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Abstract

This paper documents that stock liquidity improves shareholders' incentive to monitor management. Using a hand-collected sample of contested proxy solicitations and shareholder proposals as occurrences of shareholder activism, we find that poor firm performance increases the probability of shareholder activism and that this relationship is much stronger for firms with liquid stock than for other firms. The conclusion that liquidity improves monitoring is robust to different measures of firm performance and liquidity. We also document that target shareholders earn positive abnormal returns on the announcement date of activism and conclude that shareholder activism creates shareholder value.

Keywords: Liquidity. Shareholder activism. Proxy solicitation.

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1 Introduction

Shareholder activism has become an increasingly important vehicle for monitoring management and improving corporate governance. In this paper we examine empirically how stock liquidity influences shareholders' incentives to assume an active governance role. Our study is motivated by a theoretical literature suggesting that the liquidity of firms' stocks may impact shareholders' incentives to monitor and intervene in poorly performing firms. The literature disagrees, however, as to whether liquidity discourages or encourages shareholder activism.

On the one hand, Coffee (1991) and Bhide (1993) suggest that liquidity *discourages* shareholder activism. When a firm's stock is liquid, selling the stock (*exit*) as opposed monitoring and initiating action (*voice*), is the least costly response for shareholders in a situation where management performance does not meet expectations.[1] In addition, blockholders' incentives to monitor may be thwarted by free-riding minority shareholders who avoid the costs of monitoring but reap a proportion of the improvement in the firm's equity value. On the other hand, Maug (1998) points out that liquidity may mitigate the free-rider problem. A blockholder can profit on a planned intervention in corporate decision making by purchasing additional shares at a price that does not fully reflect the value enhancement of the intervention. The profits earned from trading prior to intervention compensate the activist for the monitoring costs associated with activism. Because liquidity increases the profits from informed trading, liquidity *encourages* activism.

Despite an extensive theoretical interest in how liquidity affect corporate governance, little empirical work has been done to assess the nature of this relationship.[2] We contribute by providing such an empirical analysis. Our data includes 507 hand-collected shareholder activist events, defined as filings to the Securities and Exchange Commission (SEC) of contested proxy solicitations and shareholder proposals, for the 14-year sample period 1994–2007.[3] Our main finding is consistent with the proposition that liquidity improves shareholders' incentive to take an active role in the governance of corporations.

[1] Hirschman (1970) coined the phrases exit and voice for shareholders' alternative reactions to worsening company performance.

[2] Other theoretical papers include Holmstrom and Tirole (1993), Noe (2002), Attari, Banerjee, and Noe (2006), Edmans (2008), Admati and Pfleiderer (2008), and Edmans and Manso (2008).

[3] Shareholder proposals are added to the company's proxy material under SEC Rule 14a-8. Matters concerning the election of directors to the board and matters in direct conflict with one of the company's own proposals may not be addressed by shareholder proposals. Instead, contested solicitations are submitted by shareholders on separate proxy cards.

We provide two results consistent with this positive effect of stock liquidity. First, we show that shareholders are more likely to take action in response to deteriorating firm performance when a firm's stock is liquid. Firms in the lowest performance decile and with liquidity above the median have a predicted probability of about 1.5% of experiencing shareholder activism. The corresponding probability for firms in the same performance decile but with below median liquidity is approximately 1%. Thus, for the worst performers, being among the most liquid firms implies a probability of being subjected to shareholder activism that is 50 percent higher than the probability of firms with low liquidity. The result that liquidity increases the likelihood of intervention is robust to alternative measures of stock liquidity, to alternative ways of selecting non-event firms, and to the inclusion of control variables such as aggregate market liquidity, institutional shareholdings, book-to-market ratio, and firm size.

Second, in the sample of firms that experience activism, we document positive abnormal returns of 3 percent during the two-day period ending on the date of a public announcement of shareholder activism.[4] The positive abnormal return indicates that activist shareholders create value. It also suggests that profits may be earned on informed trading prior to the public announcement of activism. We document that the abnormal announcement period return is lower for liquid firms than for illiquid firms. This is consistent with the mechanism proposed by Maug (1998). Because liquidity increases returns from informed trading, in equilibrium, blockholders intervene more frequently in liquid firms. In other words, the probability of observing value enhancing activism is higher in liquid firms than in illiquid firms. It follows that liquid stocks trade closer to their post-intervention value, resulting in a correspondingly lower announcement return.

Our paper is related to a large and growing, mostly theoretical, literature on the effect of liquidity on corporate governance. Bhide (1993) argues that U.S. regulators have promoted stock market liquidity at the expense of good corporate governance. Disclosure requirements, insider trading rules, and rules to eliminate price manipulation, have protected small investors but increased the cost of active shareholding. In a similar vein, Coffee (1991) argues that institutional investors rationally prefer liquidity over control. Socially optimal intervention by shareholders is therefore deterred by liquidity. In the model of Maug (1998), the trade-off between liquidity and

[4]As discussed in Section 3 we compute separate announcement returns for activism events related to tender offers or acquisitions attempts. The 3 percent abnormal announcement return refers to non-acquisitions events. Acquisition-related activism is associated with abnormal returns of 14 percent in our sample.

control only exists when investors are assumed to hold large equity stakes. In equilibrium, it is optimal for investors to hold smaller blocks. This allows an activist to cover monitoring costs by profits made through informed trading prior to intervention. A similar mechanism of speculative trading and intervention is presented in Kahn and Winton (1998) who focus on the effect of firm characteristics, rather than liquidity, on institutional investors incentives' to intervene. In Holmstrom and Tirole (1993) liquidity facilitates governance by enhancing the effectiveness of stock market-based managerial incentive contracts.[5] Recent papers by Edmans (2008) and Admati and Pfleiderer (2008) suggest that large shareholders' option to exit may discipline management. In Edmans (2008), the threat of exit allows managers to focus on the selection of projects with lower short-run, but higher long-run, cash flows. In Admati and Pfleiderer (2008), the threat of exit solves management-shareholder agency problems by inducing management to select the projects that maximize shareholder value. Liquidity plays a role because the threat of exit is only credible if shareholders can sell shares without incurring large costs in the process.

Our paper is also related to a large empirical literature that have investigated the effectiveness of shareholder activism. Early papers, surveyed extensively in Gillan and Starks (1998) and Karpoff (2001), provide little evidence of a link between activism by institutional investors and subsequent firm performance. More recent papers on shareholder activism paint a different picture. Studying activist engagements by the Hermes U.K. Focus Fund, Becht, Franks, Mayer, and Rossi (2008) find that target firms experience large positive abnormal returns upon announcement that objectives for the fund's engagement in activism have been met. Several other papers that study activist hedge funds, find that activists are able to influence target firms in ways the market perceives as value enhancing.[6] The abnormal return on target stocks around the announcement of activism is large and positive and there is evidence of improved post-activism operating efficiency. Moreover, hedge funds seem to target businesses that are fundamentally sound but have stronger takeover-defenses and higher executive salaries than comparable firms. Brav, Jiang, Partnoy, and Thomas (2008) and Klein and Zur (2009) interpret their evidence as consistent with the view that hedge fund activism creates value because it reduces agency costs. Greenwood and Schor (2009) point out

[5]The models of Noe (2002) and Attari, Banerjee, and Noe (2006) also imply that the incentive to intervene is increasing in liquidity.

[6]Brav, Jiang, Partnoy, and Thomas (2008), Klein and Zur (2009), Clifford (2008), and Greenwood and Schor (2009).

that target firms acquired in the post-intervention period experience higher abnormal returns than firms that do not become acquisition targets. They suggest that hedge funds are primarily good at identifying and "dressing up" firms as acquisition targets and do not necessarily add value through the reduction of agency costs. Compared to these papers, we provide evidence on the role of stock liquidity as a catalyst for shareholder activism in underperforming firms.

The rest of the paper is organized as follows. Section 2 describes our data, explains the sample selection procedure, and provides descriptive statistics on proxy solicitations. In Section 3 we present the main empirical results and discuss our findings. Section 4 concludes the paper.

2 Data and sample selection

We use a sample of firms listed on the New York Stock Exchange (NYSE), the American Stock Exchange (AMEX), and Nasdaq. Data on shareholder activism is collected from the Electronic Data Gathering, Analysis, and Retrieval system (EDGAR) of the U.S. Securities and Exchange Commission. Stock returns, prices, and data on volume traded are from the Center for Research in Security Prices (CRSP). Accounting variables are from Compustat. We use Thomson Financial Ownership data (CDA/Spectrum s34) to collect information on institutional investors' ownership. The following section describes our data selection procedure and explain how we define and measure shareholder activism and stock liquidity.

2.1 Shareholder activism

At shareholder meetings, registered shareholders vote using proxy cards. Issues to be voted on are decided by the management and the board of directors and are included in a company's proxy material mailed to shareholders. Rule 14a-8 of the Securities Exchange Act of 1934 provides shareholders with the right to include proposals in the company's proxy material, permitting the issues to be voted upon. A shareholder proposal is a therefore a recommendation of a shareholder that the company takes a certain action. The intention of the shareholder proposal rule is to provide, especially smaller, shareholders with an inexpensive way of expressing their views to management and other shareholders. The company's management may, however, exclude some shareholder proposals from the firms' proxy material. For example, shareholder proposals that aim at nominating

shareholder candidates to the board of directors may not be included.[7] Shareholder proposals are almost always only advisory to the board according to state laws.

In contrast to shareholder proposals, contested proxy solicitations are campaigns where the management of the company and dissident shareholders file different proxy cards with the SEC. Since the Securities Exchange Act requires the exclusion of shareholder proposals related to the election of directors from the company's proxy material, shareholders have to initiate a proxy contest when they want to nominate their own candidates to the board. Other contested issues may include proposals to sell the company, approve or vote against a merger, increase the size of the board, or replace management.

In the context of this paper, a firm is said to experience "shareholder activism" in year t if a shareholder files a shareholder proposal or a contested proxy solicitation during that year. As of May 6, 1996 all public domestic companies in the U.S. are required to file material corporate information on EDGAR. To identify firms that experience shareholder activism, we use EDGAR to retrieve forms filed in connection with shareholder proposals and contested solicitations. In particular, we define as an activist a shareholder that file one or more of the following SEC forms: PREC14A, PREN14A, PRRN14A, DEFC14A, DEFN14A, DFRN14A, DFAN14A, and DEFC14C.[8] Our sample selection procedure will include many of the events identified by Brav, Jiang, Partnoy, and Thomas (2008), Klein and Zur (2009), and Greenwood and Schor (2009) who collect 13D filings. Since 13D filings are made when the filer's stock holdings exceeds the 5% ownership threshold, a sample based on 13D filings will tend to be biased towards smaller firms. There is no ownership requirement for filing the forms we use to identify activist shareholders—and we show below that the average market cap for our targets is similar to the average market cap for non-targets, that is, our sample of activist events is not biased towards smaller firms.

Some investors filed voluntarily on EDGAR between the third quarter of 1993 and May 1996 and are included in our sample to the extent that these voluntary filings represent contested proxy material. Our sample ends in the third quarter of 2007. For this sample period, we identify 8,783

[7]The company's management may also exclude a shareholder proposal from the company's proxy statement if the proposing shareholders fail to meet certain eligibility requirements set by Rule 14a-8. In case of disagreement between the company's management and the filing shareholders, the decision whether a certain proposal should be included in the company's proxy material is made by the SEC.

[8]We exclude solicitations that concern non-contested matters such as friendly merger announcements filed under Rule 14a-12.

unique forms filed by non-management. It is common, however, for a filer to file a sequence of forms concerning the same issue for the same firm, especially in relation to contested solicitations where both management and non-management typically file interchangeably with the SEC a number of times. We adopt the rule that the first date of a filing sequence defines the year in which the firm in question experiences shareholder activism.[9] Following these procedures we are able to collect 998 such shareholder activism firm-year observations. The sample is reduced by 174 observations because we cannot find the event firm on CRSP and by an additional 135 observations because we require the event firm to be listed on NYSE, AMEX or Nasdaq with common equity.[10] In all the analysis that follows, we require information both from CRSP and Compustat. Restricting the sample firms to have information on market capitalization and book-to-market ratio in the year prior to the activism-year, reduces the sample by another 104 observations.A closer inspection of these observations reveals that 78 cases are filings that follow a friendly negotiated merger agreement between the filer and the subject firm. These observations are removed from the sample, leaving us with 507 cases of shareholder activism.

Figure 1 shows the prevalence of shareholder activism over the years of the sample. Each bar in the figure represents the fraction of firms that experience shareholder activism in a given year. The fraction varies from 0.23% to 1.3%. This represents an average of about 36 shareholder activism cases per year. The first two years in the sample show a number of activism cases that are below average. This is most likely driven by the fact that fewer firms filed through EDGAR when filing was not required by the SEC. The occurrence of shareholder activism was relatively stable during the ten year period 1996 through 2005. Assuming that the fourth quarter of 2007 (outside the sample period) displays the same activism intensity as the first three quarters of 2007, activism activity in both 2006 and 2007 is noticeably higher than in the previous years of the sample.

2.2 Measures of liquidity

Liquid assets trade with small transaction costs, minimal time delay in execution, and little or no price impact of the trade. The multi-faceted nature of liquidity implies that there are many possible

[9] If there is a period of more than one year of no filings in a sequence of filings, the first filing after the gap is defined as the first filing in a new intervention. A gap of more than one year in a sequence of filings occurs in 20 cases, which represent about 2 percent of our filing sequences.

[10] In practice we require the firm to appear on the CRSP tapes with sharecodes 10 or 11.

ways of defining a liquidity measure. In most of our analysis we will rely on a measure proposed by Amihud (2002). In robustness test we also apply the bid-ask spread and share-turnover. In what follows, we describe how we construct these liquidity variables.

