

# Selection or Influence? Institutional Investors and Acquisition Targets

Lily Qiu            Hong Wan

This draft: November 2006

Department of Economics  
Brown University  
64 Waterman Street  
Providence, RI 02912  
lily\_qiu@brown.edu

Department of Finance  
University of South Florida  
4202 E. Fowler Avenue, BSN 3403  
Tampa, FL 33620  
hwan@coba.usf.edu

Preliminary, Comments Welcome!

## ABSTRACT

This paper shows that the positive correlation between the presence of institutional investors and a firm's likelihood of being acquired is due to ownership endogeneity, i.e., due to the fact that institutions are better informed investors. After controlling for this ownership endogeneity, the presence of institutional investors reduces the probability of being acquired. There is also evidence that mutual funds or funds with high turnover rates are more likely to benefit from selective disclosure prior to Regulation Fair Disclosure. The presence of public pension funds increases the announcement premium that targets receive.

# Introduction

The role of institutional investors in the takeover market's selection of targets is quite ambiguous. It is difficult to distinguish a selection effect from an influence effect. Many researchers have shown that institutional investors have selection ability around corporate events. For example, Brennan, Jegadeesh, and Swaminathan (1993), Hong, Lim, and Stein (2000), and others, have documented that financial analysts (hired by institutions) have expertise to process and interpret information. Bailey, Li, Mao, and Zhong (2003), Jorion, Liu, and Shi (2005), and many others argue that institutions have informational advantage from selective disclosures.

On the other hand, institutions are often believed to be able to influence the acquisition likelihood, yet opinions on their exact roles also differ. Some (Brickley, Lease, and Smith (1988), Jarrell and Poulsen (1987), Holmstrom and Kaplan (2001), Gorton and Kahl (2006), etc.) believe that large shareholdings of institutions facilitate a takeover effort either through block selling or through the removal of anti-takeover measures. The implication is that higher institutional ownership may be correlated with larger probability of being acquired. Others (Jensen and Meckling (1976), Shleifer and Vishny (1986), Admati, Pfleiderer, and Zechner (1994), etc.) believe that institutions with substantial equity stakes can carry out a monitor's role. In so far as the takeover market serves as a market disciplinary force, higher institutional ownership may reduce the likelihood of being acquired due to monitoring benefits.

Given that institutional ownership and corporate events such as a takeover are often jointly determined, any study trying to identify an institutional influence on corporate decisions needs to control for this ownership endogeneity. This study relies on a "Bartik"

instrument (Bartik (1991), Blanchard and Katz (1992)) to identify the exogenous variations in institutional ownership, and thus is able to identify the exact institutional influence.

Ex ante, there are two possible sources of institutional selection ability, and two possible directions of institutional influence. We find that mutual funds and funds with high turnover rates are most likely to benefit from selective disclosures. We also find that the direction of institutional influence is mostly to reduce the likelihood of being acquired, which supports a monitoring story. There is also evidence that high turnover institutions may facilitate a take-over effort and increase the probability of being acquired.

To distinguish between the two sources of selection ability, we explore the natural experiment of the adoption of Regulation Fair Disclosure (FD) by the Securities and Exchange Commission on October 13, 2000. Regulation FD prohibits public companies from giving non-public material information to favored investment professionals. It requires that companies that intentionally disclose material information to a selected group of shareholders should disclose it to the public simultaneously. If institutional investors were beneficiaries of selective disclosure prior to the adoption of Regulation FD, we would observe a discontinuity in the relation between their share-holdings and the likelihood of being acquired. Following this logic, we examine the data in the four years prior to FD (1997-2000), and in the four years post FD (2001-2004). Our results are robust to a longer time horizon prior to FD (1980-2000).

We are able to observe this discontinuity for mutual funds and for institutional investors with a high turnover rate. Before the adoption of Regulation FD, one standard deviation increase of mutual fund holdings is correlated with an increase in the target likelihood by 20

basis points. Given that the ex post probability of being acquired in the four years before the adoption of FD is 1.46%, this increase is not trivial. Furthermore, this positive relationship no longer exists for mutual funds and high turnover institutions post the adoption of FD.

The results on the direction of institutional influence is quite interesting. When we look at the holding levels of institutional investors, there is a clear negative influence after controlling for ownership endogeneity. However, when we look at the turnover rate of institutions, there is a positive effect. It appears that institutions with high turnover rates are the group that facilitates bidders' takeover effort by providing their shares.

To ascertain whether institutions have a monitoring effect on potential targets, we examine the relation between institutional ownership and the target announcement premium. We find that public pension funds' (PPF) ownership increases the target premium. For one standard deviation increase in PPF ownership, the target announcement abnormal return increases by 2%, controlling for firm performances. It seems that the market is expecting those targets to be able to negotiate a better deal at settlement.

The remainder of this paper is organized as follows. Section I provides a literature review. Section II describes the specification and the identification strategy. Section III describes data. Section IV discusses institutional ownership impact on target likelihood and target premium. Section V concludes the paper.

