

Uncovering Hedge Fund Skill from the Portfolio Holdings They Hide^{*}

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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 significant delay through amendments to the Form 13F. Our evidence supports hiding private information as the dominant motive for hedge funds to seek confidentiality. Hedge funds managing large risky portfolios with less conventional investment strategies seek confidentiality more frequently. Stocks included in the confidential holdings of hedge funds are disproportionately associated with information-sensitive events such as mergers and acquisitions, and share characteristics indicating greater information asymmetry. Moreover, confidential holdings of hedge funds exhibit superior performance up to the typical confidential period of twelve months, suggesting valuable private information. Overall, our study presents new evidence on the performance of hedge funds, provides reference on the potential limitations of the standard 13F holdings databases which usually exclude the confidential holdings, and contributes to the policy debate regarding ownership disclosure.

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

JEL Classification: G10, G19

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This paper studies the “confidential holdings” of institutional investors, especially hedge funds, where the quarter-end equity holdings are disclosed with a significant delay through amendments to the Form 13F. Our evidence supports hiding private information as the dominant motive for hedge funds to seek confidentiality. Hedge funds managing large risky portfolios with less conventional investment strategies seek confidentiality more frequently. Stocks included in the confidential holdings of hedge funds are disproportionately associated with information-sensitive events such as mergers and acquisitions, and share characteristics indicating greater information asymmetry. Moreover, confidential holdings of hedge funds exhibit superior performance up to the typical confidential period of twelve months, suggesting valuable private information. Overall, our study presents new evidence on the performance of hedge funds, provides reference on the potential limitations of the standard 13F holdings databases which usually exclude the confidential holdings, and contributes to the policy debate regarding ownership disclosure.

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.¹ 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. When adequate written factual support is provided for certain holdings, 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.”

Using a comprehensive collection of all original and amendments to 13F filings by all institutions during the period of 1999-2007, we address three issues related to confidential treatment seeking. First, we document the extent to which institutional investors seek confidential treatment. We then focus on hedge fund management companies, the group representing the most frequent users of confidential filings, for most of our analyses. Second, we analyze the motives to seek confidentiality by examining both the characteristics of hedge funds seeking confidentiality, and those of the stocks included in the confidential

¹ Section I.A. contains a more detailed description of the institutional background regarding the ownership disclosure.

filings. Finally, we estimate the abnormal performance of the confidential holdings to examine whether hedge funds possess superior ability as well as to determine whether there is information motive underlying the confidential holdings.

Both private information and price impact considerations can motivate confidentiality seeking. On the private information side, it is in the best interest of investment managers not to disclose their informed positions before they have fully reaped the benefits of their superior information. Such incentives are often in conflict with the regulatory rules. For example, Perry Corp, a well-known hedge fund, attempted to keep secret its accumulation of position in Mylan Inc. in 2004 when the company was contemplating a merger with King Pharmaceuticals Inc. The deal ultimately fell through; nevertheless, Perry was under investigation by the SEC on the allegation of improperly withholding details about a large investment in an effort to profit.² Though the two parties settled in July 2009, the case highlights continuing tension between the desire of some investors to withhold information that could reveal their investment strategies, and the demand of the public and regulators for transparency.

As a matter of fact, several hedge funds and successful investors including Warren Buffett have appealed to the SEC for an exemption from revealing their positions in the 13F forms but have been unsuccessful in convincing the SEC. 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.”³ More generally, seeking confidentiality by informed investors is necessary for the preservation of incentives to collect and process information, which contributes to the informational efficiency of financial markets (Grossman and Stiglitz, 1980).

The second motivation for requesting confidentiality relates to price impact, and can be exemplified by the “quant meltdown” in August 2007. Quant-oriented hedge funds blamed the ownership

² For the SEC litigation release of this case, please see: <http://www.sec.gov/litigation/admin/2009/34-60351.pdf>. Perry was accused of violating the rule regarding Schedule 13D which requires prompt and proper disclosure of positions above 5%.

³ 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.

disclosure for inviting “copycats” into an increasingly correlated and crowded space of quant strategies, which contributed to the “death spiral” in the summer of 2007 when many funds employing similar strategies attempted to cut their risks simultaneously in response to their losses (Khandani and Lo (2007)). Most vocal among them was D. E. Shaw & Company who demanded confidentiality for its whole portfolio in August 2007 in order to guard its proprietary models as well as to protect its existing positions from being front-run. The request was denied by the SEC.

Though confidential treatment is meant to be the exception rather than the rule, some institutional investors—mostly hedge funds—seem to have taken advantage of it for the benefit of delayed disclosure. About 7.4% of all 13F filing institutions have resorted to confidential treatment at least once during our sample period. Hedge funds, which constitute about 30% of all institutions, account for 56% of all the confidential filings. Conditional on confidential treatment, hedge funds hide on average 34% of their total portfolio values in confidential filings, much higher than the level experienced by other types of institutions (21% for investment companies/advisors and 11% for banks and insurance companies). These stylized facts make hedge funds the ideal subjects to analyze the motives and consequences of confidential treatment.

Analyzing the original and confidential holdings of hedge funds uncovers several interesting results. First, hedge funds managing large and concentrated portfolios, and adopting non-standard investment strategies (in terms of loadings on common factors) 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 to include stocks subject to greater information asymmetry, i.e., those with smaller market capitalization, lower trading liquidity, fewer analysts following, and higher probability of financial distress. Third, confidential holdings of hedge funds exhibit significantly higher abnormal performance compared to their original holdings: The difference over the twelve-month horizon amounts to 7.5% using the Daniel, Grinblatt, Titman, and Wermers (1997) benchmark-adjusted returns, or 5.2% using the Carhart (1997) four factor alphas, on a value-weighted basis. Finally, we conduct sensitivity checks for subsamples of filings associated with SEC approvals and denials, and of other institutional investors (investment companies/advisors, banks, and insurance

companies). Our findings suggest that SEC's approval process is independent of the quality of the private information, and further confirm that hedge funds represent a group of investors who are most likely to possess private information among their confidential holdings.

To the extent that the characteristics of confidential filers and confidential holdings are both indicative of active portfolio management and private information, our study provides new evidence on the skill of hedge funds and their ability to benefit from their private information through confidential holdings. While some of the characteristics are also consistent with hedge funds' motive to minimize price impact, the significant abnormal performance of confidential holdings sustained over the confidential periods ranging from two months up to twelve months indicates that valuable private information is the dominant force.

Our study has implications for researchers and regulators concerned with the transparency of the lightly-regulated hedge funds and private funds and the role of mandatory disclosure of their investments. We believe that our study based on a complete collection of institutional investors' quarterly holdings can help settle the controversy regarding the value and effect of the "non-transparent" holdings and identify the key factors that influence the cross sectional variation in the confidential filing activities.

