



Mutual fund skill and the performance of corporate acquirers[☆]

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ABSTRACT

We show that the commonly observed correlation between institutional investor ownership and the success of mergers is partly driven by active stock picking. Several mutual fund stock selection skill measures strongly predict the post-merger performance of corporate acquirers even after controlling for possible shareholder monitoring. These findings are stronger for funds with characteristics more indicative of active stock picking. Moreover, firms held by funds with higher stock selection skills are more likely to subsequently become acquirers, suggesting that the mutual fund skill set includes the ability to identify acquirers with value-enhancing acquisition opportunities.

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1. Introduction

The steady increase in institutional block holdings over the past few decades has led academics and practitioners to question whether institutional investors actively monitor management or merely “vote with their feet” by exiting poorly performing companies.¹ An examination of the performance of mergers and acquisitions (M&A) appears to deliver consistent evidence in support of the monitoring hypothesis. Chen, Harford, and Li (2007) show that concentrated holdings of independent, long-term institutions (ILTs) are associated with better merger performance. Gasper, Massa, and Matos

(2005) find that acquirers held by institutions with low turnover rates perform better after the merger than those held by short-term institutional investors. Several other papers also note that institutional ownership is associated with better post-merger performance (see Martin, 1996; Bae, Kang, and Kim, 2002; Kang, Kim, Liu, and Yi, 2006). These M&A studies propose that institutional shareholders, particularly long-term and independent institutions, influence management into striking value-enhancing merger deals.

While a positive association between post-merger performance and institutional ownership is consistent with active monitoring by institutions, it could also be an indication of skillful stock picking by investors. An active literature on mutual fund performance suggests that at least some star funds possess stock picking ability.² Yet the

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¹ See Demsetz (1983), Shleifer and Vishny (1986), Maug (1998), and Kahn and Winton (1998) for theoretical arguments concerning monitoring by institutional shareholders.

² The positive evidence on the stock selection ability of mutual funds is mainly based on information about fund portfolio holdings or before-expense fund returns; see, for example, Grinblatt and Titman (1989, 1992), Grinblatt, Titman, and Wermers (1995), Wermers (1997), Daniel, Grinblatt, Titman, and Wermers (1997), Chen, Jegadeesh, and Wermers (2000), Wermers (2000), Kosowski, Timmermann, Wermers, and White

M&A literature tends to interpret the relation between institutional ownership and merger performance primarily in the context of monitoring and shareholder activism. The possibility that some institutional investors such as mutual funds pick firms that subsequently engage in more value enhancing investments has remained largely unexplored.

This paper explores whether the much-cited link between institutional ownership and post-merger performance of acquirers is at least partially attributable to the stock picking skill of institutional investors. We focus on mutual funds for several reasons. First, they account for a significant fraction of independent institutional ownership of corporate stock. Second, while mutual funds are known to follow active investment policies (e.g., stock picking), existing research finds little evidence of shareholder activism by mutual funds.³ Third, a rich literature on mutual funds provides several proxies for fund stock selection skill that enable us to examine the relation between mutual fund skill and the quality of subsequent acquisitions undertaken by firms that mutual funds are invested in.

Using a sample of 3,988 mergers and acquisitions between publicly traded acquirers and targets during the period from 1990 to 2006, we show that several proxies for mutual fund stock selection skill predict the post-merger performance of portfolio companies. Acquirer performance is measured using calendar time abnormal returns (CTARs) over the 6-, 12-, 24- and 36-month horizons following a merger. Specifically, for each merger in our sample, we obtain data on all mutual funds holding the acquirer's stock in the quarter prior to merger announcement and calculate three measures of skill for each fund: the Carhart (1997) four-factor fund alpha estimated over the past 24 months (Alpha24), the four-factor fund alpha estimated over the past 12 months (Alpha12), and the Cohen, Coval, and Pastor (2005) fund performance measure (CCP) based on the similarity of fund managers' holdings.

To examine the relation between mutual fund skill and acquirer performance at the level of each corporate acquisition, we further construct several deal-level fund skill measures based on the mutual funds holding a given acquirer's stock. Existing research suggests that stock-picking skills are scarce and that there is an increasing pattern of uninformative herding among funds in the recent decades.⁴ In light of this trend in the mutual fund industry, the average skill characteristics of funds investing in an acquirer could be less indicative of the existence of stock selection information than the presence of funds with a very high level of stock-picking skill. Therefore, our primary set of deal-level skill measures focuses on funds at

the right tail of fund skill. In each quarter, we classify funds into quartiles based on one of the three fund skill measures: Alpha24, Alpha12, and CCP. We then count the number of funds holding an acquirer prior to merger announcement that rank in the top quartile of the skill measure in consideration. These top-quartile measures are referred to as Top Alpha24, Top Alpha12, and Top CCP. The median acquirer in our sample has a Top Alpha24 of seven (i.e., it is held by seven funds with Alpha24 in the top quartile). Further, the top-quartile funds exhibit large performance differences relative to the average funds in our sample. For example, the average Alpha24 (i.e., the monthly four-factor alpha based on rolling 24-month before-expense fund returns) of the Top Alpha24 funds is 0.62%, whereas the average Alpha24 of all sample funds is close to zero, at 0.03%.

We find strong evidence that post-merger CTARs of acquirers are positively related to these deal-level skill measures. Across various calendar time horizons, acquirers in the low deal-level skill groups tend to have negative CTARs and acquirers in the high skill groups tend to have positive CTARs, with significant differences in the CTARs between the high and low deal-level skill groups. For example, over the 12-month horizon, the four-factor monthly CTAR of acquirers in the above-median group of Top Alpha24 is 0.374% higher than that of acquirers in the below-median group.⁵ We demonstrate the robustness of our results to alternative performance measures in the existing studies, such as buy-and-hold abnormal returns (BHARs) and the change in return on assets (ROA). We use cross-sectional regressions to examine BHARs and change in ROA over the three years following a merger. We find that our primary skill measures (i.e., Top Alpha24, Top Alpha12, and Top CCP) are positively correlated with BHARs and change in ROA even after controlling for institutional monitoring.

We further investigate whether skilled mutual funds specifically select good acquirers or whether they pick generally well governed firms that perform better on average. We conduct a probit analysis using the universe of publicly traded firms and find that firms with higher deal-level skill measures in period t are more likely to announce acquisitions in period $t+1$. This result, combined with our finding that acquirers held by more skilled funds are more successful, suggests that skilled funds can pick acquirer ability or acquisition opportunities.

Next, we examine whether our results simply reflect shareholder monitoring and seek further corroboration of the stock-picking hypothesis. Chen, Harford and Li (2007) find that concentrated holdings of independent, long-term institutions are associated with better returns, possibly due to the active monitoring role of these institutions. We double-sort acquirers, first based on ILTI into two groups and then on deal-level skill measures into quartiles. We

(footnote continued)

(2006), Kacperczyk and Seru (2007), and Kacperczyk, Sialm, and Zheng (2008). Studies examining after-expense net returns of funds find that active funds on average do not outperform their passive counterparts (Jensen, 1968; Gruber, 1996; Carhart, 1997).

³ For example, in examining mutual fund proxy voting records, Davis and Kim (2007) find that typical mutual fund families passively vote in favor of proposals put forth by corporate management.

⁴ See, e.g., Kosowski, Timmermann, Wermers, and White (2006), Barras, Scaillet, and Wermers (2010), Fama and French (2010), Brown, Wei, and Wermers (forthcoming), and Wei, Wermers, and Yao (2012).

⁵ We also perform analysis using a set of deal-level skill measures based on the weighted-average skill of funds holding an acquirer. These weighted-average measures do not focus on the right tail of fund skill distribution. We find that their power to predict acquirer performance, although positive, tends to be weaker than that of the top-quartile measures.

find that acquirer CTARs increase with deal-level fund skill measures in both below-median and above-median groups of ILTI. In contrast, when we first sort acquirers into above- and below-median fund skill groups and then within each group examine acquirer CTARs by ILTI quartile, we do not find consistent evidence that CTARs increase with ILTI. Also, in the cross-sectional regression analysis, the relation between ILTI and the alternative performance measures of BHAR and change in ROA becomes statistically insignificant if deal-level fund skill measures are included in the regression. Thus, our results suggest that fund stock selection skill dominates ILTI in predicting post-merger stock performance.

The notion that fund skill predicts acquirer performance due to stock selection is further strengthened by an analysis on the Active Share of top-skill funds. The Active Share measure developed by [Cremers and Petajisto \(2009\)](#) captures how a fund's holdings differ from its benchmark and reflects a fund's attempt to beat the benchmark through active stock picking. We find strong evidence that the link between acquirer CTARs and fund skill is driven by the subset of funds with higher Active Shares. In addition, we hypothesize that funds with concentrated holdings in certain industries could have superior information that aids in selecting successful acquirers in those industries. We find that the relation between acquirer CTARs and fund skill is marginally stronger for the subset of funds with a higher Industry Concentration Index (ICI, following [Kacperczyk, Sialm, and Zheng, 2005](#)). Thus, evidence based on Active Share and (to a lesser extent) ICI provides further support that skilled funds pick successful acquirers.

In a supplementary analysis on mutual fund performance persistence, we find that mutual funds in the highest skill decile deliver significant outperformance and mutual funds in the lowest skill decile have statistically insignificant under-performance over the subsequent 12 months. This asymmetry highlights the importance of the right tail of our fund skill measures in detecting stock selection information. As corroboration to this idea, we look at another deal-level skill measure that focuses on the right tail of fund skill: the maximum value of Alpha24 (or Alpha12 and CCP) among funds holding the acquirer. We repeat all our tests using these maximum skill measures and find that they are robust predictors of acquirer CTARs, BHARs, and change in ROA.

Together these findings provide consistent evidence that more skilled mutual funds select the stocks of acquirers that subsequently make better acquisitions. Our paper contributes to both the shareholder activism and mutual fund performance literatures. Several papers examining chief executive officer compensation, antitakeover amendments, research and development expenses, etc., find evidence of shareholder activism.⁶ However, the impact of institutional monitoring on shareholder value remains open to debate. [Parrino, Sias, and Starks \(2003\)](#)

find that institutional investors prefer to sell shares when they are unhappy with firm performance instead of exerting effort to monitor management. [Karpoff, Malatesta, and Walking \(1996\)](#), [Wahal \(1996\)](#), and [Gillan and Starks \(2000\)](#) find little impact of shareholder activism on long-term performance and shareholder value.⁷ Our paper shows that a positive relation between shareholder value and the presence of independent institutional investors such as mutual funds is attributable at least partly to informed stock picking by investors. Existing studies examining the performance of stocks held by mutual funds find that some mutual fund managers have the ability to choose stocks that outperform their benchmark before expenses are deducted. Our results complement this mutual fund literature by showing that picking successful acquirers is part of the stock selection skill of mutual funds.

The rest of the paper is organized as follows. [Section 2](#) contains the data description. [Section 3](#) examines the link between mutual fund ownership and post-merger performance of portfolio companies. [Section 4](#) contains further analysis and discussions. [Section 5](#) concludes.

2. Data and method

Our sample of mergers and acquisitions is obtained from the Securities Data Company (SDC). It includes all completed majority-stake acquisitions announced between 1990 and 2006, when both the acquirer and target are publicly traded firms in the United States and data on mutual fund ownership and skill are available. [Table 1](#) provides summary statistics by year of the 3,988 mergers in our sample. The number of deals per year varies from a low of 98 in 1991 to a high of 389 in 1998. The percentage of acquirer stock owned by mutual funds has gradually increased from a low of 4.71% in 1990 to the highest level of 13.16% in 2006. Acquirer size has been higher in the 2000s than in the 1990s, but the size of the target relative to that of the acquirer shows no definitive trend. The percentage of deal value offered in cash fluctuates significantly over time, reflecting changes in stock market valuations and the cost of borrowing.

