>3</sup> Hedge fund managers are even more elusive about their underlying strategies. For example, some hedge fund managers do not allow their own investors to view all of their funds' positions (Brown *et al.* (2010)). Hedge funds typically require their employees to sign confidentiality agreements to ensure strategy information is not disclosed to other companies.<sup>4</sup>

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<sup>2</sup> Brown, Goetzmann and Ibbotson (1999) and Fung and Hsieh (1997) both find hedge funds exhibit positive risk-adjusted performance.

<sup>3</sup> Philip Goldstein filed the suit in December of 2004. See [http://money.cnn.com/2006/06/23/markets/hedge\\_ruling/index.htm](http://money.cnn.com/2006/06/23/markets/hedge_ruling/index.htm). Brown, Goetzmann, Liang and Schwarz (2008,2009) use these disclosures to examine operational risk in the hedge fund industry.

<sup>4</sup> Recently, the topic of trade secrets in the industry has drawn more attention. For example, two former employees of Renaissance Technologies, one of the most successful hedge funds, were recently sued. See <http://www.portfolio.com/news-markets/top-5/2008/05/01/Hedge-Fund-Trade-Secrets>.

However, there is an opportunity for the public to gain insight into hedge funds' strategies. At the end of each quarter, if a hedge fund management company manages more than \$100 million of certain securities, the hedge fund management company is required by law to file a Form 13(f) with the SEC. This form documents some of their holdings, including the number of shares (contracts) of stocks (options). While the 13(f) filings do not contain all of management companies' holdings such as short positions or present information at the fund level, they might provide access to some private information hedge funds use to generate alpha. Other investors could 'free ride' off of these disclosures by 'copy-cattin' hedge funds' portfolios rather than performing their own investment research. They could also take advantage of these disclosures by knowing in advance positions the fund may be forced to buy or sell, also known as 'front-running.'

In this paper, we use hedge fund management companies' 13(f) filings to investigate whether a significant number of market participants are acting on these disclosures and whether these disclosures are valuable to investors. Since 1999, 13(f) filings have been made electronically to the SEC via the Electronic Data Gathering and Retrieval (EDGAR) system. Filings are uploaded and almost immediately posted to the EDGAR system's file transfer protocol (FTP) site for market participants to view. The SEC tracks the dates the filings are added to the system ('Filing Date'). Thus, we know the exact date the filings are made available to the public and can investigate market conditions of the disclosed securities around those dates.<sup>5</sup>

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<sup>5</sup> There are two ways for investors to find a filing. Investors could systemically poll EDGAR for a particular company's filing over short intervals (for example, minutes). Alternatively, EDGAR updates its index files each evening. Investors could then search the index files for any new 13(f) filings or for a

While prior research has documented potential gains from using mandated portfolio disclosure information<sup>6</sup>, no research has documented the use of these positions by market participants. Market participants may simply ignore or disregard this disclosure information for a number of reasons. Form 13(f) filings are stale. Management companies have up to 45 days to reports their holdings to the SEC. If positions have high turnover, these filings will have little value. Companies also have the ability to omit some positions from their original filings and later add them via an amended filing<sup>7</sup> or alter their portfolios on disclosures' effective dates to hide any useful information<sup>8</sup>. In addition, research on the disclosure of hedge fund operational risk information has shown that investors do not appear to utilize that information, even though it predicts future returns and fund failure (Brown *et al.* (2008, 2009, 2010)). Thus, there is a distinct possibility this portfolio disclosure is also not utilized by investors even if the information is valuable.

Overall, we find significant evidence of abnormal market conditions around filing disclosure dates. We find significant excess volume on and around the dates on which position changes are disclosed. Using one large hedge fund as a case study we find that

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particular company's new filings on a daily basis. For more information, see "Information for FTP Users" at <http://www.sec.gov/edgar/searchedgar/ftpusers.htm>.

<sup>6</sup> For example, Phil Goldstein, who previously fought and won against the 2004 disclosure requirement, argued 13(f) filings contained "trade secrets" and was preparing to fight the SEC on the issue of mandatory portfolio disclosure. See [http://www.businessweek.com/investor/content/sep2006/pi20060913\\_356291.htm](http://www.businessweek.com/investor/content/sep2006/pi20060913_356291.htm). Wermers (2000) discusses some of the potential issues with frequent disclosure. Coval and Stafford (2007) and Verbeek and Wang (2010) both demonstrate mutual funds' holding information is useful for front-running and copy-catting, respectively.

<sup>7</sup> Agarwal, Jiang, Tang and Yang (2010) find that hedge funds do use this exemption. They also find these holdings have higher performance than non-omitted positions.

<sup>8</sup> For example, from <http://online.wsj.com/public/resources/documents/072110madoff1.pdf>, "Madoff claimed to move his customers' funds, like the Feeder Funds, in order to avoid what he understood to be the disclosure requirements of a Form 13F filing under the SEC rules requiring those who exercise discretion over accounts having more than \$100 million in exchange-traded or NASDAQ securities to report their holdings."

this volume is buyer-initiated. In addition, we find evidence of significant and positive excess returns up to two days following such disclosures. Overall, our results imply hedge fund 13(f) filings contain valuable private information prior to their disclosure, raising the possibility that funds might have an economic incentive to trade on this information.

Indeed, we do find evidence of significant volume increases for a number of hedge fund companies' positions over the five day period *prior* to their disclosure. We find a trading strategy that purchases these companies' expanded positions and sells their contracted positions five days prior to disclosure and sells those positions five days after their disclosure earns positive, significant excess returns. A similar strategy using our entire sample results in no excess returns, suggesting the observed abnormal volume for these funds is related to the buying of expanded positions and selling of contracted positions. At the same time, we find no evidence that disclosed positions provide beneficial information to long-term investors. One and three-month excess returns from either the portfolio effective dates or the filing dates are not significantly different from zero.

These findings suggest that 13(f) filings, if anything, are positive for hedge fund companies. Excess returns on securities disclosed in 13(f) filings suggest that price pressure increases the value of hedge fund company holdings. If any of the securities are mispriced, significant investor attention appears to accelerate any price corrections. Our results also suggest some hedge fund management companies may be taking advantage of

the market's attention to their holdings information.<sup>9</sup> Doing so would result in significant performance gains.

Our results add significantly to the existing literature on disclosure. Prior research examining the use and impact of disclosure has focused on public announcements. For example, Liu, Smith and Syed (1990) find volume and return impacts from security recommendations in *The Wall Street Journal*. Fishman (2006) and Zuckerman (2009) find evidence voluntary disclosures through the media are used by other investors. Bartov, Radhakrishnan and Krinsky (2000) and Dey and Adhkrishna (2007) find significant abnormal volume and returns around earnings announcements and Sanders and Zdanowicz (1992) study abnormal volume and returns around merger announcements. Unlike these studies, we find 13(f) filings made to EDGAR, which are not announced by their managers in any major media outlets and are mandatory, are also used by market participants.

In addition, our results add to the literature on the usefulness of portfolio disclosure to investors. For short-term investors, Chen, Hanson, Hong and Stein (2008) find indirect evidence hedge fund managers profit off forced selling by mutual fund managers, which is possible due to their portfolio disclosure. Cai (2003) finds traders potentially front-ran LTCM's positions during its crisis period. Our results find that instead of investors receiving all of the benefits of mandatory portfolio disclosure<sup>10</sup>,

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<sup>9</sup> An alternative explanation for excess volume of disclosed securities prior to their announcement is the information was leaked, either intentionally or unintentionally, to select individuals. These persons trade on the holdings, knowing copy-cat traders will increase buy pressure, rather than the hedge fund management companies themselves trading their own positions.

<sup>10</sup> Although we find no evidence long-term investors benefit from disclosure, some abnormal profits for short-term traders are possible during the period immediately after disclosure. However, these profits are

hedge funds themselves profit as well, both through price pressure on their portfolios as well as through the possibility of front-running their own positions. Unlike Chen *et al.* (2008), our evidence of disclosure use by investors is direct in that we observe volume and price effects immediately around disclosures. Our results are also related to Brav *et al.* (2008) who find evidence of abnormal returns and trading prior to the public disclosure of activist hedge fund positions via Schedule 13D.

Finally, previous results by both Baker, Litov, Wachter and Wurgler (2005) and Wermers, Yao and Zhao (2007) suggest trading and disclosures by mutual fund managers provide useful information to long-term investors. Brunnermeier and Negal (2003) also find evidence hedge fund managers were able to time the technology bubble. However, Griffin and Xu (2009) question the skillfulness of hedge fund managers. Our results are consistent with this in that we find no evidence that buy and hold investors gain any particular advantage from changes in position that are disclosed. This result is in contrast with results by Verbeek and Wang (2009) who find that copy-cat traders can indeed create portfolios that outperform the mutual funds they mimic. Perhaps this is due to the fact that most hedge fund managers are not buy and hold investors, and also that few hedge funds limit their holdings to long only positions in equities disclosed in the 13(f) quarterly reports.

The remainder of the paper is organized as follows. In the next section we describe the data. In section III we report results considering the level and type of trading around filing dates. Section IV presents our results abnormal returns around filing dates.

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due to short-term price pressure rather than the release of valuable private information about the securities held.

Section V explores the possibility of hedge fund front-running. Section VI investigates the profitability of investing in securities disclosed by hedge fund management companies while Section VI concludes.

## **II. Data**

This study utilizes data from a variety of sources. Our first data source is the Tremont Advisory Shareholders Services (TASS) database. Each quarter, we use TASS data to generate a list of management companies that could possibly file a 13(f) filing with the Securities and Exchange Commission (SEC). We include any management or investment advisor company listed in the TASS Company details file that has a fund with an inception date prior to the beginning of the quarter and performance data through the end of the quarter. While TASS does not contain all hedge funds or hedge fund management companies, these management companies are more likely to generate investor interest around their filing dates since they are easily identifiable. There is also no reason to believe funds not listed in the TASS database are more likely to draw investor attention.

The second source of data is from the EDGAR website hosted by SEC. We download the quarterly filing index documents for each quarter from the second quarter of 1999, when widespread electronic filings began, to the fourth quarter of 2008. The quarter index files contain a list of all filings added to EDGAR that quarter and include the company name, the filing type, the date the filing was added to EDGAR, and the specific link for that filing. We use these files' lists of 13(f) filings to match with our lists of potential quarterly matches generated through TASS. We rely primarily on company



names to match management companies. We perform this procedure for each quarter through the end of 2008 to generate a list of hedge fund related 13(f) filings. We combine these quarterly files to generate our final match list. To ensure consistency of matches across all 39 quarters in our study, we make certain matches between a TASS management company and 13(f) management company are consistent across time.

Our third source of data is the Thomson Financial Holdings Database (TFHD). The TFHD database contains information mainly on the equity holdings of 13(f) filings.<sup>11</sup> The TFHD database contains information identifying the holding in question (ticker symbol and CUSIP) as well as provides the number of shares held. Using our list of hedge fund 13(f) filings, we match management companies' names to the management companies list in TFHD and acquire their MGRNO number. We then download the holdings for those particular MGRNO companies. Each quarter we match our 13(f) match list with filing dates within that quarter with TFHD data and keep matched holdings that have a report date within the 75 days prior to the SEC's filing date. For example in the third quarter of 1999, Soros Fund Management's filing date was 8/16/1999. This date was linked to the holdings with a report date of 6/30/1999, which was 47 calendar days prior to the filing date.<sup>12</sup>

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<sup>11</sup> 13(f) filings contain more information than is included in the TFHD. The SEC updates the list of Section 13(f) securities quarterly. According to the SEC's FAQ, "Generally, the list includes exchange-traded (*e.g.*, NYSE, AMEX) or NASDAQ-quoted stocks, equity options and warrants, shares of closed-end investment companies, and certain convertible debt securities." See <http://www.sec.gov/divisions/investment/13ffaq.htm>. Aragon and Martin (2010) study options holdings contain on 13(f) while Agarwal, Jiang, Tang and Yang (2010) examine holdings added to 13(f) via a latter amended filing. This particular study is focused on the equity market reaction to equity positions filed and therefore the TFHD data are sufficient for its purposes.

<sup>12</sup> By law, 13(f) filings must be available within 45 days of the end of the prior quarter. However, the cutoff date can be delayed by a short period of time because of holidays or weekends. We use a 75 day cutoff to allow for those companies that were late with their filings. Our use of a 75 day delay does not allow for the possibility of linking to the prior quarter. See the SEC's FAQ linked previously.

In Table 1, we present summary statistics concerning our final sample. Panel A presents information on the average number of managers available each quarter each year. It also presents the average and median number of equity holdings available in the TFHD for each manager. Finally, Panel A presents the average quarterly turnover of the 13(f) holdings, which is calculated by summing the total dollar amount of buy and sells as a percentage of the portfolio value each quarter. Panel B presents information concerning the delay at which 13(f) filings are available to EDGAR as a function of the number of calendar days from the end of the previous quarter.