Moreover, being the first comprehensive study on confidential holdings, our research 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 could be a significant conditional bias in analyzing position changes of specific types of institutions and those around specific events (such as mergers & acquisitions.)

Our paper is closely related to the literature that evaluates the performance and information content of institutional investors' holdings. For example, Grinblatt and Titman (1989, 1993), Grinblatt, Titman, and Wermers (1995), Daniel, Grinblatt, Titman, and Wermers (1997), Chen, Jegadeesh, and Wermers (2000), Wermers (2000, 2003, 2006), Kacperczyk, Sialm, and Zheng (2005, 2008), Wermers, Yao, and Zhao (2007), and Huang and Kale (2009) analyze whether mutual funds outperform their benchmarks using the holdings data. Griffin and Xu (2009) and Aragon and Martin (2009) conduct a

similar analysis with another class of active managers—hedge funds.⁴ 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.

Our paper also contributes to a strand of literature that studies the effects of portfolio disclosure on the investment decisions of money managers (Musto (1997, 1999)), theoretical implications of portfolio disclosure and performance evaluation of mutual funds (Kempf and Kreuzberg (2004)), the consequences of frequent portfolio disclosure such as free riding and front running by other market participants (Wermers (2001), and Frank, Poterba, Shackelford, and Shoven (2004)), and determinants of portfolio disclosure and its effect on performance and flows (Ge and Zheng (2006)). Our findings suggest that seeking confidential treatment is one effective way for the investment managers to attenuate some of the concerns analyzed in these papers.

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 of sample, presents the overview of original and confidential filings, and outlines the empirical motivations. Section III analyzes the determinants of confidential filings at the institution level and confidential holdings at the stock level. Section IV examines the difference between the abnormal returns of confidential holdings and those of original holdings for hedge funds, and conducts sensitivity checks. Finally, Section V discusses policy implications before concluding.

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.⁵

⁴ Aragon and Martin (2009) is among the very few papers that use the original 13F filings directly, instead of the filings compiled by Thomson Reuters. They examine a random sample of 300 hedge funds from the SEC EDGAR database, and do not account for confidential filings in the 13F amendments filed separately.

⁵ The SEC adopted enhanced rules on mutual funds expense and portfolio disclosure in 2004, requiring registered

Among the five regimes, the Form 13F requirement covers by far the largest number of institutional investors: all institutions 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 from the date required for the original 13F form. This one-year period can be extended further if an instruction with additional factual support is filed 14 calendar days in advance of the expiration date. Figure 1 illustrates the time line of the original and confidential 13F filings.

[Insert Figure 1 here.]

SEC began to adopt the Section 13(f) rules in 1978, which mandate both the quarterly reports and allow confidential treatment of some holdings as deemed appropriate by the SEC. The later 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.”⁶

Gaining confidential treatment is not meant to be a trivial task and is not guaranteed.⁷ The applying institution must provide a sufficient factual basis for the objection to public disclosure, including a detailed description of the manager’s investment strategy, e.g., risk arbitrage that warrants confidential treatment, along with supporting analysis that public disclosure of the securities would reveal the

management investment companies to file their complete portfolio holdings with the Commission on a quarterly basis, instead of on a semi-annual basis as previously mandated.

⁶ 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.

⁷ 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.

investment strategy and harm the manager's competitive position. Furthermore, the evidence for confidential treatment has to apply on a position-by-position basis, rather than apply to the entire portfolio. Finally, such applications are subject to SEC approval. The time that SEC takes to review individual applications and to make the decision varies, with the typical range being two to twelve months during our sample period. If denied, the institution is obligated to file an amendment disclosing all the confidential positions immediately (within six business days from the date of denial).⁸

In 1998, the SEC tightened the rules and restricted the conditions for confidentiality.⁹ The triggering event 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.¹⁰ Our sample period (1999-2007) starts with the inauguration of the SEC's EDGAR database, which also coincides with the new regime when there are more stringent rules for 13F amendments requiring the applying institutions to convince the SEC that revelation of these holdings can hurt their competitive position.

The extreme case of D. E. Shaw illustrates the tension arising from such a process. 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 June 30th Form 13F on October 29. That amended filing covered

⁸ 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>.

⁹ 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.

¹⁰ For a full story, please see "Large Investors Face Stiff Rules on SEC Filings," by Paul Beckett, *The Wall Street Journal*, June 19, 1998.

3,991 positions valued at \$79 billion. Similar but less extreme requests from D. E. Shaw were rejected by the SEC before.¹¹

It is worth noting that the confidential treatment under Section 13(f) does not over-ride other SEC ownership disclosure rules. For example, a beneficial owner of more than 5% of a company's equity will need to file Schedule 13D or 13G, even if the position is under confidential treatment in the owner's 13F filing. 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 (at a 60-day delay) in 2004. Nevertheless, there are more than sporadic observations in our sample where the confidential position exceeds 5% (such as the Warren Buffett position in Wells Fargo which was to be disclosed in Schedule 13G) or where the filer is a mutual fund management company (such as T. Rowe Price and American Funds). In such cases, the confidential treatment may still afford the institutions effective delay if the 13F disclosure is the most binding compared to the normal delay allowed by the Schedule 13G (45 days from the year-end) or by the disclosure rules for mutual funds (semi-annual before 2004).

Despite their potential importance, confidential holdings are usually not included in the conventional databases of institutional quarterly holdings, such as the Thomson Reuters Ownership Data (formerly the CDA/Spectrum database).¹² We verify that over 90% of the confidential holdings in our sample period are not covered by the Thomson Reuters Ownership Data. An example from the top 20 confidential filers illustrates such omission. The chosen institution is the hedge fund Stark Onshore Management LLC (manager number 10375 in Thomson Reuters). In Table I, we list all the institution's confidential holdings during our sample period, and cross check with its holdings reported in Thomson Reuters. We observe that, except for one stock (Rouse Co., CUSIP = 77927310), all the other 54

¹¹ See "SEC: D.E. Shaw Disclosure Request Part of Regular Process," by Marietta Cauchi, *Dow Jones Newswires*, January 2005.

¹² 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%20Trades.cfm). The other potential exclusion by these databases concerns non-equity holdings, such as convertible bonds and options, see Aragon and Martin (2009) for a detailed description of this issue.

confidential holdings in the amendments are not included in the latter. Therefore, arguably the most interesting facet of portfolio disclosure has been this far ignored in the extant literature. Our study fills this gap in the literature.

[Insert Table I here.]