Data on mutual funds are from two sources: the Center for Research in Security Prices (CRSP) Survivorship Bias Free Mutual Fund Database and the Thomson Reuters database on mutual fund holdings (previously known as the "CDA/Spectrum Database"). The CRSP data provide information on monthly fund net returns and total net assets, as well as annual fund characteristics such as expense ratio and turnover. The Thomson data provide information on fund stock holdings at a quarterly or semiannual frequency. Funds identified in these two databases are matched together using the MFLINK file provided by Wharton Research Data Services (WRDS). Because we are interested in the stock selection ability of mutual funds, our sample includes all US domestic equity funds with a reported investment objective of aggressive growth, growth, and growth and income in the Thomson

⁶ See [Brickley, Lease, and Smith \(1988\)](#), [Agrawal and Mandelker \(1990\)](#), [Smith \(1996\)](#), [Bushee \(1998\)](#), [Hartzell and Starks \(2003\)](#), [Almazan, Hartzell, and Starks \(2005\)](#), and [Borokhovich, Brunarski, Harman, and Parrino \(2006\)](#).

⁷ Other papers that find weak support for effective institutional monitoring are [Black \(1998\)](#), [Del Guercio and Hawkins \(1999\)](#), [Karpoff \(2001\)](#), and [Gillan and Starks \(2007\)](#).

Table 1
Merger sample.

The sample consists of 3,988 mergers and acquisitions announced between 1990 and 2006. *Fund Ownership* is the percentage of acquirer's stock held by mutual funds. *Acquirer Size* is the acquirer's market value of assets calculated as market value of equity plus book value of debt. *Acquirer MB* is acquirer's market value of assets divided by book value of assets, where market value of asset is market value of equity plus book value of debt. *Acquirer Leverage* is the acquirer's total short-term and long-term debt as of the fiscal year end preceding merger year divided by acquirer's market value of equity as of the calendar year end preceding the merger announcement. *Relative Size* is the deal transaction value divided by acquirer size. *Cash* is the percentage of transaction value paid in cash. *Percentage Hostile* is the percentage of deals in which the attitude of the target management is recorded in SDC Platinum as hostile. *ILTI* is the percentage of acquirer's stock held by independent institutions that are among the largest five shareholders in the acquirer in the quarter immediately prior to merger and have been among the largest five shareholders in each of the five quarters prior to merger announcement. *Percentage Diversify* is the percentage of deals in which the acquirer and target belong to different two-digit standard industrial classification codes.

Year	Number of deals	Fund ownership	Acquirer size	Acquirer MB	Acquirer leverage	Relative size	Cash	Percentage hostile	ILTI	Percentage diversify
1990	103	4.71%	7,143	1.24	0.83	17.59%	54.79%	0.97%	1.10%	37.86%
1991	98	6.24%	3,774	0.97	1.50	22.60%	23.26%	1.02%	1.15%	31.63%
1992	106	6.04%	2,448	0.95	1.19	31.90%	23.39%	5.66%	2.72%	27.36%
1993	152	7.09%	3,354	1.29	0.74	28.50%	31.29%	1.97%	2.03%	26.97%
1994	233	8.24%	3,770	1.16	0.60	20.83%	31.87%	6.87%	2.45%	25.75%
1995	269	9.86%	3,547	1.34	0.73	28.23%	30.32%	5.58%	4.44%	30.11%
1996	301	10.79%	4,680	1.69	0.57	30.05%	29.62%	5.98%	3.51%	31.89%
1997	367	11.86%	7,927	1.59	1.55	37.38%	27.19%	2.72%	4.28%	32.70%
1998	389	11.42%	9,277	1.90	0.41	33.36%	28.75%	1.54%	3.65%	30.59%
1999	387	10.78%	20,797	2.12	0.65	25.71%	36.70%	3.36%	0.75%	32.82%
2000	356	9.76%	30,070	2.92	0.52	35.14%	38.21%	1.97%	1.45%	35.11%
2001	273	12.11%	18,666	1.67	0.74	24.30%	39.44%	1.10%	1.70%	31.87%
2002	172	11.57%	20,174	1.81	0.63	16.54%	52.50%	1.16%	2.11%	36.63%
2003	197	10.47%	13,680	1.24	0.63	26.43%	50.54%	2.54%	3.08%	25.38%
2004	189	11.13%	16,953	1.42	0.58	26.22%	51.27%	1.59%	2.81%	28.04%
2005	185	11.10%	27,698	1.66	0.44	23.75%	53.90%	1.62%	3.16%	35.68%
2006	211	13.16%	30,453	1.54	0.64	31.00%	66.51%	1.42%	3.19%	34.12%
All	3,988	10.37	14,210	1.69	0.73	28.36%	39	2.88%	2.67%	31.57%

data. Passive index funds and funds with apparently misreported investment objectives are removed from the sample. Multiple share classes of a fund in the CRSP data are identified using the MFLINK file and are combined into a single fund before matching with the Thomson data. To ensure data accuracy, we exclude fund-quarter observations if the total net assets are below one million dollars or the total market value of reported holdings is under 50% or over 150% of the total net assets.

For each merger, we use the Thomson data to identify holdings of the acquirer's stock by all mutual funds in our sample during the quarterly portfolio snapshots just prior to the merger announcement. A majority of such portfolio holdings are reported within the three months prior to the merger announcements, although some are within the past six months due to the semiannual reporting frequency of some funds.

For each fund, we use three measures of mutual fund stock selection skill. The first two are the plain vanilla measures of fund alpha based on the Carhart (1997) four-factor model, i.e., a fund's abnormal return after controlling for fund exposure to the market, size, book-to-market, and momentum factors. One version of alpha is estimated over the 24 months preceding merger announcement (Alpha24) and the other is estimated over the 12 months preceding merger announcement (Alpha12). Fund alpha estimated over the 12-month rolling window has been a

common proxy for fund stock selection skill in the literature (e.g., Cohen, Coval, and Pastor, 2005; Wermers, Yao, and Zhao, 2012). However, four-factor alphas estimated using 12 data points are subject to potentially large estimation errors. The use of a 24-month rolling window partially alleviates this concern. In addition, we use the Cohen, Coval, and Pastor (2005) fund performance measure to alleviate this concern. The CCP measure is based on the idea that the similarity of fund managers' holdings is informative when evaluating the ability of fund managers. In a nutshell, it is the four-factor fund alpha estimated using the 12-month rolling window smoothed over using funds' portfolio weights. As illustrated by the simulation analysis of Cohen, Coval, and Pastor (2005), their measure effectively reduces the noise in the return-based fund alpha estimates and improves the power of detecting fund stock selection ability.

All these measures are constructed using fund information prior to merger announcements and details of these measures are provided in the Appendix. Before employing these fund skill measures to address our primary question about mergers, we first check whether mutual funds with higher skill as captured by Alpha24, Alpha12, and CCP actually outperform. Because the predictive power of these skill measures has been studied extensively in existing research, we present our findings as a supplementary analysis in the Appendix. We find that fund alphas

Table 2

Summary statistics.

The sample consists of 3,988 mergers and acquisitions announced between 1990 and 2006. Panel A presents summary statistics of the following variables: Number of funds is the number of funds holding acquirer *i*'s stock in the quarter prior to merger announcement. Top Alpha24 (Top Alpha12) is the number of funds with a 24-month (12-month) alpha in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. Top CCP (Top ICI) is the number of funds with Cohen, Coval, and Pastor (2005) fund performance measure (Industry Concentration Index) in the top quartile that hold an acquirer's stock in the quarter prior to acquisition. Weighted Alpha24 (Alpha12) is the weighted average 24-month (12-month) alpha across all funds holding an acquirer's stock in the quarter prior to acquisition. The weights are the portfolio weights of a fund on the given acquirer. Weighted values of CCP and ICI are calculated the same way. ILTI is the percentage of an acquirer's stock owned by institutions that are among the five largest shareholders in each of the five quarters preceding merger announcement and are classified as independent institutions by Thomson Reuters. Panel B presents average Alpha24, average Alpha12, and average CCP for top skill funds and for the full sample of funds. Panel C presents Spearman's rank order correlation between the variables.

Panel A: Summary statistics

Variable	N	Minimum	Median	Maximum	Mean
Number of funds	3,988	1	39	826	79.443
Top Alpha24	3,988	0	7	161	13.40
Top Alpha12	3,988	0	7	204	14.38
Top CCP	3,828	0	5	320	11.72
Weighted Alpha 24	3,801	−0.022	0.0005	0.043	0.0007
Weighted Alpha12	3,828	−0.0470	0.0006	0.049	0.0009
Weighted CCP	3,828	−0.019	0.0005	0.022	0.0009
ILTI	3,959	0	0	0.418	0.027

Panel B: Past alphas of top skill funds

Variable	Average: Top skill funds	Average: All funds
Alpha24	0.62%	0.03%
Alpha12	0.93%	0.06%
CCP	0.54%	0.09%

Panel C: Correlations

Variable	Top Alpha24	Top Alpha12	Top CCP	Weighted Alpha 24	Weighted Alpha12	Weighted CCP	ILTI
Top Alpha24	1						
Top Alpha12	0.94	1					
Top CCP	0.71	0.77	1				
Weighted Alpha 24	0.09	0.07	0.14	1			
Weighted Alpha12	0.08	0.14	0.33	0.63	1		
Weighted CCP	0.02	0.08	0.25	0.50	0.80	1	
ILTI	−0.10	−0.09	−0.08	−0.02	−0.04	−0.09	1

measured over the past 12 and 24 months predict fund alphas over the next 12 months. CCP also has good predictive power. Another notable finding of this auxiliary analysis is that mutual funds in the top skill decile have significantly positive future performance, while mutual funds in the bottom decile have insignificantly negative performance. Thus, stock selection skill is more evident in the right tail. Funds in the right tail of the skill distribution possess positive stock selection information, and funds in left tail of the skill distribution do not perversely possess negative stock selection skill (perhaps they are just unlucky in their past performance).

To test whether the skill of mutual funds invested in an acquirer predicts the post-merger performance of the acquisition, we need deal-level measures of fund skill. Because there are multiple funds holding an acquirer per merger, we have multiple observations for each skill measure per deal. Given this, we construct two sets of deal-level measures of fund stock selection skill. In the

first, we rank funds in each quarter into quartiles based on one of the three fund-level skill measures: Alpha24, Alpha12, and CCP. Then, for each deal, we count the number of funds holding the acquirer that are ranked in the top quartile of the fund skill measure. These three count measures (termed Top Alpha24, Top Alpha12, and Top CCP) serve as our main deal-level proxies of fund skill. We also calculate the weighted average value per deal for Alpha24, Alpha12, and CCP and use these as our secondary measures of deal-level fund skill. The weight given to each fund's skill measure is proportional to that fund's portfolio weight on the acquirer. They are termed Weighted Alpha24, Weighted Alpha12, and Weighted CCP. Intuitively, the weight a fund puts on a stock reflects the fund manager's conviction, or the intensity of the positive stock selection information on the stock. Thus, the weighted measures of fund skill take into account both the fund skill and the intensity of stock selection information a fund has on an acquirer.

Summary statistics and correlations of our deal-level skill measures are provided in Table 2. In Panel A, the median acquirer is held by 39 funds in all. However, the median acquirer is held by only seven funds belonging to the top quartile of Alpha24, seven funds from the top quartile of Alpha12, and five funds belonging to the top quartile of CCP. Panel B shows that the average Alpha24 (Alpha12) of the Top Alpha24 (Top Alpha12) funds is 0.62% (0.93%). In contrast, the average Alpha24 (Alpha12) of all funds in our sample is 0.03% (0.06%) only. The average CCP of Top CCP funds is 0.54% as compared with an average of 0.09% for all funds. Panel C presents Spearman's rank-order correlations between the skill measures. The three top-skill measures are highly correlated with correlation coefficients, ranging from 0.71 to 0.94. Correlations within the three weighted measures are also high, ranging from 0.50 to 0.80. The correlations of the top-skill measures with the weighted measures are smaller but statistically significant.

Our use of the top-quartile deal-level measures, i.e., Top Alpha24, Top Alpha12, and Top CCP, requires a further note. Amid the rapid growth of the mutual fund industry during the past two decades, many funds were founded with the primary purpose of collecting assets (i.e., expanding the assets under management to generate increased fee revenue for the fund management company), instead of implementing good investment ideas. As a consequence, the truly skillful funds have become scarce. As shown by Kosowski, Timmermann, Wermers, and White (2006), Barras, Scaillet, and Wermers (2010), and Fama and French (2010), a relatively small fraction of mutual funds possess stock selection skills. The result of the fund-level performance persistence analysis reported in the Appendix is consistent with this conclusion. Further, there is an increasing pattern of uninformative herding in fund trading, as found by Brown, Wei, and Wermers (forthcoming) and Wei, Wermers, and Yao (2012). In the presence of the scarcity of stock selection skill and fund herding, the average characteristics of funds investing in an acquirer are less indicative of the existence of stock selection information than the characteristics of the leading funds of the group, i.e., funds with the best skill. The top-quartile measures of deal-level fund skill are consistent with this notion as they focus on the decisions to hold an acquirer by funds in the right tail. Our secondary, weighted-average measures of deal-level fund skill use information across all funds. They provide a useful comparison in our analysis.

