

MONITORING BY TRANSIENT INVESTORS? INSTITUTIONS AND CORPORATE CONTROL

Lee Pinkowitz
Georgetown University
Pinkowitz@msb.edu

Abstract:

Do institutions monitor management? This paper argues that even if institutions do not actively monitor, monitoring results via the takeover market. Using 139 hostile attempts from 1985-1994, I show that higher levels of institutional ownership, primarily by mutual funds, increases bid probability. The concentration of institutional ownership is unimportant. Also, successful acquisitions are more likely when institutions sell their shares. Further, institutions are not predicting likely targets; in fact, they are sellers prior to the announcement. Even if institutions do not take an active role in corporate governance, institutional ownership results in increased monitoring by the market for corporate control.

I thank Sandeep Dahiya, Lynn Doran, Bernadette Minton, Deon Strickland, René Stulz, Dick Sweeney, Rohan Williamson, and seminar participants at Georgetown University for their comments and suggestions. This paper is based on Chapter 3 of my dissertation and previous versions were circulated under the title “Institutional Ownership and the Market for Corporate Control”. The author received financial support from the Capital Markets Research Center at Georgetown University.

1. Introduction

Ownership by institutional investors has increased dramatically in recent years. Gompers and Metrick (1998) report that the ownership of stocks by large institutions nearly doubled from 1980 to 1996 and now represents more than half the value of the U.S. market. An important question remains. Has the increase in institutional ownership lead to greater monitoring of management?

There is debate in the academic literature regarding whether institutional investors monitor management. Much of the argument centers on the direct role of institutions in corporate governance. For instance, Porter (1992) and Black (1992) argue that institutions do not monitor, rather, they are transient investors who trade frequently. However, many empirical studies argue that institutional ownership does monitor management (see Smith (1996), Opler and Sokobin (1998), Jarrell and Poulsen (1987), and Agrawal and Mandelker (1990) among others).

Thus, the role of institutional investors as monitors has received much study, but with mixed results. In the United States, the need for the type of relationship investing that Porter (1992) and Black (1992) advocate may be unnecessary. Because an active takeover market exists in the U.S., it may be that institutions perform a monitoring role through their impact on the market for corporate control.

If institutional investors take an active role in corporate governance, it is tautological that monitoring occurs. However, if institutions are transient investors, monitoring may still result. Eakins (1993) shows that institutions sell or tender nearly two-thirds of their shares in the quarter of a takeover announcement. It is possible that the speed with which institutions sell shares in response to a takeover attempt increases the probability of the attempt occurring. If a large block of shares are in the hands of institutions who are willing to sell, the bidder may believe she has a higher probability of acquiring control. Hence, she may be

more likely to initiate a disciplinary takeover attempt.

Using a sample of 139 hostile takeover attempts from 1985-1994, I find that firms with higher aggregate institutional ownership are significantly more likely to face a hostile takeover attempt. Mutual fund holdings are the primary driver of the results, indicating that institutions are heterogeneous, a result consistent with Brickley, Lease and Smith (1986), among others.

Shleifer and Vishny (1986) argue that concentrated ownership can make a takeover more likely because a blockholder can split the gains with the bidder. However, my results show that the hostile attempts occur not because the bidder can split the gains with an institutional blockholder, but rather because a block of shares is in the hands of investors that may not be aligned with management. The results show that the aggregate level, not the concentration of institutional ownership, affects takeover probability.

In addition, once a control contest is begun, a hostile bidder is significantly more likely to acquire the target when the aggregate level of institutional ownership is high. Once again, the concentration of the institutions is unimportant. Further, success is significantly more likely to occur when institutional investors, and primarily mutual funds, sell or tender their shares.

Causality runs from ownership to takeover probability. Institutions are not simply investing in firms that are likely to be targeted. Rather, the change in institutional (and mainly mutual fund) holdings in the prior quarter is significantly negatively related to the probability of being targeted. This result is similar to that in Ambrose and Megginson (1992) and implies that institutions are selling shares in the quarter before the firm is targeted. If institutions were able to predict takeover targets, we should observe them buying shares in the quarter before the takeover announcement.

The next section reviews the current literature regarding institutional shareholders and their ability

to monitor. It also examines prior studies looking at the impact of institutions on the takeover market. Section 3 describes the data used in the study, while Section 4 provides the main results. Section 5 offers conclusions.

2. Prior Evidence

2.1 Do Institutions Monitor Management?

Porter (1992) argues that the U.S. system may be failing in its ability to move capital to where it is most needed because institutional investors do not have an active voice in the management of firms. He argues that institutions may force managers to pass up profitable long-term projects in favor of short-term performance. Porter asserts "... institutions should be the ideal long-term investors. Instead, we have the paradoxical situation in which many institutions, especially pension funds, are entrusted with funds for extremely long periods yet trade actively." The view that institutions are unwilling to monitor managers is shared by Black (1992) who argues that legal reform should occur to give institutions greater "voice" in corporate governance. He claims that this will increase the role of institutions as monitors. Porter and Black argue that the U.S. system would be better off if institutional shareholders take larger, more long-term stakes in corporations and actively monitor management.

Pound (1988) shows that managers are more likely to win proxy fights when institutional ownership is large. His results imply that institutions may vote with managers, perhaps due to conflicts of interest. The results are the same for proxy fights for majority control and may indicate whether institutions will side with management in a takeover attempt. In fact, Pound claims the evidence suggests that higher institutional ownership "... will particularly discourage full control challenges ... in which dissidents must make higher

economic commitments and put more wealth at risk.” Thus, we might expect similar results in hostile takeovers which, by definition, management opposes. If institutions vote with management, they may make hostile takeovers less likely because the costs are substantially higher than in proxy contests and bidders clearly put more wealth at risk.

Brickley, Lease and Smith (1988) augment the evidence in Pound by showing that institutions are heterogeneous in their voting patterns. They find that institutions do not appear to act as rubber stamps for management, because the percentage of no-votes cast in an antitakeover amendment proposal is increasing with institutional ownership. However, they find that banks, insurance companies, and other institutions likely to be sensitive to managerial pressure tend to support management-sponsored antitakeover amendments. On the other hand, institutions such as mutual funds and pension funds, which are likely to be resistant to managerial pressure, tend to vote against such amendments. Their evidence suggests that certain institutional investors may align themselves with management, while others may side with the bidder.

At the same time, many studies argue that institutional investors already monitor managers. For instance, Jarrell and Poulsen (1987) and Agrawal and Mandelker (1990) find that abnormal returns around the announcement of an anti-takeover amendment (ATA) are higher for firms with greater institutional ownership. In addition, several studies examine the shareholder proposal process and find that firms which are targeted by institutions subsequently have better operating and financial performance.¹ Other researchers find that the percentage of votes cast in favor of shareholder proposals is increasing with institutional ownership.² Finally, Grier and Zychowicz (1994) find that firms with higher institutional

¹ See, Smith (1996), Nesbitt (1994), Opler and Sokobin (1998), and Del Guercio and Hawkins (1998).

² For instance, Brickley, Lease and Smith (1988), Wahal, (1996), and Gillan and Starks (1998).

ownership have less debt. Appealing to Jensen (1986) who argues that debt monitors management, Grier and Zychowicz argue that institutional holdings serve as a substitute for debt, hence institutions monitor management.

Recent evidence indicates that institutions do not force managers to deliver short-term performance at the expense of maximizing shareholder value. Wahal and McConnell (1998) show that firms with high institutional ownership invest more in research and development (R&D) and capital expenditures. Rajgopal and Venkatachalm (1998) find that firms with higher institutional ownership use lower amounts of discretionary accruals, and Bushee (1998) finds that firms with higher aggregate institutional ownership are less likely to cut R&D to cover an earnings shortfall.

Despite the empirical evidence that institutions allow managers to make long-term investments, it has not been apparent that these changes benefit shareholders. Additionally, many researchers argue that shareholder proposals, even when successful, have no impact on shareholder wealth (see, Karpoff, Malatesta, and Walkling (1996) or Strickland, Wiles, and Zenner (1996)). Thus, the role of institutional investors as monitors is an issue which has received much study, but with mixed results.

2.2 Institutional Investors and the Market for Corporate Control

Shleifer and Vishny (1986) argue that a takeover is more likely as the stake of a large shareholder increases because large blockholders would be willing to split the gains with a potential bidder. If institutional ownership is concentrated, corporate control activity may be more likely. Gompers and Metrick (1998) show that concentrated institutional shareholding increased dramatically from 1980 to 1996.

Ambrose and Megginson (1992) examine the impact of institutional ownership on the likelihood of receiving a takeover bid. They find that the aggregate percentage of shares owned by institutions has no effect on the likelihood of a takeover attempt. However, they do find that the quarterly change in institutional ownership is significantly negatively related to the probability of receiving a bid. They argue that their results do not support Shleifer and Vishny (1986), but they use aggregate ownership and do not control for ownership concentration.

Duggal and Millar (1994) find no relation between aggregate institutional ownership and acquisition success. They do find some evidence that pressure-sensitive (i.e. banks and insurance companies) and pressure-resistant (mutual funds and endowments) ownership increases the probability of a successful bid. However, they focus only on firms where a bid occurred, and cannot say whether institutions impact takeover probability.

Eakins (1993) examines the dynamics of institutional ownership around a tender offer. He finds that institutions sell or tender roughly two-thirds of their holdings in the quarter where a tender offer is announced. Even when management opposes the offer, institutions sell more than half their shares. If institutions are selling to the bidder, or to arbitrageurs, high institutional ownership may make takeover more likely. The willingness to quickly sell may increase the chances that bidders are able to obtain a majority of the shares. Eakins (1993) results also confirm the findings in Ambrose and Megginson (1992) that institutions are less likely to be accumulating shares in the quarter prior to a takeover announcement. It may be that institutions are selling their shares to the potential bidder in privately negotiated transactions. On the other hand, if share prices are rising due to leakage of information, institutions may be selling to take profits.