<Insert Table 1 about here>

Over the course of our sample, we find the number of hedge fund management companies and investment advisors with 13(f) filings expands greatly. In 1999, just 102 matches are identified on average each quarter as compared to 263 managers per quarter in 2006. This growth can be explained by both the growth in the number of hedge funds as well as the growth in the assets of the hedge fund industry. Only management companies with more than \$100mm of ‘13(f) securities’ are required to file a 13(f) filings with the SEC. We do observe a drop off in the number of matches in 2008 due to the global financial crisis. In fact, the last quarter of 2008 only has 196 matches compared to 249 in the first quarter of the same year.<sup>13</sup> Over the course of our entire sample, we have

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<sup>13</sup> Aragon and Martin (2010) use hedge fund 13F filings to examine the use of derivatives. As a comparison of the two sample sizes, they report 465 filings for 2006, or about 115 filings per quarter, whereas we average 263 filings per quarter. Similar differences are found over most time periods. Thus, we have a considerably larger sample. There are two primary reasons for the difference in sample size. Firstly, they limit their sample to a set of randomly selected managers due to data collection difficulties. Secondly, they select managers from lists of hedge funds at fixed points in time rather than a rolling list of possible managers that represents the sample on which we base our results.

at least one quarter of holdings information for 479 management companies.<sup>14</sup> Interestingly, we find the average and median number of holdings decreases over this time period. The median number of holdings is reduced from 124 in 1999 to only 72 in 2008. Average turnover for these filings is also surprisingly low at 33% per quarter. One factor that could limit the effectiveness of copy-cat strategies is a high turnover level.<sup>15</sup>

In Panel B, we find that the average delay between the end of the quarter and the date filings are able on EDGAR averages 40 days, which is close to the maximum delay of approximately 45 days. These results are consistent with management companies protecting their private information. Given companies trade over time, waiting until the end of their deadlines to file causes the information contained in the filings becomes less useful. The delay is fairly steady over our sample with some management companies filing quickly and some management companies filing after the deadline. The intraquartile range of delays is also fairly narrow at six days. In Figure 1, we display a histogram of the delays.

<Insert Figure 1 about here>

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<sup>14</sup> While this is a large number of companies, it only represents a small portion of the management companies available in TASS. A total of 3,362 management companies and investment advisors are listed in TASS. Thus, our sample represents approximately 14% of these companies. Our sample is limited by the \$100mm requirement for a 13(f) filing as well as our focus on equity positions.

<sup>15</sup> The issue of 13(f) holdings turnover arose in the case of Galleon. After the allegations of insider-trading surfaced on October 16<sup>th</sup>, 2009, investors filed redemption orders of \$1.3 billion. Some speculated traders would attempt to front-run Galleon sales by shorting securities disclosed in their last (June) 13(f) filing. A senior Galleon trader implied any trading would do little good as “‘If people are shooting at positions’ held by Galleon as of June 30, ‘they’re shooting at the wrong targets mostly,’ the Galleon trader said. ‘They have no clue.’” Galleon’s average portfolio turnover in our sample is 60.46% per quarter, which was in the top 15 percentile of our data. Given approximately three and a half months had passed, 70% of the June holdings would have been traded at that point.

The histogram leads to the same impression as the data in Panel B. While it may appear only a few days over the course of our 9.75 year study period have filings disclosures, a total of 1,003 unique days have at least one 13(f) form filing or 29% of all days over that period.

In addition to waiting until near the end of the filing period to file, management companies can also use the element of surprise to attempt to thwart any copy-cat traders by altering the delay at which they file. Changing the filing date could cause the need for additional monitoring by market participants interested in the holdings. It may also disrupt the timing of any trading strategies if they use other information or sources in conjunction with the 13(f) filings. To investigate whether management companies are altering their filing days, we compute the absolute value of the change in delay from one quarter to the next. We then average the change in delay for each management company over the course of our sample. We report the histogram of these average management company delay changes in Figure 2.

<Insert Figure 2 about here>

While a number of management companies have very small deviations in their filing delay, we see there are well over 100 management companies that, on average, have delays changing by more than 8 calendar days per quarter. Given that management companies only have 45 day window in which to file their holdings, these are large differences.

### III. Trading around Filing Dates

While we cannot directly observe market participants using 13(f) filings, one way in which the use of 13(f) filings may manifest itself is through abnormal changes in trading volume around the filing dates<sup>16</sup>. Securities disclosed by hedge fund may be subject to additional volume as market participants increase or decrease the size of their positions in response to the release of private information. Alternatively, one set of traders – i.e. buyers or sells – may leave the market while another set increases volume, leading to a shift in the market but exhibiting little change in the volume.

To examine this possibility, each quarter we identify securities that experienced a change in position relative to the prior quarter's holdings. For these securities, we estimate their excess volume for the ten days prior to the filings date, the filings date and ten days after the filings date. We measure excess volume by regressing volume of trading on five prior lagged volumes of trading and five trading day dummies along with a measure of the excess market value of stocks traded measured similarly. We regress our excess volume measurements against an intercept, *Large Hedge Fund*, which is one if the manager is in the top 5% of all hedge fund size, *Buy Dummy*, which is one if the security had an increase in its position size, and finally *Number of funds filing*, which is the number of managers that disclosed that position that filing date.

We run two models. In the first model, we consider each day separately. In the second model, we regress the excess volume of every security for the cumulative

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<sup>16</sup> We calculate abnormal trading volume in two steps. We first define a measure of abnormal market volume using the residual of a fifth order autoregression of the daily change in log market volume incorporating day of the week dummies. We then define abnormal trading volume as the residual of a fifth order autoregression of the daily change in log security volume including day of the week dummies and the measure of abnormal market volume for that day. This definition is similar to that proposed in Sanders and Zdanowicz (1992) which differed in that this earlier work only considered a first order autoregression on the daily change in log volume, and did not consider abnormal market volume as an explanatory variable.

intervals. Estimation is by GLS using the standard error of prediction from the model used to estimate excess volume. Results on excess volume are reported in Table II. Panel A contains results on cumulative excess volume whereas Panel B reports results for individual days.

<Insert Table II about here>

Excess volume results reveal two interesting phenomenon around filings dates. While there is no significant abnormal volume immediately following the filings date, the *Intercept*, which represents excess trading volume, is significantly different during that period as compared to other periods around the filings date. We find significant spikes in the five days leading up to the filing date as well as significant spikes five days after the filings date. Thus, it appears there is excess trading on these securities that dissipates just prior to the announcement. In Figure 3, we plot both the individual day and cumulative intercept terms over the twenty-one day period. Visually, the lack of abnormal volume at and immediately after the filings date is distinct from other periods.<sup>17</sup>

<Insert Figure 3 about here>

One limitation of our excess volume measure is we are unable to examine whether the changes in volume are due to a drop in both buyers and sellers or due to the loss of one particular type of market participant. However, the *Buy-Dummy* should be a

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<sup>17</sup> As noted later in the manuscript, these results are similar to the volume patterns seen with 13D filings. (Brav *et al.* (2008))

weak proxy. Ex-ante, traders would be more likely to take positions in those securities that hedge fund managers are expanding rather than contracting. Of course, hedge fund managers are most likely to expand positions they feel they have the largest or most valuable asymmetric information. The *Buy-Dummy* is not significant over the prior to filings date period, nor the period immediately after the filings date. However, after day five, we see a significant divergence between the excess volume of expanded positions and contracted positions. Thus, it appears that any buying pressure on the securities listed in the 13(f) filings is substantially reduced after five days from the filing date.

<Insert Figure 4 about here>

Overall, the results suggest the drop in excess volume around the filing date may be due to sellers leaving the marketplace. The level of abnormal trading is consistently lower for securities held by a large manager or large number of managers. Market participants may assume securities held by a large number of managers most likely have little private information. Positions held by large managers are most likely also of less investment value as these managers would be more apt to hold a large number of securities for exposure purposes and therefore those securities have lower levels of private information.

#### **IV. Abnormal Returns around Filing Dates**

In the previous section, we found evidence of abnormal volume around hedge fund portfolio disclosures. While these volume related results indicate there is an

abnormal level of interest in the disclosed securities, our volume related results are not signed. Thus, it is unclear whether hedge fund 13(f) disclosures have any significant price impacts. In this section, we evaluate the performance of disclosed securities around filings dates.

For each filing date in our sample, we create a list of all securities disclosed. We calculate the excess return of these securities above the market return each day ten days before to ten days after the filing date. Finally, we calculate the average excess return across all of our filing dates and then finally calculate the average excess return for each day around the filing date. In Table III, we report averages results for the twenty-one days around our filing date, along with *t*-values. We report averages for all securities disclosed together as well as expanded positions from the prior quarter (*Buys*) and all other positions from the prior quarter (*Sells*).

<Insert Table III about here>

We find significant evidence of a positive jump in excess returns on and shortly after the filing date. Except for day minus ten, there are no significant results across the twenty-one days other than the day filings are announced and the subsequent two days. As before, there is also a significant drop off in excess returns approximately five days after the filings date. The results are consistent across both *Buys* and *Sells* indicating investors appear to target all of the holdings disclosed rather than just the securities with expanded positions, although the returns on expanded positions are slightly higher. If a person was to copy a 13(f) filing, we should expect this to be the case. In Figure 5, we



graph the excess returns over the entire period, with the overall holdings excess returns in Figure 5a and the *Buys* and *Sells* coefficients separately in Figure 5b.

<Insert Figures 5a and 5b about here>

An inspection of the Figure 5a again reveals a pattern similar to the individual day coefficients for the *Buy Dummy* in the excess volume results display in Figure 4. Indeed, we find the correlation between the excess returns of *Buys* and the excess volume on *Buy Securities* (*Buy Dummy* coefficients in Table II) is 0.46 with a *p*-value of 0.04. Thus, the excess volume of expanded securities is indeed significantly related to increased buy pressure. These results are again supportive of market participants using the information disclosed on 13(f) filings.

Overall, these results support the hypothesis that traders and investors use the information disclosed on 13(f) filings.

## **V. Potential for Hedge Fund Front-running**

While concern about portfolio disclosure typically focuses on the potential for other traders to front-run hedge fund positions disclosed in the 13(f) filing, our excess return results raise the interesting possibility that a hedge fund might itself find some advantage trading in the days leading up to the public 13(f) disclosure in the expectation that changes in positions revealed in its own filing might have market impact.

Interestingly, in our prior analysis on excess volume, we found significant excess volume prior to the disclosure dates. Some benign explanations for such trading exist.

Traders may try to profit from the disclosure information by purchasing the prior 13(f) filings' securities in anticipation of the new filing. However, in unreported results, we find no evidence of a difference between the excess returns of newly reported securities and 'stale' securities. Another explanation is companies trying to finish any accumulation of securities prior to the release of the 13(f) information. Since the release does cause positive excess returns, hedge funds would want to complete any purchases before the release. On the other hand, hedge funds could potentially use their private information for profit. Knowing what securities are going to be disclosed, companies could purchase those securities before the filing date and then sell the securities after the buying pressure caused by their release. Additionally, hedge funds could either intentionally or unintentionally leak the securities that are about to be disclosed to a small group of traders. These traders could then use this information to front-run the hedge funds' disclosures.

To provide further evaluation of trading around disclosure dates, we use a large hedge fund company (LHFC) as a case study. We use this LHFC is for several reasons. Firstly, this company is well known in the industry and to the general public, which makes the use of its disclosed positions more likely. Secondly, LHFC has holdings available during our entire sample period. Thirdly, the characteristics of LHFC filings are advantageous for any copy-cat trading. The average turnover – 41% – is only slightly above the average value. LHFC is also one of the most consistent filers in our sample, changing its filing date only 0.26 days per quarter on average.

To evaluate LFHC filings, we employ the use of Trade and Quote (TAQ) data. TAQ provides information on intraday quotes and trades for equity securities. Unlike

daily volume data, TAQ data allows for us to sign trades as buy or sell initiated trades using the Lee and Ready (1991) procedure.<sup>18</sup> For ten days before and after each LFHC filing, using trade signs generated by the Lee and Ready procedure, we create a ratio of directional signed volume, where a buy is 1 and a sell is -1, and unsigned volume for each security disclosed is labeled zero. If the ratio is positive, the security experienced more buy-initiated volume than sell-initiated volume. If the ratio is negative, the opposite occurred. Each day, we calculate an equally-weighted average of all securities and then create an excess buy-initiated ratio by demeaning securities average that day by the equally weighted average since the amount of buy pressure on any given day is likely related to overall market conditions.

We aggregate excess values for each day around the filing date for our thirty-eight quarters. We then regress these values against a *Buy-side Dummy* that is one if the LFHC increased their position from the prior quarter's holdings and zero otherwise. If investors are using this company's positions to make purchases, we should then see more buy-initiated volume on securities with expanded positions. As with the excess volume results, in the first model we consider each day separately. In the second model, we regress the excess ratio values of every security for the cumulative intervals. Because securities appear may appear multiple times, we cluster standard errors by security. Results on signed volume are reported in Table IV. Panel A contains results on cumulative excess signed volume whereas Panel B reports results for individual days.

<Insert Table IV about here>

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<sup>18</sup> We thank Yuxing Yan of WRDS for making code for the Lee and Ready (1991) procedure available on the WRDS system.

Overall, the results strongly support the hypothesis of significantly higher buy-initiated trades on expanded LHFC holdings, especially those where a position has been expanded from the prior quarter.<sup>19</sup> We find significantly higher buy-initiated trades the five days prior to filings date. This continues through the four days after the filings date and then tapers off rapidly. Indeed, there is a marked decrease in buy pressure beginning in day six. We plot the individual day coefficients from Panel A in Figure 6, which displays the clear demarcation between days five and six.