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. As we mentioned in the previous section, the standard databases mostly do not provide collections of these filings. Hence, we retrieve directly both the original and amendment 13F filings (forms 13F-HR and 13F-HR/A¹³) dated between March 1999 and June 2007 from the SEC's EDGAR database. We start in 1999 since SEC began to require electronic filing of Form 13F through the EDGAR system in January 1999; we end the sample of filings in June 2007 to allow for a one-year period in ex post performance evaluation. Our full sample period happens to fall into a uniform policy regime after the SEC tightened up the rules for approving confidential treatment in 1998 (see Section I for more information).

Despite the large variation in 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. This exercise results in our initial sample of 3,315 filing institutions, which covers 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 Thomson database at all. We retrieve information about original filings exclusively directly from the SEC, rather than relying on data from Thomson Reuters. The purpose is to maintain symmetry and comparability between original and confidential filings as the latter mostly do not make their way to Thomson Reuters.

¹³ 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.

Amendments to 13F filings contain two types of information: disclosure of an increase in a position that was previously filed in 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 these criteria, our initial sample consists of 1,857 confidential filings and 53,296 original 13F filings. As we discussed earlier, the amendment filings in our sample include applications both approved and denied by the SEC. 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 SEC denials. Based on this algorithm, the SEC rejected about 17.4% of all applications during our sample period.

Table II provides the summary statistics of both types of filings. Panel A reports distribution of length of delay between filings and their corresponding quarter-end portfolio dates. Over 86% of original filings are filed within 45 days of the end of quarter, conforming to the requirement by the SEC.¹⁴ 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 may file amendments before the approved term expires (usually for a year) when the information on the confidential holdings has already become stale. Second, even denied applications effectively afford significant delays in disclosure (the modal delay time is between six and twelve months).¹⁵

¹⁴ Aragon and Martin (2009) also found significant proportions of delayed original 13F filings (i.e., beyond 45-days). Further investigation of our sample reveals only a small number of institutions that are repeatedly late in their original 13F filings. SEC may carry out criminal prosecution for the institutions which file false or delayed 13F reports (Lemke and Lins (1987)).

¹⁵ The long time it takes for the SEC to reject applications for confidential treatment that lack adequate factual support could potentially invite abuse, that is, some institutions without legitimate reasons may still resort to frequent applications for confidentiality just to enjoy the effective delay in disclosure. Our informal conversation with the SEC staff indicates that institutions which received repeated rejections could receive warnings from the

[Insert Table II 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 II Panel A). Our results are not sensitive to the particular numerical choices employed in these filters.

Our final sample consists of 52,272 original filings by 3,134 institutions, and 1,554 confidential filings by 232 institutions. Panel B of Table II 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 individual manual checking. The details of this classification are described in the Appendix. 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) that consists of institutions of miscellaneous types, which we exclude from most of our analyses.

Conditional on an institution filing both an original and an amended 13F for its holdings at a given quarter-end, the dollar value of the stock positions included in the confidential filings is significant: the average (median) value of securities in a confidential filing is 27.3% (13.4%) of the value of the complete portfolio of the institution. The weight of confidential holdings in total portfolios in terms of number of stocks is smaller, indicating that these holdings tend to be larger-than-usual positions. The average confidential holding represents 1.25% of all the shares outstanding by the issuer, as compared to the average position of 0.68% in the original holdings.

Panel C of Table II 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

SEC and will be subject to more timely review in future applications.

their confidentiality 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.¹⁶ Both Panels B and C of Table II indicate that hedge funds are by far the leading category of confidential filers. It is worth noting that due to our top-down classification approach, our list of 942 13F filing hedge funds companies is considerably longer than used in prior literature.¹⁷ Although hedge funds constitute for about 30% of all institutions in our sample, they account for 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). In other words, a typical hedge fund tends to “mask” one-quarter to one-third of its portfolio from the regular disclosure when they have both types of filings in a given quarter.

The disproportional appearance of hedge funds as confidential filers and the greater share of their portfolios hidden in confidential filings conditional on seeking confidentiality are consistent with hedge funds being active portfolio managers that engage in proprietary trading strategies. The relief that confidential filings provide in protecting private information and minimizing price impact is more important for them. For this reason, hedge funds naturally become the primary subjects for our study to test the motives and return consequences of confidential filings. As a sensitivity check, we provide brief overviews for the other two categories of institutions (investment companies/advisors, and banks and insurance companies) in Section IV.C.

¹⁶ 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 (while the number was in hundreds and thousands before). All the three applications received speedy reviews and were approved by the SEC. These two cases provide some evidence about the possible SEC actions against institutions suspicious of abusing of the rules for 13F amendment filings, consistent with the discussion in previous footnote.

¹⁷ Relying on a one-sided match from published hedge fund lists to the 13F database, Brunnermeier and Nagel (2004) study the holdings of 53 hedge fund companies, and Griffin and Xu’s (2009) sample contain 306 such firms.

B. Motivations for Empirical Analyses

In addition to presenting the prevalence and distribution of confidential filings, we address questions about the incentives and consequences of seeking confidentiality. Our main hypotheses build on perceived private information and price impact as primary motives underlying the confidentiality activities. These two motives share some, but not all, predictions.

According to the private information hypothesis, hedge funds that seek more frequent confidential treatment should exhibit characteristics that are typical of more active and less conventional portfolio strategies where the delay in holdings disclosure affords more benefits. 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, higher distress risk, and lesser analyst following. Finally, the performance of confidential holdings during the period of confidentiality would be the ultimate test for private information if these holdings were hidden until superior information has run its full course. A lack of abnormal performance would cast doubt on the information motive, or the value of private information as perceived by the hedge fund managers who seek confidentiality.

If the primary motive is to minimize price impact or to avoid front-running on unfinished transactions that are liquidity-driven, then we expect confidential holdings and the strategy of filing institutions to share characteristics indicating vulnerability to illiquidity and front-running. As such, thinly traded stocks and funds with concentrated portfolios or with high fund inflows are likely candidates. 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 two other motives behind confidentiality seeking. The first is the “window dressing” hypothesis, i.e., some institutions using confidential filings to hide “losers.” This hypothesis posits negative past abnormal returns of confidential holdings but not superior returns going forward from these positions. The second is the “portfolio blurring” hypothesis, that is, hiding part of the portfolio which makes it more difficult for observers of 13F holdings (potential copycats) to reverse-engineer the trading strategy (such as the cases of Berkshire Hathaway and D. E. Shaw illustrated in the Introduction and Section I). In this scenario, the confidential holdings do not necessarily enjoy superior performance relative to the disclosed part of the portfolio. This is analogous to strategic trading by informed traders to avoid revealing private information where some of the trades do not necessarily lead to superior returns on their own (Kyle (1989)).