An important aspect of liquidity is the extent to which one can trade without impacting the price. Amihud (2002) suggests a price impact measure, estimated as the sum of the ratio of absolute daily returns to daily dollar volume:

$$\text{Amihud illiquidity} \equiv \sum_{j+1}^{d_t} \frac{\mid r_{ij} \mid}{\text{dvol}_{ij}} \tag{1}$$

where r_{ij} is the return on stock i on day j, dvol_{ij} is the dollar volume of trading in stock i on day j, and d_t is the number of days during month t for which stock i had non-missing returns. We set the Amihud illiquidity measure to missing for firm i in month t if the number of days the stocks of firm i has traded in month t is below or equal to 14. If the dollar volume traded for stock i is high during a month, but the price has moved only very little, the Amihud measure will be small and stock i is said to be liquid.

A potential disadvantage of the Amihud measure is that it may be difficult to distinguish liquidity from volatility. If volatility does not move closely together with dollar trading volume, stocks with high volatility will tend to be classified as illiquid stocks by the Amihud measure. In robustness tests we therefore use the bid-ask spread and share turnover as alternative measures of liquidity. Bid-ask spread is measured as the proportional quoted spread:

$$100(P_A - P_B)(.5P_A + .5P_B), \tag{2}$$

where P_A is the ask price and P_B is the bid price. Monthly firm-specific bid-ask spreads are computed as the average daily bid-ask spreads for the given month.[11] To measure monthly share turnover, we follow Lo and Wang (2000) and Eckbo and Norli (2005) and use the sum of the daily share turnover values, i.e. the number of shares traded divided by the total number of shares

[11] While the bid-ask spread is a widely used measure of liquidity, it has certain shortcomings. As pointed out by Hasbrouck (1991), a discrete tick size limits the number of values the spread can take. Price discreetness tend to obscure the differences in liquidity in the cross-section of firms. Furthermore, Brennan and Subrahmanyam (1996) argue that the bid-ask spread is a noisy measure of liquidity because large trades tend to occur outside the spread while small trades tend to occur inside.

outstanding.

3 Results and discussions

3.1 Descriptive statistics

To collect data on dissident shareholders' characteristics and on the purpose of shareholder activism, we manually read the associated SEC filings and perform Factiva news searches. Table 1 reports our findings. Panel A reveals that most filings are made by hedge funds, industrial shareholders and shareholder committees, in that order. Only 7.7 percent of the filings (39 cases) are made by institutional investors. This may reflect that institutional investors prefer to exert influence on management through more informal channels.

Panel B of Table 1 shows the distribution of stated purposes for activism. In the bulk of the filings (397 cases), one of the stated purposes concern attempts to amend the board of directors. Corporate governance related issues, change in the business strategy, removal of takeover defenses, and sale of company assets are also commonly stated as the purpose of intervention. The Panel also shows that 118 out of 507 cases of activism are associated with situations in which the firm is a target in an acquisition attempt. This category represents cases where the dissident shareholder (the bidder) has made a formal tender offer, expressed a more informal interest in the subject firm (a "causal pass"), or approached the target firm with a "bear hug."[12] The type of activism that we are concerned with in this paper is different from an acquisition attempt, it therefore seems reasonable to distinguish these cases from other forms of shareholder activism. We make this separation in most of the analysis that follows.

Table 2 presents initial evidence of a relationship between shareholder activism, liquidity, and past stock market performance. Panel A reports the proportion of firms that experience shareholder activism grouped by past performance deciles and past liquidity. Past performance is measured in year $t-1$ relative to the year of shareholder activism (year t) and is defined as the difference between the annual return on the common stock of firm i and the annual return on the value-weighted CRSP NYSE/AMEX/Nasdaq index (the market index.) Liquidity is constructed using average monthly

[12] A "bear hug" involves an expression of interest in the target together with a threat of a formal tender offer if the board of the target firm rejects the bidder. Thus, a "bear hug" is a more aggressive expression of interest than a "causal pass."

Amihud illiquidity, where monthly Amihud illiquidity is computed as in equation (1). The *most* liquid firms have a below median value on the Amihud illiquidity measure while the *least* liquid firms have an above median Amihud measure. Liquidity is measured in year $(t-2)$ relative to the year of the activism event. We measure performance and liquidity in different periods to mitigate a potential in-sample spurious correlation between performance and liquidity.

Focusing first on the differences between performance deciles, Panel A in Table 2 shows that the fraction of firms that experience shareholder activism increases with poorer past performance. Only 0.24% of above-median liquidity firms in the top performance decile experience shareholder activism. The corresponding fraction for liquid firms in the bottom performance decile is more than five times as large (1.21%). For firms with below-median liquidity, shareholder activism is still related to performance, but the pattern is not monotonic and not as strong.

Next, keep performance constant and compare the two liquidity groups within performance deciles. Comparing rows within columns in Panel A, we see that poorly performing liquid firms are more likely to experience shareholder activism than poorly performing illiquid firms. For the bottom five performance deciles, the average probability of activism is *higher* for liquid firms than for illiquid firms. In contrast, for the top five performance deciles the average probability of activism is *lower* for liquid firms than for illiquid firms. This evidence indicates that firms with high stock liquidity are more sensitive to past performance than less liquid firms.

In Panel B of Table 2, past performance is measured as the difference between the two-year holding period return for firm i and the two-year holding period return on the market index. Holding period returns are measured over years $t-2$ through $t-1$ relative to the activism-year. In this Panel, liquidity is measured over year $(t-3)$ relative to the year of the activism. Comparing the numbers in Panel B with the numbers from Panel A we see that the pattern in shareholder activism is qualitatively similar. Thus, the results from Panel A are robust to the horizon at which we measure performance and liquidity.

In sum, Table 2 shows that abnormally bad stock performance increases the likelihood of shareholder activism for the average firm. Moreover, this effect appears to be particularly strong when the firm's stock is liquid. As far as preliminary evidence go, the findings are consistent with the notion that liquidity facilitates monitoring through shareholder activism.

To further investigate the relationship between shareholder activism and liquidity, we need to

control for other variables that are related to activism and at the same time may be correlated with liquidity. For example, more liquid firms tend to have a more diffuse ownership structure with smaller shareholders. It may be that these shareholders have few other means of intervention than proxy solicitations. Conversely, less liquid firms tend to have a more concentrated ownership structure. Large shareholders may influence management through formal and informal channels that do not require SEC filings. In these cases, the correlation between stock liquidity and the frequency of proxy solicitations would be spurious—driven by ownership structure rather than liquidity. In other words, ownership structure as an omitted variable may drive the univariate results in Table 2. Below we study the effect of liquidity on shareholder activism while controlling for confounding effects using probit regressions.

3.2 Probit regressions

Model specification and selection of control variables

If firms that experience shareholder activism and firms that do not are drawn from the same population, standard econometric techniques, such as binary dependent models, can be applied to study the probability of activism. This applies even if the number of firms that are not targeted by an activist is an order of magnitude larger than the number of targeted firms.[13] Nevertheless, as pointed out above, a crucial part of the analysis is to control for firm characteristics and other variables that may affect both liquidity and the propensity of experiencing activism. We do this through a careful selection of control variables and, as a robustness check, by application of propensity scoring.

In our main analysis, we examine the relationship between shareholder activism and liquidity using probit regressions of the following form:

$$\mathrm{ACT}_{it} = \gamma_0 + \gamma_1 \mathrm{PERF}_{it-1} + \gamma_2 \mathrm{PERF}_{it-1} \times \mathrm{D}^{\mathrm{liq}}_{it-2} + \gamma_3 \mathrm{D}^{\mathrm{liq}}_{it-2} + \gamma_4' \, \mathrm{X}_{it-1} + \epsilon_{it}, \tag{3}$$

where the dependent variable, ACT_{it}, equals one if firm i experiences shareholder activism in year t and zero otherwise, PERF_{it-1} denotes past performance measured as the difference between the annual return on the common stock of firm i and the value-weighted return on the CRSP

[13] In a typical year in our sample period, there are about 5,400 firms that satisfy our non-activism related sampling criteria, while the average number of firms that experience shareholder activism is 36.

NYSE/AMEX/Nasdaq index, D_{it}^{liq} is a dummy variable that equals one if the stock of firm i is above the median in terms of liquidity in year t, where the median is computed using all firms in year t that satisfy our non-activism related sampling criteria, and X_{it} is a $(k \times 1)$ vector of control variables.

As for the univariate analysis in Table 2, notice from equation (3) that there are no overlap in the years over which we measure past performance and liquidity. Past performance is measured in year $t-1$ relative to the year of shareholder activism while liquidity is measured in year $t-2$ relative to the year of activism. As stock returns and liquidity may be contemporaneously correlated, measuring liquidity and performance in the same period would make it harder to separate the effect of liquidity from the effect of performance. We also report results for a specification where past performance is measured over years $t-2$ through $t-1$ while liquidity is measured over the years $t-3$ and $t-4$.

Our control variables overlap to a large extent with those used by Brav, Jiang, Partnoy, and Thomas (2008), who estimate the probability of being targeted by a hedge fund. The variable definitions are as follows: "Institutional holdings" is the proportion of equity in firm i owned by shareholders that make 13F filings to the SEC. We follow Chen, Hong, and Stein (2002) and define "Institutional breadth" as the number of institutional investors that have reported ownership in firm i through 13F filings divided by the total number (population) of institutional owners reporting through 13F in a given year. "Log(Market cap)" is the natural logarithm of the end-of-year market capitalization. "Book-to-market ratio" is the end-of-year book value of equity divided by the market value of equity. Book value of equity is computed as in Fama and French (1993). "Log(Sales)" is the natural logarithm of the dollar value of sales. "Cash" is cash and marketable securities divided by total assets. "Dividend yield" is total dividend (common dividend plus preferred dividend) divided by the market value of common equity plus the book value of preferred equity. The book value of preferred equity is the first non-missing value when using redemption value, liquidating value, and the carrying value in that order. "R&D" is research and development expenses divided by total assets. If R&D expenses are missing from Compustat it is assumed to be zero. All variables constructed as ratios and using data from Compustat (book-to-market ratio, Cash, dividend yield, and R&D) are trimmed by removing the lower and upper 0.005 percentile, i.e, we remove 1% of the observations (except R&D which has a minimum value of zero and is trimmed only on the right

tail).

We also include a measure of aggregate market liquidity in the vector of control variables. "Aggregate Amihud illiquidity" is the average Amihud measure for all firms and all months in year t. Our hypothesized effect of liquidity on shareholder activism focuses on the cross-sectional differences in stock liquidity. Including aggregate liquidity addresses the concern that general trends in shareholder activism and liquidity may coincide even though there is no causal relationship between liquidity and activism. Moreover, if aggregate liquidity is positively correlated with the time-variation in firm performance, the estimated coefficients on terms involving PERF will be biased upwards unless we explicitly include aggregate liquidity in the regression.

Table 3 reports results from univariate tests of differences in the means of firm specific control variables for the group of firms that experience activism and the group of firms that do not experience activism. The first row shows that the stock market performance of firms targeted by shareholder activists are significantly worse than the performance of firms that are not targeted. The second row shows that liquidity is higher for targeted firms than for non-targeted firms.[14] For most of the other variables, the last column shows a statistically significant difference in the reported averages for event firms and non-event firms. In other words, the average firm that experiences shareholder activism tend to display different characteristics than the average firm that does not experience activism. Considering the two measures of institutional ownership, it is noticeable that event firms have more institutional owners on average than do non-event firm. Furthermore, firms that experience activism have significantly higher book-to-market ratios, higher sales, and lower R&D expenses.

Shareholder activism and liquidity

Because our sample of shareholder activism events is relatively small, we may increase the power of our tests by pooling sample years. However, to pool the sample we need to make sure that liquidity and other variables are comparable across years. For the liquidity variable, we remove the effect of the dramatic increase in overall market liquidity during our sample period by measuring liquidity as a dummy variable that equals one if the firm's stock has above-median liquidity in year t and zero otherwise. The other variables in the probit regression is either normalized or naturally

[14]Brav, Jiang, Partnoy, and Thomas (2008) also report a similar finding.

defined so that variables are comparable across years.

Table 4 reports the results from probit regressions of the event of shareholder activism on past performance, liquidity, and control variables. Columns (1) and (2) examine the relationship between the occurrence of activism and past performance excluding firm specific liquidity. In column (1), past performance is measured in year $t-1$ while, in column (2), it is measured over years $t-2$ and $t-1$. Both models show that poor past performance (i.e., negative Performance) increases the probability of activism, substantiating our earlier findings. The regressions also show that increased aggregate liquidity (i.e., lower average Amihud illiquidity) increases the probability of observing shareholder activism. Higher institutional ownership and more institutional owners tend to increase the probability of shareholder activism. A higher book-to-market ratio is also positively related to activism. This may reflect that the book-to-market ratio captures another dimension of performance compared to past performance. Dividend yield and R&D expenses do not have any significant effects on the probability of activism.

