Motivated Monitors:
The Importance of Institutional Investors' Portfolio Weights[☆]

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Eliezer M. Fich
LeBow College of Business
Drexel University
Philadelphia, PA 19104, USA
+1-215-895-2304
efich@drexel.edu

Jarrad Harford
Foster School of Business
University of Washington
Seattle, WA 98195, USA
+1-206-543-4796
jarrad@uw.edu

Anh L. Tran
Cass Business School
City University London
London, EC1Y 8TZ, UK
+44-207-040-5109
anh.tran@city.ac.uk

Abstract

We hypothesize that institutional monitoring will be greatest when the target firm represents a significant allocation of funds in the institution's portfolio. We show that this measure is important in reconciling mixed findings for total institutional ownership in the prior literature. The results indicate that our measure of institutional holdings leads to greater bid completion rates, higher premiums and lower acquirer returns. This empirical evidence provides support for theories predicting a beneficial effect of blockholders in monitoring the firm in general and in enhancing the gains to takeover targets in particular.

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1. Introduction

The importance of large shareholders has been long recognized in the finance literature. Shleifer and Vishny (1986) propose large shareholders as a solution to the free-rider problem of Grossman and Hart (1980). Yet, despite Shleifer and Vishny's explicit prediction that large shareholders can facilitate acquisitions even if they do not initiate them, unambiguous empirical evidence of such a role is absent from the literature, even when focusing on institutional blockholdings.[1] Most studies now treat institutional ownership in a realized or potential target as a control variable which is routinely associated with target premiums that are either positive (Edmans, Goldstein and Jiang, 2012, and Gaspar, Massa and Matos, 2005), insignificant (Bargeron, Schlingemann, Stulz and Zutter, 2008 and Ayers, Lefanowicz and Robinson, 2003), or negative (Huang, 2011, and Stulz, Walkling and Song, 1990).[2]

However, when institutions have multiple holdings across firms, they accrue differing benefits to monitoring effort across firms as well. While an institution may hold a block in a given firm, that firm may represent a small part of the institution's total portfolio. A shareholder, institutional or otherwise, will focus its efforts on its largest holdings. When institutions have differing portfolio weights on an individual firm, total institutional ownership is a noisy measure of the underlying variable of interest: how much of the firm is held by institutions for which this is a significant holding?

[1] Recent studies examine the role of specific institutions in special situations. For example, Officer, Ozbas and Sensoy (2010) document that institutional ownership and premiums are positively correlated in the particular context of club deals (situations in which two or more private equity firms jointly sponsor a leveraged buyout). Likewise, Greenwood and Schor (2009) study a subset of institutions (hedge funds) that endogenously invest in a firm to force it to sell. They find that a (forced) firm that is ultimately sold exhibits good performance.

[2] The mixed results in the literature related to the effect of institutional ownership on takeover premiums obtain under different empirical specifications and alternative ways to proxy for institutional ownership and premiums.

In this paper, we assume that institutions allocate their monitoring effort to a firm based on the relative importance of the firm's stock in their portfolio. We define monitoring institutions as those whose holding value in the firm is in the top 10% of their portfolio. Using three measures based on the size of holdings by monitoring institutions in a given firm, we examine the role of institutional investors in the acquisition process. The acquisition process is an ideal laboratory to study the impact of such institutions because of their theoretically predicted role and the substantial external effects that their monitoring can generate in that setting.

Our results indicate that traditional institutional ownership proxies (measured relative to the target firm's outstanding shares) such as the number of (or the ownership by) blockholders are not related to the probability of deal completion, to the likelihood of bid revision, or to the premium offered for the target firm.

In contrast, we find that the probability of deal completion is increasing in the holdings of monitoring institutions in the target firm. A one standard deviation increase in the ownership of monitoring institutions results in a 6% higher probability of completion. Nonetheless, the presence of these interested monitoring institutions results in higher final premiums and lower acquirer returns as well. Specifically, a single standard deviation increase in their holdings leads to a 4% higher probability of a bid revision and a 2.7% higher final premium (which translates into an additional $40 million for the average deal value of $1.49 billion). The end result is an acquirer announcement return that is lower by 0.6%.

Thus as the theory predicts, these investors facilitate completion of the deal, but at terms that are more favorable than average for the target. In a way, their presence as a monitoring institution with some negotiating power produces effects similar to those found in Hartzell, Ofek and Yermack (2004). The difference is that, unlike target CEOs, they cannot be bought-off with

private benefits, so the benefits they negotiate for completion certainty accrue to all target shareholders.

Given that the terms are less favorable for the bidder, we test whether the presence of more monitoring institutions decreases the frequency of receiving a bid and find that it does. Relative to the 4% unconditional probability of receiving a bid, a standard deviation increase in monitoring institution ownership decreases the probability by 0.6%. Nonetheless, the net effect of lower bid frequency against higher premium and completion rate conditional on a bid is approximately zero in terms of the overall wealth impact on firm shareholders (as shown by unconditional premium regressions following Comment and Schwert (1995)). This evidence is consistent with the expected effect of monitoring institutions being incorporated into the price of the firms they monitor.

We show that these results hold accounting for the endogeneity of the shares owned by monitoring institutions, as well as controlling for the traditional measures of institutional ownership. We conclude that, as theory predicts, institutional investors are important to the outcome of an acquisition bid. However, due to limited resources and attention, these effects are only present when the stockholdings themselves are an important part of the institution's portfolio. Thus our contribution comes both from suggesting a better measure of the relevant stakes for activist monitoring in a firm and from demonstrating the net impact of such monitors on the acquisition process.

Our paper is related to work by Brickley, Lease and Smith (1988), Bushee (1998), Chen, Harford and Li (2007), and Cronqvist and Fahlenbrach (2009). All of those authors focus on heterogeneity in institutional investors to identify which institutions are more likely to play an active monitoring role. Our work also contributes to the vast literature on mergers and

acquisitions, particularly papers that study the role of institutional investors in the process (e.g. Huang, 2011) and those that examine the relative bargaining power of the parties (e.g. Ahern, 2012).

Our study proceeds as follows. We develop our hypothesis in section 2. In section 3 we describe our sample and the variables we use to examine institutional ownership. Section 4 presents our empirical analyses and section 5 discusses additional tests we carry out in order to assess the robustness of our results. Section 6 contains our conclusions. The Appendix provides the definition of all the variables we use in this study.

2. Hypothesis development

Monitoring costs include the costs of gathering information, analyzing it, and acting on it, including the costs of influencing others (be they the firm managers or other shareholders). Institutions can find it beneficial to become specialized monitors. That is, the internalizable monitoring benefit to their larger and potentially longer-term investments can outweigh the costs of gathering information and acting on it. However, unless they hold their portfolio firms in equal proportion, they will not exert equal monitoring effort across their holdings. Just as the fact that they hold more shares than the atomistic investor makes it beneficial for them to monitor at all, the fact that they invest more of their funds in some firms makes it relatively more beneficial for them to monitor those firms. Moreover, due to limited attention (or limited resources), it makes sense for investors to allocate more effort to the largest positions in their portfolios. As a result, their monitoring activities will be higher for firms in which they have invested a larger fraction of their portfolio.

Thus, we have our primary hypothesis, which is that monitoring activities in a given firm will be increasing in the importance of that firm to the institutions that hold it.

For a given firm, we will use the term monitoring institutions to refer to those institutions investing a significant fraction of their portfolio in that firm. We test our primary hypothesis in the context of acquisitions. We predict that monitoring institutions will facilitate completion of an acquisition bid. They can do this either by voting or tendering their shares for the merger or by pressuring target managers to accept the bid.

The effect of monitoring institutions on the premium is ambiguous. They may facilitate more deals, including some lower premium deals that may have been otherwise successfully resisted by entrenched target managers. Conversely, their size and active interest may mitigate the coordination problem among target shareholders, allowing institutions to bargain for a higher premium. Nonetheless, in a model that controls for the other determinants of the premium, the incremental effect of the monitoring institutions should be to increase the final premium. Thus, we predict that, ceteris paribus, monitoring institutions increase the premium.

The bargaining of the monitoring institutions is predicted to increase the premium to target shareholders, but should not increase the net synergies to the deal, which are determined by the operational fit of the acquirer and target. If monitoring institutions successfully bargain for more of the gains from the merger for target shareholders, then the net effect on acquirer shareholders will be negative. Thus, we predict that the incremental effect of the presence of monitoring institutions on acquirer announcement returns is negative.

Taken alone, the prediction that monitoring institutions will facilitate bid completion would also imply that there should be more bids for firms with monitoring institutions. However, the prediction that these institutions will also influence the bargaining over the value of the

synergies has the opposite implication for attracting bids in the first place. Thus, the presence of monitoring institutions has an ambiguous effect on the probability of being targeted. To explore these issues in greater detail, we conduct a number of multivariate analyses with data which is described in the next section.

3. Sample formation and institutional ownership variables

This section details the sample of mergers and acquisition (M&A) bids we analyze as well as the proxies we use to track the ownership by institutional investors in the target firms we study.

3.1. Sample overview

We start with 7,292 M&A offers tracked by the Securities Data Company (SDC) announced during 1984-2011 in which both the target and the acquirer are publicly traded U.S. companies with a transaction value of at least $1 million. Our sample begins in 1984 because Chen, Harford and Li (2007) note that the M&A information in SDC is incomplete before 1984. Following Moeller, Schlingemann and Stulz (2004) and Masulis, Wang and Xie (2007), this initial sample excludes spinoffs, recapitalizations, exchange offers, repurchases, self-tenders, privatizations, acquisitions of remaining interest, partial interests or assets, and transactions whose value relative to the bidder's market capitalization at the fiscal year end prior to the merger announcement is less than 1%. We keep 3,377 deals in which targets and acquirers have stock market and accounting data available from the Center for Research in Security Prices (CRSP) and from Compustat, respectively. We exclude transactions without coverage for the target company from the Thomson-Reuters Institutional Holdings 13F database (formerly known as CDA/Spectrum). This database contains ownership information by institutional managers with

greater than $100 million of equity securities under discretionary management; common stock positions greater than 10,000 shares or those valued at least $200,000. These criteria yield our final sample of 1,601 deals.

Panel A of Table 1 provides the temporal and industrial distribution of our sample. We note that the annual number of bids declines at the beginning of our sample and also during 2008-2009 which coincide with periods of economic contraction. Conversely, the number of transactions is higher during the 1998 to 2001 period of economic expansion when the stock market valuation is higher. The temporal distribution of our sample is in line with the merger activity reported in numerous prior studies. The industrial distribution of our sample targets is based on the Fama and French (1997) classification. Targets are well scattered across several industries with two exceptions. The Business Services (which includes software) and the Banking sectors exhibit some clustering with just over 12% and 21% of the target firms belonging to those industries, respectively. Moreover, targets in the Banking, Insurance, Real Estate and Trading (which, broadly defined, correspond to the Financial industry) account for over 27% of the observations. While most studies typically exclude the Financial industry, there were two merger waves in that industry during our sample period, accounting for its high representation. Nonetheless, because of the high concentration of targets in the Financial sector, in robustness tests we verify that our results are not driven by firms that belong to this industry.

Panel B of Table 1 reports the deal and target characteristics in our sample.[3] Our summary statistics are similar in most important respects to the samples used elsewhere in the M&A literature. Among the 1,601 bids we analyze, about 18% are tender offers. This incidence compares favorably to that in Huang (2011). His sample of acquisitions during 1980-2008

[3] We provide a full definition of these variables in the Appendix.

consists of 18% tender offers. Just over 91% of transactions in our sample consist of friendly mergers. This frequency also resembles that in Officer's (2003) study of mergers during 1988-2000. The deals we study have a completion rate of just over 83%, which is similar to that of 84.6% in Gaspar, Massa, and Matos's (2005) M&A study of transactions during 1980-1999. Over 33% of the offers in our sample are paid in cash. This incidence is comparable to that of 35% in Officer (2003). In 33.4% of our transactions, both the target and the bidder operate in different industries and exhibit a mean relative size of about 34.8%. These statistics are comparable to those in Duchin and Schmidt (2013). For their 1980-2009 M&A sample, they report an incidence of 36.5% of transactions in which the parties to the deal operate in different industries and a mean relative size of 37.9%. Our sample targets exhibit an average Tobin's Q of 1.83. For a similar ratio, Bargeron, Schlingemann, Stulz, and Zutter (2008) report a mean value of 1.55 for the targets they study. The mean leverage for our target firms is slightly above 21% which is comparable to that of 20% in Cai and Sevilir (2012).

