

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 delay through amendments to Form 13F and are usually excluded from the standard databases. Funds managing large risky portfolios with nonconventional strategies seek confidentiality more frequently. Stocks in these holdings are disproportionately associated with information-sensitive events or share characteristics indicating greater information asymmetry. Confidential holdings exhibit superior performance up to 12 months, and tend to take longer to build. Together the evidence supports private information and the associated price impact as the dominant motives for confidentiality.

MANDATORY DISCLOSURE OF HOLDINGS in public companies by investors is an essential part of securities market regulation. At the core of this regulation is Section 13(f) of the Securities Exchange Act of 1934, which requires institutional investment managers to disclose their quarterly portfolio holdings. The

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quarterly reports, filed to the Securities and Exchange Commission (SEC) on Form 13F, disseminate information about the holdings and investment activities of institutional investors to the public. The 13(f) rule, however, gives the SEC the discretion to delay disclosure that is “necessary or appropriate in the public interest or for the protection of investors.” When filers request confidential treatment for certain holdings, they are allowed to omit those holdings from their Form 13F pending a decision by the SEC. If a request is denied, or after the approved period of confidentiality expires, the filers must reveal those holdings by filing *amendments* to their *original* Form 13F. Throughout the paper, we refer to these amendments as “confidential filings,” and the positions included in such filings as “confidential holdings.”

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

Private information along with the associated price impact underlies confidentiality seeking. It is in the best interest of investment managers not to disclose their informed positions before they have fully reaped the benefits of their private information (Huddart, Hughes, and Levine (2001)). Timely disclosure of portfolio holdings may reveal information about proprietary investment strategies that outside investors can free-ride on without incurring the costs of research themselves. Hence, some delay in disclosure is desirable for the preservation of incentives to collect and process information, which contributes to the informational efficiency of financial markets (Grossman and Stiglitz (1980)). Indeed, for this reason several hedge funds and investors, including Warren Buffett and Philip Goldstein, have even appealed to the SEC for an exemption from revealing their positions in the 13F forms.¹ It also has to be the case that institutions intend to take advantage of their private information beyond the normal delay of 45 days to justify seeking confidentiality.

Price impact concerns naturally interact with private information for two reasons. First, in equilibrium, stocks that are more prone to informed trading should incur higher price impact (Glosten and Milgrom (1985) and Kyle (1985)). Second, when the disclosed holdings are informed, an increase in free-riding activity reduces the returns of the filing managers by causing security prices to move before the managers can fully implement their investment strategies.

¹ Such attempts have not been successful. Philip Goldstein, an activist hedge fund manager at Bulldog Investors, likens his stock holdings to “trade secrets” as much as the protected formula used to make Coke, and contends that complying with the 13F rule “constitute[s] a ‘taking’ of [the fund’s] property without just compensation in violation of the Fifth Amendment to the Constitution.” For a more detailed discussion, see “Do hedge funds hold ‘trade secrets’” in the September 12, 2006 issue of *Business Week*.

Such a scenario is analyzed by [Frank et al. \(2004\)](#) and [Verbeek and Wang \(2010\)](#).

Price impact may also be unrelated to information. Recent holdings information can allow outside speculators to anticipate further trades of the filers and in turn trade ahead of the filers to capture the temporary price impact even if the filers' trades are liquidity driven. Distressed sellers are particularly vulnerable to predatory trading ([Brunnermeier and Pedersen \(2005\)](#)). The fear of being front-run thus motivates filers to seek confidentiality until the desired transactions are complete. This motive is exemplified by the quant meltdown in August 2007. Quant-oriented hedge funds, which employed similar strategies and attempted to cut their risks simultaneously in response to their losses, blamed mandatory holdings disclosure for contributing to a death spiral in the summer of 2007 ([Khandani and Lo \(2007\)](#)).

Finally, delaying the disclosure of positions through confidential filing could also serve as an alternative to "window dressing," that is, trading strategies meant to generate differences between the portfolios held on the reporting date and those held at other times ([Haugen and Lakonishok \(1988\)](#), [Lakonishok et al. \(1991\)](#), [Musto \(1997, 1999\)](#), [Ng and Wang \(2004\)](#), and [Agarwal, Gay, and Ling \(2012\)](#)). Seeking confidentiality may result in lower cost to the filing managers than engaging in predisdisclosure trading if the main purpose of such trades is to hide certain positions from outside investors, for example, holdings of stocks perceived as undesirable due to poor past performance or high risk.

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

To the extent that the private information and price impact hypotheses are inherently connected, our findings are consistent with both. Confidential treatment allows hedge funds to accumulate larger positions in stocks, and to spread the trades over a longer period of time. Such relief benefits both informed and liquidity-motivated trading. Hedge funds trade approximately three times more in their confidential stocks compared to the stocks included in their original holdings; they also take almost three times as long to accumulate their confidential stakes. Such trades may well be motivated by information, as indicated by the superior performance of confidential holdings as a whole.

Nevertheless, price impact is also an important factor motivating confidentiality seeking.

Lastly, confidential holdings consist of stocks that have performed relatively well recently, ruling out performance-based window dressing as a major motivation for filing confidentially. We do find, however, that stocks in confidential holdings have higher idiosyncratic volatility and total volatility, consistent with a risk-based window dressing motive (Musto (1997, 1999)) as well as an information motive because idiosyncratic volatility is also an established proxy for stock-specific information (Durnev et al. (2003)).

Given the perceived benefits of seeking confidentiality, it is necessary to discuss the associated costs. Gaining confidential treatment is not a trivial task, nor is it guaranteed.² The applying institution must provide sufficient factual basis for the objection to public disclosure, including a detailed position-by-position description of the manager's investment strategy (e.g., risk arbitrage) as well as supporting analysis that public disclosure of the securities would reveal the investment strategy and harm the manager's competitive position. During our sample period, we find that a decision is usually made within 2 to 12 months. If the request is denied, the institution is obligated to file an amendment disclosing all the confidential positions immediately (within 6 business days).³

Analyzing the SEC denial outcomes reveals that hedge funds associated with higher past denial rates or seeking confidentiality for larger positions are more likely to be denied confidential treatment. We also find a significant positive market reaction, averaging around 1%, associated with the involuntary disclosure of positions due to denials within 180 days. In contrast, there is no significant market reaction when hedge funds voluntarily disclose confidential filings that were not denied and that experienced the same delay. The difference in results suggests that denials force the revelation of information that has yet to be impounded into stock prices, which may interfere with the filer's plan to further accumulate the stock. This puts a constraint on hedge funds' ability to seek confidentiality without strict compliance with the rules, as denials impose costs on future applications.

Our study contributes to the literature in several ways. First, our paper adds to the literature that evaluates the performance and information content of institutional investors' holdings (Grinblatt and Titman (1989, 1993), Grinblatt, Titman, and Wermers (1995), Daniel et al. (1997), Chen, Jegadeesh, and Wermers (2000), Wermers (2000, 2003), Kacperczyk, Sialm, and Zheng (2005, 2008),

² 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>. The section "Instructions for Confidential Treatment Requests" details the requirements.

³ Although the SEC does not provide information about all denial cases, we find 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 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>.

Wermers, Yao, and Zhao (2012), and Huang and Kale (2012) on mutual funds, and Griffin and Xu (2009) and Aragon and Martin (2012) on hedge funds). By incorporating confidential holdings and comparing them to original holdings, our study provides a more complete picture of the stock-picking ability of hedge funds. Moreover, our research sheds light on the limitations of using the conventional institutional quarterly holdings databases that generally exclude confidential holdings. While any error due to the omission of confidential holdings in evaluating the aggregate portfolio performance of all institutions is likely to be small, there may be a significant conditional bias in analyzing position changes of specific types of institutions and around specific events (such as mergers and acquisitions).

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

Finally, our study contributes to the literature on mandatory *ownership* and *holdings*⁴ disclosure, which is less studied than *issuer* disclosure. In the context of issuer disclosure, stricter requirements lead to more liquid and efficient capital markets, which can reduce the disclosing parties’ cost of capital but may also reduce their competitive advantage or bargaining power due to the revelation of information to their competitors (Diamond and Verrecchia (1991), Fishman and Hagerty (1998, 2003), and Admati and Pfleiderer (2000)). Analogously, the coexistence of mandatory ownership and holdings disclosure on the one hand and occasional relief through confidentiality on the other hand weighs the benefits of increased transparency of capital movements and investor monitoring of money managers against the costs of reduced incentives for active portfolio managers to acquire information and of increased transaction costs.