Stulz, Walkling and Song (1990) show that the gain to target shareholders in a tender offer is a decreasing function of institutional ownership. They claim that institutional investors pay lower capital gains taxes and as such require a lower premium to tender their shares. They do not find that institutional ownership affects the total gains of the takeover; rather, it allows bidders to capture a larger percentage. If the bidder can capture more of the total gain, takeovers may occur more frequently in firms where the target has high institutional ownership

Jarrell, Lehn, and Marr (1986) find that targets of tender offers have lower institutional ownership than do non-targets. However, their study examines only univariate results in the quarter prior to a tender offer and does not control for other characteristics which are likely correlated with institutional ownership. They recognize this in their study, and mention that the result may be caused by size differences. Nonetheless, they argue, “[t]hese data do, however, suggest that it is not high institutional ownership per se that fuels tender offers.”

The Jarrell, Lehn, and Marr (1986) study examines institutional ownership from 1980-1983 in a cross-section of 324 industrial firms and finds that average institutional holdings increase from 30.0% to 38.0% in the four year period. For comparison, Figure 1 depicts median institutional ownership over time for both exchange-listed firms which were hostile takeover targets, and those that were not. For control firms which were never targets of a hostile takeover attempt, average holdings nearly double from the first quarter of 1985 to the last quarter of 1994, increasing from 20% to almost 40% of total shareholdings. However, for target firms, institutional holdings are higher by 50%-100% in each quarter. The median

holdings in the target firms range from 40% to over 50% by the end of 1994.³

Figure 1 also shows the concentration of institutional ownership over time. Institutional ownership is more concentrated in firms which are targets of hostile takeovers than in the control sample, which is consistent with Shleifer and Vishny (1986). Of course, since the Herfindahl index measuring concentration is positively correlated with aggregate institutional ownership, multivariate analyses need to be performed. However, Figure 1 does suggest that hostile targets have higher institutional holdings than other firms, a result which contradicts that in Jarrell, et al (1986).

2.3 Summary

Might institutions monitor management even if they do not take an active role in governance? If institutional shareholders are transient investors who are quick to liquidate their positions around a takeover attempt, then those shares are easily acquired by a potential bidder. As such, it may be that takeovers are more likely to occur as institutional ownership increases. This is different from the Shleifer and Vishny (1986) arguments because it deals only with the aggregate holdings of shareholders that will sell quickly and has nothing to do with concentration.

The Aggrawal and Mandelker (1990) and Jarrell and Poulsen (1987) studies also have implications for examining whether institutional investors affect takeover probability. Their results can be interpreted as follows. With high institutional ownership, the probability of takeover is high and will not be lowered by

³ Hostile targets which were successfully acquired drop out of the sample. Thus, there is a survivor bias in the targeted firms plot. However, if higher institutional ownership makes firms more likely to be acquired (which we will see later), then the surviving firms are likely those with the lowest institutional ownership. Thus, through time, the figure likely understates the institutional holdings of target firms.

the ATA; however, the ATA may provide for higher premiums. Thus, the chance of receiving higher premiums outweighs the decrease in takeover probability, and we should see more positive returns. On the other hand, with low institutional ownership, the ATA might lower takeover probability enough to offset the increase in premiums if the attempt occurs. Thus, with lower institutional ownership, we should see more negative returns. This interpretation of their results seems reasonable in light of the results of this paper.

The bottom line is that much of the current literature focuses on the direct monitoring of institutions. Most studies are concerned with whether institutional investors are active monitors or transient investors. However, an overlooked fact is that if institutions are transient investors, they may facilitate increased monitoring from the takeover market. If institutions are quick to sell their shares, and are willing to do so at lower premiums, these characteristics should increase takeover activity in firms with high institutional ownership. The rest of this paper analyzes the impact of institutional ownership on takeovers and supports the idea that institutional ownership results in increased monitoring of management even though the source of the monitoring is the market for corporate control.

3. Data

All money managers with investment discretion over \$100 million in equity securities are required to report their holdings quarterly to the SEC. These institutions are required to file form 13F which discloses all common-stock positions greater than \$200,000 or 10,000 shares. These data are collected and made available by Spectrum. I use the Spectrum data set to obtain institutional shareholdings in each stock for each quarter from 1985-1994. For each quarter, I determine the aggregate shareholdings of all

institutions, defined as shares owned by institutions divided by total shares outstanding. I also examine the concentration of institutional ownership by calculating a Herfindahl index. For every stock, in every quarter, the Herfindahl index is calculated by summing the squared ownership percentages for each institution.

$$Herf = \sum_{i=1}^N (Own_i)^2 \text{ where } Own_i = \frac{Shareholdings_i}{Total\ Shares} \quad (1)$$

Institutional ownership is also segmented by type. Institutions are labeled as banks or insurance companies if Spectrum labels them as such. I define mutual funds as institutions that Spectrum labels either as mutual funds or investment advisors. Finally, I define pension funds as institutions that Spectrum denotes as other institutions, which includes, but is not limited to, pension funds.

To accurately examine the impact of institutional ownership on takeover probability, I control for other firm characteristics which have been shown to affect takeover probability. In prior studies (see for instance, Palepu (1986), Ambrose and Megginson (1992), Song and Walkling (1993) Comment and Schwert (1995), and Harford (1998)), many of the same control variables appear. These include size, leverage, prior performance, and growth opportunities.

For the accounting variables in this study, the quarterly COMPUSTAT tapes are used. On the quarterly tapes, some data items are not listed every quarter, but rather biannually or annually. In these cases, I divide the numbers equally across the spanned quarters. The quarterly data set is from 1985-1994 and covers 40 quarters. I use calendar quarters rather than fiscal quarters and exclude financial firms and utilities from the analysis.

Firm size is the value of stockholders' equity deflated into 1994 dollars using the CPI, while

leverage is $(\text{long term debt} + \text{short term debt}) / \text{stockholder's equity}$.⁴ I control both for a firm's prior stock returns and accounting performance using return on equity, sales growth, and past returns. Return on equity (ROE) is net income divided by stockholder equity, while sales growth is defined from year to year, thus for quarterly data it is $(\text{sales}_t - \text{sales}_{t-4}) / (\text{sales}_{t-4})$. Past stock performance is measured as the compounded 12 month raw return calculated using CRSP monthly stock returns.⁵ To control for the quality of a firm's investment opportunities, I use the market to book ratio (see for instance, Smith and Watts (1992)) defined as $(\text{book value of assets} - \text{book value of equity} + \text{market value of equity}) / \text{book value of assets}$. However, the empirical distribution of this ratio is heavily skewed and fat tailed, thus I invert the ratio and use book to market in my analysis.⁶ Pinkowitz (2000) shows that firms with high levels of cash are less likely to be targets of hostile takeover attempts, thus I control for cash to assets. All variables are measured at the end of the prior quarter so I do not use any future information and the characteristics of the firms are potentially known to possible bidders.

Finally, because the propensity of institutions to quickly sell their shares may increase takeover probability, I control for the trading activity of the firm. Specifically, I examine the percentage of the outstanding float which is traded on an average day. I construct this variable by calculating the average

⁴ Firm quarters with negative leverage are omitted from the analysis. The main results are unchanged if the quarters are included.

⁵ I also examine the results using abnormal returns calculated by subtracting the 12 month compounded buy and hold return on the CRSP value-weighted index from the raw return measure. The results are unchanged.

⁶ The empirical distribution of the market to book ratio has a skewness of 3.5 and a kurtosis of 17.6 while the book to market ratio has a skewness of 0.34 and a kurtosis of approximately 3. My main results do not depend on whether I use book to market or market to book.

daily volume from CRSP for the period two quarters prior.⁷ Trade liquidity is defined as average daily volume divided by shares outstanding at the time. To mitigate the effects of any outliers, all data items are winsorized at the one percent level.

Takeover data are obtained from Comment and Schwert (1998), who examine acquisition attempts of exchange-listed firms from 1975-1994. Because my quarterly data start in 1985, I use the sample of 1,070 acquisition attempts from 1985-1994. Since hostile takeovers are associated with the monitoring role of the market for corporate control, I limit my analysis to the 200 hostile takeover attempts where majority control was sought. A takeover attempt is defined as hostile if Securities Data Corporation (SDC) defines it as such.⁸

Although the data in Comment and Schwert (1998) are matched with annual COMPUSTAT data, when I combine them with the quarterly tapes and eliminate financial firms and utilities, I am left with 139 hostile takeover attempts. Due to data availability, I lose another 14 targets. I do not have leverage (trade liquidity) data for nine (two) of the target firms, and I lose another three due to the lack of data regarding institutional ownership. The majority of the analysis is performed using a sample of 125 firms which were targets of a hostile takeover attempt from 1985-1994.

Because the takeover sample is limited to exchange-listed firms, I limit the control sample to COMPUSTAT firms which were listed on the NYSE or AMEX during the 1985-1994 period. Thus in

⁷ I use the period two quarters prior so that I can mitigate the problem of increased trading volume due to rumors. Since volume is likely to increase if takeover rumors emerge, I might find that targets have higher volumes in the quarter prior to a takeover even though the causality runs the other way. However, my results are robust to using the quarter before or using the period 4 quarters prior.

⁸ Schwert (2000) examines whether hostile takeovers are unlike friendly ones and argues that there appears to be few economic differences. My results are similar when I use all takeovers.

each quarter, all exchange-listed firms which were not targets of a takeover attempt serve as the control firms. Because the full time series is used, firms which were targeted serve as part of the control sample in the quarters prior to being targeted.⁹

4. Analysis

4.1 Behavior of Institutional Shareholders around a Takeover Announcement

Eakins (1993) finds that institutions sell or tender almost two-thirds of their shares in the quarter of a takeover announcement. Figure 2 shows the changes in institutional ownership for 134 hostile targets in the four quarters before through two quarters after the takeover attempt is announced. The bars in Panel A represent the median raw change in institutional ownership for the takeover sample. Event quarter zero is defined as the quarter of the takeover announcement. Panel B shows the median percentage changes in institutional ownership.¹⁰

In the year before the takeover announcement, aggregate institutional ownership is relatively constant with the median change being less than one percent (in absolute value) of outstanding shares, each quarter. This corresponds to around a three percent change in the holdings of institutions as shown in Panel B. It should be noted that the measures in Figure 2 only look at the net ownership changes in the firm, thus the identity of the institutions may be changing. However, if that is the case, sales by one type of institution are offset by purchases from another institution of the same type because there is little change in all

⁹ I find similar results using matched samples based on calendar year, industry, book to market, and/or size.

