WHICH INSTITUTIONAL INVESTORS MONITOR? EVIDENCE FROM ACQUISITION ACTIVITY*

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ABSTRACT

This paper shows that the presence of large public pension fund shareholders particularly reduces acquisitions by cash-rich and low-q firms, and by firms seeking to "buy growth", after controlling for ownership endogeneity, firm-level governance structure, and other firm characteristics. When firms with large public pension fund presence *do* acquire other firms, they perform relatively better in the long-run. Other institutional investors have either the opposite effect or no effect.

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Introduction

Theory provides ambiguous predictions about the impact of institutional investors on the governance of corporations. Well-informed institutional investors with a substantial equity stake can exert influence and reduce the agency problem between managers and shareholders with positive ramifications on firm value (Jensen and Meckling (1976), Shleifer and Vishny (1986), Admati, Pfleiderer, and Zechner (1994)). However, institutions can also have no impact on corporate governance. They can choose to trade on information they gather, and avoid the cost of activism (Kahn and Winton (1998), Noe (2002), etc.).

Empirical work has also not produced much evidence on the role of institutional investors. Most studies on institutional investor activism (Gillan and Starks (2000), Del Guercio and Hawkins (1999), Karpoff, Malatesta, and Walkling (1996), Wahal (1996), etc.) focused on institutions' activity in submitting proxy proposals. They found inconclusive results. Other studies (Hartzell and Starks (2002), Hotchkiss and Strickland (2003), Parrino, Sias, and Starks (2003), Song and Szewczyk (2003), etc.) examine institutions' non-proxy activity, such as their impact on compensation policy, CEO turnover, and market response to corporate event. However, few have documented strong evidence that institutional investors systematically influence firms' real decisions and impact firm values.

In this paper, I conduct a new test of the impact of institutional investors on the governance of firms by examining a major corporate event — M&A activity. In particular, I provide the first test of whether the presence of an institutional investor reduces M&A activities that lower firm values. Moreover, I distinguish among each of the different types of institutional investors: public pension funds, mutual funds, insurance companies, private pension funds, banks, and independent advisors. The result is that only the major public pension funds seem to be effective monitors.

Public pension funds reduce M&A frequency, particularly those by cash rich and low q firms and firms seeking to "buy growth". The presence of major public pension funds also improves long-term M&A performance. Other institutions have no effect or a positive effect on M&A frequency, and have no effect or a negative effect on M&A performance.

M&A activity provides a natural test of the efficacy of institutional investor activism. It occurs frequently and can have a substantial effect on firm values. Theories suggest that mergers can occur for good reasons, such as capturing synergy gains, or for bad reasons, such as agency costs. Evidence on bidder performance, both at the announcement and in the long-run, suggests that not all acquisitions are beneficial for bidder shareholders (Jensen and Ruback (1983), Andrade, Mitchell, and Stafford (2001), Agrawal, Jaffe, and Mandelker (1992), Loughran and Vijh (1997), Mitchell and Stafford (2000), etc.). A recent study by Moeller, Schlingemann, and Stulz (2003) show that bidders on average lose $25.2 million upon announcement, from 1980 to 2001.

Some bidders are more likely to perform worse than others. Lang, Stulz, and Walkling (1991) find that bidder returns are significantly lower for low q bidders with high cash flows, which suffer higher agency costs by Jensen's free cash flow theory, than low q bidders with low cash flows. Amihud and Lev (1981), Agrawal and Mandelker (1987), Shleifer and Vishny (1989), Morck, Shleifer, and Vishny (1990), Avery, Chevalier, and Schaefer (1998) and many others suggest that managerial objectives drive value-reducing acquisitions, for example, "buying-growth" acquisition. If institutional investors effectively monitor, then their presence should reduce the likelihood of "bad" M&A driven by managerial incentives, but not "good" M&A. I find that major public pension funds (PPFs) are playing exactly this role.

Critically, to test whether PPFs merely prefer to invest in less acquisitive firms or whether they influence M&A decisions in ways that boost valuations, I use the instrumental variables technique to correct for the potential endogeneity. The identification strategy is unusual in that it explores

the information contained in each institutional investor's equity portfolio. By classifying how acquisitive firms are, I am able to identify to what extent an institutional investor's portfolio is "pro-acquisition" or "anti-acquisition", and to come up with a score to measure this preference. Because this measure is ex post, whatever factor influences institutional ownership and is correlated with firm acquisition activity should be captured by it. I separate the ownership into acquisition-related and non-acquisition-related components by regressing the institutional ownership on this score measure. The non-acquisition-related component solves the identification problem (details in section II.B).

I find that PPFs have a substantial effect on M&A activity. Their influence is concentrated in the value-reducing acquisitions. Ceteris paribus, a 1% increase in the largest PPF ownership associates with roughly a 1.2% reduction in subsequent M&A likelihood. Because less than one in three of firm-years in the sample are M&A observations, this absolute reduction translates into a 4.0% relative reduction in M&A frequency. The effect is much stronger when M&A activity is more likely to be bad, namely when acquirer is cash-rich and low-q (2.1%), or is just "buying-growth" (8.0%). PPFs also do not reduce M&A activity when it is more likely to be good. Acquisitions by cash-poor and low-q firms on average have positive announcement abnormal returns and positive long-term abnormal returns in my sample. PPFs have no effect among these firms. Overall, when firms with large PPF shareholders *do* undertake acquisitions, their long-run performance is better. A 1% increase in the largest PPF ownership associates with an increase of 41 to 301 basis points in various twelve-month abnormal returns (including the announcement month).

The presence of other types of institutions either has no effect or has the opposite effect. The results on investment companies (mostly mutual funds) are particularly interesting. Mutual fund ownership is positively associated with future M&A activity in the whole sample. This association is the strongest among firms with few growth opportunities and a lot of free cash, and among the

bidders which "buy growth", i.e., those more likely to suffer agency costs. This positive influence is robust with respect to endogeneity concerns. In the long-term, acquirers with more mutual fund ownership also perform worse in the stock market. A 1% increase in mutual fund ownership associates with a reduction of 6 to 131 basis points in various twelve-month abnormal returns including the announcement month. The evidence suggests that for firms suffering the most agency conflicts, more mutual fund ownership may insulate the management from more scrutiny and actually encourage more bad M&A.

The evidence of this paper suggests that major public pension funds are the only effective monitors among all institutions. PPFs held 8% of the total U.S. equity market by 2001 (The Conference Board), compared with over 50% owned by all institutions. They are know to be activists of corporate governance. Gillan and Starks (2000) document that PPFs are the most active in governance activities ranging from highly public proxy targeting to closed-door negotiations. In the hotly contested acquisition of Compaq by Hewlett-Packard in 2002, six major public pension funds[1] publicly announced that they would vote against the deal. Nevertheless, my paper is among the first to actually document such a strong and systematic influence on both the real decisions and the firm values.

The remainder of this paper is organized as follows. Section I states the main testable hypotheses. Section II describes data, specification and the construction of instrumental variables. Section III and IV discuss institutional ownership impact on M&A likelihood and M&A performance. Section V concludes the paper.

[1]They are: the California Public Employee Retirement System (CalPERS), the California State Teachers' Retirement System, New York's common Retirement Fund, New York State Teachers Retirement Fund, the Public Employee's Retirement Association of Colorado, and the Public Employees Retirement System of Ohio.

I Hypotheses

Many papers, both theoretical and empirical, have argued that M&A can be motivated by managerial incentives and reduce shareholder wealth, such as Amihud and Lev (1981), Roll (1986), Agrawal and Mandelker (1987), Shleifer and Vishny (1989), Morck, Shleifer, and Vishny (1990), Avery, Chevalier, and Schaefer (1998), etc. The presence of effective monitors should reduce this bad type of M&A activity, and hence, reduce the overall frequency of M&A, ceteris paribus. There are two possible mechanisms. First, if the presence of the monitor signals credible promise of punishing value-reducing actions, the management will not carry out those M&A deals motivated by managerial incentives. Secondly, if the monitor has the capacity to judge the quality of individual transactions and effectively intervene, it can directly reduce the frequency of negative bidder NPV M&A. Although the first mechanism cannot be observed directly, there are anecdotal evidences such as the HP-Compaq incident supporting the existence of the second mechanism. CalPERS states its position on M&A as:[2] "we examine M&A activity closely ... we look at each situation to determine what course of actions is best for the long-term returns of our Fund." This statement also suggests that the second mechanism does exist.