Changes in holdings can convey underlying fundamental information to the market—either because a change in positions reveals the filer’s private information about the value of the securities, or because the change in ownership represents a potential shift in corporate control. While disclosure enables investors to make an informed assessment about how a firm’s investor structure may impact the value of the firm’s shares, some delay in revelation is necessary

⁴ There is a subtle difference between ownership and holdings. Some rules (such as Schedule 13(d) and 13(g)) require disclosure by the beneficial owners, while others (such as Section 13(f)) mandate disclosure of holdings over which the investment manager has investment discretion but not necessarily beneficial ownership.

for such information to be generated and acquired in the first place. This trade-off is analogous to those analyzed in the literature on insider trading disclosure (Fishman and Hagerty (1995), John and Narayanan (1997), Huddart, Hughes, and Brunnermeier (1999), Huddart, Hughes, and Levine (2001), and George and Hwang (2007)) and patent protection for firms to preserve their incentives to invest in R&D (Wright (1983)).

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

I. Institutional Background

The current ownership and holdings disclosure rules mandated by the SEC consist 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 for ownership by insiders, and Forms N-CSR and N-Q for quarterly or semiannual disclosure of holdings required for mutual funds.

Among the five regimes, the Form 13F requirement under Section 13(f) (passed by Congress in 1975 and adopted by the SEC in 1978) of the 1934 Securities Exchange Act covers by far the largest number of institutional investors: all institutional investment managers (including foreign investors) that have investment discretion over \$100 million or more in Section 13(f) securities (mostly publicly traded equity, but also convertible bonds and options) are required to disclose their quarter-end holdings in these securities. We refer to the date when the Form 13F is filed with the SEC as the "filing date," and the quarter-end date on which the portfolio is disclosed as the "quarter-end portfolio date." According to the SEC rule, the maximum lag between the two dates is 45 calendar days. The same rule, however, allows the SEC discretion to delay or prevent disclosure of certain holdings, usually up to 1 year (which can be extended further) from the date required for the original 13F form. Such holdings are disclosed in an amendment to the original Form 13F after a request is denied, or after the confidentiality period expires. Figure 1 provides a timeline of the original and confidential 13F filings.

The confidential treatment of some holdings by the SEC had been justified on the grounds of protecting the public interest (mainly of the investment managers and the investors whose assets are under management) because "disclosure of such strategy would impede competition and could cause increased

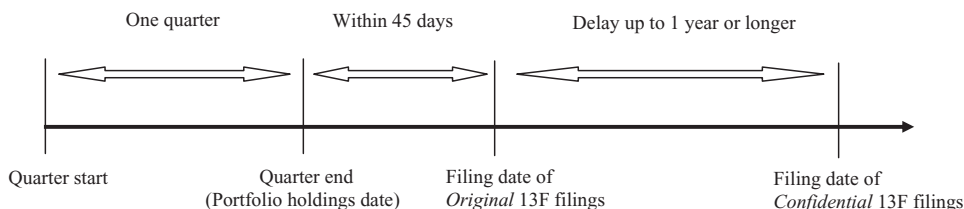


Figure 1. Timeline of the original and confidential 13F filings.

volatility in the market place.”⁵ In 1998, SEC staff issued interpretive guidance aimed at tightening the rules and restricting the conditions for confidentiality to prevent it from being used to mislead or manipulate the market.⁶ Our sample period (1999 to 2007) starts with the introduction of the SEC’s electronic filing system, which also coincides with the new regime.

The triggering event for the 1998 rule tightening was the confusion over the 13F reporting of investor Warren Buffett, which caused a significant decline in the share price of Wells Fargo & Co. in August 1997. The 13F form did not show Berkshire Hathaway’s well-known 8% stake in the bank because it was reported in a confidential filing. But the misunderstanding in the market caused Wells Fargo’s stock price to drop 5.8% in 1 hour after Buffett’s 13F filing.⁷ A more recent event further illustrates the tension arising from confidential filing. On August 14, 2007, D.E. Shaw & Company, one of the largest quant-oriented hedge fund managers, filed an entirely blank Form 13F for its second-quarter portfolio. The fund manager was effectively seeking confidential treatment of its entire portfolio, based on the argument that “copycat investors” were mimicking its strategies or could front-run its large positions. The SEC denied the request on October 19, 2007, forcing the firm to file an amended Form 13F on October 29, 2007, which covered 3,991 positions valued at \$79 billion. Similar but less extreme requests from D.E. Shaw were rejected by the SEC previously.⁸ More recently, confidential treatment received renewed attention in November 2011 when Berkshire Hathaway disclosed a \$10.7 billion bet on IBM, a position the fund accumulated in secrecy with the help of two quarters’ confidential treatment.⁹

⁵ Report of Senate Committee 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 1934 Securities Exchange Act.

⁶ 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.

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

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

⁹ See “Mum’s the Word for Some Investors — SEC Allows Money Managers Who Say Confidentiality Is Key to Conceal Certain Stock Holdings,” *The Wall Street Journal*, December 8, 2011.

It is worth noting that confidential treatment under Section 13(f) does not override other SEC ownership or holdings disclosure rules. For example, there is no confidential treatment for the disclosure of a beneficial owner of more than 5% of a company's equity under Schedule 13D or 13G. The same can be said about the holdings disclosure required for registered investment companies (mostly mutual funds), which was changed from a semiannual to a quarterly basis (with a 60-day delay) in 2004. Nevertheless, there are more than sporadic observations in our sample where the confidential positions would be required to file 13G (such as the Warren Buffett position in Wells Fargo) or quarterly holdings for a mutual fund management company (such as T. Rowe Price and American Funds). In such cases, the confidential treatment may still afford an effective delay if the 13F disclosure is the most binding (e.g., Schedule 13G allows a 45-day delay from the year end, and the disclosure requirement for mutual funds was semiannual before 2004).

Despite their potential importance, confidential holdings have not been systematically studied because they are generally not included in the conventional databases of institutional quarterly holdings, such as the Thomson Reuters Ownership Data (formerly the CDA/Spectrum database).¹⁰ In a contemporaneous paper, [Aragon, Hertzell, and Shi \(2012\)](#) also study hedge funds' use of confidential filings. In addition to having a more comprehensive sample of hedge funds, we conduct more analyses (such as characteristics of heavy users, trading behavior during confidential periods, as well as market reactions to the disclosure of confidential filings) to shed light on the costs and benefits associated with seeking confidentiality. [Aragon, Hertzell, and Shi \(2012\)](#), on the other hand, link hedge funds' confidential filings to their overall performance at the fund level.

We verify that over 90% of the confidential holdings in our sample period are not covered by the Thomson Reuters Ownership Data. The example of hedge fund Stark Onshore Management LLC (manager number 10375 in Thomson Reuters) illustrates such omissions. In Appendix A, we list all the confidential holdings of Stark Onshore Management during our sample period. Except for two stocks (Multi Fineline Electronix Inc., CUSIP = 62541B10 and Rouse Co., CUSIP = 77927310), all the other 53 confidential holdings in the amendments are not included in the Thomson Reuters database.

¹⁰ 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.

II. Sample Overview and Empirical Motivation

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

This study is based on the original 13F filings and amendments to these filings by all institutions. We directly retrieve both the original and the amendment 13F filings (forms 13F-HR and 13F-HR/A¹¹) dated between March 1999 and June 2007 from the SEC's EDGAR database. Our sample starts with the introduction of the SEC's requirement of electronic filing of Form 13F, and ends in 2007 to allow for *ex post* performance evaluation. We retrieve information about original filings directly from the SEC (rather than from Thomson Reuters) to maintain symmetry and comparability between the paired filings. Despite the large variation in reporting style and format, we are able to process complete holdings information for 91% of all the 13F filings using a combination of automated programming and manual processing. The resulting initial sample consists of 3,315 filing institutions, covering 86.1% of the institutions that report their original 13F filings to Thomson Reuters over the same period as well as 174 institutions that do not appear in the Thomson Reuters database at all.

