

# Uncovering Hedge Fund Skill from the Portfolio Holdings They Hide<sup>\*</sup>

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## ABSTRACT

This paper studies the “confidential holdings” of institutional investors, especially hedge funds, where the quarter-end equity holdings are disclosed with a delay through amendments to the Form 13F and are usually excluded from the standard databases. Evidence supports private information as the dominant motive for confidentiality. Funds managing large risky portfolios with non-conventional strategies seek confidentiality more frequently. Stocks in these holdings are disproportionately associated with information-sensitive events or share characteristics indicating greater information asymmetry. Confidential holdings exhibit superior performance up to twelve months. The probability of SEC approval is associated with the fraction of portfolios seeking confidentiality and the filer’s track records.

Key words: Confidential treatment; ownership disclosure; 13F holdings; hedge funds.

JEL Classification: G10, G19

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## ABSTRACT

This paper studies the “confidential holdings” of institutional investors, especially hedge funds, where the quarter-end equity holdings are disclosed with a delay through amendments to the Form 13F and are usually excluded from the standard databases. Evidence supports private information as the dominant motive for confidentiality. Funds managing large risky portfolios with non-conventional strategies seek confidentiality more frequently. Stocks in these holdings are disproportionately associated with information-sensitive events or share characteristics indicating greater information asymmetry. Confidential holdings exhibit superior performance up to twelve months. The probability of SEC approval is associated with the fraction of portfolios seeking confidentiality and the filer’s track records.

Mandatory disclosure of ownership in public companies by investors is an essential part of the securities market regulation. At the core of this regulation is the Section 13(f) of the Securities Exchange Act of 1934 that requires institutional investment managers to disclose their quarterly portfolio holdings. The quarterly reports, filed to the Securities and Exchange Commission (SEC) on the Form 13F, disseminate the public information about holdings and investment activities of institutional investors. An exception to the rule, however, provides confidential treatment of certain holdings through *amendments* to the *original* Form 13F. This provision allows the institutions to delay the disclosure of those holdings, usually up to one year. Throughout the paper, we refer to these amendments as “confidential filings,” and the positions included in such filings as “confidential holdings.”

Among all institutional investors, hedge fund management companies (henceforth, “hedge funds”) are most aggressive in seeking confidentiality, and are the focused sample of most of our analyses. Constituting about 30% of all institutions, hedge funds account for 56% of all the confidential filings. Conditional on confidential filing, hedge funds on average relegate about one-third of their total portfolio values into confidentiality, while the same figure is one-fifth for investment companies/advisors and one-tenth for banks and insurance companies. These stylized facts make hedge funds the ideal subjects to analyze the motives and consequences of confidential treatment.

A priori, private information, price impact considerations, and “window dressing” can all motivate confidentiality seeking. First, it is in the best interest of investment managers not to disclose their informed positions before they have fully reaped the benefits of their private information. Timely disclosure of portfolio holdings may reveal information about proprietary investment strategies which outside investors can free-ride on

without incurring the costs of research themselves. Hence some delay in disclosure is desirable for the preservation of incentives to collect and process information, which contributes to the informational efficiency of financial markets (Grossman and Stiglitz (1980)). As a matter of fact, several hedge funds and successful investors including Warren Buffett and Philip Goldstein have appealed to the SEC for an exemption from revealing their positions in the 13F forms.<sup>1</sup> Moreover, it also has to be the case that the institution intends to take advantage of the private information beyond the normal delay of 45 days to justify seeking confidentiality.<sup>2</sup> Therefore, our empirical analyses establish the two related motives: the information content of confidential holdings and the “slow” building of positions.

The second motive arises from price impact concerns, which often interact with private information for two reasons. First, in equilibrium, stocks that are more prone to informed trading should incur higher price impact (Glosten and Milgrom (1985) and Kyle (1985)). Second, when the disclosed holdings are informed, an increase in free-riding activity reduces the returns of the filing manager by causing security prices to move before the manager can fully implement his investment strategies. Such a scenario is analyzed in Frank, Poterba, Shackelford, Shoven (2004) and Verbeek and Wang (2010). The price impact may also be unrelated to information. Recent holdings information can allow outside speculators to anticipate further trades of the filer, whereas the speculator may trade ahead of the filer to capture the temporary price impact even if such trades are liquidity-driven. The fear of being front-run thus motivates filers to seek confidentiality till the desired transactions are complete. This motive can be exemplified by the “quant meltdown” in August 2007. Quant-oriented hedge funds, which employed similar strategies and attempted to cut their risks simultaneously in response to their losses, blamed mandatory ownership disclosure for contributing to a “death spiral” in the summer of 2007 (Khandani and Lo (2007)).

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<sup>1</sup> Such attempts have not been successful. Philip Goldstein, an activist hedge fund manager at Bulldog Investors, likens his stock holdings to “trade secrets” as much as the protected formula used to make Coke, and contends that complying with the 13F rule “constitute[s] a ‘taking’ of [the fund’s] property without just compensation in violation of the Fifth Amendment to the Constitution.” For a more detailed discussion, see Philip Goldstein’s interview in September 12, 2006 issue of *Business Week*: [http://www.businessweek.com/print/investor/content/sep2006/pi20060913\\_356291.htm](http://www.businessweek.com/print/investor/content/sep2006/pi20060913_356291.htm).

<sup>2</sup> If the private information has run its course, the funds would benefit from disclosing their holdings so that the revealed information could help increase the value of their holdings, similar to increased profits for insiders under mandatory disclosure as in Fishman and Hagerty (1995).

Lastly, delaying disclosing positions through confidential filing could also serve as an alternative to “window dressing,” i.e., trading strategies meant to generate differences between the portfolios on the reporting date and those held at other times (Lakonishok, Shleifer, Thaler, and Vishny (1991); Musto (1999)). In fact, seeking confidentiality would incur lower cost to the filing manager than engaging in pre-disclosure trading if the main purpose is to hide certain positions from outside investors because these stocks are perceived as undesirable due to, for example, bad past performance or high risk.

Using a complete sample of all original and amendments to 13F filings during the period of 1999-2007, our study uncovers several pieces of empirical evidence that support private information as the predominant motive for confidentiality. First, hedge funds with characteristics associated with more active portfolio management, such as those managing large and concentrated portfolios, and adopting non-standard investment strategies (i.e., higher idiosyncratic risk), are more likely to request confidentiality. Second, the confidential holdings are more likely to consist of stocks associated with information-sensitive events such as mergers and acquisitions, and stocks subject to greater information asymmetry, i.e., those with smaller market capitalization and fewer analysts following. Third, confidential holdings of hedge funds exhibit significantly higher abnormal performance compared to their original holdings for different horizons ranging from 2 months to 12 months. For example, the difference over the 12-month horizon ranges from 5.2% to 7.5% on an annualized basis.

The information and price impact hypotheses are not mutually exclusive. Indeed, some findings are consistent with both. The confidential period allows hedge funds to accumulate a larger position in a stock, and to spread the trades over a longer period of time; such a relief benefits both informed and liquidity-motivated trading. Hedge funds trade about three times more in the confidential stocks compared to stocks included in their original holdings, and take almost three times as long to complete the accumulation of the confidential stakes. Such trades may well be motivated by information, as indicated by the superior performance of confidential holdings as a whole; nevertheless price impact is a necessary component in the consideration.

Lastly, confidential holdings consist of stocks that have performed relatively well recently, ruling out performance-based window dressing as a major motivation for filing confidentially. We do, however, find stocks in confidential holdings to have higher idiosyncratic and total volatility, consistent with a risk-based window

information motive (Musto (1999)) as well as an information motive because idiosyncratic volatility is also an established proxy for stock-specific information (Durnev, Morch, Yeung, and Zarowin (2003)).

Given the perceived benefits of seeking confidentiality, it is necessary to discuss the associated costs. Gaining confidential treatment is not meant to be a trivial task and is not guaranteed.<sup>3</sup> The applying institution must provide a sufficient factual basis for the objection to public disclosure, including a detailed position-by-position description of the manager's investment strategy (e.g., risk arbitrage), along with supporting analysis that public disclosure of the securities would reveal the investment strategy and harm the manager's competitive position. If denied (which usually takes two to twelve months during our sample period), the institution is obligated to file an amendment disclosing all the confidential positions immediately (within six business days).<sup>4</sup>

Analyzing the SEC approval/denial outcomes reveals that hedge funds incurring higher past denial rates and applying to seeking confidentiality for larger positions are more likely to be denied of confidential treatment. We also find a significant positive market reaction, averaging around 1%, associated with the involuntary disclosure of positions due to denials within 180 days. In contrast, there is no significant market reaction when hedge funds voluntarily disclosed their approved confidential filings with the same length of delay. The contrast suggests that denials force revelation of information that has yet to be impounded into the stock prices, which may interfere with the filer's plan to further accumulate position in the stock. This puts a constraint on hedge funds' seeking confidentiality without strict compliance to the rules, as denials impose costs on future applications.

Our study contributes to the literature in several ways. Most specifically, our study provides new evidence on the skill of hedge funds from the superior performance of their holdings that are likely to be motivated by private information. Our paper adds to the literature that evaluates the performance and information content of institutional investors' holdings (Grinblatt and Titman (1989, 1993), Grinblatt, Titman, and Wermers (1995), Daniel, Grinblatt, Titman, and Wermers (1997), Chen, Jegadeesh, and Wermers (2000), Wermers (2000,

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<sup>3</sup> For the initial SEC release in 1979, please see <http://www.sec.gov/rules/final/34-15979.pdf>. The current SEC official guideline for 13F amendments is available at: <http://www.sec.gov/about/forms/form13f.pdf>. Section "Instructions for Confidential Treatment Requests" details the requirements.

<sup>4</sup> Although the SEC does not provide information about all denial cases, we found online documents for a few cases. For example, see <http://www.sec.gov/rules/other/34-52134.pdf> for the rejection of the request from a hedge fund, Two Sigma. There are several other cases of rejections of confidential treatment requests including those by Warren Buffett: <http://www.sec.gov/rules/other/34-50206.htm>, <http://www.sec.gov/rules/other/34-43142.htm>, and <http://www.sec.gov/litigation/admin/34-43909.htm>.

2003), Kacperczyk, Sialm, and Zheng (2005, 2008), Wermers, Yao, and Zhao (2007), and Huang and Kale (2009) on mutual funds; and Griffin and Xu (2009) and Aragon and Martin (2009) on hedge funds.) By incorporating the confidential holdings and comparing them to the original holdings, our study provides a more complete picture of the ability and performance of hedge funds. Moreover, our research also calibrates the limitations of using the conventional institutional quarterly holdings databases that mostly exclude confidential holdings. While any error due to the omission in evaluating the aggregate portfolio performance of all institutions is likely to be small, there can be a significant conditional bias in analyzing position changes of specific types of institutions and those around specific events (such as M&As.)

More generally, our paper contributes to the literature that studies the effects of portfolio disclosure on money managers, including those on the investment decisions (Musto (1997, 1999)), performance evaluation (Kempf and Kreuzberg (2004)), strategic behavior (e.g., free riding and front running) by other market participants (Wermers (2001), Frank, Poterba, Shackelford, and Shoven (2004), Verbeek and Wang (2010)), and flow-performance relation (Ge and Zheng (2006)). Our findings suggest that confidential treatment attenuates some of the tensions arising from holdings disclosure analyzed in these papers. Our focus on hedge funds also help settle the controversy regarding the value and effect of the “non-transparent” holdings in a lightly regulated sector and identify the key factors that influence the cross-sectional variation in the confidential filing activities.

Finally, our study contributes to the literature of mandatory *ownership* disclosure, which is far more scant than that of *issuer* disclosure. In the context of issuer disclosure, stricter requirements lead to more liquid and efficient capital markets which can reduce the disclosing parties’ cost of capital, but may also impose cost on them in losing competitive advantage or bargaining power due to the revelation of information to their competitors (Diamond and Verrecchia (1991), Fishman and Hagerty (1998, 2003), and Admati and Pfleiderer (2000)). Analogously, the coexistence of mandatory ownership disclosure and occasional relief through confidentiality weighs the benefits of market transparency of capital movements and investor monitoring of money managers against the costs of diluting the incentives to acquire information by active portfolio managers and of increasing their transaction cost.

Changes in ownership can convey underlying fundamental information to the market—either because the change in positions reveals the filer’s private information about the value of the securities; or because the change

in ownership represents potential shift in corporate control. While disclosure enables investors to make informed assessment about how the ownership structure of a particular firm may reflect or impact the value of the shares, some delay in revelation is necessary for such information to be generated and acquired in the first place. This trade-off is analogous to the ones analyzed in the literature on insider trading disclosure (Fishman and Hagerty (1995)), and patent protection for firms to preserve their incentives to engage in R&D (Wright (1983)).

The remainder of the paper is organized as follows. Section I provides background information regarding the SEC ownership disclosure rules. Section II describes the construction and overview of the sample, and outlines the empirical motivation. Section III analyzes the determinants of confidential filings at the institution level and confidential holdings at the stock level. Section IV examines the abnormal returns of confidential holdings of hedge funds relative to those of their original holdings. Section V models the determinants of approvals and denials of confidential filings and presents the event study of the market's reaction to disclosure of denied confidential filings. Finally, Section VI concludes.

## **I. Institutional Background**

The current ownership disclosure rules mandated by the SEC consists of five overlapping parts: Schedule 13D for large (above 5%) active shareholders, Schedule 13G for large passive shareholders; Form 13F for general institutional holdings; Section 16 regarding ownership by insiders; and Form N-CSR for quarterly disclosure of holdings required for mutual funds.

Among the five regimes, the Form 13F requirement under the Section 13(f) (passed by the Congress in 1975, and adopted by the SEC in 1978) of the Securities Exchange Act of 1934, covers by far the largest number of institutional investors: all institutions (including foreign investors) that have investment discretion over \$100 million or more in Section 13(f) securities (mostly publicly traded equity; but also include convertible bonds, and some options) are required to disclose their quarter-end holdings in these securities. We call the date when the Form 13F is filed with the SEC the “filing date,” and the quarter-end date on which the portfolio is being disclosed the “quarter-end portfolio date.” According to the SEC rule, the maximum lag between the two dates is 45 calendar days. As an exception to the rule, the SEC allows for the confidential treatment of certain portfolio holdings of institutions for which they can file 13F amendments. The provision allows the institutions to delay

the disclosure of their holdings up to one year (which can be extended further) from the date required for the original 13F form. Figure 1 illustrates the time line of the original and confidential 13F filings.