A Institutional Investors — Public Pension Funds

Black (1990) argues that PPFs are in the forefront of institutional shareholder activism due to their size and independence. Several other characteristics of PPFs also encourage and facilitate their roles as monitors of corporate governance. First, although most institutional investors at least partially outsource the management of their assets to external money managers, public pension funds appear to retain effective voting control of their assets. In 1993, PPFs retained voting control over 98.9% of the stocks they owned, compared to only 66.4% for the average institutional investor (Brancato

[2]Quote from email exchanges with Ted White, Director of Corporate Governance at CalPERS, in 2004.

(1993)). Retention of voting power provides the means of activism. Second, indexing strategies are common among PPFs. Davis and Steil (2001) document that indexation accounts for 54% of public pension funds' domestic equity and only 24% of that of corporate funds. Gillan and Starks (2000) argue that selling constraints imposed by indexing strategies can provide an important motivation for shareholder activism aimed at improving overall market performance. In a speech at Stanford University, March 21, 1996, Richard Koppes, former chief counsel of CalPERS, remarked, "It makes sense for us to try to raise the ocean in order to lift our boat."

On the other hand, PPFs may suffer their own agency costs and thus may not be effective monitors. Romano (1993) argues that the political pressure faced by the managers of public pension funds may conflict with the goal of profit maximization. Murphy and Van Nuys (1994) find that state pension system officials manage the funds "more conservatively than their corporate counterparts to avoid drawing negative attention to the pension system." Woidtke (2002) finds that firm relative values are negatively related with public pension ownership.

The principal interest of this paper is to differentiate between the following two hypotheses, which reflect the two sides of the argument.

NULL Hypothesis 1: Public pension funds are not effective monitors of corporate M&A activity, and are not able to reduce value-reducing M&A.

ALTERNATIVE Hypothesis 1: Public pension funds are effective monitors of corporate M&A activity. Public pension funds reduce value-reducing M&A.

B Institutional Investors — Other Shareholders

In contrast to PPFs, other institutional investors may not want to be active monitors. Roe (1994) argues that legal restrictions often prevent banks, insurance companies, and mutual funds etc.,

from owning large blocks of shares, and reduce their incentives to monitor. Black (1990) argues that these institutions suffer conflicts of interest and remain pro-manager: an outside manager making investment and voting decisions for a corporate/private pension fund may feel the pressure to vote pro-manager; bank trust officers who manage large amounts of stocks may be influenced by the lending officers' preference; both banks and insurance companies may not want to develop anti-management reputations for fear of losing current or prospective banking or insurance clients; mutual funds who manage 401(k)s or defined contribution pension plans for corporations may suffer similar conflicts of interest as corporate pension managers; and investment advisors may not want to oppose the management for concerns of underwriting and merger advisory business. Indeed, Pound (1988) and Brickley, Lease, and Smith (1988) document that institutions such as banks and insurance companies are more likely to side with management in proxy contests. Van Nuys (1993) finds that banks and insurance companies are more supportive of management in the proxy solicitation and restructuring at Honeywell in 1989.

On the other hand, there is also anecdotal evidence that these institutions, especially mutual funds, may have on occasion been viable monitors. For example, in 1992, Vanguard was involved in the succession and retirement of Chrysler's then-Chairman Lee Iacocca.

My paper thus also intends to test two competing hypotheses:

NULL Hypothesis 2: Non-public-pension institutions are not effective monitors of corporate M&A activity, and are not able to reduce value-reducing M&A.

ALTERNATIVE Hypothesis 2: Non-public-pension institutions are effective monitors of corporate M&A activity. Their presence reduces value-reducing M&A.

II Data

The initial sample is drawn from the Execucomp data base. This data base lists each firm in the S&P 1500 (S&P 500, S&P Midcap 400, and S&P SmallCap 600). 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 10, 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. Finally, firms with December market capitalization less than one-hundredth the level of the S&P 500 index are dropped out of the sample. For example, in 1995, the S&P500 closed at 615.93. The minimum market cap of firms in 1995 in this sample was $6.1593 million. This is to ensure that results are not driven by small firms. Only a small number of observations are eliminated by this requirement. Results do not change if these firms are included in the study.

Mergers and acquisitions information is obtained from the SDC domestic M&A database by Thomson Financial. To be included, a deal has to be completed with an acquisition of 100% of the target. The total number of M&A deals increases by 132 when deals in which acquirers acquired majorities of the targets are included. The results of the study do not change materially if the criterion of M&A deal inclusion is majority ownership of targets instead of 100% ownership. Both disclosed value and non-disclosed value deals are included, but disclosed value deals must have a value of at least 1 million. The final M&A data contains both public and private targets (from July 1993 to June 2001). This M&A sample is the closest to the one The following table provides a summary. Average deal values (in million dollars) are reported in parentheses.

	Target public company		Target non-public	
	disclosed	non-disclosed	disclosed	non-disclosed
Acquirer acquired 100% of the target	487 ($2,050.30)	1	1,286 ($252.99)	1,859
Acquirer acquired between 50% and 100% of the target	26 ($1,247.43)	1	55 ($282.98)	50

Due to multiple announcements during the 12-month period, the final M&A sample consists of 2,022 firm-year observations. Out of this total, 873 observations are for disclosed value M&A only, 760 observations are for undisclosed value M&A only, and 389 observations are for both types.

There are six types of institutional investors, and their ownership data is obtained from Thomson Financial.[3] The first five types come directly from Thomson classification, which are banks, insurance companies, investment companies (mostly mutual funds, for example, AIM management, Janus, and Liberty Mutual) and independent investment advisors (for example, Bear Stearns, Fidelity, Goldman Sachs, and Morgan Stanley). The last category from Thomson includes public and private/corporate pension funds, and endowments. Within this category, I identify public pension funds by their names, and the rest are termed as private pension funds (which include endowments). In total I find 15 public pension funds: 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

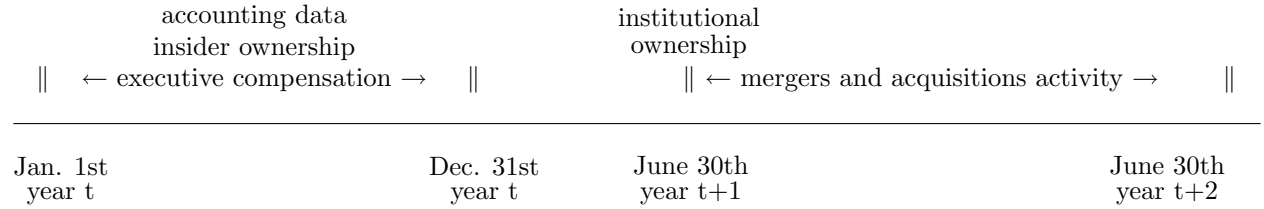
[3]Under the Securities Exchange Act of 1934 (Rule 13f), institutional investment managers who exercise investment discretion over accounts with publicly traded securities (section 13(f) securities) and who hold equity portfolios exceeding $100 million are required to file Form 13f within 45 days after 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.

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 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. 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.

Two different variables are used to measure institutional ownership: 1) The aggregate holdings by each category; 2) The largest individual holdings within each category.

A firm-level shareholder rights variable (the governance index) is obtained from Gompers, Ishii, and Metrick (2003), which quantifies firm-level provisions of 24 governance rules (mostly takeover related). A higher index value reflects weaker shareholder rights. This index is available for the full sample of Investor Responsibility Research Center (IRRC) firms for each publication of Corporate Takeover Defenses [Rosenbaum 1990, 1993, 1995, 1998, 2000]. For years (1992, 1994, 1996, 1997, 1999) during which there is no publication to provide up-to-date governance provision information, I use the most adjacent data as a proxy.

The diagram



shows the timeline of the research design. During calendar year t, corporate accounting data,

insider ownership data, and executive compensation data are recorded. The majority of firms end their fiscal years in December. At the end of June, year t+1, institutional ownership is recorded. The six-month lag ensures that all relevant information is public when institutional ownership data is considered. If the firm announces at least one merger and/or acquisition deal during the period July, year t+1 to June, year t+2, this firm is considered to be an M&A firm for data year t.