## **I Literature Review**

There is a large literature looking into institutional investors' corporate governance activity in the goal of identifying any potential influence. The early literature focuses on institutions'

activity in submitting proxy proposals. For example, Gillan and Starks (2000) report a positive relation between holdings by institutional investors and the aggregate votes for shareholder-sponsored governance proposals. Del Guercio and Hawkins (1999) find that the pension funds are more successful at monitoring and promoting changes in the firms they target their activism at. Other studies examine institutions' non-proxy activity, such as their impact on compensation policy, CEO turnover, and market response to corporate event. Hartzell and Starks (2003) show that institutional ownership is positively related to the pay performance sensitivity of the executive compensation and negatively related to the level of the compensation. Parrino, Sias, and Starks (2003) finds the change in institutional ownership holdings is negatively related to the likelihood of CEO turnover, and the institutional investors voted with their feet by selling their shares in the year prior to the forced CEO turnover. Hotchkiss and Strickland (2003) find that the stock price response is more negative for firms with higher level of institutional ownership, when firms reported earnings below the analyst's expectation. Other papers such as Karpoff, Malatesta, and Walkling (1996) and Wahal (1996), Song and Szewczyk (2003) show that there is very little evidence of the efficacy of shareholder activism, or that the shareholder proposals have negligible effect on the corporate performance.

Some papers are specifically related to the corporate control activity and institutional investors. Brickley, Lease, and Smith (1988) and Jarrell and Poulsen (1987) find that firms with higher levels of institutional investors are more likely to vote against the adoption of the Antitakeover Charter Amendments, or are less likely to adopt it. On the other hand, Pound (1988) shows that institutional investors act as managements' allies in proxy

contests. Ambrose and Megginson (1992) finds that the probability of receiving a takeover bid is negatively related to the net change of institutional holdings, while the absolute level of the institutional holding has no significant influence on receiving a takeover bid. A more recent work by Davis and Kim (2006) find that mutual funds with more business ties are less likely to vote against the management in general.

The difficulty in identifying the exact institutional investor influence is due to the fact that it is hard to control for ownership endogeneity, i.e., to control for the fact that the institutional investors are better investors and have better information, as documented by a large literature.

Brennan, Jegadeesh, and Swaminathan (1993) and Hong, Lim, and Stein (2000), and many others have shown that institutions have better skills than individual investors and hence can process better information. Others document that institutions information advantage comes from better disclosure they receive from firms. Gibson, Safieddine, and Sonti (2004) document that the selection ability of the institutional investors to identify SEOs with better performance could be attributed to the benefits of selective disclosure. Bailey, Li, Mao, and Zhong (2003), Jorion, Liu, and Shi (2005), and others find support that SEC's Regulation Fair Disclosure enacted on October 13, 2000 reduces the selective disclosure to some shareholders.

## II Specification and Identification Strategy

The structural equation is:

$$y_{it} = \beta_0 + \beta_1 InstOwnership_{it-1} + \phi X_{it} + \gamma Year_t + u_i + \epsilon_{it}, \quad (1)$$

where  $y_{it}$ , the dependent variable, is a dummy variable. It equals one for the quarter when there is at least one announcement of the firm being a merger target, which was completed successfully later on.  $t$  is a quarterly time subscript. An  $i$  denotes each firm.  $u_i$  is the firm-level effect. The ownership variables  $InstOwnership_{it-1}$  (Total Institutional Ownership, Public Pension Funds, Investment Companies, Others, the turnover rate of the institutional investors) are the variables of interest in this study, and they are ownership measures at the end of the prior quarter. The  $X_{it}$  is a vector of control variables including firm size,  $q$  ratio, cash flow ratio, capital expenditures ratio, firm prior performance in the prior quarter measured as average daily excess return, return volatility, liquidity, dividend yield, average sales growth over prior three years, and leverage ratio averaged over three years. Table I explains in detail what these variables are. The  $Year_t$ s are year dummies.

Ownership endogeneity arises when institutions are able to predict future shocks to the likelihood of being acquired, and adjust their ownership accordingly. Since it's well documented that institutions are either smarter investors who have innate selection ability, or are able to capitalize on selective disclosure of relevant information, this endogeneity problem is quite likely to exist.

A "Bartik instrument" is employed to identify the institutional influence. The assumption



of this approach is that a given institution’s portfolio size is exogenous. There are two factors affecting the fund size. One is the net inflow of funds. If individual investors can predict future shocks, and can identify a particular fund as having the same predictive power, then the fund flow can be endogenous. However, there are few reasons to believe that an ordinary individual investor possess this ability. Furthermore, the net inflows of pension funds are determined by generally fixed contributions of their members and their liabilities, which are most likely exogenous. The second factor affecting fund sizes is the performance of their portfolio, which in turn is determined by the current stock price. M&A announcements are often considered surprises. There may be rumors and trading activity in the couple of days leading to an announcement. However, the market may not able to predict M&A activity in an average time horizon of 45 days. Consequently, the current stock price most likely has not incorporated the future shocks to the target likelihood. We also look into institutions’ portfolio sizes with a longer lag, up to 6 months. The results remain robust.