Amendments to 13F filings contain two types of information: disclosure of a change in a position that was previously filed or a new holding that was previously excluded from the original filings. We define a confidential holding as one that was excluded from the original filing or the difference between the amended position and the originally filed position. Our results are qualitatively similar if we impose a threshold for the difference in the second component or simply exclude the second component. Based on the main criteria, our initial sample consists of 1,857 confidential filings (including both the denied and the nondenied cases) and 53,296 original 13F filings. By searching for key words (such as "denied" and "no longer warranted") on the first page of the amendments, we are able to separate amendments filed before or upon the expiration of confidential treatment and those filed in response to denials. Out of 1,857 confidential filings, 15.1% are denied by the SEC.

Table I provides the summary statistics. Panel A reports the distribution of the length of delay between filings and 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.¹² 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

¹¹ 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.

¹² Aragon and Martin (2012) also find similar proportions of delayed original 13F filings. We do not observe a systematic pattern in late filing of original Form 13F. For example, only a very small number of institutions are repeatedly late. Systematically late or missing filings entail legal risk for the filers.

Table I
Summary Statistics of 13F Original and Confidential Filings

Panel A of the table reports the distribution of the delay (in number of days) between the quarter-end portfolio date and the filing date for all original and confidential 13F filings (the “preliminary sample”). In panel B, we use the “final sample” that excludes observations with extreme delays, that is, more than 180 days for the original filings and confidential filings with less than a 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 Appendix B. Statistics for the two types of holdings are reported separately, and those of the confidential holdings are compared to statistics of the combined portfolio of confidential filings and their corresponding original holdings. Panel C reports the number of confidential filings and percent of rejected filings of the top 10 institutions that seek confidential treatment and the top 10 institutions that are most frequently denied their requests for confidential treatment. Both the original and the confidential filings are at the institution level. “HF” and “INVCO” are abbreviations for “Hedge Fund” and “Investment Company or Advisor,” respectively.

Panel A: Delay Period between Portfolio Date and Filing Date									
	0 – 30	31 – 45	46 – 60	61 – 180	> 180				Total
<i>Original 13F Form Filings</i>									
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%				
<i>Confidential 13F Form Filings</i>									
Delay (in days)	0 – 30	31 – 45	46 – 60	61 – 180	181 – 410	411 – 775	776 – 1,505	> 1,505	
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

(Continued)

Table I—Continued

	Panel B: Summary Statistics for Original and Confidential Holdings by Institution Type			
	Hedge Fund	Investment Company or Advisor	Bank and Insurance	Total
Institution type				
<i>Original 13F Form Filings</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>Confidential 13F Form Filings</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%

(Continued)

Table I—Continued

Panel C: Top 10 Institutions Seeking Confidentiality and Top 10 Denied Institutions				
Top 10 Institutions Seeking Confidentiality	Inst. Type	# Conf. Filings	% Rejected	
Chesapeake Partners Management Co.	INVCO	112	6.3%	
UBS O'Connor, L.L.C.	HF	79	1.3%	
T. Rowe Price Assoc Inc.	INVCO	70	5.7%	
Berkshire Hathaway Inc.	INVCO	65	72.3%	
Satellite Asset Management	HF	64	9.4%	
Lehman Brothers Inc.	INVCO	49	0.0%	
HBK Investments, L.P.	HF	48	27.1%	
Polygon Investment Partners	HF	40	0.0%	
M.H. Davidson & Company	HF	39	0.0%	
Stark Offshore Management, L.L.C.	HF	38	2.6%	
Total:		604	79	
% of the full sample		38.9%	29.3%	
Top 10 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%	

filings that result from SEC rejections and the rest. We do not tabulate these results and instead report them in the Internet Appendix.¹³ The lack of difference has two implications. First, some institutions file amendments before the expiration of the confidential period, presumably because they have completed their strategy. Second, even denied applications afford significant delays in disclosure.¹⁴

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 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 (4 years plus the 45 days allowed for the original 13F filings) for the confidential filings. We suspect that these observations are the result of data recording errors or irregular circumstances. These three filters together remove about 1.3% of original filings and 8.9% of confidential filings (see panel A of [Table I](#)). Our results are not sensitive to the particular numerical choices we use in these filters.

The resulting final sample consists of 52,272 original filings by 3,134 institutions, and 1,554 confidential filings by 232 institutions. Panel B of [Table I](#) summarizes the number of filings, number of institutions, dollar value, and number of stocks in this final sample. In classifying the institutions by type, we refine the Thomson Reuters classification of five institution types with a manual check. We describe the details of this classification in Appendix B. Using this scheme, we classify 13F institutions 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, compared to 37% in the original Thomson Reuters classification) of miscellaneous types.

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

Hedge funds, the focus of our analyses, are 13F-filing institutions whose major business is sponsoring/managing hedge funds that are manually classified according to the information revealed from a range of sources, including the institutions’ own websites, SEC filings, industry directories and publications,

¹³ The Internet Appendix may be found in the online version of this article.

¹⁴ The effective delay in disclosure enjoyed by denied confidential treatment could potentially invite abuse. Our informal conversation with the SEC staff indicates that institutions that received repeated rejections could receive warnings and will be subject to more timely review in future applications. This view is consistent with our empirical analysis in Section V. Moreover, the average time it takes for the SEC to reject applications had shortened considerably from the earlier to the later years of our sample, from over a year to about 9 months.

and news article searches.¹⁵ A Form 13F is filed at the management company level rather than at the portfolio or individual fund level. For the purpose of our study, we restrict our sample to relatively “pure-play” hedge funds (such as Renaissance Technologies) and investment companies in which hedge funds represent their core business (such as D.E. Shaw), and do not include full-service banks whose investment arms engage in hedge fund business (such as Goldman Sachs Asset Management) or mutual fund management companies that enter the hedge fund business (a relatively recent trend analyzed by [Agarwal, Boyson, and Naik \(2009\)](#), [Cici, Gibson, and Moussawi \(2010\)](#), and [Nohel, Wang, and Zheng \(2010\)](#)). Such restriction ensures that the equity holdings in the 13F filings are informative about the investments of hedge funds ([Griffin and Xu \(2009\)](#), and [Agarwal, Fos, and Jiang \(2012\)](#)). Our final sample consists of 942 unique hedge funds.

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

Panel C of [Table I](#) lists the 10 institutions that are the most frequent confidential filers during our sample period, and the 10 institutions that receive the highest number of rejections from the SEC for their applications. The majority of institutions on both lists are hedge funds, and the rest are investment companies/advisors. Berkshire Hathaway is on both lists. D.E. Shaw and Caxton Corporation (currently renamed Caxton Associates), 2 of the top 10 hedge fund companies in the United States as of 2007, have had 100% of their applications rejected by the SEC during our sample period.¹⁶

Both panels B and C of [Table I](#) indicate that hedge funds are by far the leading category of confidential filers. They constitute approximately 30% of all institutions, but 56% of all confidential filings, and take majority seats among the top 10 filers. Conditional on seeking confidential treatment, hedge funds on

¹⁵ For more details on the classification criteria of 13F-filing hedge funds, see [Agarwal, Fos, and Jiang \(2012\)](#).

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 two to three stocks only (compared to hundreds and thousands before). All three applications received speedy reviews and were approved by the SEC. These two cases are consistent with the discussion in footnote 14.

average allocate 23% of the stocks in their portfolio, or 34% of total portfolio value, to confidential filings. In comparison, the same figures for non-hedge fund institutions are much smaller (13% and 21% for investment companies/advisors, and 9% and 11% for banks and insurance companies, respectively). Such patterns are consistent with hedge funds being active portfolio managers using proprietary trading strategies, for which delay in disclosure is important to protect private information and minimize price impact. Moreover, hedge funds (especially the pure-play ones) tend to manage more concentrated portfolios, and are far less subject to other regulatory requirements for disclosure compared to other investment managers (such as mutual funds and pension funds). As a result, confidential treatment under Section 13(f) provides more privacy value to hedge funds. For these reasons, we focus on hedge funds as the primary subjects for our study, while providing a brief overview for the other two categories of institutions (investment companies/advisors, and banks and insurance companies).

B. Motivations for Empirical Analyses

Building on the prevalence and distribution of confidential filings, we motivate our empirical analysis of the incentives and consequences of seeking confidentiality from three strands of theoretical literature: the literature on mandatory disclosure, the literature on informed trading, and the literature on strategic trading by speculators. Some of the insights in this section also came up during our discussions with hedge fund managers and other industry sources.