Thomson Financial institutional ownership data is available until 2000 at the time of this study. Execucomp data is available from 1992. Thus my final sample represents the overlapping between Execucomp firms (with both accounting data and stock performance data available) and IRRC firms from 1992 to 1999. Each year, their corresponding institutional ownership (with a 6-month lag) is from end of June holdings in the following year (1993 to 2000); their merger and acquisition data (with a minimum 6-month lag) is collected from July the following year to June two years after. There are 1,362 firms and a total of 6,681 firm-year observations.

Table I provides a detailed description of all variables. All relevant data are CPI-adjusted. Table II shows that this sample is primarily larger firms. In 1992 dollars, the median market capitalization is $1,008.99 million and the median total assets are $905.57 million. Ranked by year-end market capitalization each year, 5,745 observations (88%) are above the median market capitalization of NYSE and AMEX firms. Results remain if only those firms are included. Thus, my conclusions are not driven by the smaller firms in the sample.

Among the 6,681 firm-year observations, there are in total 2,022 (30%) M&A observations. Firms in M&A firm-year observations are larger, have lower insider ownership, higher governance index, higher cash flow ratios, higher q ratios, lower capital expenditures ratios, and better prior performance than those in non-M&A firm-year observations. A total of 147 observations (2.2%) have zero PPF ownership. 11 (7.5%) of those are M&A observations.

A Specification

Peterson (2005) points out that in financial panel data, the residuals may be correlated across firms and across time, and OLS standard errors can be significantly biased. I control for this bias by including firm-level effects/industry dummies and year dummies in my specification.

The first specification is:

$$\begin{aligned} y_{it} &= \beta_0 + \beta_1 PubPension_{it} + \beta_2 InvestmentCo_{it} + \beta_3 InsuranceCo_{it} \\ &\quad + \beta_4 PvtPension_{it} + \beta_5 Bank_{it} + \beta_6 Advisor_{it} \\ &\quad + \phi X_{it} + \gamma Year_t + u_i + \epsilon_{it}, \end{aligned} \tag{1}$$

where y_{it}, the dependent variable, is a dummy variable measuring firms' M&A activity. It equals one when there is at least one M&A announcement during the 12-month period. t is a time subscript. i denotes each firm. u_i is the firm-level effect. The six ownership variables (PubPension, InvestmentCo, InsuranceCo, PvtPension, Bank, Advisor) are the variables of interest in this study. The X_{it} is a vector of control variables including managerial ownership, managerial compensation, the governance index, leverage ratio, cash flow ratio, q ratio, firm size, capital expenditures ratio, firm prior performance, and industrial concentration. Table I explains in detail what these variables are. The $Year_t$s are year dummies.

Logit specification (with year dummies and industry dummies) in general is a better model than the linear probability model when the dependent variable is binary, since the predicted value is bounded within 0 and 1. The second specification is:

$$
\begin{aligned}
Log(\frac{y_i}{1-y_i}) &= \beta_0 + \beta_1 PubPension_i + \beta_2 InvestmentCo_i + \beta_3 InsuranceCo_i \\
&\quad + \beta_4 PvtPension_i + \beta_5 Bank_i + \beta_6 Advisor_i \\
&\quad + \phi X_i + \gamma Year_i + \delta Industry_i + \epsilon_i. \qquad (2)
\end{aligned}
$$

I also use the logit specification with firm-level effects and year dummies, which yields similar estimations, and is not reported due to space constraints.

B Endogeneity

I focus mainly on the ownership variables in equation 1. These variables can be endogenous. A negative and significant β_1 could be due to the fact that PPFs sort themselves towards less acquisitive firms, or prefer to invest in firms with certain unobservable characteristics that are associated with less M&A activity. To obtain a clear interpretation, I use the instrumental variables estimation technique.

The main difficulty is to find an appropriate instrument for the institutional ownership. A valid instrument should satisfy both the exclusion condition and the correlation condition (Wooldridge (2001)). Standard "instruments" for ownership, however, are invalid. Gompers and Metrick (2001) find that firm characteristics such as dividend yield, liquidity, return volatility, and major index inclusion etc. are correlated with institutional ownership. Demsetz and Lehn (1985) find that the instability of firm profit is a determinant of firm ownership. Woidtke (2002) uses transactions costs[4] as an instrument. However, after controlling for firm-level effects in the panel data, these

[4]Calculated as 0.687 + 0.239*(Nasdaq dummy) - 0.076*(log of market value of equity) + 9.924*(inverse of price), based on Keim and Madhavan (1997)'s model. Institutions may also prefer stocks with lower transaction costs given the often large positions held by them.

variables are "weak instruments" defined by Staiger and Stock (1997). Their correlations with the institutional ownership are too low and would lead to huge biases in estimations.

To overcome this difficulty, I exploit information contained in firms' prior average acquisition expenditures and in institutional investors' asset allocations, which allows me to construct an almost ideal instrument. The goal is to orthogonalize institutional ownership into acquisition and non-acquisition related components. We start by identifying each firm's "acquisitiveness" using its average acquisition expenditure (Compustat items data129/data6) in last five years. Next I find a "preference score" ($FundScore_{jt}$), fund preference for acquisition, for an institutional investor (at time t), by looking at its asset allocation.

$$FundScore_{jt} = \sum_{i=1}^{n} w_{j,it} AverageAcquisition_{it}, \tag{3}$$

$w_{j,it}$ denotes the portfolio weight of firm i's stock in fund j's portfolio at time period t.

For each firm, the "preference score" ($FundScore_{it}$) of each type of its institutional investors is the score of the largest investor within that type. Using this institution "preference", I can orthogonalize each year the institutional ownership of firm i into the acquisition/preference related and the non-acquisition related components by running a tobit regression (since ownership is censored at zero),

$$InstOwnership_{it} = \alpha + \beta FundScore_{it} + u_i + e_{it}. \tag{4}$$

Since the $FundScore_{it}$ is an ex post measure, any factor that influences institutional ownership and is related to acquisition activity should be captured by this measure. The non-acquisition related component, e_{it}, is used as an instrument to identify the institutional effect in the M&A

context. By construction, it is uncorrelated with factors which correlate with M&A activity, thus satisfies the exclusion condition; it is strongly correlated with institutional ownership, thus satisfies the correlation condition. I call this variable "NA ownership". "NA" stands for non-acquisition.

The sample starts in year 1992, the first year executive compensation data is available. Fortunately, accounting information is available for a much longer period. I am able to construct the "preference score" measure for each firm-year. For firms with zero institutional ownership, this measure is set to zero.

The first stage of the two-stage IV regression is:

$$InstOwnership_{it} = \alpha + \beta NAownership_{it} + \phi X_{it} + \gamma Year_t + u_i + \epsilon_{it}. \tag{5}$$

The estimated institutional ownership, $\widehat{InstOwnership_{it}}$, from the first stage, is then used in the second stage IV regression, which is equation (1).

If I use the weighted "FundScore" of all institutions within each category in equation 3, the estimations are similar. Other variables used as controls may also be endogenous. When I exclude all controls from the regressions, results are even stronger. The potential endogeneity of the control variables does not bias the estimates on the ownership variables, which are the focus of this study. Since a detailed discussion of the control variables is beyond the scope of this paper, this issue is left for future explorations.

III Institutional Ownership and Likelihood of M&A

It is easier for managers to undertake "bad" M&A when there is no effective monitoring. Controlling for the firm-level governance structure and firm characteristics which may affect M&A likelihood, we would expect to observe, ceteris paribus, that firms without effective institutional monitoring

are more likely to engage in M&A activity than firms with effective institutional monitoring. In this section I examine whether institutional ownership reduces M&A frequency in the full sample, and particularly for the value-reducing ones in the subsamples.

A Full Sample Results

I report the results from the pooled logit model and the linear IV model with firm-level effects. The pooled logit model includes year and industry dummies as controls. The IV model allows for firm-level unobserved heterogeneity in mergers and acquisitions decisions, and utilizes both the time-series and the cross-sectional dimensions of the data. Unobserved industry-level heterogeneity is incorporated in this firm-level effects. During the sample period 1992-1999, the telecommunication and broadcasting industry went through major deregulation (1996). A dummy variable capturing this shock is not significantly associated with M&A activity.

Institutional Ownership Variables I find that the overall institutional ownership (sum of all types) is positively and significantly associated with future M&A activity. I then decompose the overall institutional ownership into six types as detailed earlier, and report results on different types of institutional ownership.