This Bartik instrument interacts the exogenous shocks to institutional investors’ portfolio sizes with the firm-level propensity of investment, which is obtained as the fixed effects from the following regression by each institutional investor  $j$ :

$$InstOwnership_{it} = \beta_0 + \beta_1 FundSize_{it} + \omega_i + e_{it} \quad (2)$$

$\omega_i$  can be considered as  $j$ ’s propensity to invest in firm  $i$ . It is not correlated with future target likelihood shocks, which is captured by  $e_{it}$  if insttutional ownership is correlated with this shock.  $\omega_i$  is firm specific, and does not vary across time. The institutional investor  $j$ ’s portfolio size varies across time, but not across firm. The Bartik instrument is

$\sum FundSize_{it} * \omega_i$ . It interacts the two dimensions, and varies across both firm and time.

To check that this instrument is valid, I exam the F-statistics from the first-stage IV regressions. The F-stats are much greater than ten. It does not suffer weak instrument problem (Staiger and Stock (1997)).

### III Data

The initial sample is the overlap between CRSP and COMPUSTAT databases from 1997 to 2004. Corporate financial information is obtained from COMPUSTAT and stock performance data is from CRSP. The sample is limited to securities identified by CRSP as ordinary common shares (with share codes 11 or 12). This excludes American Depository Receipts, closed-end-funds, primes and scores, and Real Estate Investment Trusts. Utilities, finance and insurance companies, and government agencies (2-digit SIC code 49, from 60 to 69, and above 89) are also excluded. There are a total of 8,494 firms, and a total of 157,726 firm-quarter observations.

Merger target information is obtained from the SDC domestic M&A database by Thomson Financial. To be included, a deal has to be completed with 100% of the target acquired by the bidder, and is classified by SDC as a “merger”. Since we cannot obtain institutional ownership information for private firms, only deals with public targets are included. There is a total of 1,887 announcement quarters, about 1.2% of the total firm-quarter observations. Table II provides detailed information on this set of announcement. Table III shows that across the eight years of study, more targets were acquired before the adoption of Regulation FD. This is mostly likely due to events post Regulation FD, such as the busting of the IT

bubble, the tragedy on Sept. 11, 2001, which bring a climate change in the macroeconomy and slow down the M&A market. Thus in our analysis we include a dummy controlling for this broad shift in addition to the year dummies.

The institutional ownership data is obtained from Thomson Financial.<sup>1</sup> I identify public pension funds by their names in the Thomson database. In total I find 15 public pension funds:<sup>2</sup> California public employees retirement system (CalPERS), California state teachers retirement system, Colorado public employees retirement association, Florida state board of administration, Kentucky teachers retirement system, Michigan state treasury, Montana board of investment, New Mexico educational retirement board, New York state common retirement fund, New York state teachers retirement system, Ohio public employees retirement system, Ohio school employees retirement system, Ohio state teachers retirement system, Virginia retirement system, and State of Wisconsin investment board. At the end of June 2000, the average size of equity assets under management is \$25.17 billion, and the median is \$24.65 billion (the largest fund is CalPERS [\$63.53 billion], the smallest is New Mexico educational retirement board [\$1.51 billion]). My results remain the same if CalPERS, the most visible activist fund, is excluded. About 2% of the observations have zero PPF ownership. The mutual fund ownership is what Thomson classified as investment company ownership. The rest are classified as other institutional ownership. The aggregate holdings by each category are used to measure institutional ownerships.

---

<sup>1</sup>Under the Securities Exchange Act of 1934 (Rule 13f), institutional investment managers who exercise investment discretion over accounts with publicly traded securities (section 13(f) securities) and who hold equity portfolios exceeding \$100 million are required to file Form 13f within 45 days after the last day of each quarter. Investment managers must report all holdings in excess of 10,000 shares and/or with a market value over \$200,000.

<sup>2</sup>Not all state and local pension funds holdings are available, because either they are too small and do not file 13f, or their assets are reported by outside money managers.

Table IV shows the summary statistics of the dataset. The median market capitalization is \$137.03 million and the mean is \$1,963.59 million. Thus this dataset is not dominant by large firms. Out of the total of 157,726 firm-quarter observations, 1.20% are target firm-quarter ones. A total of 5,427 observations have zero institutional ownership, and 1.03% of those are target firm-quarter observations.

## IV Empirical Results

Table V examines the relation between institutional holdings and the likelihood of being acquired. Apart from looking at the overall institutional ownership, we also break it down into different types of institutional investors. The literature in law and economics (Black (1990), Roe (1994), etc.) has argued that there are substantial heterogeneity among different types of institutional investors regarding monitoring incentives and activities. The most interesting classifications may be public pension funds and mutual funds. Many (Black (1990), Gillan and Starks (2000), etc.) have argued that public pension funds are the most likely monitors of corporate governance. On the other hand, Davis and Kim (2006) find that mutual funds with more business ties are more likely to vote with the management, using the recently available mutual fund proxy voting records. Thus we break the overall institutional ownership into three types: public pension funds, mutual funds, and all others.