<Insert Figure 6 about here>

While these results are only based on one of our management companies holdings, there is a striking resemblance between the shape of Figure 6, which displays additional buy-initiated trades for our expanded LHFC positions and Figure 4, which displays excess volume for all companies' expanded positions. The peaks and valleys over the entire period match fairly closely with a marked downturn around day 5. Indeed, the correlation between the individual day coefficients on the excess volume *Buy-Dummy* and the buyer-initiated *Buy-Side Dummy* is 0.48, which is significant at the 5% level. The correlation between these two results suggests that rather than our excess volume results detecting a drop in both buyers and sellers around filing dates, we are observing a decline in the amount of selling. Overall, the LHFC results support the hypothesis of market

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<sup>19</sup> In unreported results, we find the correlation between the excess buy-signed volume and the difference between buy and sell excess returns for LHFC securities is 0.61.

participants using disclosed holdings data.<sup>20</sup> These results also confirm the possibility of front-running of hedge fund companies' disclosures.

One possible trade for knowledgeable traders, which could either be traders who have obtained the disclosure information prior to filing or the hedge funds themselves, to profit is to purchase hedge funds' expanded positions while shorting hedge funds' contracted positions prior to disclosure events. Since there appears to be more buy pressure on expanded positions in our prior excess return returns, this arbitrage portfolio would potentially earn positive, excess returns. For knowledge traders to profit, they would need to accumulate positions prior to the disclosure date. Hedge fund companies that are performing this trade or whose information traders can obtain prior to the disclosure should therefore have abnormally high volume on their disclosed positions prior to the disclosure event.

To identify these companies, we calculate the excess volume from five days prior to each hedge fund management company's disclosures to five days after their disclosures. Using this screen, we identify twenty-five hedge fund companies with significant excess volume. We then select these funds and compute the return from a portfolio that buys the expanded positions and shorts the contracted positions five days prior to the disclosure events and liquidates the portfolio five days after the disclosure. While our volume results do not sign the direction of the increased volume, any evidence of positive excess returns support the conclusion of increased buy pressure on expanded positions rather than random volume changes. As a baseline comparison, we compute the

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<sup>20</sup> To ensure our results are not driven by the second half of 2007 to 2008 global financial crisis, we reran our results with disclosed filings during that period removed. The results were both economically and statistically equivalent.

returns to the same investment strategy, except we use all hedge fund companies' disclosures. We report results in Table V.

<Insert Table V about here>

Overall, we find significant profitability for the identified filers. Over a 11 day period, the long-short portfolio would yield a 0.42% profit. With 50% margin, this would be 0.84%, which is an annualized return of 20% per year. Funds could execute this strategy 4 time per year, which would add 3.36% in excess returns. Clearly, prior to filing, the information on the 13(f) filings can be viewed as 'insider' information that is profitable. At the same time, our entire sample of disclosures earns no significant profits. These results suggested the excess volume we observe for these hedge fund companies could be related to strategic trading.

In Figure 7, we plot the excess returns generated from our long-short portfolios for both the overall sample (top) and selected sample (bottom). The middle line is the point estimate of the portfolio's return while the top and bottom lines represent the 95% confidence interval.

<Insert Figure 7 about here>

Our findings suggest hedge funds or someone close to hedge funds with knowledge of future 13F disclosures are front-running the actual disclosures on EDGAR.

Interestingly, our results are very similar to those found by Brav *et al.* (2008). When examining volume and performance around the filings of Schedule 13Ds for activist positions taken by hedge funds, they find large excess volume just prior to the disclosure which then tapers off almost immediately following the public disclosure (Figure 1 in their paper). They also find a rise in excess returns prior to the public disclosure. Both are similar to our findings with 13F filings. Likewise, the authors also conclude that a potential explanation for this empirical fact is “... ‘tipping,’ where the filing hedge fund reveals its intention to a small number of investors before the public filing in exchange for reciprocation of other favors.” (Brav *et al.* (2008), page 1756)

## **VI. Investment Value of Disclosed Securities**

One of the primary draws of investors to the hedge fund industry is the ability of managers to generate positive abnormal returns. While mutual funds, on average, have been found to have no and even negative alpha, hedge fund managers on average have generated positive alpha. This alpha is after the average 1.5% management fee and 20% incentive fee hedge fund managers charge. Thus, the 13(f) filings provide investors the opportunity to obtain lists of securities held by hedge funds at little or no cost. They also allow for potential hedge fund investors to copy-cat their strategies and avoid paying fees. Our prior results suggest 13(f) filings do attract significant attention from investors.

However, 13(f) filings omit many pieces of hedge fund portfolios. Firstly, they only contain information on long positions. Since shorting securities is seen as a more sophisticated activity, these unlisted positions may be a major driver of those returns.<sup>21</sup>

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<sup>21</sup> For example, Diether, Lee and Werner (2009) find short-sells generate position abnormal returns.

These filings also do not capture intra-quarter trading by hedge fund managers, which also may be a significant driver of their profitability.<sup>22</sup> In addition, little evidence has been found that the relative performance of hedge funds is persistence across time.<sup>23</sup> Finally, prior literature has found the performance of hedge fund is negatively related to size.<sup>24</sup> Management companies that must file Form 13(f) have more than \$100mm in 13(f) securities. Given the median size of U.S. Dollar denominated hedge fund in June 2009 is \$35mm, many of the hedge funds represented by 13(f) filings are likely large. Thus, it is unclear whether the positions disclosed to investors have any investment value.

In this section, we evaluate the excess return performance of holdings disclosed by hedge funds.<sup>25</sup> We investigate the profitability of disclosed holdings beginning with their effective dates at the end of each quarter as well as their profitability from their filing dates. This is done for two reasons. Firstly, by using the effective date, we are providing these holdings the best opportunity to outperform. The delay between the effective and filing dates may allow market prices to sufficiently adjust, reducing any outperformance. Secondly, filing dates represent the returns copy-cat investors could obtain and are therefore relevant. Also, any differences between the performance of these securities from their effective and filing dates may indicate the 13(f) information is leaking to the public prior to its inclusion on EDGAR.<sup>26</sup>

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<sup>22</sup> Puckett and Yan (2009) examine intra-quarter trading of institutional traders. They find intra-quarter trades are profitable and persistent.

<sup>23</sup> Both Baquero, Horst, and Verbeek (2005) and Agarwal and Naik (2000) find persistence at the quarterly interval. However, results for longer-term persistence are mixed.

<sup>24</sup> Brown, Fraser and Liang (2009) find that hedge fund have diseconomies to scale.

<sup>25</sup> Our analyses of the investment value of disclosures, similar to our prior analyses on abnormal volume and performance, are only on the equity positions disclosed in Form 13F. Thomson only collects information on these entries while the actual 13F documents contain information on other securities such as options. (See Aragon and Martin (2010)).

<sup>26</sup> Given we find significant abnormal returns around EDGAR filing dates, it seems likely the EDGAR filing date is when the information becomes public.



Each quarter, we use the disclosed holdings of each management company to create a portfolio. Within this portfolio, we calculate the portfolio weights using the dollar values of the individual securities and the total portfolio value using only the securities disclosed in TFHD with entries in the CRSP Stock database. For each portfolio, we then calculate the excess return by multiplying the weights against security excess returns after controlling for momentum, size and book-to-market.<sup>27</sup> We then calculate the average portfolio excess return based on one month and three month returns. Results are reported in Table VI with results for one month and three month excess returns reported in Panels A and B, respectively.

<Insert Table VI about here>

Over the entire sample period, we find on average no significant evidence of outperformance by hedge fund filings on any of our time scales. We do find significant results during individual event periods; however these change direction often and do not indicate consistent outperformance by hedge fund management companies.

Although we do not find any consistent outperformance, it may be that some hedge companies offer persistently high (or low) performance. In that case, although the overall average portfolio does not outperform its benchmarks, copy-cat investors could systematically load on those management companies that consistently outperform while potentially shorting those companies that consistently underperform. In addition to

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<sup>27</sup> This type of technique was utilized in Daniel, Grinblatt, Titman, and Wermers (1997) and Wermers (2004). We thank Russ Wermers for making both the security assignment information and benchmark return information available on his website. The DGTW benchmarks are available via <http://www.smith.umd.edu/faculty/rwermers/ftpsite/Dgtw/coverpage.htm>. We compute daily excess returns needed for the filings date results.

relative outperformance, some hedge fund could offer persistent positive abnormal performance, even without demonstrating relative performance persistent. We therefore examine persistence in both these dimensions.

For relative persistence, each quarter we rank portfolios' one month excess return performance. If the portfolio's excess return is above the median, we label that fund a *High* filer and if it is below the median we label that fund a *Low* filer. For filers with two consecutive quarters of filings, we then form a 2x2 contingency table where we split filers based on the prior quarter's split values and the current quarter's split values. If there is significant persistence across quarters, we should detect a significant departure from the same percentage of values in each cell. For our absolute persistence analysis, we utilize a similar methodology, except we divide funds by whether or not their one month excess portfolio return is above zero. We present results for the entire 1999 to 2008 sample period in Table VII. Relative performance persistence results are in Panel A while absolute performance persistence results are in Panel B.

<Insert Table VII about here>

Overall, we find little evidence of relative or absolute performance persistence. While we do find relatively few significant individual yearly results, those results are inconsistent in their sign. Thus, even from the effective date, hedge fund 13(f) filings appear to offer long-term investors little value.

We then compute the same performance measures, except we examine returns after the filing date. Table VIII reports results on average excess performance while Table IX reports results on persistence.

<Insert Tables VIII and IX about here>

As with the effective date results, we find little evidence 13(f) filings provide long-term investors with valuable information. Finally, we examine whether the excess performance of the filers we identified earlier with excess volume prior to filing also offer no value to investors. We run the excess performance tests using only this subsample and report results in Table X.

<Insert Table X about here>

Consistent with our overall sample, these filers' portfolios do not earn consistent positive returns. Thus, it appears these hedge fund companies could profit from others herding into their positions when they are disclosed while not providing any long-term benefit.

Our results on the usefulness of hedge fund disclosures are markedly different from Verbeek and Wang (2010).<sup>28</sup> Hedge fund disclosures, however, differ from mutual fund disclosures, significantly impacting their effectiveness. Firstly, 13(f) filings are at the company level, not at the fund level. Investors therefore cannot simply replicate one

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<sup>28</sup> In unreported results, we compare the returns of our hedge fund management companies reported in TASS against raw returns using 13(f) filings for the three months after the filing date. Even without accounting for transactions costs, hedge fund's actual returns are approximately 4% higher per annum than copy-cat returns from 13(f) filings.

hedge fund.<sup>29</sup> Secondly, hedge funds can contain a large number of positions that would not be disclosed on 13(f) filings, such as short positions. Thus, unlike equity mutual funds whose disclosures contain information on essentially their entire portfolios, 13(f) filings are incomplete. Finally, hedge funds have significantly higher turnover than mutual funds. Our sample of 13(f) filings has an average turnover of 160% per year, which is almost twice that of equity mutual funds. Thus, hedge funds' quarterly disclosures contain less information about future returns. Overall, these properties significantly impact the ability of investors to use 13(f) filings to copy-cat hedge fund returns.

## **VI. Conclusion**

In this study, we use the filing events of hedge fund management companies' portfolio disclosures to investigate whether market participants use mandatory portfolio disclosures to make investment decisions. While prior literature has found using disclosed holdings could lead to abnormal profits, there has been no evidence that investors actually utilize filings information. In addition, other prior literature on disclosure has found it is largely ignored by market participants.

Overall, we find significant evidence of abnormal market conditions around filing disclosure dates. We find significant changes in excess volume on and immediately subsequent to filings dates, which we relate to higher levels of buyer-initiated trades on expanded 13(f) positions. We also show a large spike in excess returns of disclosed

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<sup>29</sup> This is an important issue. For example, Renaissance Technologies has multiple funds. While the Medallion fund is one of the best performing hedge funds, their newer funds have had significantly lower returns. Investors could not distinguish Medallion's holdings on a 13(f) filing. See <http://www.marketwatch.com/story/new-renaissance-ceos-consider-a-few-changes-wsj-2010-03-16>.

securities on and immediately after the filing date. These results are significantly correlated with the excess volume results, providing further evidence of increased buying pressure. At the same time, we find little evidence the information disclosed on 13(f) filings is worth significant value to long-term investors. We find no evidence of consistent outperformance and little evidence of performance persistence by hedge fund filers.

Finally, we find evidence that investors with the portfolio information prior to the filings date could profit off the information. We find a group of hedge fund companies whose disclosures have abnormal excess volume in the period prior to the filing date. This evidence is consistent with these funds trading on knowledge of the changes in positions they are about to report. Alternatively, their disclosure information could be leaked to a small group of traders who then execute these trades. Indeed, we find that such a strategy is profitable for these funds, although not for other funds in our sample. This by no means proves that these hedge funds' disclosures are being front run, but it is suggestive. On the other hand we find that these disclosures provide little benefit to long-term investors. In balance we conclude that mandatory disclosure of hedge fund portfolio positions do not hurt hedge funds and provide little long-term benefit to investors who seek to free ride on the information released in these disclosures.