Private information is at the heart of the literature on the impact of mandatory disclosure on informed trading (e.g., [Fishman and Hagerty \(1995\)](#), [John and Narayanan \(1997\)](#), [Huddart, Hughes, and Brunnermeier \(1999\)](#), [Huddart, Hughes, and Levine \(2001\)](#), and [George and Hwang \(2007\)](#)). Our setting mirrors the standard one in this literature in that we analyze the benefits of seeking relief from mandatory disclosure. Perhaps most relevant to our context is the work by [Huddart, Hughes, and Levine \(2001\)](#), henceforth HHL), who extend the [Kyle \(1985\)](#) model of an informed trader by introducing mandatory disclosure of trades at the end of each trading period. HHL prove the existence of a mixed strategy equilibrium in which the informed trader adds random noise to a linear strategy in each period in order to avoid full retrieval of private information by the market maker. Such a “dissimulation” strategy minimizes the loss in trading profits due to mandatory disclosure.

We present a modified HHL model that better fits our context in Section I of the Internet Appendix of this paper.¹⁷ The model predicts a positive relation

¹⁷ Our model, like those in HHL and other related papers, analyzes the disclosure of trades rather than that of positions, which is the subject of our empirical tests. For the purpose of theoretical motivation, we assume that the main cost of disclosing quarter-end positions comes from the revelation of trades. In reality, quarter-end position disclosure only reveals interquarter, not intraquarter, trades. However, the intuition of our model goes through.

between the benefits of confidentiality and information asymmetry. The intuition is relatively straightforward. Dissimulation in the HHL model is costly to the informed trader (relative to the no-disclosure benchmark) because some trades are made opposite to the direction of the private information. The loss is positively related to the *ex ante* information advantage of the informed trader. Relief from mandatory disclosure eliminates the need for dissimulation during the confidential periods, and hence restores some of the loss in trading profits that is positively related to information asymmetry.

Assuming an exogenous cost of seeking confidentiality, the model thus suggests that the stocks in confidential holdings should exhibit higher information asymmetry or are more likely to be associated with information-sensitive events. The same model also predicts that traders who possess more private information could benefit more from avoiding disclosure. Hence, hedge funds that deploy more active and less conventional portfolio strategies should seek confidential treatment more often. Our empirical study relates the likelihood of stocks being included in confidential holdings and the likelihood of hedge funds seeking confidentiality to proxies for information asymmetry and portfolio styles. Sections III.A and III.B below discuss the empirical proxies for these characteristics and test their relation with confidentiality.

Private information and price impact are inherently inseparable as motives for confidentiality because, as shown by the classical microstructure models (e.g., [Kyle \(1985\)](#)), potential private information as perceived by the market maker is what drives price impact to submitted trades. For this reason, confidentiality helps mitigate the price impact that may arise due to either trading by informed traders themselves or front-running by other traders. Confidentiality not only allows informed traders to spread their trading over a longer period of time under minimal dissimulation (as shown by our model in the Internet Appendix), but also protects them from being strategically traded against (i.e., front-run) by others. Less informed traders can benefit from the knowledge about more informed traders at the latter's cost ([Foster and Viswanathan \(1994\)](#) and [Madrigal \(1996\)](#)). Such costs have been empirically shown to be substantial for informed traders. [Frank et al. \(2004\)](#) show that the after-fee returns of informed actively managed mutual funds could be rendered indistinguishable or even lower than those of copycat funds who replicate their holdings as soon as the holdings are disclosed. It is worth noting that uninformed (liquidity-driven) traders can also be vulnerable to the increased price impact due to front-running. Most notably, speculators could engage in predatory trading to exploit traders in distress (e.g., [Brunnermeier and Pedersen \(2005\)](#), [Attari, Mello, and Ruckes \(2005\)](#), [Carlin, Lobo, and Viswanathan \(2007\)](#), and [Pritsker \(2009\)](#)).

Given the normal 45-day delay allowed for regular 13F filings, confidential treatment is necessary only if the private information has not run its full course after the normal delay (the "long-lived information" hypothesis), and hedge funds need to build or dispose of their confidential positions across multiple quarters (the "slow-building" hypothesis). Prior research provides

some evidence that information of positions by institutional investors is longer lasting than the quarterly frequency of mandatory disclosure. Notably, [Chen, Jegadeesh, and Wermers \(2000\)](#) show that profits from mutual fund research tend to accrue over a period of 12 to 18 months after a new position is added to a fund's portfolio. We verify the long-lived information premise (in Section V.B) with an event study that uncovers abnormal returns upon premature disclosure of confidential holdings due to an exogenous reason—quick denial by the SEC of hedge funds' confidentiality application. To test the slow-building hypothesis, we examine (in Section III.C) whether hedge funds build their confidential positions more slowly and over more quarters than their positions disclosed at the end of the quarter.¹⁸

What ultimately differentiates informed from liquidity-driven trading is the realized performance of the confidential holdings. Section IV thus analyzes the abnormal returns of confidential holdings during the confidential periods. If confidential treatment is sought for noninformational reasons, then the realized performance of the confidential holdings should be close to neutral. Nevertheless, 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 the portfolio distortion motives behind confidentiality seeking in Sections III.B and IV.D. Such a motive takes three basic forms, the main purpose of each being to present a portfolio to market participants that differs from the actual one. The first is the “window dressing” motive, that is, hiding stocks that have characteristics that reflect negatively on the portfolio manager (i.e., poor past performance) or are perceived as undesirable by investors (i.e., high risk). The second is the “portfolio blurring” motive, that is, hiding part of the portfolio to make it more difficult for outside speculators (including both copycats and front-runners) to reverse-engineer the trading strategy. Finally, there can be a nefarious motive to mislead the market and manipulate the prices by hiding stocks. Filing institutions can potentially benefit from the temporary market reaction and eventual price reversal of side trades, which may include the use of derivatives. Such behavior is illegal, and hence is usually difficult to detect in data.

Though different motives are not necessarily mutually exclusive and can share common predictions, positive abnormal returns on confidential holdings supports the view that hedge funds benefit from private information with mitigated price impact. Note that findings about performance should be considered a *lower bound* estimate of the abnormal return on information-driven confidential holdings if other portfolio distortion motives are also present.

¹⁸ It is worth noting that intraquarter trades underestimate the prevalence of “slow building.” [Wang \(2010\)](#) shows that money managers are more likely to initiate new trades at the beginning of the quarter, and tend to complete new round-trip trades toward the end of the quarter. Such trading pattern reflects a trade-off between minimizing the impact from disclosure and compromising on the quality of trades.

III. Determinants of Confidential Filings and Holdings of Hedge Funds

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

A. Hedge Fund Characteristics and Propensity of Confidential Filings

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

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

and the second is a 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 an indicator variable for the existence of a confidential filing in institution-quarter (j, q) . The dependent variable in (2) is the dollar value proportion of confidential holdings in the total portfolio (which includes 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 characteristic variables (*InstChar*) and quarterly dummies to control for unspecified time effects.

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

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

where $\phi(\bullet)$ is the standard normal probability density function. We construct the empirical analog by replacing parameters with their estimates and using the sample average to proxy for the expectation.

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

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

Table II

Determinants of 13F Confidential Holdings of Hedge Funds

This table reports results on the determinants of 13F confidential filings of hedge funds. The dependent variable of the probit model is an indicator variable for a confidential filing. The dependent variable of the tobit model is the dollar value of confidential holdings as a percentage of the total dollar value of holdings for an institution-quarter. Reported are coefficient estimates and their *t*-statistics (in parentheses) and associated average partial effects (APE, in percentage points). *Log(Age)* is the 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 interquarter portfolio turnover rate calculated as the lesser of purchases and sales divided by the average portfolio size of the last and current quarters. *PortHHI* is the Herfindahl index of the portfolio, calculated from the market value of each component stock. *PortRet* is the monthly average return on the portfolio during the quarter, and *PortVol* is the monthly portfolio return volatility during the past 12 months ending in this quarter-end. The construction of both variables assumes that the institution maintains the holdings of the last quarter-end. *|Flow|* is the absolute change in total portfolio value between two consecutive quarters net of the increase due to returns, expressed as a percentage of the portfolio size at the previous quarter-end. *IdioVol* is the idiosyncratic volatility computed from the residuals of the four factors (market, size, book-to-market, and momentum) using imputed monthly returns for the 36-month period ending in the current quarter. Standard errors are adjusted for heteroskedasticity and clustering at the institution level. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

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

where $\Phi(\bullet)$ is the cumulative probability function of the standard normal distribution. The reported APE is the empirical analog to (4).