In sum, the presence of positive abnormal returns of confidential holdings would establish private information as the dominant motive for seeking confidentiality. In light of other motives that do not predict superior abnormal performance for confidential holdings, our findings should also be viewed as a *lower bound* estimate for the abnormal return of the part of confidential holdings that are information-driven.

III. Determinants of Confidential Filings and Confidential 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. Institutional 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 III. 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:

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

Our estimates of the APE are the empirical analogue to the expression above:

$$\widehat{APE} = \hat{\beta} \left[\frac{1}{n} \sum_{j,q} \phi\left(\hat{\beta} InstChar_{j,q} + \hat{\lambda}_q\right) \right], \quad (4)$$

where $\phi(\cdot)$ is the standard normal probability density function. The APE associated with a covariate is determined by both the underlying sensitivity of confidentiality-seeking propensity to this covariate (β) and the sample distribution of all covariates (the sample average of $\phi(\cdot)$).

[Insert Table III here.]

The γ 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:

$$APE = E \left(\frac{\partial CF_{j,q}}{\partial InstChar_{j,q}} \mid InstChar_{j,q}, \lambda_q \right) = \gamma E \left[\Phi \left(\frac{\gamma InstChar_{j,q} + \lambda_q}{\sigma_{\sigma}} \right) \right], \quad (5)$$

where $\Phi(\bullet)$ is the cumulative probability function of the standard normal distribution. The empirical analogue to (5) is readily available:

$$\widehat{APE} = \hat{\gamma} \frac{1}{n} \sum_{j,q} \Phi \left(\frac{\hat{\gamma} InstChar_{j,q} + \hat{\lambda}_q}{\hat{\sigma}_{\sigma}} \right) \quad (6)$$

Table III uses a set of *InstChar* variables that consist of continuous variables mostly constructed based on 13F quarterly holdings. These variables capture the degree of active portfolio management or 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 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.¹⁸ *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 of the portfolio during the quarter, assuming that the institution maintains the holdings of the last quarter-end. *Flow* is defined as the change in total portfolio value between two consecutive quarters, net of the change due to returns, and expressed as a percentage of the portfolio size at the previous quarter-end. That is,

$$Flow_{j,q} = \frac{PortSize_{j,q} - PortSize_{j,q-1}(1 + PortRet_{j,q})}{PortSize_{j,q-1}}. \quad (7)$$

Flow measures the change in the value an institution's equity portfolio due to changes in investment (and not due to appreciation of the stock prices), and is a proxy for the fund inflows that the institution receives.

¹⁸ 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.

Finally, *BetaMkt*, *BetaSMB*, *BetaHML*, and *BetaMom* are the loadings on the Fama and French (1993) three factors (market, size, book-to-market) and the momentum factor (Jegadeesh and Titman, 1993) using imputed monthly returns for the 36-month period ending in the current quarter.

Table III suggests that several characteristics are significantly associated with more frequent confidential filings. First is portfolio size (*PortSize*), consistent with larger hedge funds bearing higher market impact and maybe having larger capacity in collecting private information. 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 return volatility (*PortVol*).

Interestingly, hedge funds that seek confidential treatment more often and that have larger portion of their portfolio masked from their original filings have equity portfolios with significantly lower loadings on the market (*BetaMkt*), size (*BetaSMB*), and the momentum (*BetaMom*) factors. Combining higher portfolio return volatility and lower factor loadings, we can conclude that these funds manage portfolios that have higher idiosyncratic risk (or low R-squared with respect to the market and common factors). Indeed, when we replace portfolio volatility with idiosyncratic volatility, the coefficient on the latter turns out to be significant at the 1% level in both regressions.

We argue that such a pattern is supportive of private information and active portfolio management. First, a recent paper by Titman and Tiu (2009) find that better hedge funds (in terms of Sharpe ratios and information ratios) exhibit lower R-squared values with respect to systematic factors. Second, given the additive property of idiosyncratic risk, an equity long portfolio with high idiosyncratic risks necessarily over-weights stocks with high idiosyncratic variations. Such stocks are shown by the literature (Durnev, Morck, Yeung, and Zarowin (2003) and Durnev, Morck, Yeung (2004)) as having a higher ratio of private, firm-specific information to noise, and carrying more information that gets impounded into the price through informed trading (Chen, Goldstein, and Jiang (2006)). Finally, this pattern echoes Agarwal, Fos, and Jiang's (2009) finding that hedge funds which choose not to report to any commercial databases have significantly lower factor loadings compared to 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.

B. Stock Characteristics and Confidential Holdings

The next question in line is what types of stocks are more likely to be included in confidential holdings of hedge funds. If the primary purpose of confidential filing is to conceal private information, then stocks in such holdings are likely to be associated with information-sensitive events (such as M&A attempts), more opaque, and subject to more information asymmetry among investors compared to stocks that are revealed in the regular quarterly filings.

In the SEC guideline for amendment to 13F filings, “open risk arbitrage” and “block positioning” are allowable reasons for the delay in disclosure. The event that best exemplifies both motives is merger and acquisition (M&A). A merger arbitrage trade is usually made upon an announced attempt of acquisition after which the risk arbitrageurs bet on the completion of the deal and the convergence of the price to the bidding price. Therefore, we use the indicator variable ($M\&A$) for a stock that was an announced M&A target 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 are retrieved from Securities Data Company (SDC), updated to the end of 2007.¹⁹ A necessary condition for the classification of M&A attempts is an intended change-of-control. For this purpose, we exclude transactions classified as acquisitions of partial stakes, minority squeeze-outs, buybacks, recapitalizations, and exchange offers. We also require that the bidder had a stake below 50% before the transaction and an announced intention to take a stake above 50%. Our final sample has 4,726 announced deals during the period of 1998-2007.

More generally, we use several variables that are firm-specific drivers of information asymmetry including firm size, liquidity, distress risk, and analyst following. Extant literature indicates that greater

¹⁹ This data was obtained from Edmans, Goldstein, and Jiang (2009). We thank the authors for sharing the data.

information asymmetry is associated with smaller stocks (Chari, Jagannathan, and Ofer (1988), Llorente, Michaely, Saar, and Wang (2002)), illiquid stocks (Glosten and Milgrom (1985), Merton (1987), Diamond and Verrecchia (1991), and Kim and Verrecchia (1994)), lesser analyst following (Brennan and Subrahmanyam (1995), Hong, Lim, and Stein (2000), Chang, Dasgupta, and Hilary (2006)), and higher probability of financial distress (Griffin and Lemmon (2002)).

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 the Amihud (2002) illiquidity measure as the proxy for trading liquidity (*Illiquidity*). The measure is constructed as the yearly average of the square root of $|\text{return}|/(\text{price} \times \text{volume})$, 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*).

Finally, we measure the probability of financial distress by 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 populated by Moody's KMV, and is now a standard measure for the default risk. We estimate distance-to-default for each firm at each year-end following the estimation 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).