In our empirical analysis, we primarily rely on the calendar time abnormal return approach to examine the relation between these measures of deal-level fund skill and the post-merger performance of acquisitions. This approach is as follows. In each month t , we identify all acquisitions in our sample that take place during the past K months (month $t-K$ to $t-1$, with $K=6, 12, 24$, and 36 months). We sort the identified acquirers into two groups based on a deal-level fund skill variable, which is measured prior to the acquisition announcements. If an acquirer has made multiple acquisitions during the past K months, we keep only the deal-level skill measure of the last acquisition. Then, we form equal-weighted portfolios within each of the two groups and compute the portfolio returns during month $t+1$. Finally, based on the monthly

time series of portfolio returns obtained in the above step, we estimate alphas of the portfolios using the Fama-French three-factor model as well as the Carhart four-factor model.

We also check the robustness of our results to the more common measures of post-merger performance such as long-run BHARs and change in ROA. Following the standard methodology outlined in Lyon, Barber, and Tsai (1999), we calculate BHARs as the buy-and-hold return of an acquirer during the 36 months following announcement less the buy-and-hold return of a Fama-French size and book-to-market matched portfolio. ROA is the ratio of earnings before interest and taxes to total assets. To remove the impact of industry-wide factors, we subtract the median ROA of all firms in the same two-digit standard industrial classification (SIC) code. We follow Chen, Harford, and Li (2007) and estimate an AR(1) model with the industry-adjusted average ROA over the three years following the merger as the dependent variable and the industry-adjusted average ROA over the three years preceding the merger as the right-hand-side variable. The residual from this regression serves as the measure of abnormal change in ROA.

3. Results

Because our research question is motivated by the long-held view that institutional monitoring results in better post-merger performance, in Section 3.1, we replicate existing evidence on the relation between merger performance and institutional monitoring. Next, in Section 3.2, we present our main evidence on the link between mutual fund skill and merger performance.

3.1. Institutional monitoring and merger performance

Chen, Harford, and Li (2007) show that three-year BHARs and change in ROA are higher for acquirers held by independent long-term institutions. We begin by briefly revisiting their results using our data sample. We create their measure of concentrated holdings by independent long-term institutions. ILTI is defined as the percentage of an acquirer's stock owned by institutions that meet the following three conditions: (1) independence; they are classified by Thomson Reuters as type 3 (investment companies) or type 4 (investment advisers), (2) large shareholder; they are one of the five largest shareholders in $Q-1$, where Q is the merger quarter and (iii) long-term: they are also one of the five largest shareholders in each of the quarters from $Q-5$ to $Q-1$.⁸ Summary statistics of ILTI are presented in Table 2.

⁸ CDA/Spectrum's type classification is not accurate beyond 1998. Many of the institutions are improperly classified as type 5 institutions. Following Chen, Harford, and Li (2007), we use the pre-1998 CDA classification of each particular institution and apply it to the holdings data in year 1998 and after. Moreover, pension funds are classified as type 5 institutions even though they are independent. We manually go through all type 5 institutions and identify all pension funds as independent institutions.

We regress BHARs and change in ROA on ILTI while controlling for several factors that could affect acquirer returns. The following cross-sectional regression is estimated using ordinary least squares with industry fixed effects (at the two-digit SIC level), announcement year fixed effects and standard errors clustered by announcement year:

$$\begin{aligned} BHAR_i \text{ or } \Delta ROA_i = & \alpha_0 + \alpha_1 ILTI_i + \alpha_2 OTHerINST_i \\ & + \alpha_3 RELSIZE_i + \alpha_4 CASH_i + \alpha_5 DIVERSIFY_i \\ & + \alpha_6 HOSTILE_i + \alpha_7 LEVERAGE_i + \alpha_8 AMB_i \\ & + \alpha_9 ACQSIZE_i + \alpha_{10} PASTRET_i + \varepsilon_i \quad (1) \end{aligned}$$

BHAR and change in ROA are described in Section 2. *OTHERINST* is the percentage of large institutional holdings that are not ILTIs. These institutions are one of the five largest shareholders as of the quarter prior to merger announcement, but they do not meet the independence or long-term criteria of the ILTI classification. *RELSIZE* captures the size of the target relative to acquirer size and is measured as transaction value of the merger divided by acquirer market value of assets. *CASH* is the percentage of deal value paid in cash. *DIVERSIFY* is a dummy variable equal to one if the acquirer and target belong to different two-digit SIC codes and zero if they belong to the same two-digit SIC. *HOSTILE* is a dummy variable equal to 1 if the attitude of target management is hostile toward the acquirer. *LEVERAGE* is acquirer's total long-term and short-term debt divided by its market value of equity. *AMB* is the acquirer's market-to-book ratio calculated as market value of assets divided by book value of total assets (market value of assets is the market value of equity plus book value of debt). *ACQSIZE* is the acquirer's market value of assets calculated as market value of equity plus book value of debt.⁹ *PASTRET* is the buy-and-hold return of the acquirer in the six months preceding the merger announcement.

Results are presented in Table 3. We see that ILTI is positively related to both BHARs and change in ROA. This suggests that firms held by independent, long-term institutions make better acquisitions, possibly due to the monitoring role of these institutions. In Section 3.2.2 we return to these regressions to see how the results change if mutual funds' stock picking skill is also taken into account.

3.2. Mutual fund stock selection skill and merger performance

In this subsection, we present the relation between mutual fund stock selection skill and the post-merger stock performance of acquirers held by the funds. While BHARs are a popular measure of abnormal stock performance; they are known to have skewed distributions and suffer from biases, as pointed out by Lyon, Barber, and Tsai (1999). Mitchell and Stafford (2000) recommend the

calendar time returns method in which the performance of event portfolios is tracked in calendar time with reference to an asset pricing model. We adopt the calendar time returns as our primary performance measure and present our main results in Section 3.2.1. In Section 3.2.2 we present the robustness of our results using BHAR and change in ROA.

3.2.1. Calendar time returns

Tables 4 and 5 compare calendar time abnormal returns of acquirers with above-median and below-median deal-level fund skill measures. As explained in Section 2, CTARs are the alphas from regressing acquirer portfolio return on the three Fama-French factors or alphas from a four-factor model that includes the momentum factor. Acquirer portfolios are constructed based on acquisitions announced over the previous 6, 12, 24, or 36 months. In Table 4, we present the CTAR comparison based on our primary skill measures: Top Alpha24, Top Alpha12, and Top CCP. Table 5 presents the CTAR comparison by Weighted Alpha24, Weighted Alpha12, and Weighted CCP.

In Table 4, acquirer CTARs are presented for the above- and below-median fund skill groups. Acquirers in the low Top Alpha24 group have a negative but statistically insignificant six-month CTAR of -0.35% per month. Acquirers in the high Top Alpha24 group have positive and statistically significant six-month CTAR of 0.27% per month. The difference between the two is statistically significant. The 12-month CTAR of the high Top Alpha24 group is also significantly greater than that of the low Top Alpha24 group. A similar result can be seen for the 24-month CTAR. The low Top Alpha24 group has insignificant 24-month CTAR but the high Top Alpha24 group has significantly positive 24-month CTAR. The pattern is the same for the 36-month CTAR with negative CTAR for the low Top Alpha24 group and positive CTAR for the high Top Alpha24 group, but the *t*-statistics are weaker. Results are similar if we use Top Alpha12 and Top CCP. CTARs of acquirers held by high skill funds are better than CTARs of acquirers held by low skill funds. The results remain stronger for the 6-month and 12-month CTARs than for the 24-month and 36-month CTARs. Table 5 shows consistent evidence with weighted skill measures. CTARs of above-median group of Weighted Alpha24 are significantly higher than CTARs of the below-median Weighted Alpha24 group. The same result holds if we split the sample by Weighted Alpha12 or Weighted CCP, with *t*-statistics strongest at the 6- and 12-month horizons. To summarize, Tables 4 and 5 show that all our fund skill measures significantly predict acquirers' post-merger performance.

3.2.2. BHARs and change in ROA

Having shown that acquirers held by more skilled mutual funds experience better post-merger CTARs, we check the robustness of our findings to alternative measures of post-merger performance. We return to the cross-sectional analysis of BHAR and change in ROA shown in Eq. (1) but this time we include our fund skill measures as the key explanatory variables in addition to ILTI. For each acquirer, we also calculate the percentage of acquirer's outstanding shares owned by all Top Alpha24 (Top Alpha12 or Top CCP) funds that held the acquirer's stock

⁹ Larger firms attract more mutual funds and are more likely to have extreme values of our fund skill measures. We systematically include acquirer size in the regressions to control for this effect. In additional, untabulated, analysis, we find that variables that proxy for the dispersion of fund skill measures, such as the deal-level standard deviations of fund skill measures and deal-level minimums of fund skill measures, do not predict acquirer performance.

Table 3

Post-merger performance and institutional ownership.

The dependent variable is the buy-and-hold abnormal return (BHAR) or the change in return on assets (Δ ROA) following mergers and acquisitions announced between 1990 and 2006. BHARs are calculated as the buy-and-hold return of acquirers over the 36 months after announcement less the buy-and-hold return over the same horizon of size and book-to-market matched portfolios. Δ ROA is the residual from a cross-sectional regression of the post-merger three-year average of industry-adjusted ROA on the pre-merger corresponding measure. *ILTI*, *Cash*, *Relative Size*, *Acquirer MB*, *Acquirer Size*, and *Acquirer Leverage* are as described in Table 1. *Other Institutions* is the percentage of acquirer's stock held by institutional shareholders that are not independent long-term institutions. *Diversify* is a dummy variable equal to one if the acquirer and target belong to different two-digit standard industrial classification codes and zero otherwise. *Hostile* is a dummy variable equal to 1 if the attitude of the targeted firm's management is recorded in SDC Platinum as being hostile to the merger. *Past Returns* is the buy-and-hold return of the acquirer in the six months preceding announcement. *t*-Statistics based on standard errors clustered by year are in parentheses, and ^a, ^b and ^c indicate significance at the 1%, 5%, and 10% level respectively.

Explanatory variables	BHAR	Δ ROA
<i>ILTI</i>	0.880 (2.27) ^b	0.048 (1.84) ^c
<i>Other institutions</i>	0.330 (0.60)	0.062 (1.69)
<i>Relative size</i>	0.260 (6.74) ^a	−0.012 (3.91) ^a
<i>Cash</i>	0.236 (4.73) ^a	0.023 (6.38) ^a
<i>Diversify</i>	−0.063 (1.31)	−0.001 (0.34)
<i>Hostile</i>	0.003 (0.03)	0.006 (0.44)
<i>Acquirer leverage</i>	0.004 (0.19)	−0.000 (0.62)
<i>Acquirer MB</i>	0.017 (1.49)	0.002 (2.83) ^a
<i>Acquirer size</i>	0.006 (1.26)	0.002 (7.09) ^a
<i>Past returns</i>	0.005 (1.70) ^c	0.001 (2.38) ^b
Constant	−0.007 (0.01)	0.014 (0.19)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Number of observations	2,410	2,622
R-squared	0.08	0.13

in the quarter prior to merger announcement. We call this control variable *Top Holdings*. *Top Holdings* serves as a proxy for the potential ability of these funds to influence acquirers' decisions either through active monitoring or via an implicit threat of exit.¹⁰

¹⁰ Even if top-skill funds are not long-term investors, the threat of exit itself could be a sufficient monitoring mechanism provided that the

Table 6 shows results for our three primary skill measures: Top Alpha24, Top Alpha12, and Top CCP. The coefficients on all skill proxies presented in Table 6 are positive and all coefficients are statistically significant. The coefficients on *Top Holdings* are insignificant. The coefficients on *ILTI* are positive but statistically insignificant (these remain insignificant even if we exclude *Top Holdings* from the regressions).