[Insert Figure 1 here.]

The confidential treatment of some holdings as deemed appropriate by the SEC was justified on the grounds of protecting public interest, mainly the investment manager and the investors whose assets are under management, because “disclosure of such strategy would impede competition and could cause increased volatility in the market place.”<sup>5</sup> In 1998, the SEC tightened the rules and restricted the conditions for confidentiality to prevent it from being used to mislead or manipulate the market.<sup>6</sup> Our sample period (1999-2007) starts with the inauguration of the SEC’s electronic filing system, which also coincides with the new regime.

The triggering event for the 1998 rule tightening was the confusion over the 13F reporting of investor Warren Buffett which caused a significant decline in the share price of Wells Fargo & Co. in August 1997. The 13F form did not show Berkshire Hathaway’s well-known 8% stake in the bank, only because it was reported in a confidential filing. But the misunderstanding in the market caused Wells Fargo’s stock price to drop by 5.8% in one hour after Buffett’s 13F filing.<sup>7</sup> A more recent event further illustrates the tension arising from confidential filing. On August 14, 2007, D.E. Shaw & Company, one of the largest quant-oriented hedge fund managers, filed an entirely blank Form 13F for its second-quarter portfolio. That is, the fund manager was seeking from the SEC a confidential treatment of its entire portfolio, based on the argument that “copycat investors” were mimicking its strategies or could front-run on its large positions. The SEC denied the request on October 19, forcing the firm to file an amended Form 13F on October 29 which covered 3,991 positions valued at \$79 billion. Similar but less extreme requests from D. E. Shaw were rejected by the SEC before.<sup>8</sup>

It is worth noting that the confidential treatment under Section 13(f) does not over-ride other SEC ownership disclosure rules. For example, there is no confidential treatment for the disclosure of a beneficial

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<sup>5</sup> Report of Senate Comm. on Banking, Housing and Urban Affairs, S. Rep. No. 75, 94th Cong., 1st Sess. 87 (1975). See Lemke and Lins (1987) for a detailed discussion of the background, legislative history, and requirements of the institutional disclosure program under Section 13(f) of the Securities Exchange Act of 1934.

<sup>6</sup> See <http://www.sec.gov/divisions/investment/guidance/13fpt2.htm> for the letter issued by the SEC in June 1998 where they explain the specific requirements and conditions for granting confidentiality.

<sup>7</sup> For a full story, please see “Large Investors Face Stiff Rules on SEC Filings,” by Paul Beckett, *The Wall Street Journal*, June 19, 1998.

<sup>8</sup> See “SEC: D.E. Shaw Disclosure Request Part of Regular Process,” by Marietta Cauchi, *Dow Jones Newswires*, January 2005.



owner of more than 5% of a company's equity under Schedule 13D or 13G. The same can be said about the holdings disclosure required for registered investment companies (mostly mutual funds), which was changed from a semi-annual to a quarterly basis (with a 60-day delay) in 2004. Nevertheless, there are more than sporadic observations in our sample where the confidential positions would be required to file 13G (such as the Warren Buffett position in Wells Fargo) or quarterly holdings for a mutual fund management company (such as T. Rowe Price and American Funds). In such cases, the confidential treatment may still afford an effective delay if the 13F disclosure is the most binding (e.g., Schedule 13G allows a 45-day delay from the year-end, and the disclosure requirement for mutual funds was semi-annual before 2004).

Despite their potential importance, confidential holdings have not been systematically studied because they are generally not included in the conventional databases of institutional quarterly holdings, such as the Thomson Reuters Ownership Data (formerly the CDA/Spectrum database).<sup>9</sup> In a contemporaneous working paper, Aragon, Hertz, and Shi (2010) also study hedge funds' use of confidential filings. In addition to having a more comprehensive sample of hedge funds, we also analyze the characteristics of hedge funds that are associated with heavier uses of confidential treatment, compare the hedge funds' trading behavior between the stocks included in the original holdings and those in the confidential holdings, and assess the SEC approval/denial of the confidential filings as well as the market's reactions. These analyses afford better understanding of the costs and benefits associated with confidentiality.

We verify that over 90% of the confidential holdings in our sample period are not covered by the Thomson Reuters Ownership Data. The example of hedge fund Stark Onshore Management LLC (manager number 10375 in Thomson Reuters) illustrates such omissions. In Appendix A, we list all the confidential holdings of Stark Onshore Management during our sample period. We observe that, except for one stock (Rouse Co., CUSIP = 77927310), all the other 54 confidential holdings in the amendments are not included in the Thomson Reuters database.

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<sup>9</sup> The manual for Thomson Reuters Ownership Data, available through Wharton Research Data Services (WRDS), provides the following caveat about its S12 (for mutual funds) and S34 (for institutions) data: "The holdings in the S12 and S34 sets are rarely the entire equity holdings of the manager or fund. There are minimum size requirements and confidentiality qualifications." It also explicitly acknowledges the lack of coverage on confidential holdings in a research guide:

[http://wrds-web.wharton.upenn.edu/wrds/support/Data/004Research%20Applications/003Research%20Guides/000Files%20for%20Thomson%20Reuters%2013F%20Database%20Research%20Applications/Institutional\\_Trades.cfm](http://wrds-web.wharton.upenn.edu/wrds/support/Data/004Research%20Applications/003Research%20Guides/000Files%20for%20Thomson%20Reuters%2013F%20Database%20Research%20Applications/Institutional_Trades.cfm).

## II. Sample Overview and Empirical Motivation

### *A. Sample of Original and Amendments to 13F Filings*

A key data component to this study is the original 13F filings and amendments to these filings by all institutions. We retrieve directly both the original and amendment 13F filings (forms 13F-HR and 13F-HR/A<sup>10</sup>) dated between March 1999 and June 2007 from the SEC's EDGAR database. Our sample starts with the inauguration of the SEC's requirement of electronic filing of Form 13F, and ends in 2007 to allow ex post performance evaluation. We retrieve information about original filings directly from the SEC (rather than from Thomson Reuters), to maintain symmetry and comparability between the paired filings. Despite the large variation in the reporting style and format, we are able to process the complete holdings information for 91% of all the 13F filings using a combination of automated programming and manual processing. The resulting initial sample consists of 3,315 filing institutions, covering 86.1% of the institutions that report their original 13F filings to Thomson Reuters over the same period and 174 more institutions that do not appear in the database at all.

Amendments to 13F filings contain two types of information: disclosure of an increase in a position that was previously filed or a new holding that was previously excluded from the original filings. We define a confidential holding as one that was excluded from the original filing or the difference between the amended position and the originally filed position. Our results are qualitatively similar if we impose a threshold for the difference in the second component or simply exclude the second component. Based on the main criteria, our initial sample consists of 1,857 confidential filings (including both approved and denied by the SEC) and 53,296 original 13F filings. By searching for key words (such as "denied" and "no longer warranted") on the first page of the amendments, we are able to separate amendments filed before or upon the expiration of approved confidential treatment and those filed in response to denials. The denial rate is 17.4% during our sample period.

Table I provides the summary statistics. Panel A reports the distribution of length of delay between filings and the quarter-end portfolio dates. Over 86% of original filings are filed within 45 days of the end of

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<sup>10</sup> A form 13F-HR/A states on its cover regarding whether it is an "Amendment" (i.e., whether it adds new holdings) or a "Restatement." For our purpose, we only include forms with the "Amendment" box checked.

quarter, conforming to the requirement by the SEC.<sup>11</sup> On the other hand, about 93% of confidential filings are filed more than 45 days from the quarter-end, justifying resorting to the amendments for delayed disclosure. Surprisingly, the distribution of the duration of confidentiality does not differ qualitatively between amendment filings that result from SEC approvals of confidential treatment and those from rejections (not tabulated). Such a lack of difference has two implications: First, some institutions file amendments before the approved term expires, presumably because the information has already become stale. Second, even denied applications effectively afford significant delays in disclosure.<sup>12</sup>

[Insert Table I here.]

In the analyses that follow, we exclude confidential holdings filed within 45 days of delay, as motives to conceal positions in these filings cannot be justified. We also filter out both types of filings with extremely long delays from their quarter-end portfolio dates: more than 180 days for the original filings and more than 1,505 days (four years plus the 45 days allowed for the original 13F filings) for the confidential filings. We suspect that these observations are results of data recording errors or irregular circumstances. These three filters combined remove about 1.3% of original filings and about 8.9% of confidential filings (see Table I, panel A). Our results are not sensitive to the particular numerical choices employed in these filters.

The resulting final sample consists of 52,272 original filings by 3,134 institutions, and 1,554 confidential filings by 232 institutions. Panel B of Table I summarizes the number of filings, number of institutions, the dollar value, and the number of stocks in this final sample. In classifying the type of institutions, we refine the Thomson Reuters classification of five institution types with manual checking. The details of this classification are described in the Appendix B. With this scheme, 13F institutions are classified as hedge funds, investment companies/advisors, banks and insurance companies, and others. Our refined classification scheme renders “others” into a small category (about 4% of the sample, from 37% in the original Thomson Reuters classification) of miscellaneous types, which we exclude from most of our analyses.

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<sup>11</sup> Aragon and Martin (2009) also found similar proportions of delayed original 13F filings. Only a very small number of institutions are repeatedly late in their original 13F filings. SEC may carry out criminal prosecution for the institutions which repeatedly file false or delayed 13F reports (Lemke and Lins (1987)).

<sup>12</sup> The effective delay in disclosure enjoyed by denied confidential treatment could potentially invite abuse. Our informal conversation with the SEC staff indicates that institutions which received repeated rejections could receive warnings and will be subject to more timely review in future applications. This view is consistent with our empirical analysis in Section V.

Conditional on an institution filing both an original and an amended 13F at a given quarter-end, the dollar value of the stock positions included in the confidential filings is significant: their average (median) value is 27.3% (13.4%) of the value of the complete portfolio of the institution. Moreover, confidential holdings tend to be larger positions than regular ones. The average confidential holding represents 1.25% of all the shares outstanding by the issuer, as compared to the average of 0.68% for the original holdings.

Hedge funds, the focus of our analyses, are manually classified 13F-filing institutions whose major business is sponsoring/managing hedge funds according to the information revealed from a range of sources, including the institution's own websites, SEC filings, industry directories and publications, and news article searches.<sup>13</sup> A Form 13F is filed at the "management company" rather than at the "portfolio" or at the individual fund level. For the purpose of our study, we restrict our sample to relatively "pure-play" hedge funds (such as Renaissance Technologies), and investment companies where hedge funds represent their core business (such as D.E. Shaw), and do not include full-service banks whose investment arms engage in hedge fund business (such as Goldman Sachs Asset Management), nor do we include mutual fund management companies that enter the hedge fund business (a relatively recent trend analyzed by Agarwal, Boyson, and Naik (2009), Cici, Gibson, and Moussawi (2010), and Nohel, Wang, and Zheng (2010)). Such restriction ensures that the equity holdings in the 13F filings are informative about the investments of hedge funds (Griffin and Xu (2009); Agarwal, Fos, and Jiang (2010)). Our final sample consists of 942 unique hedge funds.

For robustness, we repeat our analyses by cross-validating our hedge fund classification against information from Form ADV by investment advisors to register with the SEC. Specifically, we follow the prior literature (Brunnermeier and Nagel (2004), Griffin and Xu (2009)) to affirm the classification of a hedge fund if (1) at least 50% of its clients are "Other pooled investment vehicles (e.g., hedge funds)" or "High net worth individuals," and (2) it charges performance-based fees. This alternative filter produces a smaller list of 781 hedge funds. However, from other reliable information sources, we find that the 161 institutions excluded by this filter indeed have major hedge fund business. In fact, the Form ADV-based filter excludes well-established hedge funds such as Appaloosa, AQR, Bridgewater, Citadel, Fortress, Magnetar, and Relational Capital to name just a

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<sup>13</sup> For more details on the classification criteria of 13F-filing hedge funds, see Agarwal, Fos, and Jiang (2010).

few. For this reason, we use this alternative list only for robustness check, results of which are reported in Table IA.I in the Internet Appendix.

Panel C of Table I lists the ten institutions that were the most frequent confidential filers during our sample period, and the ten institutions that received the highest number of rejections from the SEC for their applications. The majority of institutions on both lists are hedge funds, and the rest are investment companies/advisors. Berkshire Hathaway is on both lists. D. E. Shaw and Caxton Corporation (currently renamed “Caxton Associates”), two of the top ten hedge fund companies in the U.S. as of 2007, have been rejected by the SEC for 100% of their applications during our sample period.<sup>14</sup>

Both panels B and C of Table I indicate that hedge funds are by far the leading category of confidential filers. They constitute for about 30% of all institutions, but 56% of all confidential filings, and take majority seats among the top 10 filers. Conditional on seeking confidential treatment, hedge funds on average relegate 23% of the stocks in their complete portfolio, or 34% of the total portfolio value, to confidential filings. In comparison, the same figures for non-hedge fund institutions are much smaller (13% and 21% for investment companies/advisors, and 9% and 11% for banks and insurance companies, respectively). Such patterns are consistent with hedge funds being active portfolio managers using proprietary trading strategies, for which delay in disclosure is important in order to protect private information and to minimize price impact. For these reasons, we focus on hedge funds as the primary subjects for our study, while providing brief overview for the other two categories of institutions (investment companies/advisors, and banks and insurance companies).

### *B. Motivations for Empirical Analyses*

After presenting the prevalence and distribution of confidential filings, we address questions about the incentives and consequences of seeking confidentiality.<sup>15</sup> A priori, both perceived private information and price impact could constitute major motives to seek confidentiality. Moreover, the two motives naturally share some

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<sup>14</sup> We followed these two institutions out of the sample period. Caxton ceased to seek confidential treatment after October 2005 when eight of its applications were rejected all at once. D. E. Shaw stopped confidential filing after its last one in our sample in June 2007 for about a year. It has filed three applications since June 2008 each of which covers 2-3 stocks only (compared to hundreds and thousands before). All the three applications received speedy reviews and were approved by the SEC. These two cases are consistent with the discussion in footnote 11.