Table II uses a set of *InstChar* variables, which we construct mostly based on 13F quarterly holdings, to capture the degree of active portfolio management and the market impact of the institutions. More specifically, *Age* is the number of years since the institution's first appearance on Thomson Reuters; *PortSize* is the total equity portfolio size, calculated as the market value of its quarter-end holdings; *Turnover* is the interquarter portfolio turnover rate, calculated as the lesser of purchases and sales divided by the average portfolio size of the last and current quarters¹⁹; and *PortHHI* is the Herfindahl index of the portfolio, calculated from the market value of each component stock. *PortRet* is the monthly average return on the portfolio during the quarter, and *PortVol* and *IdioVol* are the monthly portfolio total and idiosyncratic volatility during the past 12 months ending in this quarter-end. The construction of all variables assumes that the institution maintains the holdings of the last quarter-end. We compute *IdioVol* as the standard deviation of the residuals from the [Carhart \(1997\)](#) four-factor model (market, size, book-to-market, and momentum) using imputed monthly returns for the 36-month period ending in the current quarter. We define $|Flow|$ as the absolute change in total portfolio value between two consecutive quarters, net of the change due to returns, scaled by the portfolio size at the previous quarter-end. That is,

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

Table II reveals that several characteristics are significantly associated with more frequent confidential filings. The first two are portfolio size (*PortSize*) and absolute flows ($|Flow|$), consistent with larger hedge funds with higher inflows or outflows bearing higher market impact and also having potentially larger capacity to collect private information. An interquartile change in these two variables is associated with a 2.7% and 0.3% increase in the probability of confidential filing. Second, several characteristics associated with active portfolio management are uniformly associated with more confidential filings. They include high portfolio turnover rate (*Turnover*), high portfolio concentration as measured by the Herfindahl index (*PortHHI*) ([Kacperczyk, Sialm, and Zheng \(2005\)](#)), and high portfolio idiosyncratic return volatility (*IdioVol*). The changes in the probability of confidential filing corresponding to the interquartile ranges of these three variables are 3.2, 0.9, and 0.7 percentage points. These numbers are economically significant relative to the unconditional probability of 3.4%.

We argue that such a pattern is consistent with private information. First, a recent paper by [Titman and Tiu \(2011\)](#) finds that better hedge funds (in terms

¹⁹ We calculate purchases (sales) as the sum of the products of positive (negative) changes in the number of shares in the holdings from the previous quarter-end to the current quarter-end and the average of the stock 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.

of Sharpe ratios and information ratios) exhibit lower R^2 values with respect to systematic factors. Second, a long-equity portfolio with high idiosyncratic risks, conditional on portfolio concentration, implies component stocks of high idiosyncratic variations. Durnev et al. (2003) show that such stocks contain more firm-specific information. Finally, this pattern echoes Agarwal, Fos, and Jiang's (2012) finding that hedge funds that choose not to report to any commercial databases tend to have higher idiosyncratic volatility compared to the funds that report. Both their findings and ours indicate that hedge funds that adopt less conventional investment strategies value privacy more—they are more likely to refrain from voluntary disclosures or to seek exemptions from mandatory ones.

An alternative way to characterize hedge funds is to look at their stated investment styles. Such information is only publicly available for the funds that voluntarily report to commercial hedge fund databases. Based on the 450 sample hedge funds (as 13F filing institutions) that have matches in a union of five major hedge fund databases (Center for International Securities and Derivative Markets (CISDM), EurekaHedge, Hedge Fund Research (HFR), Morgan Stanley Capital International (MSCI), and Tremont Advisory Shareholder Services (TASS, now Lipper)),²⁰ we find that the top styles associated with seeking confidentiality are Event Driven, Multi-Strategy, and Relative Value Arbitrage. Indeed, these categories are likely candidates for “risk arbitrage” and “block positioning,” two major allowable reasons in the SEC guidelines for delay in disclosure.

B. Characteristics of Confidential Holdings

We next examine the characteristics of stocks in confidential holdings and relate them to the various motives behind seeking confidentiality.

The event that best exemplifies sensitive information, and acknowledged by the SEC as an acceptable motive for confidentiality, is “open risk arbitrage,” which involves a long position in the target stock (possibly paired with a short position in the acquirer's stock if a stock deal) right after the deal is announced. The position is expected to be reversed when the deal is closed, and the profits come from the price convergence to the offer. We use the indicator variable $M\&A$ for a stock of the target in an announced (but not completed) merger and acquisition (M&A) during the 1-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 are eventually completed. We retrieve the data on M&A attempts, defined as an intended change of control, from Securities Data Company (SDC).²¹ Our final sample comprises 4,726 announced deals during the period from 1998 to 2007.

²⁰ Agarwal, Fos, and Jiang (2012) provides a detailed description of the union database as well as its matching to the 13F data.

²¹ Edmans, Goldstein, and Jiang (2012) use these data. We thank the authors for sharing these data with us.

In addition, we use several variables that are firm-specific drivers of information asymmetry, including firm size (Chari, Jagannathan, and Ofer (1988), Llorente et al. (2002)), illiquidity (Glosten and Milgrom (1985)), distress risk (Griffin and Lemmon (2002)), and analyst following (Brennan and Subrahmanyam (1995), Hong, Lim, and Stein (2000), Chang, Dasgupta, and Hilary (2006)). We obtain market capitalization (*Size*) at the end of the quarter from the CRSP database. We compute book-to-market ratios (*B/M*) at year-ends using data from the CRSP and COMPUSTAT databases. We also include market (CRSP value-weighted index) adjusted past 12-month returns (*Adj. Past Return*) to control for momentum. We employ a variant of the Amihud (2002) illiquidity measure (developed by Hasbrouck (2009)) as a proxy for trading liquidity (*Illiquidity*). We compute this measure as the yearly average of the square root of $|\text{return}|/(\text{price} \times \text{volume})$. We measure analyst coverage of a firm as the number of analysts in the I/B/E/S database (available through WRDS) that make at least one forecast or recommendation on the firm during the year (*Analysts*). We proxy for the probability of financial distress with the distance-to-default (*DtD*), the number of standard deviation decreases in firm value before the value of the firm drops to the face value of debt (i.e., the firm is in default). This measure is motivated by Merton's (1974) bond pricing model and estimated for each firm at the end of each year following the procedure in Vasalou and Xing (2004). Because *DtD* is a one-sided measure, we use a dummy variable for *DtD* smaller than 1.64 as an indicator for nonnegligible distress risk (i.e., the estimated probability of distress being 5% or higher). Finally, we measure *Volatility* and *IdioVol* by the standard deviation of the returns and residuals from the Carhart (1997) four-factor model for the past 36 months of stock returns.

Panel A of Table III reports the summary statistics of the stock-level variables discussed above separately for positions included in the original filings and those in the confidential filings of hedge funds. Differences along all dimensions are statistically significant at the 1% level, which supports greater information asymmetry in the confidential holdings. Stocks in confidential holdings of hedge funds are smaller, have higher book-to-market ratio, lower analyst coverage, higher distress risk, higher volatility, and higher idiosyncratic volatility compared to stocks in the original filings. Moreover, stocks in confidential holdings are far more likely to have been recent targets in M&A announcements, with a probability of 7.5% versus 4.1% for the original filings, pointing to risk arbitrage as an important motive underlying confidential treatment.²² The Stark Onshore Management LLC featured in Appendix A is an example: 39 out of 55 confidential holdings were targets in M&A announcements within the year preceding the end of the quarter.

²² In contrast, *future* M&A targets are not overrepresented in the confidential holdings, that is, hedge funds speculating on future M&A activities do not systematically resort to confidential filings to hide their predicted targets. One explanation is that the SEC exercises heightened scrutiny of trading before M&A announcements. Therefore, hedge funds may not want to explicitly seek confidentiality for such potentially legally sensitive positions.

Many of the variables, such as *Size*, *Illiquidity*, *Analyst*, and *IdioVol.*, also represent established proxies for trading liquidity. Hence, some of the results are also in line with the price impact motive, which is closely intertwined with private information, as we discuss above in Section II.B. On the other hand, stocks in confidential filings experience slightly higher (not statistically significant) market-adjusted returns over the past 12 months than those in original holdings, which contradicts a performance-based window dressing motive whereby money managers hide losing positions in order to make their disclosed portfolios look smart. Nevertheless, significantly higher total and idiosyncratic volatilities of the confidential holdings are still consistent with a risk-based window dressing motive whereby money managers make their portfolio appear less risky to their investors. This result is analogous to [Musto's \(1999\)](#) findings regarding money market fund managers' overweighting less risky government issues before portfolio disclosure dates.