Table III reports the first-stage from the IV regressions, which provide information on factors influencing various institutional ownership. In the first stage, the ownership variables are regressed on its instrument(s) and all other exogenous variables used in the second stage regression. The fitted ownership variable from the first stage is then used in the second stage to predict the likelihood of M&A. The Hausman test for endogeneity is performed to determine whether variables are endogenous, for which Wooldridge (2001) provides a detailed discussion (pages 118-120). The overall set of institutional ownership variables is endogenous as a group.

The instruments I use are the various "NA" ownerships. Because they are constructed by

decomposing the respective institutional ownership, and acquisition preference is only one factor among many influencing institutions' investment decisions, the loading on the same-category instrument is very close to one. This indicates that the correlation between the instruments and the endogenous variables are very large. Consequently the potential bias in the IV estimation, which is scaled by this correlation, is likely to be very small (Staiger and Stock (1997)).

There is some evidence that institutions prefer firms with better governance structure measured by the governance index, and bigger firms. Better prior stock performance leads to less PPF ownership and less insurance company ownership. These two types of institutions also do not appear to be momentum investors in the sample.

Institutions do not avoid firms with prior M&A activity. I use two independent dummy variables to measure firms' prior M&A activities. The first dummy equals one if a firm announced a deal in the prior year which received positive announcement abnormal return, and it equals zero for all others. The second dummy equals one if a firm announced a deal in the prior year which received negative announcement abnormal return, and zero for the rest. The strict exogeneity assumption of panel data models excludes lagged dependent variables(Wooldridge (2001)). This two-dummy approach is to avoid this issue. Results are similar without the inclusion of these two dummies.

The results from the second stage IV regressions are reported in Table IV.[5] PPF ownership has a negative and significant impact on M&A. This impact remains significant and is economically larger when I exclude all other controls. Although the control variables can potentially be endogenous, they do not bias the estimations on the variables of interest.

Concentrated PPF ownership matters more than the aggregate level. While a 1% increase in the aggregate PPF ownership leads to a 0.7% reduction in M&A likelihood, a 1% increase in the

[5]The Hausman tests show that the random effects specification is appropriate for equation (1), so I adopt the GLS random effects models.

largest PPF ownership leads to a 1.2% reduction.

Other institutional investors have either a positive effect or no effect on M&A likelihood. To summarize,

1. Investment companies and insurance companies have a positive effect in the whole sample. This effect remains after correcting for endogeneity, which suggests that these two types of institutions encourage more M&A.

2. The aggregate bank ownership has a positive effect on M&A which is robust to endogeneity correction.

3. Private pension funds and independent advisors have no effect on M&A activity.

Controls Table IV also includes other variables. From the perspective of my study, they are primarily controls, and not a focus or subject of interest. Thus I discuss the findings only briefly.

Gompers, Ishii, and Metrick (2003) constructed an index on shareholder rights by examining firm-level governance rules, most of which are anti-takeover provisions. This index is especially relevant in the context of this study. Mitchell and Lehn (1990) find that firms that make value-reducing acquisitions become takeover targets. Thus a higher level of anti-takeover protection may insulate the management from possible takeovers following a bad acquisition, and consequently encourages bad acquisitions. Gompers, Ishii, and Metrick (2003) find that firms with stronger shareholder rights (lower index value) made fewer corporate acquisitions. This is also confirmed in my sample.

When CEOs receive more option grants in their compensation package, firms are more likely to undertake M&A. If M&A activity adds risk, this result suggests that options encourage risk-taking behavior. However, M&A could also be motivated to reduce risk (diversification for example). Thus the role of options in the context of M&A activity is unclear.

Several firm characteristics variables also matter for M&A activity.

1. Firm prior M&A activity, firm size, and Tobin's q ratio are significantly and positively related to M&A activity.

2. Firm leverage exhibits a negative and significant correlation with M&A activity as predicted by theories.[6] My calculation of the leverage ratio does not differentiate between bank debt and public debt. It is possible that a measure using only bank debt would yield stronger results.

3. There is a substitution effect between capital expenditures and M&A activity.

4. M&A activity is motivated by a firm's prior performance.[7] It is possible that firms either extrapolate their prior performance when making investment decisions or take advantage of their relatively high valuations.

B Subsample Results

Some mergers and acquisitions *can* create value for the acquirers. It is important to know if PPFs have the ability to differentiate between good and bad M&A ex ante, and thus discourage bad deals; or, if the presence of PPF investors deters managers from undertaking M&A, whether it deters the bad M&A only.

[6] Jensen (1986) points out that debt commits management to pay out a steady stream of cash in the future and thereby reduces the free cash flow available for discretionary spending. The requirements of debt service also motivate managers to perform well. Myers and Majluf (1984)'s pecking order theory predicts that investment projects will be financed by internal cash whenever it is available. Investment projects financed by external debt or stock issuance require higher rates of returns. In this theory, a high leverage ratio correlates with less internal free cash, which causes a higher threshold of profitable investment returns. Both theories predict that a higher leverage ratio should correlate with less M&A activity. Berger, Ofek, and Yermack (1997) find that managerial entrenchment is higher for less leveraged firms. The agency conflict associated with managerial entrenchment is positively correlated with agency-driven M&A. It is possible that a higher leverage ratio is associated with less managerial entrenchment and thus less M&A activity.

[7] I use four measures for prior performance: one-year sales growth rate, cumulative abnormal returns using the benchmark method, cumulative abnormal returns using the Fama-French 3-factor model, and buy-and-hold abnormal returns. I report my results using benchmarked CAR throughout this paper. Results using other measures are similar both in economic and statistical significance, and are available upon request.

Lang, Stulz, and Walkling (1991) and Morck, Shleifer, and Vishny (1990) suggest worse performance for cash rich, low q acquirers and "buying-growth" acquirers. Table V confirms it.

Low q firms and cash rich firms are classified independently. Each year, firms with q ratios less than the sample median are classified as low q firms. Annual median q ratios vary from 1.31 to 1.60. Half of the original observations are classified as low q observations. Cash richness is defined as the ratio of non-current-debt cash and cash equivalents to non-cash total assets (see table I). Each year, firms with above industry (by 4-digit SIC code) median cash holdings are classified as cash-rich firms. To define which deal is "buying growth", I need accounting data for the targets. Target growth rate is defined to be the 3-year sales growth rate prior to the takeover. Deals with target sales growth above the sample median are considered to be "buying growth."

Table V reports that among the low q firms, the market responds more favorably towards M&A news when the acquirer is cash poor: cash rich ones have insignificant announcement abnormal returns, while cash poor ones have significant and positive announcement abnormal returns at 68 basis points on average (equal weight). The value-weighted announcement abnormal return is negative for cash-rich and low q firms, and positive for cash poor and low q firms. "Buying-growth" M&A receives significantly negative announcement abnormal returns, while "non-buying-growth" M&A announcement abnormal returns are insignificant. When I look at long-term performance over a 12-month period including the announcement month, cash poor low q firms and "non-buying-growth" firms appear to perform better.

If PPF monitoring is effective, I would expect PPF ownership to: 1) have a more pronounced effect in the cash rich group than the cash poor group among the low q firms; 2) reduce the likelihood of "buying-growth" M&A. I find strong support for effective PPF monitoring.

Cash Rich Low-q vs Cash Poor Low-q Table VI shows that the PPF impact among low q firms is concentrated in the cash rich firms, which suggests PPFs' ability to reduce ex ante bad

M&A. A 1% increase in the largest PPF ownership leads to a 2.1% reduction in M&A likelihood, almost doubling its impact in the whole sample. PPF ownership has no impact in the cash poor low q subsample. On the contrary, the presence of investment company ownership (mutual funds) is associated with more M&A activity in the cash rich low q group.

Table VI also shows that cash poor low q firms undertake more M&A when their prior stock performance is better, while cash rich low q firms' M&A decisions are not influenced by prior performance. The cash rich group is also more likely to undertake M&A when their shareholder rights are weaker (measured by the governance index). These findings suggest that cash rich low q firms are indeed more likely to undertake M&A driven by managerial incentives.

Buying-growth M&A Table VII looks at PPFs' impact on the likelihood of "buying-growth" M&A. PPFs reduce the likelihood of "buying growth" M&A: a 1% increase in the largest PPF ownership reduces the probability of buying a fast-growing target by 8%. Again, on the contrary, investment company (mostly mutual funds) ownership is positively correlated with "buying-growth" M&A.