Our secondary deal-level measures based on weighted-average fund skill are not shown in Table 6, because none of them has a significant positive relation with BHARs or change in ROA. Our finding that the primary skill measures, which capture the right tail of fund skill, are robust with BHAR and change in ROA while the weighted measures are not suggests that only funds with exceptional skill are consistent predictors of acquisition quality. This result is in line with the mutual fund performance persistence analysis presented in the Appendix, which shows that our skill proxies Alpha24, Alpha12, and CCP significantly predict fund performance only in the right tail. In the robustness section, we repeat our analysis using an alternative deal-level fund skill proxy that captures the right tail of fund skill per acquirer and find strongly consistent results.

4. Further analysis and discussions

In this section, we address several concerns that could arise from the analyses presented above. Section 4.1 examines whether fund skill is related to the likelihood that an acquisition will occur. Section 4.2 addresses concerns about the difference between monitoring and stock picking. Section 4.3 briefly discusses whether recent shareholder activism by mutual funds could affect our inference.

4.1. The likelihood of being an acquirer

The results in the previous sections show that acquirers held by high skill funds are more likely to have post-acquisition success. We interpret these results as evidence that skilled mutual funds pick firms that make good acquisitions. One issue we have not addressed is whether skilled funds specifically predict good acquirers or

(footnote continued)

funds own a significant fraction of outstanding shares. We find that the average value of *Top Holdings* ranges from 2.5% to 2.8% of acquirer's outstanding shares depending on the measure of skill used. The possibility of all top-skill funds simultaneously dumping roughly 2.5% of outstanding shares could deter management from making bad investment decisions. We also find that *Top Holdings* is positively correlated with our top-skill measures. This link between *Top Holdings* and the number of top-skill funds is, to some extent, mechanical because more funds would own more stock combined. Moreover, if the number of top-skill funds holding an acquirer is high, there is likely more positive information about the stock-performance prospects of the acquirer. This same positive information can cause top-skill funds to hold larger amounts of the acquirer's stock, thus leading to a viable threat of exit. In unreported tests, we find that the link between acquirer CTARs and fund skill is weakly stronger when total percentage holding is high. Because stock picking by skilled funds can lead naturally to a threat of exit, thus making the two difficult to differentiate, in Section 4.2 we focus on additional tests to separate the monitoring effect from the stock-picking effect.

Table 4

Calendar time returns and top-quartile skill measures.

Acquirer calendar time abnormal returns (CTARs) are presented for mergers and acquisitions announced between 1990 and 2006. Calendar time portfolios of high skill acquirers and low skill acquirers are created over the six-month, 12-month, 24-month, and 36-month horizons. For each month, the high skill portfolio consists of all mergers announced in the previous six (12, 24, or 36) months with above-median values of fund skill. The low skill portfolio consists of all mergers announced in the previous six (12, 24, or 36) months with below-median values of fund skill. 3F CTAR and 4F CTAR are the alphas of the monthly return of a portfolio (high skill and low skill separately) under the Fama and French three-factor model and the Carhart four-factor model, respectively. Skill measures used are as follows. Top Alpha24 (Top Alpha12) is the number of funds with a 24-month (12-month) alpha in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. Top CCP is the number of funds with the [Cohen, Coval, and Pastor \(2005\)](#) fund performance measure in the top quartile that hold an acquirer's stock in the quarter prior to acquisition. *t*-Statistics are in parenthesis. ^a, ^b, and ^c indicate significance at the 1%, 5%, and 10% level respectively.

Skill group	3F CTAR	3F <i>t</i> -statistic	4F CTAR	4F <i>t</i> -statistic	3F CTAR	3F <i>t</i> -statistic	4F CTAR	4F <i>t</i> -statistic
Six-month CTAR					24-month CTAR			
Low top Alpha24	−0.347%	(1.63)	−0.338%	(1.54)	0.001%	(0.01)	0.019%	(0.12)
High top Alpha24	0.274%	(1.82) ^c	0.168%	(1.11)	0.205%	(1.96) ^b	0.224%	(2.08) ^b
Difference	0.621%	(2.45) ^b	0.506%	(1.95) ^c	0.204%	(1.13)	0.205%	(1.10)
12-month CTAR					36-month CTAR			
Low Top Alpha24	−0.280%	(1.62)	−0.289%	(1.62)	−0.037%	(0.25)	−0.032%	(0.22)
High top Alpha24	0.151%	(1.33)	0.085%	(0.74)	0.146%	(1.61)	0.152%	(1.65) ^c
Difference	0.431%	(2.19) ^b	0.374%	(1.84) ^c	0.183%	(1.12)	0.185%	(1.11)
Six-month CTAR					24-month CTAR			
Low top Alpha12	−0.341%	(1.62)	−0.211%	(0.99)	0.010%	(0.07)	0.025%	(0.16)
High top Alpha12	0.232%	(1.55)	0.114%	(0.76)	0.184%	(1.75) ^b	0.206%	(1.90) ^c
Difference	0.573%	(2.22) ^b	0.325%	(1.28)	0.174%	(0.95)	0.180%	(0.96)
12-month CTAR					36-month CTAR			
Low top Alpha12	−0.206%	(1.16)	−0.134%	(0.74)	0.072%	(0.48)	0.044%	(0.29)
High top Alpha12	0.123%	(1.08)	0.057%	(0.49)	0.123%	(1.34)	0.136%	(1.45)
Difference	0.329%	(1.58)	0.191%	(0.91)	0.051%	(0.29)	0.092%	(0.51)
Six -month CTAR					24-month CTAR			
Low top CCP	−0.229%	(1.07)	−0.160%	(0.73)	−0.094%	(0.65)	−0.049%	(0.33)
High top CCP	0.292%	(1.66) ^c	0.179%	(1.01)	0.182%	(1.46)	0.244%	(1.91) ^c
Difference	0.521%	(1.79) ^c	0.338%	(1.15)	0.277%	(1.39)	0.293%	(1.43)
12-month CTAR					36-month CTAR			
Low top CCP	−0.267%	(1.58)	−0.140%	(0.82)	−0.244%	(1.78) ^c	−0.237%	(1.70) ^c
High top CCP	0.166%	(1.20)	0.114%	(0.81)	0.126%	(1.17)	0.152%	(1.39)
Difference	0.433%	(1.86) ^c	0.254%	(1.08)	0.370%	(2.01) ^b	0.390%	(2.08) ^b

whether they simply pick generally well governed firms that on average make better investment decisions. We address this question by studying the acquisitiveness of the universe of Compustat firms (with positive total assets) for which fund skill measures can be calculated.

We run a pooled probit regression to examine the relation between firm characteristics in year *t* and the likelihood of an acquisition announcement in year *t*+1. For each firm-year between 1990 and 2006, we create a dummy variable that equals one if the firm announces an acquisition in year *t*+1 and zero otherwise. To test if a firm held by highly skilled funds is more likely to announce an acquisition in year *t*+1, we measure fund skill as of the last quarter in year *t*. As before, the firm-level measures of fund skill are Top Alpha24, Top Alpha12, and Top CCP. The following control variables based on [Harford \(1999\)](#) are calculated as of year *t*. *Leverage* is total long-term and short-term debt divided by the market value of equity. *Market-to-Book* is the market value of equity plus book value of debt divided by book value of total assets. *Size* is the market value of assets calculated as market value of equity plus book value of debt. *PE ratio* is the price per share divided

by earnings per share. *Sales growth* is the growth in sales from year *t*−1 to year *t*. *Excess cash* is calculated as the cash and cash equivalents held by a firm less the industry median value of cash and cash equivalents. *Firm Return* is the cumulated stock return for a firm during year *t*. *Market Return* is the cumulated return on a value-weighted market index in year *t*. *Institutional ownership* is the percentage of outstanding stock held by institutional shareholders. Because high skill funds are more likely to select stocks that perform better in the following year, we include firm return in year *t*+1 as a control variable. We also include industry acquisition activity, measured as the number of acquisitions announced in a firm's industry in year *t*+1.

The pooled probit regression is estimated with year fixed effects and standard errors clustered by firm and year. Results are presented in [Table 7](#). We see that all the firm-level fund skill measures are positive and statistically significant at the 99% confidence level. Firms held by higher skill funds are more likely to announce an acquisition in the following year. Together with the results presented in [Section 3](#), this finding shows that firms held by highly

Table 5

Calendar time returns and weighted skill measures.

Acquirer calendar time abnormal returns (CTARs) are presented for mergers and acquisitions announced between 1990 and 2006. Calendar time portfolios of high skill acquirers and low skill acquirers are created over the six-month, 12-month, 24-month and 36-month horizons. For each month, the high skill portfolio consists of all mergers announced in the previous six (12, 24, or 36) months with above-median values of fund skill. The low skill portfolio consists of all mergers announced in the previous six (12, 24, or 36) months with below-median values of fund skill. 3F CTAR and 4F CTAR are the alphas of the monthly return of a portfolio (high skill and low skill separately) under the Fama and French three-factor model and the Carhart four-factor model, respectively. Deal-level fund skill measures are as follows. Weighted Alpha24 (Weighted Alpha12) is the weighted average 24-month (12-month) alpha across all funds holding an acquirer's stock in the quarter prior to acquisition. Weighted CCP is the weighted average Cohen, Coval, and Pastor (2005) fund performance measure across all funds holding an acquirer's stock in the quarter prior to acquisition. The weights are the portfolio weights of a fund on the given acquirer. *t*-Statistics are in parenthesis. ^a, ^b, and ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

Skill group	3F CTAR	3F <i>t</i> -statistic	4F CTAR	4F <i>t</i> -statistic	3F CTAR	3F <i>t</i> -statistic	4F CTAR	4F <i>t</i> -statistic
Six-month CTAR				24-month CTAR				
Low weighted Alpha24	−0.305%	(1.52)	−0.263%	(1.27)	0.032%	(0.26)	0.153%	(1.22)
High weighted Alpha24	0.361%	(1.59)	0.241%	(1.05)	0.212%	(1.43)	0.244%	(1.60)
Difference	0.666%	(2.20) ^b	0.504%	(1.64)	0.180%	(0.99)	0.091%	(0.49)
12-month CTAR				36-month CTAR				
Low weighted Alpha24	−0.343%	(1.92) ^c	−0.227%	(1.25)	0.106%	(0.94)	0.122%	(1.07)
High weighted Alpha24	0.283%	(1.59)	0.222%	(1.22)	0.214%	(1.68) ^c	0.229%	(1.77) ^c
Difference	0.626%	(2.44) ^b	0.449%	(1.73) ^c	0.108%	(0.66)	0.107%	(0.64)
Six-month CTAR				24-month CTAR				
Low weighted Alpha12	−0.414%	(2.24) ^b	−0.471%	(2.49) ^b	−0.025%	(0.19)	0.109%	(0.82)
High weighted Alpha12	0.584%	(2.74) ^a	0.394%	(1.86) ^c	0.247%	(1.79) ^c	0.233%	(1.65)
Difference	0.998%	(3.55) ^a	0.866%	(3.02) ^a	0.272%	(1.57)	0.124%	(0.71)
12-month CTAR				36-month CTAR				
Low weighted Alpha12	−0.351%	(2.25) ^b	−0.379%	(2.35) ^b	0.015%	(0.14)	0.059%	(0.55)
High weighted Alpha12	0.471%	(3.01) ^a	0.408%	(2.54) ^b	0.192%	(1.70) ^c	0.190%	(1.65) ^c
Difference	0.822%	(3.70) ^a	0.787%	(3.44) ^a	0.176%	(1.29)	0.131%	(0.95)
Six-month CTAR				24-month CTAR				
Low weighted CCP	−0.328%	(1.66) ^c	−0.426%	(2.12) ^b	−0.072%	(0.52)	0.043%	(0.31)
High weighted CCP	0.693%	(3.16) ^a	0.602%	(2.69) ^a	0.295%	(1.96) ^b	0.250%	(1.62)
Difference	1.021%	(3.46) ^a	1.028%	(3.38) ^a	0.367%	(2.01) ^b	0.207%	(1.13)
12-month CTAR				36-month CTAR				
Low weighted CCP	−0.215%	(1.34)	−0.266%	(1.62)	−0.019%	(0.17)	0.020%	(0.17)
High weighted CCP	0.308%	(1.66) ^c	0.221%	(1.16)	0.233%	(1.69) ^c	0.225%	(1.61)
Difference	0.523%	(2.15) ^b	0.488%	(1.94) ^c	0.252%	(1.61)	0.205%	(1.29)

skilled funds are not only more likely to become acquirers, but are also more successful acquirers. Control variables are largely of the expected signs. Larger firms, higher growth firms, and firms experiencing higher stock returns are more likely to announce acquisitions. Highly levered firms are less likely to announce acquisitions. Consistent with existing evidence on industry clustering of mergers, the coefficient on the industry acquisition variable is positive.