Equations (1) through (6) in Table V are fixed effect regressions. We find that institutional ownership is positively associated with firms' likelihood of being acquired throughout the sample. This association is stronger prior to the adoption of Regulation FD. Upon examination of different types of institutions, it is clear that the stronger association before

FD is entirely driven by mutual fund ownership. In the regressions, we control for both the level of institutional ownership and the Regulation FD dummy which equals one for years before FD. The interaction term between mutual fund ownership and the time dummy is analogous to “difference-in-difference”. It compares the difference in correlation before and after Regulation FD for those firms with high mutual fund ownership with the difference for those with low mutual fund ownership. It tells us the extra “effect” mutual fund ownership has prior to 2001.

A one standard deviation increase in mutual fund ownership before the adoption of Regulation FD is correlated with an increase of 14 to 20 basis points in the probability of being acquired. Since the ex post target likelihood in that period is 1.46%, this absolute increase translates into a 10% to 14% relative reduction. Post Regulation FD, mutual fund ownership is no longer positively associated with target likelihood, while public pension funds and other institutional ownership are still positively associated with the likelihood. A similar pattern is also found for institutional investors with high turnover rates. We conclude that mutual funds and institutions which trade frequently are the most likely candidates to benefit from the selective disclosure prior to Regulation FD. Other institutions exhibit some skills in picking the potential targets.

Equations (7) to (12) in Table V are fixed effect IV regressions. We can give their coefficients a clearer interpretation in terms of the causality. Contrary to the theoretical interpretation that higher institutional ownership facilitates takeover and thus increase the probability of being acquired, the higher level of all types of institutions leads to smaller target likelihood, after controlling for firm characteristics, firm fixed effects, and year fixed

effects. The silver lining of this argument is that a higher average turnover rate of a given firm's institutional investors leads to larger probability of being acquired. This seems to suggest that the role of facilitating takeover efforts is mostly taken by institutions who trade very frequently.

We also control for relevant firm characteristics in the regressions following existing literature. Palepu (1986) and Jensen and Ruback (1983) conclude that it is difficult to predict targets. We confirm their opinion as few variables are significant. Furthermore, the firm characteristics variables can be endogenous themselves. There can be a confounding factor which influences both variables like firm size and  $q$  ratio, etc., and the shocks to the likelihood of being acquired. Since these variables are not the main interest of this paper, we leave the task of finding the causality between firm characteristics and target likelihood for future research.

One variable that is interesting to mention is the Regulation FD dummy. It is equal one for years 1997 to 2000, which are prior to the adoption of the regulation. The last quarter of 2000 is in fact post the adoption, since we are looking into the institutional ownership at the end of the prior quarter, we classify this quarter as before FD. The first quarter of 2001 could be problematic, as the change in the institutional ownership in the prior quarter could happen before the adoption of the regulation. Whether we classify this as before FD or after FD, or drop it from the sample, does not make any material changes. This FD dummy is significantly negative across all specifications. Although the actual number of target announcement is fewer in the second half of the sample, 612 announcement from 2001 to 2004 comparing to 1,275 announcement from 1997 to 2000, in the counter-factual,

if we could hold all other things, such as firm characteristics, constant between the two sub-samples, there would be more target announcements in the second half. This suggests that the barrier to acquire or getting acquired actually was lower post FD, even though the absolute number of announcement is much smaller.

The negative effect institutional ownership has on the likelihood of being acquired can be due to two different mechanisms. The first one is a monitoring mechanism. Institutions as large share holders can exercise a monitor's role, and lead to better firm performance and reduce the probability of firms falling prey of a bidder. The second one is a "friendship" mechanism. It is possible that institutional investors side with the management and use their shareholdings to help the management fend off potential takeover bids. This mechanism may not lead to better firm values.

Although it is hard to distinguish between the two mechanisms using our current data, we can do one test to see whether the institutional investors are representing shareholder interest. Table VI examines the relation between institutional ownership and the target announcement premium. After controlling for ownership endogeneity, deal characteristics, firm characteristics, and year fixed effects, we find that only public pension fund ownership leads to higher target announcement abnormal returns. A one standard deviation increase in PPF ownership leads to an increase of 2% in the announcement premium. It suggests that the market expects those firms to be able to negotiate a better deal. This positive effect does not exist for other types of institutions.

## V Conclusions

The role of institutional investors in the market for takeover targets is much debated. We explore the discontinuity created by the adoption of Regulation Fair Disclosure to identify the source of institutional investors' selection ability. We find that while other institutions exhibit some stock picking skills, mutual funds and institutions who trade more were most likely benefiting from selective disclosure prior to the adoption of the regulation. We are also able to identify the direction of institutional investor influence by using an IV technique. Institutional investors are found to reduce the probability of firms' being acquired. Among them, public pension funds are able to increase the target announcement premium.