IV Institutional Ownership and Performance of M&A

This section looks at bidder announcement stock abnormal returns, bidder long-term stock abnormal returns, and bidder post-M&A operating performance to judge whether an M&A deal is good or bad. Appendix A provides the details on the methodologies measuring the performance.

The primary goal here is not to test for market efficiency. It differs from the studies by Barber and Lyon (1997), Mitchell and Stafford (2000) and others, because it includes the announcement month in the calculation of long-term abnormal returns. Results are similar if I look at post-M&A performance only.

A Market reactions

This section examines whether the stock market reacts differently to M&A events given different institutional ownerships.

Table VIII reports the results on announcement abnormal returns during the 3-day window (-1, 1). Private pension fund ownership and aggregate investment company ownership are significantly and negatively associated with abnormal returns. However, the market does not appear to perceive that higher PPF ownership can improve shareholder value in M&A. It is possible that the market is not responsive to PPF ownership variable because there are other factors that affect the profitability of a deal, such as managerial ability.

Travlos (1987) finds that the form of payment is significantly correlated with announcement abnormal returns. I include the method of payment variable (measuring the percentage of the deal financed by cash) as a control. The sample size is thus restricted to disclosed value deals only. The use of cash is significantly and positively related with announcement abnormal returns.

Table IX reports the results on long-term abnormal returns over twelve months, *including* the announcement month. The long-term abnormal returns may provide a better measure of M&A performance since the measure of announcement abnormal returns can be noisy. For example, Mitchell, Pulvino, and Stafford (2004) find that nearly half of the negative acquirer announcement stock return reflects price pressure caused by merger arbitrage.

It appears that M&A firms with higher PPF ownership perform relatively better in the long-run. In contrast, investment company ownership correlates negatively with long-run abnormal returns.

For long-term abnormal return regressions, the method of payment variable is not significantly related with any abnormal return measures, and reduces the sample size from 2,013 to only 873 observations. The results on institutional ownership variables do not change materially with or

without the method of payment variable. I choose to report the long-run results from the bigger sample excluding this variable.

I also checked whether PPF ownership is correlated with M&A stock performance within the cash rich low q group, but was unable to find a significant association. It is possibly due to limited sample size (less than 400 firm-years and 261 firms).

B Operating performance

The operating performance of the M&A firms within my sample, as measured by both operating cash flow returns and cash flow margin on sales, is on average better than their industry median both pre- and post-M&A. Consistent with findings in Healy, Palepu, and Ruback (1992), their performance as measured by these two benchmarks improve after their acquisitions. Post-M&A industry-adjusted cash flow returns on average increase by 1.53% as compared to their pre-M&A levels; post-M&A industry-adjusted cash flow margins on average increase by 5.38% as compared to pre-M&A levels. Both improvements are statistically different from zero at the 1% significance level.

However when I look at their asset turnover rates, they performed worse on average than the industry median both before and after M&A. Also, their asset turnover rates appear to deteriorate after the acquisitions' completion. The decline is not statistically significant except for the subgroup of M&As with publicly traded targets.

Table X reports that PPF ownership is positively associated with improvements in asset turnover rates. Earlier results show a positive relation between PPF ownership and twelve-month stock abnormal returns, thus this positive association between PPF ownership and abnormal asset turnover rate is less likely to be driven by a relatively low market valuation of firm assets.

V Robustness check

In a contemporaneous and independent paper, Gaspar, Massa, and Matos (2004) find that institutional investors' investment horizon impacts firms' M&A activity. They define activist investors by membership in the Council of Institutional Investors (CII), the majority of which are private pension funds and small public pension funds which outsource the management of their assets. Song and Szewczyk (2003) find little evidence that the CII has been effective in its activist activity. This membership variable is unlikely to capture the activism impact by major public pension funds. When I include investment horizon variables for various types of institutional investors in the regressions, my results remain. A further discussion is beyond the scope of this paper. Chen, Harford, and Li (2005) provide a more detailed study.

If I measure M&A activity by the deal size, the results are similar. The full sample includes undisclosed deal value M&A. When I restrict the sample to M&A with disclosed deal value, I find that 1% increase in the largest PPF ownership reduces about $109 million dollars in deal size. The aggregate PPF ownership has a similar but smaller economic effect. Investment company ownership encourages bigger deals on the other hand. 1% increase in the largest mutual fund ownership leads to $79 million more in deal size. Moeller, Schlingemann, and Stulz (2003) find that value-reducing M&A occurs mostly in big deals. Thus PPF's negative effect on deal value may be correlated with better M&A overall.

I also studied the sample of firms from 1980 to 1999 without the inclusion of executive compensation data and insider ownership data (since those data are available only from 1992). The results remain similar.

If I measure the institutional ownership using two different measures: 1) A dummy variable which equals one if there is at least one 5% block holder within a category; 2) The Herfindahl

concentration, The results remain similar.

When I look at a much longer horizon, the negative relation between PPF ownership and future M&A remains. I examine whether institutional ownership at the end of June, 1993 can predict M&A frequency in the eight years from July, 1993 to June, 2000. A 1% increase in the largest PPF ownership is associated with a 4% reduction in the number of M&As in eight years. The positive association between aggregate insurance company ownership and future M&A remains in the long-run. There is no relationship between investment company ownership and future M&A in the long-run.

I also check the robustness of IV regression results using a simultaneous equations system. This model assumes that public pension fund ownership and firm M&A activity can have reciprocal influence on each other. The results confirm that the negative impact of PPF ownership on M&A activity is strong and significant.

VI Conclusions

As Holmstrom and Kaplan (2001) point out, the hostile takeover market, which served as a disciplinary force in the 1980s, has largely disappeared in the 1990s. Furthermore, various antitakeover measures adopted by management in the 90s have rendered takeover market ineffective (Bebchuk, Coates IV, and Subramanian (2002)). Black (1992) and Pound (1992) thus argue that the market-and-transaction-based system of corporate governance has evolved into a political model of monitoring. However, empirical research by Bebchuk and Cohen (2005), Yermack (1996), and Shivdasani and Yermack (1999), among many others, have cast doubts on the effectiveness of monitoring by the board of directors. There are also many studies examining institutional investor activism, yet few existing ones have documented strong evidence.

My paper documents a strong effect on corporate M&A activity by one class of institutions, major public pension funds. After controlling for ownership endogeneity, firm-level governance structure, and firm characteristics, my study has shown that PPF ownership reduces the likelihood of buying other firms. The reduction in M&A activity is greater in cases with higher potential agency conflict, i.e., for firms with low q ratios but high free cash flows, and for firms seeking to buy fast-growing targets. PPF ownership is also positively correlated with long-run M&A abnormal returns. Overall, I believe that there is enough evidence to support Hypothesis 1a, which states that public pension funds are effective monitors of corporate M&A activity.

Ownership by investment companies is positively correlated with M&A likelihood among firms with higher agency costs. The aggregate investment company ownership is negatively associated with both announcement abnormal returns and long-run M&A abnormal returns. Given these findings, investment companies appear to be the least likely monitors among all types of institutions. The fact that investment company ownership is negatively correlated with M&A stock performance in the long-run is not explained by the "preference" story, and may instead be more consistent with the story that their presence encourages value-reducing activity by firm management. However, Shleifer and Vishny (2003) demonstrate in their model that a rational manager may undertake an acquisition when the stock is overvalued by an irrational market. In this scenario, M&A is not value-reducing for bidder shareholders at all, despite the post-event drop in stock price as the true valuation is revealed.

Core, Holthausen, and Larcker (1999) find that CEO compensation level is higher when governance structures are less effective. Therefore, greater CEO compensation could be correlated with greater agency problems and higher agency costs in M&A activity. There is some weak evidence in my paper that the level of CEO cash compensation is negatively correlated with M&A performance. CEO stock options are significantly and positively correlated with M&A likelihood, but

not significantly correlated with M&A performance. I find no support within my sample for the argument that more option grants encourage better performance, and thus encourage good M&A, which is consistent with findings by Yermack (1995) that agency or financial contracting theories do not explain the patterns of CEO stock option awards.

The variables on managerial incentives are primarily control variables in this study. It would be interesting to further pursue the effect of managerial incentives on managers' M&A decisions. It is very possible that factors such as agency costs, which affect firms' M&A activity, also affect firm-level managerial incentives. This endogeneity problem should be addressed in further studies.