4.2. Monitoring or stock picking

In this subsection, we explore whether our results are just another manifestation of shareholder monitoring and present further tests to pinpoint the effect of active stock picking. It could be argued that acquirers picked by high skill funds perform better because these high skill funds stay invested for the long term and actively monitor management. In untabulated results, we compare turnover of funds in the top quartile of Alpha24, Alpha12, and CCP with that of remaining funds and find that top-quartile funds have higher turnover. Thus, relative to other funds, top-skill funds are less likely to be long-term monitors. In the following subsections, we provide

more detailed analysis based on the proxy in the existing literature for the institutional monitoring effect, ILTI, and two proxies for active stock picking by mutual funds.

4.2.1. ILTI and fund skill

The role of stock picking is difficult to isolate if skilled mutual funds have a preference for stocks that are being monitored well by other institutional shareholders. Chen, Harford, and Li (2007) argue that independent, long-term institutions with large shareholdings are the most likely to monitor management and, consistent with this argument, they find a positive correlation between the presence of large holdings of ILTIs and post-merger performance. In this subsection, we first use large shareholdings of ILTIs as a proxy for good monitoring and check whether high skill funds are more likely to hold well-monitored acquirers. In untabulated results, we sort acquirers into two groups by each of the deal-level fund skill measures and compare the ILTI measure between the two groups. We do not find any evidence that the average ILTI measure is greater for acquirers with high deal-level skill measures. This indicates

Table 6

Buy-and-hold abnormal returns and changes in return on assets.

The dependent variables are the buy-and-hold abnormal return (BHAR) and the change in return on assets (Δ ROA) over the three years following mergers and acquisitions announced between 1990 and 2006. BHARs are calculated as the buy-and-hold return of acquirers over the 36 months after announcement less the buy-and-hold return over the same horizon of size and book-to-market matched portfolios. Δ ROA is the residual from a cross-sectional regression of the post-merger three-year average of industry-adjusted return on assets on the pre-merger corresponding measure. Top Alpha24 (Top Alpha12) is the number of funds with a 24-month (12-month) alpha in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. Top CCP is the number of funds with [Cohen, Coval, and Pastor \(2005\)](#) fund performance measure in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. *ILTI*, *Cash*, *Relative Size*, *Acquirer MB*, *Acquirer Size* and *Acquirer Leverage* are as described in [Table 1](#). *Other Institutions*, *Diversify*, *Hostile*, and *Past Returns* are as described in [Table 3](#). *Top Holdings* is the number of shares of an acquirer held by top-skill funds as a percentage of the acquirer's total shares outstanding. *t*-Statistics based on standard errors clustered by year are in parentheses, and ^a, ^b, and ^c indicate significance at the 1%, 5%, and 10% level, respectively.

Explanatory variables	Dependent variable					
	BHAR			Δ ROA		
	1	2	3	4	5	6
Top Alpha24	0.003 (3.29) ^a			0.001 (6.54) ^a		
Top Alpha12		0.002 (2.69) ^b			0.001 (6.71) ^a	
Top CCP			0.002 (2.47) ^b			0.000 (3.01) ^a
<i>ILTI</i>	0.347 (0.89)	0.347 (0.90)	0.333 (0.86)	0.047 (1.27)	0.046 (1.26)	0.039 (1.05)
<i>Other institutions</i>	0.432 (1.08)	0.407 (0.94)	0.344 (0.85)	0.043 (1.36)	0.041 (1.38)	0.050 (1.18)
<i>Top holdings</i>	−0.859 (1.57)	−0.690 (1.39)	−0.325 (1.01)	0.081 (1.36)	0.111 (1.33)	0.081 (1.57)
<i>Relative size</i>	0.035 (0.40)	0.034 (0.38)	0.031 (0.35)	−0.010 (1.99) ^c	−0.010 (2.06) ^c	−0.012 (2.49) ^b
<i>Cash</i>	0.168 (3.33) ^a	0.166 (3.21) ^a	0.170 (3.33) ^a	0.021 (3.91) ^a	0.021 (3.74) ^a	0.022 (4.07) ^a
<i>Diversify</i>	−0.057 (1.88) ^c	−0.056 (1.86) ^c	−0.053 (1.74)	−0.001 (0.35)	−0.001 (0.17)	0.000 (0.02)
<i>Hostile</i>	0.027 (0.35)	0.028 (0.36)	0.031 (0.39)	0.005 (0.60)	0.007 (0.89)	0.009 (1.06)
<i>Acquirer leverage</i>	0.006 (0.37)	0.005 (0.31)	0.002 (0.13)	−0.000 (0.85)	−0.000 (1.00)	−0.000 (1.13)
<i>Acquirer MB</i>	−0.011 (0.64)	−0.011 (0.64)	−0.010 (0.58)	−0.000 (0.10)	0.000 (0.04)	0.001 (0.30)
<i>Acquirer size</i>	−0.002 (1.00)	−0.001 (0.28)	0.002 (0.76)	0.001 (1.58)	0.001 (1.63)	0.002 (2.97) ^a
<i>Past returns</i>	0.003 (0.98)	0.003 (1.03)	0.004 (1.08)	0.000 (0.98)	0.000 (1.11)	0.000 (1.57)
Constant	0.716 (9.30) ^a	0.794 (10.05) ^a	0.737 (12.79) ^a	−0.044 (4.24) ^a	−0.033 (3.58) ^a	−0.033 (3.24) ^a
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,349	2,349	2,349	2,557	2,557	2,557
<i>R</i> -squared	0.10	0.10	0.10	0.18	0.18	0.15

that the positive relation between fund skill and successful corporate mergers is not due to a stronger presence of ILTIs.

We further examine the joint effect on acquirer performance of fund stock selection and institutional monitoring using a double-sorted portfolio approach. In [Table 8](#), we present a more detailed look at the 12-month CTAR conditional on ILTI, the proxy for institutional monitoring.¹¹ In

Panel A of [Table 8](#), we first divide acquirers by above- and below-median values of ILTI. Within each ILTI group, we present 12-month CTARs for acquirer quartiles sorted on the deal-level fund skill, as well as the difference between the CTAR of the top and bottom quartiles of deal-level fund skill. The left-most section of Panel A presents the results

(footnote continued)

are largely insignificant, as observed in Subsection 3.2. Moreover, the results presented are for sequential double sorts. Although not shown in the tables, results are similar if we use independent double sorts.

¹¹ We use the 12-month CTAR for brevity. Results are qualitatively similar with the six-month and 24-month CTARs. Thirty-six month CTARs

Table 7

Fund skill and acquisitiveness.

This pooled probit regression examines the relation between firm characteristics in year t and the likelihood of an acquisition announcement in year $t+1$. The dependent variable in any given firm year is equal to one if the firm announces an acquisition in following year and zero if it does not. Top Alpha24 (Top Alpha12) is the number of funds with a 24-month (12-month) alpha in the top quartile that hold a firm's stock in the last quarter of year t . Top CCP is the number of funds with Cohen, Coval, and Pastor (2005) fund performance measure in the top quartile that hold a firm's stock in the last quarter of year t . The following control variables are calculated as of year t . *Leverage* is total long-term and short-term debt divided by the market value of equity. *Market-to-book* is the market value of equity plus book value of debt divided by book value of total assets. *Size* is the market value of assets calculated as market value of equity plus book value of debt. *PE ratio* is the price per share divided by earnings per share. *Sales growth* is the growth in sales from year $t-1$ to year t . *Excess cash* is calculated as the cash and cash equivalents held by a firm less the industry median value of cash and cash equivalents. *Firm return* is the cumulated stock return for a firm during the year t . *Market Return* is the cumulated return on a value weighted market index in the year t . The following control variables are calculated as of year $t+1$ – *Firm return* _{$t+1$} is the cumulated firm return during the year $t+1$. *Industry Acquisition* is the number of acquisitions announced in a firm's industry in year $t+1$. t -Statistics based on standard errors clustered by firm and year are presented in parenthesis. ^a, ^b, and ^c indicate significance at the 1%, 5%, and 10% level, respectively.

Explanatory variables	1	2	3
Top Alpha24	0.008 (5.59) ^a		
Top Alpha12		0.006 (4.87) ^a	
Top CCP			0.003 (3.59) ^a
<i>Leverage</i>	−0.042 (5.03) ^a	−0.041 (5.00) ^a	−0.045 (5.14) ^a
<i>Market-to-book</i>	−0.034 (2.66) ^a	−0.032 (2.59) ^a	−0.028 (2.56) ^b
<i>Size</i>	0.171 (13.77) ^a	0.174 (15.48) ^a	0.186 (18.47) ^a
<i>PE ratio</i>	0.000 (1.12)	0.000 (1.30)	0.000 (1.59)
<i>Sales growth</i>	0.044 (2.53) ^b	0.044 (2.55) ^b	0.042 (2.38) ^b
<i>Excess cash</i>	0.000 (0.13)	0.000 (0.13)	0.000 (0.67)
<i>Firm return</i>	0.035 (2.02) ^b	0.034 (2.06) ^b	0.033 (2.09) ^b
<i>Market return</i>	−0.003 (0.01)	0.031 (0.09)	0.064 (0.19)
<i>Firm return</i> _{$t+1$}	0.045 (4.18) ^a	0.044 (4.37) ^a	0.045 (4.23) ^a
<i>Industry acquisition</i>	0.004 (1.79) ^c	0.004 (1.82) ^c	0.004 (1.90) ^c
Constant	−3.100 (26.78) ^a	−3.106 (28.58) ^a	−3.158 (30.43) ^a
Year fixed effects	Yes	Yes	Yes
Number of observations	59,698	60,948	60,384
R-squared	0.088	0.087	0.085

using Top Alpha24. In the below-median ILTI group, CTARs increase with Top Alpha24. CTARs in the lower quartiles of Top Alpha24 are negative, but the top quartile has positive and statistically significant CTARs. Moreover, the difference in three-factor and four-factor CTARs between the top and bottom quartile is statistically significant. In the above-median ILTI group, CTARs also increase with Top Alpha24. The difference in the three-factor CTARs between the top and bottom quartile is significant. Results are similar using the four-factor CTARs but with weaker t -statistics. Thus, the positive relation between Top Alpha24 and CTARs is observed in both high and low ILTI groups, although the relation is stronger in the low ILTI group. Results are similar when using Top Alpha12 (the middle section of Panel A) and Top CCP (the right-most section). Although we observe some non-monotonicity in the CTAR patterns, evidence exists of either significant negative CTARs in the lower skill quartiles or significant positive CTARs in the high skill quartiles or a combination of both. Thus, Top Alpha24, Top Alpha 12, and Top CCP appear positively related to CTARs in both the above-median and below-median ILTI groups.

In Panel B of Table 8, we reverse the sorting sequence and test whether a positive relation between CTAR and ILTI exists regardless of fund skill. We first sort acquirers into above-median and below-median values of Top Alpha24, Top Alpha12, or Top CCP. Within each deal-level fund skill group, we further sort acquirers into quartiles based on ILTI. We find that the magnitude of CTAR declines as ILTI increases, but the statistical significance paints a mixed picture. In the below-median Top Alpha24 group, we see significantly negative three-factor CTAR for the top ILTI quartile and significant negative four-factor CTAR for the second ILTI quartile. Thus, both high and low ILTI groups show some evidence of under-performance. In the above-median Top Alpha24 group, we see significant outperformance for the low ILTI groups. A similar mixed or insignificant picture emerges if we use Top Alpha12 and Top CCP to capture skill. Overall, Table 8 shows that, for all three measures of skill, the positive relation between fund skill and acquirer CTAR holds in both high and low ILTI groups, albeit with greater statistical significance in the low ILTI group. In contrast, the positive link between ILTI and merger performance does not hold if we examine acquirer CTARs conditional on fund skill.