3.2. Measures of institutional ownership

Panel A in Table 2 reports summary statistics for different measures of institutional ownership. The first five rows in the table provide institutional ownership measured *relative to the target firms' shares outstanding* which are the metrics most often used in the literature. Targets in our sample have an average of 1.5 blockholders and these blockholders account for about 5.5% of all institutions holding the target's shares. Blockholders are defined as institutions owning at least 5% of the target's shares. The mean (median) target equity ownership by blockholders in our sample is 12.66% (9.16%). On average, the largest shareholding by an institution is just over 8%. For a similar measure, Chen, Harford and Li (2007) report an average of 7.1%. We find that the top five institutions (in terms of ownership) control approximately

21% of the target's shares. Comparably, Hartzell and Starks (2003) report that the top five institutions in their sample control about 22% of the firm's stock.

Panel A also presents our proposed measures of institutional ownership. These measures capture the *relative importance of the target firm to the institutional investor*. As argued earlier, we hypothesize that monitoring activities in a given target firm will be increasing in the importance of that firm to the institutions that hold it. Based on this conjecture, we define *monitoring institutions* as those whose holding value in the target firm is in the top 10% of their portfolio.[4] On average, targets in our sample are held by 4 institutions classified as monitoring institutions and they account for only 2.4% of all institutions holding the target shares. The mean total target equity ownership by monitoring institutions is 6.83%. The last three rows of panel A summarize the number, proportion and ownership of monitoring institutions in a firm, conditional on there being at least one monitoring institution present. There are 696 targets for which this is the case. When monitoring institutions are present, the median number of monitors in the same firm is 3 and they represent about 5% of the institutions holding the firm. They control about 11% of the target at the median and 16% at the mean.

Panel A shows important differences between the traditional blockholder metrics and our monitoring institutions measures. For instance, the distribution of the number of monitoring institutions is remarkably different from that for the number of blockholders. The latter variable exhibits a lower mean, a higher median, and a much lower standard deviation. Likewise, total ownership by institutional investors exceeds the total ownership by monitoring institutions in terms of both the mean and the median. These distributional differences are also evident when

[4] All of our results continue to hold when we change the holding value threshold in the target to be in the top 5% of the institution's portfolio.

we look at the annual decomposition of the traditional blockholder and our proposed monitoring institutions variables in Panel B of Table 2.[5]

To offer a perspective from the institutional investors' side, the last two rows of Panel A of Table 2 present statistic related to the 4,155 institutions that hold equity in our target firms. At the median, almost 11 positions (which may not necessarily include a sample target) are considered monitored according to our definition. These positions represent just over 40 percent of the institution's portfolio value.

4. Institutional monitoring during acquisitions

In order to study the effect of (and possible oversight exerted by) monitoring institutions we perform a number of multivariate tests. The definitions for all of the variables used in these analyses are provided in the Appendix.

4.1. Deal completion

We first examine the relation between institutional ownership and deal completion. In Table 3, we report the estimation of four variants of a logit model in which the dependent variable equals one for completed deals and zero for withdrawn deals. Officer (2003) estimates a similar model. Therefore, except for the controls for institutional ownership, all independent variables in our regressions are similar to his. To account for the role of institutional investors, all the tests in Table 3 control for total institutional blockholder ownership in the target firm. In addition, in models (2), (3), and (4) we respectively add the number of monitoring institutions,

[5] We note that an alternative way to measure the importance of a position in an institution's portfolio would be to use the dollar value of such position. To estimate this dollar value one would multiply the percentage of the firm's equity the institution owns by the firm's market value. To capture this, in some of our multivariate tests, we use the percentage of equity in the target owned by the institutional investor as the key independent variable while controlling for the target's size.

the proportion of monitoring institutions, and the total ownership of monitoring institutions as control variables.

We note that the blockholder variable –an often-used proxy to control for institutional ownership in the literature– does not attain statistical significance in any of the tests reported in Table 3. In contrast, all of our proxies for monitoring institutions exhibit positive and statistically significant coefficients which imply a non-trivial effect on the likelihood that the deal materializes. For example, according to the marginal effect in model (4), a one standard deviation increase in ownership by monitoring institutions is associated with a 6.01 percentage point increase in the probability of deal completion.

Results for the other independent variables in Table 3 are consistent with those in the existing M&A literature. For example, transactions in our sample are about 19.5 percentage points more likely to complete if there is a target termination fee. This marginal effect is close to that of 17 percentage points that Officer (2003) estimates for the same variable. Tender offers are 8.34 percentage points more likely to go through, as are mergers in which the parties to the transaction are in the same industry. Comment and Schwert (1995) and Schwert (2000) argue that deal attitude is crucial for mergers to be completed. This is certainly true in our sample: Deals characterized as hostile are 38.6 percentage points less likely to be completed.

4.2. Bid revisions

An analysis of the bid revisions for the transactions in our sample provides a test of the potential monitoring by institutional investors and the effect of such oversight on the wealth of shareholders. We define a bid revision as the percent difference between the initial and final bid

premium offered for the target firm as recorded by SDC.[6] We note that 161 (or 10.05%) of the bids in our sample suffer a revision. This incidence is similar to that of 10.32% in Bates, Lemmon and Linck (2006).

In Table 4, we estimate five bid revision logit regressions similar to those in Bates, Lemmon and Linck (2006). The dependent variable is set to one in model (1) if there is any bid revision, in model (2) if the bid is revised downward, and in models (3)-(5) if the bid is revised upward. The variables used to control for institutional ownership are similar to those we use in the deal completion tests.

Our bid revision regressions indicate that the total ownership by blockholders is not related to any of our dependent variables. Conversely, all of our proxies for institutional monitoring are associated with increases in the bid premium offered to the target firms. According to the marginal effect we estimate in model (3), a one standard deviation increase in ownership by monitoring institutions increases the probability of an upward bid premium revision by 5.2 percentage points. We note that the same monitoring institution variable is unrelated to the probability that the initial bid is revised downward.[7] The results in Table 4 appear consistent with our hypothesis that institutions are more likely to monitor a firm when it becomes a takeover target –particularly when the firm is an important holding in the institution's portfolio.

4.3. Acquisition premiums

If a takeover target represents a key holding in an institution's portfolio which leads this investor to intensify its monitoring, then we may observe such effect in the premium offered to

[6] We cannot observe any bid revisions that are privately negotiated before the initial bid is publicly announced.
[7] In unreported tests we find that none of our other proxies for monitoring institutions (described in Table 2) are related to downward bid revisions. Likewise, none of the traditional blockholding or institutional ownership measures are related to any type of bid premium revisions.

the target. Therefore, we examine the role of both the traditional and our proposed measure of institutional ownership on the acquisition premiums. Before performing this analysis, we note that firms are unlikely to receive an acquisition bid by chance. Consequently, in Panel A of Table 5, we estimate four logit regressions of the probability of becoming an acquisition target using 154,227 firm-year observations during 1983-2011. In all tests, the dependent variable is set to one if the firm becomes a takeover target and is set to zero otherwise. Our specification augments those in Palepu (1986) due to the inclusion of our controls for institutional ownership.

The results in Panel A indicate that total institutional blockholder ownership has no significant effect on the probability of becoming a target. In contrast, all of our monitoring institutions' proxies attain negative and significant coefficients. The marginal effect we estimate in model (4) of Panel A indicates that a single standard deviation increase in ownership by monitoring institutions lowers the likelihood of becoming a target by 0.6%. To put this result in perspective, the unconditional probability of becoming a target in the sample analyzed in Panel A of Table 5 is 4.41%. One potential interpretation of this result is that a firm that is operating efficiently (due to the oversight of monitoring institutions) is less likely to be disciplined by the takeover market. However, without an analysis of the merger premiums offered to firms with monitoring institutions (which we conduct next) the foregoing conjecture cannot be fully substantiated.

Following the two-step procedure suggested in Heckman (1979) we address issues related to self-selection because firms do not randomly become acquisition targets. Therefore, we estimate an inverse Mill's ratio from each of the four models in Panel A in Table 5 and respectively use them as additional controls in the four premium regressions we report in Panel B of Table 5. These regressions include year- and industry-fixed effects and use the four-week

premium reported by SDC as the dependent variable.[8] Our target premium tests closely follow the specification in Bargeron, Schlingemann, Stulz, and Zutter (2008). In model (1), the main independent variable is the total ownership held by blockholders in the target firm. In model (2), (3), and (4) the independent variables of interest are the number of monitoring institutions, the proportion of monitoring institutions, and the total ownership of monitoring institutions, respectively.

We note that the estimates for several control variables in Table 5 are in agreement with the existing M&A literature. For example, we find acquisition premiums to be higher in deals characterized as tender offers (Bates, Lemmon and Linck, 2006). Premiums also increase when the transaction includes a target termination fee (Officer, 2003), when there are competing bids (Gaspar, Massa and Matos, 2005), and when cash is used as the sole medium to pay for the consideration (Aktas, de Bodt and Roll, 2010). In contrast, acquisition premiums are inversely related to the size of the target firm (Bargeron, Schlingemann, Stulz, and Zutter, 2008), to the relative size of the parties (Cai and Sevilir, 2012), and also decline when the transaction is characterized as a merger of equals (Wulf, 2004, and Wang and Xie, 2009).

More importantly, the coefficient for the blockholder variable is not statistically significant in any of the premium regressions reported in Panel B of Table 5. However, the same tests document an economically important positive association between all of our monitoring institutions proxies and the takeover premiums. According to the estimates in model (4), increasing the ownership of monitoring institutions by one standard deviation translates into a premium increase of 2.72 percentage points. For the average transaction in our sample, this increase represents an additional $40.4 million in terms of deal value for the target shareholders.

[8] Following Officer (2003), we limit the premium to values between 0 and 2 (or 200%).

These results support our view that institutions do monitor targets, particularly when targets account for an important holding in the institutions' portfolios.[9]

4.4. Unconditional premiums

In their study of poison pills, Comment and Schwert (1995, p.30) argue that "The estimated effect of antitakeover measures on the unconditional premium is of interest because it is a net effect of a decrease in the premium if antitakeover devices deter offers and an increase if they increase premiums in successful takeovers." Unlike poison pills, institutional ownership is not an antitakeover device. Nevertheless, the tests in Panel A of Table 5 suggest that monitoring institutions deter takeover offers as we find an inverse association between these institutions and the probability that a firm becomes a takeover target. At the same time, in Panel B of Table 5 we find that monitoring institutions are associated with higher takeover premiums. To examine the net effect of these institutions in the gains to target shareholders we use the method in Comment and Schwert (1995) to estimate *unconditional* premium regressions. We run these tests, which are reported in Table 6, in a sample of 154,227 firm-years with data available from CRSP and Compustat during 1983-2011. As in Comment and Schwert, we set the premium to zero in nontakeover firm-years. Our unconditional premium regressions control for institutional ownership in a manner similar to that in previous multivariate tests.

The estimates in Table 6 show that the unconditional premium is not a statistically significant function of either the blockholder variable or our monitoring institutions proxies. Therefore, together with our earlier results, the tests in Table 6 suggest that the net effect of lower bid frequency against higher premium and completion rate conditional on a bid is

[9] We also examine smaller portfolio holdings by defining a "low attention" position if the target firm is in the bottom 10% of the institution's portfolio. In a premium regression similar to that reported as model (4) of Panel B in Table 5, the coefficient estimate for the total ownership of low attention institutions is 0.0545 (*p*-value=0.3295).

approximately zero in terms of the overall wealth impact on target shareholders. This evidence suggests that monitoring institutions are relevant—their effect is already incorporated into the price of the firms they monitor. Further, since the positive impact of the monitoring institutions is priced, the increase in premium we find conditional on a bid underestimates their full impact on firm value. Thus, the 2.7% higher premium for a one standard deviation increase in monitoring institutions' holdings can be viewed as a conservative estimate of their value impact.