<sup>15</sup> Some of the insights in the section came up during our discussions with hedge fund managers and other industry sources.

predictions as trading is an important way for private information to be impounded into prices.

Under the first hypothesis of private information being a major motive for confidentiality, hedge funds that seek more frequent confidential treatment should exhibit characteristics that are typical of more active and less conventional portfolio strategies which benefit more from delays in holdings disclosure. Such characteristics include high portfolio concentration, turnover rate, and portfolio idiosyncratic risk. By the same argument, the stocks in confidential holdings should be disproportionately involved in information-sensitive events (such as M&A attempts) or share characteristics that indicate higher information asymmetry, such as smaller firm size (Chari, Jagannathan, and Ofer (1988), Llorente, Michaely, Saar, and Wang (2002)), illiquidity (Glosten and Milgrom (1985)), higher distress risk (Griffin and Lemmon (2002)), lesser analyst following (Brennan and Subrahmanyam (1995), Hong, Lim, and Stein (2000), Chang, Dasgupta, and Hilary (2006)). Moreover, idiosyncratic volatility is a proxy for private, firm-specific information (Durnev, Morck, Yeung, and Zarowin (2003) which gets impounded into the price through informed trading (Chen, Goldstein, and Jiang (2006)), a characteristic that well fits the requirement for confidential holdings to be justified on a stock-by-stock basis.

The fact that confidential stocks tend to have high private information component does not sufficiently establish an information motive. What needs to be demonstrated further is that such information has value after the normal 45-day delay allowed for regular 13F filings. Chen, Jegadeesh, and Wermers (2000) show that profits from mutual fund research tend to accrue over a 12 to 18 month period after the new position is added to a fund's portfolio. While a performance evaluation of confidential holdings during the period of confidentiality beyond 45 days is an ultimate test for private information, we also uncover the continuing changes in confidential positions during the confidential periods to support the hypothesis that these holdings were hidden in order for the manager to take further advantage of such information.

A second major motive for confidentiality is to minimize price impact or to avoid being front-run on on-going transactions whether they are informed or not. Such costs could be substantial. Frank, Poterba, Shackelford, Shoven (2004) show that the after-fee returns of informed actively managed mutual funds could be rendered indistinguishable, or even lower than those of "copycat funds" who replicate their holdings as soon as the holdings are disclosed. Thinly traded stocks and funds with concentrated portfolios or high net flows are particularly vulnerable to price impact. Needless to say, characteristics associated with illiquidity have a large

overlap with those suggestive of information asymmetry because private information is a leading cause for illiquidity. The differentiating test thus rests on the return performance of the confidential holdings. If confidential treatment is sought for purely liquidity reasons, then the realized performance of the confidential holdings should be close to neutral. Nevertheless, a neutral performance in this case does not refute the benefits of confidentiality because the counterfactual—conducting large and sequential trades in the open air—may well lead to subpar performance.

Lastly, we consider three motives behind confidentiality seeking that aim at presenting a portfolio to market participants that are different from the actual one. The first is the “window dressing” motive, that is, hiding stocks that have characteristics that reflect negatively on the portfolio manager (i.e., poor past performance) or are perceived as undesirable by investors (i.e., high risk). The second is the “portfolio blurring” hypothesis, that is, hiding part of the portfolio which makes it more difficult for outside speculators (including both copycats and front runners) to reverse-engineer the trading strategy. Finally, there can be nefarious motive of misleading the market and manipulating the prices by hiding stocks. The filing institutions can potentially benefit from the temporary market reaction and eventual price reversion by placing side trades including using derivatives. Such behavior is illegal, and hence is usually difficult to detect in data.

Though different motives are not necessarily mutually exclusive and can share common predictions, the presence of positive abnormal returns of confidential holdings eventually separate private information from other motives for seeking confidentiality. Findings about performance should be viewed as a *lower bound* estimate for the abnormal return of information-driven confidential holdings if other motives are also present.

### **III. Determinants of Confidential Filings and Holdings of Hedge Funds**

By focusing on hedge funds, this section discusses the determinants of confidential filings at the institutional level (using institution-quarter data) and confidential holdings at the stock level (using institution-quarter-holding data). Unless otherwise specified, we adjust standard errors for heteroskedasticity and cluster them at the filing institution level, as well as control for time effects by including quarter dummies.

#### *A. Hedge Fund Characteristics and Propensity of Confidential Filings*

We resort to the following models to relate the characteristics of hedge funds to their propensity to use confidential filings. The first is a probit model:

$$(CF_{j,q} > 0) = (\beta InstChar_{j,q} + \lambda_q + \varepsilon_{j,q} > 0), \quad (1)$$

and the second is tobit model:

$$\begin{aligned} (Latent) \quad CF_{j,q}^* &= \gamma InstChar_{j,q} + \lambda_q + \omega_{j,q}, \\ (Observed) \quad CF_{j,q} &= \max(CF_{j,q}^*, 0). \end{aligned} \quad (2)$$

The dependent variable in (1),  $(CF_{j,q} > 0)$ , is the indicator variable for the existence of a confidential filing in the institution-quarter  $(j, q)$ . The dependent variable in (2) is the dollar value proportion of confidential holdings in the total portfolio (that include both confidential holdings and holdings disclosed in the original 13F filings) of the given institution-quarter. The regressors in both models include a vector of institutional characteristics variables ( $InstChar$ ) and quarterly dummies to control for unspecified time effects.

Results are reported in Table II. In addition to the coefficients and their associated t-statistics, we also report the average partial effects (APE) to facilitate the interpretation of the economic magnitude. For the probit model, the APE is defined as:

$$APE = E\left(\partial \Pr(CF_{j,q} > 0) / \partial InstChar_{j,q}\right) = \beta E\left[\phi\left(\beta InstChar_{j,q} + \lambda_q\right)\right]. \quad (3)$$

where  $\phi(\cdot)$  is the standard normal probability density function. The empirical analogue is constructed by replacing parameters with their estimates and using sample average to proxy for expectation.

[Insert Table II here.]

The  $\gamma$  estimate in the tobit model indicates the partial effect of the regressors on the latent variable:  $\partial CF_{j,q}^* / \partial InstChar_{j,q}$ , which is not usually of interest. Instead, the more meaningful APE concerns the effect of the regressors on the actual choice of confidential holdings, that is,  $\partial CF_{j,q} / \partial InstChar_{j,q}$ , which could be expressed as follows:

$$APE = E\left(\frac{\partial CF_{j,q}}{\partial InstChar_{j,q}}\right) = \gamma E\left[\Phi\left(\frac{\gamma InstChar_{j,q} + \lambda_q}{\sigma_\omega}\right)\right], \quad (4)$$

where  $\Phi(\cdot)$  is the cumulative probability function of the standard normal distribution. The reported APE are the



empirical analogues to (4).

Table II uses a set of *InstChar* variables, constructed mostly based on 13F quarterly holdings, to capture the degree of active portfolio management and the market impact of the institutions. More specifically, *Age* is the number of years since the institution's first appearance on Thomson Reuters. *PortSize* is the total equity portfolio size calculated as the market value of its quarter-end holdings. *Turnover* is the inter-quarter portfolio turnover rate calculated as the lesser of purchases and sales divided by the average portfolio size of the last and the current quarter.<sup>16</sup> *PortHHI* is the Herfindahl index of the portfolio, calculated from the market value of each component stock. *PortRet*, *PortVol*, and *IdioVol* are the monthly average return, total volatility, and idiosyncratic volatility of the portfolio during the quarter, assuming that the institution maintains the holdings of the last quarter-end. *IdioVol* is computed as the standard deviation of the residuals from the Carhart (1997) four-factor model (market, size, book-to-market, and momentum) using imputed monthly returns for the 36-month period ending in the current quarter.  $|Flow|$  is defined as the absolute change in total portfolio value between two consecutive quarters, net of the change due to returns, scaled by the portfolio size at the previous quarter-end. That is,

$$|Flow_{j,q}| = \left| \frac{PortSize_{j,q} - PortSize_{j,q-1}(1 + PortRet_{j,q})}{PortSize_{j,q-1}} \right|.$$

Table II reveals that several characteristics are significantly associated with more frequent confidential filings. First two are portfolio size (*PortSize*) and absolute flows ( $|Flow|$ ), consistent with larger hedge funds that have higher inflows or outflows bearing higher market impact and also having potentially larger capacity in collecting private information. An inter-quartile change in these two variables is associated with an increase in the probability of confidential filing by 2.7% and 0.3% percentage points. Second, several characteristics associated with active portfolio management are uniformly associated with more confidential filings. They include high portfolio turnover rate (*Turnover*), high portfolio concentration as measured by the Herfindahl index (*PortHHI*) (Kacperczyk, Sialm, and Zheng (2005)), and high portfolio idiosyncratic return volatility (*IdioVol*). The changes in the probability of confidential filing corresponding to the inter-quartile ranges of these three

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<sup>16</sup> Purchases (sales) are calculated as the sum of the products of positive (negative) changes in the number of shares in the holdings from the previous to the current quarter-end and the average of the stocks prices at the two quarter-ends. The logic of using the *lesser* (rather than the average) of purchases and sales is to free the measure from the impact of net flows—a practice used in mutual fund research (e.g., by Morningstar) in defining portfolio turnover rates.

variables are 3.2%, 0.9%, and 0.7% percentage points. These numbers are economically significant relative to the unconditional probability of 3.4%.

We argue that such a pattern is supportive of private information. First, a recent paper by Titman and Tiu (2011) find that better hedge funds (in terms of Sharpe ratios and information ratios) exhibit lower R-squared values with respect to systematic factors. Second, a long-equity portfolio with high idiosyncratic risks, conditional on portfolio concentration, implies component stocks of high idiosyncratic variations. Such stocks are shown by the literature reviewed in Section II.B as containing more firm-specific information. Finally, this pattern echoes Agarwal, Fos, and Jiang's (2010) finding that hedge funds which choose not to report to any commercial databases tend to have higher idiosyncratic volatility compared to the funds that do. Both their findings and ours indicate that hedge funds who adopt less conventional investment strategies value privacy more—they are more likely to refrain from voluntary disclosures or to seek exemptions from mandatory ones.

An alternative way to characterize hedge funds is to look at their stated investment style. Such information is only publicly available for the funds that voluntarily report to commercial hedge fund databases. Based on the 450 sample hedge funds (as 13F filing institutions) that have matches in a union of five major hedge fund databases (Center for International Securities and Derivative Markets (CISDM), EurekaHedge, Hedge Fund Research (HFR), Morgan Stanley Capital International (MSCI), Tremont Advisory Shareholder Services (TASS, now Lipper)),<sup>17</sup> we find that the top styles associated with seeking confidentiality are: Event Driven, Multi-Strategy, and Relative Value Arbitrage. Indeed these categories are likely candidates for “risk arbitrage” and “block positioning”, two major allowable reasons in the SEC guidelines for delay in disclosure.

### *B. Characteristics of Confidential Holdings*

We next examine the characteristics of stocks in confidential holdings and relate them to the various motives, especially private information.

The event that best exemplifies sensitive information, and acknowledged by the SEC as acceptable motives for confidentiality, is an “open risk arbitrage,” which involves a long position in the target stock (possibly paired with a short position in the acquirer's stock if a stock deal) right after the deal is announced. The position

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<sup>17</sup> Agarwal, Fos, and Jiang (2010) provides a detailed description of the union database as well as its matching to the 13F data.

is expected to be reversed when the deal is closed, and the profits come from the price convergence to the offer. We use the indicator variable (*M&A*) for a stock of the target in an announced (but not completed) M&A deal during the one-year period ending in the portfolio quarter as a proxy for the merger arbitrage motive of the confidential filing. About 86% of the announced deals in our sample were eventually completed. Data on M&A attempts, defined as an intended change-of-control, are retrieved from Securities Data Company (SDC).<sup>18</sup> Our final sample has 4,726 announced deals during the period of 1998-2007.

In addition, we use several variables that are firm-specific drivers of information asymmetry as discussed in Section II.B. More specifically, market capitalization (*Size*) at the quarter-end is obtained from CRSP. Book-to-market ratios (*B/M*) are recorded at year-end using data from CRSP and COMPUSTAT. We also include the market (CRSP value-weighted index) adjusted past twelve-month return (*Adj. Past Return*) to control for momentum. We employ a variant of the Amihud (2002) illiquidity measure (developed by Hasbrouck (2009)) as the proxy for trading liquidity (*Illiquidity*). The measure is constructed as the yearly average of the square root of  $|return|/(price \times volume)$ , essentially an empirical analogue to the inverse of Kyle's (1985) lambda, or the inverse of market depth. We measure analyst coverage of a firm by counting the number of analysts in the I/B/E/S database (available through WRDS) that make at least one forecast or recommendation on the firm during the year (*Analysts*). We proxy the probability of financial distress with the distance-to-default (*DtD*), which refers to the number of standard deviation decreases in firm value before it drops to the face value of debt (i.e., the firm is in default). This measure is motivated by Merton's (1974) bond pricing model and estimated for each firm at each year-end following the procedure in Vassalou and Xing (2004). Because *DtD* is a one-sided measure, we use a dummy variable for *DtD* to be smaller than 1.64 as an indicator for non-negligible distress risk (i.e., the estimated probability of distress being 5% or higher). Finally, we measure the *Volatility* and *IdioVol* by the standard deviation of the returns and residuals from Carhart (1997) four-factor model for past 36 months of stock returns, respectively.

Table III panel A reports the summary statistics of stock-level variables discussed above separately for positions included in the original filings and those in the confidential filings of hedge funds. Differences along all dimensions are statistically significant at the 1% level in favor of greater information asymmetry in the

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<sup>18</sup> This data was obtained from Edmans, Goldstein, and Jiang (2009). We thank the authors for sharing the data.

confidential holdings. Stocks in confidential holdings of hedge funds are smaller, have higher book-to-market ratio, lower analyst coverage, higher distress risk, higher volatility, and higher idiosyncratic volatility compared to the stocks in the original filings of hedge funds. Moreover, stocks in confidential holdings are far more likely to have been recent targets in M&A announcements, a probability of 7.5% versus 4.1% for the original filings, pointing to risk arbitrage as an important motive underlying confidential treatment.<sup>19</sup> The Stark Onshore Management LLC featured in Appendix A is an example: 39 out of 55 confidential holdings were targets in M&A announcements within a year up to the quarter-ends.