¹⁰ The raw change in ownership represents the change in the percentage of outstanding shares of the firm. Thus, a decrease in institutional ownership from 25% of the firm to 20% of the firm would be measured as -5% in Panel A. For the percentage change in Panel B, the calculation is $(0.20-0.25)/0.25 = -20\%$.

institution types. I also examine the Herfindahl index each quarter and do not find evidence that ownership concentration is significantly changing.

There is a dramatic change in institutional ownership in event quarter zero. Panel A shows that, in the median firm, institutions were net sellers of more than 5% of the firm. Mutual funds and banks were the leading sellers, each accounting for more than 2% of the sales. In percentage terms, we see that institutions sell more than 12% of their stake during the quarter that a hostile takeover attempt is announced. The results may not seem surprising to some, and may seem small when compared with the Eakins (1993) study. However, there are some key differences between the results shown in Figure 2 and the analysis in Eakins. First, the change in ownership in the figures represents sales for the 127 firms which are not (yet) acquired. Any firm which is successfully acquired in the same quarter that the announcement is made does not contribute to the figure. In addition, the figure shows that of the 90 firms still trading at the end of two quarters after the announcement, the median firm experiences a decrease in institutional ownership of another two percent of its shares. Therefore, I am not measuring the change in firms which are successfully acquired thereby decreasing 100% of their institutional holdings. Although I cannot measure who acquires the shares, it is likely arbitrageurs, or perhaps, the bidder.

A second difference is that all of my takeover attempts are hostile and Eakins (1993) finds that institutions sell a smaller percentage of their shares in hostile bids. Finally, Eakins' results are based on regression analysis and correspond to means rather than medians. In my analysis, the mean change in institutional ownership is -16.6% (-21% accounting for successfully acquired firms).

Because I limit the analysis to firms which have not been successfully acquired, the results in Figure 2 are conservative depictions of the selling of institutions around a takeover attempt. However, the

evidence in the figure, combined with that in Eakins, indicates that when hostile takeovers are announced, institutions either tender or sell a large percentage of their shares relatively quickly. Thus, it seems that shares in the hands of institutional investors may be highly liquid. Given that a potential hostile bidder is concerned with the amount of shares she can successfully acquire, bidders may be more likely to target firms with high institutional ownership. Hence, higher institutional ownership may increase monitoring by increasing takeover probability.

4.2 Univariate Results

Table 1 shows summary statistics for firms which were hostile targets during 1985-1994 and for control firms which were not. Firms which were targets of hostile takeovers have nearly 44% of their shares in the hands of institutions, compared to 34% for control firms. The differences are highly significant both at the mean and the median.

As Brickley, Lease, and Smith (1988) point out, institutions may be heterogeneous. Therefore, I separate ownership into four categories: Banks, Insurance Companies, Pension Funds, and Mutual Funds. The differences persist throughout all four categories. Targeted firms have significantly more of their shares held by all types of institutions.

Because ownership of different institutions is highly correlated (by construction, their sum is 1), I also examine how much of the total institutional holdings are owned by mutual funds. The variable Percentage Funds is equal to the percentage of shares owned by mutual funds divided by the percentage of shares owned by all institutions. Thus, for both targets and control firms, roughly 60% of institutional shares are in the hands of mutual funds.

Finally, consistent with Figure 1, targeted firms have significantly higher concentrations of institutional ownership than do the control firms. The results in Table 1, although only univariate, indicate that hostile targets have both higher levels of institutional ownership as well as higher concentrations. Hence, institutional ownership may contribute to the probability of a hostile attempt. The control variables show that hostile targets are larger than non-targets, at least with respect to medians. This is consistent with Schwert (2000) and indicates that hostile takeovers involve larger firms. Targeted firms seem to have better performance with higher ROE and stock returns, but the ROE results reverse when examining medians. Also, targets have lower sales growth and higher book to market ratios indicating poorer growth opportunities. Finally, firms which were targets have higher trading liquidity than control firms both at the mean and the median. Average daily volume in hostile targets represents about 7.8% of the outstanding float compared to 5.4% for the control sample.

4.3 Do institutional investors make firms more likely to be hostile targets?

The results in Table 1 suggest that higher levels of institutional ownership are correlated with the probability of facing a hostile takeover. However, it may also be that the results are driven by the concentration of ownership among the institutions. To determine which effect dominates, I examine takeover probability in a multivariate framework using logistic regressions.

To assess whether the regressions suffer from multicollinearity, I examine the correlation matrix shown in Table 2. Though there are few control variables which are highly correlated, ROE and Debt/Equity have a correlation of -0.3082. Because, the rest of the control variables have low correlations, I include them simultaneously in the logistic regressions. As for the ROE and Debt/Equity

correlation, I reexamine all my results leaving one of the two variables out of the regressions, and find the results are unaffected.

Although there are few worrisome correlations among the ownership variables and the control variables, not surprisingly, I find that ownership among different institutional types is related. Nonetheless, in some of the specifications I include all of the ownership types to ascertain if institutional identity affects takeover probability. Finally, the Herfindahl measure of ownership concentration is positively correlated with aggregate institutional ownership with a coefficient of 0.37. The higher the level of institutional ownership, the more concentrated it appears to be. This is not surprising given that the Herfindahl index is calculated using only institutions, thus when there is no institutional ownership, the index equals zero.

The results in Table 2 show that although there may be some multicollinearity among the different ownership variables, there are few large correlations among the ownership and control variables. Thus, I estimate logistic regressions of the following form:

Probability of Being Targeted = f(ROE, Sales Growth, Leverage, Firm Size, Cash, Prior Returns, Trade Liquidity, Institutional Ownership).

Table 3 shows the results. In the logistic regressions, the dependent variable is set to one if a firm is the target of a hostile takeover attempt in a given quarter, and zero otherwise. Thus, firms which are targets in one quarter serve as their own control in prior quarters.

We see that firms which are likely to be hostile targets are smaller and have poorer growth options, as evidenced by the signs on size and book to market. Consistent with Pinkowitz (2000), firms with large amounts of cash are less likely to be hostile targets. Trade liquidity is positive and significant indicating that bidders are attracted to firms where shares are more liquid. Finally, the positive and significant sign on prior

returns is a bit puzzling since we might expect that firms which are subject to a hostile takeover are those which performed poorly for their shareholders.¹¹

The first column shows the impact of institutional ownership on the probability of being a hostile target. We see that the coefficient on institutional ownership is 0.0325 and strongly significant with a z-statistic of nearly 9. To assess whether this is economically significant, I analyze the marginal effects. Gompers and Metrick (1998) show that in 1994, the interquartile range for institutional ownership is roughly 38%. Using this number, I find that the probability of being a hostile target is 43% higher for firms at the 3rd quartile of institutional ownership than firms at the 1st quartile.¹²

The results are different from those in Ambrose and Megginson (1992) who find that the level of institutional ownership is unrelated to takeover probability. There are several reasons why my results may differ from Ambrose and Megginson. First, their sample of takeovers is from 1981-1986 while my sample is drawn from 1985-1994. Second, they select control firms at random instead of using the population. Finally, my sample includes only hostile takeover attempts while they do not segment their sample by attitude of the transaction.

As shown in Table 1, the bulk of institutional shares are held by mutual funds. Additionally, mutual funds may be the least likely institution to take an active role in corporate governance. For both these reasons, I examine fund ownership separately in the second regression. The coefficient on fund ownership

¹¹ To determine whether the results are driven by incorrect announcement dates, I search the Wall Street Journal Index for the earliest rumor of the firm being a potential takeover target. I use a rolling six month window, so if a story appears, I search the prior 6 months. I continue to go back until no rumor appears in the six month window. Using the earliest announcement dates, I still find positive prior returns.

¹² The 45% increase is still rather small since the unconditional probability of being a hostile target in any one quarter is only about 0.25% (125 out of 49,372).

is significantly positive indicating that high mutual fund ownership seems to increase the probability of being a hostile target. The marginal effects of fund ownership are roughly 40% higher than those of aggregate institutional ownership. The third specification includes all types of institutional ownership simultaneously. We see that ownership by mutual funds appears to be the most important, though holdings by banks and insurance companies are also significant. It is important to keep in mind that the correlations among the different ownership measures are around 0.30, but the coefficient on fund ownership changes very little from the 2nd to the 3rd specification. It does not appear that collinearity impacts the results.

The results support the notion that mutual fund ownership makes firms susceptible to being targeted because funds control a large amount of stock and are not aligned with management. They provide a liquid base of shares that the bidder can attempt to acquire, which may attract bids. It is important to note, though, that trade liquidity is a control variable in the regressions, so the results are not driven by the fact that both institutions and bidders are attracted to liquid firms. However, the results may also be evidence of the Shleifer and Vishny (1986) argument that blockholders make takeover more likely because they can share the gains with the bidder.

To determine whether the prior results reflect the fact that institutions own large blocks of shares, I include a Herfindahl index in the fourth regression. The coefficient on concentration is positive, but recall that the level and concentration of ownership are highly correlated. In regression five, I include both the level and the concentration of ownership. The level remains significantly positive while the Herfindahl index becomes significantly negative. Thus, it seems that firms are more likely to be targeted if a large percentage of their shares are owned by institutions, while the concentration of those holdings is unimportant.