4.5. Endogeneity

Recent work by Giannetti and Simonov (2006) shows that institutions appear reluctant to invest in companies with weak corporate governance. Their findings suggest that even if institutions are able and motivated (due to higher stockholdings) to monitor a firm, they prefer to invest in companies in which monitoring may not be necessary. Under a similar logic and in our setting, it is possible that institutions raise their shareholdings in firms that are likely to be acquired or are particularly likely to earn higher premiums if they become acquisition targets. Under any of these possibilities, causality runs in the opposite direction and our assertion that the higher deal completion probabilities and takeover premiums we observe obtain due to the influence of monitoring institutions would be incorrect.

To address the endogeneity problem just described, we employ a fuzzy regression discontinuity design approach in the context of an instrumental variable (IV) estimation similar to that Schmidt (2012) and Crane, Michenaud and Weston (2012).[10] Following their empirical scheme, our identification strategy exploits the nature of the Russell index composition and annual reconstitution. Every year in June, the largest 1,000 firms (in terms of market capitalization) are selected to make up the Russell 1000 index and the next 2,000 firms are

[10] See, Lee and Lemieux (2010) for technical details on the regression discontinuity design (RDD) approach in general and Roberts and Whited (2012) for a primer on the fuzzy RDD in particular.

included in the Russell 2000 index. Since both indices are value-weighted, institutions tracking them will have to adjust their holdings in particular firms when these companies switch from one index to the other, enter one of the indices for the first time, or leave an index. These adjustments are likely to create a non-trivial exogenous discontinuity in a firm's ownership structure. Indeed, Chang and Hong (2012) find that firms that are first included in the Russell 2000 index experience higher returns after the index is reconstituted. Those authors argue that this phenomenon is due to price pressure that results from higher institutional demand for the new Russell 2000 stocks.

To evaluate the causal relationship between monitoring institutions and bid premiums we use an IV approach based on the changes in holdings by these institutions upon index reconstitutions. These changes in holdings are likely to change the number, proportion, and total ownership of the monitoring institutions in our sample.

To implement the IV estimator, we first regress changes in the number of monitoring institutions on a set of instruments and control variables. As in Schmidt (2012), the instruments consist of discrete changes (dummy variables to indicate index switches, index departures, and index entrances) and continuous changes tracked by differences in the annual Russell Rankings. We employ the methods outlined by Staiger and Stock (1997) to test the validity of these instruments.

For the first stage test, we use 154,227 firm-year observations with data available from both CRSP and Compustat during 1983-2011. During this period, we track 31,407 changes related to a Russell 1000/2000 reconstitution as follows: 4,041 firms (or 2.6%) switch from the 1000 to the 2000 index, 19,348 are removed from the 2000 index, 2,237 switch from the 2000 to the 1000 index, and 5,781 are newly added to the 2000 index. For our purposes, the annual

Russell 1000/2000 index reconstitutions *directly* affect 216 of our 1,601 sample targets as follows: 32 switch from the 1000 to the 2000 index, 99 are removed from the 2000 index, 24 switch from the 2000 to the 1000 index, and 61 are new additions to the 2000 index. It is important to note that some targets firms that are not directly affected by these changes could be *indirectly* impacted by index reconstitutions involving other (index) firms that are held in the portfolio of the same institutional investors. In other words, the weight of a target firm in the institution's portfolio could change due to changes in weights of non-portfolio firms directly affected by an index reconstitution.

The first stage regression of the change in the number monitoring institutions is reported as model (1) in Table 7. We calculate changes in the number of monitoring institutions from the end of the third quarter in year *t-1* to the end of the third quarter in year *t* because index reconstitutions occur annually at the end of May/beginning of June.[11] According to the estimates, if a firm switches from the Russell 1000 last year to the Russell 2000 in the current year, the ownership by monitoring institutions declines by about 1%. A switch in the opposite direction, however, is associated with an increase in ownership of 0.38%. These findings are broadly consistent with Schmidt (2012), who uses switches to the Russell 2000 to identify exogenous increases in passive investors.

In the second-stage test, the fitted value for the change in the number of monitoring institutions becomes the key explanatory variable in the premium regression reported in model (2) of Table 7.[12] The coefficient for the instrumented variable of the change in the number of

[11] According to this time line, deals in our sample announced in the fourth quarter occur in year *t* whereas those announced anytime during the first three quarters occur in year *t+1*.

[12] The standard errors in this regression are adjusted for the fact that the instrumental variable for monitoring institutions is estimated. See Roberts and Whited (2012) for a discussion of this issue.

monitoring institutions is positive and statistically significant.[13] This finding indicates that firms that become a top holding in an institution's portfolio (due to Russell index reconstitutions) receive higher takeover premiums. This result suggests that these monitoring investors are responsible for the higher premium and, therefore, mitigates the concern that causality runs in the opposite direction. The results in Table 7, which exploit the exogenous nature of the Russell index reconstitutions, also alleviate the concern that some institutions in our sample somehow have the ability to predict or anticipate takeovers which, in turn, leads these investors to overweight certain firms in their portfolios. Moreover, the index reconstitutions results also cast doubt on the idea that our results are mostly driven by institutions that purposely overweight certain positions (relative to a benchmark). Indeed, our IV analyses suggest that an exogenous shock to an institution's portfolio weights (and not a pre-determined investment strategy) appear to induce the institutions to monitor portfolio positions that experience an increase in weight.[14]

We employ a similar empirical procedure to instrument for the proportion of monitoring institutions as well as for the total ownership of monitoring institutions. The second stage results for these proxies, which are respectively reported as models (4) and (6) in Table 7, also suggest

[13] Our instrument for the change in monitoring institutions comes from index changes. When companies drop out of (or enter) a Russell index, indexing and quasi-indexing investors would have to rebalance their portfolios by selling (or buying) the affected firms. Affected firms may therefore experience a change in the institutions that hold their stock. Because of this, all firms (affected or not) might change in terms of their weight and relative importance to the institutions that hold them. Consequently, our instrument satisfies the *relevancy condition* because index changes are correlated with changes in monitoring institutions. Since inclusion in the Russell indices is based on market capitalization, variations in index membership are not random, but correlated with changes in market capitalization. Nonetheless, a firm's index membership becomes random when controlling for differences in market capitalization. In this setting, our change in the number monitoring institutions instrument satisfies the *exclusion restriction* because it is conditionally random: it consists of the change in index membership conditional on changes in market capitalization. As in Schmidt (2012), controls for the change in market capitalization include a continuous measure tracking how many rankings the raw market capitalization changed (Δ Ranking in Russell$_{(t-1,\,t)}$) and its squared term, respectively.

[14] Nevertheless, the IV tests do not rule out the possibility that some targets are held by certain "types" of institutions and that we are just picking up targets with large weights in the portfolios of those institutions. Ideally, this issue could be addressed econometrically by including institutions' fixed effects in our analyses. We note, however, that this is not feasible since we have over 4,000 institutions holding shares in 1,601 targets. Nonetheless, in Section 5 we study the effect of institutions based on their propensity to monitor (passive vs. active types) as in Bushee (1998) and also based on their independence from the firm's management (pressure sensitive vs. pressure resistant types) as in Brickley et al. (1985).

that monitoring institutions cause target firms to earn higher premiums. Overall, the results in Table 7 support the hypothesis that institutional monitoring will be greatest when the target firm represents a significant allocation of funds in the institution's portfolio.

4.6. Acquirer returns

To test whether monitoring institutions of the target firm affect the returns to acquirers, in Table 8, we run four ordinary least squares (OLS) regressions of the three-day merger announcement cumulative abnormal return (CAR) meeting the bidders in our sample. This CAR is centered on the acquisition announcement day. We follow the M&A literature in order to properly specify our acquirer return regressions. Therefore, all models in Table 8 control for variables similar to those in the acquirer return tests performed by Moeller, Schlingemann, and Stulz (2004) and by Masulis, Wang, and Xie (2007). In our acquirer return tests, we expand the specification in those studies by including our proxies for institutional ownership.

The estimates in Table 8 indicate that acquirer returns decrease in our target monitoring institutions proxies. Using the estimate in model (4), a one standard deviation increase in the ownership of monitoring institutions is associated with a 0.62% decrease in the return to the acquirer. This drop implies a value decline of over $79 million for the average bidder in our sample with a market capitalization of $12.7 billion. Together with the results from our bid premium regressions, our acquirer return tests indicate that monitoring institutions increase the bargaining power or effort of the target managers, resulting in them negotiating a bigger "piece of the pie" for their shareholders.

Our results show that M&A deals in which there is oversight by monitoring institutions of the target firm exhibit a transfer of some of the synergy gain from acquirer shareholders to target shareholders. The fact that the ownership structure of the target firm affects the gains to

the acquirer is potentially important because it raises the possibility that cross-ownership by institutions can account for this result. We address this issue in one of the additional tests provided in the next section.

5. Additional analyses

In this section, we perform a number of additional tests in order to probe the reliability of the reported findings, assess the robustness of our results, and consider alternative explanations.

5.1. Acquisition premium and acquirer return alternatives

The regressions presented in Table 5 Panel B use the four-week premium reported by SDC as the dependent variable. In untabulated analyses, we re-estimate the same regressions using three different premium measures as dependent variables. The first is the target's CAR during the window (-20, +1) relative to the announcement date as in Jarrell and Poulsen (1989). Our second measure follows Schwert (1996) and uses the target's CAR during the window (-42, +126). Our third measure uses the "combined" merger premium defined in Officer (2003) as the dependent variable.[15] The results of the regressions that use the three alternative measures also document a positive and economically important association between monitoring institutions and the takeover premium. For instance, raising the total ownership of monitoring institutions by one standard deviation is associated with an increase of 3.32% in the combined premium.

We also estimate several regressions similar to those reported in Table 8. In these tests we follow the procedure in Masulis Wang, and Xie (2007) and replace the acquirer's return (-1,

[15] Specifically, following Officer (2003), we first estimate a premium based on component data using the aggregate value of cash, stock, and other securities offered by the bidder to target shareholders as reported by SDC. We then estimate premiums based on initial price and final price data, respectively. These prices are also reported by SDC. All premium measures are then deflated by the target's market value 42 trading days prior to the bid announcement. The combined premium is based on the component measure if it is greater than zero and less than two. Otherwise, the premium relies on the initial price measure (or on the final price measure if initial price data are missing).

+1) with the CAR accruing to the bidder on deal announcement during the (-2, +2) and (-5, +5) windows. Looking at Panel A of Table 9, we note that the coefficients for the total ownership of monitoring institutions in the target firm are still negatively related to the acquirer's return as measured during these alternative windows. In contrast, estimates for the target blockholder variable do not attain statistical significance at conventional levels.

5.2. Excluding targets in the financial industry

As noted earlier, just over one fifth of the targets in our sample operate in the Financial sector (see Panel A of Table 1). Although all of our multivariate tests include industry fixed-effects, we check whether our results hold if we remove these targets from our regressions. The tests in Panels B and C of Table 9 exclude targets operating in the Financial industry from the analysis. In Panel B of Table 9 we report the coefficients for our monitoring institutions variables from premium regressions similar to those reported in Panel B of Table 5. As with the earlier results, all variables exhibit positive and significant coefficients. Panel C of Table 9 reports estimates for our monitoring institution proxies from acquirer return tests that follow the specification reported in Table 8. The results in Panel C of Table 9 continue to document an inverse association between our monitoring institutions proxies and the return to the bidder firms. In general, the results in Panels B and C of Table 9 alleviate concerns that our findings are driven by observations in the Financial industry.