However, there are also many issues left for further research. First, firm characteristics are used as control variables in this study. They can very well be endogenous. It is interesting to find the direction of causality for this set of variables. Second, the exact mechanism via which institutions are able to reduce the target probability is worth exploring. Third, target announcement abnormal returns can also be interpreted as the market expectation of the value improvement through a takeover. If so, why the value improvement is larger for firms with higher public pension funds? Is it because these firms are able to find a better bidder, or is it because these firms are very poorly wrong so there is larger room for improvement?



## References

- Admati, Anat R., Paul Pfleiderer, and Josef Zechner, 1994, Large shareholder activism, risk sharing, and financial market equilibrium, *Journal of Political Economy* 102, 1097–1130.
- Ambrose, B.W., and W.L. Megginson, 1992, The role of asset structure, ownership structure, and takeover defenses in determining acquisition likelihood, *Journal of Financial and Quantitative Analysis* 27, 575–589.
- Bailey, W., H.T. Li, C. X. Mao, and R. Zhong, 2003, Regulation fair disclosure and earnings information: Market, analyst, and corporate responses, *The Journal of Finance* 58, 2487–2514.
- Bartik, T. J., 1991, *Who Benefits from State and Local Economic Development Policies?* (Kalamazoo, MI:W.E. Upjohn Institute for Employment Research).
- Black, Bernard S., 1990, Shareholder passivity reexamined, *Michigan Law Review* 89, 520–608.
- Blanchard, Olivier Jean, and Lawrence F. Katz, 1992, Regional evolutions, *Brookings Papers on Economic Activity* I, 1–75.
- Brennan, M. J., N. Jegadeesh, and B. Swaminathan, 1993, Investment analysis and the adjustment of stock-prices to common information, *Review of Financial Studies* 6, 799–824.
- Brickley, James A., Ronald C. Lease, and Clifford W. Smith, 1988, Ownership structure and voting on antitakeover amendments, *Journal of Financial Economics* 20, 267–291.

- Davis, Gerald F., and E. Han Kim, 2006, Business ties and proxy voting by mutual funds, forthcoming, *Journal of Financial Economics*.
- Del Guercio, Diane, and Jennifer Hawkins, 1999, The motivation and impact of pension fund activism, *Journal of Financial Economics* 52, 193–340.
- Gibson, S., A. Safieddine, and R. Sonti, 2004, Smart investment by smart money: Evidence from seasoned equity offerings, *Journal of Financial Economics* 72, 581–604.
- Gillan, Stuart L., and Laura T. Starks, 2000, Corporate governance proposals and shareholder activism: The role of institutional investors, *Journal of Financial Economics* 57, 275–305.
- Gorton, Gary B., and Matthias Kahl, 2006, Blockholder identity, equity ownership structures, and hostile takeovers, NBER Working Paper No. W7123.
- Hartzell, Jay C., and Laura T. Starks, 2003, Institutional investors and executive compensation, *The Journal of Finance* 58, 2351–2374.
- Holmstrom, Bengt, and Steven N. Kaplan, 2001, Corporate governance and merger activity in the united states: Making sense of the 1980s and 1990s, *Journal of Economic Perspectives* 15, 121–144.
- Hong, H., T. Lim, and J.C. Stein, 2000, Bad news travel slowly: Size, analyst coverage, and the profitability of momentum strategies, *The Journal of Finance* 55, 265–295.

- Hotchkiss, Edith S., and Deon Strickland, 2003, Does shareholder composition matter? evidence from the market reaction to corporate earnings announcements, *The Journal of Finance* 58, 1469–1498.
- Jarrell, G.A., and A.B. Poulsen, 1987, Shark repellents and stock-prices: the effects of antitakeover amendments since 1980, *Journal of Financial Economics* 19, 127–168.
- Jensen, Michael C., and William H. Meckling, 1976, Theory of the firm: Managerial behavior, agency costs, and ownership structure, *Journal of Financial Economics* 3, 305–360.
- Jensen, Michael C., and Richard S. Ruback, 1983, The market for corporate control: the scientific evidence, *Journal of Financial Economics* 11, 5–50.
- Jorion, P., Z. Liu, and C. Shi, 2005, Informational effects of regulation fd: evidence from rating agencies, *Journal of Financial Economics* 76, 309–330.
- Karpoff, Jonathan M., Paul H. Malatesta, and Ralph A. Walkling, 1996, Corporate governance and shareholder initiatives: Empirical evidence, *Journal of Financial Economics* 42, 365–395.
- Palepu, Krishna G., 1986, Predicting takeover targets: a methodological and empirical analysis, *Journal of Accounting and Economics* 8, 3–35.
- Parrino, Robert, Richard W. Sias, and Laura T. Starks, 2003, Voting with their feet: Institutional ownership changes around forced ceo turnover, *Journal of Financial Economics* 68, 3–46.