Panel A of Table IV reports the summary statistics of stock-level variables discussed above separately for positions included only in the original filings and those only in the confidential filings of hedge funds. For the purpose of comparison, we discard amendment filings (original filings) that are not paired with a confidential filing (original filing) from the same institution-quarter, and exclude stocks that appear in both the original and amendment filings of an institution-quarter. We adopt these sample selection criteria in order to facilitate extracting information relating a stock's characteristics to the

probability of its being included in a confidential holding when it could have been in the original holdings. Quarterly dummies are incorporated in all specifications.

[Insert Table IV here.]

Panel A of Table IV shows that stocks in confidential holdings of hedge funds are smaller, have higher book-to-market ratio, higher momentum, lower trading liquidity, lower analyst coverage, and higher distress risk compared to the stocks in the original filings of hedge funds. Differences along these dimensions are all statistically significant at the 1% level and strongly suggest greater information asymmetry in the confidential holdings. Moreover, stocks in confidential holdings are far more likely to have been recent targets in M&A announcements, a probability of 7.5% versus 3.4% for the original filings, pointing to risk arbitrage as an important motive underlying confidential treatment. The confidential holdings of Stark Onshore Management LLC tabulated in Table I exemplify the motive as 39 out of these 55 holdings (i.e., 70.9%) were targets in M&A announcements within a year on the quarter-end dates. Lastly, the stocks in confidential filings experience much better market-adjusted returns in the past twelve months than those of original holdings: the difference of 10.4 percentage points is significant at the 1% level. This finding clearly refutes the “window dressing” hypothesis which posits that hedge funds relegate losing positions to confidential filings in order to make their disclosed positions look smart.

In addition to the univariate analyses, we explore the same issue using multivariate logistic regressions. The model specification is as follows:

$$CH_{i,j,q} = (\lambda StockChar_{i,q} + \alpha_q + \delta_{Ind} + \varepsilon_{i,j,q} > 0), \quad (8)$$

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 35.8%. $StockChar_{i,q}$ is the same vector of stock characteristics variables used in Panel A of Table IV. All standard errors in these regressions are adjusted for heteroskedasticity and clustering at the institution level. In addition to the quarterly dummies (α_q), the Fama and French (1997) 10 industry dummies (δ_{Ind}) are added to regression (8) to control for unobserved heterogeneity at the industry level. Results without the industry dummies are qualitatively similar and

marginally stronger.

Reported in Table IV 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 $E\left[\partial \Pr(CH_{i,j,q} = 1) / \partial StockChar_{i,q} \mid StockChar_{i,q}\right]$:

$$\begin{aligned} \widehat{APE} &= \hat{\lambda} \frac{1}{n} \sum_{i,j,q} \Lambda\left(\hat{\lambda} StockChar_{i,q} + \hat{\alpha}_q + \hat{\delta}_{Ind}\right) \left[1 - \Lambda\left(\hat{\lambda} StockChar_{i,q} + \hat{\alpha}_q + \hat{\delta}_{Ind}\right)\right] \\ &= \hat{\lambda} \frac{1}{n} \sum_{i,j,q} \frac{\exp\left(\hat{\lambda} StockChar_{i,q} + \hat{\alpha}_q + \hat{\delta}_{Ind}\right)}{\left[1 + \exp\left(\hat{\lambda} StockChar_{i,q} + \hat{\alpha}_q + \hat{\delta}_{Ind}\right)\right]^2}, \end{aligned} \quad (9)$$

where $\Lambda(\bullet)$ is the cumulative probability function for logistic distribution.

Again, the sample for regression (8) includes only holdings in paired original-confidential filings. Using the full sample (including positions of original filings without paired confidential filings) would also yields consistent results, but the power of the test would be lower due to the large number of observations with very little information content because most of the unpaired original filings are made by the great majority (about 89%) of hedge funds that have never resorted to confidentiality.²⁰ Moreover, a logistic regression using the paired sample has the desirable feature that all of its slope coefficients (but not the intercept) have the same probability limit as those using the full sample, but the former are more efficient estimates.

Results from multivariate logistic regressions, as reported in Table IV Panel B, provide messages consistent with those from Panel A. Because *Size*, *Analyst*, and *Illiquidity* have high pairwise correlations (with absolute values above 0.60), we try specifications that have only one of these three variables at a time, as well as having all three of them together in one regression. Overall, characteristics of confidential holdings of hedge funds are strongly associated with higher level of private information, but do not support the window dressing motive.

²⁰ In general, a discrete response regression model suffers from low power if the unconditional probability of a positive response is miniscule (as would be the case if we use the full sample). In such cases, “choice-based sampling” such as eliminating observations that have a zero probability to have a positive response (such as holdings of hedge funds that never resort to confidential filing) can increase the power of the test by increasing the average information content of the kept observations. Please see Manski and McFadden (1981) for a general discussion of the approach.

IV. Performance of Confidential Holdings of Hedge Funds

Having examined the determinants of confidential holdings of hedge funds, we next assess the return performance of these holdings. As we mentioned earlier, the presence of positive abnormal returns is necessary to differentiate the private information hypothesis from other possible motives to seek confidentiality.

A. Choice of Performance Measure

We adopt two abnormal performance measures. The first measure is the Carhart (1997) four-factor alpha. More specifically, we compute the daily portfolio returns assuming the holdings of the previous quarter-end using value or equal weights of the stock positions in the portfolio, and then obtain the intercepts (alphas) from regressions on the daily returns of the four factors (market, size, book-to-market, and momentum).²¹ 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- or equal-weighting in the portfolio.

While the alpha from multifactor models is the most commonly used measure 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 three components: 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

²¹ Daily factor returns are obtained from Kenneth French’s website:
http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

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 measure.

B. Comparing Return Performance of Confidential and Original Holdings

We first compare the abnormal performance measures of confidential and original holdings at the 13F filing level. Moreover, we group the confidential filings based on the length of their confidential periods to both accurately reflect the motives of remaining confidential and avoid the impact of public disclosure. As a result, we evaluate the abnormal performance at seven horizons from two months up to one year. For each specified horizon, we consider all confidential filings whose confidential periods 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 three months or longer but less than four months from the portfolio quarter-end are grouped to assess the abnormal returns for the three-month horizon.