Appendix A: Measuring Performance

M&A bidder stock performance is measured by both the announcement abnormal return and the long-run abnormal return. For announcement abnormal returns, I follow standard event study methodology to calculate CARs for the three-day window (-1,1) around the announcement date supplied by SDC. The abnormal returns are estimated using a modified market model:

$AR_i = r_i - r_m$,

where r_i is the return on firm i and r_m is the value-weighted market index return. If there are multiple announcements during the 12-month period, I take the average abnormal announcement return of all announcements during the period.

Measuring long-term abnormal performance is difficult. Barber and Lyon (1997) advocate the use of buy-and-hold abnormal returns over cumulative abnormal returns. They document that cumulative abnormal returns are most affected by new listing bias, and are generally positively biased, while buy-and-hold abnormal returns are generally negatively biased. Kothari and Warner (1997) caution that long-horizon abnormal returns are severely misspecified. Fama (1998) argues that formal inferences about long-term abnormal returns should be based on averages or sums of short-term abnormal returns. Mitchell and Stafford (2000) show that the conventional methodology of calculating multi-year buy-and-hold abnormal returns and conducting inferences via a bootstrapping procedure is flawed because the abnormal returns for event firms are not independent. After accounting for the positive cross-correlations of event firm abnormal returns, they find no abnormal performance in their sample of mergers, seasoned equity offerings, and share repurchases. Brav (2000) uses a Bayesian approach in estimating long-term abnormal returns and finds the three-factor model to be inconsistent with the long-term performance of IPOs.

Since no one measure appears to be perfect, I examine all three measures of long-term abnormal returns: cumulative abnormal returns using the benchmark method, buy-and-hold abnormal returns, and cumulative abnormal returns using Fama-French 3-factor model.

Each month, NYSE/AMEX ordinary common stocks with prior book-to-market values are sorted into 10 size portfolios according to their market capitalizations at the beginning of the month. Within each size portfolio, these stocks are further sorted into 5 groups according to their book-to-market values. The breaking points for these 50 portfolios are used to place all ordinary common stocks with CRSP and COMPUSTAT coverage and prior book-to-market values (to mitigate the new listing bias) into 50 benchmark portfolios.

Cumulative abnormal returns (CAR, benchmarked) are calculated over 12 months for individual event firms, including the announcement month. When there are multiple announcements during a year, CAR is calculated starting from the announcement month of the first announcement.

$CAR_i = \sum_{t=1}^{12}(R_{it} - R_{bt})$,

where R_{it} is the simple monthly return on the common stock of firm i. R_{bt} is the equal-weighted average monthly return of its benchmark portfolio.

Buy-and-hold abnormal returns (BHAR) are calculated over 12 months, including the announcement month,

$BHAR_i = \prod_{t=1}^{12}(1 + R_{it}) - \prod_{t=1}^{12}(1 + R_{bt})$.

Fama-French 3-factor monthly abnormal return is the α_i from the time-series regression of the model:

$R_{it} - R_{ft} = \alpha_i + \beta_i(R_{mt} - R_{ft}) + s_i SMB_t + h_i HML_t + \epsilon_{it}$,

where R_{ft} is the return on three-month Treasury bills, R_{mt} is the return on the value-weighted market index, SMB_t is the difference between the return on a portfolio of small stocks and the return on a portfolio of large stocks, and HML_t is the difference between the return on a portfolio of high book-to-market stocks and the return on a portfolio of low book-to-market stocks. Cumulative abnormal returns (CAR, 3-factor) are then calculated as $12 * \alpha_i$ for individual event firms.

Abnormal post M&A operating performance is measured by changes in industry-adjusted operating cash flow returns, cash flow margins, and asset turnover rates that occur after the deal completion dates. We follow methodologies used both in Barber and Lyon (1996) and in Healy, Palepu, and Ruback (1992).

Barber and Lyon (1996) evaluate different methodologies used to measure accounting-based operating performance, and find the change models to be more desirable than the level models. Firm-level operating performance is adjusted by the industry median before M&A and after M&A. The changes in industry-adjusted performance are the measure of M&A abnormal operating performance.

- Operating cash flow return,
  $CF = \frac{\text{Operating Income[13]+Depreciation[14]+Goodwill[204]}}{\text{Total Asset[6]-Book Value Of Equity[60]+Market Value Of Equity Beginning Of Year}}$
- Cash flow margin on sales,
  $CFM = \frac{\text{Operating Income[13]+Depreciation[14]+Goodwill[204]}}{\text{Sales[12]}}$
- Asset turnover rate,
  $AT = \frac{\text{Sales[12]}}{\text{Total Asset[6]-Book Value Of Equity[60]+Market Value Of Equity Beginning Of Year}}$

These operating performance measures are not affected by depreciation and goodwill. Thus, they allow cross-section comparison of firms which used purchase accounting method and firms which used pooling-of-interests accounting method. These measures are also not affected by the methods of financing used in mergers because the interest expense is not deducted.

These measures are then adjusted by subtracting industry medians. Industry-adjusted operating cash flow return(IACF), industry-adjusted cash flow margin on sales(IACFM), and industry-adjusted asset turnover rate(IAAT) are calculated for the 3 years before the M&A completion year and the 3 years after the M&A completion year.

The majority of my M&A sample acquired private targets. For the small number of M&As with publicly traded targets, pre-M&A operating performance is calculated as the weighted average between the bidder and the target. The weights are the bidder and the target's market capitalizations at the beginning of the year prior to the M&A completion year.

The median value of operating performance from the 3 years pre-M&A($IACF_{pre,i}$, $IACFM_{pre,i}$, $IAAT_{pre,i}$) and the median value of operating performance from the 3 years post-M&A($IACF_{post,i}$, $IACFM_{post,i}$, $IAAT_{post,i}$) are used to calculate abnormal operating performance.

I use two methods of calculation. The first one follows Barber and Lyon (1996). It is the difference between post-M&A industry-adjusted performance and pre-M&A industry-adjusted performance:

$$
\begin{aligned}
AIACF_i &= IACF_{post,i} - IACF_{pre,i} \\
AIACFM_i &= IACFM_{post,i} - IACFM_{pre,i} \\
AIAAT_i &= IAAT_{post,i} - IAAT_{pre,i}
\end{aligned}
$$

The second method follows Healy, Palepu, and Ruback (1992). Taking into consideration that pre-M&A operating performance may predict the post-M&A operating performance,

$$
\begin{aligned}
IACF_{post,i} &= a1 + b1 * IACF_{pre,i} + \epsilon_{i1} \\
IACFM_{post,i} &= a2 + b2 * IACFM_{pre,i} + \epsilon_{i2} \\
IAAT_{post,i} &= a3 + b3 * IAAT_{pre,i} + \epsilon_{i3}
\end{aligned}
$$

These regressions are run on the whole sample of M&A observations to get estimates of the coefficients. The abnormal operating performance of the individual acquirer is thus calculated as,

$$
\begin{aligned}
AIACF_i &= IACF_{post,i} - (a1 + b1 * IACF_{pre,i}) \\
AIACFM_i &= IACFM_{post,i} - (a2 + b2 * IACF_{pre,i}) \\
AIAAT_i &= IAAT_{post,i} - (a3 + b3 * IAAT_{pre,i})
\end{aligned}
$$

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.

Agrawal, Anup, Jeffrey F. Jaffe, and Gershon N. Mandelker, 1992, The post-merger performance of acquiring firms: A re-examination of an anomaly, *The Journal of Finance* 47, 1605–1621.

Agrawal, Anup, and Gershon N. Mandelker, 1987, Managerial incentives and corporate investment and financing decisions, *The Journal of Finance* 42, 823–837.

Amihud, Yakov, and Baruch Lev, 1981, Risk reduction as a managerial motive for conglomerate mergers, *Bell Journal of Economics* 12, 605–617.

Andrade, Gregor, Mark Mitchell, and Erik Stafford, 2001, New evidence and perspectives on mergers, *Journal of Economic Perspectives* 15, 103–120.

Avery, Christopher, Judith A. Chevalier, and Scott Schaefer, 1998, Why do managers undertake acquisition? an analysis of internal and external rewards to acquisitiveness, *Journal of Law, Economics, and Organization* 14, 24–43.

Barber, Brad M., and John D. Lyon, 1996, Detecting abnormal operating performance: The empirical power and specification of test statistics, *Journal of Financial Economics* 41, 359–399.

——— , 1997, Detecting long-run abnormal stock returns: The empirical power and specification of test statistics, *Journal of Financial Economics* 43, 341–372.