- Pound, John, 1988, Proxy contests and the efficiency of shareholder oversight, *Journal of Financial Economics* 20, 237–265.
- Roe, Mark J., 1994, *Strong Managers, Weak Owners: The Political Roots of American Corporate Finance* (Princeton University Press: Princeton, New Jersey).
- Shleifer, Andrei, and Robert W. Vishny, 1986, Large shareholders and corporate control, *Journal of Political Economy* 94, 461–488.
- Song, Wei-Ling, and Samuel H Szewczyk, 2003, Does coordinated institutional investor activism reverse the fortunes of underperforming firms?, *Journal of Financial and Quantitative Analysis* 38, 317–336.
- Staiger, Douglas, and James H. Stock, 1997, Instrumental variables regression with weak instruments, *Econometrica* 65, 557–586.
- Wahal, Sunil, 1996, Pension fund activism and firm performance, *Journal of Financial and Quantitative Analysis* 31, 1–23.

Table 1: Data Sources and Definitions

Aggregate institutional holdings	Thomson Financial	aggregate institutional ownership by each category, in percent, at the end of each quarter
Target dummy	SDC	1=there is an announcement of 100% of the firm being acquired, in the current quarter, and the deal was successful; 0=no announcement
Total assets	COMPUSTAT	item[6]
Size	COMPUSTAT	$\ln(\text{item}[6])$
Market capitalization	CRSP	market capitalization at the end of prior quarter
$q$ ratio	COMPUSTAT	$(\text{item}[6] + \text{market cap} - (\text{item}[60] + \text{item}[35] - \text{item}[336])) / \text{item}[6]$
Cash flow ratio	COMPUSTAT	$(\text{item}[18] + \text{item}[14]) / \text{item}[6]$
Capital expenditures ratio	COMPUSTAT	item[128]/item[6]
Daily excess return	CRSP	average daily excess return using Fama-French 3-factor model, over the prior quarter
Return volatility	CRSP	standard deviation of monthly stock return over the prior 24 months
Liquidity	CRSP	average monthly share turnover over the prior quarter
Dividend yield	COMPUSTAT	(common stock dividends (item[21]), when available, or cash dividends (item[127]))/year end market cap, lagged one year
Sales growth	COMPUSTAT	$(\text{item}[12] - 1) / \text{item}[12]$ , average over prior 3 years
Leverage ratio	COMPUSTAT	item[9]/item[60], average over prior 3 years
Turnover	Thomson Financial	$\sum_{i=1}^I W_{k,i,t} (\frac{1}{4} \sum_{r=1}^4 CR_{i,t-r+1})$ , where $CR_{i,t}$ is the churn rate for institutional investor $i$ at quarter $t$ : $CR_{i,t} = \frac{\sum_{k=1}^S  N_{k,i,t} P_{k,t} - N_{k,i,t-1} P_{k,t-1} }{\sum_{k=1}^S \frac{N_{k,i,t} P_{k,t} + N_{k,i,t-1} P_{k,t-1}}{2}}$

Table II: Deal characteristics

This table presents mean and median (in parentheses) of deal characteristics for the targets included in our sample. The targets are recorded in the SDC mergers and acquisitions database (1997-2004). To be included, each deal satisfy the following criteria: 1) domestic mergers; 2) deal status is completed; 3) classified as mergers by SDC. self-tender offer, repurchase and rumored deals are excluded; 4) acquirers and targets both are public firms; 5) 100% of the target is acquired. For each company involved in the event, we request that they also have information in CRSP and Compustat database. If we drop the fifth criterion, results are similar.

	100% being acquired		over 50% less than 100% being acquired	
	disclosed value	undisclosed value	disclosed value	undisclosed value
Number of obs.	1861	26	102	0
Deal value (million \$)	1,496.874 (233.6)	n/a	552.77 142.67	n/a
Days between announcement and completion	112.50 (96)	153.27 (170.5)	131.91 (125)	n/a
Days between the beginning of the quarter and announcement	46.33 (46)	47.23 (50.50)	45.65 43	n/a
Hostile dummy	0.01 (0)	0 (0)	0.03 (0)	n/a
Tender offer dummy	0.28 (0)	0 (0)	0.51 (1)	n/a
All cash deal dummy	0.48 (0)	0 (0)	0.86 (1)	n/a

Table III: Deal distribution

This table presents the deal distribution for our sample years 1997-2004. This sample consists of CRSP and COMPUSTAT firms issuing ordinary common shares, excluding utilities, finance and insurance companies and government agencies. The total number of observations is reported in the second column. The number of firm-quarter observations with M&A announcements for a public target is reported in the third column.

Year	# of observations	% of target firm-quarters
1997	22,431	1.23
1998	22,773	1.55
1999	21,407	1.61
2000	20,651	1.46
2001	20,002	1.07
2002	18,174	0.71
2003	16,623	0.81
2004	15,665	0.86

Table IV: Descriptive Statistics

The sample consists of CRSP and COMPUSTAT firms (1997 – 2004) issuing ordinary common shares, excluding utilities, finance and insurance companies and government agencies. The “Bartik” instrument is the summation of the interactions between an institutional investor’s propensity to invest in each firm and its portfolio size. Each institutional investor  $j$ ’s propensity to invest in a firm  $i$  is measured as  $u_i$ , the firm-level fixed effect, from the following estimation by each institutional investor:  $InstOwnership_{it} = \alpha + \beta FundSize_t + u_i + e_{it}$ .