In Maug (1998), liquidity matters because intervention creates value in target firms. Using past performance as a proxy for potential value creation, we capture this idea by interacting past performance and our liquidity dummy, $\text{PERF} \times \text{D}^{\text{liq}}$. Given that past performance will be negative for firms with the worst performance, we expect the sign of the interaction effect to be negative. If the interaction effect is estimated using a linear regression, the coefficient γ_2 will pick up the marginal effect of the interacted variables on the probability of activism. In probit regressions, the correct marginal effect is in general not given by the coefficient estimate. For interaction terms, Ai and Norton (2003) show that even the sign of the true marginal effect can be different than the sign of the estimated regression coefficient. Let $\Phi(\cdot)$ be the normal cumulative distribution function, then Ai and Norton (2003) show that the the marginal effect in a probit model is the cross-derivative $\Delta(\partial\Phi(\cdot)/\partial\text{PERF})/\Delta\text{D}^{\text{liq}}$.[15] That is, the sign of the interaction term will be a non-linear function of all independent variables included in the regression. We compute the estimated value of the interaction effect using the approach detailed in Norton, Wang, and Ai (2004). This

[15] For the model in (3) with $u \equiv \gamma_0 + \gamma_1 \text{PERF}_{i,t-1} + \gamma_2 \text{PERF}_{i,t-1} \times \text{D}^{\text{liq}}_{it-2} + \gamma_3 \text{D}^{\text{liq}}_{it-2} + \gamma_4' \, \text{X}_{i,t-1}$, this works out to

$$\frac{\Delta\left(\frac{\partial\Phi(u)}{\partial\text{PERF}}\right)}{\Delta\text{D}^{\text{liq}}} = (\gamma_1+\gamma_2)\phi\{(\gamma_1+\gamma_2)\text{PERF}_{i,t-1} + \gamma_3 + \gamma_0 + \gamma_4' \, \text{X}_{i,t-1}\} - \gamma_1\phi(\gamma_1 \text{PERF}_{i,t-1} + \gamma_0 + \gamma_4' \, \text{X}_{i,t-1})$$

approach to compute the interaction effect is also used by Lel and Miller (2008).[16]

Columns (3) and (4) in Table 4 shows the effect of liquidity on the probability of shareholder activism. Focus first on column (3) where liquidity is measured in year $t-2$. Notice that when the regression includes an interaction term between past performance and liquidity, there is no separate statistically significant effect of neither past performance nor liquidity. In other words, past performance has no discernible effect on the probability of shareholder activism for firms with below-median stock liquidity (i.e. when the liquidity dummy equals zero). The coefficient on the interaction term is, however, negative and statistically significant. Using the approach suggested by Ai and Norton (2003), the bottom segment of Table 4 shows that the average interaction effect is -0.0043 with an average z-statistic of -2.74. To understand how these statistics are computed, consider the graphical representation in Figure 2. Panel A in the Figure shows the interaction effect for all combinations of independent variables that exists in the sample. The "Mean interaction effect" of -0.0043 reported in column (3) of Table 4 is the average value of the numbers reported on the vertical axis in the Figure. The interpretation of the reported number is that, controlling for all other variables included in the regression, the probability of shareholder activism is significantly more sensitive to performance when firms are liquid than when firms are illiquid. In other words, the "Mean interaction effect" picks up the marginal effect of bad performance that comes from the stock being liquid. To put this finding in perspective, an abnormal performance of -10 percent has an effect on the probability of activism that is 0.043 percentage points larger for liquid firms than for illiquid firms. Held against the average frequency of shareholder activism of 0.76 percent—this is an economically significant number.[17] Panel B in Figure 2 reports the z-statistics associated with each estimated interaction term. Similar to how the average interaction term is computed, the average z-statistic reported in Table 4 is the average value of the numbers reported on the vertical axis of Panel B in the Figure. Observe that the vast majority of interaction terms associated with a predicted probability of activism "away from zero" is statistically significant. Thus, for firms with a non-zero probability of activism, liquidity increases the sensitivity to past performance.

To get a further sense of the economic importance of the above result, Figure 3 shows the average predicted probability of intervention for ten performance deciles, plotted for the sample of stocks

[16]The approach of Norton, Wang, and Ai (2004) is available as the Stata function "inteff."

[17]Computed as 402 cases of activism divided by 52,609 cases of non-activism from the bottom part of column (3) in Table 4.

with above-median and below-median liquidity. For the best performing stocks, the probability of experiencing shareholder activism is between a quarter and a half percent, whereas the probability for the worst performing stocks is between one and 1.5 percent—that is, about four times higher. As we would expect, the probability falls when performance increases. Furthermore, for the firms in the lowest performance deciles we find that the probability of experiencing shareholder activism is in the order of 1 percent for firms with below-median stock liquidity. For firms with above-median stock liquidity, the corresponding probability is around 1.5 percent—that is, 50% percent higher than for stocks with below-median liquidity.

Column (4) in Table 4 reports the results from a probit regression using a different definition of past performance and liquidity. In particular, past performance is abnormal return measured as the difference between the two-year holding period return for firm i and the two-year holding period return on the market index. Liquidity is measured over years $(t-4)$ through $(t-3)$ relative to the year of activism. The liquidity dummy variable equals one if the firm was among the 50% most liquid firms in both years $(t-4)$ and $(t-3)$. The dummy variable equals zero if the firm was among the 50% least liquid firms in both years. If a firm moves between "most liquid" and "least liquid" between the years $(t-4)$ and $(t-3)$, the observation is dropped. The results reported in column (4) are qualitatively close to the results from column (3).

In sum, the results presented in Table 4 reinforce our earlier conclusion that abnormally poor stock market performance tends to increase the likelihood of shareholder activism. Moreover, we show that performance only has a statistically significant effect on the probability of shareholder activism if the targeted firm is liquid. This support the idea that liquidity facilitates monitoring through shareholder activism. The next section investigates the robustness of this conclusion.

Robustness tests

Panel B of Table 1 shows that our data include 118 cases where a shareholder activist has made a formal tender offer or a more informal expression of interest in the subject firm.[18] In these cases, the sponsor of the solicitation intends to acquire all the shares in the target and may initiate an election contest, for example, with the purpose of electing new directors willing to redeem bylaws that impede a takeover.

[18]Informal expression of interest includes "bear hugs." See footnote 12.

There are reasons to believe that proxy solicitations associated with acquisition attempts are different from solicitations that involve the continuation of the target company as a stand-alone firm. In acquisition related cases a proxy solicitation is essentially a referendum on the sponsor's offer for the company (Bebchuck (2007)) and is fundamentally different from the notion of activism that constitutes the focus of our paper. Liquidity may, however, play a role also in acquisition-related cases to the extent that it permits establishment of a toehold in the target.[19] Grossman and Hart (1980) argue that a toehold mitigates the free-rider problem and, therefore, increases the chance of a successful acquisition. If the target's stock is liquid, the bidder may be able to establish a toehold in the target without impacting the price. Bris (2002), on the other hand, shows that a zero toehold is optimal if the cost of revealing information through pre-tender offer announcement trading is large enough. Empirical investigations find that toeholds are, in fact, uncommon in tender offers (Betton, Eckbo, and Thorburn, 2008a), suggesting that liquidity plays a minor role in acquisition cases.

In Panels A and B of Table 5 we split the sample of events into acquisition and non-acquisition related cases of activism and rerun the previous regressions. Panel A reports the results for the non-acquisition related cases of shareholder activism. After restricting cases to have information on all independent variables, we are left with between 230 and 338 activism events. Comparing regressions (1) through (4) in Panel A of Table 5 with the corresponding regressions in Table 4, the point estimates and the significance levels are remarkably stable. Thus, all conclusions drawn based on Table 4 carry over to Panel A of Table 5.

In Panel B of Table 5, we study acquisition related shareholder activism. Focusing first on regression (1), we see that performance over the most recent year have a statistically significant effect on the likelihood of activism. This does not carry over to regression (2) where performance is measured over the two most recent years. When the liquidity dummy and the interaction between past performance and the liquidity dummy are added in regressions (3) and (4), the results are very different from the results in Panel A. For acquisition related shareholder activism, liquidity does not seem to play an important role. In regressions (3) and (4), the mean interaction term between performance and liquidity is -0.0004. This is only about one tenth of the interaction effect documented for non-acquisition related activism in the bottom part of Panel A. Since liquidity allow

[19] A toehold refers to a "small" ownership in the target prior to launching a bid for the target.

a bidder to more easily acquire a toehold, the lack of importance for liquidity is consistent with toeholds being uncommon in tender offers.

In our next set of robustness test, we change the way in which we sample non-event firms. In the current approach we include all firms-years that satisfy our sampling criteria. This implies that our regressions use a large number of non-event firms compared to the number of event-firms. Including a large number of non-event firms improves the precision of our estimated coefficients. However, it may introduce a bias related to the fact that we compare event-firms to non-event-firms that may differ in ways that are important for shareholder activism. Up to this point we have included a set of control variables to control for such differences. An alternative approach is to use the same set of control variables to identify non-event firms that are "close" to the event-firms. We follow Rosenbaum and Rubin (1983) and measure "closeness" using the *propensity score*—defined as the conditional probability of observing shareholder activism given the set of control variables:

$$p(x_{it-1}) \equiv \Pr(\text{ACT}_{it} = 1 \mid x_{it-1} = X_{it-1}),$$

where ACT_{it} and X_{it-1} are the dependent variable and the control variables, respectively, from equation (3). In the first step of this alternative estimation procedure, we use all observations in a given year and estimate the propensity score using a probit model.[20] This is repeated for all sample years. In the next step, we identify the m firms that are closest to each event-firm in terms of the propensity score. With n events this gives a sample of $n + nm$ firm-years. In the last step we re-estimate the model in equation (3) using the n event firms and the nm non-event firms.

Table 6 reports the interaction effect of past performance and liquidity using the matched sample.[21] Columns numbered (1) and (2) on the left hand side of the Table reports results for $m = 2$ while the last two columns report results for $m = 1$. Panel A contains results for non-acquisition related shareholder activism. Focusing first on columns (1) and (2), notice that the absolute value of the point estimates are more than thirty times larger than the point estimates in columns (3) and (4) in Panel A of Table 5. This is due to the fact that our alternative sample

[20]The propensity scoring algorithm is available as a Stata module "psmatch2," authored by Leuven and Sianesi (2003).

[21]Even though the second step regressions include all control variables, the coefficient estimates are dropped from Table 6. All estimates are statistically insignificant—as expected, since we have selected matching firms based on the same set of control variables.

selection includes fewer non-event firms. In other words, the proportion of events in the matched sample far exceeds the proportion of evens in the original sample. Focusing next on the z-statistics in Panel A, we see that the interaction effect is statistically significant at conventional levels for $m = 2$. Using only one match for each event firm ($m = 1$,) the z-statistic "drop" to -1.75 for the case where performance is measured over the most recent year while remaining significant with a z-statistic of -2.71 when performance is measured over the two most recent years. The difference in statistical significance between columns (3) and (4) is more likely caused by the fact that we use different samples of matching firms than by the fact that we use different performance measures. Overall, the results documented in Panel A reinforce our finding from Table 4 and from Panel A of Table 5.

Panel B of Table 6 documents the interaction effect for the sub-sample of firms that are targeted in acquisition attempts. The findings are similar to the findings from Panel B of Table 5. There is no evidence that liquid firms with bad performance are more likely to be targeted in an acquisition attempt than non-liquid firms.

In our final set of robustness tests, we replace the Amihud illiquidity measure with turnover and proportional quoted spread. Columns (1) and (2) on the left hand side of Table 7 contain results using turnover as the liquidity measure while columns (3) and (4) report results using the proportional quoted spread. Excluding acquisition-related activist cases from the sample, the results in Panel A of Table 7 are generally similar to the results reported in Panel A of Table 5. For turnover, the interaction effect have the same sign, magnitude and statistical significance. For proportional quoted spread, this is only true when performance is measured over the two most recent years. When performance is measured over the most recent year, the point estimate is still negative, but closer to zero and not statistically significant. Comparing the number of activism events in columns (1) and (3), we see that the number of events are similar. This implies that the two regressions use more or less the same set of event-firms. Thus, it seems that Amihud illiquidity and turnover pick up an aspect of liquidity that is important for shareholder activism that proportional quoted spread does not.

Panel B of Table 7 reinforce the notion that proportional quoted spread pick up a different aspect of liquidity. Focusing on columns (3) and (4), the absolute value of the interaction term is about three times as large as the effect documented in Panel B of Table 5 and the effect is

marginally statistically significant. However, looking at columns (1) and (2), we find no evidence of a significant interaction term when liquidity is measure using turnover.

Overall, the results presented in this section show that the findings in Table 4 are robust to how non-event firms are selected and to how liquidity is defined. For non-acquisition related shareholder activism, we retain our conclusion that liquidity facilitate monitoring through shareholder activism. We also document that liquidity does not play an important role in our—relatively small—sample of acquisition attempts. Next we turn to an investigation of abnormal stock returns around the announcement dates of shareholder activism.

3.3 Run-up and announcement effects

Studying the stock returns around the announcement of shareholder activism is interesting for at least two reasons. First, the abnormal return generated by the announcement of shareholder activism will uncover whether or not the market on average perceives activism as a value-destroying or value-enhancing activity. Second, the model of Maug (1998) has cross-sectional implications for the stock-price movements prior to the announcement (stock price run-up) and for the stock returns associated with the announcement of shareholder activism (announcement return). These cross-sectional implications are discussed below and are presented in more detail in Appendix A.

The most immediate implications of Maug (1998) is that both stock price run-up and announcement return should be positive in the sample of activism events. The intuition for the positive announcement return is straightforward. Prior to the announcement, the stock price reflects the expected value of the firm given the likelihood of intervention. After the activism announcement, the stock price reflects the full value of intervention. The intuition for the stock price run-up rests on realizing that the activist will be trading in the stock prior to announcing the intervention. The stock price preceding the activist's trading is set by uninformed investors who trade for liquidity reasons and therefore expect a loss on their trades with the activist. It follows that the stock price prior to trading must equal the expected firm value less the expected trading loss. As market participants observe trading volume they will update the intervention probability, resulting in a positive stock price run-up in a sample of activism events.[22]

[22]In Maug's model, a market maker observes trading volume, update the probability of intervention, and set the price equal to the expected value of the firm.

Next we turn to the question of how the announcement return changes with liquidity in a cross-section of activism events. The key finding of Maug (1998) is, for a given value of intervention, that a large shareholder intervenes more frequently when stocks are more liquid. In other words, the probability of intervention is increasing in the liquidity of the stock. This implies that illiquid firms will be less common in a sample of activism events, but, when illiquid firms do experience activism, the market is more "surprised" and the announcement returns are larger than for liquid firms.