In Panels A and B of Table V, we report the return performance of original and confidential holdings separately, as well as their differences, using value- and equal-weighted four-factor alpha measure (Panel A) and the DGTW benchmark-adjusted return measure (Panel B). 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 in Panel A and B of Table V provides strong evidence that confidential holdings exhibit higher benchmark-adjusted returns compared to original holdings over different confidential periods. For both four-factor alphas and DGTW measures in value-weighted terms, the mean differences are positive for all seven horizons from two to twelve months, and are statistically significant at the 10% level or better for all but one horizon. The difference in the daily four-factor alpha measure amounts to 2.57 (2.05) basis points per day over the two-month (twelve-month) horizon, corresponding to annualized return spreads of 6.48 (5.17) percentage points in favor of confidential holdings. Similarly, the difference in the DGTW measure is 5.26% (7.51%) over the two-month (twelve-month) horizon. Importantly, the

abnormal returns remain economically and statistically significant up to one year after the portfolio quarter-end date. Results are qualitatively similar using equal weights. The presence of such superior returns supports that confidential holdings are more informed than original holdings. Moreover, the persistence of the abnormal returns up to one year also rules out the possibility that the returns are primarily driven by the temporary price pressure to avoid price impact. This does not completely rule out the price impact motive but simply allows us to distinguish private information from alternative motive as the dominant reason for filing confidentially.

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 the same methodology on hedge funds' confidential holdings. More specifically, 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 Panel C of Table V. We find qualitatively similar results to 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 some superior stock selection ability.

C. Sensitivity checks

We conducted several sensitivity checks on the return analysis, which we report in this section without tabulation. First, we repeat the calculation presented in Panels A and B of Table V but separately for the subsamples of confidential filings that result from SEC approvals of the confidential treatment and those responding related to SEC denials. Interestingly, the abnormal returns on the two subsamples are statistically indistinguishable for all time horizons considered. The lack of difference indicates that institutions' ability or willingness to provide adequate factual support for their confidential holdings is neither indicative of the quality of their private information, nor of the SEC's judgment on whether an

application for confidentiality merits approval. The SEC approval is more likely to be driven by those stated criteria such as “reveal investment strategy” and “harm the manager’s competitive position”.²²

Second, we calculate similar abnormal returns as in Panels A and B of Table V for the category of investment companies/advisors. The abnormal returns for the confidential holdings of investment companies/advisors are similar to those of hedge funds but weaker in magnitude (not tabulated). This is expected as hedge funds are arguably the most active portfolio managers and among the most aggressive in seeking private information. In sharp contrast to hedge funds, we do not find any positive abnormal returns for the confidential holdings of banks and insurance companies. These institutions are infrequent users of the confidential treatment (see Table II Panel B) and their confidential holdings do not seem to be informed.

Finally, the implicit assumption that portfolios are formed right at the quarter-end could bias down our return results 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 that analyzes returns using holdings data. Nevertheless, we repeat the analysis in Panel C of Table V by assuming the beginning of the quarter as the portfolio formation date and evaluate the performance over the following three months in the portfolio holding quarter. It turns out that the difference between DGTW benchmark-adjusted returns of confidential holdings and the original holdings of hedge funds over the portfolio holding quarter are even higher than reported in Panel C of Table V (11.5% per annum for value-weighted and 12.3% for equal-weighted returns). 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.

D. Acquisition- and Disposition-Motivated Confidential Holdings

Within the confidential filings, stocks that are part of the ongoing acquisition can be quite

²² See the SEC official guideline for 13F amendments (<http://www.sec.gov/about/forms/form13f.pdf>.)

different from those of the ongoing disposition. For example, when a hedge fund seeks confidentiality for a position that it plans to acquire more, the private information about a stock is likely to be positive; conversely, the concealment of an ongoing disposition is more likely to happen upon negative private information. A separation of the two types can sharpen our tests regarding the motives of confidential filings.

Unfortunately, the acquisition/disposition purpose is not explicitly stated in the confidential filings and therefore cannot be exactly identified. For practical purpose, we adopt the following classification algorithm. For each stock in a confidential filing, we compare the position (after adjusting the number of shares for stock splits) to that of the same stock by the same institution at the previous quarter-end, and classify net increase (decrease) as acquisition (disposition). In case of no change (5.4% of the sample), we break the tie by looking at the position change of the same stock in the next quarter (or, if a tie remains, two quarters before) and classify acquisition (disposition) if a net increase (decrease) is detected. Such an algorithm classifies 80.7% (19.3%) of the positions in confidential holdings of hedge funds as acquisition- (disposition-) motivated.

Based on the classification of acquisition/disposition status at the institution-quarter-stock level, we form portfolios of acquisition- and disposition-motivated confidential holdings separately for each 13F filing, and then compare the return performance, using both the four-factor alpha and the DGTW measure, of these portfolios with those of the original portfolios. For the sake of brevity, only results using the value-weighted returns are tabulated in Table VI.

[Insert Table VI]

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 mostly economically significant. At the one-year horizon, the performance difference amounts to 3.90 and 7.06 percentage points using four-factor alphas and DGTW measure respectively. As a robustness check, we also classify acquisitions and dispositions by comparing the positions to the subsequent quarter-ends (i.e., a “forward-looking” approach compared to the previously discussed “backward-looking” one). We find qualitatively similar

results using the alternative classification algorithm.

We note that the results of disposition-motivated subsample (shown in the bottom parts of both panels in Table VI) are not nearly as consistent as those about acquisitions, possibly because on-going dispositions are more likely to be liquidity motivated while acquisition are primarily information driven. In such cases, institutional managers may still benefit from confidential filings in mitigating the adverse price impact that might ensue had the institution carried out the disposition in the open, even though we do not observe as strong abnormal returns of these confidential positions.

V. Concluding Remarks and Policy Implications

Our results show that a selective subset of institutional investors' portfolios, i.e., the confidential holdings of hedge funds, embody superior information although the literature has shown a general lack of economically significant and persistent abnormal performance among active portfolio managers as a whole (French, 2008). These findings provide positive evidence of superior managerial skills and offer an explanation to the ongoing resistance by investment managers against ownership disclosure.

Our study prompts several implications for the researchers, practitioners, and regulators. First, our study of a comprehensive sample of the complete 13F holdings suggest that although ignoring confidential holdings will bias the results for certain types of institutional investors, 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 (as only about 3% of all 13F filings are confidential).

However, given the importance of confidential holdings conditional on a confidential filing (on average 34% of the total value of an institution-quarter portfolio for hedge funds), their disproportionate association with information sensitive events (such as M&As), and their characteristics that point to general information asymmetry, ignoring confidential holdings could be a significant omission in analyzing position changes of individual institutions or in response to specific events (such as merger arbitrage). Such information is also potentially important for investment managers who use Form 13F information in formulating investment strategies, predicting implementation costs, and identifying traders

who would likely take the other side of a large order.