We supplement the univariate analyses in panel A of [Table III](#) with multivariate logistic regressions. The model specification is as follows:

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

where $CH_{i,j,q}$ is a dummy variable equal to one if stock i is in the confidential holdings of institution j in quarter q . The full-sample average of $CH_{i,j,q}$ is 2.2%. The vector $StockChar_{i,q}$ is the same vector of stock characteristic variables used in panel A. In addition to the quarterly dummies (α_q), the [Fama and French \(1997\)](#) 10 industry dummies (δ_{Ind}) are added to the regression in equation (5) to control for unobserved heterogeneity at the industry level. Results without the industry dummies are qualitatively similar and marginally stronger. We report the estimated coefficients $\hat{\lambda}$, their associated t -statistics, and the average partial effects of the $StockChar_{i,q}$ variables in panel B of [Table III](#). More specifically, we compute the APEs as the empirical analog to

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

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

More specifically, targets of announced M&A deals are 2% more likely to be confidential holdings than nontargets, almost doubling the unconditional probability for stocks to appear in confidential filings. Interquartile changes in *Size*, *Illiquidity*, *Analyst*, and *IdioVol* are associated with incremental probabilities of -1.5%, -0.3%, -0.1%, and 0.1%. Such magnitudes (especially that associated with *Size*) are sizable relative to the unconditional probability, indicating

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

Panel A compares the summary statistics of stocks in the 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 12 months prior to the quarter-end portfolio date adjusted by the CRSP value-weighted market return. *Illiquidity* is the variant of Amihud (2002) illiquidity measure, computed as the yearly average of the square root of daily $|Return|/(Price \times Vol)$. *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) distance-to-default measure to be smaller than 1.64 (implying a 5% or higher default probability). *Volatility* and *IdioVol* are total and idiosyncratic volatilities from the four-factor model using past 36 monthly stock returns. *M&A* is an indicator variable that takes a value of one for the stock of the firm that was an announced M&A target during the four-quarter period ending in the portfolio-quarter. The standard errors of the two sample *t*-tests adjust for clustering at the stock and quarter levels. Panel B reports the results from logistic regressions modeling the determinants of 13F confidential holdings at the stock level. The dependent variable is an indicator variable for a stock to be included in the confidential holdings of an institution-quarter. Each column reports estimated coefficients, their *t*-statistics (in parentheses), and the average partial effects (APE). All standard errors adjust for heteroskedasticity and clustering at the institution level. Quarterly dummies and Fama-French 10-industry dummies are included in all specifications in panel B. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

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

(Continued)

Table III—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel B: Determinants of Confidential Holdings of Hedge Funds—Stock Level							
M&A	0.932*** (22.81)	0.951*** (20.22)	0.956*** (21.90)	0.942*** (20.19)	0.938*** (20.47)	0.946*** (22.64)	0.945*** (22.64)
Log(Size)	1.93% -0.148*** (-26.39)	1.97% -0.148*** (-26.39)	1.98% -0.148*** (-26.39)	1.95% -0.252*** (-38.05)	1.94% -0.252*** (-38.05)	1.95% -0.252*** (-38.05)	1.95% -0.251*** (-37.22)
Illiquidity	-0.31%	-0.296*** (-6.11)	-0.31%	-0.52%	-0.52%	-0.52%	-0.52%
Log(Analysts)		-0.61%	-0.110*** (-9.84)	-4.19%	-2.031*** (-26.77)	-4.22%	-2.044*** (-26.90)
Volatility			-0.23%	0.728*** (13.41)	0.187*** (3.96)	-0.020** (-2.21)	-0.020** (-2.14)
Idio Vol				1.51%	0.39%	-0.04%	-0.04%
DTD < 1.64	0.016 (0.80)	0.217*** (8.78)	0.156*** (6.80)	-0.059** (-2.19)	0.833*** (14.12)	-0.012 (-0.51)	0.195*** (3.71)
B/M	0.03% -0.185*** (-8.32)	0.45% 0.083*** (3.14)	0.32% -0.024 (-1.01)	-0.12% 0.009 (0.38)	(-2.83) -0.15% (-0.10)	(-0.32) -0.02% -0.114***	-0.007 (-0.01% (-5.26)
Adj. Past Return	0.026** (2.39)	0.051*** (3.91)	0.007 (0.59)	0.013 (1.08)	-0.02% (-0.06)	-0.24% (-11.50)	-0.24% 0.126*** (11.32)
Constant	-3.784*** (-44.24)	0.11% -5.020*** (-66.03)	0.01% -4.777*** (-60.69)	0.03% (-66.20)	0.00% -5.282*** (-66.47)	0.26% -2.827*** (-29.55)	0.26% -2.828*** (-29.34)
Observations	1,761,104	1,755,335	1,758,763	1,758,672	1,758,672	1,755,335	1,755,335
Unconditional Mean	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%	2.2%
Pseudo R ²	0.104	0.0976	0.0987	0.0988	0.0991	0.110	0.110

that these variables are driving a significant portion of the variation in the data.

C. Trading during the Confidential Period

If hedge funds are protecting private information through confidentiality because the information still has value and they are still accumulating their position, then they should be expected to trade more in the confidential stocks during the period of confidentiality. Given that revealing information about the holdings helps the convergence of price to the private valuation of the informed trader (e.g., [Huddart, Hughes, and Levine \(2001\)](#)), hedge funds should not be averse to disclosure if they have completed the planned acquisitions.²³ This section investigates these issues by analyzing interquarter trading during the confidential periods. We report the results in [Table IV](#).

[Table IV](#) reveals several notable contrasts between hedge funds' trading in confidential and original holdings from the two-sample *t*-tests. The initial positions (as a percentage of shares outstanding) are only slightly larger (not significant) in the confidential holdings, but hedge funds trade more aggressively on their confidential positions during the following quarters within the confidential periods. The aggressiveness in trading is measured by both total trading volume (the sum of unsigned interquarter changes in holdings, scaled by either shares outstanding or the initial position) and the difference between the maximum and initial position (using the same scaling variables). Trading activities in confidential holdings almost triple those in original holdings by the same funds using all measures, and all differences but one are significant at the 5% level. For example, the average total trading volume in confidential stocks is 0.96% of the shares outstanding, versus 0.34% for the average stock in the original holdings. The maximum position in a confidential stock during the confidential period is 6.55 times the initial position on average, while the same multiple for a stock in the original holdings is 3.03. Finally, it takes much longer for hedge funds to accumulate to the maximum position of a confidential holding (2.58 quarters on average) than a regular holding (0.93 quarters), justifying the price impact motive for seeking confidentiality beyond the normal delay of 45 days from the quarter-end.

Hedge fund managers may choose to disclose after liquidation, or after completing the accumulation of their positions but before liquidating them. Of the 37,204 confidential holdings examined in [Table IV](#), managers disclose 27,306 (73.4%) positions after liquidating them. Out of the remaining 9,898 (26.6%), 7,844 (79.3%) see no further acquisition in the confidential holdings in the quarter after the disclosure while 2,054 (20.7%) exhibit further build-up in the positions. The overall evidence suggests that hedge funds have mostly completed their trades in the confidential holdings upon post-confidentiality disclosure.

²³ In fact, some successful money managers, such as Warren Buffet (Berkshire Hathaway) and David Einhorn (Greenlight Capital), frequently talk in public about the positions they have taken.

Table IV
Trading during Confidential Periods

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

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

IV. Performance of Confidential Holdings of Hedge Funds

The presence of positive abnormal returns is necessary to differentiate the private information hypothesis from alternative motives for seeking confidentiality. Though price impact influences the pace at which the price adjusts to information, it should not affect the cumulative stock return over the entire confidential period, extending up to 12 months. Hence, performance analysis in this section provides a sharp test of the private information hypothesis.

A. Choice of Performance Measure

We adopt two abnormal performance measures. The first is the [Carhart \(1997\)](#) four-factor alpha using imputed daily returns assuming the holdings at the end of the previous quarter. We do not resort to [Fung and Hsieh \(2004\)](#) hedge fund factors because they are meant for alternative asset classes while we are analyzing equity positions exclusively. The second performance measure is the [Daniel et al. \(1997\)](#), henceforth DGTW) benchmark-adjusted return. 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 to which it belongs, and the average DGTW benchmark-adjusted return for each portfolio aggregates over all the component stocks using value-weighting in the portfolio. Sensitivity analysis using equal weights yields similar results.