As a way to examine whether the impact of mutual funds drives the results, in regression seven, I

include both the level of institutional ownership and the percentage of those holdings which are owned by mutual funds. The coefficient on aggregate institutional holdings is again strongly significant; however, controlling for total ownership, the larger the percentage of the institutional shares in the hands of mutual funds, the more likely the firm will be a hostile target. Thus, it appears that mutual funds drive the results. Overall, the results indicate that institutional ownership increases takeover probability, supporting the idea that institutional ownership results in monitoring, albeit via the market for corporate control.

A potential concern about Table 3 is that the correlations among the ownership variables affect the inferences. I examine the robustness of the results by orthogonalizing the variables using a modified Gram-Schmidt procedure. This not only eliminates correlation among the variables, but has an added benefit. Gompers and Metrick (1998) find that institutional ownership is affected by size, momentum, book to market ratio, and other firm characteristics. By orthogonalizing, I remove from the ownership variables the impact of firm characteristics and isolate the affect of ownership on takeover probability. Although having firm size, prior returns, and trade liquidity in the logistic regressions mitigates this problem, this procedure allows for a more robust test.

The order of the variables is important in the Gram-Schmidt procedure. For my tests, I orthogonalize the variables in the following order: return on equity, sales growth, leverage, book to market, firm size, cash to assets, prior returns, trading liquidity, aggregate institutional ownership, fund ownership, bank ownership, insurance ownership, pension fund ownership, and the Herfindahl index. In each variable, the impact of the preceding ones are removed. Thus, by construction, the transformed variables all have zero correlation. The unreported results are nearly identical to those in Table 3. For instance, although the coefficients are different because the variables have been transformed, the z-statistic on institutional

ownership is 8.70 in the first regression in Table 3, while in the orthogonalized regression, the z-statistic is 8.69. However, the orthogonalized regressions do show that pension fund ownership is negatively related to takeover probability once the affect of aggregate ownership is removed. Because fund ownership is positive and significant, this further supports the Brickley, Lease, and Smith (1988) assertion that institutions are heterogeneous. Regardless, it does not appear that the results are driven either by correlations among the variables or by institutions being attracted to characteristics of firms that are related to takeover probability.¹³

Finally, another possible interpretation of the results in Table 3 is that the real impact is the effect of insider ownership, an omitted variable. It is reasonable to think that the higher institutional ownership is, the lower insider ownership may be. To address this, I collect insider ownership data quarterly from Compact Disclosure. The data start in the fourth quarter of 1987, thus I cannot use it with my full sample of takeover attempts. I am able to include insider ownership for 48 hostile attempts in 27,357 firm quarters. Insider ownership is negatively related to takeover probability; however, the institutional ownership results remain unchanged. Thus, it does not appear that the significant coefficients on institutional ownership are the result of an omitted variable.

The evidence in Table 3 indicates that firms are likely to be hostile targets when a larger percentage of their shares is owned by institutional investors, primarily mutual funds. The results show that ownership concentration is not driving the results, rather it is the aggregate level of fund ownership that makes firms likely to be targeted. The reason firms are more likely to be targeted as institutional ownership increases

¹³ Gompers and Metrick (1998) also show that volatility is a factor in institutional ownership. When I include volatility in the orthogonalized regressions, the results are unchanged.

is not because the bidder can share the gains with institutional blockholders as in Shleifer and Vishny (1986), but rather because a large percentage of the firm's shares are in the hands of investors who will quickly sell and/or tender their shares.

4.4 Institutional Investors and Takeover Success

I have shown that higher aggregate institutional ownership makes firms more likely to be targets of a hostile takeover attempt. However, the question remains as to whether those takeovers are more likely to succeed. Table 4 examines this issue by looking only at the firms which were targeted and analyzes the determinants of takeover success. I consider the bid to be successful if the hostile bidder acquires control of the firm.

Walking (1985) documents that target management opposition, shares owned by the bidder (toehold) and the bid premium are important determinants of tender offer success. Although my sample is not limited to tender offers, I include variables which control for these factors as well as other characteristics of the bid. Management opposition is inherently controlled for since I examine only hostile attempts. However, I also include a measure of a firm's antitakeover defenses. I define a dummy variable which equals one if the target had a poison pill in place since such a defense may reduce the probability of success. To control for toeholds, I use the percentage of shares that the bidder owned in the target on the day of the announcement. Bid premiums are measured comparing the highest hostile bid to the target stock price 20 trading days prior to the first announcement of a takeover attempt (approximately one month). Lastly, I include dummy variables which measure bid characteristics. Cash Offer equals one if the bid is made for all cash, while if there are multiple bidders, I set the variable Auction to one.

Panel A shows that of 132 hostile attempts, 38% were successful in that the target was acquired by the hostile bidder. The table shows that cash offers are more likely to be completed. Consistent with Walking (1985), the coefficient on bid premium is positive and significant. The negative coefficient on Auction indicates that hostile bidders are significantly less likely to win when there are multiple bidders. This is likely cases where the target sought a white knight.

If institutional investors quickly tender their shares, or sell them to arbitrageurs in the open market, then we should observe a positive relationship between the level of ownership and the probability of success. The first regression examines this issue. The coefficient on institutional ownership is 0.0332 and has a z-statistic above 2. Thus, higher institutional ownership does increase the probability that a takeover is successful. I find similar, albeit marginally significant, results when I examine fund ownership.

However, as Brickley, Lease, and Smith (1988) document, some institutions may vote with management while others would vote against them. In the third specification, the coefficients on funds, banks, and insurers are positive while there is a negative coefficient on pension fund ownership. However, none of the coefficients are significantly different from zero indicating that no particular category of institution appears responsible for the completion of a hostile contest, rather the aggregate holdings are important.

In the fourth regression, the coefficient on concentration is significant and positive, but, when both concentration and level are included, the coefficient on institutional ownership remains marginally significant, while the coefficient on concentration becomes insignificant. Once again, the level is driving the results and not the concentration.¹⁴ This does not mean that Shleifer and Vishny are wrong, though, since my

¹⁴ Orthogonalizing the ownership variables produces similar results.

concentration measure only examines the concentration of institutional investors and not of all shareholders. The final two regressions include both aggregate level of ownership and the percentage of shares held by mutual funds.

The results in Panel A indicate that aggregate institutional holdings are positively related to the probability of a successful hostile takeover attempt. This is consistent with the evidence in Figure 2 and in Eakins (1993) that institutions tender or sell their shares quickly after a takeover is announced. In Panel B, I attempt to directly test whether this is occurring.

I reexamine the results in Panel A, except that I include variables which measure the change in institutional ownership from the quarter of the takeover announcement to the subsequent quarter. Thus, in Panel B, I can only examine the 110 takeover attempts which were not completed in the same quarter that they were announced. If shares are sold by institutions after the takeover is announced, the change variables are negative. Hence, if institutions are important to the takeover process because they sell their shares to arbitrageurs or the bidder, then we should find significantly negative coefficients on the change in ownership variables. This would indicate that the more shares institutions sell, the more likely the firm is to be successfully acquired.

This is precisely what we observe in the first specification. We see that the change in institutional ownership has a coefficient of -0.0865 with a z-statistic of -3.5. Thus, the more shares that institutions tender or sell, the more likely the firm is to be successfully acquired. The next two regressions again lend support to the idea that mutual funds are the driving factor. We see that the change in fund ownership is significantly negative while none of the other categories has a significant coefficient.

When ownership level and concentration are both included, the change in aggregate institutional

ownership is still significantly negative, while the coefficients on the Herfindahl Index variables are insignificant. Panel B confirms that the level of institutional shareholdings are important in the takeover process. It appears that institutions may be swing votes. If they decide to sell or tender their shares, the hostile bid is significantly more likely to succeed. This result helps explain why firms with higher aggregate institutional shareholdings are more likely to be targets of hostile bids in the first place.

4.5 Can institutional investors predict takeovers?

The prior results indicate that higher institutional ownership increases the probability that a firm becomes the target of a hostile takeover attempt. This is consistent with one of two possibilities. It is either the case that higher ownership causes firms to be targeted because it increases the availability of the firm's shares, or it is possible that institutional investors are able to identify firms which are likely to be targeted. Firms which are takeover targets receive significant premiums, thus if investors could predict which firms are going to be targeted, they could reap large returns. Institutional investors are thought to have better information than individual investors; thus, I may find a relation between takeover probability and institutional ownership because institutions are buying shares in firms about to be targeted. The causality of the result is unclear.

I examine the causality of the result using not only the level of institutional ownership, but the change as well. If institutions are adept at picking targets, we should see them increasing their holdings prior to the takeover announcement. Ambrose and Megginson (1992) find that the change in institutional ownership is significantly negatively related to takeover probability. Their results suggest that institutions are leaving large returns "on the table", by selling shares prior to a takeover announcement; a finding which casts doubt

on whether institutions are informed.

Table 5 examines whether institutions are able to predict takeovers. The regressions are similar to those in Table 3, except I include the change in ownership as well as the level. To mitigate the problem of collinearity between the level of ownership and the change, I measure the level as of the previous quarter. Thus, the level is measured as of quarter $t-2$, while the change is measured from $t-2$ to $t-1$ where t is the quarter in which the takeover is announced.

The control variables in the regressions have similar coefficients to those in Table 3, hence I focus only on the ownership variables. In the first specification, aggregate institutional ownership is still significantly positive, with a coefficient (0.0349) not very different from that in Table 3. Of primary interest is the sign on the difference variable which measures the change in ownership during the quarter immediately prior to the takeover announcement. The coefficient is negative and significant with a z-statistic of -2.77. The interpretation is that institutional investors are not accumulating shares in the quarter preceding the takeover announcement, a result consistent with Ambrose and Megginson (1992).