On the regulation front, our study raises interesting questions regarding the design of ownership disclosure rules that optimally balance between ensuring sufficient transparency and preserving the incentives for sophisticated investors to collect and benefit from private information. Our findings indicate that confidential treatment, on top of the regular 45-day delay in regular 13F filings, offers adequate relief for institutions who wish to disclose holdings only after a significant delay. At the same time, the high rejection rates among some of the heavy users (such as D. E. Shaw and Caxton) who enjoyed effective delays given the turnaround time of SEC review during our sample period (see discussion in Section II.A) also call for attention for rules that make the cost and benefit clear and consistent for all players.

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Appendix: The Classification of 13F Filing Institutions

The classification of institution types employed in this paper is quite different from that used in the Thomson Reuters database. Thomson Reuters divides all institutions into five types: banks (type code = 1, narrowly defined as financial institutions that accept and manage deposits and make loans, or loosely “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).²³ 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.

We made the following changes to the Thomson classification of institutional categories. We first divide all institutions into four groups: (i) hedge funds (the classification of which will follow), (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.

Hedge funds are classified by manually identifying hedge fund management companies from all 13F-filing institutions. A hedge fund management company is defined as an institutional investor that has

²³ The Thomson Reuters Ownership database acknowledges this issue with the classification in their data manual.

major hedge fund business according to the information revealed from a wide range of sources, including the institution's own websites and SEC filings, industry directories and publications, and news article searches. The full list of 13F-filing hedge funds is obtained from Agarwal, Fos, and Jiang (2009) which provides a detailed description for the classification criteria. There are 942 unique hedge funds in the final sample used in this paper.

Figure 1
Time Line of the Original and Confidential 13F Filings

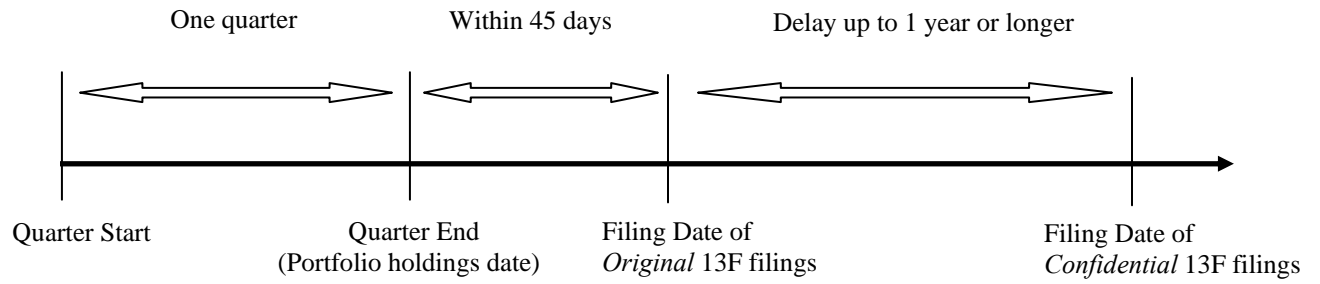


Table I
Confidential Holdings of Stark Onshore Management LLC

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. A confidential holding is defined as a position in an amendment filing that was unreported in the corresponding original 13F filing, or that was reported in the original filing with a different number of shares. “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

Table II
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. 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. 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
<i><u>Original 13F Form Filings</u></i>				
# 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%
<i><u>Confidential 13F Form Filings</u></i>				
# 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 Confidential Filers and Top Ten Denied Institutions

Top Ten Confidential Filers	Inst. Type	# Conf. Filings	% Rejected
Chesapeake Partners Management Co.	INVCO	112	6.3%
UBS Oconnor, L.L.C.	HF	79	1.3%
Price T. Rowe 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 III
Determinants of 13F Confidential Holdings of Hedge Funds

This table reports the results from probit and tobit regressions modeling 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 (both original and confidential) 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 defined as the increase 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. “*BetaMkt*”, “*BetaSMB*”, “*BetaHML*”, and “*BetaMom*” are the loadings on the Fama-French three factors (market, size, book-to-market) and the momentum factor using imputed monthly returns for the 36-month period ending in the current quarter, assuming that the institution always maintains the most recent past quarter-end holdings. 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.

	Dep. Variable: Indicator for Confidential Filing	Dep. Variable: Percent of Value filed as Confidential
	Probit	Tobit
Log(Age)	-0.038 (-1.40)	-0.014 (-0.17)
	-0.25%	-0.05%
Log(PortSize)	0.214*** (9.57)	0.141*** (3.93)
	1.41%	0.47%
Turnover	2.116*** (14.39)	1.772*** (3.81)
	13.95%	5.91%
PortHHI	3.241*** (15.50)	2.551*** (6.51)
	21.37%	8.51%
PortRet	0.172 (0.33)	0.244 (0.44)
	1.13%	0.8139%
PortVol	2.995*** (4.16)	2.665** (2.05)

	Dep. Variable: Indicator for Confidential Filing	Dep. Variable: Percent of Value filed as Confidential
	Probit	Tobit
	19.75%	8.89%
Flow	0.058 (1.16)	0.054 (1.55)
	0.38%	0.18%
BetaMkt	-0.302*** (-3.22)	-0.256** (-2.00)
	-1.99%	-0.85%
BetaSMB	-0.279*** (-4.26)	-0.213* (-1.87)
	-1.84%	-0.71%
BetaHML	0.024 (0.58)	0.012 (0.13)
	0.16%	0.04%
BetaMom	-0.257*** (-4.22)	-0.198 (-1.10)
	-1.69%	-0.66%
Constant	-3.762*** (-17.48)	-2.884*** (-7.69)
Observations	11,144	11,144
Pseudo R-squared	0.129	0.130
Unconditional mean	3.37%	1.18%

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

Panel A compares the summary statistics (mean, median, and standard deviation) of the characteristics 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 Amihud (2002) illiquidity measure, or 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. “*DTD < 1.64*” is the dummy variable for the Merton (1974) and Vassalou and Xing (2004) distance-to-default measure to be smaller than 1.64 (implying a 5% or higher default probability). “*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 are adjusted for clustering at the stock and quarter levels. Panel B reports the results from a logistic regression modelling 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. “*Log(Size)*” is the natural logarithm of “*Size*” and “*Log(Analysts)*” is the natural logarithm of one plus the “*Analysts*” measure defined above. Each column reports estimated coefficients, their t-statistics (in parentheses), and the average partial effects (APE, in percentage points). Quarterly dummies and Fama-French 10-industry dummies are included in all specifications in Panel B. 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.