[Insert Table III here.]

Many of the variables, such as *Size*, *Illiquidity*, *Analyst*, and *Idio. Vol.*, also represent established proxies for trading liquidity. Hence, some of the results also conform to the hypothesis of trading impact motive. On the other hand, stocks in confidential filings experience slightly higher (not statistically significant) market-adjusted returns in the past twelve months as those of original holdings, which contradicts a performance-based window dressing motive where money managers hide losing positions in order to make their disclosed portfolios look smart. Nevertheless, confidential holdings' significantly higher total and idiosyncratic volatilities are still consistent with a risk-based window dressing motive by money managers to make their portfolio appear less risky to their investors. This result is analogous to Musto's (1999) findings regarding money-market fund managers' over-weighting less risky government issues before portfolio disclosure dates.

The univariate analyses in Table III panel A are supplemented with multivariate logistic regressions. The model specification is as follows:

$$CH_{i,j,q} = (\lambda StockChar_{i,q} + \alpha_q + \delta_{Ind} + \varepsilon_{i,j,q} > 0), \quad (5)$$

where  $CH_{i,j,q}$  is a dummy variable equal to one if stock  $i$  is in the confidential holdings of institution  $j$  in quarter  $q$ . The all-sample average of  $CH_{i,j,q}$  is 2.2%.  $StockChar_{i,q}$  is the same vector of stock characteristics variables used in panel A. In addition to the quarterly dummies ( $\alpha_q$ ), the Fama and French (1997) 10 industry dummies (

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<sup>19</sup> In contrast, *future* M&A targets are not over-represented in the confidential holdings, that is, hedge funds speculating on future M&A activities do not systematically resort to confidential filings to hide their predicted targets. One explanation is that the SEC exercises heightened scrutiny on trading before M&A announcement. Therefore, hedge funds may not want to explicitly seek confidentiality for such potentially legally sensitive positions.

$\delta_{ind}$ ) are added to regression (5) to control for unobserved heterogeneity at the industry level. Results without the industry dummies are qualitatively similar and marginally stronger. Reported in Table III panel B are the estimated coefficients  $\hat{\lambda}$ , their associated t-statistics, and the average partial effects (APE) of the  $StockChar_{i,q}$  variables. More specifically, the APEs are computed as the empirical analogue to

$$E\left[\partial \Pr(CH_{i,j,q} = 1) / \partial StockChar_{i,q}\right] = \lambda E\left\{\frac{\exp(\lambda StockChar_{i,q} + \alpha_q + \delta_{ind})}{[1 + \exp(\lambda StockChar_{i,q} + \alpha_q + \delta_{ind})]^2}\right\}.$$

Because *Size*, *Analyst*, *Illiquidity*, *Volatility* and *Idio. Vol.* have high pairwise correlations (with absolute values above 0.60), we try specifications that have only one of these five variables at a time (corresponding to columns 1 to 5), as well as having four of these five variables together in specifications (6) and (7). Results in panel B provide messages broadly consistent with those from panel A.

More specifically, targets of announced M&A deals have probabilities of being confidential holdings that are two percentage points higher than non-targets, about doubling the unconditional probability for stocks to appear in confidential filings. Inter-quartile changes in *Size*, *Illiquidity*, *Analyst*, and *Idio. Vol.* are associated with incremental probabilities of -1.5%, -0.3%, -0.1%, and 0.1% percentage points. Such magnitudes (especially those associated with *Size* and *Illiquidity*) are sizable relative to the unconditional probability, indicating that these variables are driving significant portion of variations in the data.

### C. Trading during the Confidential Period

If hedge funds are protecting private information through confidentiality because the information still has value, or are trying to minimize price impact on continuing liquidity-driven acquisition, then they should be expected to trade more stocks in the confidential holdings during the period of confidentiality. If the private information has run its course or if the planned acquisition is complete, then revealing the holdings information could even help increase the value of their holdings (Fishman and Hagerty (1995)). This section investigates these issues by analyzing inter-quarter trading during the confidential periods. Results are reported in Table IV.

[Insert Table IV here.]

Table IV reveals several notable contrasts between hedge funds' trading in confidential and original holdings from the two-sample t-tests. The initial positions (as percentage of shares outstanding) are only slightly

(not significant) larger in the confidential stock, but hedge funds trade more aggressively on their confidential positions during the following quarters within the confidential periods. The aggressiveness in trading is measured by both total trading volume (the sum of unsigned inter-quarter changes in holdings, scaled by either shares outstanding or by the initial position), and the difference between the maximum and initial position (using the same scaling variables). Trading activities in confidential holdings more than double those in original holdings by the same funds using all measures, and all differences but one are significant at the 5% level. For example, the average total trading volume in confidential stocks is 0.96% of the shares outstanding, vs. 0.34% for the average stock in the original holdings. The maximum position in a confidential stock during the confidential period is 6.55 times the initial position on average, while the same multiple for a stock in the original holdings is 3.03. Finally, it takes longer for hedge funds to accumulate to the maximum position of a confidential holding (2.58 quarters on average) than a regular holding (0.93 quarters), justifying the needs to seek confidentiality beyond the normal delay of 45 days from the quarter end.

#### **IV. Performance of Confidential Holdings of Hedge Funds**

The presence of positive abnormal returns is necessary to differentiate the private information hypothesis from alternative motives to seek confidentiality. This section thus conducts the performance analysis.

##### *A. Choice of Performance Measure*

We adopt two abnormal performance measures. The first is the Carhart (1997) four-factor alpha using imputed daily returns assuming the holdings of the previous quarter-end. We do not resort to Fung and Hsieh (2004) hedge fund factors because they are meant for alternative asset classes while we are analyzing equity positions exclusively. The second performance measure is the Daniel, Grinblatt, Titman, and Wermers (1997) (henceforth “DGTW”) benchmark-adjusted returns. We form 125 portfolios, in June of each year, using all the common stocks listed on NYSE, AMEX and NASDAQ based on a three-way quintile sorting along the size (using the NYSE size-quintile), book-market ratio, and momentum dimensions. The abnormal performance of a given stock is its return in excess of that of the benchmark portfolio it belongs, and the average DGTW benchmark-adjusted return for each portfolio aggregates over all the component stocks using value-weighting in

the portfolio. Sensitivity analysis using equal weights yields similar results.

While alpha is the most commonly used metric to assess abnormal returns in the literature, the DGTW measure has the advantage for its focus on stock picking abilities. Daniel, Grinblatt, Titman, and Wermers (1997) decompose the superior performance of a money manager into stock selectivity, style timing, and execution costs. Given that applications for confidential treatment need to be made at the individual stock level, the justifiable private information should mostly be stock-specific rather than about asset classes or overall market timing. Further, our analyses are based on holdings that do not incorporate transaction costs. Therefore, the DGTW measure, which corresponds to the stock characteristic selectivity component, serves well as a complement to the more conventional alpha measures.

### *B. Comparing Return Performance of Confidential and Original Holdings*

We assess the performance of confidential holdings by comparing their abnormal returns during the confidential periods to those of the original holdings of the same institution during the same periods of time. We group the length of confidential periods into seven grids from two months up to one year, where each specific horizon includes confidential periods that are at least as long as that horizon but shorter than the next horizon. For example, all confidential filings that are filed at a delay of at least three months but shorter than four months from the portfolio quarter-end are grouped in the three-month horizon grid. Constraining performance evaluation of confidential holdings to be within their confidential periods is necessary to both ensure the property motive for remaining confidential and to avoid the price impact due to disclosure.

Panel A of Table V reports the return performance of original and confidential holdings separately, as well as their differences, using value-weighted four-factor alpha and the DGTW benchmark-adjusted return measure. For the DGTW measure, the same benchmark portfolio is used throughout the return horizon under consideration to ensure consistency.

[Insert Table V here.]

The results provide strong evidence that confidential holdings exhibit higher benchmark-adjusted returns compared to original holdings over all seven horizons from two to twelve months, where the differences are statistically significant at the 10% level or better for all but one horizon. The difference in the four-factor alpha amounts to 2.57 (2.05) basis points daily over the two-month (twelve-month) horizon, corresponding to

annualized return spreads of 6.48 (5.17) percentage points in favor of confidential holdings.<sup>20</sup> Similarly, the difference in the DGTW measure is 5.26% (7.51%) over the two-month (twelve-month) horizon. The presence of such superior returns supports that confidential holdings are more informed than original holdings, even though the price impact motive cannot be completely ruled out. Moreover, the persistence of the abnormal returns up to one year suggests that returns are unlikely to be driven by the temporary price pressure from trading by the filers.

Griffin and Xu (2009) document limited evidence of skill by hedge funds using the original holdings from Thomson Reuters Ownership database. To facilitate comparison, we apply their methodology separately on hedge funds' original and confidential holdings, that is, we compute the raw returns and DGTW benchmark-adjusted returns at three months after the quarter-end for each institution-quarter using both value- or equal-weighting, and then average across all institution-quarter portfolios in the sample period. The results are reported in the panel B of Table V. We replicate the results of Griffin and Xu (2009) regarding original holdings, but further show that the confidential holdings significantly outperform the original holdings of hedge funds by 5.0% (3.5%) per annum using the value-weighted (equal-weighted) DGTW benchmark-adjusted returns. This comparison reiterates the private information motive underlying hedge funds' confidential filings as well as the presence of their superior stock selection ability.

### *C. Acquisition- and Disposition-Motivated Confidential Holdings*

Hedge funds may seek confidential treatment for stocks that are part of the ongoing acquisition or disposition plans. When information driven, the nature of the two types could be quite different as the former (latter) should entail positive (negative) private information. A separation of the two types can sharpen our tests.

The acquisition/disposition purpose is not explicitly stated in the confidential filings and therefore can only be identified with an approximation algorithm. For each stock in a confidential filing, we compare the position (adjusted for stock splits) at the current quarter-end ( $t$ ) to that of the same stock by the same institution at the previous quarter-end ( $t-1$ ), and classify net increase (decrease) as acquisition (disposition). In case of no change (5.4% of the sample), we break the tie by relying on the position change of the same stock in the next quarter forward ( $t+1$ ) relative to the current one. This algorithm is analogous to Lee and Ready (1991) in

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<sup>20</sup> Using the simple one-factor alpha would yield a difference of 1.76 (2.74) basis points per day over the two-month (twelve-month) horizon, corresponding to annualized return spreads of 4.43 (6.90) percentage points.



classifying the direction of trades. Such an algorithm classifies 80.7% (19.3%) of the confidential positions of hedge funds as acquisition- (disposition-) motivated. Table VI replicates Table V separately for acquisitions and dispositions.

[Insert Table VI here.]

Table VI confirms that acquisition-motivated confidential holdings exhibit higher benchmark-adjusted returns compared to original holdings, and differences are statistically significant for almost all horizons up to one year. The spreads at different horizons are also economically significant. At the one-year horizon, the performance difference amounts to 3.88 and 7.06 percentage points using four-factor alphas and DGTW measure respectively. In contrast, results of disposition-motivated subsample are not nearly as consistent, possibly because on-going dispositions are more likely to be liquidity driven. In such cases, hedge funds may still benefit from confidential filings in mitigating the adverse price impact that might ensue had they carried out the disposition in the open, even though we do not observe as strong abnormal returns of these confidential positions.

In a robustness check, we classify acquisitions and dispositions by primarily relying on the position changes from the current to the subsequent quarter-end (i.e., a “forward” rather than the “backward” classification approach used in Table VI). Results, reported in Table IA.II in the Internet Appendix, are qualitatively similar.

#### *D. Sensitivity checks*

First, like all the studies based on the quarter-end holdings data, our study does not capture the effects of inter-quarter trades and assumes that portfolios at any given time are identical to those at the previous quarter-end. If some inter-quarter trades are informed, then our return results are biased downwards. The quarter-end portfolio formation assumption also tends to produce conservative return measures if the positions are actually accumulated throughout the quarter. However, this stringent assumption is necessary to avoid any look-back bias or attributing superior performance to momentum trading, and is the default method adopted by the literature. If we adopt the same aggregation procedure as in Panel A of Table V but use beginning of the quarter as the portfolio formation date, return measures are markedly higher: 3.2% for original and 5.0% for confidential holdings during the holding quarter. The difference of 1.8% (7.2% annualized) is highly significant (t-statistic = 4.81). The truth is probably somewhere between, but we do not wish to over-interpret the strengthened results given the possible look-back bias for any assumed portfolio formation date other than the quarter-end.

Second, the presence of derivatives in hedge funds' positions may bias our results if they are systematically used to offset the long positions filed in the 13F, especially those in the confidential holdings. While we cannot refute such a possibility due to the lack of disclosure and transparency of derivatives holdings, two pieces of evidence are helpful. The first piece is provided by Ang, Gorovyy, and van Inwegen (2010). Using a proprietary dataset from a large fund of hedge funds, they show that hedge funds following equity and event-driven strategies (which constitute a great majority of the funds in our sample) have the lowest leverage through derivatives among all major strategy categories.

The second piece of evidence comes from our own analysis of abnormal performance of confidential and original holdings after excluding those stock positions that are accompanied with reported positions in call and/or put options. For this purpose, we collect information on all option positions included in both confidential and original holdings from SEC's EDGAR database. Almost all exchange traded options are "13(f) securities" and their holdings are required to be disclosed in the Form 13F,<sup>21</sup> but this information is not available in Thomson Reuters Ownership database. Our sample hedge funds have only a small fraction of option positions disclosed in their holdings with the mean call, put, and a combination of call and put positions equaling 0.8%, 0.6%, and 0.6% of the stock positions and the median positions being all equal to zero. More importantly, when we exclude the stocks with option positions in the original and confidential holdings, we continue to find stocks in confidential holdings perform better than those in the original holdings. Results are reported in Table IA.III of the Internet Appendix. Outperformance for the two-month to twelve-month horizons ranges from 2.48% to 1.64% for four-factor alpha, and from 4.76% to 7.01% for DGTW measure.