When I examine fund ownership in the second specification, the level is again significantly positive and similar to that in Table 3, while the change is negative and marginally significant. Thus, it seems that mutual funds are not increasing their holdings in the quarter prior to the announcement. We can say more than that however. Returning to Figure 2, we notice that in the quarter prior to the takeover announcement, institutions are, in fact, net sellers of shares. The fact that they are selling shares in firms immediately prior to a takeover announcement indicates that they do not appear to be adept at forecasting takeover targets. Rather, it supports the idea that the causality runs from institutional ownership to takeover probability.

The third specification shows that no type of institution has a significant positive coefficient on the

change in ownership. Thus, no category of institution appears able to predict targets. The remaining specifications show that the change in concentration is also never significant. If informed institutions exist, we would expect them to increase their holdings ahead of the bid. Because the average institution is selling at the same time, we should observe an increase in ownership concentration. The fact that the change in concentration is never significant suggests that there are, at most, only a few informed institutions.

There is a possible explanation for the results in Table 5 that relies solely on measurement error. It may be that I do not have the date of the earliest takeover announcement. If there were takeover rumors prior to the announcement date that I use, we might see negative coefficients on the changes in ownership since institutions may simply be selling into the rumor. To control for this, I examine the Wall Street Journal Index (WSJI) for each takeover firm using rolling six month windows. If any story appears in the WSJI that mentions the firm and the possibility of being a takeover target, I search the preceding six months. I repeat this procedure until I have the earliest mention of the firm as a potential target. Of the 139 hostile targets, I find that 23 had prior takeover rumors. I repeat the analysis using the earliest date from the WSJI as the announcement date. The (unreported) results show that although the inferences remain the same, the significance levels are decreased. This is especially true for the results with fund ownership. Hence, it appears that some of the result is driven by rumors prior to the takeover announcement. The fact that the change in fund ownership is significantly negative when the announcement date is used and insignificantly negative when the rumor date is used, indicates that mutual funds sell at least some of their stake when rumors arise. However, this result reinforces the idea that institutional ownership may increase the likelihood

of takeover because fund managers are quick to sell.¹⁵

For robustness, I also examine ownership changes in the year prior to the takeover attempt. The coefficients are usually negative, although often insignificant. However, on average, institutions are not buying shares in firms in the year prior to them becoming targets

The evidence indicates that the results in Table 3 are not driven by institutions' abilities to predict takeover targets. To a lesser extent, it indicates that institutions may not be as informed as many people believe. Overall, the results of Table 5 support the idea that aggregate institutional ownership, primarily by mutual funds, increases the probability that a firm becomes a hostile target.

5. Conclusions

The results of this paper show that institutional ownership may lead to monitoring through its effect on the market for corporate control. I find that the probability a firm is targeted in a hostile takeover is significantly increasing with the level of institutional ownership. The results appear to be driven by the holdings of mutual funds. In addition, the results are not caused by ownership concentration and thus are not evidence of the arguments of Shleifer and Vishny (1986). Rather, it appears that institutional investors penchant for selling and/or tendering their shares quickly leads to takeover attempts by increasing the liquidity of the target firm's stock.

¹⁵ Another form of measurement error is that institutions might report their end of quarter holdings late. If a takeover announcement is made early in the next quarter and institutions report their portfolio holdings after the announcement is made, we would see a negative coefficient on the change in ownership variable. Hence, I reexamine the results of Table 5, using matched samples, excluding all takeover targets (and their corresponding matching firms) where the announcement is made within 30 calendar days of the end of the quarter. The main inferences are unchanged, although the significance levels are attenuated. Thus, measurement error is not driving the results.

This paper also shows that institutions do not appear to be very informed in that they are net sellers of firms in the quarter immediately prior to the announcement of a hostile takeover attempt. Hence the results indicate that institutional ownership increases the probability of a takeover attempt, rather than implying that institutions are adept at forecasting firms about to be targeted.

Future research should examine a breakdown of the data to the institutional level to see if some institutions are more informed than others. For instance, although institutional investors are in aggregate net sellers of firms in the quarter before a takeover attempt, are there some institutions which are consistently net buyers? Since mutual funds drive the results, it would be interesting to see if funds which charge higher loads or expenses are more informed than those with lower fees.

Additionally, future studies should examine whether managers try to control the ownership structure of their firms through equity issuances and repurchases. If institutional ownership makes managers vulnerable to a hostile takeover attempt, firms may repurchase (issue) shares in an attempt to lessen (dilute) institutional holdings.

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Figure 1:
Institutional Ownership over time for Targets and Control Firms
 The figures show the median level (concentration) of institutional ownership by year

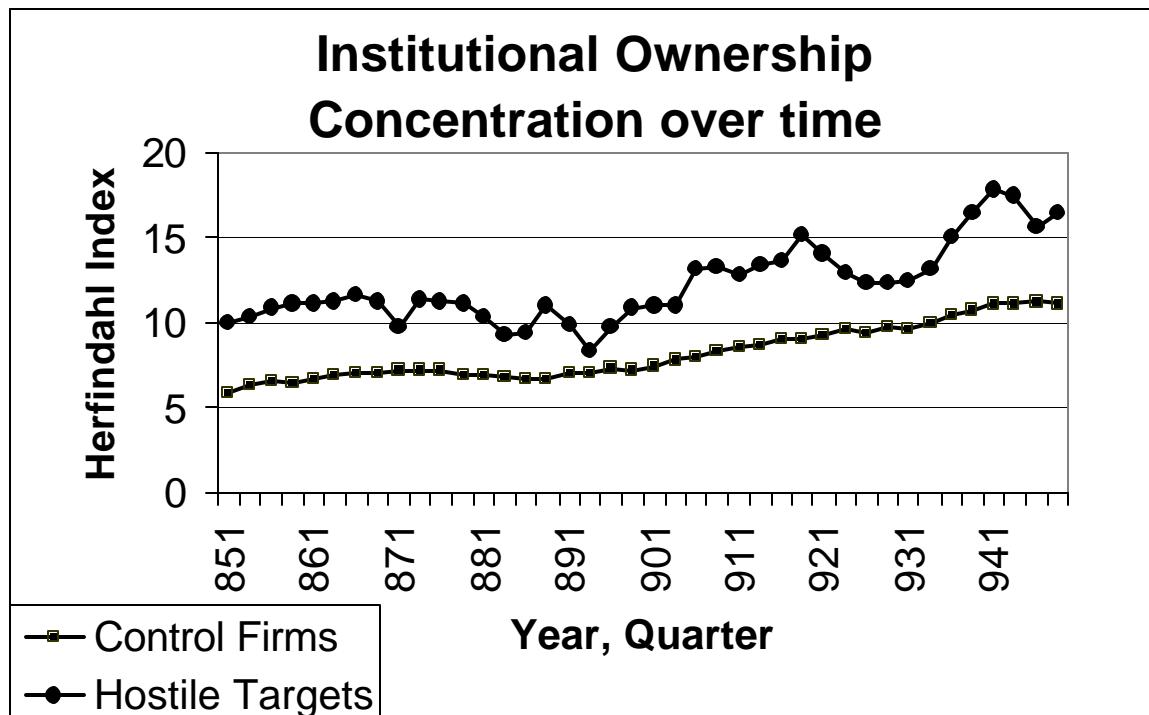
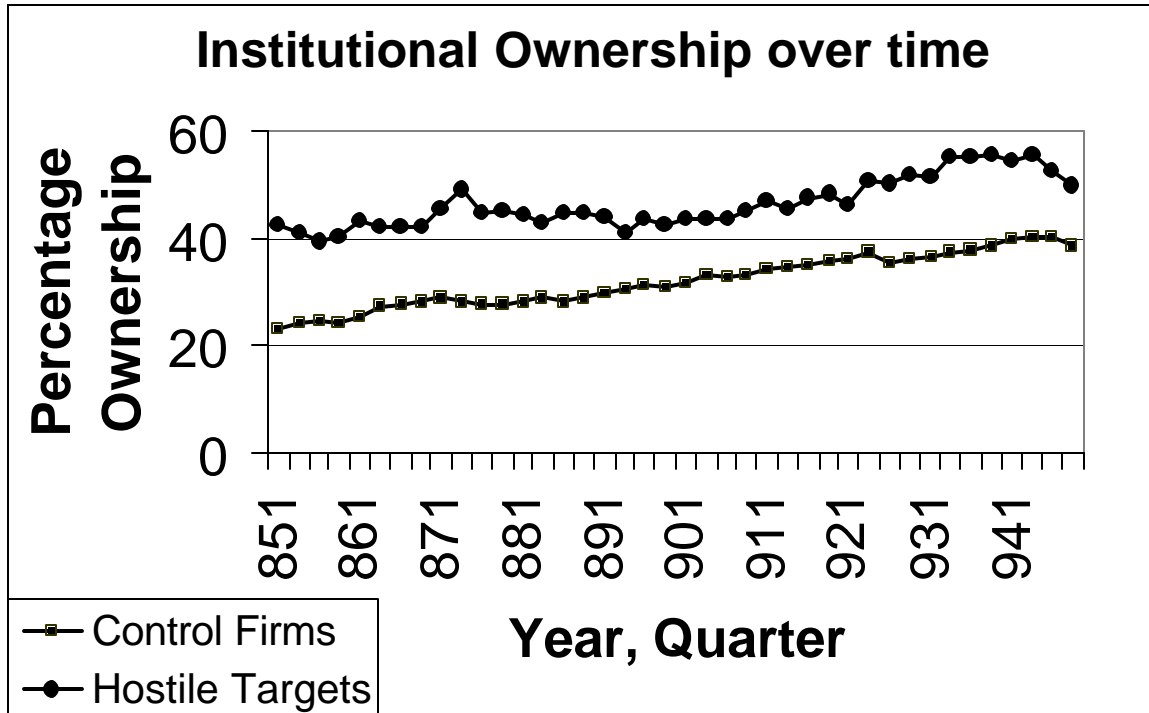


Figure 2:
Changes in Institutional Ownership Percentage Around Hostile Takeover Attempts