5.3. Corporate governance

To address concerns that monitoring institutions simply invest in targets that are better governed and, therefore, more likely to earn higher premiums, we conduct a two-part analysis similar to that in Chen, Harford and Li (2007). The first step includes estimating three (untabulated) regressions that use the number of monitoring institutions, the proportion of

monitoring institutions, and the total ownership of monitoring institutions as the respective dependent variables. The independent variables in these tests include the target's size, lagged stock return, leverage, Tobin's Q, and the Gompers, Ishii, and Metrick (2003) corporate governance index (G index).[16] As in Chen et al. the G index does not attain a statistically significant coefficient in any of our three regressions. These results do not suggest that institutional monitors tend to systematically hold shares in better performing or better governed companies.

Next, we retain the residuals from the three monitoring institutions tests we estimate in the first step described above. These residuals (which measure the abnormal level of our monitoring institutions proxies) are used as the key independent variables in premium regressions which are specified similar to those in Table 4. We report the estimates for the abnormal level of monitoring institutions variables in Panel D of Table 9. These coefficients capture the oversight role by monitoring institutions that is purged from the effect of either the governance or the performance of the target firm. We find that the abnormal monitoring institutions estimates are positive and significantly associated with the bid premium. These findings (in tandem with those from the endogeneity tests in Table 7) assuage the concern that our results are the byproduct of institutional monitors investing according to the better governance or the superior performance of the target firms.

5.4. Cross-holdings

Our results show that institutions for which the target constitutes a top ten holding are associated with higher premiums paid for the targets and with lower acquirer returns. Matvos and Ostrovsky (2008) argue that gains on target shares held by the bidder's institutional investors

[16] These tests include 464 deals for which governance data (G-index) for the target firms are available from Risk Metrics.

more than offset their losses on bidder shares. To consider this possibility, for each target in our sample, we perform a shareholder-by-shareholder analysis. This test shows that monitoring institutions do not generally hold shares of the bidder firm, and in the few cases in which they do, they tend to have very small stakes. These results are consistent with the findings on cross-holdings of Harford, Jenter and Li (2011), who show that it is uncommon for cross-holding institutions to have large stakes in both the bidder and target. Given this, it is unlikely that cross-holdings explain our results. Nonetheless, we rerun our target premium and acquirer return tests controlling for the presence of cross-holdings. Such control does not alter our results.

5.5. Alternative blockholder measures

In all of our multivariate tests we use total ownership by blockholders in the target firm to control for the holdings by institutions measured relative to the target firm's outstanding shares. This variable fails to achieve statistical significance in our analyses. We repeat all of our multivariate tests replacing the blockholder ownership with (i) the number of blockholders, (ii) the proportion of blockholders, (iii) the ownership by the largest five institutions, and (iv) the ownership of the largest institution. None of these alternative measures of institutional ownership in the target firm attain significant coefficients. In contrast, our monitoring institution proxies continue to obtain statistically significant estimates in all tests.

We note that proxy (iii) above is similar to one of the two measures put forth by Hartzell and Starks (2003). They find that this measure as well as the Herfindahl index of institutional fractional holdings (which they refer to as institutional concentration) is related to the pay-for-performance of managerial compensation. We use their Herfindahl index measure as the key independent variable in a premium regression (similar to those in Table 5 Panel B). The coefficient estimate for this variable is 0.0325 with an associated *p*-value of 0.5572.

5.6. Banding rule affecting index reconstitutions

Chang, Hong and Liskovich (2013) note that, after 2007, Russell Inc. followed a more complicated rule to limit switching around the upper cut-off of the Russell 2000. Essentially, a stock could only change indices if it moved far enough beyond the 1000 cut-off. Under this rule known as "banding," if two stocks (on the periphery of the threshold) are supposed to switch places in year *t*, Russell may leave them in their *t-1* index if the market value differential is small.

Due to the banding rule, we repeat the tests presented in Table 7 excluding all deals that occur on or after 2007. All of our results continue to hold. The (untabulated) coefficients for the parameter estimates of the second stage premium regressions related to the Δ in the number of monitoring institutions, the Δ in the proportion of monitoring institutions, and the Δ in the total ownership of monitoring institutions are 0.53 (*p*-value = 0.02), 25.95 (*p*-value = 0.01) and 3.31 (*p*-value = 0.01), respectively.

5.7. Dedicated vs. passive investors

Studies by Brickley, Lease, and Smith (1988), Bushee (1998), Hartzell and Starks (2003), and Schmidt (2012) (amongst others) investigate whether institutional investors exert effort to influence management. Although the evidence on this issue is mixed, a reasonable conclusion from these papers is that some –but not all– institutional investors appear to influence management on some corporate activities (such as antitakeover amendments, R&D investment decisions, and CEO compensation). Based on this literature and because institutional investors tend to have a particular focus, we identify institutions more likely to undertake a monitoring role. Bushee (1998) classifies institutions into three groups—dedicated, quasi-indexer, and transient—based on their past investment patterns in the areas of portfolio turnover,

diversification, and momentum trading. While transient institutions are not expected to exert effort to influence managers, dedicated institutions (and perhaps quasi-indexers) are more likely to perform the full monitoring role of gathering information and attempting to influence managers. To consider this possibility, we refine our tests by developing a measure that intersects our monitoring institutions proxies with those classified by Bushee's method as dedicated and quasi-indexer investors. We use this measure to identify transactions in which the target firm is held by monitoring institutions and also by institutions with investment styles suited to monitoring activities. With this information, we estimate a regression by expanding model 4 in Panel B of Table 5 as follows:

$$\text{Merger premium} = \text{Total ownership of monitoring institutions} + \text{Dedicated (0,1)} + \textit{Total ownership of monitoring institutions} \times \textit{Dedicated (0,1)} + \text{Control variables} \quad (1)$$

In this regression, the variable Dedicated (0,1) is set to "1" when at least one monitoring institution holding the target's shares is classified as dedicated or quasi-indexer and is set to "0" otherwise. The coefficient on the interaction term is 0.4176 (p-value = 0.0461). According to this coefficient, a one standard deviation increase in the total ownership of monitoring institutions when at least one is a dedicated investor is related to a 5.10% increase in the merger premium. Thus, the effect of monitoring institutions strengthens whenever they are also dedicated investors.

5.8. Pressure sensitive institutions

Brickley, Lease and Smith (1988) note that some institutions are not really independent of management because they are linked to a portfolio firm through other business activities. Because insurance companies, banks, and nonbank trusts are more likely to be susceptible to management's influence, those authors define them to be pressure sensitive institutions.

To assess the effect of potential pressure exerted by the target's management on an institution holding the target's shares, we expand the specification of the premium tests reported in Table 5 to estimate the following (untabulated) regression:

Merger premium = Total ownership of monitoring institutions + Independent institutions (0,1) +

Total ownership of monitoring institutions × *Independent institutions (0,1)* + Other controls (2)

In this test, the dummy variable is set to "1" when at least one monitoring institution holding the target's shares is classified as an independent institution (using the definition in Chen, Harford, and Li (2007) that adjusts the classification in Brickley *et al.* to fit the Spectrum dataset taxonomy). Thus, independent institutions include investment companies (from Spectrum type 3 institutions), investment advisors (from Spectrum type 4 institutions), and public pension funds, foundations, and endowments (from Spectrum type 5 institutions).

The coefficient on the interaction term in the above model is 0.5432 (p=0.0653). A one standard deviation increase in the total ownership of monitoring institutions in the presence of at least one independent institution is associated with a premium increase of 0.1221 x 0.5265 = 6.63%.

5.9. Monitoring institutions that are also blockholders

The rationale for our monitoring institution measure is that their motivation to exert influence on management increases with the size of their shareholdings in a given firm. The rationale for the 5%-blockholding measures traditionally used in the literature is that firms must pay attention to their largest shareholders. Put differently, blockholders have the *power* to influence management whereas monitoring institutions have an *incentive* to do so. To study potential differences between institutions with power and those with incentives, we test whether

one of these characteristics dominates the other and also estimate their joint effect. The joint effect is of interest because it could provide evidence of coordination between investors with an incentive to monitor and those with the power to influence management. To capture this, we estimate the following variant of model 4 in Panel B of Table 5:

Merger premium = Total ownership of monitoring institutions + Number of blockholders +

Total ownership of monitoring institutions × *Number of blockholders* + Controls (3)

In the above specification, the coefficient on the interaction term is 0.0183 (*p*-value = 0.7717). As with our tabulated analyses, the standalone coefficient for the monitoring institutions variable is positive and statistically significant whereas that for the blockholder variable is not statistically different from zero. These results suggest that the incentive to monitor trumps the power to influence management and that their joint effect is negligible during takeovers.[17]

5.10. Monitoring institutions of the acquirer

Just as institutions monitor targets in which they have significant holdings, acquirers could be susceptible to similar oversight by their own monitoring institutions. A possible caveat with this conjecture, however, is that most of the bargaining power improvements that would come from shareholder action would be on the target side. With this issue in mind, we recalculate our premium and acquirer return regressions including an additional explanatory variable: a (0,1) dummy variable set to "1" whenever the acquirer shares are held by at least one monitoring institution. The dummy is set to "0" otherwise. All of our results are robust to the inclusion of this control. Moreover, the dummy variable does not attain significant coefficients in either the premium or the acquirer return regressions.

[17] We also redefined blockholder to be equal to 1 only when one of the monitoring institutions is also a blockholder. The interaction term is still insignificant.

5.11. Investors' horizon

Gaspar *et al.* (2005) maintain that shareholders with a longer investment horizon have bigger incentives to monitor. They argue that, in firms with long-term investors, managers are less likely to trade off shareholder returns for their own personal benefit. To test this conjecture, they examine whether investment horizon affects the gains to shareholders in takeover target firms. To proxy for investor horizon, Gaspar *et al.* use the target firm's investor turnover arguing that this variable likely captures the particularly long investment horizon of certain activist institutions or short investment horizon of merger arbitrageurs. The results in Gaspar *et al.* suggest that long-term shareholders (i.e., those that exhibit low turnover) in the target enhance the premium paid to buy that firm.

Based on the work by Gaspar *et al.*, we classify an institution as low-turnover if its average portfolio churn rate over the four most recent quarters (immediately preceding the merger announcement) is in the bottom 33rd percentile of the distribution of all institutions covered in the 13F database at the quarter end.[18] We use this classification to define a dummy variable which we set to "1" if at least one monitoring institution is also a low-turnover (long investment horizon) institution and set to '0" otherwise. With this dummy we expand the specification presented in Table 5 (Model 4 of Panel B) and run the following regression:

Merger premium = Total ownership of monitoring institutions + Low-turnover (0,1) + *Total ownership of monitoring institutions* × *Low-turnover (0,1)* + Control variables (4)

The parameter estimate on the interaction term is 0.3914 (*p*-value = 0.0587). This coefficient implies that a one standard deviation increase in the total ownership of monitoring

[18] As in Gaspar *et al.* (2005), to calculate the churn rate we measure how frequently each institutional investor rotates the positions on all the portfolio stocks during this period.

institutions when at least one is classified as low-turnover is related to a 4.78% increase in the merger premium. This result suggests that, whenever their investment horizon is long, the impact of monitoring institutions intensifies.

5.12. Active share

Equity fund managers can outperform their fund's benchmark by taking positions that are different from those in the benchmark. Based on this premise, Cremers and Petajisto (2009) define Active Share as the portion of portfolio holdings that differs from the benchmark index holdings. Their results show that mutual funds with the highest Active Share significantly outperform their benchmarks. To evaluate to role of Active Share in our setting, we classify an institution to be active if its Active Share is in the top 33rd percentile of the distribution of all institutions tracked in the 13F database during the last quarter ending prior to the acquisition announcement.[19] We use this definition to define an indicator variable which is equal to "1" if at least one monitoring institution is also classified as active. The indicator is equal to "0" otherwise. With this variable we estimate the following OLS model:

Merger premium = Total ownership of monitoring institutions + Active (0,1) + *Total ownership of monitoring institutions* × *Active (0,1)* + Control variables (5)

The results of regression (5) suggest that the effect of monitoring institutions is stronger if they are also classified as active investors. The estimate on the interaction term is 0.3702 (*p*-value = 0.0409). According to this coefficient, raising the total ownership of monitoring institutions by a single standard deviation when at least one institution is classified as active is associated with a 4.52% increase in the merger premium.