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

B. Comparing Return Performance of Confidential and Original Holdings

We assess the performance of confidential holdings by comparing their abnormal returns during the confidential periods to those of the original holdings of the same institution during the same periods of time. We group the length of confidential periods into seven grids from 2 months up to 1 year, where each specific horizon includes confidential periods that are at least as long as that horizon but shorter than the next horizon. For example, all confidential filings that are filed at a delay of at least 3 months but shorter than 4 months from the portfolio at the end of the quarter are grouped in the 3-month-horizon grid. Constraining performance evaluation of confidential holdings to their confidential periods is necessary both to ensure the proper motive for remaining confidential and to avoid the price impact due to disclosure.

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

The results provide strong evidence that confidential holdings exhibit higher benchmark-adjusted returns compared to original holdings over all seven horizons from 2 to 12 months, where the differences are statistically significant at the 10% level or better for all but one horizon. The difference in the four-factor alpha amounts to 2.57 (2.05) basis points daily over the 2-month (12-month) horizon, corresponding to annualized return spreads of 6.48% (5.17%) in favor of confidential holdings.²⁴ Similarly, the difference in the DGTW measure is 5.26% (7.51%) over the 2-month (12-month) horizon. The presence of such superior returns supports the view that confidential holdings are more informed than original holdings. Moreover, the persistence of abnormal returns up to 1 year suggests that returns are unlikely to be driven by the temporary price pressure from trading by the filers.

Griffin and Xu (2009) document limited evidence of skill by hedge funds using the original holdings from the Thomson Reuters Ownership database. To facilitate comparison, we apply their methodology separately on hedge funds' original and confidential holdings, that is, we compute the raw returns and DGTW benchmark-adjusted returns 3 months after the quarter-end for each institution-quarter using value- or equal-weighting, and then average across all institution-quarter portfolios in the sample period. We report the results in panel B of Table V. We replicate the results of Griffin and Xu (2009) regarding original holdings, but further show that the confidential holdings significantly outperform the original holdings of hedge funds by 5.0% (3.5%) per annum using the value-weighted (equal-weighted) DGTW benchmark-adjusted returns. This comparison further supports the private information motive underlying hedge funds' confidential filings as well as the presence of their superior stock selection ability.

C. Acquisition- and Disposition-Motivated Confidential Holdings

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

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

²⁴ Using the simple one-factor alpha would yield a difference of 1.76 (2.74) basis points per day over the 2-month (12-month) horizon, corresponding to annualized return spreads of 4.43 (6.90) percentage points.

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

Panel A reports the [Carhart \(1997\)](#) four-factor alpha and the [Daniel et al. \(1997, DGTW\)](#) benchmark-adjusted returns for both original and confidential 13F holdings of hedge funds, and the differences between the two types. Confidential filings are grouped by the length of their confidential periods and evaluated for their abnormal performance at seven horizons from 2 months up to 1 year. The paired original holdings are by the same institutions and during the same period. The four-factor alpha (in basis points daily) is computed from the daily value-weighted portfolio returns. The DGTW benchmark-adjusted returns are first computed for each stock and then averaged at the portfolio level using value weights of the portfolio. Both abnormal return measures are first calculated for each original or confidential 13F filing, and then averaged at the institution level. Panel B follows the [Griffin and Xu \(2009\)](#) approach by reporting the raw returns and DGTW benchmark-adjusted returns evaluated 3 months after the portfolio holding quarter-end for original and confidential 13F holdings of hedge funds, and the differences between the two. Return measures are first calculated for each institution-quarter portfolio using value or equal weights of the portfolio holdings and then averaged across the institution-quarter portfolios in the sample period. Both raw and DGTW benchmark-adjusted returns are annualized. Coefficients marked with ***, **, and * are significant at the 1%, 5%, and 10% level, respectively.

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

(Continued)

is analogous to that in [Lee and Ready \(1991\)](#) used to classify the direction of trades. The algorithm classifies 80.7% (19.3%) of the confidential positions of hedge funds as acquisition- (disposition-) motivated. [Table VI](#) replicates [Table V](#) separately for acquisitions and dispositions.

Table V—Continued

Panel B: Comparison to Griffin and Xu (2009)								
	# of 13F Filings		Raw Returns			DGTW Benchmark-Adjusted Returns		
	Conf.	Orig.	Conf.	Orig.	Diff.	Conf.	Orig.	Diff.
<i>Value-Weighted Returns</i>								
1999–2007	870	14,002	19.97%	13.00%	6.98%***	6.37%	1.39%	4.99%***
<i>t</i> -stat.			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%*
<i>t</i> -stat.			7.10	33.16	2.74	2.66	8.36	1.82

Table VI confirms that acquisition-motivated confidential holdings exhibit higher benchmark-adjusted returns compared to original holdings, with differences statistically significant for almost all horizons up to 1 year. The spreads at different horizons are also economically significant. At the 1-year horizon, the performance difference amounts to 3.88 and 7.06 percentage points using four-factor alphas and DGTW measures, respectively. In contrast, results of the disposition-motivated subsample are not nearly as consistent, possibly because ongoing dispositions are more likely to be liquidity driven. In such cases, hedge funds may still benefit from confidential filings that mitigate the adverse price impact that might have ensued had they carried out the disposition in the open, even though we do not observe as strong abnormal returns for these confidential positions.

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

D. Sensitivity Checks

First, like all the studies based on quarter-end holdings data, our study does not capture the effects of interquarter trades and assumes that portfolios at any given time are identical to those at the previous quarter-end. If some interquarter trades are informed (see Puckett and Yan (2011) for such evidence), then our return results are biased downwards, assuming quarter-end portfolio formation also tends to produce conservative return measures if the positions are actually accumulated throughout the quarter. However, this stringent assumption is necessary to avoid look-back bias or attributing superior performance to momentum trading, and is the default method adopted by the literature.

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

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

	Return Horizons						
	2m	3m	4m	5m	6m	9m	12m
Panel A: Daily Four-Factor Alphas							
<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%**
<i>t</i> -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%
<i>t</i> -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							
<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%***
<i>t</i> -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%
<i>t</i> -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

If we adopt the same aggregation procedure as in panel A of Table V but use the beginning of the quarter as the portfolio formation date, return measures are markedly higher: 3.2% for original holdings and 5.0% for confidential holdings during the holding quarter. The difference of 1.8% (7.2% annualized)

is highly significant (t -statistic = 4.81). The truth is probably somewhere in between, but we do not wish to overinterpret the strengthened results given the possible look-back bias for any assumed portfolio formation date other than the quarter-end.

Second, the presence of derivatives in hedge funds' positions may bias our results if they are systematically used to offset the long positions filed in the 13F, especially those in the confidential holdings. While we cannot refute such a possibility due to the lack of disclosure and transparency of derivatives holdings and short positions, two pieces of evidence are helpful. The first piece of evidence is provided by [Ang, Gorovyy, and van Inwegen \(2011\)](#), who show that hedge funds following equity and event-driven strategies (which constitute a great majority of the funds in our sample) have the lowest leverage through derivatives among all major strategy categories. The second piece of evidence comes from our own analysis of abnormal performance of confidential and original holdings after excluding those stock positions that are accompanied by reported positions in call and/or put options. For this purpose, we collect information on all option positions included in both confidential and original holdings from the SEC's EDGAR database.²⁵ For our sample hedge funds, the median position in options is zero, and the mean call, put, and combination of call and put positions are 0.8%, 0.6%, and 0.6% of the stock positions. Once the stocks with option positions are excluded, confidential holdings continue to outperform the original holdings in the 2- to 12-month horizons, with the four-factor alpha ranging from 2.48% to 1.64% and the DGTW measure from 4.76% to 7.01%. We report the results in the Internet Appendix.

Needless to say, confidential treatment is not the only way that hedge funds can gain undisclosed long exposure in a stock. Derivatives contracts such as total return swaps that are traded over the counter can accomplish the same goal. Nevertheless, the two approaches are far from perfect substitutes even without considering differential transaction costs. For example, when the block-building aims to influence corporate policies or control, then the long position with which the voting rights are endowed becomes necessary. This explains why confidential treatment is constantly sought after by M&A arbitrageurs and activist shareholders.