Next, we replicate panel A of Table V for the category of investment companies/advisors, and report results in Table IA.IV of the Internet Appendix. The abnormal returns for the confidential holdings of this category are similar to those of hedge funds but weaker in magnitude. This is expected as hedge funds are arguably the most active portfolio managers and among the most aggressive in seeking private information. Banks and insurance companies are only sporadic users of the confidential treatment (see Table I, panel B) and

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<sup>21</sup> We check the list of 13(f) securities, published by the SEC for the last quarter of 2007, and find that it includes 96.4% of the options (by the issuers) and 97.1% of the trading volume (by dollar values) covered by the OptionMetrics database (available through WRDS). Moreover, 19.8% of the options listed as the 13(f) securities were not covered by OptionMetrics, and were most likely non-exchange traded.

their confidential holdings do not exhibit any positive abnormal returns.

Finally, we ensure that our results are not driven by a handful of outlying institutions listed in Table I.C who sought confidentiality frequently and were rejected most of the time. Such institutions, notably, Caxton Corporation and D.E. Shaw & Co. Inc., may have resorted to confidential filings as a systematic way to avoid revealing their holdings, rather than to protect occasional stock-level private information. When we exclude these two institutions, we find slightly stronger results, as shown in Table IA.V of the Internet Appendix.

## V. Approval and Denial of Confidentiality

The SEC rules state clearly that confidential treatment is meant to be an exception rather than a rule. Given the perceived benefits of seeking confidentiality, it is necessary to discuss the associated costs of doing so, especially beyond the intended purpose. So far in our analyses, we have pooled confidential filings that are approved and denied, where the latter constitute 22% of all applications by hedge funds in our sample. An analysis on the causes for rejection and the resulting market responses helps us to assess the cost of denials.

### A. Causes for Denials of Confidentiality Requests

The SEC does not publicize the specific reasons for rejecting individual applications other than stating the general principle of requiring adequate factual support for the need of confidentiality on a stock-by-stock basis. Therefore, we attempt to reverse-engineer the causes for denials on a large sample basis using the following probit model:

$$(Denial_{j,q} > 0) = (\delta CFChar_{j,q} + \omega InstChar_{j,q} + \mathcal{G}_q + \xi_{j,q} > 0), \quad (6)$$

The dependent variable,  $(Denial_{j,q} > 0)$ , is the indicator variable for the denial of a confidential filing in the institution-quarter  $(j, q)$ . The regressors include a vector of confidential filing characteristics ( $CFChar$ ), institutional characteristics ( $InstChar$ ), and quarterly dummies to control for unspecified time effects.

Table VII reports the estimation of equation (6), conditional on the subsample of confidential filings. We first identify several observable characteristics from confidential filings, i.e., the number of past filings ( $\# Past CF$ ), the frequency of denials in the past ( $\% Past Denied$ ), the number of distinct stocks in the filings as a fraction of total number of distinct stocks held ( $\% Conf. Stocks$ ), the value of the confidential holdings ( $Value CF$ ), the

value of the confidential holdings as fraction of the value of total holdings (*% Value CF*), and the average shares in confidential holdings as a percentage of shares outstanding (*Avg. Conf. Position*). Since four of our variables — *% Conf. Stocks*, *% Value CF*, *Log(Value CF)*, and *Avg. Conf. Position*, are highly correlated, we first report the results by including them individually in specifications (1) to (4) in Table VII. The next two specifications (5) and (6) show the results pooling the regressors but still excluding either *% Value CF* or *Log(Value CF)* due to the near-perfect collinearity between these two variables.

[Insert Table VII here.]

We expect that the denial decision to be positively related to *% Conf. Stocks*, *Value CF*, *% Value CF*, and *Avg. Conf. Position* given that the intended purpose of the amendment to 13(f) is to provide occasional relief from disclosure for a small number of stocks by institutions who can demonstrate adequate factual support. We also expect that institutions that have been denied frequently in the past earn a reputation of potential abusers, which endangers their future prospects of obtaining approvals. Our findings are broadly consistent with these predictions.

First, in all specifications, we find denial probabilities are positively related to past denial rates, and this is the single most important predictor of future denials. For two otherwise comparable institutions with past denial rates of zero and 50% respectively, the probability of their future success in obtaining approval will differ by 27% percentage points, indicating a serious cost from a bad reputation. Second, we observe higher denial probabilities are positively and significantly (at the 5% level) associated with both *% Conf. Stocks* and *Avg. Conf. Position*. Third, we observe that the estimated coefficients of *Log(Value CF)* and *% Value CF* are negative and significant (at the 10% level) in specifications (5) and (6), indicating greater probability of denial when funds try to mask a larger portion of their portfolios.

The above results are robust to the inclusion of fund characteristic variables that we employed in Table II to analyze the determinants of confidentiality seeking. In addition, we find negative coefficients on *Log(PortSize)* and *Turnover*, statistically significant at the 5% and 10% levels, respectively. Therefore, the confidentiality requests by larger and more actively managed (i.e., high turnover) hedge funds are less likely to be denied by the SEC, consistent with these funds being the ones likely to possess private information and being vulnerable to price impact.

## *B. Market Reaction to Disclosure of Confidential Filings*

We study the market's reaction to the disclosure of the confidential filings, especially ones in response to SEC denials, for two related purposes. First, a significant market reaction to positions involuntarily disclosed due to relatively speedy denials is a powerful piece of evidence supporting the private information motive of seeking confidentiality. Moreover, such a market reaction is costly to the filer because the market price adjustment prevents the filer from further benefiting from the private information now prematurely revealed. This should restrain the institutions from seeking confidentiality aggressively because, as Table VII shows, past denials make future approvals less likely.

To sharpen our tests, we focus on the market's reaction to the quick denials, classified as filings that are denied within 45-180 days after the quarter-end portfolio date. In these cases, funds will be forced to reveal their stock positions earlier than they would choose to. If the positions contain private information, their exogenous revelation should generate market reactions. In contrast, when hedge funds voluntarily disclose their approved confidential holdings after a similar length of delay, there should not be significant market responses because the funds presumably have fully benefitted from their information.

We design the tests along this line and report the results in Table VIII. More specifically, Table VIII reports the average cumulative abnormal returns (CAR) for the quick denials and accepted confidential filings over three windows around the event date:  $[-1, +1]$ ,  $[-2, +2]$ , and  $[-5, +5]$  days. The event date is the amendment filing date that discloses the confidential positions, and the event study is conducted separately for the involuntary disclosures due to denials and the voluntary disclosures of approved filings. For each filing, the CARs of individual stocks are equally weighted and estimated using a market model with equally-weighted CRSP market index, where the factor loadings are estimated with daily data over a period of 300 to 91 days before the event date. Betas are estimated using Scholes and Williams (1977) approach to account for non-synchronous trading. The mean CARs for the quick denials over the three windows are positive: 0.54%, 0.97%, and 1.19%, and are all significant at the 5% level. In contrast, the mean CAR figures for the accepted confidential filings are smaller and none is significant. These results again support the private information hypothesis.

[Insert Table VIII here.]

## VI. Concluding Remarks

Despite a general lack of economically significant and persistent abnormal performance among active portfolio managers as a whole as documented by the literature (French, 2008), our study of a selective subset of institutional investors' portfolios, i.e., the confidential holdings of hedge funds, reveals positive evidence of managerial skills.

Our findings also offer an explanation to the ongoing resistance by investment managers against ownership disclosure, and inform the debate on the optimal level of ownership disclosure. While timely disclosure contributes to market transparency and enhances investor monitoring of money managers, it may also dilute the incentives for active portfolio managers to acquire information by encouraging free-riding and front-running. We show that confidential treatment provides tangible relief for institutions from revealing their private information about the issuers before reaping the full benefits, and from incurring additional trading cost due to leakage of information regarding their own on-going trading plans. Except for a handful of extreme cases, we find that the great majority of institutions resort to confidentiality selectively.

Our study also points to the limitation of using conventional 13F databases that ignore confidential holdings. The bias is likely to be small if the purpose of the research is to track aggregate institutional ownership in public companies or to assess the overall portfolio performance of any large sample of institutional investors. However, given the importance of confidential holdings conditional on a confidential filing (on average, one-third of the total portfolio value for hedge funds), their disproportionate association with information sensitive events (notably M&As), and their concentration on stocks with higher level of information asymmetry, ignoring them could be a significant omission in analyzing position changes of individual institutions or in response to specific events. Such information is also potentially important for investment managers who use Form 13F information in formulating investment strategies, predicting implementation costs, and identifying likely counterparts in large trades.

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## Appendix A: Confidential Holdings of Stark Onshore Management LLC

This table lists all the common stock confidential holdings reported in the 13F amendments filed by Stark Onshore Management LLC over the sample period 1999Q1-2007Q2. “Issuer Name” is the name of the company issuing the common stock. “Shares” is the number of shares held by Stark Onshore on the portfolio date. “Portfolio Date” is the quarter-end date for which the portfolio holdings are reported. “Filing Date” is the date when the 13F amendment is filed. “Thomson Reuters” is an indicator variable for whether the holding is reported to the Thomson Reuters Ownership Database. “M&A Target” is an indicator variable for whether the issuer company was a target in a merger and acquisition announcement during four-quarter period ending in the portfolio quarter.

Issuer Name	CUSIP	Shares	Portfolio Date	Filing Date	Thomson Reuters	M&A Target
Anthem Inc	94973V10	67,360	9/30/2004	2/14/2005	No	No
Cox Communications Inc	22404410	269,964	9/30/2004	2/14/2005	No	No
Metro-Goldwyn-Mayer Inc	59161010	60,000	9/30/2004	2/14/2005	No	Yes
Sears Holdings	81238710	390,800	12/31/2004	5/13/2005	No	Yes
Symantec Corp	87150310	161,650	12/31/2004	8/16/2005	No	No
Gold Fields Ltd	38059T10	73,277	3/31/2005	8/16/2005	No	No
Symantec Corp	87150310	161,650	3/31/2005	8/16/2005	No	No
Sungard Data Systems	86736310	1,557,250	3/31/2005	9/27/2005	No	Yes
Unocal Corp	91528910	393,650	3/31/2005	9/27/2005	No	No
MCI Communications Corp	55269110	2,103,850	3/31/2005	2/15/2006	No	Yes
Sungard Data Systems	86736310	1,557,250	6/30/2005	9/27/2005	No	Yes
Unocal Corp	91528910	393,650	6/30/2005	9/27/2005	No	Yes
Brookstone Inc	11453710	98,463	6/30/2005	10/7/2005	No	Yes
Infousa Inc New Com	45670G10	221,542	6/30/2005	10/7/2005	No	Yes
Metals Usa Inc	59132420	183,275	6/30/2005	10/7/2005	No	Yes
Cablevision Systems Corp	12686C10	281,250	6/30/2005	1/6/2006	No	Yes
Medicis Pharmaceutical	58469030	13,750	6/30/2005	1/6/2006	No	No
AT&T Corp	00195750	6,250	6/30/2005	2/15/2006	No	Yes
MCI Communications Corp	55269110	1,119,450	6/30/2005	2/15/2006	No	Yes
Gold Banc Corp Inc	37990710	555,203	9/30/2005	12/15/2005	No	No
AT&T Corp	00195750	6,250	9/30/2005	2/15/2006	No	Yes
Bei Technologies Inc	05538P10	46,200	9/30/2005	2/15/2006	No	Yes
Cablevision Systems Corp	12686C10	281,250	9/30/2005	2/15/2006	No	Yes
Chiron Corp	17004010	506,040	9/30/2005	2/15/2006	No	Yes
Hibernia Corp	42865610	525,000	9/30/2005	2/15/2006	No	Yes
MCI Communications Corp	55269110	1,119,450	9/30/2005	2/15/2006	No	Yes

Issuer Name	CUSIP	Shares	Portfolio Date	Filing Date	Thomson Reuters	M&A Target
Medicis Pharmaceutical	58469030	13,750	9/30/2005	2/15/2006	No	No
Metals Usa Inc	59132420	185,775	9/30/2005	2/15/2006	No	Yes
Petrokazakhstan Inc	71649P10	93,750	9/30/2005	2/15/2006	No	No
Guidant Corporation	40169810	61,650	9/30/2005	5/19/2006	No	Yes
Boston Scientific Corp	10113710	506,250	12/31/2005	5/19/2006	No	No
Guidant Corporation	40169810	397,011	12/31/2005	5/19/2006	No	Yes
Ipayment, Inc	46262E10	26,360	12/31/2005	5/19/2006	No	Yes
Independence Comm. Bank Corp	45341410	373,797	12/31/2005	6/5/2006	No	Yes
Albertson's Inc	01310410	392,240	3/31/2006	6/5/2006	No	Yes
Independence Comm. Bank Corp	45341410	13,677	3/31/2006	6/5/2006	No	Yes
Education Management Corp	28139T10	411,591	3/31/2006	8/15/2006	No	Yes
Thomas Nelson	64037610	75,360	3/31/2006	8/15/2006	No	Yes
Capital One Financial	14040H10	110,000	3/31/2006	11/20/2006	No	No
Engelhard Corp	29284510	72,800	3/31/2006	11/20/2006	No	Yes
Keyspan Corp	14040H10	396,780	3/31/2006	2/20/2007	No	Yes
Capital One Financial	14040H10	145,000	6/30/2006	11/20/2006	No	No
Commercial Capital Bancorp, Inc	20162L10	443,073	6/30/2006	11/20/2006	No	Yes
Exelon Corp	30161N10	783,500	6/30/2006	11/20/2006	No	No
Fisher Scientific Intl	33803220	116,080	6/30/2006	11/20/2006	No	Yes
Kinder Morgan Inc	49455P10	202,340	6/30/2006	11/20/2006	No	Yes
Nco Group Inc	62885810	407,999	6/30/2006	11/20/2006	No	Yes
Public Service Enterprise Group	74457310	730,774	6/30/2006	11/20/2006	No	No
Keyspan Corp	49337W10	540,040	6/30/2006	2/20/2007	No	Yes
Longview Fibre Co	54321310	40,000	6/30/2006	2/20/2007	No	Yes
Constellation Energy Group Inc	21037110	648,660	6/30/2006	5/3/2007	No	Yes
Northwestern Corp	66807430	175,832	6/30/2006	5/3/2007	No	Yes
Univision Communications Inc	91490610	1,298,435	6/30/2006	5/3/2007	No	Yes
Multi Fineline Electronix In	62541B10	933,653	3/31/2007	5/16/2007	No	No
Rouse Co	77927310	269,910	9/30/2004	11/25/2004	Yes	Yes