Bebchuk, Lucian Arye, John C. Coates IV, and Guhan Subramanian, 2002, The powerful antitakeover force of staggered boards: Theory, evidence, and policy, *Stanford Law Review* 54, 887–951.

Bebchuk, Lucian Arye, and Alma Cohen, 2005, The costs of entrenched boards, *Journal of Financial Economics* 78, 409–433.

Berger, Philip G., Eli Ofek, and David L. Yermack, 1997, Managerial entrenchment and capital structure decisions, *The Journal of Finance* 52, 1411–1438.

Black, Bernard S., 1990, Shareholder passivity reexamined, *Michigan Law Review* 89, 520–608.

——— , 1992, Institutional investors and corporate governance: The case for institutional voice, *Journal of Applied Corporate Finance* 5, 19–32.

Brancato, Carolyn Kay, 1993, Patterns of institutional investment and control in the usa, Institutional Investor Project, Center for Law & Economic Studies, Columbia University.

Brav, Alon, 2000, Inference in long-horizon event studies: A bayesian approach with application to initial public offerings, *The Journal of Finance* 55, 1979–2016.

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.

Chen, Xia, Jarrad Harford, and Kai Li, 2005, Monitoring: Which institutions matter?, working paper, Sauder School of Business, University of British Columbia.

Core, John E., Robert W. Holthausen, and David F. Larcker, 1999, Corporate governance, chief executive officer compensation, and firm performance, *Journal of Financial Economics* 51, 371–406.

Davis, E. Philip, and Benn Steil, 2001, *Institutional Investors* (MIT Press: Cambridge, MA, and London, England).

Del Guercio, Diane, and Jennifer Hawkins, 1999, The motivation and impact of pension fund activism, *Journal of Financial Economics* 52, 193–340.

Demsetz, Harold, and Kenneth Lehn, 1985, The structure of corporate ownership: Causes and consequences, *Journal of Political Economy* 93, 1155–1177.

Fama, Eugene F., 1998, Market efficiency, long-term returns, and behavioral finance, *Journal of Financial Economics* 49, 283–306.

Gaspar, Jose-Miguel, Massimo Massa, and Pedro Matos, 2004, Shareholder investment horizons and the market for corporate control, forthcoming Journal of Financial Economics.

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.

Gompers, Paul A., Joy L. Ishii, and Andrew Metrick, 2003, Corporate governance and equity prices, *Quarterly Journal of Economics* 118, 107–155.

Gompers, Paul A., and Andrew Metrick, 2001, Institutional investors and equity prices, *Quarterly Journal of Economics* 116, 229–259.

Hartzell, Jay C., and Laura T. Starks, 2002, Institutional investors and executive compensation, AFA 2003 Washington, D.C. meetings.

Healy, Paul M., Krishna G. Palepu, and Richard S. Ruback, 1992, Does corporate performance improve after mergers?, *Journal of Financial Economics* 31, 135–175.

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.

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.

Jensen, Michael C., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323–329.

——— , 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.

Kahn, Charles, and Andrew Winton, 1998, Ownership structure, speculation, and shareholder intervention, *The Journal of Finance* 53, 99–129.

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.

Keim, Donald B., and Ananth Madhavan, 1997, Transactions costs and investment style: an inter-exchange analysis of institutional equity trades, *Journal of Financial Economics* 46, 265–292.

Kothari, S.P., and Jerold B. Warner, 1997, Measuring long-horizon security price performance, *Journal of Financial Economics* 43, 301–339.

Lang, Larry H.P., Rene M. Stulz, and Ralph A. Walkling, 1991, A test of the free cash flow hypothesis: The case of bidder returns, *Journal of Financial Economics* 29, 315–335.

Loughran, Tim, and Anand M. Vijh, 1997, Do long-term shareholders benefit from corporate acquisitions, *The Journal of Finance* 52, 1765–1790.

Mitchell, Mark, Todd Pulvino, and Erik Stafford, 2004, Price pressure around mergers, *The Journal of Finance* 59, 31–63.

Mitchell, Mark L., and Kenneth Lehn, 1990, Do bad bidders become good targets?, *Journal of Political Economy* 98, 372–398.

Mitchell, Mark L., and Erik Stafford, 2000, Managerial decisions and long-term stock price performance, *Journal of Business* 73, 287–329.

Moeller, Sara B., Frederik P. Schlingemann, and Rene M. Stulz, 2003, Firm size and the gains from acquisitions, *Journal of Financial Economics* 73, 201–228.

Morck, Randall, Andrei Shleifer, and Robert W. Vishny, 1990, Do managerial objectives drive bad acquisitions?, *The Journal of Finance* 45, 31–48.

Murphy, Kevin, and Karen Van Nuys, 1994, Governance, behavior, and performance of state and corporate pension funds, working paper.

Myers, Stewart C., and Nicholas S. Majluf, 1984, Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187–221.

Noe, Thomas H., 2002, Investor activism and financial market structure, *Review of Financial Studies* 15, 289–318.

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.

Peterson, Mitchell A., 2005, Estimating standard errors in financial panel data sets: Comparing approaches, NBER Working Paper # 11280.

Pound, John, 1988, Proxy contests and the efficiency of shareholder oversight, *Journal of Financial Economics* 20, 237–265.

——— , 1992, Raiders, targets, and politics: The history and future of american corporate control, *Journal of Applied Corporate Finance* 5, 6–18.

Roe, Mark J., 1994, *Strong Managers, Weak Owners: The Political Roots of American Corporate Finance* (Princeton University Press: Princeton, New Jersey).

Roll, Richard, 1986, The hubris hypothesis of corporate takeovers, *Journal of Business* 59, 197–216.

Romano, Roberta, 1993, Public pension fund activism in corporate governance reconsidered, *Columbia Law Review* 93, 795–853.

Shivdasani, Anil, and David Yermack, 1999, Ceo involvement in the selection of new board members: An empirical analysis, *The Journal of Finance* 54, 1829–1853.

Shleifer, Andrei, and Robert Vishny, 2003, Stock market driven acquisitions, forthcoming, Journal of Financial Economics.

Shleifer, Andrei, and Robert W. Vishny, 1986, Large shareholders and corporate control, *Journal of Political Economy* 94, 461–488.

——— , 1989, Managerial entrenchment: The case of manager-specific investments, *Journal of Financial Economics* 25, 123–139.

Song, Wei-Ling, and Samuel H Szewczyk, 2003, Does coordinated institutional investor activism reverse the forturnes 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.

Travlos, Nickolaos G., 1987, Corporate takeover bids, methods of payment, and bidding firms' stock returns, *The Journal of Finance* 42, 943–63.

Van Nuys, Karen, 1993, Corporate governance through the proxy process: Evidence from the 1989 honeywell proxy solicitation, *Journal of Financial Economics* 34, 101–132.

Wahal, Sunil, 1996, Pension fund activism and firm performance, *Journal of Financial and Quantitative Analysis* 31, 1–23.

Woidtke, Tracie, 2002, Agents watching agents? evidence from pension fund ownership and firm value, *Journal of Financial Economics* 63, 99–131.

Wooldridge, Jeffrey M., 2001, *Econometric Analysis of Cross Section and Panel Data* (MIT Press: Cambridge, MA).

Yermack, David, 1995, Do corporations award ceo stock options effectively?, *Journal of Financial Economics* 39, 237–269.

——— , 1996, Higher market valuation of companies with a small board of directors, *Journal of Financial Economics* 40, 185–211.