4.2.2. Evidence based on active share and industry concentration index

Having shown that the association between fund skills and acquirer performance is not driven by the effect of shareholder monitoring as measured by ILTI, we next provide additional evidence in support of the stock-picking hypothesis. We consider two fund characteristics that are viewed by the mutual fund literature as proxies for active stock picking: Active Share and the Industry Concentration Index (ICI) of fund portfolios. Active Share is developed by Cremers and Petajisto (2009) to measure the extent to which a fund's portfolio positions differ from its benchmark. They find that active stock pickers, i.e., funds with the high Active Shares outperform their benchmarks, before and after fund expenses. Kacperczyk, Sialm, and Zheng (2005) argue that some mutual funds choose to hold concentrated portfolios in certain industries when they have superior information about those

Table 8

Twelve-month calendar time returns by independent long-term institutions (ILTI) and fund skill.

Acquirer calendar time abnormal returns (CTARs) are presented for mergers and acquisitions announced between 1990 and 2006. Calendar time portfolios are created over a 12-month horizon based on fund skill and ownership of independent, long-term institutions. ILTI is the percentage of acquirer's stock held by independent institutions that are among the largest five shareholders in the acquirer in the quarter immediately prior to merger and have been among the largest five shareholders in each of the five quarters prior to merger announcement. In Panel A, calendar time portfolios are created based on above- and below-median values of ILTI and then sorted into quartiles of fund skill. The three fund skill measures are Top Alpha24, Top Alpha12, and Top CCP. Top Alpha24 (Top Alpha12) is the number of funds with a 24-month (12-month) alpha in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. Top CCP is the number of funds with [Cohen, Coval, and Pastor \(2005\)](#) fund performance measure in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. In Panel B, calendar time portfolios are created based on above- and below-median values of each of the three skill measures and then sorted into quartiles of ILTI. ^a, ^b, and ^c indicate significance at the 1%, 5%, and 10% level, respectively.

Quartile	Skill measure is top Alpha24				Skill measure is top Alpha12				Skill measure is top CCP			
	3F CTAR	3F <i>t</i> -statistic	4F CTAR	3F <i>t</i> -statistic	3F CTAR	3F <i>t</i> -statistic	4F CTAR	4F <i>t</i> -statistic	3F CTAR	3F <i>t</i> -statistic	4F CTAR	4F <i>t</i> -statistic
<i>Panel A: CTARs sorted by ILTI first</i>												
Below-median ILTI												
Skill quartile												
1	−0.196%	(0.56)	−0.371%	(1.03)	0.422%	(1.21)	0.317%	(0.87)	−0.169%	(0.62)	−0.120%	(0.42)
2	−0.294%	(1.21)	−0.443%	(1.79) ^c	−0.431%	(1.57)	−0.633%	(2.28) ^b	−0.568%	(2.21) ^b	−0.618%	(2.31) ^b
3	−0.010%	(0.04)	−0.260%	(0.95)	−0.189%	(0.76)	−0.279%	(1.08)	0.084%	(0.25)	−0.139%	(0.41)
4	0.675%	(2.86) ^a	0.452%	(1.92) ^c	0.657%	(2.83) ^a	0.410%	(1.80) ^c	1.333%	(2.96) ^a	1.208%	(2.58) ^a
4 minus 1	0.871%	(2.24) ^b	0.823%	(2.04) ^b	0.235%	(0.59)	0.093%	(0.23)	1.502%	(2.62) ^a	1.328%	(2.24) ^b
Above-median ILTI												
Skill quartile												
1	−0.714%	(2.23) ^b	−0.483%	(1.50)	−0.628%	(2.25) ^b	−0.347%	(1.27)	−0.662%	(2.13) ^b	−0.427%	(1.37)
2	−0.403%	(1.62)	−0.321%	(1.26)	0.052%	(0.20)	0.238%	(0.89)	−0.182%	(0.70)	−0.033%	(0.13)
3	0.265%	(0.74)	0.464%	(1.28)	0.196%	(0.55)	0.327%	(0.90)	0.277%	(0.73)	0.547%	(1.43)
4	−0.051%	(0.22)	0.022%	(0.09)	−0.138%	(0.59)	−0.060%	(0.25)	−0.059%	(0.19)	0.134%	(0.44)
4 minus 1	0.663%	(1.83) ^c	0.504%	(1.37)	0.490%	(1.51)	0.287%	(0.87)	0.603%	(1.34)	0.561%	(1.21)
<i>Panel B: CTARs sorted by skill first</i>												
Below-median top Alpha24												
ILTI quartile												
1	−0.318%	(0.95)	−0.373%	(1.04)	−0.414%	(1.52)	−0.523%	(1.79) ^c	−0.132%	(0.36)	−0.163%	(0.41)
2	−0.459%	(1.93) ^c	−0.510%	(1.99) ^b	−0.407%	(1.61)	−0.443%	(1.63)	−0.342%	(1.17)	−0.193%	(0.61)
3	−0.137%	(0.62)	−0.071%	(0.31)	0.016%	(0.07)	0.145%	(0.60)	−0.572%	(2.53) ^b	−0.310%	(1.34)
4	−0.842%	(2.36) ^b	−0.556%	(1.48)	−0.703%	(1.84) ^c	−0.288%	(0.73)	−0.390%	(0.93)	0.156%	(0.36)
4 minus 1	−0.524%	(1.06)	−0.183%	(0.35)	−0.290%	(0.66)	0.235%	(0.52)	−0.258%	(0.49)	0.319%	(0.58)
Above-median top Alpha24												
ILTI quartile												
1	0.578%	(2.07) ^b	0.217%	(0.76)	0.577%	(1.96) ^b	0.139%	(0.47)	0.689%	(2.15) ^b	0.294%	(0.90)
2	0.721%	(2.64) ^a	0.312%	(1.13)	0.506%	(1.90) ^c	0.128%	(0.47)	0.657%	(2.14) ^b	0.313%	(0.99)
3	−0.324%	(1.31)	−0.340%	(1.31)	−0.201%	(0.87)	−0.214%	(0.88)	−0.268%	(1.06)	−0.305%	(1.15)
4	−0.222%	(0.71)	0.021%	(0.06)	−0.342%	(1.04)	−0.106%	(0.30)	−0.031%	(0.10)	0.090%	(0.26)
4 minus 1	−0.800%	(1.89) ^c	−0.196%	(0.46)	−0.920%	(2.10) ^b	−0.245%	(0.55)	−0.720%	(1.58)	−0.205%	(0.44)

Table 9

Active share and industry concentration index (ICI) of top-skill funds.

Panel A presents the mean and standard deviation of Avg. Active, and Avg. ICI across mergers and acquisitions announced between 1990 and 2006. Avg. Active is the deal-level average Active Share of all Top Alpha24 (or Top Alpha12 or Top CCP) funds holding an acquirer's stock in the quarter prior to merger announcement. Avg. ICI is the deal-level average industry concentration index of all Top Alpha24 (or Top Alpha12 or Top CCP) funds holding an acquirer's stock in the quarter prior to merger announcement. Panel B presents Spearman's rank-order correlation between Avg. Active, and Avg. ICI with each of the each of the three skill measures: Top Alpha24, Top Alpha12 and Top CCP.

Panel A: Summary statistics

	Avg. Active		Avg. ICI	
	Mean	Standard deviation	Mean	Standard deviation
Top Alpha24 Funds	0.171	0.163	0.026	0.051
Top Alpha12 Funds	0.177	0.167	0.026	0.047
Top CCP Funds	0.206	0.227	0.026	0.047

Panel B: Correlations

	Avg. Active	Avg. ICI
Top Alpha24	0.14	0.28
Top Alpha12	0.16	0.27
Top CCP	0.53	0.52

industries. They find that mutual funds with higher industry-level portfolio concentration (measured by ICI) perform better. To sharpen the test on the stock-picking hypothesis, we examine whether Active Share and ICI affect the link between acquirers' post-merger performance and fund skill.

For each merger, we calculate the average value of Active Share and ICI for all Top Alpha24 (or Top Alpha12 or Top CCP) funds holding an acquirer's stock in the quarter prior to merger announcement. We call these deal-level averages Average Active and Average ICI. Panel A of Table 9 presents summary statistics of Average Active and Average ICI for the sample of acquirers. Panel B of Table 9 shows the rank-order correlation of Average Active and Average ICI with the three skill measures across the sample. We see strong positive correlations, indicating that when the number of top-skill funds holding an acquirer is high, the average Active Share and ICI of those funds is also higher.

Our test results are reported in Table 10. We first divide the sample of mergers by Average Active or Average ICI and then examine the link between fund skill and the post-merger acquirer performance within each group. In Panel A of Table 10, we first sort acquirers into above- and below-median values of Average Active and then present acquirers' 12-month CTARs by skill quartiles. For all three proxies of fund skill, we find that the link between CTARs and fund skill holds in the high Active Share group only. In the low Active Share group, the *t*-statistics are insignificant. In the high Active Share group, the difference in CTARs between the top- and bottom-skill quartile is consistently positive and statistically significant. This finding is consistent with the hypothesis that the link between fund skill and acquirer performance is driven by active stock picking.

In Panel B of Table 10, we present a similar analysis by first sorting on Average ICI. We find that the CTAR difference between acquirers ranked in the top and

bottom fund skill quartile is statistically insignificant in both the above- and below-median Average ICI groups. However, we do find that the acquirers ranked in highest Top Alpha12 quartile and in the highest Top CCP quartile deliver significantly positive CTARs within the high Average ICI group but not in the low Average ICI group.¹² Therefore, although the statistical significance is not as strong as for the results based on Active Share, we do find some evidence that industry concentration helps skilled funds pick more successful acquirers.

4.3. Analysis based on maximum deal-level fund skill

While the top-quartile versions of the deal-level skill measures predict acquirer performance in both the calendar time portfolio approach and the cross-sectional regression approach, the weighted-average versions tend to be significant only in the calendar time portfolio approach. A possible explanation of this difference is that the stock selection skill is scarce and possessed only by funds in the right tail of the skill measures. Thus, the average skill level of funds holding an acquirer is less informative in revealing potential stock selection information than the action taken by the top-skill funds.

In this subsection, we provide corroborating evidence by looking at another deal-level measure of fund skill that focuses on the right tail of the skill distribution. We define

¹² We also look at a fund's industry focus (instead of ICI) as an alternative proxy for the fund's industry stock selection expertise. The industry focus of a fund is identified as the two industries in which the fund has the highest portfolio weight (following the Fama-French 48-industry classification). We find that acquirers held by top-skill funds exhibit positive CTARs with marginal statistical significance when the acquirers are in the focus industries of the top-skill funds, whereas the CTARs are insignificant if the acquirers are not in the focus industries of the top-skill funds. The results suggest that industry focus helps skilled funds pick successful acquirers but are not tabulated for the purpose of brevity.

Table 10

Twelve-month calendar time abnormal returns (CTARs) conditional on Active Share and industry concentration index (ICI).

Acquirer calendar time abnormal returns are presented for mergers and acquisitions announced between 1990 and 2006. In Panel A, calendar time portfolios are created based on above- and below-median values of Avg. Active and then sorted into quartiles of fund skill. In Panel B, calendar time portfolios are created based on above- and below-median values of Avg. ICI and then sorted into quartiles of fund skill. Avg. Active is the deal-level average active share of all Top Alpha24 (or Top Alpha12 or Top CCP) funds holding an acquirer's stock in the quarter prior to merger announcement. Avg. ICI is the deal-level average industry concentration index of all Top Alpha24 (or Top Alpha12 or Top CCP) funds holding an acquirer's stock in the quarter prior to merger announcement. The three fund skill measures are Top Alpha24, Top Alpha12, and Top CCP. Top Alpha24 (Top Alpha12) is the number of funds with a 24-month (12-month) alpha in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. Top CCP is the number of funds with [Cohen, Coval, and Pastor \(2005\)](#) fund performance measure in the top quartile that hold an acquirer's stock in the quarter prior to an acquisition. ^a, ^b, and ^c indicate significance at the 1%, 5%, and 10% level, respectively.