[19] This classification is analogous to that used by Cremers and Petajisto (2009).

6. Summary and conclusions

Several studies theorize that through activism, intervention and monitoring, large shareholders (such as institutional investors) can enhance the value of the firm (Shleifer and Vishny, 1986; Maug, 1998; Kahn and Winton, 1998). Nonetheless, empirical evidence on the purported role of institutions in improving shareholder wealth is mixed. In a survey of the literature, Holderness (2003) asserts that with the exception of the form (and level) of executive compensation, few major corporate decisions have been shown to be different in the presence of blockholders. He notes that academic studies have not definitely established whether the impact of blockholders on firm value is positive or negative. We argue that the lack of academic consensus in assessing the impact of institutional ownership on shareholder wealth stems from the way the ownership is typically measured. Specifically, most studies track institutional ownership relative to a public firm's outstanding common equity. The logic behind this measure is that the more equity the institution holds, the more likely it is that the firm will pay attention to this investor. This logic, however, ignores the possibility that even if the firm has to pay attention to an institution – because the latter holds an important block of the firm's shares – the institution may not be interested in monitoring it. This could happen because, relative to the institution's own portfolio, the firm may not be an important holding.

To investigate this issue, in this paper we propose a new way to proxy for the effect of institutional investors: we measure institutional ownership relative to the institution's entire portfolio. We hypothesize that the more funds an institution invests in a given firm, the more likely the institution is to monitor that firm. Based on this premise, we define monitoring institutions as those for which the firm constitutes a top ten portfolio holding.

We test our hypotheses in the context of acquisitions. This choice is motivated by the fact that acquisitions are notable investments in which the incentives of managers and investors are not always aligned.

Our results show that in M&A transactions monitoring institutions of the target firm are associated with (i) a higher probability of deal completion, (ii) a higher bid premium offered for the target firm, (iii) an increased likelihood that the bid for the target firm is revised upward, and (iv) a lower acquirer return. These findings support the view that institutional monitoring heightens when the target firm represents a top allocation of funds in the institution's portfolio.

By proposing a better measure of the relevant shareholdings for activist investors in a firm and by showing the net impact of such monitors on M&A deals, our study has broad implications for the literature studying the effect of institutional ownership on firm value. Our findings show that our monitoring institutions proxies better capture the influence and potential activism by institutional investors. We show that a firm is likely to listen to a monitoring institution even if this investor is not a blockholder. This could happen because, otherwise, the institution will try to coordinate with other investors (in order to have its voice heard) or will sell its stake. Both of these alternatives may attract unfavorable attention to the firm and its managers.

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Table 1: M&A sample characteristics

This table describes our sample which consists of 1,601 merger and acquisition bids by U.S. bidders for U.S. targets announced during 1984-2011 and tracked in the Securities Data Company's (SDC) merger and acquisition database. We screen deals from SDC following the criteria in Moeller, Schlingemann, and Stulz (2004) and Masulis, Wang, and Xie (2007). In addition, we require that both acquirer and target firms have stock market, accounting, and institutional ownership data available from the Center for Research in Security Prices (CRSP), Compustat, and Thomson 13F, respectively. In Panel A we report the temporal and Fama and French 48 industrial distribution of the sample targets. In Panel B we report deal status, mode of acquisition, method of payment, deal attitude, deal value, and target financial characteristics. All financial variables are measured at the end of the fiscal year before the merger public announcement date and inflation-adjusted to the end of 2011.

Panel A: Temporal and industrial distribution

Year	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
Deal count	28	26	18	20	37	33	17	15	11	22
Percent	1.75	1.62	1.12	1.25	2.31	2.06	1.06	0.94	0.69	1.37
Year	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Deal count	45	56	71	77	89	158	123	120	68	82
Percent	2.81	3.5	4.43	4.81	5.56	9.87	7.68	7.5	4.25	5.12
Year	2004	2005	2006	2007	2008	2009	2010	2011		Total
Deal count	77	75	78	78	46	41	62	28		1,601
Percent	4.81	4.68	4.87	4.87	2.87	2.56	3.87	1.75		100

Industry	Count	%	Industry	Count	%
Agriculture	1	0.06	Shipbuilding, Railroad Equipment	6	0.37
Food Products	17	1.06	Defense	2	0.12
Candy & Soda	2	0.12	Precious Metals	7	0.44
Beer & Liquor	3	0.19	Industrial Metal Mining	2	0.12
Tobacco Products	1	0.06	Petroleum and Natural Gas	56	3.50
Recreation	12	0.75	Utilities	47	2.94
Entertainment	21	1.31	Communication	45	2.81
Printing and Publishing	5	0.31	Personal Services	3	0.19
Consumer Goods	20	1.25	Business Services	195	12.18
Apparel	8	0.50	Computer Hardware	94	5.87
Healthcare	28	1.75	Computer Software	86	5.37
Medical Equipment	70	4.37	Measuring and Control Equipment	46	2.87
Pharmaceutical Products	71	4.43	Business Supplies	18	1.12
Chemicals	17	1.06	Shipping Containers	5	0.31
Rubber and Plastic Products	14	0.87	Transportation	28	1.75
Textiles	5	0.31	Wholesale	28	1.75
Construction Materials	21	1.31	Retail	65	4.06
Construction	12	0.75	Restaurants, Hotels, Motels	12	0.75
Steel work	14	0.87	Banking	349	21.80
Fabricated Products	3	0.19	Insurance	36	2.25
Machinery	37	2.31	Real Estate	8	0.50
Electrical Equipment	4	0.25	Trading	52	3.25
Automobiles and Trucks	11	0.69	Others	7	0.44
Aircraft	7	0.44	Total	1,601	100

Panel B: Deal and firm characteristics

	Proportion of sample	Mean	Median
Deal characteristics			
Completed	0.8339		
Tender offer	0.1805		
Stock only	0.3042		
Cash only	0.3348		
Friendly attitude	0.9113		
Same industry	0.6658		
Deal value (US$ billion)		1.4853	0.2342
Relative size (Target/Acquirer)		0.3476	0.1188
Target characteristics			
Market value of equity (US$ billion)		0.8321	0.1155
Q		1.8331	1.2146
Leverage		0.2139	0.1547

Table 2: Targets' institutional monitoring proxies

In this table we report summary statistics of the target firms' institutional monitoring proxies: (1) commonly used in the literature and (2) proposed in this paper.

We report the 5 variables traditionally used to proxy for institutional monitoring.

1. Number of blockholders: the number of institutions whose ownership in the target is at least 5% of the target's shares outstanding
2. Proportion of blockholders: the proportion of blockholders among all institutions holding the target's shares
3. Total ownership of blockholders: the total ownership of blockholders on the target's total shares outstanding
4. Total ownership of the five largest institutions: the total share ownership controlled by the five largest institutional investors in the target
5. Ownership of the largest institution: the share ownership controlled by the largest institutional investor in the target

We assume that institutions allocate their effort to a portfolio firm (here the target firm) based on the relative importance of their holding of the target's stock in the portfolio. *We define monitoring institutions as those whose holding value in the target is in the top 10% of their portfolio.* We use 3 proxies of the target's institutional monitoring:

1. Number of monitoring institutions: the number of institutions whose holding value in the target is in the top 10% of the institution's portfolio
2. Proportion of monitoring institutions: the proportion of monitoring institutions among all institutions holding the target's shares
3. Total ownership of monitoring institutions: the total ownership of monitoring institutions as a proportion of the target's total shares outstanding

In Panel A, we report summary statistics for each institutional monitoring proxy for 1,601 sample targets and portfolio characteristics for 4,155 institutions holding shares in these targets during the last quarter end before the merger public announcement. In Panel B, we report the sample mean for each institutional monitoring proxy each year during 1984-2011.

	Mean	Median	Q1	Q3	σ
Traditional targets' institutional blockholder measures					
Number of institutional blockholders	1.4553	1.0000	0.0000	2.0000	1.4281
Proportion of institutional blockholders	0.0545	0.0196	0.0000	0.0645	0.0939
Total ownership of institutional blockholders	0.1266	0.0916	0.0000	0.1995	0.1328
Total ownership of the five largest institutions	0.2051	0.1971	0.1087	0.2880	0.1278
Ownership of the largest institution	0.0804	0.0719	0.0418	0.1024	0.0624
New target's institutional monitoring proxies					
Number of monitoring institutions	4.1224	0.0000	0.0000	2.0000	15.7879
Proportion of monitoring institutions	0.0243	0.0000	0.0000	0.0370	0.0418
Total ownership of monitoring institutions	0.0683	0.0000	0.0000	0.0913	0.1221
Conditional on at least one monitoring institution					
Number of monitoring institutions	9.4828	3.0000	1.0000	8.0000	22.8675
Proportion of monitoring institutions	0.0559	0.0424	0.0256	0.0696	0.0475
Total ownership of monitoring institutions	0.1572	0.1086	0.0534	0.2069	0.1426
Institutions' portfolio holdings					
Number of monitored portfolio companies	24.4080	10.8000	5.6000	24.5000	39.9456
Proportion of monitored portfolio market value	0.4280	0.4018	0.2960	0.5442	0.1788

Panel B: Mean institutional ownership by year

			Traditional institutional blockholder measures						Institutional monitoring proxies		
Year	Deal count	Targets with institutional blockholders	Number of institutional blockholders	Proportion of institutional blockholders	Total ownership of institutional blockholders	Total ownership of the five largest institutions	Ownership of the largest institution	Targets with monitoring institutions	Number of monitoring institutions	Proportion of monitoring institutions	Total ownership of monitoring institutions
1984	28	12	2	0.0732	0.0538	0.1224	0.0534	9	5	0.0245	0.0238
1985	26	11	1	0.0666	0.0412	0.1188	0.0489	12	6	0.0369	0.0494
1986	18	13	2	0.1387	0.1219	0.1860	0.0813	8	1	0.0309	0.0399
1987	20	10	2	0.0537	0.0681	0.1687	0.0610	11	3	0.0380	0.0626
1988	37	20	2	0.0947	0.0867	0.1618	0.0741	12	2	0.0184	0.0388
1989	33	14	1	0.0543	0.0541	0.1349	0.0620	8	10	0.0205	0.0465
1990	17	10	1	0.0277	0.0543	0.1411	0.0539	6	5	0.0177	0.0226
1991	15	8	1	0.0348	0.0579	0.1222	0.0512	4	6	0.0136	0.0397
1992	11	6	2	0.0303	0.0928	0.1655	0.0749	4	6	0.0177	0.0384
1993	22	13	1	0.0879	0.0887	0.1737	0.0812	9	3	0.0246	0.0513
1994	45	24	2	0.0526	0.0827	0.1622	0.0610	10	7	0.0146	0.0405
1995	56	40	2	0.0912	0.1208	0.2041	0.0865	21	4	0.0233	0.0631
1996	71	50	2	0.0717	0.1373	0.2191	0.0840	26	6	0.0211	0.0652
1997	77	49	2	0.0459	0.1171	0.1961	0.0772	37	8	0.0310	0.0820
1998	89	58	2	0.0702	0.1276	0.1965	0.0772	31	10	0.0234	0.0687
1999	158	106	2	0.0485	0.1178	0.1967	0.0745	80	10	0.0308	0.0803
2000	123	83	2	0.0467	0.1127	0.1877	0.0765	49	9	0.0225	0.0554
2001	120	69	2	0.0478	0.1130	0.1838	0.0792	38	9	0.0160	0.0538
2002	68	46	2	0.0684	0.1413	0.2134	0.0986	21	13	0.0156	0.0414
2003	82	59	2	0.0649	0.1509	0.2224	0.0947	31	10	0.0184	0.0604
2004	77	53	2	0.0367	0.1082	0.1927	0.0701	36	10	0.0218	0.0643
2005	75	64	3	0.0508	0.1797	0.2541	0.0907	41	13	0.0308	0.1008
2006	78	66	2	0.0370	0.1659	0.2609	0.0934	56	11	0.0339	0.1158
2007	78	63	2	0.0336	0.1581	0.2444	0.0832	41	7	0.0233	0.0796
2008	46	41	3	0.0666	0.2002	0.2756	0.1021	20	19	0.0330	0.1028
2009	41	30	3	0.0465	0.1811	0.2602	0.0991	20	21	0.0271	0.0748
2010	62	45	3	0.0297	0.1652	0.2526	0.0963	39	8	0.0245	0.0978
2011	28	22	3	0.0336	0.1509	0.2397	0.0718	16	12	0.0249	0.0793
All	1,601	1,085	2	0.0545	0.1266	0.2051	0.0804	696	9	0.0243	0.0683