The above argument rests on holding the value of intervention fixed. Shareholder intervention will happen if and only if the overall profit from intervention is sufficiently large. Some of the profit from intervention is derived from the ability to trade in the stock prior to the announcement of activism. Thus, a liquid stock needs a smaller potential value enhancement to trigger shareholder activism than an illiquid stock. For a sample of activism events, this implies that the average value enhancement for liquid firms will be smaller than the average value enhancement for illiquid firms. Since the announcement return is decreasing in value enhancement, the sample could contain liquid firms with value enhancements small enough to result in larger announcement returns for liquid firms than for illiquid firms.[23] To empirically assess the relationship between stock liquidity and announcement returns, we therefore need to compare liquid and illiquid firms with the same potential value enhancement. We do not observe the added value from intervention directly, but we create a sample of liquid and illiquid firms matched on a propensity score that captures the potential value enhancement.

Finally, we look at how stock price run-up relates to liquidity. This relationship turns out to be ambiguous even when holding the value of intervention fixed. The stock price run-up depends on two factors: (i) The size of the trading profit and (ii) the change in the probability of intervention caused by the activist's trading. For a given value of intervention, the first effect is larger for liquid firms while the second effect is larger for illiquid firms. When the value of intervention is large, getting an imperfect signal of activist trading only leads to a small change in the probability of activism. Thus, the size of the trading profit is more important for the run-up—resulting in a larger in-sample run-up for liquid firms. As the value of intervention is decreasing, the change in the probability of intervention becomes the dominating factor for the run-up—giving a larger

[23]The Appendix discusses this point more in detail.

run-up for illiquid firms. Thus, the relationship between stock price run-up and liquidity depends critically on how the value of intervention is distributed in a particular sample. The Appendix discusses this ambiguity in more detail.

We now turn to an empirical investigation of announcement return and stock price run-up in our sample of activism events. The date of the public announcement of shareholder activism is defined as the earliest of the date of the first SEC filing and the date on which a solicitation is first mentioned in news sources covered by Factiva. We follow the event study literature and define the announcement period as the two-day period ending on the announcement day. To determine a reasonable starting day for the run-up period, we follow the tender-offer literature, in looking for a price that does not reflect any specific information about the event that we study. To this end, Figure 4 documents the cumulative average abnormal returns around the announcement date of shareholder activism. The figure shows that shareholder activism is associated with both stock price run-up and significant announcement period abnormal returns in our sample. Based on this Figure, it seems reasonable to use the price on day -30 as a non-informative base price for the computation of the run-up return.[24] The run-up period ends on day -2 relative to the announcement day.

Run-up and announcement period abnormal returns for firm i are estimated using the following market model:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \sum_{j=1}^{2} \delta_{ij} d_{jt} + \epsilon_{it},$$

where r_{it} is the continuously compounded daily excess return for firm i and r_{mt} is the continuously compounded daily excess return on the CRSP value-weighted NYSE/AMEX/Nasdaq market index. The dummy variable d_{1t} equals one during the run-up period and zero otherwise, while d_{2t} equals one for the two days in the announcement period window. The estimation period is 378 trading days, starting on trading day -252 relative to the announcement date and ending on trading day $+126$.

Table 8 documents run-up and announcement period returns as defined above. The results reported in the first row of Panel A show that non-acquisition related shareholder activism generates statistically and economically significant positive run-up and announcement returns. During the 29-day run-up period, the cumulative abnormal return is 2.86%. On the announcement of activism,

[24] In a study of tender offer contests, Betton and Eckbo (2000) use day -60 while Schwert (1996) use day -42 as base dates for non-informative prices.

the market reacts positively resulting in an average abnormal return of 3% over the two-day announcement window. For completeness, Panel B presents the estimated run-up and announcement effects for firms targeted in acquisition attempts. This group of firms experiences no run-up prior to the announcement. The announcement return, however, is considerably larger than for the non-acquisition related activism events—supporting our decision to treat these cases as fundamentally different.[25]

Panel A of Table 8 also shows that the run-up and announcement returns associated with the events of activism are larger for illiquid stocks than for liquid stocks. However, as pointed out above, the predictions of the Maug (1998) model concerning the effect of liquidity on announcement and run-up returns are ambiguous. For announcement returns, the ambiguity disappears if we hold the value of intervention fixed while studying the relationship to liquidity. Our empirical approach to holding the value of intervention fixed is as follows. Notice that for every illiquid firm experiencing shareholder activism, the "corresponding liquid" firm with the same potential value enhancement must also experience shareholder activism. Our approach is therefore based on matching every illiquid firm in our sample with a corresponding liquid firm. Since we cannot observe the added value of activism directly, we use a set of covariates that proxy for the unobserved added value. In particular, for all available firms, we estimate a probit regression using an illiquidity dummy as the dependent variable and a set of covariates that are likely to be related to the unobserved value enhancement. Two firms with similar covariates, will have estimated propensity scores that are close. If the covariates capture the potential value enhancement, the added value of shareholder activism must also be close for the two firms. Thus, selecting a liquid firm with a propensity score close to that of an illiquid firm will ensure that the value enhancement arising from shareholder activism will be similar in the two firms. The covariates that we use to proxy for value enhancements are, with the exception of liquidity, the same as the variables described in Table 3. In all that follows, Amihud illiquidity is used as our liquidity measure.

Table 9 reports the effect of liquidity on the announcement period returns using cross-sectional regressions on samples matched on the basis of the estimated propensity scores. For completeness, the Table also reports results for run-up returns. The three Panels in the Table reports results

[25]The reported announcement return of 14.41% is smaller than what is typically found in large-samle studies of tender offers. See for example Betton, Eckbo, and Thorburn (2008b).

that vary on how close the matches are. There are a total of 136 illiquid firms that have data on the dependent variable and on all covariates. The most distant matches use all 136 illiquid firms and match each of these firms with one liquid firm without replacement (i.e., a match is used only once.) The sample with the closest matches is selected by removing the 80 pairs of matched firms with propensity scores that are furthest apart. We also report results for an intermediate group of matches where we remove the 40 matches with the most distant propensity scores.

Focus first on the results for the set of close matches in vertical Panel A of Table 9. In the first row, Liquidity dummy$_{t-2}$ is a dummy variable that equals one if the firm is in the group of liquid matching firms and is zero otherwise. Liquidity is measured over year $(t-2)$ relative to the year of activism. This dummy variable captures the difference in average run-up and announcement returns for liquid and illiquid firms. Consistent with the predictions of the Maug-model, liquid firms tend to have lower announcement period returns. The two-day announcement period return is three percentage points smaller for liquid firms than it is for illiquid firms. The run-up is on average eight percentage points smaller for liquid firms than for illiquid firms. Still focusing on the first row of the Table, but looking at the results in Panel B and Panel C. Observe that the point estimates for run-up and announcement period return are stable when the "closeness" criterion for choosing matching firms is relaxed. In Panel B and C, the statistical significance of run-up remains high with t-statistics exceeding 2.5. For the liquidity effect on announcement period return, the statistical significance is still close to the 5 percent level in Panel B, but is not statistically significant at conventional levels in Panel C. The lack of statistical significance could be caused by a loss of statistical power as matches are less close in Panel C. Looking at the effect of control variables across all three Panels, we see that some of the variables seem to be related to run-up and announcement period in the cross-section. However, since we are primarily interested in the effect of liquidity and that these variables are included to control for potential spurious relationships, we abstain from commenting on these effects directly.

In sum, this section has argued that the model of Maug (1998) implies positive run-up and announcement returns in a cross-section of activism events and that the average announcement period return should be smaller for liquid firms than for illiquid forms. Tables 8 and 9 presents evidence consistent with these implications. We interpret our findings as evidence in favor of a positive effect of liquidity on value creation: By allowing a potential activist to profit from informed

trading in a stock, liquidity induces more value enhancing shareholder activism than would have occurred if the stock was less liquid.

4 Conclusion

This paper empirically examines the effect of stock liquidity on shareholder activism in the form of contested proxy solicitations for a cross-section of firms listed on the major U.S. stock exchanges. Liquidity may affect shareholder activism in two diametrically opposite ways. On one hand, liquidity can discourage shareholder activism and lack of liquidity can encourage activism. If a stock is liquid, shareholders can easily sell their shares if they disagree with management. On the other hand, liquidity may induce shareholder activism. Maug (1998) suggests that liquidity improves the incentives to intervene because a potential activist in a liquid stock can trade—and profit—on the information that he will create value through intervention. Thus, liquidity mitigates the free-rider problem and makes shareholder activism more attractive because the activist can earn trading profits.

Using a sample of 507 shareholder activist events collected for the 1994–2007 sample period, our main conclusion is that liquidity improves shareholders' incentive to take an active role in the governance of corporations. We provide two sets of results that support this conclusion. First, we show that shareholders are more likely to take action in response to deteriorating firm performance when a firm's stock is liquid. For the decile of the worst performing firms—being among the most liquid firms increases the probability of being subjected to shareholder activism with 50 percent when compared to the least liquid firms. Second, we document positive abnormal returns during the two-day period surrounding the date of a public announcement of shareholder activism. For shareholder activism events not related to tender offers or acquisitions attempts, the two-day announcement period return is 3%. The positive abnormal return is consistent with the notion that activist shareholders create value and that they earn a positive return on their intervention. We also document that the abnormal announcement period return is lower for liquid firms than for illiquid firms. This finding is consistent with our conclusion that liquidity induces shareholder activism. The intuition for why announcement period returns should be smaller for liquid firms is straight forward. If liquidity is a trigger for activism, then investors will attach a relatively high

probability to the event that a liquid firm will experience shareholder activism—and will not be surprised when it happens. When activism is expected, announcement period returns should be small. The opposite holds true for illiquid firms.

In contrast to Coffee (1991) and Bhide (1993), recent papers by Edmans (2008) and Admati and Pfleiderer (2008) suggest that a large shareholder's option to sell shares and exit the stock serve as a disciplinary mechanism for management. In the latter papers, there is a cost associated with the exit of large informed shareholders. Liquidity is important for this mechanism because the threat of exit is only credible if shareholders can sell shares without incurring too large costs in the process. Holmstrom and Tirole (1993) make a related argument. They point out that liquidity makes prices more informative—which in turn increases the effectiveness of the stock market as a monitoring device. Although our findings cannot shed light on the monitoring mechanism suggested in Holmstrom and Tirole (1993), Edmans (2008) and Admati and Pfleiderer (2008), we show that liquidity is important for the monitoring decision—making it more likely that the mechanism studied in these papers are in fact relevant for corporate governance.

Appendix A

Liquidity and activism in a cross-section of firms

This appendix uses the model of Maug (1998) to derive implications for announcement returns and stock price run-up associated with shareholder activism events. First, we define stock price run-up and announcement return in the context of Maug's model and show that both are positive in equilibrium. Second, we show that for a given level of value enhancement from activism, announcement return is decreasing in stock liquidity. However, we point out that this does not hold in general when firms are assumed to be different in terms of value enhancement.[26] Finally, we argue that without making specific assumptions about the cross-sectional distribution of liquidity and value added by activism—Maug's model does not have an unambiguous implication for the relationship between stock-price run-up and liquidity.

In the model of Maug (1998), the economy has one firm, one large shareholder, and a continuum of households. The firm is exogenously endowed with a value enhancement that can be brought out by shareholder activism.[27] The firm's assets are worth L in their current use, but, can be increased to H through activism. Initially, a potential activist shareholder F acquires a fraction α of the firm at price P_0 and households buy the remaining $1-\alpha$ shares. Subsequently, the activist decides on whether or not to intervene to release the value enhancement. The activist is assumed to play a mixed strategy where intervention occurs with probability q and non-intervention with probability $(1-q)$. The activist's cost of intervention is c_M. After the decision to intervene is made, a proportion ϕ of all households face a liquidity shock with probability 1/2. Thus, market liquidity is increasing in ϕ. The main goal of Maug (1998) is to study how the probability of intervention q relate to liquidity ϕ. If households experience a liquidity-shock and the activist has decided to intervene, the activist can "hide" her trades and earn trading profit on the private information that she will enhance the value of the firm to H. As in Kyle (1985), a market maker receives orders from households and F and sets the stock price P_1. At the model's ending date, all information becomes common knowledge and the price of the firm P_2 is either H or L—depending on whether the shareholder intervenes or not.

[26] In the empirical part of this paper we propose an empirical strategy allowing us to control for differences in value enhancement from activism.

[27] Maug (1998) uses the terms intervention, monitoring, and activism interchangeably.

Proposition 4 in Maug (1998) derives the equilibrium values of the initial stake α and the randomizing probability q:

$$\hat{\alpha} = \frac{c_M}{2(H-L) - c_M} \qquad \hat{q} = \frac{1}{2} - \frac{c_M}{\phi(H-L)}.$$

Maug shows that the randomizing probability q increases in ϕ if and only if $\alpha < C_M/(H-L)$. Comparing this condition with the equilibrium value $\hat{\alpha}$—we see that F, in equilibrium, has an initial ownership that is smaller than $C_M/(H-L)$. This represents the key finding of Maug (1998): When α is endogenous, F acquires an initial shareholding that is small enough to induce a positive relationship between the probability of intervention and the liquidity of the firm.

The ratio $C_M/(H-L)$ is the key to generate a positive relationship between q and ϕ. We assume, without loss of generality, that $L = 0$ and use the notation $h \equiv H/C_M$. It follows that the value enhancement from activism relative to the cost of activism is increasing in h. The equilibrium values of α and q can now be written as:

$$\hat{\alpha} = \frac{1}{2h-1} \qquad \hat{q} = \frac{1}{2} - \frac{1}{\phi h} \tag{4}$$

In a sample of shareholder activism events, we only observe the firms where F decided to intervene. Conditional on the occurrence of intervention, the equilibrium prices derived by Maug (1998) correspond to the following expressions:

$$\begin{aligned} P_0 &= \hat{q}H - \frac{\phi}{2}(1-\hat{q})\hat{q}H \\ P_1 &= \begin{cases} H & \text{with probability } 1/2 \\ \hat{q}H & \text{with probability } 1/2 \end{cases} \\ P_2 &= H \end{aligned} \tag{5}$$

In Maug's model, the only information revealed between setting prices P_1 and P_2 is the intervention announcement. Thus, we define the announcement return as the percent difference between the fully revealing stock price P_2 and the price set by the market maker P_1. We are also interested in the stock price run-up created by the large shareholder trading on the private information that she will intervene and increase firm value to H. We measure this run-up as the return to investing at

the initial price P_0 and selling at the price set by the market maker P_1.