## **Appendix B: The Classification of 13F Filing Institutions**

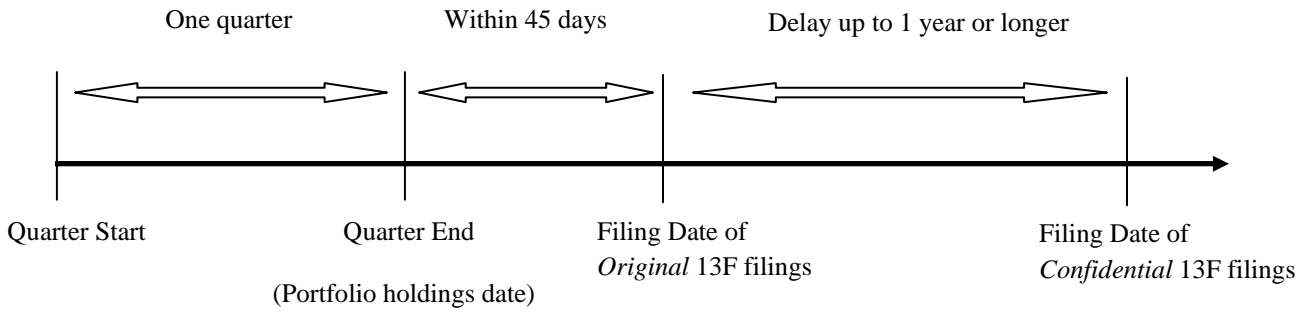
The classification of institution types employed in this paper refines that used in the Thomson Reuters database. Thomson Reuters divides all institutions into five types: banks (type code = 1, mostly commercial banks), insurance companies (type code = 2), investment companies (type code = 3, mostly mutual fund management companies), independent investment advisors (type code = 4, including asset management companies, investment banks, brokers, private wealth management companies, etc.), and others (type code = 5, including pension funds, endowment funds, most of the hedge funds, financial arms of corporations, and others). The type code 5, especially since 1998, is known to be problematic in that the category could include many misclassified institutions that should be assigned with the other type codes (mostly, type code 4), a problem acknowledged by the database. As a result, the “other” category, instead of being a residual claimant, turns out to be the largest category in the Thomson database, accounting for over 50% of all institutions in recent years.

We made the following changes to the Thomson classification of institutional categories. We first divide all institutions into four groups: (i) hedge funds, (ii) investment companies and investment advisors (a combination of type 3 and type 4 institutions by the Thomson classification, excluding hedge funds), (iii) banks and insurance companies (a combination of type 1 and type 2 institutions by the Thomson classification), and (iv) other institutions. For institutions in our sample that are not covered by Thomson, we manually classify them.

Next, we made major corrections for the “other” category as classified by Thomson. First, we reassign all hedge funds from this category. Second, we reassign an institution which has type code 5 after 1997 to an earlier code, if available and if different from 5. Third, we manually classify the remaining institutions (mainly based on information from the institutions’ websites and news articles) and reassign all investment companies and advisors. After all these corrections, the “other” category shrinks sharply to about 4% of all institutions in our sample.

**Figure 1**

**Time Line of the Original and Confidential 13F Filings**



**Table I**

**Summary Statistics of 13F Original and Confidential Filings**

Panel A of the table reports the distribution of the delay (in number of days) between the quarter-end portfolio date and the filing date for all original and confidential 13F filings (the “preliminary sample”). In Panel B, we use the “final sample” that excludes observations with extreme delays, i.e., more than 180 days for the original filings, and confidential filings with less than 45-day or more than 1,505-day (4 years plus 45 days) delay. Panel B summarizes the number of filings, the number of institutions, the dollar value, the number of stocks, and the average stock ownership share in the final sample. The classification of institutions (Hedge Fund, Investment Company or Advisor, Bank and Insurance) is described in the Appendix B. The statistics for the two types of holdings are reported separately, and those of the confidential holdings are compared to the combined portfolio of the confidential filings and their corresponding original holdings. Panel C reports the number of confidential filings and percent of rejected filings of the top ten institutions that seek confidential treatment and the top ten institutions that are most frequently denied of their requests for confidential treatment. Both the original and confidential filings are at the institution level. The institution types “HF” and “INVCO” are abbreviations of “Hedge Fund” and “Investment Company or Advisor”.

Panel A: Delay Period between Portfolio Date and Filing Date

<u>Original 13F Form Filings</u>									Total
Delay (in days)	0–30	31–45	46–60	61–180	> 180				
Number	12,332	33,645	5,424	1,190	705				53,296
Percent	23.14%	63.13%	10.18%	2.23%	1.32%				
<u>Confidential 13F Form Filings</u>									
Delay (in days)	0–30	31–45	46–60	61–180	181–410	411–775	776–1505	> 1505	
Number	34	105	123	485	703	277	103	27	1,857
Percent	1.83%	5.65%	6.62%	26.12%	37.86%	14.92%	5.55%	1.45%	
Total									55,153

Panel B: Summary Statistics of Original and Confidential Holdings by Institution Types

	Institution type			
	Hedge Fund	Investment Company or Advisor	Bank and Insurance	Total
<u>Original 13F Form Filings</u>				
# of institutions	942	1,842	350	3,134
# of 13F filings	14,002	31,963	6,307	52,272
\$ million per institution-quarter (Mean)	1,313.2	3,366.3	6,755.6	3,225.5
\$ million per institution-quarter (Median)	270.0	268.3	486.0	286.9
# of stocks per institution-quarter (Mean)	138.3	219.3	539.5	235.9
# of stocks per institution-quarter (Median)	63.0	92.0	220.0	90.0
% of outstanding shares (Mean)	1.16%	0.51%	0.52%	0.69%
% of outstanding shares (Median)	0.36%	0.10%	0.06%	0.13%
<u>Confidential 13F Form Filings</u>				
# of institutions	106	103	23	232
# of 13F filings	870	627	57	1,554
\$ million per institution-quarter (Mean)	743.0	1,048.1	793.3	876.3
% to original and conf. holdings combined (Mean)	33.8%	20.6%	11.4%	27.3%
\$ million per institution-quarter (Median)	156.4	151.5	49.6	147.8
% to original and conf. holdings combined (Median)	23.7%	5.3%	0.2%	13.4%
# of stocks per institution-quarter (Mean)	77.2	67.3	61.5	72.2
% to original and conf. holdings combined (Mean)	22.8%	13.2%	9.4%	18.3%
# of stocks per institution-quarter (Median)	7.0	11.0	7.0	8.0
% to original and conf. holdings combined (Median)	12.0%	3.2%	0.3%	6.7%
% of outstanding shares (Mean)	1.24%	1.29%	1.15%	1.25%
% of outstanding shares (Median)	0.76%	0.61%	0.43%	0.68%



Panel C: Top Ten Institutions Seeking Confidentiality and Top Ten Denied Institutions

Top Ten Institutions Seeking Confidentiality	Inst. Type	# Conf. Filings	% Rejected
Chesapeake Partners Management Co.	INVCO	112	6.3%
UBS Oconnor, L.L.C.	HF	79	1.3%
T. Rowe Price Assoc Inc	INVCO	70	5.7%
Berkshire Hathaway Inc	INVCO	65	72.3%
Satellite Asset Management	HF	64	9.4%
Lehman Brothers Inc.	INVCO	49	0.0%
HBK Investments, L.P.	HF	48	27.1%
Polygon Investment Partners	HF	40	0.0%
M.H. Davidson & Company	HF	39	0.0%
Stark Offshore Management, L.L.C.	HF	38	2.6%
Total:		604	79
% of the full sample		38.9%	29.3%

Top Ten Institutions with Denied Confidential Requests	Inst. Type	# Conf. Filings	% Rejected
Berkshire Hathaway Inc	INVCO	65	72.3%
D. E. Shaw & Co., Inc.	HF	17	100.0%
Relational Investors, L.L.C.	HF	24	62.5%
HBK Investments, L.P.	HF	48	27.1%
Staro Asset Management, L.L.C.	HF	25	52.0%
SAB Capital Advisors, L.L.C.	HF	26	46.2%
Atlantic Investment Co	INVCO	12	91.7%
RBS Partners, L.P.	HF	31	29.0%
Caxton Corporation	HF	9	100.0%
Two Sigma Investments, L.L.C.	HF	10	80.0%
Total:		267	154
% of the full sample		17.2%	57.0%

**Table II**  
**Determinants of 13F Confidential Holdings of Hedge Funds**

This table reports the results of the determinants of 13F confidential filings of hedge funds. The dependent variable of the probit model is an indicator variable for a filing to be confidential. The dependent variable of the tobit model is the dollar value of confidential holdings as a percentage of the total dollar value of holdings for an institution-quarter. Reported are coefficient estimates, and their t-statistics (in parentheses) and associated average partial effects (APE, in percentage points). *Log(Age)* is natural logarithm of the number of years since the institution's first appearance on Thomson Reuters. *PortSize* is the total equity portfolio size of an institution calculated as the market value of its quarter-end holdings. *Turnover* is the inter-quarter portfolio turnover rate calculated as the lesser of purchases and sales divided by the average portfolio size of the last and the current quarter. *PortHHI* is the Herfindahl index of the portfolio, calculated from the market value of each component stock. *PortRet* and *PortVol* are the monthly average return and volatility on the portfolio during the quarter, assuming that the institution maintains the holdings of the last quarter-end. *|Flow|* is the absolute change in total portfolio value between two consecutive quarters net of the increase due to returns, expressed as a percentage of the portfolio size at the previous quarter-end. *IdioVo* is the idiosyncratic volatility computed from the residuals to the four factors (market, size, book-to-market, and momentum) using imputed monthly returns for the 36-month period ending in the current quarter. Standard errors are adjusted for heteroskedasticity and clustering at the institution level. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level respectively.

	Probit Regressions			Tobit Regressions		
	(1)	(2)	(3)	(4)	(5)	(6)
Log(Age)	-0.001 (-0.06) -0.01%	-0.017 (-0.81) -0.12%	-0.018 (-0.90) -0.12%	0.018 (0.26) 0.06%	0.005 (0.08) 0.02%	0.004 (0.06) 0.01%
Log(PortSize)	0.191*** (9.55) 1.30%	0.200*** (10.82) 1.36%	0.198*** (10.15) 1.34%	0.127*** (3.54) 0.43%	0.133*** (3.70) 0.45%	0.131*** (3.70) 0.44%
Turnover	1.837*** (15.30) 12.47%	1.859*** (15.17) 12.60%	1.861*** (15.29) 12.60%	1.575*** (3.75) 5.34%	1.587*** (3.82) 5.38%	1.589*** (3.83) 5.38%
PortHHI	3.175*** (14.64) 21.55%	2.937*** (14.80) 19.91%	2.912*** (14.84) 19.72%	2.603*** (6.93) 8.82%	2.409*** (6.36) 8.16%	2.396*** (6.17) 8.12%
PortRet	-0.070 (-0.16) -0.48%	-0.100 (-0.24) -0.68%	-0.163 (-0.37) -1.10%	0.097 (0.18) 0.33%	0.064 (0.13) 0.22%	0.032 (0.06) 0.11%
Flow	0.196*** (6.61) 1.33%	0.192*** (6.42) 1.30%	0.194*** (6.53) 1.31%	0.170*** (4.11) 0.58%	0.167*** (4.13) 0.57%	0.168*** (4.14) 0.57%
PortVol	0.759 (0.98) 5.15%		-1.402 (-1.01) -9.50%	0.861 (0.75) 2.92%		-0.802 (-0.49) -2.72%
IdioVol		4.846*** (3.10) 32.85%	6.696** (2.40) 45.35%		4.068* (1.94) 13.79%	5.123* (1.73) 17.35%
Constant	-3.902*** (-21.10)	-3.975*** (-24.24)	-3.914*** (-20.88)	-3.092*** (-9.76)	-3.124*** (-10.17)	-3.089*** (-9.73)
Observations	12,845	12,845	12,845	12,845	12,845	12,845
Pseudo R-square	0.106	0.109	0.109	0.110	0.112	0.113
Unconditional Mean	3.39%	3.39%	3.39%	1.21%	1.21%	1.21%

**Table III**  
**Stock Characteristics of the Original and Confidential 13F Holdings of Hedge Funds**

Panel A compares the summary statistics of stocks in original and confidential 13F holdings of hedge funds. All variables, unless otherwise specified, are calculated at the fiscal year-end before the portfolio dates. *Size* is the quarter-end market capitalization of the stock in millions of dollars. *B/M* is the firm's book-to-market ratio. *Adj. Past Return* is the stock return during the twelve months prior to the quarter-end portfolio date adjusted by CRSP value-weighted market return. *Illiquidity* is the variant of Amihud (2002) illiquidity measure, computed as the yearly average of the square root of daily  $|\text{Return}|/(\text{Price} \times \text{Vol})$ . *Analysts* is the number of I/B/E/S analysts covering the firm during the year. ( $\text{DTD} < 1.64$ ) is the dummy variable for the Merton (1974) distance-to-default measure to be smaller than 1.64 (implying a 5% or higher default probability). *Volatility* and *Idio. Vol* are total and idiosyncratic volatilities from the four-factor model using past 36 monthly stock returns. *M&A* is an indicator variable that takes a value of 1 for the stock of the firm that was an announced M&A target during the four-quarter period ending in the portfolio quarter. The standard errors of the two sample t-tests adjust for clustering at the stock and quarter levels. Panel B reports the results from logistic regressions modeling the determinants of 13F confidential holdings at the stock level. The dependent variable is an indicator variable for a stock to be included in the confidential holdings of an institution-quarter. Each column reports estimated coefficients, their t-statistics (in parentheses), and the average partial effects (APE, in percentage points). All standard errors adjust for heteroskedasticity and clustering at the institution level. Quarterly dummies and Fama-French 10-industry dummies are included in all specifications in Panel B. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level.