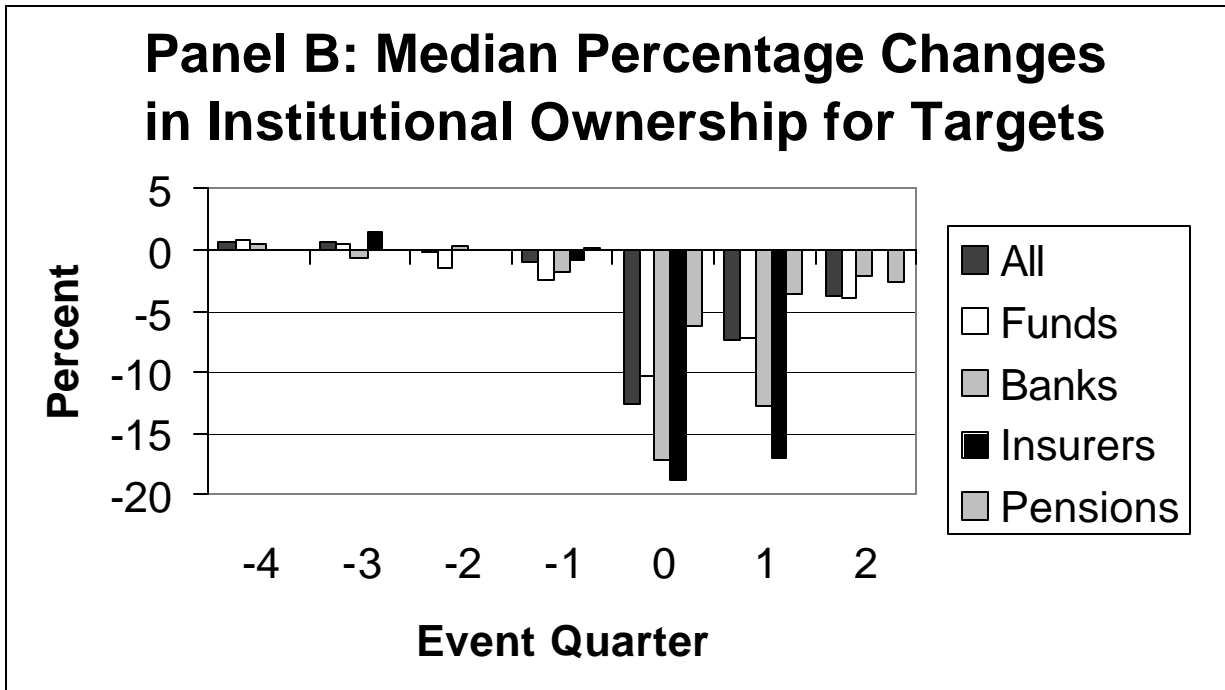
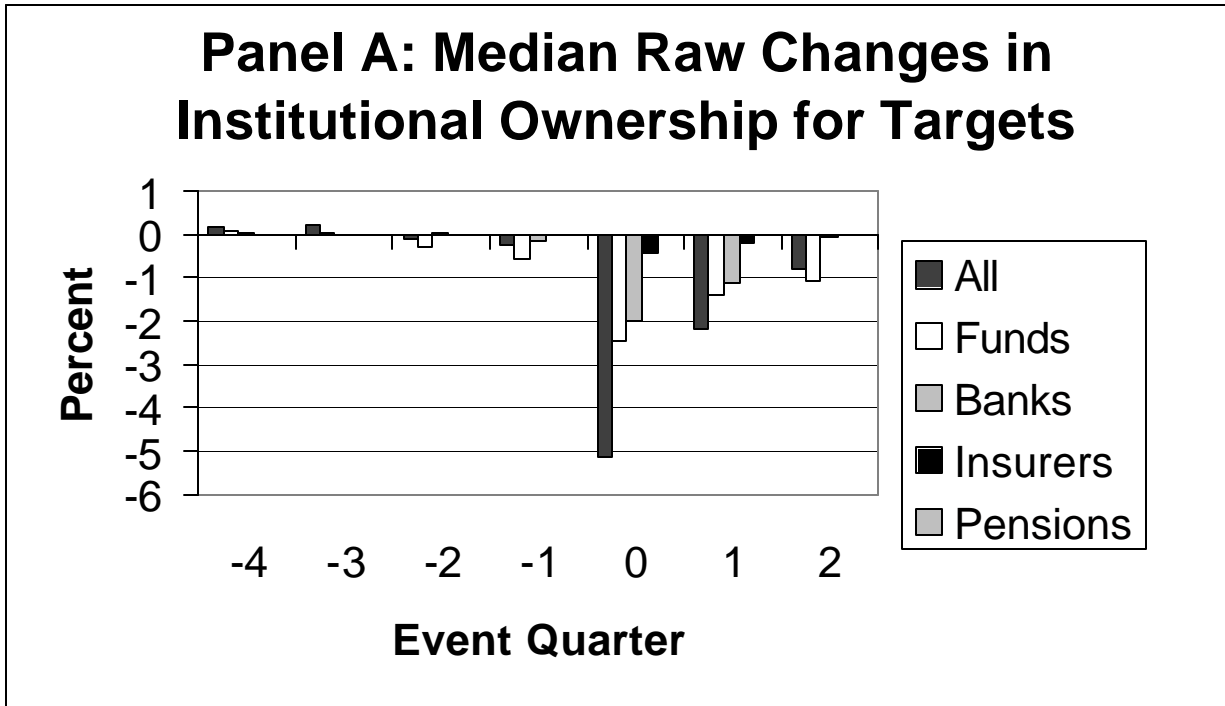


Table 1
Summary Statistics of Quarterly Data

Institutional ownership is the aggregate percentage of shares owned by institutions. Fund ownership is the aggregate percentage of shares owned by mutual funds and investment advisers. Bank (Insurance) [Pension] ownership is the aggregate percentage ownership by banks (insurance companies) [pension funds and university endowments]. Herfindahl index is a measure of institutional ownership concentration calculated as the sum of squared percentage ownership of each institution. Percentage Funds is defined as fund ownership divided by institutional ownership. Cash is defined as cash plus marketable securities. Size is stockholder equity deflated into 1994 dollars using the CPI. Book to market is defined as book assets / (book assets - book equity + market equity). Leverage is (long term debt + short term debt) / equity. ROE is return on equity and measured as (net income / stockholders equity). Sales growth is measured on a year to year basis as $(sales_t - sales_{t-4}) / (sales_{t-4})$. Prior Returns is the compounded raw returns for the previous 12 months. Trading Liquidity is the average daily volume divided by shares outstanding for the period 2 quarters prior. Differences of means are tested using a t-test while differences in medians are tested with a Wilcoxon Z-test. The number of firm quarters is shown in brackets.

Table 1
Summary Statistics

Variable	Hostile Targets			Control Sample			t-stat. (p-value)	z-stat (p-value)
	Mean	Median	Std. Dev	Mean	Median	Std. Dev		
Panel A: Ownership Variables								
Institutional Ownership	0.4391 [2,390]	0.4493	0.1939	0.3369 [55,461]	0.3211	0.2293	-21.46 (0.0000)	-22.02 (0.0000)
Bank Ownership	0.1003 [2,390]	0.0905	0.0666	0.0804 [55,466]	0.0541	0.0808	-11.87 (0.0000)	-19.65 (0.0000)
Insurance Ownership	0.0354 [2,390]	0.0292	0.0357	0.0278 [55,468]	0.0155	0.0404	-9.07 (0.0000)	-17.60 (0.0000)
Pension Ownership	0.0417 [2,390]	0.0304	0.0478	0.0292 [55,468]	0.0113	0.0458	-13.15 (0.0000)	-18.39 (0.0000)
Fund Ownership	0.2618 [2,390]	0.2617	0.1293	0.1997 [55,467]	0.1784	0.1479	-20.19 (0.0000)	-23.11 (0.0000)
Percentage Funds	0.6070 [2,390]	0.5951	0.1604	0.6087 [55,406]	0.6253	0.2237	0.37 (0.7131)	3.78 (0.0002)
Herfindahl Index	0.1723 [2,390]	0.1161	0.1929	0.1528 [55,412]	0.0805	0.3713	-2.55 (0.0108)	-17.88 (0.0000)
Panel B: Control Variables								
Size	771.1 [2,550]	301.7	1167.7	827.1 [62,888]	119.0	2743.6	1.03 (0.3045)	-21.62 (0.0000)
Book / Market	0.8396 [2,543]	0.8352	0.2255	0.7878 [61,743]	0.8005	0.2880	-8.95 (0.0000)	-8.88 (0.0000)
ROE	0.0117 [2,547]	0.0218	0.1656	-0.0021 [62,835]	0.0251	0.2025	-3.40 (0.0007)	2.43 (0.0153)
Sales Growth	0.0848 [2,546]	0.0500	0.4966	0.1674 [62,313]	0.0703	0.7149	5.78 (0.0000)	8.02 (0.0000)
Cash / Assets	0.0739 [2,550]	0.0367	0.0960	0.0997 [62,912]	0.0472	0.1333	9.67 (0.0000)	6.14 (0.0000)
Prior Returns	0.1747 [2,550]	0.1382	0.4345	0.1457 [62,912]	0.0801	0.4890	-2.95 (0.0032)	-6.21 (0.0000)
Leverage	1.1682 [2,378]	0.6799	1.9927	1.2266 [54,874]	0.6262	2.3857	1.18 (0.2395)	-4.26 (0.0000)
Trading Liquidity	0.0783 [2,518]	0.0589	0.0713	0.0541 [62,679]	0.0385	0.0629	-18.82 (0.0000)	-25.38 (0.0000)

Table 2

Correlation Matrix

Institutional ownership is the aggregate percentage of shares owned by institutions. Fund ownership is the aggregate percentage of shares owned by mutual funds and investment advisers. Bank (Insurance) [Pension] ownership is the aggregate percentage ownership by banks (insurance companies) [pension funds and university endowments]. Herfindahl index is a measure of institutional ownership concentration calculated as the sum of squared percentage ownership of each institution. Percentage Funds is defined as fund ownership divided by institutional ownership. Cash is defined as cash plus marketable securities. Size is stockholder equity deflated into 1994 dollars using the CPI. Book to market is defined as book assets / (book assets - book equity + market equity). Leverage is (long term debt + short term debt) / equity. ROE is return on equity and measured as (net income / stockholders equity). Sales growth is measured on a year to year basis as $(sales_t - sales_{t-4}) / (sales_{t-4})$. Prior Returns is the compounded raw returns for the previous 12 months. Trade Liquidity is the average daily volume divided by shares outstanding for the period 2 quarters prior. The numbers in parentheses are p-values testing whether the correlation is zero.