Using the prices in (5), the announcement day return is $H/H - 1 = 0$ with probability 1/2 and $H/\hat{q}H - 1$ with equal probability. Thus, for given ϕ and h, the expected announcement day return is:

$$A(\phi, h) \equiv \frac{1 - \hat{q}}{2\hat{q}} \tag{6}$$

Correspondingly, for given ϕ and h, the expected stock price run-up is:

$$U(\phi, h) \equiv \frac{1 + \hat{q}}{2\hat{q} - \phi\hat{q} + \phi\hat{q}^2} - 1 \tag{7}$$

Since the equilibrium probability $\hat{q}$ is smaller than 1/2, equations (6) and (7) imply that announcement return and run-up is positive. In other words, Maug's model implies positive announcement return and run-up in any sample of activism events. The intuition for this is that activism adds value and that, as we move from stage zero to stage one and from stage one to stage two of the game—the uncertainty about whether or not activism will take place is reduced.

Announcement return and liquidity. In a sample of activism events, sample firms will vary in terms of ϕ and h. We first study how announcement return depends on liquidity ϕ by taking the partial derivative of (6) with respect to ϕ while holding h fixed. This gives,

$$\frac{\partial A(\phi, h)}{\partial \phi} = \frac{-2\hat{q}'_\phi}{4\hat{q}^2} < 0,$$

where $\hat{q}'_\phi = 1/\phi^2 h > 0$. That is, announcement returns for liquid firms will be smaller than announcement returns for illiquid firms. The intuition for this results is straight forward. Suppose liquidity is increasing so that $\hat{q}$ approaches one.[28] Then, all market participants will take this into account and the prices P_1 and P_2 will both approach H—resulting in a close to zero announcement return. Alternatively, consider the announcement return when liquidity is reduced and $\hat{q}$ approaches zero. Then, market participants will be "surprised" when activism is announced, resulting in a large announcement return.

In the empirical section where we study run-up and announcement effects, we will be interested

[28] This will never happen in equilibrium. From (4) it follows that the equilibrium probability of intervention $\hat{q}$ never exceeds 1/2.

in comparing high liquidity firms with low liquidity firms. Therefore, assume that the distribution of liquidity is degenerate with firms either having low liquidity $\underline{\phi}$ or high liquidity $\overline{\phi}$. From the expression for $\hat{q}$ in (4), it follows that the threshold level of value enhancement that triggers intervention with positive probability is higher for illiquid firms than for liquid firms. Denote the minimum value enhancement that results in a positive equilibrium probability of intervention for an illiquid and a liquid firm by $\underline{h}$ and $\overline{h}$, respectively. Using (4), these threshold levels of of value enhancements are given by:

$$\underline{h} = 2/\underline{\phi} \text{ and } \overline{h} = 2/\overline{\phi} \tag{8}$$

It follows that liquid firms with $h \in [\overline{h}, \underline{h}]$ will experience activism, while illiquid firms with $h \in [\overline{h}, \underline{h}]$ will not experience activism. Since announcement return is decreasing in h, the average announcement return for firms with $h \in [\overline{h}, \underline{h}]$ will be lower than the average announcement return for firms with $h > \underline{h}$. Without specific assumptions about the cross-sectional distribution of ϕ and h, the average announcement return for liquid firms with $h > \overline{h}$ may be larger or smaller than the average announcement return for illiquid firms with $h > \underline{h}$. However, since $\partial A/\partial \phi < 0$, the average announcement return for liquid firms with $h > \underline{h}$ will be smaller than the average announcement return for illiquid firms with $h > \underline{h}$. Thus, to study the impact of liquidity on the announcement returns using a sample of activism events, we need to compare firms with different levels of liquidity but with the same potential value enhancement. The details of our empirical approach is described in section 3.3.

Stock price run-up and liquidity. To study how stock price run-up depends on liquidity, we follow the same approach as for the announcement return and take the partial derivative of (7) with respect to ϕ while holding h fixed. This gives,

$$\frac{\partial U}{\partial \phi} = \frac{\hat{q} - (2-\phi)q'_\phi - 2\phi\hat{q}q'_\phi - \hat{q}^3 - \phi\hat{q}^2 q'_\phi}{\left(2\hat{q} - \phi\hat{q} + \phi\hat{q}^2\right)^2}. \tag{9}$$

We are interested in the sign of this expression. Substituting using $\hat{q}$ from (4) and $\hat{q}'_\phi = 1/\phi^2 h$, the numerator in (9) simplifies to:

$$-\frac{1}{2h\phi} - \frac{2}{h\phi^2} + \frac{3}{h^2\phi^2} + \frac{3}{8}.$$

This is a second degree polynomial in ϕ. The positive root is

$$\phi^* = \frac{4\sqrt{3h-2}+2}{3h}. \tag{10}$$

The expression in (9) is negative for ϕ smaller than ϕ^*, implying that stock price run-up is decreasing in liquidity. For ϕ larger than ϕ^*, stock price run-up is increasing in liquidity. Notice that ϕ^* is equal to 1 when h is equal to 6 and that ϕ^* converges to zero when h converges to positive infinity. Thus, if sample firms have moderate h, run-up will be larger for low-liquidity firms than for high liquidity firms, irrespective of how ϕ is distributed. On the other hand, if h is large stock price run-up will be increasing in liquidity. Thus, the relationship between stock price run-up and liquidity depends critically on the cross-sectional distribution of ϕ and h. To illustrate this relationship further, we use Monte Carlo simulations.

Our Monte Carlo simulations rests on specifying a density function f for ϕ on $[0,1]$. Having specified f, we draw an activism sample of size N, where N is close to the number of observations in our activism sample. Using the median ϕ from the simulated sample, the N observations are allocated to a low-liquidity group with ϕ less than the median and a high-liquidity group with ϕ greater than the median. Next, we fix $h = h_j$ and compute average run-ups in the two sub-samples using $U(\phi, h)$ from (7). For a simulated sample s, let $U_s(\overline{\phi}, h_j)$ be the average run-up for the high-liquidity group and let $U_s(\underline{\phi}, h_j)$ be the average run-up for the low-liquidity group. The simulation is repeated $S = 5,000$ times. Across simulations, we compute the overall averages $U_S(\underline{\phi}, h_j) = (1/S)\sum_s U_s(\underline{\phi}, h_j)$ and $U_S(\overline{\phi}, h_j) = (1/S)\sum_s U_s(\overline{\phi}, h_j)$. Finally, we repeat the whole process for a set of reasonable h_j. Looking at the equilibrium value $\hat{q}$ in (4) and setting $\phi = 1$, we see that the smallest h that gives a positive probability of activism is $h = 2$. Thus, we repeat the Monte Carlo simulation for each $h_j \in \{3, 4, 5, \ldots, 99, 100\}$. The maximum of 100 is arbitrary, but, implies a situation where the value enhancement from activism is 100 times larger than the cost of activism.

Figure 5 plots averages $U_S(\underline{\phi}, h_j)$ and $U_S(\overline{\phi}, h_j)$ against h for three different distributions f. In Panel A, the liquidity parameter ϕ is distributed according to a truncated normal distribution with mean 0.5 and standard deviation 0.1. As explained above, when h is large, ϕ^* from (10) is close to zero. Thus, for large h, the distribution of ϕ mostly covers the region where there is a

positive relationship between liquidity and stock price run-up. This results in a lower average run-up for low-liquidity firms than for high-liquidity firms. As h decreases and approaches it's minimum value, ϕ^* will exceed 1. The distribution of ϕ then covers the region where run-up is decreasing in liquidity—implying that low-liquidity firms will have higher run-up than high-liquidity firms.

In Panel B of Figure 5, the liquidity distribution has the same variance as in Panel A but with a larger mean. The effect of this is to make it more likely to draw a ϕ from the region where run-up is increasing in liquidity. In the left hand side graph of Panel B, this has the effect of decreasing the h where run-up is identical for low-liquidity and high-liquidity firms, and correspondingly, increasing the range of h where run-up is larger for high liquidity firms.

In sum, the analysis in this appendix shows that the model of Maug (1998) implies positive stock price run-up and announcement return in a sample of activism events. We further show that, holding h fixed, Maug's model implies that announcement returns should be larger for low-liquidity firms than for high-liquidity firms. Finally, we argue that without making specific assumptions about the cross-sectional distribution of liquidity ϕ and value enhancement from activism h—Maug's model does not allow an unambiguous prediction about the relationship between stock-price run-up and liquidity.

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Figure 1
Fraction of firms that experience shareholder activism: 1994–2007

The Figure shows how shareholder activism varies across sample years. For each year we identify all firms that satisfy non-activism related sampling criteria. Each bar in the figure represent the fraction of firms experiencing shareholder activism in a given year. A firm experiences shareholder activism if a non-management shareholder or group of shareholders file a shareholder proposal or a contested solicitation through EDGAR.

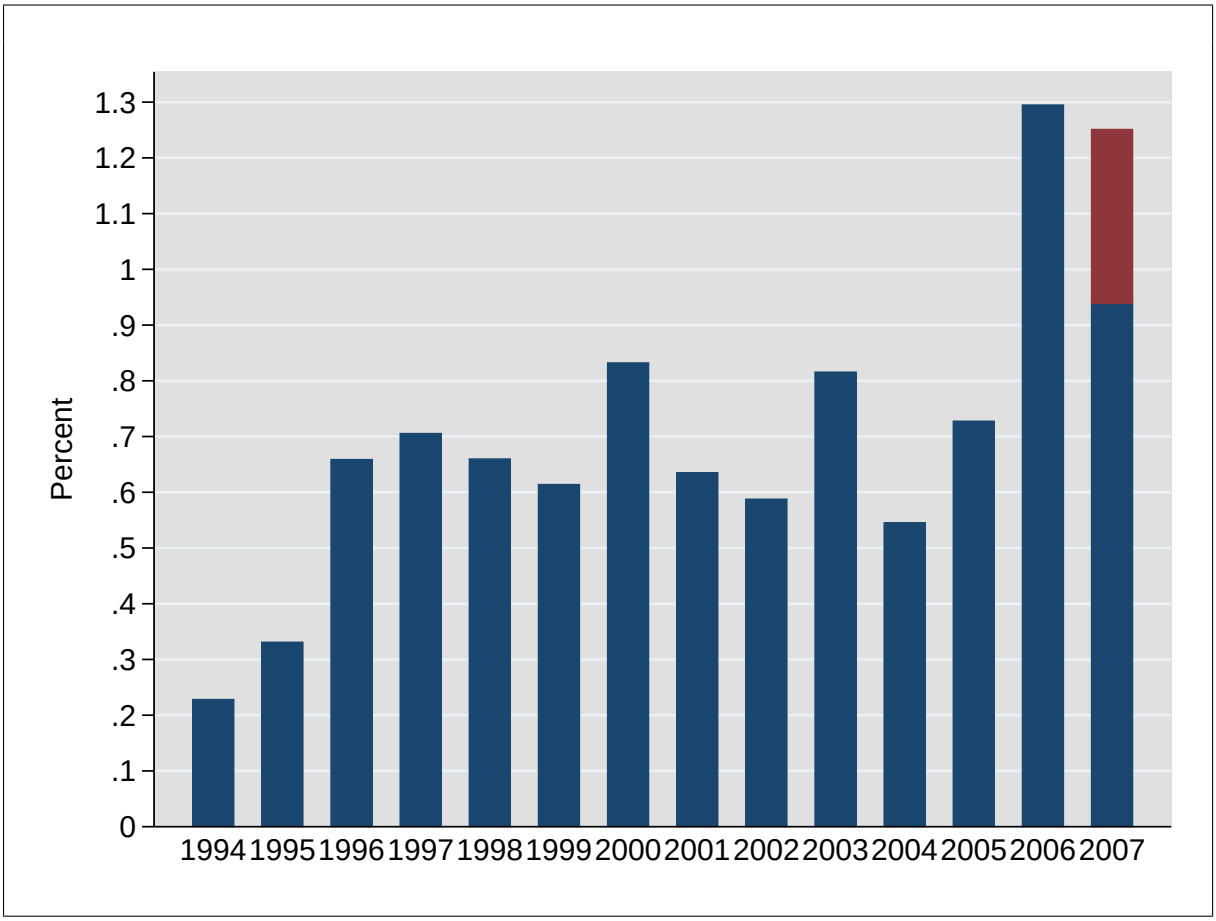


Figure 2
Interaction effect of past performance and liquidity on the probability of shareholder activism

Panel A shows the interaction effect of past performance and liquidity on the probability of shareholder activism for all the combinations of independent variables that exists in the sample. Panel B shows the corresponding z-statistics.