## References

- Agarwal, Vikas, Wei Jiang, Yuehua Tang and Baozhong Yang, 2010, Do institutional investors have an ace up their sleeves? Evidence from confidential filings of portfolio holdings, working paper.
- Agarwal, Vikas, and Narayan Naik, 2000, Multi-Period performance persistence analysis of hedge funds, *Journal of Financial and Quantitative Analysis* 35, 327-342.
- Aragon, George O. and J. Spencer Martin, 2010, A unique view of hedge fund derivatives usage: Safeguard or speculation?, working paper.
- Baker, Malcolm, Lubomir Litov, Jessica Wachter and Jeffrey Wurgler, 2005, Can mutual fund managers pick stocks? Evidence from their trades prior to earnings announcements, Working paper.
- Baquero, Guillermo, Jenke Ter Horst, and Marno Verbeek, 2005. Survival, look-ahead bias and the persistence in hedge fund performance, *Journal of Financial and Quantitative Analysis* 40, 493-517.
- Bartov, Eli, Suresh Radhakrishnan and Itzhak Krinsky, 2000, Investor sophistication and patterns in stock returns after earnings announcements, *The Accounting Review* 75, 43-63.
- Brav, Alon, Wei Jiang, Frank Partnoy and Randall Thomas, 2008, Hedge fund activism, corporate governance, and firm performance, *Journal of Finance* 58(4), 1729-1776.
- Brown, Stephen J., William N. Goetzmann, Roger Ibbotson and Stephen Ross, Survivorship bias in performance studies, *Review of Financial Studies* 5(4), 553-580.
- Brown, Stephen J, William N. Goetzmann and Roger Ibbotson, 1999. Offshore hedge funds: survival and performance, 1989-95, *Journal of Business* 72, 91-117.
- Brown, Stephen J., William N. Goetzmann, Bing Liang, and Christopher Schwarz, 2008, Mandatory disclosure and operational risk: Evidence from hedge fund registration, *The Journal of Finance* 63, 2785-2815.
- Brown, Stephen J., William N. Goetzmann, Bing Liang, and Christopher Schwarz, 2009, Estimating operational risk for hedge funds: The  $\omega$ -score, *Financial Analysts Journal* 65, 43-53.
- Brown, Stephen J., William N. Goetzmann, Bing Liang, and Christopher Schwarz, 2009, Trust and delegation, working paper.

Brown, Stephen J., Thomas Fraser, and Bing Liang, 2008, Hedge fund due diligence: A source of alpha in a hedge fund portfolio strategy, *Journal of Investment Management* 6, 23-33.

Brunnermeier, Markus and Stefan Nagel, 2003, Hedge funds and the technology bubble, *Journal of Finance* 59, 2013-2040.

Cai, Fang, 2003, Was there front running during the LTCM crisis?, Working paper.

Chen, Joseph, Samuel Hanson, Harrison Hong and Jeremy Stein, 2008, Do hedge funds profit from mutual fund distress?, NBER Working Paper W13786.

Coval, Joshua and Erik Stafford, 2007, Asset fire sales (and purchases) in equity markets, *Journal of Financial Economics* 86, 479-512.

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

Dey, Malay and B. Adhkrishna, 2007, Who trades around earnings announcements? Evidence from Torq data, *Journal of Business Finance & Accounting* 34, 269-291.

Diether, Karl, Kuan-Hui Lee, and Ingrid Werner, 2008, Short-sale strategies and return predictability, *Review of Financial Studies* 22, 575-607.

Fishman, Tal, 2006, Follow the leader: Informative voluntary disclosure and exploitation, working paper.

Fung, William and David Hsieh, 1997, Empirical characteristics of dynamic trading strategies: The case of hedge funds, *Review of Financial Studies* 10, 275-302.

Griffin, John and Jin Xu, 2009, How smart are the smart guys? A unique view from hedge fund stock holdings, *Review of Financial Studies* 22, 2331-2370.

Lee, Charles and Mark Ready, 1991, Inferring trade direction from intraday data, *Journal of Finance* 46, 733-46.

Liu, Pu, Stanley Smith and Azmat Syed, 1990, Stock price reactions to *The Wall Street Journal's* securities recommendations, *Journal of Financial and Quantitative Analysis* 25, 399-410.

Puckett, Andy and Xuemin Sterling Yan, 2010, The interim trading skills of institutional investors, working paper.

Sanders, Ralph and John Zdanowicz, 1992, Target firm abnormal returns and trading volume around the initiation of change in control transactions, *The Journal of Financial and Quantitative Analysis* 27(1) 109-129.

Verbeek, Marno and Yu Wang, 2010, Better than the original? The relative success of copycat funds, *Journal of Financial Economics*, forthcoming.

Wermers, Russ, 2000, The potential effects of more frequent portfolio disclosure on mutual fund performance, *Perspective* 7, 1-12.

Wermers, Russ, 2004, Is money really 'smart'? New evidence on the relation between mutual fund flows, manager behavior, and performance persistence, working paper.

Wermers, Russ, Tony Yao and Jane Zhao, 2007, The investment value of mutual fund portfolio disclosure, working paper.

Zuckerman, Roy, 2009, Synchronized arbitrage and the value of public announcements, working paper.



**Table 1: Summary Statistics**

Each quarter we compile a list of all active management companies and advisors in the TASS database. This list is matched against the EGDAR filing index file for that same quarter. Matches are made by name. We then link the resulting matches to the Thomson 13F filings database to arrive at our final sample. In Panel A, we report the average number of managers in each quarter for each year as well as the average and median number of holdings and average holdings turnover. Average turnover is computed as the total sum of buy and sell transactions divided by the total asset amount. Panel B reports the average quarterly filing delay by year.

**Panel A: Summary Statistics**

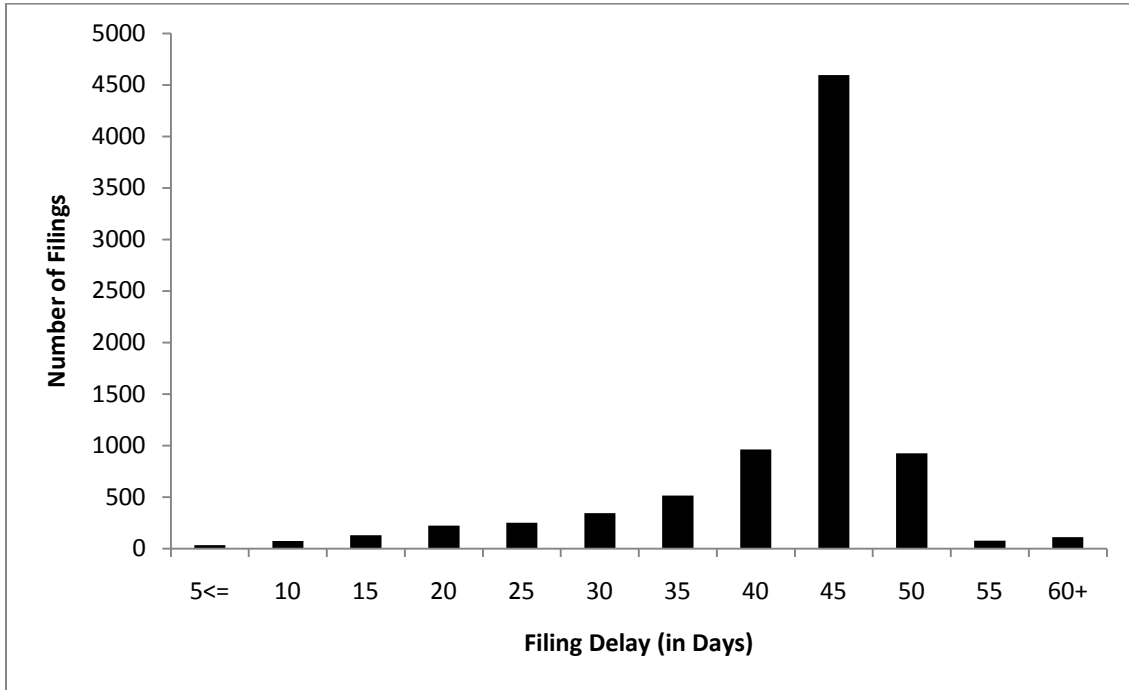
| Year    | Managers | Avg. Num Holdings | Median Num Holdings | Avg. Portfolio Turnover |
|---------|----------|-------------------|---------------------|-------------------------|
| 1999    | 102      | 288               | 124                 | 32.47%                  |
| 2000    | 125      | 332               | 114                 | 34.41%                  |
| 2001    | 152      | 366               | 105                 | 34.10%                  |
| 2002    | 166      | 361               | 103                 | 34.39%                  |
| 2003    | 191      | 320               | 99                  | 34.65%                  |
| 2004    | 226      | 291               | 94                  | 34.09%                  |
| 2005    | 244      | 238               | 87                  | 33.84%                  |
| 2006    | 263      | 238               | 75                  | 33.28%                  |
| 2007    | 258      | 239               | 80                  | 33.11%                  |
| 2008    | 226      | 268               | 72                  | 33.99%                  |
| Average | 195      | 294               | 95                  | 33.83%                  |

**Panel B: Information on Filing Delays**

| Year    | Mean  | Min | 25 Percentile | Median | 75 Percentile | Max |
|---------|-------|-----|---------------|--------|---------------|-----|
| 1999    | 40.99 | 5   | 40            | 43     | 46            | 72  |
| 2000    | 40.95 | 6   | 40            | 44     | 45            | 74  |
| 2001    | 39.91 | 2   | 38            | 44     | 45            | 71  |
| 2002    | 39.70 | 3   | 37            | 44     | 45            | 71  |
| 2003    | 40.36 | 2   | 39            | 44     | 45            | 67  |
| 2004    | 41.02 | 2   | 40            | 43     | 46            | 68  |
| 2005    | 39.84 | 1   | 39            | 43     | 45            | 74  |
| 2006    | 39.82 | 2   | 38            | 44     | 45            | 70  |
| 2007    | 40.32 | 3   | 39            | 44     | 45            | 74  |
| 2008    | 40.91 | 6   | 41            | 44     | 45            | 65  |
| Average | 40.38 | 3   | 39            | 44     | 45            | 71  |

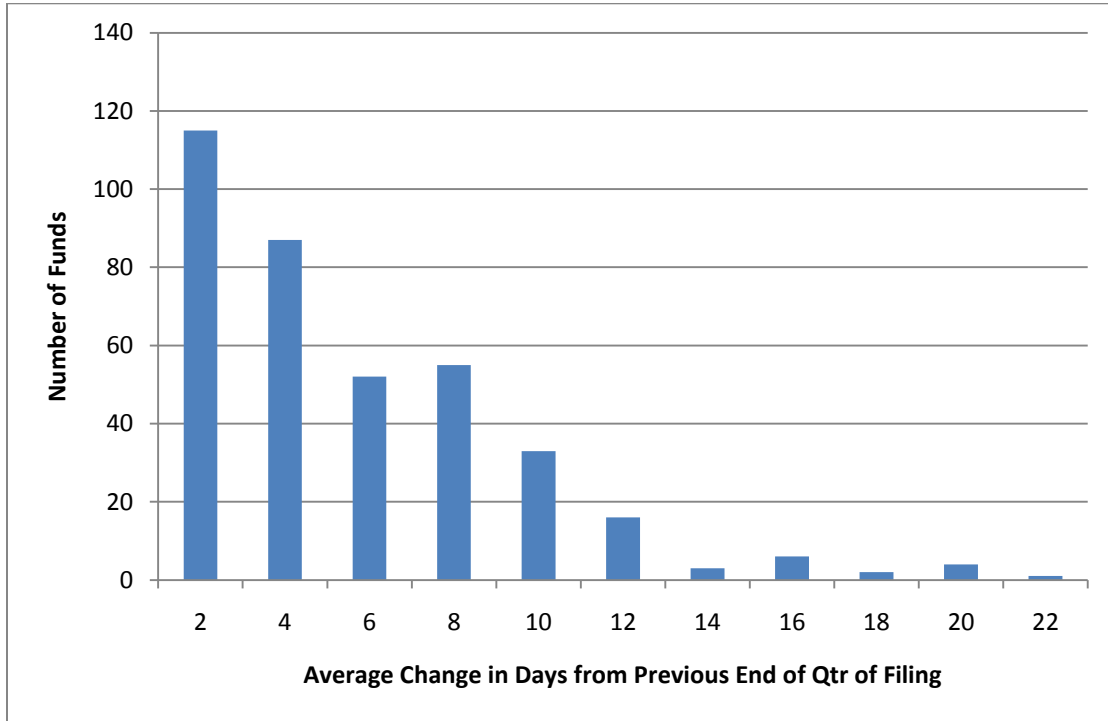
**Figure 1: Delay in 13(f) Filing with the SEC**

This figure displays the histogram of the difference between the end of the quarter and then number of calendar days until a 13(f) is filed with the SEC’s EDGAR website. The vertical axis is the number of funds while the horizontal axis is the number of days.



**Figure 2: Change in Filing Dates**

This figure displays the average change in the number of days that 13(f) filings are delayed on consecutive filings on EDGAR.