	ROE	Sales Growth	Debt / Equity	Book / Market	Size	Cash / Assets	Prior Returns	Trade Liquidity	Inst Own	Bank Own	Insure Own	Pension Own	Fund Own	Herf Index
Sales growth	0.0383 (0.0000)													
Debt / equity	-0.3082 (0.0000)	0.0092 (0.0280)												
Book / market	-0.0604 (0.0000)	-0.1338 (0.0000)	0.0638 (0.0000)											
Size	0.0437 (0.0000)	-0.0353 (0.0000)	-0.0527 (0.0000)	-0.0247 (0.0000)										
Cash / assets	0.0069 (0.0789)	0.0741 (0.0000)	-0.1076 (0.0000)	-0.2088 (0.0000)	-0.0646 (0.0000)									
Prior returns	0.1491 (0.0000)	0.1578 (0.0000)	-0.0628 (0.0000)	-0.3548 (0.0000)	0.0130 (0.0009)	0.0696 (0.0000)								
Trade Liquidity	0.0055 (0.1635)	0.0974 (0.0000)	-0.0201 (0.0000)	-0.1723 (0.0000)	0.0411 (0.0000)	0.0768 (0.0000)	0.1893 (0.0000)							
Inst own	0.1257 (0.0000)	-0.0513 (0.0000)	-0.1351 (0.0000)	-0.1897 (0.0000)	0.1247 (0.0000)	-0.0944 (0.0000)	0.0807 (0.0000)	0.2023 (0.0000)						
Bank Own	0.1030 (0.0000)	-0.0510 (0.0000)	-0.1234 (0.0000)	-0.1922 (0.0000)	0.2068 (0.0000)	-0.1141 (0.0000)	0.0492 (0.0000)	0.0370 (0.0000)	0.6759 (0.0000)					
Insure Own	0.0577 (0.0000)	-0.0305 (0.0000)	-0.0577 (0.0000)	-0.1027 (0.0000)	0.0526 (0.0000)	-0.0562 (0.0000)	0.0153 (0.0002)	0.0931 (0.0000)	0.5311 (0.0000)	0.2644 (0.0000)				
Pension Own	0.0620 (0.0000)	-0.0448 (0.0000)	-0.0846 (0.0000)	-0.1174 (0.0000)	0.1756 (0.0000)	-0.0131 (0.0016)	-0.0151 (0.0003)	0.0687 (0.0000)	0.5345 (0.0000)	0.3473 (0.0000)	0.2208 (0.0000)			
Fund Own	0.1034 (0.0000)	-0.0291 (0.0000)	-0.0991 (0.0000)	-0.1240 (0.0000)	0.0118 (0.0046)	-0.0650 (0.0000)	0.0988 (0.0000)	0.2475 (0.0000)	0.8724 (0.0000)	0.3235 (0.0000)	0.3387 (0.0000)	0.2697 (0.0000)		
Herf Index	0.0189 (0.0000)	-0.0110 (0.0085)	-0.0068 (0.1262)	0.0276 (0.0000)	-0.0422 (0.0000)	0.0455 (0.0000)	0.0042 (0.3115)	-0.0324 (0.0000)	0.3669 (0.0000)	0.2380 (0.0000)	0.2117 (0.0000)	0.3513 (0.0000)	0.2745 (0.0000)	
Pct Funds	-0.0225 (0.0000)	0.0099 (0.0183)	0.0378 (0.0000)	0.1089 (0.0000)	-0.1737 (0.0000)	0.0291 (0.0000)	0.0428 (0.0000)	0.0708 (0.0000)	-0.1065 (0.0000)	-0.4718 (0.0000)	-0.2620 (0.0000)	-0.3135 (0.0000)	0.2600 (0.0000)	-0.0778 (0.0000)

Table 3
Probability of Being Targeted

The dependent variable is set equal to 1 if a takeover attempt is announced for a firm in a given quarter and set to 0 otherwise. The sample includes all takeover activity from 1985-1994 as reported in Comment and Schwert (1998). The control sample includes all exchange listed firm quarters from 1985-1994. All specifications include annual dummies as well as dummies for three of the four quarters to account for seasonality. ROE is defined as net income divided by equity. Sales growth is the growth rate in sales this quarter based on the sales in the same quarter of the previous year. Size is stockholder equity deflated into 1994 dollars using the CPI. Book to Market is defined as book assets / (book assets - book equity + market equity). Cash is defined as cash plus marketable securities. Debt / Equity is (long term debt + short term debt) / equity. Prior Returns is the compounded raw returns for the previous 12 months. Trade Liquidity is the average daily volume divided by shares outstanding for the period 2 quarters prior. Institutional ownership is the aggregate percentage of shares owned by institutions. Fund ownership is the aggregate percentage of shares owned by mutual funds and investment advisers. Bank (Insurance) [Pension] ownership is the aggregate percentage ownership by banks (insurance companies) [pension funds and university endowments]. Herfindahl index is a measure of institutional ownership concentration calculated as the sum of squared percentage ownership of each institution. Percentage Funds is defined as fund ownership divided by institutional ownership. Targets gives the number of hostile acquisition attempts in the sample. The numbers in parentheses are z-statistics which are obtained using robust standard errors.

Table 3
Probability of Being Targeted

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ROE	-0.0026 (-0.47)	-0.0019 (-0.33)	-0.0023 (-0.42)	0.0009 (0.15)	-0.0032 (-0.58)	-0.0032 (-0.58)	-0.0027 (-0.48)	-0.0032 (-0.58)
Sales growth	-0.0045 (-1.36)	-0.0051 (-1.51)	-0.0049 (-1.43)	-0.0045 (-1.64)	-0.0047 (-1.35)	-0.0050 (-1.40)	-0.0047 (-1.39)	-0.0048 (-1.38)
Debt / equity	-0.0010 (-1.20)	-0.0011 (-1.26)	-0.0010 (-1.21)	-0.0015 (-1.57)	-0.0008 (-1.03)	-0.0009 (-1.06)	-0.0010 (-1.20)	-0.0008 (-1.04)
Book / market	1.6938 (4.66)	1.3510 (3.77)	1.5598 (4.16)	0.9918 (3.21)	1.9553 (5.16)	1.7856 (4.45)	1.6016 (4.29)	1.8644 (4.75)
Size	-0.0001 (-2.22)	-0.0000 (-1.28)	-0.0001 (-1.77)	-0.0000 (-1.36)	-0.0002 (-2.49)	-0.0001 (-2.01)	-0.0001 (-1.96)	-0.0002 (-2.30)
Cash / assets	-0.0266 (-2.50)	-0.0301 (-2.82)	-0.0275 (-2.51)	-0.0312 (-2.97)	-0.0238 (-2.07)	-0.0257 (-2.26)	-0.0273 (-2.57)	-0.0248 (-2.18)
Prior returns	0.0056 (2.32)	0.0049 (2.08)	0.0052 (2.15)	0.0049 (2.45)	0.0057 (2.32)	0.0051 (2.04)	0.0054 (2.23)	0.0055 (2.23)
Trade Liquidity	0.0172 (5.35)	0.0165 (5.12)	0.0163 (5.11)	0.0186 (4.53)	0.0158 (5.07)	0.0150 (4.75)	0.0169 (5.30)	0.0156 (4.98)
Institutional Ownership	0.0325 (8.70)				0.0414 (8.12)		0.0332 (8.69)	0.0415 (8.09)
Fund Ownership		0.0455 (10.07)	0.0420 (8.41)			0.0509 (6.93)		
Bank Ownership			0.0175 (2.09)			0.0290 (2.22)		
Insurance Ownership			0.0331 (2.02)			0.0374 (1.65)		
Pension Ownership			0.0103 (0.61)			0.0107 (0.39)		
Herfindahl Index				0.0015 (1.98)	-0.0151 (-2.42)	-0.0146 (-2.11)		-0.0144 (-2.24)
Percentage Funds							0.0077 (2.09)	0.0062 (1.46)
N	49,372	49,378	49,377	49,340	49,334	49,339	49,334	49,334
Targets	125	125	125	125	125	125	125	125
Pseudo R ²	11.75%	11.69%	12.01%	8.77%	12.25%	12.44%	11.88%	12.32%

Table 4

Probability of Success

The dependent variable is set equal to 1 if an announced takeover target is successfully acquired by the hostile bidder and set to 0 otherwise. The sample includes all takeover activity from 1985-1994 as reported in Comment and Schwert (1998). Pill equals one if the target had a pill in place and zero otherwise. Cash offer equals one if the bid was for all cash, and zero otherwise. Auction equals one if there were multiple bidders for the firm, and zero otherwise. Toehold equals the percentage of shares that the bidder owns in the target as of the date the bid is announced. Premium is the highest premium offered for the target by the hostile bidder measured relative to the target's stock price 20 trading days before the announcement of the bid. Institutional ownership is the aggregate percentage of shares owned by institutions. Fund ownership is the aggregate percentage of shares owned by mutual funds and investment advisers. Bank (Insurance) [Pension] ownership is the aggregate percentage ownership by banks (insurance companies) [pension funds and university endowments]. Herfindahl index is a measure of institutional ownership concentration calculated as the sum of squared percentage ownership of each institution. Percentage Funds is defined as fund ownership divided by institutional ownership. The numbers in parentheses are z-statistics which are obtained using robust standard errors. Completed in the last row gives the number of takeovers completed in the regression. In Panel B, the Change variables represent the change in ownership level (or concentration for Herfindahl Change) from the quarter that the takeover is announced to the following quarter. If institutions are selling, the Change variable is negative.