Panel A: Summary Statistics of Stocks of Original and Confidential Holdings of Hedge Funds

	Size	B/M	Adj. Past Return	Illiquidity	Analysts	DTD < 1.64	Volatility	Idio. Vol	M&A
<i>Confidential 13F Form Filings</i>									
Mean	7,781.3	0.557	17.6%	0.094	14.31	21.4%	0.515	0.451	7.5%
Median	1,374.5	0.463	5.7%	0.047	12.00	0	0.445	0.386	0
Std. Dev.	23,959.4	0.411	60.9%	0.143	11.09	41.0%	0.265	0.243	26.4%
Min	25.6	0.038	-74.2%	0.003	1.00	0	0.137	0.110	0
Max	244,686.7	2.258	291.8%	1.147	52.00	1	1.333	1.210	1
# obs	38,126	38,126	38,126	37,999	38,069	38,126	38,068	38,068	38,126
<i>Original 13F Form Filings</i>									
Mean	16,882.7	0.505	12.9%	0.089	16.26	14.5%	0.442	0.388	4.1%
Median	2,477.4	0.411	2.7%	0.031	14.00	0	0.380	0.328	0
Std. Dev.	39,989.8	0.388	55.2%	0.174	12.18	35.2%	0.238	0.221	19.9%
Min	25.6	0.038	-74.2%	0.003	1.00	0	0.137	0.110	0
Max	244,686.7	2.258	291.8%	1.147	52.00	1	1.333	1.210	1
# obs	1,723,003	1,722,978	1,723,003	1,717,361	1,720,719	1,723,003	1,720,629	1,720,629	1,723,003
<i>Two-sample Tests (Conf. - Original)</i>									
Differences in Mean	-9,101***	0.051***	4.7%	0.005	-1.944***	0.069***	0.073***	0.062***	3.4%***
Clustered t-stat.	(-7.29)	(3.46)	(1.63)	(0.85)	(-4.86)	(4.68)	(5.36)	(5.42)	(3.33)

Panel B: Determinants of Confidential Holdings of Hedge Funds – Stock Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
M&A	0.932*** (22.81) 1.93%	0.951*** (20.22) 1.97%	0.956*** (21.90) 1.98%	0.942*** (20.19) 1.95%	0.938*** (20.47) 1.94%	0.946*** (22.63) 1.95%	0.945*** (22.64) 1.95%
Log(Size)	-0.148*** (-26.39) -0.31%					-0.252*** (-38.05) -0.52%	-0.251*** (-37.22) -0.52%
Illiquidity		-0.296*** (-6.11) -0.61%				-2.031*** (-26.77) -4.19%	-2.044*** (-26.90) -4.22%
Log(Analysts)			-0.110*** (-9.84) -0.23%			-0.020** (-2.21) -0.04%	-0.020** (-2.14) -0.04%
Volatility				0.728*** (13.41) 1.51%		0.187*** (3.96) 0.39%	
Idio. Vol.					0.833*** (14.12) 1.73%		0.195*** (3.71) 0.40%
DTD < 1.64	0.016 (0.80) 0.03%	0.217*** (8.78) 0.45%	0.156*** (6.80) 0.32%	-0.059** (-2.19) -0.12%	-0.074*** (-2.83) -0.15%	-0.012 (-0.51) -0.02%	-0.007 (-0.32) -0.01%
B/M	-0.185*** (-8.32) -0.38%	0.083*** (3.14) 0.17%	-0.024 (-1.01) -0.05%	0.009 (0.38) 0.02%	-0.010 (-0.41) -0.02%	-0.114*** (-5.26) -0.24%	-0.114*** (-5.26) -0.24%
Adj. Past Return	0.026** (2.39) 0.05%	0.051*** (3.91) 0.11%	0.007 (0.59) 0.01%	0.013 (1.08) 0.03%	-0.001 (-0.06) 0.00%	0.128*** (11.50) 0.26%	0.126*** (11.32) 0.26%
Constant	-3.784*** (-44.24)	-5.020*** (-66.03)	-4.777*** (-60.69)	-5.293*** (-66.20)	-5.282*** (-66.47)	-2.827*** (-29.55)	-2.828*** (-29.34)
Observations	1,761,104	1,755,335	1,758,763	1,758,672	1,758,672	1,755,335	1,755,335
Unconditional Mean	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Pseudo R-squared	0.104	0.0976	0.0987	0.0988	0.0991	0.110	0.110

**Table IV**  
**Trading during Confidential Periods**

This table reports the trades of confidential holdings by hedge funds seeking confidential treatment within the confidential periods, and compares them with the trades of original holdings by the same funds in the same periods. The initial position of confidential holdings is the position for which confidential treatment is sought, scaled by number of shares outstanding. The initial positions of original holdings are the contemporaneous positions of the same fund in original holdings. The total trade volume is the sum of absolute values of quarter-to-quarter position changes in the confidential or contemporaneous original stocks within the confidential period. Increase from initial to maximum (max) position is the difference between the maximum position and the initial position of the fund in the confidential stock or contemporaneous original stocks. Summary statistics for initial position, total trade volume, and increase from initial to max position are reported after scaling each of these variables by (a) the number of shares outstanding, and (b) the initial position. Time to max position is the number of quarters between the initial position and the maximum position within the confidential period. The last two rows of the table reports the differences between each of the variables (initial position, total trade volume, and increase from initial to max position, and time to max position) for confidential and original holdings and the two-sample mean difference t-statistics are reported in parentheses below. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level respectively.

Variable	Initial Position	Total Trade Volume	Maximum - Initial	Total Trade Volume	Maximum - Initial	Time to Maximum
	% of Shares Outstanding			Multiple of initial position		Quarters
<i><u>Confidential Holdings</u></i>						
Mean	0.30%	0.96%	0.25%	14.77	6.55	2.58
Median	0.11%	0.50%	0.05%	3.00	0.51	1.00
Std. Dev.	0.57%	1.23%	0.45%	33.65	18.49	3.16
Min	0.00%	0.00%	0.00%	0.00	0.00	0.00
Max	4.88%	5.86%	2.25%	193.01	114.94	11.00
N	37,204	37,204	37,204	37,204	37,204	37,204
<i><u>Original Holdings</u></i>						
Mean	0.28%	0.34%	0.09%	5.55	3.03	0.93
Median	0.05%	0.07%	0.00%	1.00	0.00	0.00
Std. Dev.	0.74%	0.80%	0.29%	20.34	12.74	1.24
Min	0.00%	0.00%	0.00%	0.00	0.00	0.00
Max	4.88%	5.86%	2.25%	193.01	114.94	9.00
N	97,723	97,723	97,723	97,717	97,717	97,723
<i><u>Two-sample Tests</u></i>						
Difference in Mean (Conf. - Original)	0.02%	0.62%***	0.16%***	9.22**	3.52*	1.66***
t-stat	(0.21)	(3.77)	(3.03)	(2.45)	(1.77)	(2.95)

**Table V**

**Abnormal Returns: Comparison of Original and Confidential Holdings of Hedge Funds**

Panel A reports the Carhart (1997) four-factor alpha and the Daniel, Grinblatt, Titman, and Wermers (1997) (DGTW) benchmark-adjusted returns for both original and confidential 13F holdings of hedge funds, and the differences between the two types. Confidential filings are grouped by the length of their confidential periods and evaluated for their abnormal performance at seven horizons from two months up to one year. The paired original holdings are by the same institutions and during the same period. The four-factor alpha (in basis points daily) is computed from the daily value-weighted portfolio returns. The DGTW benchmark-adjusted returns are first computed for each stock and then are averaged at the portfolio level using value weights of the portfolio. Both abnormal return measures are first calculated for each original or confidential 13F filing, and then averaged at the institution-level. Panel B follows the Griffin and Xu (2009) approach by reporting the raw returns and DGTW benchmark-adjusted returns evaluated three months after the portfolio holding quarter-end for original and confidential 13F holdings of hedge funds, and the differences between the two. Return measures are first calculated for each institution-quarter portfolio using value or equal weights of the portfolio holdings and then averaged across the institution-quarter portfolios in the sample period. Both raw and DGTW benchmark-adjusted returns are annualized. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level respectively.

Panel A: Abnormal Returns of Original and Confidential Holdings

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Daily Four-factor Alphas</i>							
Conf. Holdings (in basis points)	5.39	5.04	4.36	3.74	4.32	3.7	4.5
Original Holdings (in basis points)	2.82	2.72	2.77	2.54	2.45	2.38	2.44
Diff: Conf. - Orig. (in basis points)	2.57***	2.31**	1.59**	1.21	1.88***	1.31*	2.05***
Annualized Diff.	6.48%***	5.83%**	4.01%**	3.04%	4.73%***	3.31%*	5.17%***
t-Stat.	3.02	2.22	2.05	1.04	2.68	1.72	3.11
# of Conf. Filings	81	35	144	24	162	112	309
# of Original Filings	14,000	14,000	13,997	13,992	13,990	13,986	13,976
<i>DGTW Benchmark-adjusted Returns</i>							
Conf. Holdings	5.48%	1.97%	0.89%	3.86%	2.64%	4.86%	8.08%
Original Holdings	0.22%	0.26%	0.15%	0.19%	0.17%	0.29%	0.57%
Diff: Conf. - Original	5.26%***	1.71%**	0.74%	3.67%**	2.47%**	4.57%***	7.51%***
Annualized Diff.	31.56%***	6.83%**	2.22%	8.80%**	4.94%**	6.09%***	7.51%***
t-Stat.	6.78	2.39	0.93	2.56	2.46	2.83	4.27
# of Conf. Filings	78	34	142	19	165	102	331
# of Original Filings	13,973	13,973	13,973	13,973	13,973	13,973	13,973

Panel B: Comparison to Griffin and Xu (2009)

	# of 13F Filings		Raw Returns			DGTW benchmark-adjusted Returns		
	Conf.	Orig.	Conf.	Orig.	Diff.	Conf.	Orig.	Diff.
<i>Value-Weighted Returns</i>								
1999-2007	870	14,002	19.97%	13.00%	6.98%***	6.37%	1.39%	4.99%***
t-stats			6.88	31.18	2.65	3.13	5.48	2.63
<i>Equal-Weighted Returns</i>								
1999-2007	870	14,002	22.09%	14.36%	7.73%***	5.52%	2.02%	3.50%*
t-stats			7.10	33.16	2.74	2.66	8.36	1.82

**Table VI**  
**Abnormal Returns of Acquisition- and Disposition-Motivated Confidential Holdings of Hedge Funds**

This table repeats the analyses in Table V, except separately for acquisition- and disposition-motivated confidential holdings. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level respectively.

Panel A: Daily four-factor alphas

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Acquisition Sample</i>							
Conf. Holdings (basis points)	5.57	5.34	2.75	5.38	4.44	3.88	3.98
Original Holdings (basis points)	2.80	2.70	2.75	2.51	2.43	2.37	2.44
Diff: Conf. - Orig. (basis points)	2.77**	2.64**	0.00	2.87**	2.01***	1.52*	1.54**
Annualized Diff.	6.97%**	6.66%**	0.003%	7.23%**	5.06%***	3.82%*	3.88%**
t-Stat.	2.13	2.32	0.00	2.55	2.58	1.86	2.25
# of Conf. Filings	59	47	115	34	141	101	288
# of Original Filings	14,000	14,000	13,997	13,992	13,990	13,986	13,976
<i>Disposition Sample</i>							
Conf. Holdings (basis points)	3.21	4.74	6.05	2.92	1.85	-0.52	2.95
Original Holdings (basis points)	2.80	2.70	2.75	2.51	2.43	2.37	2.44
Diff: Conf. - Orig. (basis points)	0.41	2.04	3.30***	0.41	-0.58	-2.88***	0.51
Annualized Diff.	1.03%	5.14%	8.32%***	1.04%	-1.47%	-7.27%***	1.29%
t-Stat.	0.40	1.56	3.39	0.23	-0.58	-3.05	0.57
# of Conf. Filings	49	29	55	12	51	40	155
# of Original Filings	14,000	14,000	13,997	13,992	13,990	13,986	13,976

Panel B: DGTW benchmark-adjusted returns

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Acquisition Sample</i>							
Conf. Holdings	4.64%	1.56%	-0.63%	4.15%	2.22%	4.61%	7.63%
Original Holdings	0.22%	0.26%	0.15%	0.19%	0.17%	0.29%	0.57%
Diff: Conf. - Original	4.42%***	1.29%*	-0.78%	3.96%***	2.06%**	4.32%***	7.06%***
Annualized Diff.	26.53%***	5.18%*	-2.33%	9.51%***	4.11%**	5.76%***	7.06%***
t-Stat.	6.12	1.81	-0.97	2.76	2.05	2.63	3.95
# of Conf. Filings	59	29	131	19	149	97	307
# of Original Filings	13,973	13,973	13,973	13,973	13,973	13,973	13,973
<i>Disposition Sample</i>							
Conf. Holdings	5.24%	1.07%	5.92%	5.69%	0.94%	-4.21%	3.51%
Original Holdings	0.22%	0.26%	0.15%	0.19%	0.17%	0.29%	0.57%
Diff: Conf. - Original	5.02%***	0.80%	5.77%***	5.50%	0.77%	-4.50%**	2.94%
Annualized Diff.	30.15%***	3.22%	17.32%***	13.20%	1.55%	-6.00%**	2.94%
t-Stat.	6.13	0.74	5.85	0.58	0.60	-2.40	1.42
# of Conf. Filings	40	13	57	6	65	34	190
# of Original Filings	13,973	13,973	13,973	13,973	13,973	13,973	13,973