**Table II: Abnormal Trading Volume around 13(f) Filings**

This table reports excess volume of trades around 13F filing dates by hedge funds for each security the hedge fund reports a change in position relative to the prior quarterly holding. Excess volume is measured by regressing volume of trading on five prior lagged volumes of trading and five trading day dummies along with a measure of the excess market value of stocks traded measured similarly. In Panel A, we regress the excess volume of every security for the cumulative intervals given, on an intercept, a dummy indicating that the hedge fund is in the largest 5% of all hedge funds, a dummy indicating whether the 13F indicates an acquisition (buy dummy = 1) or reduction in position and finally the number of hedge funds filing on that date. Panel B considers each day separately. Estimation is by GLS using the standard error of prediction from the model used to estimate excess volume

| <b>Panel A: Cumulative Results</b> |                  |                |                 |                |                  |                |                   |                |
|------------------------------------|------------------|----------------|-----------------|----------------|------------------|----------------|-------------------|----------------|
| <b>Days before Filing</b>          | <b>Intercept</b> | <b>t-value</b> | <b>Large HF</b> | <b>t-value</b> | <b>Buy Dummy</b> | <b>t-value</b> | <b># of Funds</b> | <b>t-value</b> |
| -10                                | 0.0042           | 4.04**         | 0.0116          | 10.68**        | -0.0014          | -1.45          | 0.0004            | 2.49*          |
| -9                                 | 0.0046           | 3.10**         | 0.0238          | 15.56**        | -0.0023          | -1.74          | 0.0007            | 3.26**         |
| -8                                 | 0.0055           | 3.10**         | 0.0337          | 18.19**        | -0.0011          | -0.66          | 0.0005            | 1.70           |
| -7                                 | 0.0037           | 1.84           | 0.0489          | 23.16**        | -0.0020          | -1.10          | -0.0005           | -1.68          |
| -6                                 | 0.0065           | 2.93**         | 0.0590          | 25.57**        | -0.0039          | -1.95          | -0.0022           | -6.48**        |
| -5                                 | 0.0119           | 5.03**         | 0.0570          | 23.04**        | -0.0034          | -1.59          | -0.0030           | -8.17**        |
| -4                                 | 0.0152           | 6.14**         | 0.0561          | 21.80**        | -0.0035          | -1.60          | -0.0043           | -11.06**       |
| -3                                 | 0.0203           | 7.97**         | 0.0515          | 19.44**        | -0.0035          | -1.53          | -0.0054           | -13.56**       |
| -2                                 | 0.0241           | 9.27**         | 0.0497          | 18.35**        | -0.0026          | -1.10          | -0.0065           | -16.06**       |
| -1                                 | 0.0259           | 9.77**         | 0.0490          | 17.77**        | -0.0035          | -1.46          | -0.0078           | -18.81**       |
| 0                                  | 0.0276           | 10.26**        | 0.0478          | 17.08**        | -0.0033          | -1.38          | -0.0086           | -20.39**       |
| 1                                  | 0.0255           | 9.38**         | 0.0479          | 16.91**        | -0.0027          | -1.10          | -0.0088           | -20.66**       |
| 2                                  | 0.0254           | 9.25**         | 0.0453          | 15.83**        | -0.0026          | -1.05          | -0.0088           | -20.40**       |
| 3                                  | 0.0226           | 8.14**         | 0.0464          | 16.07**        | -0.0034          | -1.35          | -0.0085           | -19.65**       |
| 4                                  | 0.0226           | 8.09**         | 0.0476          | 16.35**        | -0.0048          | -1.92          | -0.0088           | -20.26**       |
| 5                                  | 0.0235           | 8.32**         | 0.0478          | 16.28**        | -0.0048          | -1.90          | -0.0085           | -19.29**       |
| 6                                  | 0.0251           | 8.82**         | 0.0509          | 17.20**        | -0.0051          | -1.99*         | -0.0091           | -20.50**       |
| 7                                  | 0.0316           | 11.02**        | 0.0478          | 16.03**        | -0.0062          | -2.44*         | -0.0100           | -22.30**       |
| 8                                  | 0.0398           | 13.79**        | 0.0412          | 13.71**        | -0.0072          | -2.80**        | -0.0108           | -23.90**       |
| 9                                  | 0.0420           | 14.46**        | 0.0446          | 14.75**        | -0.0098          | -3.76**        | -0.0103           | -22.65**       |
| 10                                 | 0.0442           | 15.12**        | 0.0505          | 16.58**        | -0.0141          | -5.39**        | -0.0098           | -21.46**       |

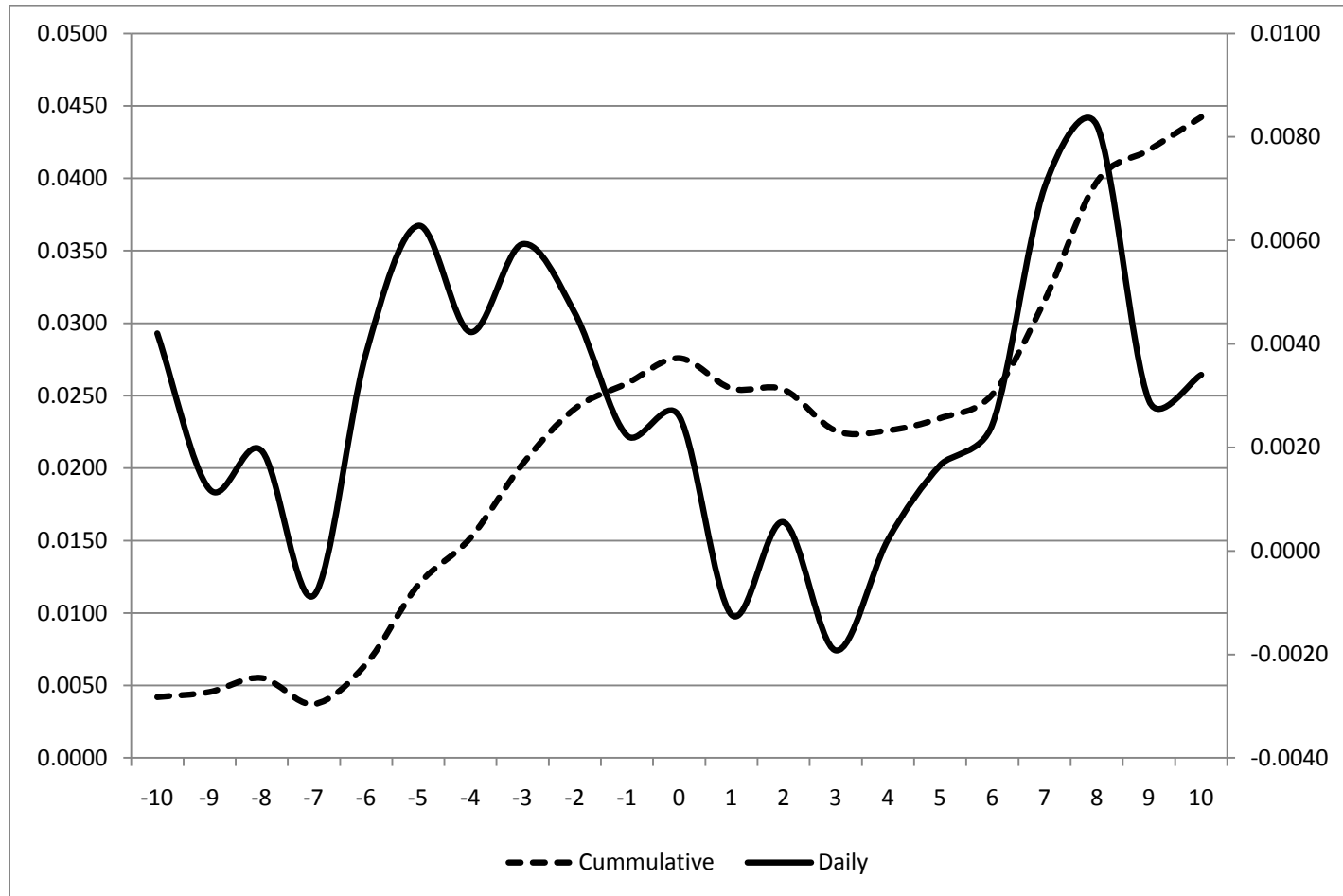
**Panel B: Individual Day Results**

| Days before Filing | Intercept | t-value | Large HF | t-value | Buy Dummy | t-value | # of Funds | t-value  |
|--------------------|-----------|---------|----------|---------|-----------|---------|------------|----------|
| -10                | 0.0042    | 4.04**  | 0.0116   | 10.68** | -0.0014   | -1.45   | 0.0004     | 2.49*    |
| -9                 | 0.0012    | 1.14    | 0.0124   | 11.40** | -0.0010   | -1.03   | 0.0003     | 1.96*    |
| -8                 | 0.0019    | 1.86    | 0.0101   | 9.26**  | 0.0012    | 1.27    | -0.0003    | -1.80    |
| -7                 | -0.0009   | -0.83   | 0.0153   | 14.13** | -0.0009   | -1.01   | -0.0010    | -6.32**  |
| -6                 | 0.0038    | 3.68**  | 0.0101   | 9.38**  | -0.0020   | -2.12*  | -0.0017    | -10.66** |
| -5                 | 0.0063    | 6.07**  | -0.0017  | -1.56   | 0.0002    | 0.25    | -0.0008    | -4.99**  |
| -4                 | 0.0042    | 4.07**  | -0.0009  | -0.81   | -0.0003   | -0.27   | -0.0012    | -7.64**  |
| -3                 | 0.0059    | 5.70**  | -0.0047  | -4.30** | 0.0001    | 0.08    | -0.0011    | -6.87**  |
| -2                 | 0.0046    | 4.44**  | -0.0020  | -1.84   | 0.0009    | 0.99    | -0.0011    | -6.95**  |
| -1                 | 0.0022    | 2.15*   | -0.0006  | -0.54   | -0.0009   | -0.95   | -0.0012    | -7.65**  |
| 0                  | 0.0026    | 2.51*   | -0.0012  | -1.08   | 0.0002    | 0.18    | -0.0010    | -5.87**  |
| 1                  | -0.0012   | -1.19   | -0.0002  | -0.15   | 0.0006    | 0.67    | -0.0003    | -1.94    |
| 2                  | 0.0006    | 0.54    | -0.0029  | -2.70** | 0.0004    | 0.44    | 0.0000     | -0.21    |
| 3                  | -0.0019   | -1.87   | 0.0007   | 0.65    | -0.0008   | -0.88   | 0.0002     | 1.45     |
| 4                  | 0.0002    | 0.21    | 0.0014   | 1.34    | -0.0014   | -1.49   | -0.0003    | -2.08*   |
| 5                  | 0.0017    | 1.62    | -0.0004  | -0.38   | 0.0001    | 0.12    | 0.0004     | 2.35*    |
| 6                  | 0.0024    | 2.38*   | 0.0032   | 2.98**  | -0.0005   | -0.50   | -0.0006    | -3.55**  |
| 7                  | 0.0070    | 6.87**  | -0.0033  | -3.07** | -0.0012   | -1.28   | -0.0008    | -4.87**  |
| 8                  | 0.0082    | 8.05**  | -0.0060  | -5.63** | -0.0010   | -1.09   | -0.0006    | -3.76**  |
| 9                  | 0.0029    | 2.84**  | 0.0039   | 3.67**  | -0.0030   | -3.22** | 0.0005     | 2.84**   |
| 10                 | 0.0034    | 3.33**  | 0.0055   | 5.18**  | -0.0045   | -4.93** | 0.0004     | 2.71**   |

\*\* Significant at the 1% level; \* Significant at the 5% level

**Figure 3: Abnormal Trading around Filings Dates**

This figure plots the cumulative and daily abnormal trading of holdings disclosed on 13F filings around their filing dates. The horizontal axis is the number of days relative to the filing date whereas the left and right vertical axes represent the cumulative and daily abnormal trading values, respectively.



**Figure 4: Abnormal Buy Securities Trading around Filings Dates**

This figure plots the cumulative and daily abnormal trading differences of buy and sell securities disclosed on 13F filings around their filing dates. The horizontal axis is the number of days relative to the filing date whereas the left and right vertical axes represent the cumulative and daily abnormal trading values, respectively.



**Table III: Performance of Holdings around Disclosure Date**

This table reports the performance of disclosed holdings around the filing date. Each day with disclosed holdings, we calculate the average excess returns over the market return of all holdings each day for ten days prior to and after that date. We then average the excess returns over those twenty-one days for all of the days with disclosed holdings. Panel A reports the average excess return for all disclosed holdings while Panel B reports results for holdings with expanded (“Buys”) positions and contracted (“Sells”) positions separately.