Table 3: Targets' institutional monitoring and deal completion

The sample consists of 1,601 mergers and acquisitions announced during 1984-2011 described in Table 1. We run logit regressions of merger completion probability similar to those in Officer (2003). The dependent variable equals one if the proposed bid is completed. The main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Deal completion (0,1)			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	-0.4274	-0.2618	-0.6226	-1.1219
	(0.5592)	(0.7229)	(0.3992)	(0.1421)
Targets' institutional monitoring proxies				
Number of monitoring institutions		0.0167**		
		(0.0410)		
Proportion of monitoring institutions			8.8710***	
			(0.0013)	
Total ownership of monitoring institutions				3.6731***
				(0.0008)
Deal and market characteristics				
Target termination fee (0,1)	1.8983***	1.9299***	1.9286***	1.9309***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Lockup (0,1)	-0.0988	-0.0664	-0.0608	-0.0955
	(0.8676)	(0.9114)	(0.9211)	(0.8758)
Competed deal (0,1)	-2.1103***	-2.1795***	-2.1877***	-2.1789***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Toehold (0,1)	0.1946	0.1908	0.2422	0.2249
	(0.5999)	(0.6083)	(0.5165)	(0.5476)
Cash only payment (0,1)	0.0382	0.0435	0.0364	0.0528
	(0.8668)	(0.8488)	(0.8736)	(0.8183)
Stock only payment (0,1)	0.3633*	0.3432	0.3204	0.3575*
	(0.0921)	(0.1128)	(0.1401)	(0.0995)
Tender offer (0,1)	1.3448***	1.4171***	1.4085***	1.4155***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Hostile deal (0,1)	-2.1828***	-2.2419***	-2.2623***	-2.2906***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Merger of equals (0,1)	-0.7061	-0.7838	-0.7349	-0.7271
	(0.3353)	(0.2941)	(0.3274)	(0.3301)
Same industry (0,1)	0.4520**	0.4594**	0.4807**	0.4829**
	(0.0171)	(0.0158)	(0.0120)	(0.0117)
Relative size (Target / Acquirer)	-0.2665**	-0.2489**	-0.2493**	-0.2672**
	(0.0259)	(0.0375)	(0.0367)	(0.0276)
Target's size	-0.0037	-0.0828	-0.1399**	-0.1550**
	(0.9472)	(0.2066)	(0.0473)	(0.0314)
Target industry liquidity index	0.2949	0.3230	0.3264	0.3156
	(0.5242)	(0.4886)	(0.4863)	(0.5013)
One year macroeconomic change	0.0150	0.0105	0.0028	0.0157
	(0.8202)	(0.8733)	(0.9658)	(0.8113)
Constant	-0.1273	0.1724	0.5405	0.6080
	(0.9052)	(0.8734)	(0.6223)	(0.5811)
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 4: Targets' institutional monitoring and bid revision

The sample consists of 1,601 mergers and acquisitions announced during 1984-2011 described in Table 1. We run logit regressions of bid revision probability similar to those in Bates, Lemmon, and Linck (2006). The dependent variable equals one if there is a revision of the bid price in Model (1), downward price revision in Model (2), and upward revision in Models (3)-(5). The main independent variable is the total ownership of monitoring institutions in Models (1)-(3), the number of monitoring institutions in Model (4), and the proportion of monitoring institutions among all target's institutions in Model (5). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Dependent var = Bid revision (0,1)	All	Downward	Upward	Upward	Upward
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**
Total inst blockholder ownership	0.6798	-0.1866	0.7269	1.4354	1.1152
	(0.3917)	(0.8921)	(0.5371)	(0.2229)	(0.3412)
Targets' inst monitoring proxies					
Total ownership of monitor inst	1.9506**	1.0505	2.5167**		
	(0.0283)	(0.5515)	(0.0122)		
Number of monitoring inst				0.0170**	
				(0.0449)	
Proportion of monitoring inst					5.8901**
					(0.0363)
Deal and market characteristics					
Target termination fee (0,1)	-0.1247	-0.0656	-0.0553	0.0059	-0.0324
	(0.5899)	(0.8638)	(0.8466)	(0.9837)	(0.9094)
Lockup (0,1)	-1.2376	-5.7726	-0.8244	-0.5207	-0.6224
	(0.2627)	(0.8017)	(0.4746)	(0.6465)	(0.5840)
Competed deal (0,1)	1.3258***	-7.1130	2.1357***	2.1587***	2.1371***
	(0.0001)	(0.5055)	(0.0001)	(0.0001)	(0.0001)
Toehold (0,1)	0.5189	0.5456	0.4959	0.4488	0.4375
	(0.1822)	(0.3407)	(0.2960)	(0.3471)	(0.3566)
Cash only payment (0,1)	-0.1466	-0.2155	-0.1174	-0.1209	-0.1401
	(0.5864)	(0.6317)	(0.7215)	(0.7143)	(0.6703)
Stock only payment (0,1)	0.2103	-0.3209	0.5141	0.5338	0.4778
	(0.4181)	(0.4222)	(0.1200)	(0.1077)	(0.1477)
Tender offer (0,1)	0.1484	-0.5236	0.4726	0.5000	0.4950
	(0.6141)	(0.3439)	(0.1695)	(0.1465)	(0.1506)
Hostile deal (0,1)	3.7279***	2.0350***	4.0183***	4.1349***	4.0746***
	(0.0001)	(0.0011)	(0.0001)	(0.0001)	(0.0001)
Merger of equals (0,1)	-0.3710	-5.4035	-0.1635	-0.3561	-0.1538
	(0.7396)	(0.8617)	(0.8891)	(0.7655)	(0.8954)
Same industry (0,1)	0.4435*	0.0548	0.5020*	0.4738	0.4834
	(0.0592)	(0.8806)	(0.0883)	(0.1072)	(0.1004)
Relative size (Target / Acquirer)	0.0212	0.1126	-0.2017	-0.1761	-0.1752
	(0.6657)	(0.1818)	(0.4051)	(0.4288)	(0.4356)
Target's size	0.0000	-0.0001	0.0000	0.0000	0.0000
	(0.1199)	(0.3358)	(0.4362)	(0.3547)	(0.5110)
Target industry liquidity index	0.0473	-1.3563	0.5734	0.6019	0.6192
	(0.9242)	(0.1358)	(0.3380)	(0.3120)	(0.2984)
One year macroeconomic change	0.0947	0.3410**	0.0123	0.0121	0.0107
	(0.1938)	(0.0213)	(0.8931)	(0.8947)	(0.9061)
ln (Initial offer premium)	-0.1404	-0.1228	-0.1355	-0.1581	-0.1463
	(0.2256)	(0.5162)	(0.3431)	(0.2620)	(0.3026)
Constant	-10.9710	-9.6006	-11.3341	-10.9236	-11.0186
	(0.9562)	(0.9634)	(0.9568)	(0.9589)	(0.9577)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001	0.0001

Table 5: Targets' institutional monitoring and acquisition premiums

Panel A presents first stage regressions of the probability of becoming a takeover target using 154,227 firm-years with data from CRSP and Compustat during fiscal year 1983-2011. These tests are similar to those in Palepu (1986). In Panel B we estimate OLS regressions of merger premiums similar to those in Bargeron, Schlingemann, Stulz, and Zutter (2008). The dependent variable is the final offer premium reported by SDC. The main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). The sample consists of 1,601 mergers and acquisitions described in Table 1. We include the inverse Mill's ratio obtained from the first stage test to control for target self-selection (Heckman, 1979). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Probability of becoming a target

	Dependent variable = Target (0,1)			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	-0.1975	-0.2196	-0.1723	-0.0916
	(0.1747)	(0.1326)	(0.2375)	(0.5452)
Number of monitoring institutions		-0.0029**		
		(0.0372)		
Proportion of monitoring institutions			-1.2215**	
			(0.0163)	
Total ownership of monitoring institutions				-0.5465***
				(0.0099)
Size	-0.3632***	-0.3883***	-0.4011***	-0.4026***
	(0.0006)	(0.0003)	(0.0002)	(0.0002)
Q	0.0300*	0.0289*	0.0304*	0.0300*
	(0.0581)	(0.0680)	(0.0547)	(0.0591)
Leverage	0.0002	0.0121	0.0179	0.0210
	(0.9854)	(0.3551)	(0.1972)	(0.1401)
OCF	-0.1034	-0.0991	-0.1016	-0.0965
	(0.2527)	(0.2727)	(0.2611)	(0.2860)
Prior year market adjusted return	-0.0084	-0.0083	-0.0076	-0.0075
	(0.3491)	(0.3598)	(0.3970)	(0.4073)
Target Herfindahl-Hirschman Index	0.3260	0.3510	0.3453	0.3817
	(0.5727)	(0.5439)	(0.5505)	(0.5094)
Target industry liquidity index	0.3355	0.3383	0.3427	0.3363
	(0.1902)	(0.1862)	(0.1807)	(0.1890)
One year macroeconomic change	0.0084	0.0080	0.0082	0.0080
	(0.6236)	(0.6390)	(0.6311)	(0.6384)
Constant	-16.6134	-16.4400	-17.0724	-16.9135
	(0.9114)	(0.9462)	(0.9443)	(0.9445)
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	154,227	154,227	154,227	154,227
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Panel B: Targets' institutional monitoring and acquisition premiums

	Dependent variable = Acquisition premium			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	0.0621	0.0761	0.0437	0.0147
	(0.4108)	(0.3144)	(0.5625)	(0.8523)
Targets' institutional monitoring proxies				
Number of monitoring institutions		0.0015**		
		(0.0325)		
Proportion of monitoring institutions			0.9444***	
			(0.0013)	

Total ownership of monitoring institutions				0.2229**
				(0.0382)
Target characteristics				
Size	-0.0371***	-0.0445***	-0.0515***	-0.0469***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Q	0.0000	0.0000	0.0000	0.0000
	(0.9185)	(0.9610)	(0.9632)	(0.9394)
Leverage	-0.1109*	-0.1114*	-0.1070*	-0.1113*
	(0.0788)	(0.0771)	(0.0887)	(0.0773)
OCF	-0.0653	-0.0684	-0.0697	-0.0697
	(0.2129)	(0.1920)	(0.1826)	(0.1840)
Prior year market adjusted return	-0.0653***	-0.0659***	-0.0757***	-0.0698***
	(0.0002)	(0.0001)	(0.0001)	(0.0001)
Acquirer characteristics				
Q	0.0000	0.0000	0.0001	0.0000
	(0.9219)	(0.8675)	(0.7493)	(0.8307)
Leverage	0.0499	0.0550	0.0572	0.0570
	(0.5243)	(0.4827)	(0.4642)	(0.4674)
OCF	0.0394	0.0361	0.0354	0.0389
	(0.5090)	(0.5446)	(0.5522)	(0.5140)
Prior year market adjusted return	0.0202	0.0194	0.0171	0.0183
	(0.2035)	(0.2212)	(0.2805)	(0.2497)
Deal and market characteristics				
Relative size (Target / Acquirer)	-0.0173**	-0.0169**	-0.0163**	-0.0167**
	(0.0206)	(0.0236)	(0.0288)	(0.0252)
Cash only payment (0,1)	0.0528**	0.0547**	0.0548**	0.0548**
	(0.0343)	(0.0283)	(0.0279)	(0.0282)
Stock only payment (0,1)	0.0266	0.0281	0.0272	0.0295
	(0.2737)	(0.2479)	(0.2617)	(0.2255)
Tender offer (0,1)	0.0866***	0.0898***	0.0900***	0.0897***
	(0.0023)	(0.0016)	(0.0015)	(0.0016)
Hostile deal (0,1)	0.0463	0.0456	0.0418	0.0412
	(0.3279)	(0.3345)	(0.3756)	(0.3836)
Competed deal (0,1)	0.1332***	0.1295***	0.1289***	0.1319***
	(0.0002)	(0.0003)	(0.0003)	(0.0002)
Toehold (0,1)	-0.0352	-0.0339	-0.0329	-0.0345
	(0.4218)	(0.4399)	(0.4515)	(0.4318)
Target termination fee (0,1)	0.0444*	0.0499**	0.0486**	0.0469**
	(0.0539)	(0.0311)	(0.0345)	(0.0417)
Lockup (0,1)	-0.0274	-0.0244	-0.0317	-0.0313
	(0.7168)	(0.7462)	(0.6736)	(0.6783)
Same industry (0,1)	0.0196	0.0206	0.0195	0.0210
	(0.3500)	(0.3246)	(0.3498)	(0.3167)
Merger of equals (0,1)	-0.2105**	-0.2220**	-0.2169**	-0.2153**
	(0.0261)	(0.0190)	(0.0215)	(0.0228)
Target Herfindahl-Hirschman Index	-0.4117	-0.4432	-0.4379	-0.4503
	(0.2805)	(0.2451)	(0.2496)	(0.2379)
Target industry liquidity index	0.0480	0.0522	0.0512	0.0488
	(0.3537)	(0.3125)	(0.3207)	(0.3448)
One year macroeconomic change	-0.0258***	-0.0259***	-0.0266***	-0.0259***
	(0.0003)	(0.0003)	(0.0002)	(0.0003)
Constant	0.5841***	0.6012***	0.6402***	0.6249***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Heckman self-selectivity correction	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 6: Targets' institutional monitoring and unconditional premiums