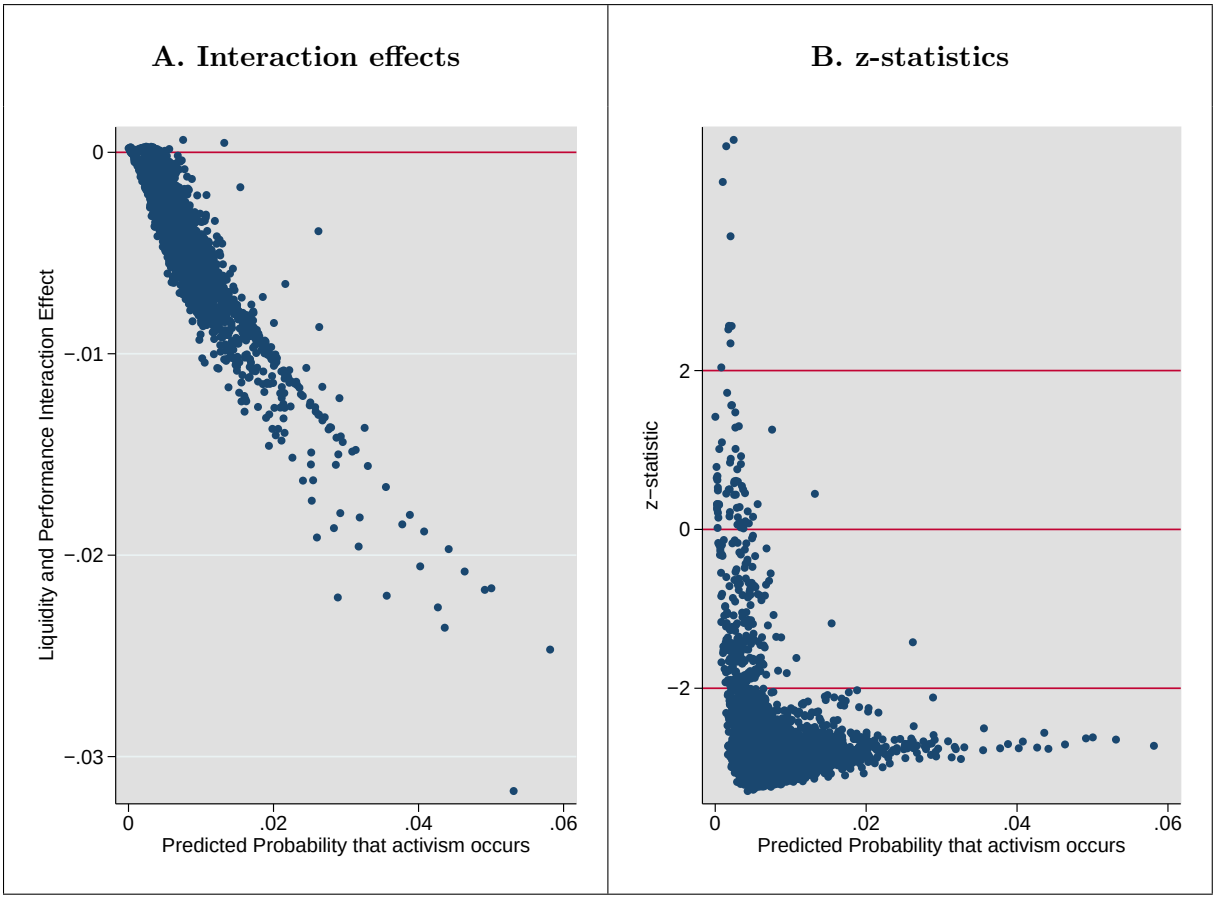


Figure 3
Predicted probability of shareholder activism for past performance deciles

The figure shows how the predicted probability of shareholder activism varies with past performance for the most liquid and the least liquid firms in the sample. Liquidity is the Amihud measure and is computed for year $t-2$ relative to the activism year. A firm experiences shareholder activism if a non-management shareholder or group of shareholders file a shareholder proposal or a contested solicitation through EDGAR.

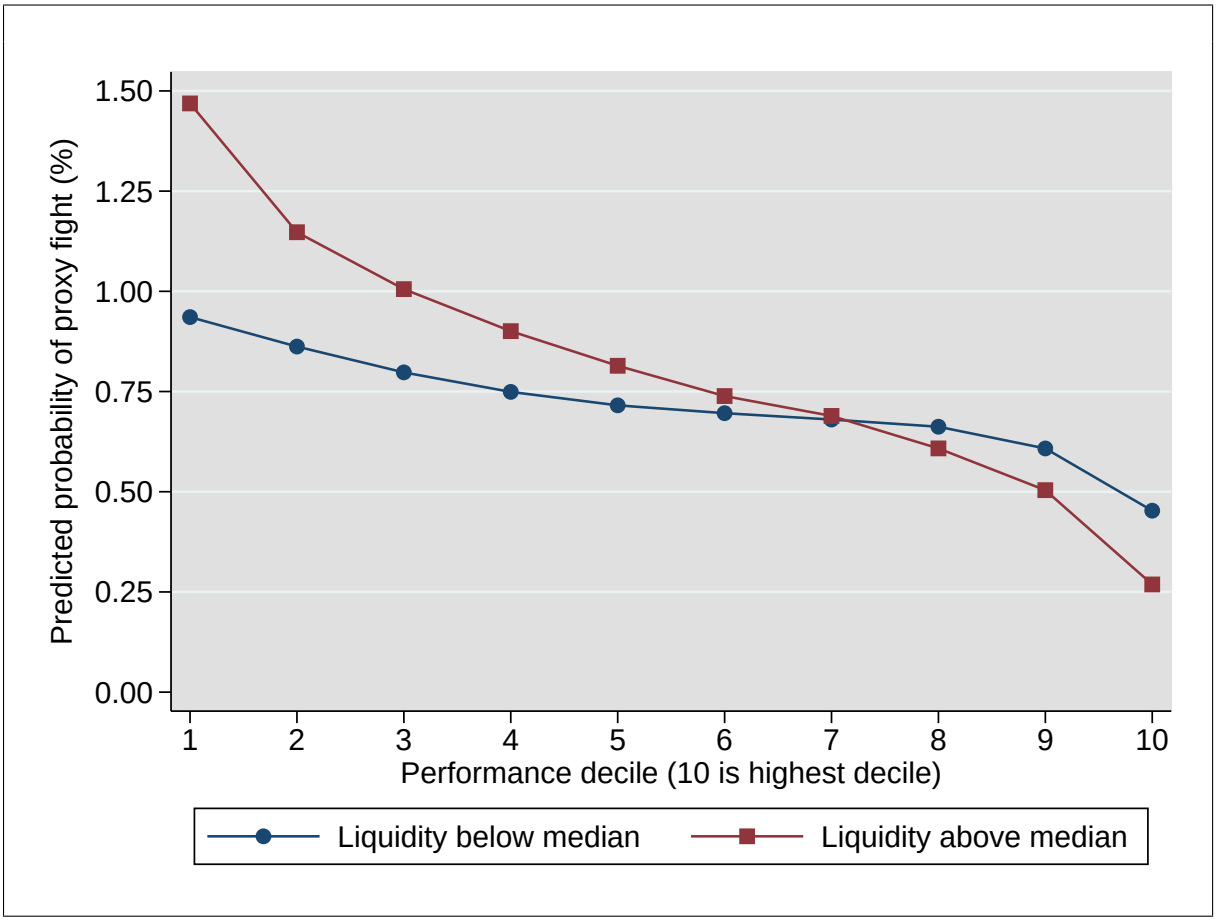


Figure 4
Cumulative abnormal return around the announcement date of shareholder activism: 1994–2007

The Figure shows the cumulative abnormal returns (CAR) starting on day −30 and ending on day +5 relative to the announcement date of shareholder activism. The CAR is computed by cumulating average daily abnormal returns. The daily abnormal returns are computed using:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \sum_{j=-30}^{5} \delta_{ij} d_{jt} + \epsilon_{it},$$

where r_{it} is the continuously compounded daily excess return on firm i and r_{mt} is the continuously compounded daily excess return on the CRSP value-weighted NYSE/AMEX/Nasdaq market portfolio. The dummy variable d_{jt} takes on a value of one on trading day j relative to the announcement day. The estimate of $\delta_i j$ captures the abnormal return for firm i on trading day j relative to the announcement day. The estimation period is 378 trading days, starting on trading day −252 relative to the announcement date and ending on trading day +126 relative to the announcement date.

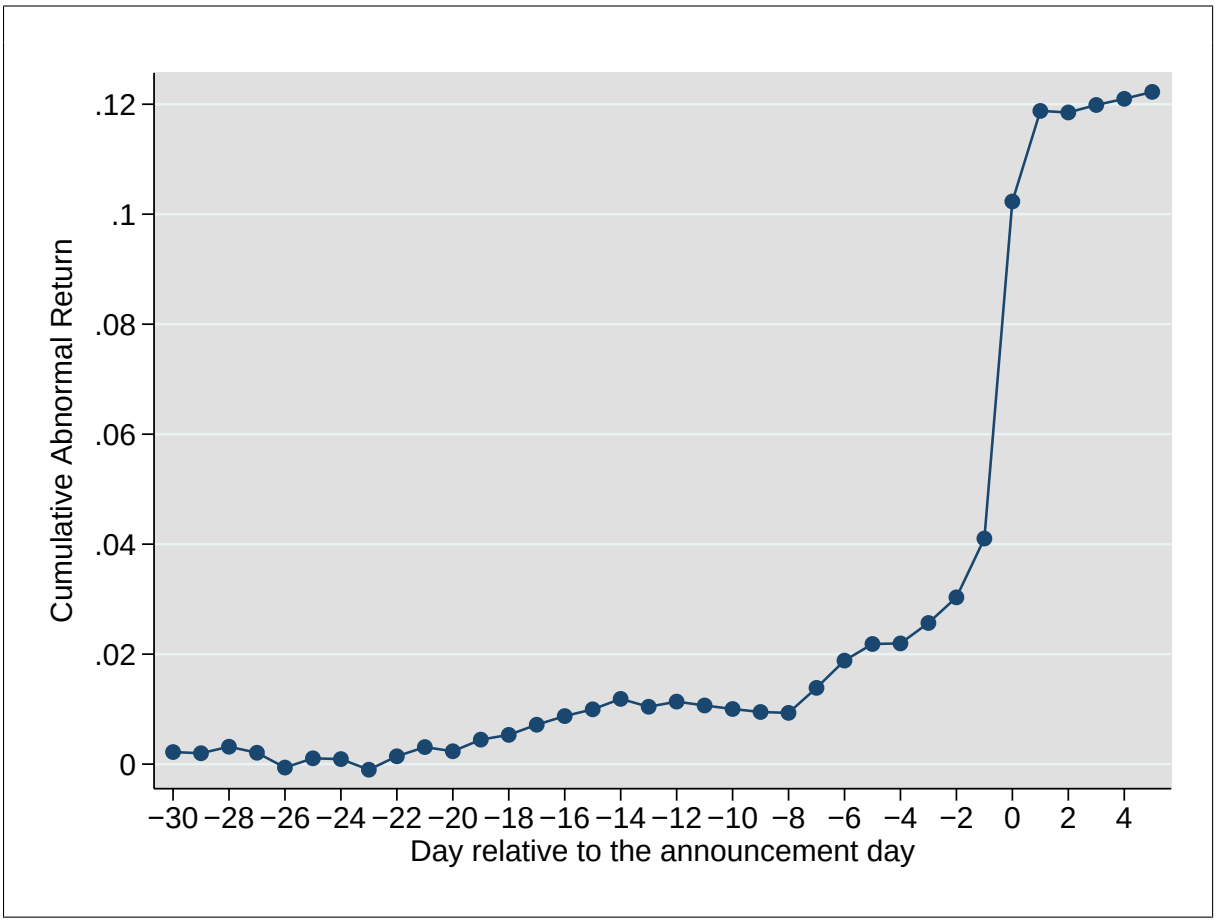
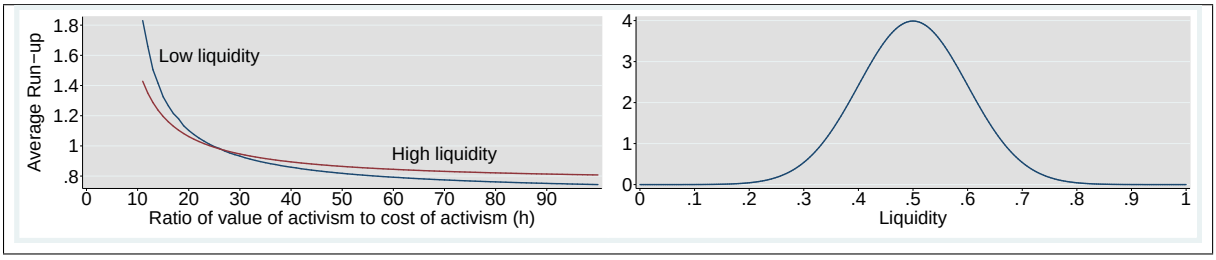


Figure 5
Simulated average stock price run-up for low-liquidity firms and high-liquidity firms

The Figure plots simulated average run-up returns for high- and low-liquidity firms against the ratio of the value of activism to the cost of activism h. The procedure used to to perform the simulations is as follows: (1) Specify a density function f for ϕ on $[0, 1]$. (2) Draw a sample of size N from f. (3) Use the median ϕ from the simulated sample to allocated the N observations to a low-liquidity group with ϕ less than the median and a high-liquidity group with ϕ greater than the median. (4) Fix $h = h_j$ and compute average run-up in the two sub-samples using $U(\phi, h)$ from (7). For a simulated sample s, let $U_s(\overline{\phi}, h_j)$ be the average run-up for the high-liquidity group and let $U_s(\underline{\phi}, h_j)$ be the average run-up for the low-liquidity group. (5) Repeat the simulation $S = 5,000$ times and compute overall averages: $U_S(\underline{\phi}, h_j) = (1/S)\sum_s U_s(\underline{\phi}, h_j)$ and $U_S(\overline{\phi}, h_j) = (1/S)\sum_s U_s(\overline{\phi}, h_j)$. (6) For a given f, repeat steps (2) through (5) for $h_j \in \{3, 4, 5, \ldots, 99, 100\}$.