	Mean	Median	Std Dev	Min	Max
<b>Target Probability</b>					
Target dummy	0.01	0.00	0.11	0.00	1.00
<b>Institutional Ownership</b>					
Aggregate public pension fund holdings	0.01	0.00	0.02	0.00	0.23
Aggregate investment company holdings	0.08	0.05	0.10	0.00	1.00
Aggregate other institutional holdings	0.24	0.21	0.19	0.00	1.00
Aggregate all institutional holdings	0.34	0.29	0.27	0.00	1.00
<b>Bartik Instrument</b>					
Aggregate PPF	106.57	0.00	278.47	-546.37	4,904.75
Aggregate investment co.	4853.01	0.00	11,664.32	-16,035	113,963.30
Aggregate others	2,803.17	127.92	6,445.85	-8,665.05	94,251.52
<b>Firm Characteristics</b>					
Total assets (millions)	1,543.82	133.44	10,795.24	0.00	647,483.00
Market capitalization (millions)	1,963.59	137.03	12,566.20	0.00	602,432.90
q ratio	2.55	1.48	5.28	0.00	485.57
Cash flow ratio	-0.06	0.06	0.92	-182.66	3.05
Capital expenditures ratio	0.07	0.04	0.10	-0.31	8.88
Leverage ratio	2.15	0.21	197.89	-804.88	25,187.39
Sales growth	0.70	0.11	28.24	-2.34	2,947.51
Dividend yield	0.01	0.00	0.62	-4.42	121.41
Daily excess return	0.00	0.00	0.01	-0.34	0.71
Return volatility	0.20	0.17	0.13	0.00	2.64
Liquidity	0.14	0.08	0.34	0.00	74.24



Table V: Likelihood of Being Acquired and Institutional Ownership

We report the coefficients and standard errors from the fixed effect regressions, and the fixed effect IV regressions. There are a total of 157,726 firm-quarters in the sample, out of which 1.2% are target firm-quarters. There are a total of 8,494 firms in the sample.

	Dependent variable — 1=target(1.20%); 0=not a target											
	Fixed Effect						Fixed Effect IV					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<b>Institutional Ownership</b>												
Overall	0.013*** (0.003)	0.012*** (0.004)					-0.405*** (0.028)	-0.493*** (0.042)				
Before FD*Overall	0.007*** (0.002)	0.003 (0.002)					-0.011** (0.005)	0.018*** (0.005)				
Public Pension			0.092*** (0.035)	0.086** (0.042)					-0.854*** (0.090)	-0.698*** (0.104)		
Investment Co.			-0.009 (0.006)	-0.013* (0.007)					-0.292*** (0.030)	-0.478*** (0.043)		
Other			0.019*** (0.004)	0.018*** (0.005)					-0.739*** (0.055)	-0.686*** (0.062)		
Before FD*PPF			0.009 (0.039)	-0.022 (0.047)					-0.330*** (0.070)	-0.555*** (0.092)		
Before FD*Investment			0.021*** (0.007)	0.014* (0.008)					-0.036* (0.020)	0.008 (0.020)		
Before FD*Other			0.001 (0.004)	-0.001 (0.005)					0.045*** (0.013)	0.083*** (0.016)		
Turnover					-0.505*** (0.136)	-0.385** (0.174)					21.491*** (3.767)	18.305*** (4.346)
Before FD*Turnover					0.420*** (0.136)	0.312* (0.173)					-20.931*** (3.753)	17.807*** (4.341)