This table presents unconditional premium regressions similar to those in Comment and Schwert (1995). The dependent variable is the acquisition premium reported by SDC. The premium is set to zero in non-takeover firm-years. All models use 154,227 firm-years with data available from CRSP and Compustat during fiscal year 1983-2011. The main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Acquisition premium			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	0.0000	0.0000	0.0000	0.0001
	(0.9447)	(0.9429)	(0.9449)	(0.9224)
Targets' institutional monitoring proxies				
Number of monitoring institutions		0.0000		
		(0.7717)		
Proportion of monitoring institutions			0.0006	
			(0.9699)	
Total ownership of monitoring institutions				-0.0005
				(0.8698)
Size	-0.0009***	-0.0010***	-0.0009**	-0.0009***
	(0.0052)	(0.0073)	(0.0187)	(0.0097)
Q	0.0000	0.0000	0.0000	0.0000
	(0.9091)	(0.9090)	(0.9092)	(0.9092)
Leverage	0.0135***	0.0134***	0.0135***	0.0135***
	(0.0007)	(0.0008)	(0.0007)	(0.0007)
OCF	-0.0003	-0.0003	-0.0003	-0.0003
	(0.7594)	(0.7577)	(0.7592)	(0.7600)
Prior year market adjusted return	0.0000	0.0000	0.0000	0.0000
	(0.9185)	(0.9196)	(0.9181)	(0.9203)
Target Herfindahl-Hirschman Index	-0.0134	-0.0136	-0.0134	-0.0133
	(0.4939)	(0.4878)	(0.4933)	(0.4952)
Target industry liquidity index	-0.0063	-0.0063	-0.0063	-0.0063
	(0.5203)	(0.5220)	(0.5204)	(0.5201)
One year macroeconomic change	0.0001	0.0001	0.0001	0.0001
	(0.6835)	(0.6786)	(0.6833)	(0.6865)
Constant	-0.0005	-0.0004	-0.0005	-0.0006
	(0.8897)	(0.9214)	(0.8971)	(0.8765)
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	154,227	154,227	154,227	154,227
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 7: Endogeneity of institutional monitoring and acquisition premiums

This table addresses the endogeneity of institutional monitoring and the acquisition premiums using a regression discontinuity approach around index inclusions. The specification is similar to that in Schmidt (2013). Model (1) presents the first stage regression of the change in the number of monitoring institutions on target characteristics and Russell index inclusions using 154,227 firm-years with data from CRSP and Compustat during fiscal year 1983-2011. Model (2) presents the second stage regression of the acquisition premium on the predicted change in the number of monitoring institutions obtained from the first stage. Model (3) presents the regular regression of the acquisition premium on the change in the number of monitoring institutions. We use the proportion of monitoring institutions among all target's institutions in Models (4) and (5), and the total ownership of monitoring institutions in Models (6) and (7). In Models (2) to (7), the sample consists of 1,601 mergers and acquisitions described in Table 1. All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Number of monitoring institutions			*Proportion of monitoring inst*		*Ownership of monitoring inst*	
Dependent variable =	Δ Number of monitoring inst.	Premium	Premium	Premium	Premium	Premium	Premium
	1st stage	2nd stage IV	OLS	2nd stage IV	OLS	2nd stage IV	OLS
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**	**Model (5)**	**Model (6)**	**Model (7)**
Δ Number of monitoring institutions $_{(t-1,\,t)}$		0.0521**	0.0011				
		(0.0220)	(0.4404)				
Δ Proportion of monitoring institutions $_{(t-1,\,t)}$				20.6144**	0.3304		
				(0.0133)	(0.3553)		
Δ Total ownership of monitoring inst $_{(t-1,\,t)}$						2.6170**	0.0559
						(0.0281)	(0.6640)
Russell index inclusion of target							
Russell 1000 $_{t-1}$ → Russell 2000 $_{t}$	-1.0007***						
	(0.0001)						
Russell 2000 $_{t-1}$ → No index $_{t}$	-0.2782***						
	(0.0046)						
Russell 2000 $_{t-1}$ → Russell 1000 $_{t}$	0.3780*						
	(0.0810)						
No index $_{t-1}$ → Russell 2000 $_{t}$	-0.2335						
	(0.1192)						
Δ Ranking in Russell $_{(t-1,\,t)}$	0.0000						
	(0.9977)						
[Δ Ranking in Russell $_{(t-1,\,t)}$]^2	0.0000						
	(0.1826)						

Target characteristics							
Total institutional blockholder ownership	-0.0010	0.0607	0.0642	0.0610	0.0632	-0.0373	0.0616
	(0.9000)	(0.4202)	(0.4035)	(0.4181)	(0.4109)	(0.7547)	(0.4230)
Size	0.4357***	-0.0575***	-0.0386***	-0.0493***	-0.0386***	-0.0366***	-0.0384***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Q	0.0001	0.0000	0.0004	0.0000	0.0004	0.0000	0.0004
	(0.4454)	(0.9996)	(0.4977)	(0.9720)	(0.5043)	(0.9760)	(0.4833)
Leverage	-1.8237***	-0.0488	-0.1176*	-0.0095	-0.1192*	-0.0783	-0.1189*
	(0.0001)	(0.4759)	(0.0697)	(0.8993)	(0.0656)	(0.2614)	(0.0667)
OCF	0.1016***	-0.0738	-0.0676	-0.0707	-0.0684	-0.0639	-0.0671
	(0.0014)	(0.1601)	(0.2088)	(0.1774)	(0.2028)	(0.2227)	(0.2119)
Prior year market adjusted return	0.0346***	-0.0648***	-0.0685***	-0.0692***	-0.0701***	-0.0643***	-0.0682***
	(0.0001)	(0.0002)	(0.0001)	(0.0001)	(0.0001)	(0.0002)	(0.0002)
Acquirer characteristics							
Q		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
		(0.9519)	(0.9213)	(0.9990)	(0.9181)	(0.9119)	(0.9192)
Leverage		0.0541	0.0816	0.0532	0.0839	0.0492	0.0820
		(0.4893)	(0.3124)	(0.4965)	(0.2983)	(0.5298)	(0.3102)
OCF		0.0398	0.0353	0.0334	0.0348	0.0371	0.0343
		(0.5039)	(0.5604)	(0.5749)	(0.5658)	(0.5346)	(0.5718)
Prior year market adjusted return		0.0203	0.0112	0.0218	0.0104	0.0204	0.0114
		(0.2008)	(0.4955)	(0.1700)	(0.5264)	(0.1997)	(0.4873)
Deal and market characteristics							
Relative size (Target / Acquirer)		-0.0182**	-0.0186**	-0.0181**	-0.0188**	-0.0178**	-0.0188**
		(0.0142)	(0.0152)	(0.0148)	(0.0145)	(0.0168)	(0.0145)
Cash only payment (0,1)		0.0555**	0.0473*	0.0565**	0.0476*	0.0530**	0.0475*
		(0.0259)	(0.0658)	(0.0235)	(0.0640)	(0.0336)	(0.0649)
Stock only payment (0,1)		0.0300	0.0255	0.0270	0.0268	0.0278	0.0258
		(0.2162)	(0.3071)	(0.2655)	(0.2838)	(0.2521)	(0.3020)
Tender offer (0,1)		0.0861***	0.1002***	0.0839***	0.1003***	0.0875***	0.1000***
		(0.0023)	(0.0006)	(0.0030)	(0.0006)	(0.0020)	(0.0007)
Hostile deal (0,1)		0.0402	0.0388	0.0415	0.0409	0.0426	0.0408
		(0.3884)	(0.4201)	(0.3732)	(0.3949)	(0.3618)	(0.3960)
Competed deal (0,1)		0.1311***	0.1325***	0.1315***	0.1338***	0.1336***	0.1343***
		(0.0003)	(0.0003)	(0.0002)	(0.0002)	(0.0002)	(0.0002)
Toehold (0,1)		-0.0379	-0.0384	-0.0381	-0.0370	-0.0342	-0.0384

		(0.3869)	(0.3977)	(0.3850)	(0.4160)	(0.4350)	(0.3986)
Target termination fee (0,1)		0.0471**	0.0449*	0.0464**	0.0454**	0.0455**	0.0443*
		(0.0367)	(0.0508)	(0.0396)	(0.0480)	(0.0440)	(0.0534)
Lockup (0,1)		-0.0324	-0.0265	-0.0319	-0.0202	-0.0271	-0.0214
		(0.6670)	(0.7375)	(0.6713)	(0.7971)	(0.7193)	(0.7860)
Same industry (0,1)		0.0194	0.0219	0.0206	0.0216	0.0205	0.0222
		(0.3520)	(0.3085)	(0.3237)	(0.3149)	(0.3274)	(0.3007)
Merger of equals (0,1)		-0.2114**	-0.1974**	-0.2096**	-0.1948**	-0.2124**	-0.1974**
		(0.0252)	(0.0428)	(0.0263)	(0.0455)	(0.0246)	(0.0431)
Target Herfindahl-Hirschman Index	2.0452***	-0.4981	-0.6909*	-0.4720	-0.6954*	-0.4164	-0.6897
	(0.0001)	(0.1932)	(0.0997)	(0.2161)	(0.0973)	(0.2750)	(0.1004)
Target industry liquidity index	0.7816**	0.0553	0.0320	0.0585	0.0346	0.0527	0.0318
	(0.0186)	(0.2848)	(0.5442)	(0.2584)	(0.5125)	(0.3094)	(0.5473)
One year macroeconomic change	0.0853***	-0.0265***	-0.0249***	-0.0264***	-0.0251***	-0.0260***	-0.0248***
	(0.0001)	(0.0002)	(0.0007)	(0.0002)	(0.0007)	(0.0003)	(0.0008)
Constant	-1.9752***	0.5935***	0.6162***	0.5305***	0.6106***	0.5403***	0.6144***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Year and industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	154,227	1,601	1,601	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001