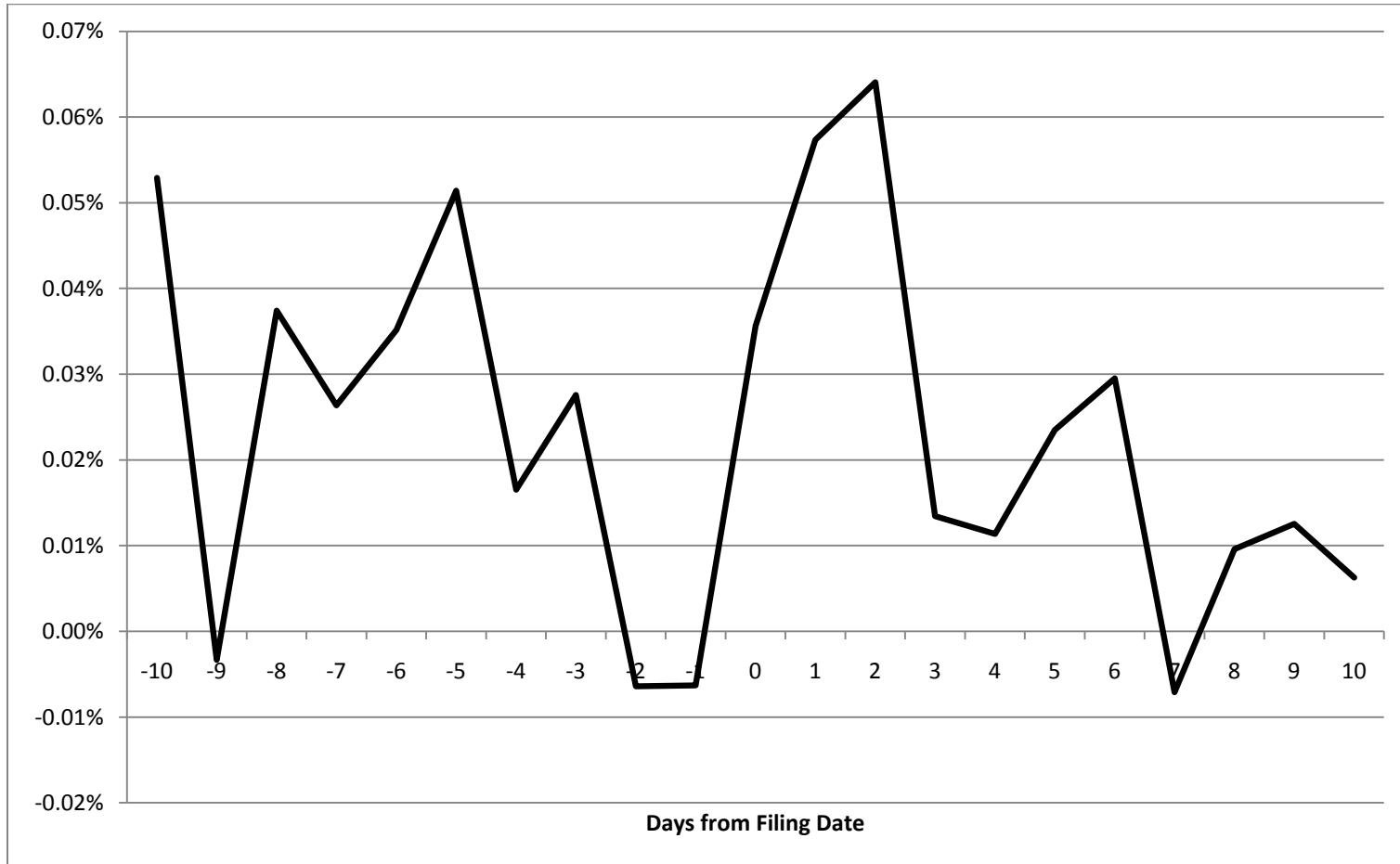
| <b>Days before Filing</b> | <b>All Holdings</b> | <b>t-value</b> | <b>Buys</b> | <b>t-value</b> | <b>Sells</b> | <b>t-value</b> |
|---------------------------|---------------------|----------------|-------------|----------------|--------------|----------------|
| -10                       | 0.05%               | 2.59**         | 0.06%       | 2.65**         | 0.03%        | 1.47           |
| -9                        | 0.00%               | -0.18          | 0.01%       | 0.46           | -0.01%       | -0.45          |
| -8                        | 0.04%               | 1.42           | 0.04%       | 1.82           | 0.01%        | 0.26           |
| -7                        | 0.03%               | 1.34           | 0.06%       | 2.55*          | 0.01%        | 0.66           |
| -6                        | 0.04%               | 1.84           | 0.01%       | 0.52           | 0.03%        | 1.37           |
| -5                        | 0.05%               | 1.93           | 0.02%       | 1.05           | 0.04%        | 2.12*          |
| -4                        | 0.02%               | 0.75           | 0.03%       | 1.66           | 0.03%        | 1.37           |
| -3                        | 0.03%               | 1.44           | 0.03%       | 1.40           | 0.01%        | 0.77           |
| -2                        | -0.01%              | -0.32          | 0.02%       | 0.79           | 0.00%        | -0.20          |
| -1                        | -0.01%              | -0.34          | 0.00%       | -0.12          | 0.00%        | 0.21           |
| 0                         | 0.04%               | 2.07*          | 0.02%       | 1.17           | 0.04%        | 2.10*          |
| 1                         | 0.06%               | 2.58**         | 0.06%       | 2.95**         | 0.02%        | 1.22           |
| 2                         | 0.06%               | 2.92**         | 0.06%       | 3.11**         | 0.03%        | 1.77           |
| 3                         | 0.01%               | 0.80           | 0.02%       | 1.22           | 0.01%        | 0.50           |
| 4                         | 0.01%               | 0.60           | 0.01%       | 0.54           | 0.02%        | 0.97           |
| 5                         | 0.02%               | 1.30           | 0.01%       | 0.70           | 0.03%        | 1.55           |
| 6                         | 0.03%               | 1.41           | 0.01%       | 0.30           | 0.03%        | 1.45           |
| 7                         | -0.01%              | -0.43          | -0.02%      | -0.83          | 0.00%        | 0.15           |
| 8                         | 0.01%               | 0.53           | 0.02%       | 1.15           | 0.01%        | 0.48           |
| 9                         | 0.01%               | 0.71           | 0.01%       | 0.47           | 0.00%        | 0.08           |
| 10                        | 0.01%               | 0.40           | -0.01%      | -0.44          | 0.01%        | 0.74           |

\*\* Significant at the 1% level; \* Significant at the 5% level



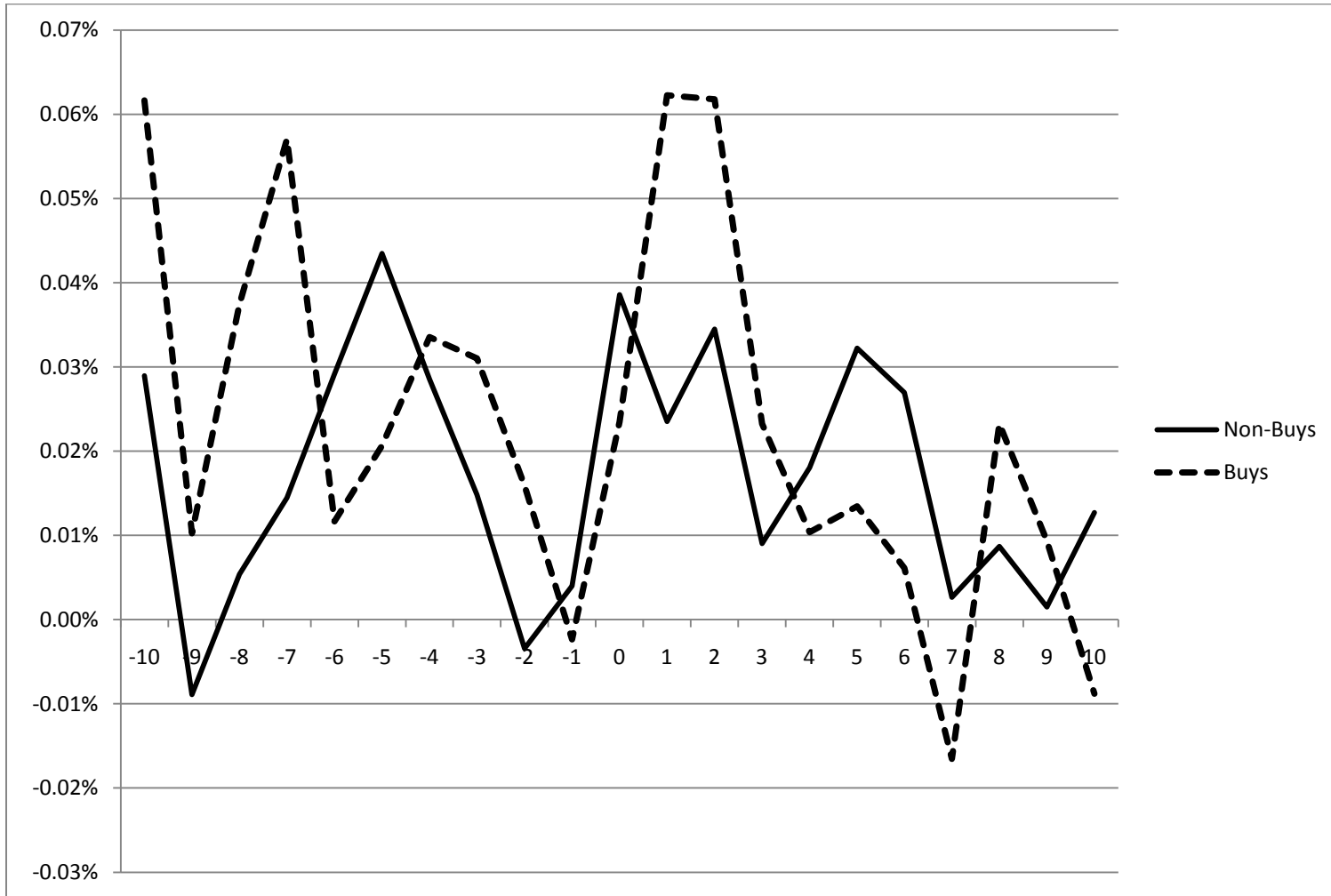
**Figure 5a: Excess Returns around Filing Dates**

In this figure, we plot the average excess returns on stocks disclosed on Filing Dates. The y-axis represents the average excess return while the x-axis represents the number of days from the filing date.



**Figure 5b: Excess Returns around Filing Dates**

In this figure, we plot the average excess returns for expanded (“Buys”) and contracted (“Sells”) stocks disclosed on Filing Dates. The y-axis represents the average excess return while the x-axis represents the number of days from the filing date.



**Table IV: Trading Results around LHFC Disclosures**

This table reports results examining buy volume of disclosed purchases and sells by a large hedge fund (LHFC) company. Each day around the disclosed date each filing period we compute the ratio of signed volume for each security disclosed by the LHFC, where positive volume indicates buy-initiated. We demean this value by the average ratio of signed volume for that day. In Panel A, we regress the securities' cumulative excess signed volume ratios against a *Buy Dummy*, which is one if the LHFC increased their holdings in this disclosure filing and zero otherwise. In Panel B, we simply regress that individual days' excess signed volume ratios on the *Buy Dummy*. Standard errors are clustered by security. Filing dates are from 1999Q3 to 2008Q4.

**Panel A: Cumulative Results**

| <b>Days before<br/>Filing</b> | <b>Intercept</b> | <b>t-value</b> | <b>Buy Dummy</b> | <b>t-value</b> |
|-------------------------------|------------------|----------------|------------------|----------------|
| -10                           | -0.19            | -0.57          | 0.41             | 1.05           |
| -9                            | -0.42            | -0.76          | 0.91             | 1.48           |
| -8                            | -0.87            | -1.12          | 1.91             | 2.28*          |
| -7                            | -0.96            | -1.00          | 2.09             | 2.05*          |
| -6                            | -1.13            | -0.96          | 2.47             | 2.01*          |
| -5                            | -1.58            | -1.10          | 3.46             | 2.33*          |
| -4                            | -1.92            | -1.21          | 4.19             | 2.57*          |
| -3                            | -2.33            | -1.29          | 5.11             | 2.75**         |
| -2                            | -2.66            | -1.33          | 5.82             | 2.85**         |
| -1                            | -2.90            | -1.31          | 6.34             | 2.87**         |
| 0                             | -3.24            | -1.35          | 7.11             | 2.97**         |
| 1                             | -3.41            | -1.32          | 7.49             | 2.92**         |
| 2                             | -3.64            | -1.31          | 7.99             | 2.92**         |
| 3                             | -4.01            | -1.34          | 8.80             | 3.00**         |
| 4                             | -4.44            | -1.40          | 9.74             | 3.12**         |
| 5                             | -4.76            | -1.41          | 10.44            | 3.17**         |
| 6                             | -4.83            | -1.36          | 10.60            | 3.07**         |
| 7                             | -4.94            | -1.32          | 10.84            | 3.01**         |
| 8                             | -5.04            | -1.28          | 11.06            | 2.91**         |
| 9                             | -5.07            | -1.24          | 11.13            | 2.83**         |
| 10                            | -5.27            | -1.23          | 11.57            | 2.82**         |