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

	Size (\$M)	B/M	Adj. Past Return	Illiquidity	Analysts	DTD < 1.64	M&A
<i>Confidential 13F Form Filings</i>							
Mean	7,482	0.555	17.1%	0.091	13.28	21.4%	7.5%
Median	1,374	0.463	5.7%	0.047	11.00	0	0
Std. Dev.	21,309	0.405	59.0%	0.125	10.99	41.0%	26.4%
Min	46	0.042	-73.4%	0.004	0.00	0	0
Max	178,760	2.141	263.6%	0.742	48.00	1	1
# obs	38,126	38,126	38,126	37,999	38,069	38,126	38,126
<i>Original 13F Form Filings</i>							
Mean	11,959	0.497	6.7%	0.064	14.96	9.3%	3.4%
Median	2,486	0.420	-0.3%	0.028	13.00	0	0
Std. Dev.	28,179	0.351	46.0%	0.108	11.15	29.1%	18.3%
Min	46	0.042	-73.4%	0.004	0.00	0	0
Max	178,761	2.141	263.6%	0.742	48.00	1	1
# obs	68,292	68,290	68,292	67,999	68,196	68,292	68,292
<i>Two-sample Tests</i>							
Differences in Mean (Conf.- Original)	-4,476***	0.058***	10.4%***	0.027***	-1.67***	12.1%***	4.1%***
t-stat.	(-4.98)	(3.58)	(3.36)	(5.91)	(-3.02)	(6.58)	(3.70)

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

	(1)	(2)	(3)	(4)
M&A	1.682*** (17.13) 25.01%	1.636*** (17.01) 24.93%	1.665*** (17.60) 25.20%	1.681*** (17.04) 24.91%
Log(Size)	-0.230*** (-31.09) -3.42%			-0.281*** (-27.15) -4.16%
Illiquidity		1.071*** (8.52) 16.32%		-1.575*** (-10.85) -23.34%
Log(Analysts)			-0.218*** (-13.61) -3.30%	-0.055*** (-3.73) -0.82%
DTD < 1.64	0.122*** (6.71) 1.81%	0.056*** (2.88) 0.85%	0.059*** (3.14) 0.89%	0.195*** (9.91) 2.89%
B/M	-0.198*** (-4.57) -2.94%	0.063 (1.38) 0.96%	0.053 (1.18) 0.80%	-0.184*** (-4.19) -2.73%
Adj. Past Return	0.208*** (9.06) 3.09%	0.100*** (4.05) 1.52%	0.136*** (5.64) 2.06%	0.270*** (10.83) 4.00%
Constant	1.061*** (9.19)	-0.988*** (-10.30)	-0.418*** (-3.99)	1.691*** (13.19)
Observations	106,416	105,996	106,263	105,996
Unconditional Mean	35.8%	35.8%	35.8%	35.8%
Pseudo R-squared	0.312	0.298	0.302	0.314

Table V
Abnormal Returns of Original and Confidential Holdings of Hedge Funds

In this table, Panel A and Panel B report the Carhart (1997) four-factor alphas and Daniel, Grinblatt, Titman, and Wermers (1997) (DGTW) benchmark-adjusted returns for original and confidential 13F holdings of hedge funds. In these two panels, we group the confidential filings by the length of their confidential periods and evaluate the abnormal performance at seven horizons from two months up to one year. For each specified horizon, we consider all confidential filings whose confidential periods 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 three months or longer but less than four months from the portfolio quarter-end are grouped to assess the abnormal returns for the three-month horizon. The daily four-factor alphas (in basis points) are computed from the daily value-weighted and equal-weighted portfolio returns. DGTW benchmark-adjusted returns are first computed for each stock in each portfolio and then are averaged at the portfolio level using value or equal weights of the portfolio. The abnormal return measures are first calculated for each original or confidential 13F filing, and then averaged for each institution. The differences and annualized differences between the abnormal returns of confidential and original holdings and two-sample mean difference t-statistics are reported. To facilitate the comparison to Griffin and Xu (2009), Panel C reports 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. Similar to Griffin and Xu (2009), return measures are first calculated for each institution-quarter portfolio using value or equal weights of the portfolio and then average across the institution-quarter portfolios in the sample period. Both raw and DGTW benchmark-adjusted returns are annualized. Two-sample mean difference t-statistics and t-statistics for the return measures of each type of 13F holdings are reported. 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>Value-Weighted</i>							
Conf. Holdings (in basis points)	5.39	5.04	4.36	3.74	4.32	3.70	4.50
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>Equal-Weighted</i>							
Conf. Holdings (in basis points)	6.30	5.80	4.31	5.56	3.98	2.70	3.87
Original Holdings (in basis points)	3.09	2.75	2.80	2.52	2.43	2.43	2.42
Diff: Conf. - Orig. (in basis points)	3.22***	3.05***	1.51**	3.04***	1.56**	0.27	1.45**
Annualized Diff.	8.10%***	7.67%***	3.81%**	7.66%***	3.92%**	0.69%	3.65%**
t-Stat.	4.23	3.36	2.15	2.96	2.43	0.38	2.25
# 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

Panel B: DGTW benchmark-adjusted returns

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
<i>Value-Weighted</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
<i>Equal-Weighted</i>							
Conf. Holdings	4.56%	1.70%	1.05%	4.20%	3.41%	3.00%	6.66%
Original Holdings	0.46%	0.39%	0.31%	0.33%	0.30%	0.49%	0.83%
Diff: Conf. - Original	4.11%***	1.31%**	0.74%	3.87%***	3.11%***	2.51%	5.83%***
Annualized Diff.	24.65%***	5.24%**	2.23%	9.29%***	6.22%***	3.35%	5.83%***
t-Stat.	6.24	2.24	1.07	2.98	3.45	1.64	3.54
# 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 C: 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 reports the Carhart (1997) four-factor alphas and Daniel, Grinblatt, Titman, and Wermers (1997) (DGTW) benchmark-adjusted returns of acquisition- and disposition-motivated confidential 13F holdings of hedge funds. A confidential holding is classified as acquisition-(disposition-) motivated if the position shows a net increase (decrease) over the previous quarter-end. We group the confidential filings by the length of their confidential periods and evaluate the abnormal performance at seven horizons from two months up to one year. For each specified horizon, we consider all confidential filings whose confidential periods 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 three months or longer but less than four months from the portfolio quarter-end are grouped to assess the abnormal returns for the three-month horizon. The daily four-factor alphas (in basis points) are computed from the daily value-weighted and equal-weighted portfolio returns. DGTW benchmark-adjusted returns are first computed for each stock in each portfolio and then are averaged at the portfolio level using value or equal weights of the portfolio. The abnormal return measures are first calculated for each original or confidential 13F filing, and then averaged for each institution. The differences and annualized differences between the abnormal returns of confidential and original holdings and two-sample mean difference t-statistics are reported. 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)	5.57	5.34	2.75	5.38	4.44	3.88	3.98
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)	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 (in basis points)	3.21	4.74	6.05	2.92	1.85	-0.52	2.95
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)	0.41	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