Panel A:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Pill	0.3302 (0.64)	0.4906 (0.98)	0.4798 (0.91)	0.7097 (1.44)	0.3689 (0.71)	0.4812 (0.91)	0.3155 (0.61)	0.3570 (0.69)
Cash Offer	0.9678 (1.85)	0.8963 (1.73)	0.9125 (1.78)	0.8834 (1.69)	0.9744 (1.87)	0.9157 (1.80)	0.9682 (1.86)	0.9755 (1.88)
Auction	-2.5558 (-5.28)	-2.5123 (-5.23)	-2.6362 (-5.11)	-2.6167 (-5.28)	-2.6043 (-5.19)	-2.6434 (-5.10)	-2.5786 (-5.25)	-2.6295 (-5.18)
Toehold	-0.1029 (-1.78)	-0.1128 (-2.03)	-0.1098 (-1.85)	-0.1272 (-2.33)	-0.1092 (-1.79)	-0.1105 (-1.81)	-0.0997 (-1.73)	-0.1062 (-1.74)
Premium	0.0002 (2.00)	0.0001 (1.80)	0.0002 (2.03)	0.0002 (1.85)	0.0002 (2.01)	0.0002 (2.03)	0.0002 (2.01)	0.0002 (2.02)
Institutional ownership	0.0332 (2.13)				0.0298 (1.76)		0.0321 (2.11)	0.0286 (1.74)
Fund Own		0.0356 (1.82)	0.0259 (1.34)			0.0252 (1.23)		
Bank Own			0.0434 (0.98)			0.0435 (1.00)		
Insurance Own			0.0950 (1.61)			0.0918 (1.34)		
Pension Own			-0.0151 (-0.22)			-0.0140 (-0.20)		
Percent Funds							-0.0101 (-0.58)	-0.0103 (-0.61)
Herfindahl Index				0.0247 (1.95)	0.0104 (0.69)	0.0017 (0.10)		0.0105 (0.71)
N	132	132	132	132	132	132	132	132
Pseudo R ²	32.90%	31.51%	33.64%	31.06%	33.06%	33.65%	33.08%	33.24%
Successful	50	50	50	50	50	50	50	50

Panel B:	(1)	(2)	(3)	(4)	(5)	(6)
Pill	0.9862 (1.60)	0.9593 (1.60)	1.0187 (1.63)	0.9154 (1.62)	0.9488 (1.52)	0.9329 (1.49)
Cash Offer	0.8349 (1.38)	0.8665 (1.45)	0.7410 (1.26)	0.7781 (1.33)	0.8900 (1.46)	0.8049 (1.37)
Auction	-2.3672 (-4.50)	-2.1949 (-4.16)	-2.2769 (-4.16)	-2.2719 (-4.32)	-2.3897 (-4.45)	-2.2474 (-4.10)
Toehold	-0.1420 (-1.75)	-0.1559 (-1.95)	-0.1387 (-1.62)	-0.1255 (-1.91)	-0.1417 (-1.73)	-0.1400 (-1.59)
Premium	0.0001 (1.49)	0.0001 (1.28)	0.0001 (1.40)	0.0001 (1.63)	0.0001 (1.53)	0.0001 (1.44)
Institutional ownership	0.0062 (0.32)				0.0072 (0.35)	
Institutional Change	-0.0865 (-3.51)				-0.0735 (-2.23)	
Fund Own		0.0113 (0.44)	0.0033 (0.12)			0.0100 (0.34)
Fund Change		-0.1040 (-2.73)	-0.0855 (-2.17)			-0.0648 (-1.52)
Bank Own			0.0044 (0.06)			0.0069 (0.09)
Bank Change			-0.0543 (-0.48)			-0.0139 (-0.11)
Insurance Own			-0.0015 (-0.02)			-0.0138 (-0.12)
Insurance Change			-0.1971 (-0.92)			-0.1940 (-0.86)
Pension Own			0.0146 (0.20)			0.0202 (0.27)
Pension Change			-0.0892 (-0.56)			-0.0813 (-0.48)
Herfindahl Index				-0.0075 (-0.37)	-0.0001 (-0.00)	-0.0089 (-0.30)
Herfindahl Change				-0.0848 (-2.29)	-0.0217 (-0.60)	-0.0420 (-1.03)
N	110	110	110	110	110	110
Pseudo R ²	36.07%	33.61%	36.68%	31.86%	36.29%	37.08%
Successful	37	37	37	37	37	37

Table 5
Probability of Being Targeted - Differences

The dependent variable is set equal to 1 if a takeover attempt is announced for a firm in a given quarter and set to 0 otherwise. The sample includes all takeover activity from 1985-1994 as reported in Comment and Schwert (1998). The control sample includes all exchange listed firm quarters from 1985-1994. All specifications include annual dummies as well as dummies for three of the four quarters to account for seasonality. ROE is defined as net income divided by equity. Sales growth is the growth rate in sales this quarter based on the sales in the same quarter of the previous year. Size is stockholder equity deflated into 1994 dollars using the CPI. Book to Market is defined as book assets / (book assets - book equity + market equity). Cash is defined as cash plus marketable securities. Debt / Equity is (long term debt + short term debt) / equity. Prior Returns is the compounded raw returns for the previous 12 months. Trade Liquidity is the average daily volume divided by shares outstanding for the period 2 quarters prior. Institutional ownership is the aggregate percentage of shares owned by institutions. Fund ownership is the aggregate percentage of shares owned by mutual funds and investment advisers. Bank (Insurance) [Pension] ownership is the aggregate percentage ownership by banks (insurance companies) [pension funds and university endowments]. Herfindahl index is a measure of institutional ownership concentration calculated as the sum of squared percentage ownership of each institution. Percentage Funds is defined as fund ownership divided by institutional ownership. Lagged variables are measured as of quarter t-2, where t is the quarter where the takeover is announced. Difference variables are the quarterly change in the variables from quarter t-2 to t-1. The numbers in parentheses are z-statistics which are obtained using robust standard errors.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ROE	0.0026 (0.39)	0.0052 (0.79)	0.0033 (0.48)	0.0063 (1.00)	0.0031 (0.47)	0.0029 (0.44)	0.0032 (0.48)	0.0033 (0.51)
Sales growth	-0.0068 (-2.25)	-0.0076 (-2.52)	-0.0074 (-2.38)	-0.0064 (-2.58)	-0.0071 (-2.28)	-0.0074 (-2.35)	-0.0071 (-2.30)	-0.0073 (-2.31)
Debt / equity	-0.0010 (-1.13)	-0.0010 (-1.13)	-0.0009 (-1.10)	-0.0015 (-1.45)	-0.0008 (-0.98)	-0.0008 (-0.97)	-0.0010 (-1.12)	-0.0008 (-0.99)
Book / market	1.6765 (4.38)	1.3242 (3.50)	1.5376 (3.88)	0.9535 (2.93)	1.9538 (5.00)	1.7681 (4.24)	1.5850 (4.03)	1.8613 (4.58)
Size	-0.0001 (-2.17)	-0.0000 (-1.28)	-0.0001 (-1.74)	-0.0000 (-1.38)	-0.0002 (-2.46)	-0.0002 (-1.98)	-0.0001 (-1.95)	-0.0002 (-2.29)
Cash / assets	-0.0288 (-2.57)	-0.0326 (-2.89)	-0.0297 (-2.56)	-0.0332 (-3.01)	-0.0264 (-2.15)	-0.0283 (-2.32)	-0.0295 (-2.63)	-0.0273 (-2.25)
Prior returns	0.0059 (2.43)	0.0052 (2.17)	0.0055 (2.22)	0.0048 (2.32)	0.0061 (2.44)	0.0054 (2.09)	0.0057 (2.35)	0.0059 (2.36)
Trade Liquidity	0.0198 (4.06)	0.0172 (3.70)	0.0182 (3.98)	0.0223 (2.17)	0.0171 (3.87)	0.0156 (3.36)	0.0181 (3.77)	0.0159 (3.55)
Lag Institutional ownership	0.0349 (8.74)				0.0440 (8.26)		0.0358 (8.69)	0.0443 (8.24)
Difference Institution Own	-0.0236 (-2.77)				-0.0351 (-3.18)		-0.0235 (-2.78)	-0.0337 (-3.11)
Lag Fund Own		0.0478 (9.88)	0.0440 (8.18)			0.0533 (7.04)		
Difference Fund Own		-0.0217 (-1.88)	-0.0242 (-2.02)			-0.0351 (-2.26)		
Lag Bank Own			0.0217 (2.47)			0.0355 (2.62)		
Difference Bank Own			-0.0158 (-0.88)			-0.0270 (-0.99)		
Lag Insurance Own			0.0385 (2.20)			0.0435 (1.88)		
Difference Insurance Own			-0.0447 (-0.85)			-0.0525 (-0.72)		
Lag Pension Own			0.0057 (0.29)			0.0008 (0.03)		
Difference Pension Own			0.0167 (0.52)			0.0110 (0.22)		
Lag Percent Funds							0.0077 (1.96)	0.0061 (1.33)
Difference Percent Funds							-0.0062 (-0.70)	-0.0045 (-0.47)
Lag Herfindahl Index				0.0018 (2.22)	-0.0155 (-2.56)	-0.0155 (-2.33)		-0.0148 (-2.39)
Difference Herfindahl				-0.0027 (-1.49)	0.0028 (0.60)	0.0011 (0.21)		0.0022 (0.43)
N	47,093	47,102	47,101	47,061	47,051	47,059	47,051	47,051
Targets	118	118	118	118	118	118	118	118
Pseudo R ²	13.26%	13.03%	13.61%	9.47%	13.86%	14.16%	13.41%	13.94%