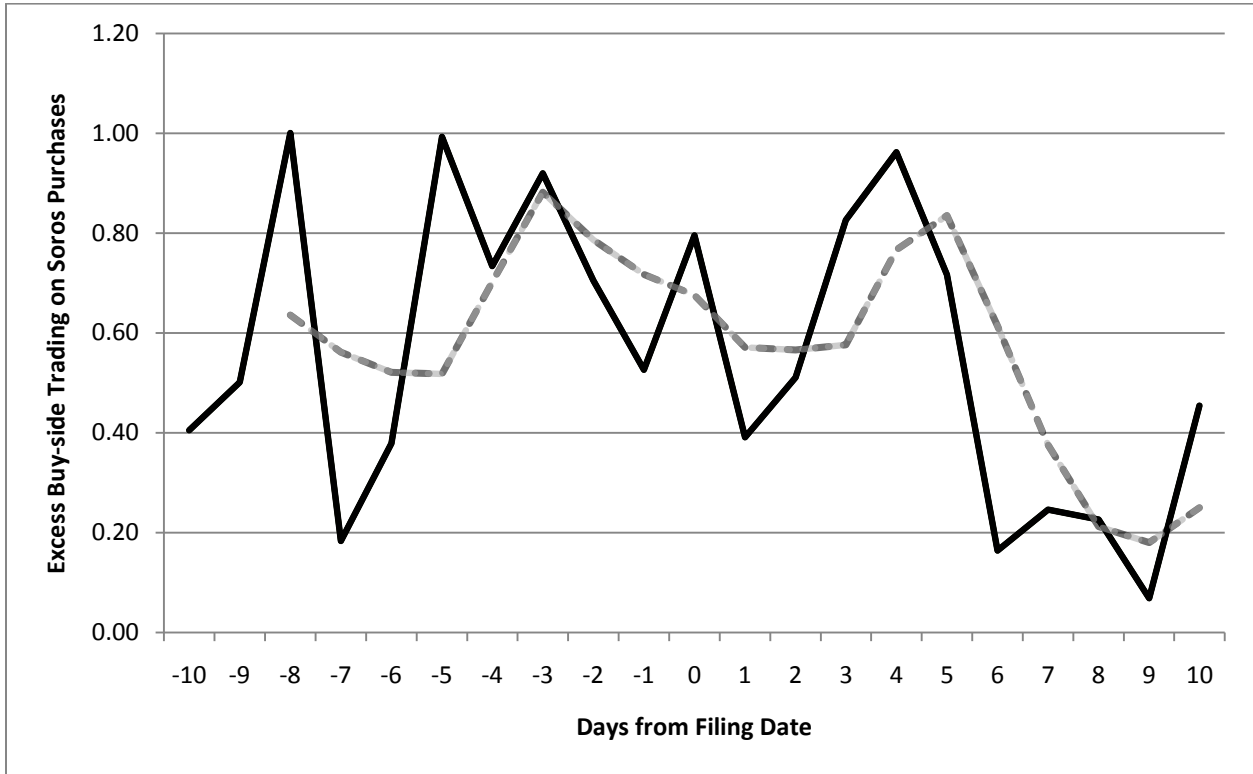
**Panel B: Individual Day Results**

| <b>Days before Filing</b> | <b>Intercept</b> | <b>t-value</b> | <b>Buy Dummy</b> | <b>t-value</b> |
|---------------------------|------------------|----------------|------------------|----------------|
| -10                       | -0.19            | -0.57          | 0.41             | 1.05           |
| -9                        | -0.23            | -0.69          | 0.50             | 1.26           |
| -8                        | -0.46            | -1.34          | 1.00             | 2.49*          |
| -7                        | -0.08            | -0.28          | 0.18             | 0.48           |
| -6                        | -0.17            | -0.51          | 0.38             | 0.94           |
| -5                        | -0.45            | -1.20          | 0.99             | 2.26*          |
| -4                        | -0.34            | -1.10          | 0.73             | 1.85           |
| -3                        | -0.42            | -1.22          | 0.92             | 2.12*          |
| -2                        | -0.32            | -1.01          | 0.70             | 1.76           |
| -1                        | -0.24            | -0.73          | 0.53             | 1.36           |
| 0                         | -0.37            | -1.12          | 0.80             | 1.98*          |
| 1                         | -0.18            | -0.57          | 0.39             | 0.99           |
| 2                         | -0.23            | -0.72          | 0.51             | 1.24           |
| 3                         | -0.38            | -1.04          | 0.83             | 1.85           |
| 4                         | -0.44            | -1.37          | 0.96             | 2.36*          |
| 5                         | -0.33            | -1.01          | 0.72             | 1.76           |
| 6                         | -0.08            | -0.24          | 0.16             | 0.42           |
| 7                         | -0.11            | -0.35          | 0.25             | 0.59           |
| 8                         | -0.10            | -0.30          | 0.23             | 0.52           |
| 9                         | -0.03            | -0.10          | 0.07             | 0.18           |
| 10                        | -0.21            | -0.68          | 0.45             | 1.17           |

\*\* Significant at the 1% level; \* Significant at the 5% level

**Figure 6: Individual Excess Buying of LFHC Purchases**

In this figure, we plot the individual day coefficients on the *Buy Dummy* variable reported in Table III, Panel B. The solid line represents the actual values whereas the dashed line is a three day moving average. Zero is the date LFHCs's holdings were disclosed on EDGAR.



**Table V: Profits from trading on Disclosed Holdings**

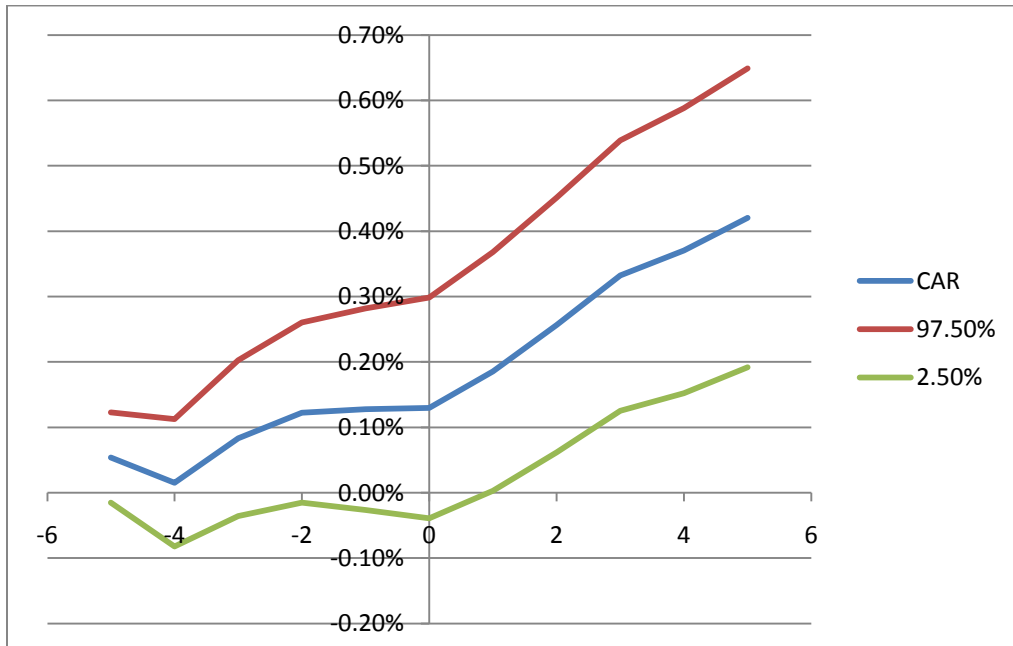
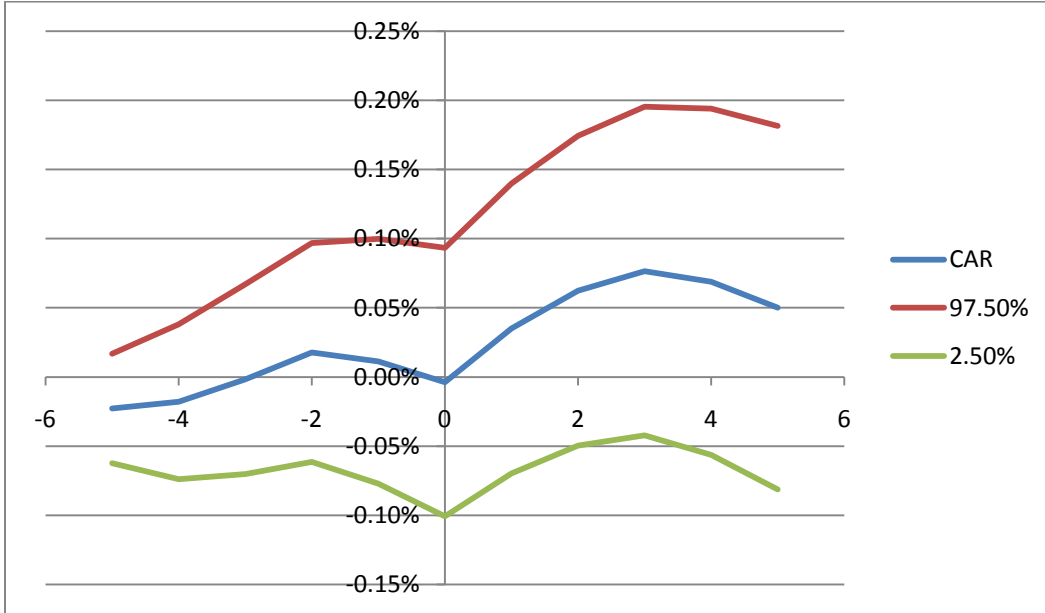
This table reports results on the profitability of trading on filings information. We report cumulative excess returns above the market for the expanded positions over the prior quarter (“Buys Only”) as well as returns from a portfolio that buys expanded positions and sells contracted positions over the prior quarter (“Buys – Sells”). We also report t-values for the cumulative excess returns as well as the average daily excess return and its t-value based on the Fama-Macbeth method. We report results for all filers as well as results for a group of hedge fund companies (‘Identified Filers’) that have significant, excess volume on their positions prior to disclosure.

| <b>Days before Filing</b> | <b>All Filers</b> | <b>t-value</b> | <b>Identified Filers</b> | <b>t-value</b> |
|---------------------------|-------------------|----------------|--------------------------|----------------|
| -5                        | -0.02%            | -1.13          | 0.05%                    | 1.53           |
| -4                        | -0.02%            | -0.63          | 0.02%                    | 0.31           |
| -3                        | 0.00%             | -0.05          | 0.08%                    | 1.37           |
| -2                        | 0.02%             | 0.44           | 0.12%                    | 1.74           |
| -1                        | 0.01%             | 0.25           | 0.13%                    | 1.62           |
| 0                         | 0.00%             | -0.08          | 0.13%                    | 1.51           |
| 1                         | 0.03%             | 0.65           | 0.19%                    | 1.99*          |
| 2                         | 0.06%             | 1.09           | 0.26%                    | 2.58**         |
| 3                         | 0.08%             | 1.26           | 0.33%                    | 3.15**         |
| 4                         | 0.07%             | 1.08           | 0.37%                    | 3.33**         |
| 5                         | 0.05%             | 0.75           | 0.42%                    | 3.61**         |
| <b>Daily Average</b>      | <b>0.00%</b>      |                | <b>0.04%</b>             | <b>3.19**</b>  |

\*\* Significant at the 1% level; \* Significant at the 5% level

**Figure 7: Excess Return Trading**

This figure graphs the cumulative excess returns and their 95% confidence intervals. The first figure represents cumulative excess returns for a trading strategy that goes long expanded positions and short contracted positions while the second figure depicts a trading strategy that goes long expanded positions and shorts the market. The top figure displays results for all filers while the bottom figure displays results for those hedge fund companies with significant excess volume prior to disclosure.



**Table VI: Long-Term Holdings Performance Subsequent the Effective Date**

This table reports the performance of the holdings portfolios disclosed for the period immediately after their effective dates. Each quarter we use each manager's holdings to calculate portfolio weights as of the end of quarter. We use these weights to calculate excess portfolio returns using individual security returns adjusted by the appropriate size, book-to-market and momentum portfolio. Panel A reports the average portfolio excess return over the month after the holdings' effective date, whereas Panel B and Panel C report results for two and three months after the effective date, respectively.

**Panel A: One Month Excess Returns**

|         | Q1      | Q2       | Q3       | Q4     |
|---------|---------|----------|----------|--------|
| 1999    |         |          | 0.30%    | 1.00%  |
| 2000    | 0.19%   | -0.22%   | -0.14%   | -0.33% |
| 2001    | 0.84%   | 0.48%*   | -0.39%   | 0.66%  |
| 2002    | -0.22%  | -0.48%   | -0.95%** | -0.08% |
| 2003    | 0.09%   | 0.43%*   | 0.25%    | 0.31%  |
| 2004    | 0.07%   | -0.06%   | -0.19%   | 0.10%  |
| 2005    | 0.22%   | -0.39%** | 0.53%**  | -0.49% |
| 2006    | 0.55%** | 0.29%**  | -0.29%*  | 0.21%  |
| 2007    | 0.23%*  | 0.30%**  | -0.12%   | 0.32%  |
| 2008    | -0.13%  | 0.38%*   | -0.68%** | -0.75% |
| Average | 0.05%   |          |          |        |

**Panel B: Three Month Excess Returns**

|         | Q1       | Q2       | Q3       | Q4       |
|---------|----------|----------|----------|----------|
| 1999    |          |          | 0.12%    | 4.60%**  |
| 2000    | 2.08%    | -0.38%   | 1.54%*   | 0.61%    |
| 2001    | 0.67%    | -0.33%   | -1.74%** | 1.84%**  |
| 2002    | -0.55%   | -1.63%** | -0.67%   | -0.27%   |
| 2003    | 0.31%    | 2.25%**  | 0.71%    | 0.26%    |
| 2004    | 0.61%*   | 0.09%    | -0.07%   | 0.72%**  |
| 2005    | 0.40%    | 0.09%    | 1.19%**  | 0.00%    |
| 2006    | 0.59%*   | 0.02%    | -0.60%** | 0.63%*   |
| 2007    | 0.49%*   | 0.67%**  | -0.58%*  | -0.12%   |
| 2008    | -0.71%** | 1.74%**  | -2.21%** | -1.44%** |
| Average | 0.28%    |          |          |          |

\*\* Significant at the 1% level; \* Significant at the 5% level



**Table VII: Performance Persistence of Portfolio Holdings Subsequent Effective Dates**

This table examines the performance persistence of manager's portfolio holdings based on one month excess returns after the effective dates. Each quarter we rank the one month holdings portfolios' performance for all funds after the holdings effective date. We then split funds in two ways. The first method we label funds with performance above the median as high performance. The second method we label funds as high performance if their excess return is positive. We then compare the persistence of managers' rankings by forming a two-by-two contingency table. Panel A reports results for relative performance persistence against other portfolios whereas Panel B reports results for persistence in positive excess returns.