A. Liquidity $\phi \sim \mathbf{N}(0.5, 0.1)$ truncated at 0 and 1.



B. Liquidity $\phi \sim \mathbf{N}(0.7, 0.1)$ truncated at 0 and 1.

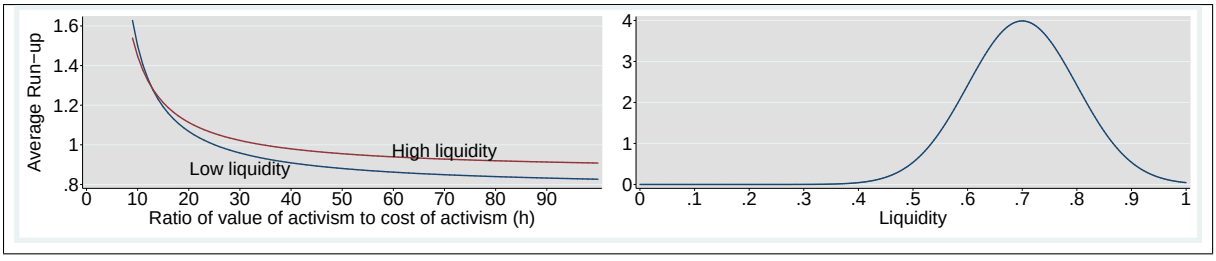


Table 1
Dissident shareholder types and purpose of shareholder activism

The Table categorizes shareholder activists by type and purpose. Information on dissident shareholder types is from the SEC filings and Factiva news searches. The classification of the purpose of activism is based on what the activist has stated in the SEC filing. The sample period is 1994 through the third quarter of 2007. Included in the sample are firms listed with common shares on NYSE, AMEX, or Nasdaq. The sample is also restricted to firms that have information on market capitalization and book-to-market ratio in the year prior to the activism-year.

A. Dissident shareholder type	
Hedge funds	149
Industrial owners	111
Shareholder committees	108
Individual investors	52
Institutional investors and investment companies	39
Workers unions	29
Others	19
Total	507
B. Stated purpose of activism (categories may overlap)	
Change in the board of directors	397
Change in corporate governance, including voting procedures	190
Change in business strategy	170
Removal of takeover defense	137
Sale of target assets or sale of target company	133
Tender offer or informal expression of interest	118
Improvement in operating efficiency	102
Chance in the compensation of CEO or directors	91
Change in payout policy (dividend or stock repurchase)	64
Replacement of the CEO	63
Prevention of acquisition or merger with another company	40
Change in capital structure (debt-equity ratio)	31
Prevention of take-over	21
Suggestion of a specific means of financing	10

Table 2
Fraction of firms that experience shareholder activism grouped by liquidity and past performance: 1994–2007

The Table reports the frequency of shareholder activism grouped by past performance and liquidity. A firm experiences shareholder activism if a non-management shareholder or group of shareholders file a shareholder proposal or a contested solicitation through EDGAR. In each Panel of the Table, firm-years are sorted into deciles based on past performance and into two groups based on Amihud illiquidity. Both Panels report the proportion of shareholder activism events relative to the total number of firm-years in each group created by intersecting the ten past performance sorts and the two liquidity sorts. In Panel A, past performance is measured as the difference between the annual return on the common stock of firm i and the annual return on the value-weighted CRSP NYSE/AMEX/Nasdaq index (the market index). The performance is measured in year $t-1$ relative to the year of shareholder activism. Amihud illiquidity for year t is measured as the average monthly illiquidity, where monthly illiquidity is computed as in equation (1). The *most* liquid firms are firms with a below median value on the Amihud illiquidity measure. The *least* liquid firms are firms with an above median Amihud measure. In Panel A, liquidity is measured over year $(t-2)$ relative to the year of the activism. In Panel B, past performance is measured as the difference between the two-year holding period return for firm i and the two-year holding period return on the market index. Holding period returns are measured over years $t-2$ through $t-1$ relative to the activism-year. Liquidity is measured over year $(t-3)$ relative to the year of the activism. The sample period is 1994 through the third quarter of 2007. Included in the sample are firms listed with common shares on NYSE, AMEX, or Nasdaq. The sample is also restricted to firms that have information on market capitalization and book-to-market ratio in the year prior to the activism-year.

	Past performance deciles									
	Low	2	3	4	5	6	7	8	9	High
A. Past performance measured in period $t-1$										
Fraction of the *most* liquid firms in year $t-2$	1.21	0.98	1.22	0.95	0.71	0.84	0.83	0.50	0.51	0.24
Fraction of the *least* liquid firms in year $t-2$	0.86	0.84	0.88	0.76	0.78	0.65	0.75	0.92	0.64	0.27
B. Past performance measured over periods $t-2$ through $t-1$										
Fraction of the *most* liquid firms in year $t-3$	1.46	1.31	0.93	1.03	1.00	0.94	0.58	0.65	0.46	0.33
Fraction of the *least* liquid firms in year $t-3$	0.93	0.96	0.62	0.83	1.05	0.44	0.54	0.59	0.62	0.48

Table 3
Firm characteristics for firms that experience shareholder activism and for firms that do not experience shareholder activism: 1994–2007

The Table compares characteristics of firms that experience shareholder activism with the characteristics firms that do not experience shareholder activism. A firm experiences shareholder activism if a non-management shareholder or group of shareholders file a shareholder proposal or a contested solicitation through EDGAR. Abnormal return $\text{PERF}_{(t-1)}$ is measured as the difference between the annual return on the common stock of firm i and the return on the CRSP NYSE/AMEX/Nasdaq index. Amihud illiquidity is defined in section 2. Institutional holding is the aggregate stockholdings of shareholders making 13F filings to the SEC. Institutional breadth is the number of institutional investors that have reported ownership through 13F filings normalized with the total number of institutional owners reporting in a given year. Log(Market cap) is the natural logarithm of the end-of-December market capitalization. Book-to-market ratio is the book value of equity divided by the market value of equity. Log(Sales) is the natural logarithm of the dollar value of sales. Cash is cash and marketable securities divided by total assets. Dividend yield is total dividend (common dividend plus preferred dividend) divided by market value of common equity plus book value of preferred equity. Book value of preferred equity is the first non-missing value when using redemption value, liquidating value, and the carrying value in that order. R&D is research and development expenses divided by total assets. If R&D expenses are missing from Compustat it is assumed to be zero. All variables that are ratios based on Compustat data (book-to-market ratio, Cash, dividend yield, and R&D) are trimmed by removing the lower and higher 0.005 percentile (i.e, 1% of the observations.), except R&D which is trimmed only at the upper tail. The sample period is 1994 through the third quarter of 2007. Included in the sample are firms listed with common share on NYSE, AMEX, or Nasdaq. The sample is also restricted to firms that have information on market capitalization and book-to-market ratio in the year prior to the activism-year.

Variable	Firm-years with activism	Firm-years without activism	Mean activism	Mean no-activism	No activism less activism	t-value
Abnormal return, $\text{PERF}_{(t-1)}$	499	70,248	-0.125	0.064	0.192	7.84
Amihud illiquidity$_{(t-2)}$	450	58,295	0.020	0.043	0.023	5.61
Institutional holding$_{(t-1)}$	464	70,183	0.421	0.350	-0.071	-5.60
Institutional breadth$_{(t-1)}$	464	70,184	0.052	0.041	-0.011	-2.73
Log(Market cap)$_{(t-1)}$	507	75,307	5.322	5.151	-0.171	-1.85
Book-to-market ratio$_{(t-1)}$	507	75,307	0.920	0.694	-0.226	-6.41
Log(Sales)$_{(t-1)}$	453	68,826	5.431	4.879	-0.552	-5.43
Dividend yield$_{(t-1)}$	459	68,812	0.019	0.012	-0.007	-0.86
Cash$_{(t-1)}$	456	68,380	0.164	0.178	0.014	1.34
R&D$_{(t-1)}$	464	70,115	0.026	0.049	0.023	2.46

Table 4
Probit model of shareholder activism: 1994–2007

The table documents the effects of independent variables on the probability of experiencing shareholder activism. All independent variables are lagged relative to the year of activism. In the column headings, $\text{PERF}_{(t-1)}$ is the abnormal return measured as the difference between the annual return on the common stock of firm i and the return on the CRSP NYSE/AMEX/Nasdaq index (the market index.) $\text{PERF}_{(t-2,t-1)}$ is abnormal return measured as the difference between the two-year holding period return for firm i and the two-year holding period return on the market index. Amihud illiquidity is defined in section 2. When performance is measured using $\text{PERF}_{(t-1)}$, liquidity is measured over year $(t-2)$ relative to the year of activism. Liquidity is a dummy variable that equals one if the firm is among the 50% most liquid firms, using the Amihud illiquidity measure, and zero otherwise. When performance is measured using $\text{PERF}_{(t-2,t-1)}$, liquidity is measured over years $(t-4)$ through $(t-3)$ relative to the year of activism and liquidity is a dummy variable that equals one if the firm was among the 50% most liquid firms in both years $(t-4)$ and $(t-3)$. The dummy variable equals zero if the firm was among the 50% least liquid firms in both years. If a firm moves between "most liquid" and "least liquid" between the years $(t-4)$ and $(t-3)$, the observation is dropped. The other explanatory variables are defined in Table 3. The sample period is 1994 through the third quarter of 2007. Parentheses contain z-values.

Model	(1)	(2)	(3)	(4)
Performance measure	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$
Performance	−0.12 (−2.97)	−0.08 (−3.06)	−0.04 (−0.96)	−0.02 (−0.66)
Performance×Liquidity dummy			−0.20 (−3.16)	−0.14 (−2.12)
Liquidity dummy			−0.02 (−0.30)	0.11 (1.49)
Aggregate Amihud illiquidity$_{(t-1)}$	−2.63 (−3.58)	−2.35 (−3.07)	−2.65 (−3.39)	−2.77 (−3.06)
Institutional holding$_{(t-1)}$	0.31 (4.61)	0.33 (4.60)	0.31 (4.24)	0.37 (3.59)
Institutional breadth$_{(t-1)}$	0.77 (2.12)	0.80 (2.17)	1.08 (2.88)	1.36 (3.22)
Log(Market cap)$_{(t-1)}$	−0.06 (−2.76)	−0.05 (−2.39)	−0.06 (−2.72)	−0.10 (−3.31)
Book-to-market ratio$_{(t-1)}$	0.13 (5.27)	0.11 (4.49)	0.13 (4.95)	0.11 (3.65)
Log(Sales)$_{(t-1)}$	0.05 (2.61)	0.03 (1.85)	0.03 (1.77)	0.03 (1.44)
Dividend yield$_{(t-1)}$	0.15 (1.31)	0.14 (1.25)	0.15 (1.14)	−0.72 (−0.80)
Cash$_{(t-1)}$	0.23 (2.04)	0.19 (1.62)	0.15 (1.25)	0.08 (0.49)
R&D$_{(t-1)}$	−0.27 (−1.03)	−0.20 (−0.72)	−0.20 (−0.72)	−0.13 (−0.38)
Intercept	−2.56 (−28.23)	−2.52 (−27.10)	−2.43 (−23.50)	−2.30 (−18.12)
Mean interaction effect			−0.0043	−0.0035
Mean z-value for interaction effect			[−2.74]	[−2.22]
Number of observations	63,591	57,959	52,609	37,907
Number of activism events	447	422	402	308
Pseudo R^2	0.026	0.022	0.025	0.027

Table 5
Probit model of shareholder activism for firms targeted in acquisition attempts and firms not targeted in acquisition attempts: 1994–2007

The table documents the effects of independent variables on the probability of experiencing shareholder activism. All independent variables are lagged relative to the year of activism. In the column headings, $\text{PERF}_{(t-1)}$ is abnormal return measured as the difference between the annual return on the common stock of firm i and the return on the CRSP NYSE/AMEX/Nasdaq index (the market index.) $\text{PERF}_{(t-2,t-1)}$ is abnormal return measured as the difference between the two-year holding period return for firm i and the two-year holding period return on the market index. Amihud illiquidity is defined in section 2. When performance is measured using $\text{PERF}_{(t-1)}$, liquidity is measured over year $(t-2)$ relative to the year of activism. Liquidity is a dummy variable that equals one if the firm is among the 50% most liquid firms, using the Amihud illiquidity measure, and zero otherwise. When performance is measured using $\text{PERF}_{(t-2,t-1)}$, liquidity is measured over years $(t-4)$ through $(t-3)$ relative to the year of activism and liquidity is a dummy variable that equals one if the firm was among the 50% most liquid firms in both years $(t-4)$ and $(t-3)$. The dummy variable equals zero if the firm was among the 50% least liquid firms in both years. If a firm moves between "most liquid" and "least liquid" between the years $(t-4)$ and $(t-3)$, the observation is dropped. The other explanatory variables are defined in Table 3. A firm is classified as being targeted in an acquisition attempt if a bidder has made a tender offer, approached the bidder using a "bear hug," or expressed a more informal interest in the target firm (a "causal pass.") Panel A reports results from probit regressions that include event-firms not classified as targeted in an acquisition attempt. Regressions in Panel B only includes event-firms classified as targeted in an acquisition attempt. The sample period is 1994 through the third quarter of 2007. Parentheses contain z-values.