Next, we replicate panel A of [Table V](#) for the category of investment companies/advisors; we report the results in the Internet Appendix. The abnormal returns for the confidential holdings of this category are similar to those of hedge funds but weaker in magnitude. This is expected as hedge funds are arguably the most active portfolio managers and among the most aggressive in seeking private information. Banks and insurance companies are only sporadic users of the confidential treatment (see panel B of [Table I](#)) and their confidential holdings do not exhibit any positive abnormal returns.

²⁵ Almost all exchange-traded options are "13(f) securities" and their holdings are required to be disclosed in Form 13F. We verify Form 13F coverage by cross-checking with the OptionMetrics database (available through WRDS). Note that information on the option holdings is not available in the Thomson Reuters Ownership database.

Table VII
Determinants of Denials of Confidential Filings

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

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>Confidential Filing Characteristics</i>							
Log(# Past CF)	-0.085 (-0.83)	-0.133 (-1.49)	-0.115 (-1.21)	-0.140 (-1.62)	-0.068 (-0.67)	-0.042 (-0.40)	-0.060 (-0.50)
% Past Denied	3.158*** (14.09)	3.201*** (14.48)	3.187*** (14.16)	3.189*** (11.98)	3.109*** (14.05)	3.278*** (12.50)	3.677*** (9.37)
% Conf. Stocks	0.513** (2.24)				1.405*** (3.14)	0.735*** (3.16)	1.062 (2.34)
Avg. Conf. Position		12.482*** (2.81)			14.929*** (3.17)	16.120*** (3.95)	10.082** (2.07)
% Value CF			0.247 (1.18)		-0.853** (-2.18)		-1.289** (-2.44)
Log(Value CF)				0.001 (0.03)		-0.062* (-1.70)	
<i>Fund Characteristics</i>							
Log(Age)							-0.058 (-0.41)
Log(PortSize)							-0.144** (-1.96)

(Continued)

Table VII—Continued

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Turnover							-1.279*
							(-1.86)
PortHHI							-0.567
							(-0.74)
PortRet							1.660
							(0.77)
Flow							0.095
							(1.30)
Idio Vol							4.867
							(1.01)
Constant	-1.568***	-1.489***	-1.441***	-1.325**	-1.772***	-1.772***	-0.433
	(-6.54)	(-8.28)	(-6.78)	(-2.31)	(-7.57)	(-7.57)	(-0.85)
Observations	713	713	713	713	713	713	629
Unconditional mean	22.0%	22.0%	22.0%	22.0%	22.0%	22.0%	19.4%
Pseudo R ²	0.413	0.417	0.408	0.406	0.432	0.430	0.481

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

V. Denial of Confidentiality Requests

The SEC rules state clearly that confidential treatment is meant to be an exception rather than a rule. Given the perceived benefits of seeking confidentiality, it is necessary to discuss the associated costs of doing so, especially beyond the intended purpose. So far in our analyses, we have pooled confidential filings that are denied with those that are not denied; among the latter we cannot accurately distinguish between applications that are approved and those that do not receive an SEC decision before the term expires. An analysis of the causes for rejection and the resulting market responses can help us assess the cost of denials.

A. Causes for Denials of Confidentiality Requests

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

$$(\text{Denial}_{j,q} > 0) = (\delta \text{CFChar}_{j,q} + \omega \text{InstChar}_{j,q} + \vartheta_q + \xi_{j,q} > 0). \quad (6)$$

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

[Table VII](#) reports the estimation of equation (6), conditional on the subsample of confidential filings. We first identify several observable characteristics from confidential filings, in particular, the number of past filings (*# Past CF*), the frequency of denials in the past (*% Past Denied*), the number of distinct stocks in the filings as a fraction of the total number of distinct stocks held (*% Conf. Stocks*), the value of the confidential holdings (*Value CF*), the value of the confidential holdings as a fraction of the value of total holdings (*% Value CF*), and the average shares in confidential holdings as a percentage of shares outstanding (*Avg. Conf. Position*). Since four of our variables—*% Conf. Stocks*, *% Value CF*, $\text{Log}(\text{Value CF})$, and *Avg. Conf. Position*—are highly correlated, we first report the results by including them individually in specifications (1) to (4) in [Table VII](#). The next two specifications, (5) and (6), show the results pooling

the regressors but still excluding either *% Value CF* or *Log(Value CF)* due to the near-perfect collinearity between these two variables.

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

First, in all specifications, we find that denial probabilities are positively related to past denial rates, and that this is the single most important predictor of future denials. For two otherwise comparable institutions with past denial rates of zero and 50%, their probability of being denied in the future differs by 27 percentage points, indicating a serious cost from a bad reputation.²⁶ Second, we find that higher denial probabilities are positively and significantly (at the 5% level) associated with both *% Conf. Stocks* and *Avg. Conf. Position*, indicating a higher probability of denial when funds try to mask a larger portion of their portfolios.

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

B. Market Reaction to Disclosure of Confidential Filings

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

To sharpen our tests, we focus on the market's reaction to quick denials, classified as filings that are denied within 45 to 180 days after the quarter-end

²⁶ This pattern is also consistent with persistence in some applicants' noncompliance, which leads to repeated rejections. We find that past denials not only lead to a higher likelihood of future denials, but also to faster denials in the future. On average, every past denial reduces the time it takes for the SEC to deny an application from the same fund in the future by 10 days. This additional piece of evidence supports the reputation hypothesis.

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

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

Windows	Quickly Denied Confidential Filings			Nondenied Confidential Filings		
	Num	(1) Mean CAR (%)	(2) % Positive	Num	(3) Mean CAR (%)	(4) % Positive
(-1,+1)	66	0.54%** (2.42)	63.6%** (2.34)	197	0.39% (1.45)	52.3% (0.93)
(-2,+2)	66	0.97%*** (2.61)	63.6%** (2.09)	197	0.30% (1.25)	53.8% (1.35)
(-5,+5)	66	1.19%*** (2.18)	62.1%*** (2.58)	197	0.52% (0.84)	52.8% (1.07)

portfolio date. In these cases, funds are forced to reveal their stock positions earlier than they would choose to. If the positions contain private information, their exogenous revelation should generate market reactions. In contrast, if after a similar length of delay hedge funds voluntarily disclose their confidential holdings that are not denied, there should not be a significant market response because the funds presumably have fully benefitted from their information.

We design the tests along this line and report the results in [Table VIII](#). More specifically, [Table VIII](#) reports the average cumulative abnormal returns (CAR) for the quick denials and nondenial cases of confidential filings over three windows around the event date: [-1, +1], [-2, +2], and [-5, +5] days. The event date is the amendment filing date that discloses the confidential positions. We conduct the event study separately for the involuntary disclosures due to denials and the voluntary disclosures of nondenial cases. For each stock in each filing, we first estimate abnormal returns using a market model with equally weighted CRSP market index. We estimate the factor loadings with daily data over a period of 300 to 91 days before the event date, and use the [Scholes and Willams \(1977\)](#) approach to account for nonsynchronous trading. We then equally weight the CARs of individual stocks to compute the CARs for each filing. The mean CARs for the quick denials over the three windows

are positive (0.54%, 0.97%, and 1.19%), and are all significant at the 5% level. In contrast, the mean CARs for the nondenial cases of confidential filings are smaller and none is significant. These results again support the private information hypothesis.

VI. Concluding Remarks

Despite a general lack of economically significant and persistent abnormal performance among active portfolio managers as a whole (French (2008)), our study of a select subset of institutional investors' portfolios, namely, the confidential holdings of hedge funds, reveals evidence of managerial skill in stock picking.

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

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

Appendix A: Confidential Holdings of Stark Onshore Management LLC

Table A.1

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

(Continued)

Table A.1—Continued

Issuer Name	CUSIP	Shares	Portfolio Date	Filing Date	Thomson Reuters	M&A Target
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 Finline Electronix In	62541B10	933,653	3/31/2007	5/16/2007	Yes	No
Rouse Co.	77927310	269,910	9/30/2004	11/25/2004	Yes	Yes

Appendix B: The Classification of 13F Filing Institutions

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

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

Next, we make major corrections for the “other” category as classified by Thomson. First, we reassign all hedge funds from this category. Second, we

reassign an institution that 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.

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Supporting Information

Additional Supporting Information may be found in the online version of this article at the publisher’s web site:

Appendix S1: Internet Appendix