\* significant at 10 %; \*\* significant at 5%; \*\*\* significant at 1%

Table V: Likelihood of Being Acquired and Institutional Ownership: continued

	Dependent variable — 1=target(1.20%); 0=not a target											
	Fixed Effect			Fixed Effect						Fixed Effect IV		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
<b>Controls</b>												
Before FD	-0.031*** (0.001)	-0.031*** (0.002)	-0.030*** (0.001)	-0.031*** (0.002)	-0.025*** (0.001)	-0.026*** (0.002)	-0.047*** (0.003)	-0.073*** (0.004)	-0.080*** (0.005)	-0.093*** (0.006)	-0.001 (0.002)	-0.060*** (0.003)
Size	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	0.027*** (0.003)	0.027*** (0.003)	0.035*** (0.003)	0.035*** (0.003)	-0.003*** (0.001)
q ratio	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	-0.000** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	0.002*** (0.000)	-0.000** (0.000)
Cash Flow	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	0.002*** (0.001)	-0.000 (0.001)
Capital Expenditure	-0.004 (0.004)	-0.004 (0.004)	-0.004 (0.004)	-0.004 (0.004)	-0.003 (0.004)	-0.003 (0.004)	-0.002 (0.007)	-0.002 (0.007)	-0.001 (0.007)	-0.001 (0.007)	-0.001 (0.007)	-0.009 (0.006)
Dividend Yield	-0.004* (0.003)	-0.004* (0.003)	-0.004* (0.003)	-0.004* (0.003)	-0.004* (0.003)	-0.004* (0.003)	-0.004* (0.003)	-0.005 (0.005)	-0.005 (0.005)	-0.005 (0.005)	-0.005 (0.005)	-0.007 (0.005)
Sales growth	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Leverage	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000* (0.000)
Excess Return	-0.063 (0.053)	-0.063 (0.053)	-0.062 (0.053)	-0.062 (0.053)	-0.064 (0.053)	-0.064 (0.053)	-0.329*** (0.064)	-0.329*** (0.064)	-0.329*** (0.064)	-0.392*** (0.069)	-0.392*** (0.069)	-0.096* (0.057)
Return Volatility	-0.006* (0.003)	-0.006* (0.003)	-0.006* (0.003)	-0.006* (0.003)	-0.007** (0.003)	-0.007** (0.003)	-0.051*** (0.006)	-0.051*** (0.006)	-0.051*** (0.006)	-0.062*** (0.007)	-0.062*** (0.007)	-0.002 (0.005)
Liquidity	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	0.013*** (0.002)	0.013*** (0.002)	0.013*** (0.002)	0.017*** (0.003)	0.017*** (0.003)	-0.004** (0.002)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<b>First Stage F-stats</b>												
Overall							1,037.61	469.33				
Before FD*Overall							39,800.09	494.09				
Public Pension									4,132.08	2,626.56		
Investment Co.									1,901.19	1,196.94		
Others									185.77	245.24		
Before FD*PPF									16,735.69	12,715.67		
Before FD*Investment Co.									14,454.03	12,254.23		
Before FD*Others									11,962.14	9,712.22		
Turnover												
Before FD*Turnover									12,886.73	12,981.58		
									9,763.11	9,792.90		

\* significant at 10 %; \*\* significant at 5%; \*\*\* significant at 1%

Table VI: Institutional Ownership and Target Announcement Premium

We report the coefficients and standard errors from OLS regressions, and IV regressions. Target announcement premium is the abnormal return during the (-1,1) three-day window. It is measured using a market model. The market beta is measured during the (-260, -60) window.

	Dependent variable — Target Premium					
		OLS			IV	
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Institutional Ownership</b>						
Overall	0.059** (0.027)			-0.093 (0.119)		
Public Pension		0.018 (0.192)			1.046*** (0.357)	
Investment Co.		0.034 (0.060)			-0.070 (0.148)	
Other		0.068** (0.031)			-0.175 (0.196)	
Turnover			-0.336* (0.199)			0.836 (1.042)
<b>Controls</b>						
Before FD	0.001 (0.019)	0.002 (0.019)	-0.004 (0.018)	-0.014 (0.021)	-0.023 (0.024)	-0.006 (0.018)
Tender offer dummy	0.032* (0.018)	0.032* (0.019)	0.029 (0.018)	0.032* (0.018)	0.028 (0.018)	0.038* (0.020)
All cash dummy	-0.021 (0.016)	-0.022 (0.017)	-0.024 (0.017)	-0.024 (0.016)	-0.017 (0.017)	-0.018 (0.017)
Size	0.005 (0.004)	0.005 (0.004)	0.011*** (0.004)	0.018* (0.011)	0.015 (0.012)	0.006 (0.006)
<i>q</i> ratio	0.011** (0.005)	0.011** (0.005)	0.012** (0.005)	0.012** (0.005)	0.013** (0.006)	0.011** (0.005)
Cash flow	0.065** (0.030)	0.066** (0.030)	0.067** (0.031)	0.069** (0.032)	0.075** (0.033)	0.065** (0.030)
Capital expenditure	-0.076 (0.074)	-0.076 (0.074)	-0.076 (0.073)	-0.092 (0.074)	-0.080 (0.074)	-0.096 (0.074)
Excess return	49.195*** (2.886)	49.190*** (2.905)	49.052*** (2.875)	48.861*** (2.861)	48.571*** (2.899)	49.101*** (2.892)
Return volatility	-0.083 (0.081)	-0.081 (0.081)	-0.108 (0.080)	-0.141 (0.092)	-0.169 (0.104)	-0.099 (0.080)
Liquidity	0.071 (0.063)	0.071 (0.063)	0.083 (0.060)	0.105 (0.066)	0.108 (0.066)	0.086 (0.060)
Dividend yield	0.080 (0.247)	0.077 (0.246)	0.030 (0.244)	0.008 (0.247)	0.049 (0.251)	0.106 (0.252)
Sales growth	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)	0.003 (0.003)
Leverage	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)	-0.000 (0.000)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
# of Obs	1,322	1,322	1,322	1,322	1,322	1,322
R-squared	0.672	0.672	0.671	0.665	0.656	0.664

\* significantly different from zero at 10%; \*\* significantly different from zero at 5%; \*\*\* significantly different from zero at 1%