	Skill measure is top Alpha24				Skill measure is top Alpha12				Skill measure is top CCP			
	3F CTAR	3F t-statistic	4F CTAR	3F t-statistic	3F CTAR	3F t-statistic	4F CTAR	4F t-statistic	3F CTAR	3F t-statistic	4F CTAR	4F t-statistic
<i>Panel A: CTARs sorted by Active Share first</i>												
Below-median active share												
Skill quartile												
1	−0.045%	(0.16)	0.058%	(0.20)	−0.017%	(0.06)	0.077%	(0.25)	−0.115%	(0.37)	−0.002%	(0.01)
2	−0.160%	(0.63)	−0.182%	(0.70)	−0.114%	(0.46)	−0.081%	(0.31)	0.049%	(0.19)	0.127%	(0.50)
3	−0.136%	(0.61)	−0.091%	(0.40)	−0.331%	(1.58)	−0.368%	(1.71) ^c	−0.171%	(0.81)	−0.106%	(0.49)
4	−0.072%	(0.38)	−0.075%	(0.39)	−0.074%	(0.39)	−0.131%	(0.67)	−0.044%	(0.19)	−0.057%	(0.24)
4 minus 1	−0.027%	(0.09)	−0.133%	(0.42)	−0.057%	(0.17)	−0.207%	(0.63)	0.070%	(0.17)	−0.055%	(0.13)
Above-median active share												
Skill quartile												
1	−0.761%	(2.77) ^a	−0.712%	(2.52) ^a	−0.298%	(1.08)	−0.312%	(1.10)	−0.367%	(1.49)	−0.381%	(1.51)
2	0.185%	(0.84)	0.209%	(0.92)	−0.138%	(0.62)	−0.040%	(0.18)	−0.406%	(1.39)	−0.409%	(1.36)
3	−0.096%	(0.49)	−0.165%	(0.83)	0.240%	(1.14)	0.095%	(0.45)	−0.152%	(0.61)	−0.223%	(0.87)
4	0.293%	(1.12)	0.361%	(1.35)	0.377%	(1.63)	0.285%	(1.20)	0.845%	(2.86) ^a	0.788%	(2.59) ^a
4 minus 1	1.054%	(2.61) ^a	1.073%	(2.58) ^a	0.674%	(1.85) ^c	0.597%	(1.59)	1.212%	(3.15) ^a	1.169%	(2.95) ^a
<i>Panel B: CTARs sorted by ICI first</i>												
Below-median ICI												
Skill quartile												
1	−0.174%	(0.56)	−0.040%	(0.13)	−0.084%	(0.30)	0.053%	(0.18)	−0.250%	(0.81)	−0.129%	(0.41)
2	−0.210%	(0.84)	−0.162%	(0.63)	−0.511%	(1.92) ^c	−0.410%	(1.51)	−0.056%	(0.20)	−0.039%	(0.14)
3	−0.605%	(2.61) ^a	−0.494%	(2.09) ^a	−0.417%	(1.58)	−0.391%	(1.44)	−0.248%	(1.15)	−0.154%	(0.70)
4	−0.146%	(0.79)	−0.129%	(0.67)	−0.305%	(1.52)	−0.289%	(1.40)	−0.346%	(1.34)	−0.210%	(0.80)
4 minus 1	0.027%	(0.08)	−0.089%	(0.26)	−0.221%	(0.71)	−0.341%	(1.08)	−0.096%	(0.23)	−0.081%	(0.19)
Above-median ICI												
Skill quartile												
1	−0.025%	(0.09)	−0.200%	(0.76)	0.304%	(1.04)	0.208%	(0.70)	0.314%	(1.09)	0.236%	(0.80)
2	0.474%	(1.93) ^b	0.308%	(1.24)	−0.013%	(0.06)	−0.151%	(0.76)	−0.120%	(0.43)	−0.170%	(0.59)
3	−0.024%	(0.10)	−0.320%	(1.39)	0.359%	(1.81) ^c	0.225%	(1.13)	0.218%	(0.89)	0.133%	(0.53)
4	0.168%	(0.74)	0.255%	(1.10)	0.528%	(1.78) ^c	0.517%	(1.70) ^c	0.593%	(1.83) ^c	0.553%	(1.66) ^c
4 minus 1	0.193%	(0.54)	0.455%	(1.27)	0.223%	(0.53)	0.309%	(0.71)	0.278%	(0.60)	0.317%	(0.67)

Table 11

Maximum skill measures and merger performance.

Panel A shows calendar time abnormal returns (CTARs) for above- and below-median groups of fund skill. Fund skill is measured by the maximum values per acquirer of fund Alpha24, Alpha12, and CCP. Maximum Alpha24 (Alpha12) is the highest value of 24-month (12-month) alpha among all funds holding an acquirer's stock in the quarter prior to an acquisition. Maximum CCP is the highest value of [Cohen, Coval, and Pastor \(2005\)](#) fund performance measure among all funds holding an acquirer's stock in the quarter prior to an acquisition. Calendar time portfolios are created over the six-month, 12-month, 24-month and 36-month horizons. For each month, the high skill portfolio consists of all mergers announced in the previous six (12, 24, or 36) months with above-median values of the maximum skill measures. The low skill portfolio consists of all mergers announced in the previous six (12, 24, or 36) months with below-median values of maximum skill measures. 3F CTAR and 4F CTAR are the alphas of the monthly return of a portfolio (high skill and low skill separately) under the Fama and French three-factor model and the Carhart four-factor model, respectively. In Panel B, the dependent variables are buy-and-hold abnormal returns (BHARs) and the change in return on assets (Δ ROA) following mergers and acquisitions announced between 1990 and 2006. BHARs and Δ ROA are calculated as described in [Table 3](#). *ILTI*, *Cash*, *Relative size*, *Acquirer MB*, *Acquirer size*, and *Acquirer leverage* are as described in [Table 1](#). *Other Institutions*, *Diversify*, *Hostile*, and *Past returns* are as described in [Table 3](#). *Top holdings* is the number of shares of an acquirer held by top-skill funds as a percentage of the acquirer's total shares outstanding. ^a, ^b, and ^c indicate significance at the 1%, 5%, and 10% level, respectively.

Panel A: CTARs based on maximum skill measures

	3F CTAR	3F t-statistic Six-month CTAR	4F CTAR	4F t-statistic	3F CTAR 24-month CTAR	3F t-statistic	4F CTAR	4F t-statistic
Low max Alpha24	−0.584%	(2.83) ^a	−0.495%	(2.35) ^b	−0.168%	(1.07)	−0.164%	(1.01)
High max Alpha24	0.440%	(2.48) ^b	0.313%	(1.75) ^c	0.226%	(1.89) ^c	0.284%	(2.32) ^b
Difference	1.023%	(3.75) ^a	0.808%	(2.96) ^a	0.395%	(1.90) ^c	0.449%	(2.10) ^b
12-month CTAR								
Low max Alpha24	−0.353%	(1.87) ^c	−0.284%	(1.46)	−0.142%	(1.02)	−0.128%	(0.90)
High max Alpha24	0.182%	(1.39)	0.119%	(0.89)	0.167%	(1.64)	0.189%	(1.83) ^c
Difference	0.535%	(2.22) ^b	0.404%	(1.64)	0.309%	(1.76) ^c	0.317%	(1.77) ^c
Six-month CTAR								
Low max Alpha12	−0.415%	(1.93) ^c	−0.342%	(1.55)	0.007%	(0.05)	0.047%	(0.29)
High max Alpha12	0.343%	(2.04) ^b	0.227%	(1.34)	0.177%	(1.46)	0.225%	(1.81) ^c
Difference	0.759%	(2.72) ^a	0.569%	(2.03) ^b	0.169%	(0.82)	0.178%	(0.83)
12-month CTAR								
Low max Alpha12	−0.274%	(1.51)	−0.259%	(1.38)	0.105%	(0.72)	0.093%	(0.62)
High max Alpha12	0.187%	(1.40)	0.138%	(1.01)	0.088%	(0.86)	0.117%	(1.12)
Difference	0.461%	(1.98) ^b	0.396%	(1.66) ^c	−0.017%	(0.09)	0.025%	(0.14)
Six-month CTAR								
Low max CCP	−0.249%	(1.24)	−0.254%	(1.23)	−0.010%	(0.08)	0.122%	(0.96)
High max CCP	0.386%	(1.86) ^c	0.277%	(1.31)	0.262%	(2.06) ^b	0.264%	(2.01) ^b
Difference	0.636%	(2.26) ^b	0.532%	(1.85) ^c	0.272%	(1.62)	0.142%	(0.84)
12-month CTAR								
Low max CCP	−0.279%	(1.92) ^c	−0.225%	(1.51)	0.069%	(0.58)	0.083%	(0.69)
High max CCP	0.246%	(1.72) ^c	0.159%	(1.09)	0.135%	(1.30)	0.150%	(1.41)
Difference	0.525%	(2.75) ^a	0.384%	(1.99) ^c	0.067%	(0.47)	0.067%	(0.46)

Panel B: BHAR and ROA

Explanatory variables	Dependent variable					
	BHAR			Δ ROA		
	1	2	3	4	5	6
Max Alpha24	−1.113 (0.37)			0.467 (2.29) ^b		
Max Alpha12		3.295 (2.14) ^b			0.576 (2.65) ^b	
Max CCP			9.396 (1.92) ^c			0.857 (1.46)
<i>ILTI</i>	0.237 (0.60)	0.325 (0.81)	0.325 (0.81)	0.029 (1.16)	0.030 (0.84)	0.025 (0.75)
<i>Other institutions</i>	0.401 (1.01)	0.330 (0.77)	0.298 (0.75)	0.033 (0.91)	0.024 (0.77)	0.042 (1.03)
<i>Top holdings</i>	−0.561 (1.05)	−0.699 (1.51)	−0.039 (0.14)	0.162 (3.64) ^a	0.163 (1.98)	0.151 (2.51) ^b
<i>Relative size</i>	0.031	0.030	0.029	−0.014	−0.013	−0.014

Table 11 (continued)

Panel B: BHAR and ROA						
Explanatory variables	Dependent variable					
	BHAR			Δ ROA		
	1	2	3	4	5	6
Cash	(0.35) 0.165 (3.31) ^a	(0.35) 0.170 (3.38) ^a	(0.34) 0.176 (3.58) ^a	(4.36) ^a 0.022 (6.41) ^a	(2.61) ^b 0.023 (3.97) ^a	(2.80) ^b 0.023 (4.11) ^a
Diversify	–0.058 (2.16) ^b	–0.059 (2.10) ^c	–0.055 (1.97) ^c	–0.002 (0.45)	–0.001 (0.34)	–0.001 (0.33)
Hostile	0.037 (0.52)	0.027 (0.34)	0.024 (0.31)	0.008 (0.55)	0.009 (1.08)	0.008 (0.98)
Acquirer leverage	0.001 (0.09)	0.002 (0.16)	–0.000 (0.01)	–0.000 (0.57)	–0.000 (1.17)	–0.000 (1.26)
Acquirer MB	–0.005 (0.30)	–0.011 (0.70)	–0.008 (0.46)	0.002 (1.86) ^c	0.001 (0.30)	0.002 (0.45)
Acquirer size	0.004 (1.46)	0.003 (1.05)	0.004 (1.58)	0.002 (7.31) ^a	0.002 (4.06) ^a	0.003 (4.16) ^a
Past returns	0.004 (1.23)	0.003 (1.00)	0.004 (1.08)	0.000 (1.92) ^c	0.000 (1.52)	0.000 (1.79)
Constant	0.901 (11.57) ^a	0.165 (2.05) ^c	0.127 (1.03)	0.013 (0.19)	–0.036 (3.60) ^a	–0.037 (3.52) ^a
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	2,326	2,337	2,337	2,538	2,546	2,546
R-squared	0.10	0.10	0.09	0.15	0.16	0.15

deal-level skill as the maximum value of a skill variable across all funds holding an acquirer's stock in the quarter prior to merger announcement. We refer to these skill measures as Maximum Alpha24, Maximum Alpha12, and Maximum CCP. In Panel A of Table 11, we use the calendar time portfolio approach to show that CTARs of acquirers in the high maximum-skill groups tend to be significantly higher than CTARs of acquirers in the low maximum-skill groups. In Panel B, we use the cross-sectional regression approach to show that BHARs and change in ROA are, for the most part, positively related to our maximum-skill measures. Thus, our key results are robust to these alternative measures that highlight the importance of the most-skilled funds in predicting acquirer performance.