**Panel A: Relative Persistence against Other Managers**

|         | Low(t-1) |         | High(t-1) |         | Log-Odds ratio | t-value |
|---------|----------|---------|-----------|---------|----------------|---------|
|         | Low(t)   | High(t) | Low(t)    | High(t) |                |         |
| 1999    | 27.00    | 22.50   | 21.50     | 29.00   | 0.2091         | 0.73    |
| 2000    | 25.00    | 23.76   | 25.00     | 26.24   | 0.0431         | 0.24    |
| 2001    | 19.97    | 29.43   | 28.74     | 21.86   | -0.2875        | -1.71   |
| 2002    | 26.57    | 22.80   | 22.64     | 27.99   | 0.1586         | 1.00    |
| 2003    | 25.72    | 24.21   | 23.26     | 26.81   | 0.0880         | 0.59    |
| 2004    | 24.21    | 25.03   | 25.03     | 25.73   | -0.0024        | -0.02   |
| 2005    | 20.58    | 28.83   | 28.62     | 21.97   | -0.2612        | -1.97*  |
| 2006    | 26.36    | 23.94   | 23.43     | 26.26   | 0.0914         | 0.72    |
| 2007    | 27.28    | 22.66   | 23.20     | 26.85   | 0.1440         | 1.09    |
| 2008    | 23.11    | 25.33   | 25.33     | 26.22   | -0.0249        | -0.13   |
| Overall | 24.53    | 25.00   | 24.86     | 25.61   | 0.0047         | 0.10    |

**Panel B: Persistence of Positive Excess Returns**

|         | Low(t-1) |         | High(t-1) |         | Chi-Sq | p-value |
|---------|----------|---------|-----------|---------|--------|---------|
|         | Low(t)   | High(t) | Low(t)    | High(t) |        |         |
| 1999    | 25.50    | 19.50   | 26.00     | 29.00   | 1.75   | 0.19    |
| 2000    | 26.45    | 24.59   | 25.21     | 23.76   | 0.01   | 0.94    |
| 2001    | 18.93    | 28.40   | 28.06     | 24.61   | 10.24  | 0.00**  |
| 2002    | 30.66    | 26.26   | 21.54     | 21.54   | 0.93   | 0.33    |
| 2003    | 20.66    | 22.16   | 25.31     | 31.87   | 1.14   | 0.28    |
| 2004    | 24.10    | 25.84   | 23.05     | 27.01   | 0.42   | 0.52    |
| 2005    | 22.19    | 30.01   | 30.12     | 17.68   | 39.21  | 0.00**  |
| 2006    | 22.42    | 23.84   | 23.43     | 30.30   | 2.34   | 0.13    |
| 2007    | 23.31    | 22.23   | 23.52     | 30.93   | 5.91   | 0.02*   |
| 2008    | 27.33    | 22.89   | 28.67     | 21.11   | 0.46   | 0.50    |
| Overall | 23.71    | 25.02   | 25.28     | 25.99   | 0.29   | 0.59    |

\*\* Significant at the 1% level; \* Significant at the 5% level. Note that the log odds ratio is used instead of the Chi Square test when examining the significance of persistence of relative performance since the latter test is misspecified in this context since given one cell count all other cell counts are predetermined once we know the total number of observations. See Brown *et al.* (1992).

**Table VIII: Long-Term Holdings Performance Subsequent the Filing Date**

This table reports the performance of the holdings portfolios disclosed for the period immediately after their filing dates. Each quarter we use each manager's holdings to calculate portfolio weights as of the filing date. We use these weights to calculate excess portfolio returns using individual security returns adjusted by the appropriate size, book-to-market and momentum portfolio. Panel A reports the average portfolio excess return over the month (23 trading days) after the holdings' effective date, whereas Panel B reports results for three months (69 days) after the effective date, respectively.

**Panel A: One Month Excess Returns**

|         | Q1      | Q2       | Q3      | Q4       |
|---------|---------|----------|---------|----------|
| 1999    |         |          | 0.71%*  | 0.54%    |
| 2000    | 0.84%*  | 1.01%**  | -0.40%  | 0.44%    |
| 2001    | 0.09%   | -0.08%   | -0.18%  | -0.51%   |
| 2002    | -0.25%  | -0.16%   | 0.32%   | -1.05%** |
| 2003    | 0.44%** | -0.46%   | -0.19%  | -0.45%*  |
| 2004    | -0.23%  | 0.09%    | 0.27%   | 0.08%    |
| 2005    | 0.20%   | 0.44%**  | 0.34%** | 0.05%    |
| 2006    | 0.03%   | -0.74%** | 0.12%   | 0.00%    |
| 2007    | -0.14%  | 0.51%**  | 0.08%   | 0.03%    |
| 2008    | -0.27%  | 1.17%**  | -0.35%  | -0.75%   |
| Average | 0.04%   |          |         |          |

**Panel B: Three Month Excess Returns**

|         | Q1      | Q2       | Q3       | Q4       |
|---------|---------|----------|----------|----------|
| 1999    |         |          | 0.81%    | 3.75%**  |
| 2000    | -0.65%  | 2.28%**  | -1.76%** | -1.44%** |
| 2001    | 0.38%   | -1.04%*  | -0.64%   | -0.96%   |
| 2002    | -1.00%* | -0.33%   | -0.48%   | -1.71%** |
| 2003    | 0.03%   | -0.64%*  | -0.43%   | -0.45%   |
| 2004    | -0.42%  | -0.43%   | -0.53%*  | 0.26%    |
| 2005    | -0.08%  | 0.54%**  | 0.31%    | 0.55%*   |
| 2006    | -0.04%  | -0.89%** | 0.24%    | -0.19%   |
| 2007    | 0.47%*  | -0.15%   | 0.60%*   | -0.69%*  |
| 2008    | 0.14%   | 1.66%**  | -0.66%   | -0.67%   |
| Average | -0.11%  |          |          |          |

\*\* Significant at the 1% level; \* Significant at the 5% level.

**Table IX: Performance Persistence of Portfolio Holdings**

This table examines the performance persistence of manager's portfolio holdings based on one month excess returns after the filing dates. Each quarter we rank the one month holdings portfolios' performance for all funds after the holdings effective date. We then split funds in two ways. The first method we label funds with performance above the median as high performance. The second method we label funds as high performance if their excess return is positive. We then compare the persistence of managers' rankings by forming a two-by-two contingency table. Panel A reports results for relative performance persistence against other portfolios whereas Panel B reports results for persistence in positive excess returns.

**Panel A: Relative Persistence against Other Managers**

|         | Low(t-1) |         | High(t-1) |         | Log-Odds ratio | t-value |
|---------|----------|---------|-----------|---------|----------------|---------|
|         | Low(t)   | High(t) | Low(t)    | High(t) |                |         |
| 1999    | 28.00    | 21.00   | 21.00     | 30.00   | 0.2798         | 0.98    |
| 2000    | 28.19    | 21.19   | 20.99     | 29.63   | 0.2736         | 1.49    |
| 2001    | 23.16    | 26.07   | 26.07     | 24.70   | -0.0750        | -0.45   |
| 2002    | 22.90    | 26.32   | 26.48     | 24.30   | -0.0979        | -0.62   |
| 2003    | 27.15    | 21.96   | 22.78     | 28.10   | 0.1832         | 1.23    |
| 2004    | 27.61    | 21.81   | 22.62     | 27.96   | 0.1944         | 1.42    |
| 2005    | 26.74    | 22.99   | 23.10     | 27.17   | 0.1359         | 1.04    |
| 2006    | 24.70    | 24.90   | 24.90     | 25.50   | 0.0069         | 0.05    |
| 2007    | 25.24    | 23.97   | 23.55     | 27.24   | 0.0857         | 0.66    |
| 2008    | 22.65    | 26.05   | 27.51     | 23.79   | -0.1238        | -0.77   |
| Overall | 25.52    | 23.79   | 24.06     | 26.62   | 0.0743         | 1.55    |

**Panel B: Persistence of Positive Excess Returns**

|         | Low(t-1) |         | High(t-1) |         | Chi-Sq | p-value |
|---------|----------|---------|-----------|---------|--------|---------|
|         | Low(t)   | High(t) | Low(t)    | High(t) |        |         |
| 1999    | 15.00    | 17.50   | 23.00     | 44.50   | 2.72   | 0.10    |
| 2000    | 22.02    | 21.40   | 23.25     | 33.33   | 4.46   | 0.03*   |
| 2001    | 28.47    | 25.73   | 28.47     | 17.32   | 5.49   | 0.02*   |
| 2002    | 24.61    | 30.84   | 25.23     | 19.31   | 9.54   | 0.00**  |
| 2003    | 32.47    | 20.33   | 25.10     | 22.10   | 5.18   | 0.02*   |
| 2004    | 28.89    | 22.74   | 20.88     | 27.49   | 14.09  | 0.00**  |
| 2005    | 17.65    | 23.53   | 24.71     | 34.12   | 0.07   | 0.79    |
| 2006    | 25.10    | 26.81   | 26.41     | 21.69   | 4.27   | 0.04*   |
| 2007    | 20.17    | 22.28   | 20.49     | 37.06   | 13.62  | 0.00**  |
| 2008    | 19.58    | 20.39   | 28.80     | 31.23   | 0.06   | 0.81    |
| Overall | 23.92    | 23.65   | 24.52     | 27.91   | 8.63   | 0.00 ** |

\*\* Significant at the 1% level; \* Significant at the 5% level. Note that the log odds ratio is used instead of the Chi Square test when examining the significance of persistence of relative performance since the latter test is misspecified in this context since given one cell count all other cell counts are predetermined once we know the total number of observations. See Brown *et al.* (1992)

**Table X: Long-Term Holdings Performance of Companies with Significant Trading**

This table reports the performance of the holdings portfolios disclosed for funds with significant trading prior to the filings dates. Each quarter we use each manager's holdings to calculate portfolio weights as of the filing date. We use these weights to calculate excess portfolio returns using individual security returns adjusted by the appropriate size, book-to-market and momentum portfolio. Panel A reports the average portfolio excess return over the month (23 trading days) after the holdings' effective date, whereas Panel B reports results for three months (69 days) after the effective date, respectively.

**Panel A: One Month Excess Returns**

|         | Q1       | Q2      | Q3     | Q4     |
|---------|----------|---------|--------|--------|
| 1999    |          |         | 0.22%  | 1.26%  |
| 2000    | -1.40%   | 2.22%   | 1.83%  | -2.23% |
| 2001    | 2.28% ** | 0.01%   | -1.17% | -0.21% |
| 2002    | -0.90%   | 0.95%   | -0.50% | 0.70%  |
| 2003    | 0.61%    | 0.25%   | 0.54%  | 0.60%  |
| 2004    | -0.77%   | -0.27%  | 0.18%  | 0.63%  |
| 2005    | -0.06%   | 0.42%   | 0.92%  | 0.40%  |
| 2006    | -0.22%   | -0.81%  | 0.39%  | 0.52%  |
| 2007    | -0.04%   | 0.97% * | -0.81% | 0.31%  |
| 2008    | -1.35%   | 1.72%   | -3.45% | -1.51% |
| Average | 0.06%    |         |        |        |

**Panel B: Three Month Excess Returns**

|         | Q1        | Q2       | Q3       | Q4     |
|---------|-----------|----------|----------|--------|
| 1999    |           |          | -3.05%   | 3.35%  |
| 2000    | -5.53%    | 4.44%    | 0.49%    | -2.51% |
| 2001    | 1.02%     | -1.37%   | -1.04%   | 0.30%  |
| 2002    | -3.67% ** | -1.29%   | -0.02%   | 2.05%  |
| 2003    | 1.06%     | 0.07%    | 0.79% *  | 0.48%  |
| 2004    | -1.44%    | -1.93%   | -0.47%   | -0.09% |
| 2005    | -0.01%    | -0.40%   | 1.24%    | 1.26%  |
| 2006    | 0.02%     | -1.49% * | 0.80%    | 0.32%  |
| 2007    | 0.56%     | -1.00%   | -1.87% * | 1.06%  |
| 2008    | -1.01%    | 1.09%    | -3.41%   | -0.36% |
| Average | -0.30%    |          |          |        |

\*\* Significant at the 1% level; \* Significant at the 5% level