Table 8: Targets' institutional monitoring and acquirer returns

The sample consists of 1,601 mergers and acquisitions announced during 1984-2011 described in Table 1. We run OLS regressions of acquirer announcement returns similar to those in Moeller, Schlingemann, and Stulz (2004) and Masulis, Wang, and Xie (2007). The dependent variable is the acquirer's cumulative abnormal return (CAR) over three days around the merger announcement date. The main independent variable is the number of monitoring institutions in Model (2), the proportion of monitoring institutions among all target's institutions in Model (3), and the total ownership of monitoring institutions in Model (4). All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable = Acquirer CAR [-1,+1]			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Total institutional blockholder ownership	-0.0072	-0.0083	-0.0017	0.0068
	(0.5930)	(0.5379)	(0.9005)	(0.6303)
Targets' institutional monitoring proxies				
Number of monitoring institutions		-0.0003***		
		(0.0026)		
Proportion of monitoring institutions			-0.1372***	
			(0.0022)	
Total ownership of monitoring institutions				-0.0510***
				(0.0016)
Acquirer characteristics				
Size	-0.0013	-0.0005	-0.0002	-0.0002
	(0.1440)	(0.6020)	(0.8041)	(0.8353)
Q	0.0000	0.0000	0.0000	0.0000
	(0.6258)	(0.6598)	(0.6955)	(0.6740)
Leverage	-0.0015	-0.0011	-0.0004	-0.0012
	(0.8891)	(0.9210)	(0.9717)	(0.9126)
OCF	-0.0062	-0.0048	-0.0049	-0.0051
	(0.5666)	(0.6538)	(0.6524)	(0.6330)
Prior year market adjusted return	0.0135***	0.0136***	0.0138***	0.0138***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Target characteristics				
Q	0.0000	0.0000	0.0000	0.0000
	(0.5169)	(0.6237)	(0.7166)	(0.6399)
Leverage	-0.0039	-0.0051	-0.0057	-0.0051
	(0.6178)	(0.5116)	(0.4610)	(0.5080)
OCF	-0.0014	0.0002	0.0006	0.0009
	(0.8818)	(0.9842)	(0.9482)	(0.9250)
Prior year market adjusted return	0.0022	0.0023	0.0028	0.0026
	(0.2848)	(0.2702)	(0.1826)	(0.2100)
Deal and market characteristics				
Relative size (Target / Acquirer)	-0.0006	-0.0003	-0.0003	-0.0002
	(0.6363)	(0.8076)	(0.8425)	(0.8631)
Cash only payment (0,1)	0.0257***	0.0239***	0.0236***	0.0233***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Stock only payment (0,1)	-0.0059	-0.0061	-0.0059	-0.0064
	(0.1800)	(0.1589)	(0.1787)	(0.1399)
Tender offer (0,1)	0.0082	0.0076	0.0080	0.0078
	(0.1083)	(0.1338)	(0.1169)	(0.1243)
Hostile deal (0,1)	-0.0144*	-0.0124	-0.0118	-0.0112
	(0.0809)	(0.1343)	(0.1551)	(0.1778)
Competed deal (0,1)	-0.0058	-0.0039	-0.0039	-0.0042
	(0.3714)	(0.5426)	(0.5451)	(0.5187)
Toehold (0,1)	0.0012	0.0009	0.0006	0.0008
	(0.8745)	(0.9054)	(0.9369)	(0.9213)

Merger of equals (0,1)	0.0249	0.0290*	0.0280*	0.0283*
	(0.1397)	(0.0848)	(0.0957)	(0.0926)
Same industry (0,1)	0.0027	0.0028	0.0033	0.0029
	(0.5433)	(0.5313)	(0.4610)	(0.5180)
Competitive industry (0,1)	0.0052	0.0051	0.0052	0.0051
	(0.2381)	(0.2446)	(0.2326)	(0.2434)
Unique industry (0,1)	0.0079	0.0081	0.0077	0.0076
	(0.1163)	(0.1037)	(0.1213)	(0.1283)
High tech industry (0,1)	-0.0087	-0.0086	-0.0092	-0.0089
	(0.2162)	(0.2202)	(0.1863)	(0.2037)
Target industry liquidity index	-0.0172*	-0.0180*	-0.0178*	-0.0175*
	(0.0668)	(0.0540)	(0.0569)	(0.0609)
One year macroeconomic change	0.0002	0.0002	0.0003	0.0002
	(0.8789)	(0.8712)	(0.8361)	(0.8982)
Constant	0.0075	0.0054	0.0021	0.0019
	(0.7193)	(0.7963)	(0.9216)	(0.9270)
Heckman self-selectivity correction	Yes	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes	Yes
N	1,601	1,601	1,601	1,601
Regression's *p*-value	0.0001	0.0001	0.0001	0.0001

Table 9: Additional analyses

In Panel A we estimate OLS regressions of acquirer announcement returns similar to those in Table 8. In Panel B we estimate four premium regressions similar to those in Panel B of Table 5. In Panel C, we run four acquirer return regressions similar to those in Table 8. The subsample analyzed in Panels B and C consists of 1,156 deals from the original sample of 1,601 deals described in Table 1 that excludes targets in the Financial industry (including Banking, Insurance, Real Estate and Trading). Panel D presents the second stage regressions of the acquisition premium on the residual of target's institutional monitoring proxies from the first stage similar to the premium regressions in Table 5 Panel B. All variables are defined in the appendix. We report *p*-values in parentheses. The symbols *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Targets' institutional monitoring and acquirer returns

	Model (1)	**Model (2)**
Dependent variable = Acquirer return alternatives	CAR [-2,+2]	CAR [-5,+5]
Institutional blockholder ownership	-0.0050	-0.0109
	(0.7804)	(0.6224)
Total ownership of monitoring institutions	-0.0630***	-0.0511**
	(0.0021)	(0.0431)

Panel B: Targets' institutional monitoring and acquisition premiums

	Dependent variable = Acquisition premium			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Institutional blockholder ownership	0.0893	0.1069	0.0744	0.0450
	(0.3559)	(0.2711)	(0.4403)	(0.6517)
Number of monitoring institutions		0.0015*		
		(0.0763)		
Proportion of monitoring institutions			1.1914***	
			(0.0021)	
Total ownership of monitoring institutions				0.2437**
				(0.0462)

Panel C: Targets' institutional monitoring and acquirer returns

	Dependent variable = Acquirer return			
	Model (1)	**Model (2)**	**Model (3)**	**Model (4)**
Institutional blockholder ownership	0.0001	-0.0023	0.0046	0.0136
	(0.9940)	(0.8960)	(0.7917)	(0.4455)
Number of monitoring institutions		-0.0004***		
		(0.0088)		
Proportion of monitoring institutions			-0.1593***	
			(0.0053)	
Total ownership of monitoring institutions				-0.0573***
				(0.0035)

Panel D: Abnormal institutional monitoring and acquisition premiums

	Dependent variable = Acquisition premium		
	Model (1)	**Model (2)**	**Model (3)**
Number of monitoring institutions $_{residual}$	0.0013*		
	(0.0665)		
Proportion of monitoring institutions $_{residual}$		1.3198***	
		(0.0041)	
Ownership of monitoring institutions $_{residual}$			0.2805**
			(0.0418)
Target, acquirer, deal and market characteristics	Yes	Yes	Yes
Year and industry fixed effects	Yes	Yes	Yes
Regression's *p*-value	0.0001	0.0001	0.0001

Appendix: Variable definition

Institutional monitoring proxies	
Number of monitoring institutions	the number of institutions whose holding value in the target is in the top 10% of their portfolio
Proportion of monitoring institutions	the proportion of monitoring institutions among all institutions holding the target's shares
Total ownership of monitoring institutions	the total ownership of monitoring institutions on the target's total shares outstanding
Traditional blockholder proxies	
Number of blockholders	the number of institutions whose ownership in the target is at least 5% of the target's shares outstanding
Proportion of blockholders	the proportion of blockholders among all institutions holding the target's shares
Total ownership of blockholders	the total ownership of blockholders on the target's total shares outstanding
Total ownership of the five largest institutions	the total share ownership controlled by the five largest institutional investors in the target
Ownership of the largest institution	the share ownership controlled by the largest institutional investor in the target
Deal characteristics	
Acquisition premium	the offer price divided by the target's stock price four weeks before the merger announcement date, as reported by SDC and limited between 0% and 200%
Combined premium	Following Officer (2003), we first estimate a premium based on "component" data using the aggregate value of cash, stock, and other securities offered by the bidder to target shareholders as reported by SDC. We then estimate premiums based on "initial price" and "final price" data, respectively. These prices are also reported by SDC. All premium measures are then deflated by the target's market value 42 trading days prior to the bid announcement. The combined premium is based on the component measure if it is greater than 0% and less than 200%; otherwise the premium relies on the initial price measure (or on the final price measure if initial price data are missing).
Target CAR	the target's cumulative abnormal return over the window around the merger announcement date, calculated as the residual from the market model estimated during the one year window ending four weeks prior to the merger announcement
Acquirer CAR	the acquirer's cumulative abnormal return over the window around the merger announcement date, calculated as the residual from the market model estimated during the one year window ending four weeks prior to the merger announcement
Completion (0,1)	one if the announced deal is completed
Target termination fee (0,1)	one if the target has a termination fee provision in the merger contract
Lockup (0,1)	one if the deal includes a lockup of target or acquirer shares
Prior bidding (0,1)	one if the deal follows a prior bid within one year
Toehold (0,1)	one if the bidder owns a fraction of the target's shares
Cash payment (0,1)	one if the deal is paid entirely in cash
Stock payment (0,1)	one if the deal is paid entirely in stock
Tender offer (0,1)	one if the form of the deal is tender offer
Merger of equals (0,1)	one if the deal is classified by SDC as a merger of equals
Same industry (0,1)	one if both the target and the acquirer belong to the same Fama and French (1997) 48 industrial classification group

Market characteristics	
Target Herfindahl-Hirschman index	the competitiveness of the target industry. An industry's Herfindahl index is computed as the sum of squared market shares of all firms in the industry using data on sales, as in Masulis, Wang and Xie (2007).
Target industry liquidity	the liquidity of the market for corporate control for the target firms' industry. This variable is defined as the value of all corporate control transactions for US$1 million or more reported by SDC for each year and industry divided by the total book value of assets of all Compustat firms in the same industry and year, as in Schlingemann, Stulz and Walkling (2002)
One year macroeconomic change	the difference in the industrial production index over one year period before the merger
Competitive industry (0,1)	one if the bidder's industry is in the bottom quartile of all industries sorted annually by the Herfindahl index. An industry's Herfindahl index is computed as the sum of squared market shares of all firms in the industry using data on sales (as in Masulis, Wang and Xie, 2007)
Unique industry (0,1)	one if the bidder's industry is in the top quartile of all industries sorted annually by industry-median product uniqueness. Product uniqueness is defined as selling expenses scaled by sales (as in Masulis, Wang and Xie, 2007)
High tech industry (0,1)	one if bidder and target are both from high tech industries defined by Loughran and Ritter (2004)
Financial characteristics	
Size	the natural logarithm of the market value of assets
Leverage	the book value of debt divided by the sum of book value of debt and market value of equity.
Q	the market value of assets divided by the book value of assets
Prior year market adjusted return	the cumulative abnormal return during the one year window ending four weeks prior to the merger announcement, calculated as the residual from the market model estimated during the year before
Operating cash flow	the cash flow from operations scaled by the value of assets
Russell index inclusion of target	
Russell 1000 $_{t-1}$ → Russell 2000 $_{t}$	one if the target firm moves from the Russell 1000 to the Russell 2000
Russell 2000 $_{t-1}$ → No index $_{t}$	one if the target firm moves out of the Russell 2000 to below the top 3000
Russell 2000 $_{t-1}$ → Russell 1000 $_{t}$	one if the target firm moves from the Russell 2000 to the Russell 1000
No index $_{t-1}$ → Russell 2000 $_{t}$	one if the target firm moves to the Russell 2000 from below the top 3000
Δ Ranking in Russell $_{(t-1,\,t)}$	change in the target firm's ranking in the Russell from time *t*-1 to *t*
Other variables	
Heckman self-selectivity	the Heckman (1979) lambda obtained from a two stage estimation process. In the first-stage, we estimate the probability of becoming a target. In the second stage, the inverse Mill's ratio from the first stage model is included in the estimation as a variable to control for self-selection.