4.4. Mutual fund activism

Although we do not examine shareholder activism in this paper, the literature on mutual fund activism is related to our results. In this part, we briefly discuss existing literature on shareholder activism by mutual funds and how our study relates to it.

Mutual funds traditionally have played a passive role in monitoring, siding with management in most corporate voting activities (Bhide, 1993). Such behavior has been widely cited and criticized by media and practitioners (Pozen, 2002). A few recent studies further find conflicts of interest of mutual funds in corporate governance activities (Davis and Kim 2007; Matvos and Ostrovsky 2008). However, since 2003, because of Securities and Exchange Commission (SEC) mandated disclosure of mutual fund proxy voting records, some mutual funds have taken a more active role in

corporate voting. For example, Ng, Wang, and Zaiats (2009) find that, after 2003, although mutual funds continue to vote in favor of a majority of management-sponsored proposals, they are more responsive to shareholder proposals and more responsive to the recommendations of institutional proxy advisory services such as Institutional Stockholder Services (ISS), particularly when prior firm performance is poor. Evidence on the recent emergence of mutual fund shareholder activism is also reported by Ashraf, Jayaraman, and Ryan (2012), Morgan, Poulsen, Wolf, and Yang (2011), Duan and Jiao (2011), and Chou, Ng, and Wang (2011). However, Cremers and Romano (2011) find no significant change in fund voting behavior before and after the SEC fund voting record disclosure requirement of 2003.

If there is a newly emerging trend of mutual fund activism, this trend is unlikely to explain our main finding. First, most of our sample period is before 2003, the start of mandatory fund proxy voting disclosure. Moreover, in untabulated analysis we find that our main results hold if we exclude the period after 2003. Second, our empirical focus is on the relation between measures of fund stock selection abilities and acquirers' subsequent stock performance. The specific stock selection measures we employ are not likely to be explained by the degree of mutual fund activism. A few studies report that fund families with more passive funds, such as Vanguard, are more active in proxy voting than fund families with mainly active funds (e.g., Matvos and Ostrovsky, 2010). Such evidence further suggests that, across funds or fund families, mutual fund activism is not strongly correlated with active stock picking. Finally, in most cases, funds belonging to the same family vote in blocks (Ng, Wang, and Zaiats, 2009). Thus, the activism role played by funds, if any, is often at the fund family level and unlikely to subsume the relation between

fund-specific stock-picking skill and post-merger performance of acquirers.

5. Conclusion

Several empirical papers find a positive association between institutional ownership of an acquirer's stock and the success of mergers. This correlation could be due to the active governance role of institutional investors, the stock-picking skill of some institutional investors, or both. [Chen, Harford, and Li \(2007\)](#) and [Gasper, Massa, and Matos \(2005\)](#) provide evidence on the existence of shareholder monitoring in the context of mergers and acquisitions by focusing on institutional characteristics such as independence from managerial influence, size of shareholding, and investor horizon. Although [Chen, Harford, and Li \(2007\)](#) acknowledge the possibility that institutional ownership is endogenous to stock picking, this hypothesis has not been empirically examined.

Using various proxies for fund skill, we provide evidence that more skilled mutual funds hold stock of companies that make more successful acquisitions. Specifically, we find that post-merger stock performance and operating performance of acquirers is better if they are held by mutual funds that are ranked high along several stock-picking skill measures. The relation between fund skill and post-merger performance is stronger when funds' Active Share is higher. We also find that firms held by higher skilled fund are more likely to subsequently engage in acquisitions. Together our results suggest that the ability to pick valuable acquisition opportunities is part of the mutual fund skill set. Moreover, our paper provides a strong indication that the stock-picking skill of some mutual funds contributes to the observed positive correlation between institutional ownership and merger performance.

Appendix. Measures of mutual fund stock selection skill

A.1. The [Carhart \(1997\)](#) four-factor alpha

The four-factor alpha is calculated using the regression

$$R_t - R_{ft} = \alpha + \beta_1 RMRF_t + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + \varepsilon_t \quad (2)$$

where R_t is the monthly net fund return, R_{ft} is the risk-free rate (proxied by the one-month Treasury bills yield), $RMRF_t$ is the market return (CRSP value-weighted index return) in excess of the risk-free rate, and SMB_t , HML_t , and UMD_t are size, book-to-market, and momentum factors, respectively. Data on R_{ft} , $RMRF$, SMB , HML , and UMD are obtained from Ken French's website.¹³ The regression is performed using monthly data during a 12-month window or 24-month window prior to the fund portfolio holding reporting date (which is within three or six months prior to the merger announcement). These two fund alpha measures are referred to as Alpha12 and Alpha24.

¹³ http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

Table A1

Fund skill measures and subsequent fund performance.

This table reports the performance of fund deciles sorted by fund skill measures. For the period from 1990 to 2006, in each month we sort sample funds into deciles based on one of the four fund skill measures defined in the Appendix: Alpha12, Alpha24, and CCP. We report the Carhart four-factor alpha of the return during the subsequent 12 months for each fund decile, as well as the alpha for return difference between the top and bottom fund deciles. Subsequent fund decile returns are measured using the [Jegadeesh and Titman \(1993\)](#) nonoverlapping portfolio approach. Panel A reports the results for all actively managed US domestic equity funds. Panel B reports the results for funds holding at least an acquirer prior to merger announcement. The alphas reported in the table are expressed in percentage points per month. *t*-Statistics are in the parentheses. ^a, ^b, ^c indicate significance at the 1%, 5%, and 10% levels, respectively.

	Skill measure				
Decile	Alpha 12		Alpha24	CCP	
Panel A: All funds					
1 (L)	−0.1244	(1.60)	−0.0715	(1.01)	−0.1473 (1.39)
2	−0.0592	(1.01)	−0.0137	(0.23)	−0.0865 (1.08)
3	−0.0253	(0.53)	−0.0214	(0.43)	−0.0598 (0.93)
4	−0.0231	(0.50)	−0.0146	(0.33)	−0.0406 (0.77)
5	−0.0001	(0.00)	−0.0074	(0.18)	−0.0134 (0.29)
6	0.0038	(0.10)	−0.0045	(0.11)	0.0339 (0.74)
7	0.0330	(0.73)	0.0225	(0.53)	0.0612 (1.20)
8	0.0823	(1.66) ^c	0.0351	(0.73)	0.0982 (1.68) ^c
9	0.0970	(1.83) ^c	0.0869	(1.69) ^c	0.1369 (1.83) ^c
10 (H)	0.2329	(3.00) ^a	0.1682	(2.26) ^b	0.2330 (2.33) ^b
H-L	0.3573	(3.59) ^a	0.2396	(2.48) ^b	0.3803 (2.24) ^b
Panel B: Funds holding at least one acquirer					
1 (L)	−0.0968	(1.11)	−0.0597	(0.74)	−0.1180 (1.00)
2	−0.0776	(1.25)	−0.0383	(0.64)	−0.1005 (1.18)
3	−0.0357	(0.71)	−0.0446	(0.85)	−0.0651 (0.97)
4	−0.0407	(0.88)	−0.0257	(0.58)	−0.0598 (1.11)
5	−0.0086	(0.20)	−0.0080	(0.20)	−0.0220 (0.45)
6	−0.0092	(0.24)	−0.0194	(0.48)	0.0204 (0.44)
7	0.0199	(0.45)	0.0101	(0.24)	0.0388 (0.76)
8	0.0569	(1.08)	0.0344	(0.68)	0.0655 (1.06)
9	0.0710	(1.69) ^c	0.0691	(1.58)	0.1125 (1.81) ^c
10 (H)	0.2158	(2.49) ^b	0.1419	(1.72) ^c	0.1946 (2.08) ^b
H-L	0.3126	(2.79) ^a	0.2017	(1.89) ^c	0.3127 (2.67) ^a

A.2. The similarity-based performance measure (CCP)

Based on [Cohen, Coval, and Pastor \(2005\)](#), we construct a variable CCP to gauge the skill of a fund manager by the extent to which his stock holding resemble those of funds with superior past performance. In each quarter, CCP for fund i is

$$CCP_{i,t} = \sum_{j=1}^J w_{ij} \delta_j$$

where there are I funds ($i=1, \dots, I$) and J stocks ($j=1, \dots, J$). w_{ij} is the weight on stock j in manager i 's portfolio at the end of each quarter and δ_j is the quality of stock j . δ_j is

measured as $\sum_{i=1}^J v_{ij} \alpha_i$, where $v_{ij} = \frac{w_{ij}}{\sum_{i=1}^J w_{ij}}$ and α_i is a fund's four-factor alpha estimated using the past 12 months of fund returns.

We calculate CCP using fund portfolio holdings reported prior to the merger announcements and 12 months of fund returns (for computing fund alphas) prior to the portfolio reporting date.

A.3. Fund skill measures and subsequent mutual fund performance

Here we examine the ability of the fund skill measures, Alpha12, Alpha24, and CCP, in predicting fund performance. We adopt the nonoverlapping portfolio approach of Jegadeesh and Titman (1993) to examine fund performance during subsequent 12 months after measuring fund skill. Specifically, in each month t , we rank funds into deciles based on one of the four fund skill measures and form equal-weighted fund portfolios. The fund portfolios are held for the subsequent 12 months, with monthly rebalancing to keep equal weights. Thus, in each holding month τ there are K portfolios with the same decile rank, which are formed during the past 12 months (i.e., during months τ to $\tau - 11$). We further take equal weights to combine these 12 portfolios with the same decile rank into one single decile portfolio, and compute its monthly returns. Finally, we compute the Carhart four-factor alphas for these decile portfolios based on their time series of monthly returns. Fund returns used in this analysis are the before-expense returns, computed by adding 1/12 of the annual expense ratio to the reported net monthly returns. We focus on the before-expense returns instead of the after-expense returns because the before-expense returns represent fund managers' stock selection ability and the after-expense returns represent investors' benefit from fund stock selection activities after fund companies and fund managers have extracted rents from investors in the form of fund fees (e.g., Berk and Green, 2004).

The results are reported in two panels of Table A1. In Panel A, we include all actively managed US domestic equity funds (averaging 1,405 funds per month). In Panel B we include only funds holding at least one acquirer during the quarter prior to the acquisition announcements (averaging 878 funds per month). However, we retain fund decile ranking formed in the entire fund sample, so that funds with the same decile rank in Panel A and B have comparable skill measures.

In both panels and under all three fund skill measures, funds ranked in the top-skill decile significantly outperform funds ranked in the bottom-skill decile. Furthermore, the top-decile funds tend to have significantly positive alphas, and the bottom-decile funds tend to have insignificant alphas. That is, the right tails of the fund skill measures are indicative of superior future fund performance, and the left tails of these fund skill measures do not have significant ability to predict future under-performance. Finally, the results in Panel B tend to be somewhat weaker than those in Panel A. However, when we also test the differences in the numbers between the two panels, we find that the differences are generally not

statistically significant. Thus, we cannot rule out that the somewhat weaker performance-predictive power of the fund skill measures for the subsample in Panel B is merely due to the reduced fund sample size.

The results reported here are consistent with those obtained by recent studies on mutual fund performance; for example, Cohen, Coval, and Pastor (2005). In particular (e.g., in their Table 2), they also find significant future outperformance by the top-ranked funds (based on past 12 month alphas, past 24 months alphas, and the CCP measure developed in their study) and no significant future under-performance by the bottom-ranked funds. In addition, multiple explanations exist for the lack of persistent under-performance of low-skill funds. One explanation is that funds identified as having low skill based on their past alphas are likely to be funds without stock selection information. Such funds could have extremely poor performance for one period by chance, but there is no reason to expect them to have persistently poor performance in the future merely because they do not have stock selection ability. A second explanation is proposed by Lynch and Musto (2003), who argue that funds with poor past performance are more likely to change their investment strategies or change investment managers, and thus poor performance is less likely to persist. Regardless of the explanations, the implication relevant for our study is that a stock being held by funds with low skill measures does not provide strong information about the future returns of the stock, while a stock being held by funds with high skill measures does provide positive information about future returns of the stock.

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