Model	(1)	(2)	(3)	(4)
Performance measure	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$
A. Non-acquisition related shareholder activism				
Performance	−0.10 (−2.27)	−0.09 (−3.25)	−0.03 (−0.65)	−0.03 (−0.99)
Performance×Liquidity dummy			−0.23 (−3.14)	−0.18 (−3.19)
Liquidity dummy			−0.04 (−0.71)	0.05 (0.61)
Aggregate Amihud illiquidity$_{(t-1)}$	−2.99 (−3.58)	−2.66 (−3.06)	−2.98 (−3.34)	−2.81 (−2.73)
Institutional holding$_{(t-1)}$	0.22 (2.91)	0.23 (2.92)	0.23 (2.81)	0.35 (3.10)
Institutional breadth$_{(t-1)}$	0.81 (1.92)	0.79 (1.84)	1.12 (2.61)	1.36 (2.81)
Log(Market cap)$_{(t-1)}$	−0.05 (−2.10)	−0.04 (−1.50)	−0.05 (−1.82)	−0.08 (−2.46)
Book-to-market ratio$_{(t-1)}$	0.13 (4.92)	0.11 (4.05)	0.13 (4.55)	0.10 (2.92)
Log(Sales)$_{(t-1)}$	0.03 (1.52)	0.01 (0.66)	0.01 (0.64)	0.01 (0.40)
Dividend yield$_{(t-1)}$	−0.20 (−0.87)	−0.18 (−0.88)	−0.30 (−1.44)	−0.77 (−0.70)
Cash$_{(t-1)}$	0.28 (2.30)	0.24 (1.88)	0.22 (1.62)	0.14 (0.79)
R&D$_{(t-1)}$	−0.52 (−1.77)	−0.51 (−1.65)	−0.51 (−1.64)	−0.36 (−0.95)
Intercept	−2.56 (−25.79)	−2.53 (−25.00)	−2.44 (−21.68)	−2.34 (−16.83)
Mean interaction effect			−0.0036	−0.0034
Mean z-value for interaction effect			[−2.64]	[−2.70]
Number of observations	63,482	57,857	52,509	37,829
Number of activism events	338	320	302	230
Pseudo R^2	0.022	0.020	0.023	0.026

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Model	(1)	(2)	(3)	(4)
Performance measure	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$
B. Acquisition related shareholder activism				
Performance	−0.19 (−3.26)	−0.04 (−0.91)	−0.12 (−1.83)	0.01 (1.13)
Performance×Liquidity dummy			−0.04 (−0.43)	−0.06 (−0.58)
Liquidity dummy			0.07 (0.68)	0.22 (1.68)
Aggregate Amihud illiquidity$_{(t-1)}$	−0.98 (−0.82)	−0.94 (−0.74)	−1.11 (−0.86)	−1.78 (−1.24)
Institutional holding$_{(t-1)}$	0.44 (4.18)	0.45 (4.05)	0.41 (3.72)	0.37 (2.05)
Institutional breadth$_{(t-1)}$	0.28 (0.51)	0.44 (0.77)	0.53 (0.91)	1.00 (1.54)
Log(Market cap)$_{(t-1)}$	−0.07 (−1.91)	−0.09 (−2.28)	−0.10 (−2.55)	−0.13 (−2.55)
Book-to-market ratio$_{(t-1)}$	0.08 (2.00)	0.08 (1.99)	0.08 (2.03)	0.11 (2.17)
Log(Sales)$_{(t-1)}$	0.10 (3.30)	0.11 (3.30)	0.11 (3.34)	0.09 (2.57)
Dividend yield$_{(t-1)}$	0.30 (2.57)	0.29 (2.46)	0.32 (2.41)	−0.54 (−0.44)
Cash$_{(t-1)}$	−0.03 (−0.15)	−0.08 (−0.35)	−0.15 (−0.67)	−0.22 (−0.81)
R&D$_{(t-1)}$	0.58 (1.35)	0.82 (1.81)	0.81 (1.84)	0.57 (1.00)
Intercept	−3.37 (−20.88)	−3.31 (−19.49)	−3.25 (−17.39)	−3.04 (−13.58)
Mean interaction effect			−0.0004	−0.0004
Mean z-value for interaction effect			[−0.67]	[−0.56]
Number of observations	63,253	57,639	52,307	37,677
Number of activism events	109	102	100	78
Pseudo R^2	0.044	0.038	0.041	0.034

Table 6
Probit model of shareholder activism using event-firms and corresponding control firms selected based on propensity score: 1994–2007

The table documents the interaction effect of past performance and liquidity on the probability of experiencing shareholder activism. For each event-firm, the m firms that are closest to the event-firm in terms of propensity score are selected as control firms. The Table reports results for $m = 1, 2$. The propensity score is the conditional probability of observing shareholder activism given the set of control variables from equation (3). The conditional probability is estimated using a probit model. Using event-firms and control firms, the interaction effect of past performance and liquidity is estimated, as a second step regression, using the model in equation (3). Liquidity, Column, and Panel headings are defined and explained in Table 5. A firm is classified as being targeted in an acquisition attempt if a bidder has made a tender offer, approached the bidder using a "bear hug," or expressed a more informal interest in the target firm (a "causal pass"). Panel A reports the interaction effect for event-firms not classified as targeted in an acquisition attempt. Panel B only includes event-firms classified as targeted in an acquisition attempt. The sample period is 1994 through the third quarter of 2007. Parentheses contain z-values.

	Two non-event firms per event firm ($m = 2$)		One non-event firm per event firm ($m = 1$)	
Model	(1)	(2)	(3)	(4)
Performance measure	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$
A. Non-acquisition related shareholder activism				
Mean interaction effect	−0.1251	−0.1405	−0.1398	−0.1566
Mean z-value for interaction effect	[−2.11]	[−3.23]	[−1.75]	[−2.71]
Number of observations	906	690	604	460
Number of activism events	302	230	302	230
B. Acquisition related shareholder activism				
Mean interaction effect	−0.0614	−0.0534	−0.0165	−0.0699
Mean z-value for interaction effect	[−0.52]	[−0.87]	[−0.10]	[−0.94]
Number of observations	300	234	200	156
Number of activism events	100	78	100	78

Table 7
Probit model of shareholder activism for firms targeted in acquisition attempts and firms not targeted in acquisition attempts using turnover and proportional quoted spread as liquidity measures: 1994–2007

The table documents how independent variables effect the probability of experiencing activism. All independent variables are lagged relative to the year of activism. In the column headings, $\text{PERF}_{(t-1)}$ is the abnormal return measured as the difference between the annual return on the common stock of firm i and the return on the CRSP NYSE/AMEX/Nasdaq index (the market index.) $\text{PERF}_{(t-2,t-1)}$ is abnormal return measured as the difference between the two-year holding period return for firm i and the two-year holding period return on the market index. Share turnover and proportional quoted spread are defined in section 2. When performance is measured using $\text{PERF}_{(t-1)}$, liquidity is measured over year $(t-2)$ relative to the year of activism. Liquidity is a dummy variable that equals one if the firm is among the 50% most liquid firms and zero otherwise. When performance is measured using $\text{PERF}_{(t-2,t-1)}$, liquidity is measured over years $(t-4)$ through $(t-3)$ relative to the year of activism and liquidity is a dummy variable that equals one if the firm was among the 50% most liquid firms in both years $(t-4)$ and $(t-3)$. The dummy variable equals zero if the firm was among the 50% least liquid firms in both years. If a firm moves between "most liquid" and "least liquid" between the years $(t-4)$ and $(t-3)$, the observation is dropped. A firm is classified as being targeted in an acquisition attempt if a bidder has made a tender offer or expressed a more informal interest in the target firm through a "causal pass" or a "bear hug." The sample period is 1994 through the third quarter of 2007. Parentheses contain z-values.

	Turnover		Proportional quoted spread	
Model	(1)	(2)	(3)	(4)
Performance measure	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$	$\text{PERF}_{(t-1)}$	$\text{PERF}_{(t-2,t-1)}$
A. Non-acquisition related shareholder activism				
Mean interaction effect	−0.0026	−0.0035	−0.0011	−0.0042
Mean z-value for interaction effect	[−1.98]	[−2.92]	[−0.95]	[−2.87]
Number of observations	58,045	39,743	64,338	40,049
Number of activism events	324	237	317	216
B. Acquisition related shareholder activism				
Mean interaction effect	−0.0002	0.0005	−0.0011	−0.0014
Mean z-value for interaction effect	[−0.11]	[0.58]	[−1.71]	[−1.95]
Number of observations	57,823	39,581	64,119	39,897
Number of activism events	102	75	98	64

Table 8
Run-up and announcement period cumulative abnormal return associated with shareholder activism announcements

The Table documents abnormal stock return during a 29-day period prior to the announcement of shareholder activism (the "run-up period") and for the two-day period ending with the announcement day (the "announcement period"). The date of the public announcement is identified as the earliest of the date of the first SEC filing and the date on which a solicitation is first mentioned in news sources covered by Factiva. Pre-announcement period run-up return and announcement period abnormal return for firm i are computed using the following market model:

$$r_{it} = \alpha_i + \beta_i r_{mt} + \sum_{j=1}^{2} \delta_{ij} d_{jt} + \epsilon_{it},$$

where r_{it} is the continuously compounded daily excess return on firm i and r_{mt} is the continuously compounded daily excess return on the CRSP value-weighted NYSE/AMEX/Nasdaq market portfolio. The dummy variable d_{1t} takes on a value of one on trading days -30 through -2 relative to the announcement day, d_{2t} equals one on trading day -1 and on the announcement day. The estimation period is 378 trading days, starting on trading day -252 relative to the announcement date and ending on trading day $+126$ relative to the announcement date. The *most* liquid firms are firms with a below median value on the Amihud illiquidity measure. The *least* liquid firms are firms with an above median Amihud measure. Amihud illiquidity is defined in section 2. The columns with heading $[-30, -2]$ reports the cross-sectional average of $29 \times \hat{\delta}_{i1}$. The columns with heading $[-1, 0]$ reports the cross-sectional average of $2 \times \hat{\delta}_{i2}$. Under the null hypothesis of zero abnormal return, the reported z-statistic converge in distribution to the standard normal. The sample period is 1994 through the third quarter of 2007.

		Run-up period		Announcement period	
	N	$[-30, -2]$	z-stat.	$[-1, 0]$	z-stat.
A. Non-acquisition related shareholder activism					
All	385	0.0286	3.58	0.0300	12.75
The *most* liquid firms in year $t-2$	181	−0.0013	1.20	0.0278	7.97
The *least* liquid firms in year $t-2$	159	0.0646	3.98	0.0399	9.53
B. Acquisition related shareholder activism					
All	118	−0.0002	0.45	0.1441	40.25
The *most* liquid firms in year $t-2$	69	0.0085	0.56	0.1875	43.33
The *least* liquid firms in year $t-2$	37	−0.0431	−0.92	0.0879	9.56

Table 9
Run-up and announcement period cumulative abnormal return for liquid and illiquid firms experiencing non-acquisition related shareholder activism

The Table reports the results from the regression:

$$\omega_j \times \hat{\delta}_{ij} = \theta_0 + \theta_1 D_i^{\text{liq}} + \theta_2' \, \mathrm{X}_i + \epsilon_i,$$

where $\hat{\delta}_{ij}$ is the event-window abnormal return estimated as described in Table 8, ω_j is the number of days in event-window j, D_i^{liq} is a dummy variable that equals one if the firm is among the 50% most liquid firms, using the Amihud illiquidity measure, and zero otherwise. Liquidity is measured over year $(t-2)$ relative to the year of activism. The vector X_i is a set of control variables measure in year $t-1$ relative to the year of activism. For each firm with liquidity below the median (illiquid firms), a matching firm is chosen from the set of liquid firms. Matching firms are chosen based on a propensity score. The propensity score is estimated using a probit regression with an "illiquidity" dummy, computed as $1 - D_i^{\text{liq}}$, as the dependent variable and X_i as explanatory variables. The table reports three sets of regressions: "Close matches", "Medium matches", and "Distant matches". For "Distant matches," a liquid firm is selected for all the 136 available illiquid firms, resulting in 272 observations. For "Medium matches," the propensity scores of illiquid firms and liquid firms are restricted to be so "close" that the sample of available illiquid/liquid firm pairs is reduced by 40 observations. For "Close matches," the propensity score restriction reduces the sample with another 40 illiquid/liquid firm pairs. The columns with heading $[-30,-2]$ report regressions with the 29-day stock price run-up as the dependent variable. The columns with heading $[-2,0]$ report regressions with the two-day announcement period abnormal return as the dependent variable. The sample period is 1994 through the third quarter of 2007.

	A. Close matches		**B. Medium matches**		**C. Distant matches**	
	$[-30,-2]$	$[-1,0]$	$[-30,-2]$	$[-1,0]$	$[-30,-2]$	$[-1,0]$
Liquidity dummy$_{(t-2)}$	−0.08 (−2.13)	−0.03 (−2.09)	−0.09 (−2.60)	−0.03 (−1.92)	−0.08 (−2.57)	−0.02 (−1.48)
Performance, PERF$_{(t-1)}$	−0.00 (−0.09)	−0.03 (−1.24)	−0.03 (−0.92)	−0.03 (−2.13)	−0.02 (−0.83)	−0.03 (−3.11)
Institutional holding$_{(t-1)}$	3.42 (1.30)	0.70 (0.60)	2.84 (2.21)	0.01 (0.01)	1.16 (1.93)	−0.15 (−0.64)
Institutional breadth$_{(t-1)}$	−0.02 (−0.23)	−0.02 (−0.40)	0.02 (0.33)	−0.01 (−0.25)	0.05 (0.95)	0.01 (0.33)
Log(Market cap)$_{(t-1)}$	−0.05 (−1.74)	0.02 (1.29)	−0.06 (−2.57)	0.01 (0.91)	−0.03 (−2.01)	0.00 (0.60)
Book-to-market ratio$_{(t-1)}$	0.00 (0.15)	0.03 (2.34)	−0.00 (−0.19)	0.02 (2.76)	0.02 (1.37)	0.01 (2.36)
Log(Sales)$_{(t-1)}$	0.00 (0.14)	0.00 (0.28)	0.01 (0.96)	0.01 (1.30)	0.02 (1.41)	0.00 (0.26)
Dividend yield$_{(t-1)}$	−1.70 (−1.21)	−1.13 (−1.82)	−0.12 (−0.14)	−0.41 (−1.17)	0.47 (0.90)	0.19 (0.94)
Cash$_{(t-1)}$	0.22 (2.36)	0.02 (0.59)	0.08 (1.19)	0.01 (0.49)	0.09 (1.53)	0.01 (0.45)
R&D$_{(t-1)}$	−1.54 (−3.65)	0.12 (0.63)	−0.45 (−2.23)	0.20 (2.38)	−0.23 (−1.22)	0.17 (2.32)
Intercept	0.26 (1.42)	−0.09 (−1.11)	0.20 (2.08)	−0.06 (−1.59)	0.06 (0.87)	−0.01 (−0.38)
Number of observations	$56 \times 2 = 112$		$96 \times 2 = 202$		$136 \times 2 = 272$	

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