**Table VII**  
**Determinants of Denial and Approval of Confidential Filings**

This table estimates the denial decisions of the SEC on applications for confidential treatment using the probit model. The sample includes all confidential filings by hedge funds. *# Past CF* is the number of past confidential filings by the same institution. *% Past Denied* is the percent of past confidential filings denied by the SEC. *% Conf. Stocks* is the number of distinct stocks contained in the confidential filing as a percentage of the total portfolio. *Value CF* is the market value of confidential holdings in the given filing. *% Value CF* is the market value of confidential holdings as percentage of value of total portfolio. *Avg. Conf. Position* is the average number of shares of confidential holdings as a percentage of shares outstanding. The fund characteristics are as defined in Table II. All standard errors adjust for heteroskedasticity and clustering at the institution level. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>Confidential Filing Characteristics</u>							
Log(# Past CF)	-0.085 (-0.83)	-0.133 (-1.49)	-0.115 (-1.21)	-0.140 (-1.62)	-0.068 (-0.67)	-0.042 (-0.40)	-0.060 (-0.50)
% Past Denied	3.158*** (14.09)	3.201*** (14.48)	3.187*** (14.16)	3.189*** (11.98)	3.109*** (14.05)	3.278*** (12.50)	3.677*** (9.37)
% Conf. Stocks	0.513** (2.24)				1.405*** (3.14)	0.735*** (3.16)	1.062** (2.34)
Avg. Conf. Position		12.482*** (2.81)			14.929*** (3.17)	16.120*** (3.95)	10.082** (2.07)
% Value CF			0.247 (1.18)		-0.853** (-2.18)		-1.289** (-2.44)
Log(Value CF)				0.001 (0.03)		-0.062* (-1.70)	
<u>Fund Characteristics</u>							
Log(Age)							-0.058 (-0.41)
Log(PortSize)							-0.144** (-1.96)
Turnover							-1.279* (-1.86)
PortHHI							-0.567 (-0.74)
PortRet							1.660 (0.77)
Flow							0.095 (1.30)
IdioVol							4.867 (1.01)
Constant	-1.568*** (-6.54)	-1.489*** (-8.28)	-1.441*** (-6.78)	-1.325** (-2.31)	-1.772*** (-7.57)	-1.772*** (-7.57)	-0.433 (-0.85)
Observations	713	713	713	713	713	713	629
Unconditional Mean	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	19.4%
Pseudo R-squared	0.413	0.417	0.408	0.406	0.432	0.430	0.481



**Table VIII**  
**Market Reactions to the Disclosure of the Confidential 13F Filing by Hedge Funds**

This table reports the market reactions to the disclosure of the confidential 13F filing by hedge funds. We report the mean cumulative abnormal returns (CAR) associated with the disclosure of the quickly-denied confidential filings that are disclosed within 45-180 days after the quarter-end portfolio date, and disclosure of the accepted confidential filings with similar delay in disclosure. Each confidential filing is treated as one event with equal weights assigned to the stock positions included in the filing. Abnormal returns are estimated from the market model using the equally-weighted CRSP market index over the period from 300 to 91 days prior to the event date. Betas are estimated using Scholes and Willams (1977) approach to account for non-synchronous trading. CARs are reported over the (-1, +1), (-2, +2), and (-5, +5) windows around the event date. The z-statistics from the Patell test (with two tails) to test if the mean cumulative abnormal returns are statistically different from zero are provided in the parentheses below the mean CARs. % positive represents the proportion of portfolios that have positive abnormal returns and the z-statistics from the generalized sign test (with two tails) to test their statistical significance are reported below in parentheses. Num is the number of events, i.e., confidential filings. \*\*\*, \*\* and \* indicate significance at 1%, 5%, and 10% respectively.

Windows	Quickly-denied Confidential Filings			Accepted Confidential Filings		
	Num	(1) Mean CAR (%)	(2) % Positive	Num	(3) Mean CAR (%)	(4) % Positive
<b>(-1,+1)</b>	66	0.54%** (2.42)	63.6%** (2.34)	197	0.39% 1.45	52.3% 0.926
<b>(-2,+2)</b>	66	0.97%*** (2.61)	63.6%** (2.09)	197	0.30% 1.25	53.8% 1.353
<b>(-5,+5)</b>	66	1.19%** (2.18)	62.1%*** (2.58)	197	0.52% 0.842	52.8% 1.068

## Internet Appendix for

### “Uncovering Hedge Fund Skill from the Portfolio Holdings They Hide”

**Table IA.I**  
**Abnormal Returns of Original and Confidential Holdings of Hedge Funds:**  
**Alternative Hedge Fund List**

This table repeats the analyses of Table V except using an alternative list of hedge funds using the Form ADV information as described in Section II.A. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level, respectively.

Panel A. Table V with alternative hedge fund list

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Daily Four-factor Alphas</i>							
Conf. Holdings (in basis points)	6.16	4.50	4.29	4.23	4.10	3.76	4.27
Original Holdings (in basis points)	3.00	2.82	2.83	2.60	2.45	2.34	2.43
Diff: Conf. - Orig. (in basis points)	3.16***	1.68	1.46*	1.63	1.65**	1.42*	1.85**
Annualized Diff.	7.96%***	4.23%	3.67%*	4.10%	4.15%**	3.57%*	4.65%**
t-Stat.	3.45	1.43	1.77	1.38	2.27	1.76	2.54
# of Conf. Filings	73	29	118	23	136	89	262
# of Original Filings	10,434	10,434	10,431	10,428	10,426	10,423	10,417
<i>DGTW Benchmark-adjusted Returns</i>							
Conf. Holdings	6.15%	0.03%	0.74%	1.59%	2.06%	6.69%	8.63%
Original Holdings	0.24%	0.27%	0.15%	0.21%	0.16%	0.26%	0.59%
Diff: Conf. - Original	5.91%***	-0.24%	0.59%	1.38%	1.90%*	6.43%***	8.04%***
Annualized Diff.	35.46%***	-0.98%	1.76%	3.31%	3.79%*	8.58%***	8.04%***
t-Stat.	6.60	-0.29	0.64	0.90	1.78	3.63	4.04
# of Conf. Filings	71	28	116	18	138	83	277
# of Original Filings	10,415	10,415	10,415	10,415	10,415	10,415	10,415

**Table IA.II**  
**Abnormal Returns of Acquisition- and Disposition-Motivated Confidential Holdings: Forward-Looking Classification**

This table repeats the analyses of Table VI except classifying acquisition- and disposition-motivated confidential holdings based on a forward-looking algorithm. For each stock in a confidential filing, we compare the position (adjusted for stock splits) at the current quarter-end ( $t$ ) to that of the same stock by the same institution at the following quarter-end ( $t+1$ ), and classify net increase (decrease) as acquisition (disposition). Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level, respectively.

Panel A: Daily four-factor alphas

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Acquisition Sample</i>							
Conf. Holdings (in basis points)	9.03	7.46	4.38	9.93	3.32	4.10	4.05
Original Holdings (in basis points)	2.80	2.70	2.75	2.51	2.43	2.37	2.44
Diff: Conf. - Orig. (in basis points)	6.23***	4.76***	1.63**	7.42***	0.89	1.73**	1.61**
Annualized Diff.	15.69%***	11.98%***	4.11%**	18.69%***	2.24%	4.35%**	4.05%**
t-Stat.	6.94	4.66	1.99	6.90	1.19	2.17	2.27
# of Conf. Filings	49	51	103	30	97	72	215
# of Original Filings	14,000	14,000	13,997	13,992	13,990	13,986	13,976
<i>Disposition Sample</i>							
Conf. Holdings (in basis points)	2.28	0.09	3.94	3.24	3.16	3.17	3.34
Original Holdings (in basis points)	2.80	2.70	2.75	2.51	2.43	2.37	2.44
Diff: Conf. - Orig. (in basis points)	-0.52	-2.62**	1.19	0.73	0.73	0.80	0.90
Annualized Diff.	-1.31%	-6.59%**	2.99%	1.84%	1.84%	2.00%	2.28%
t-Stat.	-0.57	-2.37	1.47	0.61	0.98	1.00	1.35
# of Conf. Filings	58	32	92	23	122	91	258
# of Original Filings	14,000	14,000	13,997	13,992	13,990	13,986	13,976

Panel B: DGTW benchmark-adjusted returns

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Acquisition Sample</i>							
Conf. Holdings	9.23%	3.69%	0.29%	8.66%	3.61%	10.96%	5.00%
Original Holdings	0.22%	0.26%	0.15%	0.19%	0.17%	0.29%	0.57%
Diff: Conf. - Original	9.01%***	3.43%***	0.14%	8.47%***	3.44%***	10.6%***	4.43%**
Annualized Diff.	54.07%***	13.71%***	0.42%	20.33%***	6.88%***	14.22%***	4.43%**
t-Stat.	10.49	4.33	0.17	5.73	2.96	5.64	2.47
# of Conf. Filings	46	24	111	15	105	67	251
# of Original Filings	13,973	13,973	13,973	13,973	13,973	13,973	13,973
<i>Disposition Sample</i>							
Conf. Holdings	1.34%	-2.42%	2.06%	-8.43%	1.37%	-4.98%	3.95%
Original Holdings	0.22%	0.26%	0.15%	0.19%	0.17%	0.29%	0.57%
Diff: Conf. - Original	1.12%*	-2.68%***	1.91%**	-8.62%***	1.20%	-5.27%***	3.38%*
Annualized Diff.	6.73%*	-10.71%***	5.74%**	-20.69%***	2.40%	-7.03%***	3.38%*
t-Stat.	1.76	-3.05	2.32	-5.37	1.16	-3.33	1.88
# of Conf. Filings	57	21	93	12	131	79	291
# of Original Filings	13,973	13,973	13,973	13,973	13,973	13,973	13,973

**Table IA.III****Abnormal Returns of Original and Confidential Holdings without accompanying option positions**

This table repeats the analyses of panel A of Table V except excluding the stocks positions accompanied with call/put option positions in the original and confidential holdings. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level, respectively.

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Daily Four-factor Alphas</i>							
Conf. Holdings (in basis points)	5.29	4.72	3.79	1.91	4.00	3.73	4.08
Original Holdings (in basis points)	2.82	2.72	2.77	2.54	2.45	2.38	2.44
Diff: Conf. - Orig. (in basis points)	2.48***	2.00*	1.03	-0.62	1.55**	1.35*	1.64**
Annualized Diff.	6.24%***	5.03%*	2.59%	-1.57%	3.91%**	3.40%*	4.13%**
t-Stat.	2.89	1.95	1.32	-0.51	2.19	1.78	2.46
# of Conf. Filings	81	34	143	22	160	112	301
# of Original Filings	14,000	14,000	13,997	13,992	13,990	13,986	13,976
<i>DGTW Benchmark-adjusted Returns</i>							
Conf. Holdings	4.98%	1.05%	0.64%	-0.55%	2.36%	4.28%	7.58%
Original Holdings	0.22%	0.26%	0.15%	0.19%	0.17%	0.29%	0.57%
Diff: Conf. - Original	4.76%***	0.79%	0.50%	-0.74%	2.19%**	4.00%**	7.01%***
Annualized Diff.	28.58%***	3.14%	1.49%	-1.77%	4.39%**	5.33%**	7.01%***
t-Stat.	6.09	1.06	0.62	-0.51	2.16	2.45	3.97
# of Conf. Filings	78	34	142	17	163	102	325
# of Original Filings	13,973	13,973	13,973	13,973	13,973	13,973	13,973

**Table IA.IV**  
**Abnormal Returns of Original and Confidential Holdings of Investment Companies or Advisors**

This table repeats the analyses of panel A of Table V except focusing on the confidential and original holdings of investment companies or advisors. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level, respectively.

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Daily Four-factor Alphas</i>							
Conf. Holdings (in basis points)	2.89	1.04	2.29	3.40	5.23	2.37	3.81
Original Holdings (in basis points)	2.47	2.54	2.80	2.71	2.55	2.68	2.72
Diff: Conf. - Orig. (in basis points)	0.42	-1.50	-0.50	0.69	2.68***	-0.31	1.09
Annualized Diff.	1.06%	-3.77%	-1.27%	1.75%	6.75%***	-0.79%	2.74%
t-Stat.	0.58	-1.50	-0.62	0.76	3.29	-0.38	1.59
# of Conf. Filings	93	22	105	22	110	67	209
# of Original Filings	31,953	31,952	31,951	31,949	31,946	31,945	31,935
<i>DGTW Benchmark-adjusted Returns</i>							
Conf. Holdings	2.11%	0.63%	-1.02%	2.83%	1.50%	2.75%	1.83%
Original Holdings	0.07%	0.06%	0.14%	0.09%	0.12%	0.18%	0.34%
Diff: Conf. - Original	2.04%**	0.57%	-1.15%	2.73%*	1.38%	2.57%	1.49%
Annualized Diff.	12.23%**	2.27%	-3.46%	6.56%*	2.76%	3.42%	1.49%
t-Stat.	2.56	0.64	-1.23	1.92	0.99	1.29	0.70
# of Conf. Filings	94	24	104	21	107	65	217
# of Original Filings	31,876	31,876	31,876	31,876	31,876	31,876	31,876

**Table IA.V**  
**Abnormal Returns of Original and Confidential Holdings of Hedge Funds excluding Caxton and D.E. Shaw**

This table repeats the analyses of panel A of Table V except excluding Caxton Corporation and D.E. Shaw & Co. Inc. from the sample of hedge funds. Coefficients marked with \*\*\*, \*\*, and \* are significant at the 1%, 5%, and 10% level, respectively.

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Daily Four-factor Alphas</i>							
Conf. Holdings (in basis points)	5.39	5.04	4.36	3.75	4.38	3.74	4.57
Original Holdings (in basis points)	2.82	2.73	2.77	2.54	2.45	2.38	2.44
Diff: Conf. - Orig. (in basis points)	2.57***	2.31**	1.59**	1.21	1.93***	1.36*	2.13***
Annualized Diff.	6.48%***	5.83%**	4.01%**	3.04%	4.86%***	3.42%*	5.36%***
t-Stat.	3.02	2.22	2.05	1.04	2.72	1.75	3.17
# of Conf. Filings	80	35	143	23	160	110	290
# of Original Filings	13,952	13,952	13,950	13,945	13,943	13,940	13,930
<i>DGTW Benchmark-adjusted Returns</i>							
Conf. Holdings	5.55%	2.19%	0.89%	4.07%	2.75%	5.13%	8.41%
Original Holdings	0.21%	0.26%	0.14%	0.18%	0.15%	0.27%	0.56%
Diff: Conf. - Original	5.34%***	1.93%***	0.75%	3.89%***	2.60%**	4.86%***	7.85%***
Annualized Diff.	32.04%***	7.73%***	2.24%	9.34%***	5.19%**	6.48%***	7.85%***
t-Stat.	6.82	2.64	0.94	2.64	2.53	2.91	4.34
# of Conf. Filings	77	33	142	18	162	100	312
# of Original Filings	13,930	13,930	13,930	13,930	13,930	13,930	13,930