Table I: Data Sources and Definitions

Aggregate institutional holdings	Thomson Financial	aggregate institutional ownership by each category, in percent, at the end of June, year t+1
Top individual institutional holdings	Thomson Financial	highest individual institutional ownership within each category, in percent, at the end of June, year t+1
5% institutional block holder dummy	Thomson Financial	1=at least one individual institution with at least 5% ownership; 0=no individual institution with at least 5% ownership, within each category, at the end of June, year t+1
Institutional ownership concentration	Thomson Financial	Herfindahl-index measure of concentration (sum of the squares of individual ownership) / aggregate ownership, in each category
Mergers and acquisitions dummy	SDC	1=there is at least one M&A announcement during the 12-month period: July t+1 – June t+2; 0=no M&A announcement during the same 12-month period
Governance index	Gompers, Ishii, &Metrick	measures shareholder rights, smaller number indicates better governance provisions, "Corporate Governance and Equity Prices," *The Quarterly Journal of Economics*, Feb. 2003
Insider ownership	EXECUCOMP	aggregate insider ownership of top 5 executives, in percent, during year t
CEO salary and bonus	EXECUCOMP	CEO annual salary and bonus, in millions of dollars
CEO options (% of compensation)	EXECUCOMP	option granted as the percentage of CEO total compensation. Total compensation is comprised of the following: salary, bonus, other annual compensation, total value of restricted stock granted, total value of stock options granted, long-term incentive payouts, and all others.
CPI, base year 1992	U.S. Department of Labor	Consumer Price Index - all urban consumers, U.S. all items series, index=1 for year 1992
Total assets	COMPUSTAT	total book assets[6] / CPI, base year 1992
Size	COMPUSTAT	ln(total assets[6] / CPI, base year 1992)
Market capitalization	CRSP	market capitalization at the end of calendar year / CPI, base year 1992
Cash flow ratio	COMPUSTAT	(ebitda[13] - interest[15] - tax[16-Δ35] - common dividends[21] - preferred dividends[19]) / (total assets[6] - cash and cash equivalents[1])
Capital expenditures ratio	COMPUSTAT	capital expenditures[128] / (total assets[6] - cash and cash equivalents[1]), averaged over three years (t, t+1 and t+2)
Leverage ratio	COMPUSTAT	(current debt[34] + long-term debt[9])/(total assets[6] - cash and cash equivalents[1])
Q ratio	COMPUSTAT	(market capitalization + long-term debt[9] + current debt[34] + preferred stock value[130]) / total assets[6]
Cash richness	COMPUSTAT	(cash and cash equivalents[1] - current debt[34]) / (total assets[6] - cash and cash equivalents[1])
Industrial concentration	COMPUSTAT	Herfindahl-index calculated using sales data[12], based on 4-digit SIC code
Sales growth	COMPUSTAT	1-year sales growth rate
Target sales growth	COMPUSTAT	3-year sales growth rate of the target prior to M&A

Table II: Descriptive Statistics

The sample (6,681 observations) are all Execucomp firms (1992 – 1999) issuing ordinary common shares, with Governance index available, and excluding utilities, finance and insurance companies and government agencies. The institutional ownership data is from the end of June the following year. Therefore, there is a lag of minimum six months between the firm characteristics data (including the insider ownership and executive compensation data) and the institutional ownership data to ensure that characteristics-related information is all public. The institutional "acquisition preference", $FundScore_{jt}$, was derived from the composition of the largest investor's portfolio within each category. This "preference" was then used to construct the instrumental variable for institutional ownership, which is the error term (e_{it}) in a tobit regression of institutional ownership regressed on this "preference", $InstOwnership_{it} = \alpha + \beta FundScore_{jt} + u_i + e_{it}$. By construction, this error term, called "NA" ownership, is orthogonal to the acquisition-related institutional ownership.

	Mean	Median	Std Dev	Min	Max
Ownership Data					
Aggregate public pension fund holdings (%)	3.14	2.44	2.47	0.00	20.25
Aggregate investment company holdings (%)	12.92	10.79	9.19	0.00	59.59
Aggregate insurance company holdings (%)	5.05	4.15	3.86	0.00	47.53
Aggregate private pension fund holdings (%)	2.00	0.48	2.10	0.00	54.47
Aggregate bank holdings (%)	10.04	9.15	6.40	0.00	53.76
Aggregate independent advisor holdings (%)	24.48	24.27	10.85	0.00	78.79
Largest individual public pension fund holdings (%)	1.42	0.80	1.81	0.00	18.39
Largest individual investment company holdings (%)	5.57	4.59	4.01	0.00	50.13
Largest individual insurance company holdings (%)	2.53	1.63	2.90	0.00	47.20
Largest individual private pension fund holdings (%)	1.02	0.20	2.00	0.00	51.72
Largest individual bank holdings (%)	3.32	2.17	3.88	0.00	47.58
Largest individual independent advisor holdings (%)	5.63	4.79	3.88	0.00	57.10
Institutional "Acquisition Preference"					
Public pension funds	0.016	0.016	0.004	0	0.026
Investment companies	0.018	0.018	0.007	0	0.067
Insurance companies	0.017	0.017	0.005	0	0.070
Private pension funds	0.017	0.016	0.009	0	0.108
Banks	0.015	0.015	0.004	0	0.035
Independent advisors	0.019	0.017	0.010	0	0.133
Instrumental Variables					
NA aggregate PPF	0.129	-0.192	2.286	-5.456	15.539
NA aggregate investment co.	0.098	-1.010	8.127	-29.259	42.442
NA aggregate insurance co.	0.042	-0.741	3.635	-15.458	42.489
NA aggregate private pension	0.057	-0.325	2.438	-6.235	51.166
NA aggregate banks	0.054	-0.757	5.476	-16.277	42.568
NA aggregate indep. advisors	0.063	-0.700	10.003	-40.596	51.407
NA largest PPF	0.118	-0.166	1.741	-4.143	14.990
NA largest investment co.	0.042	-0.767	3.827	-10.222	43.700
NA largest insurance co.	0.037	-0.694	2.809	-10.581	43.705
NA largest private pension	0.046	-0.299	1.908	-3.102	50.100
NA largest bank	0.039	-0.819	3.706	-9.099	44.791
NA largest indep. advisor	0.028	-0.778	3.667	-8.606	51.107

Table II: Descriptive Statistics: continued

	Mean	Median	Std Dev	Min	Max
Firm Characteristics					
Total assets (millions, CPI-adjusted)	2,999.14	922.35	7,026.08	10.09	142,663.00
Market capitalization (millions, CPI-adjusted)	4,590.66	1,029.87	15,976.99	13.17	507,331.00
Q-ratio	1.88	1.33	2.08	0.27	46.11
Cash flow ratio (%)	10.00	9.92	17.03	−500.69	100.19
Capital expenditures ratio (%)	7.90	6.44	5.76	0.00	58.40
Leverage ratio (%)	25.79	24.34	24.44	0.00	966.61
Sales growth (%)	13.50	8.51	27.08	−40.80	225.50
Firm Level Governance Structure					
Governance index	9.26	9.00	2.78	2	16
Insider ownership (%)	4.38	0.86	8.72	0.00	82.47
CEO Compensation					
CEO cash compensation (millions, CPI-adjusted)	0.96	0.74	0.86	0.00	15.71
CEO options (% of total compensation)	29.99	25.99	27.78	0.00	100
Industry Characteristics					
Ln(industrial concentration)	8.00	8.12	0.87	5.29	9.21
Stock Return Data (%)					
Pre-M&A					
CAR benchmarked, July t – June t+1	0.99	−0.78	41.48	−224.20	774.26
CAR 3-factor, July t – June t+1	2.64	1.21	41.53	−76.71	105.31
Buy-and-hold return, July t – June t+1	1.60	−5.85	53.40	−125.66	958.21
M&A performance					
Announcement abnormal return	0.22	0.21	5.42	−51.57	30.59
Long-term CAR, benchmarked	0.06	−0.11	10.03	−59.20	60.02
Long-term CAR, 3-factor	4.37	2.36	49.60	−134.82	162.00
Long-term BHAR	1.47	−3.25	47.54	−138.45	378.52

Table III: First Stage Regressions

This table reports the coefficients from the first stage regressions. The instrumental variable for each category of institutional ownership, "NA" ownership, is the non-acquisition related component of the ownership. It is the e_{it} from the tobit regression: $InstOwnership_{it} = \alpha + \beta FundScore_{jt} + u_i + e_{it}$. (Details in Section II.B)
The dummy variable "prior M&A good" equals one if the firm had prior M&A activity which received positive announcement CAR, and equals zero if otherwise. The dummy variable "prior M&A bad" equals one if the firm had prior M&A activity which received negative announcement CAR, and equals zero if otherwise. Firm's prior M&A activity is split into two dummies to satisfy the strict exogeneity assumption of panel data analysis.
For equation 1, 3, and 5, the dependent variables are the aggregate PPF, investment company, and insurance company ownership, respectively. For equation 2, 4, and 6, the dependent variables are the largest PPF, investment company, and insurance company ownership, respectively. Other types of institutions mostly do not have any significant effect on M&A, thus are not reported. The constants are not reported.

	Dependent Variable					
	PPF ownership		Investment Co.		Insurance Co.	
	aggregate	largest	aggregate	largest	aggregate	largest
	(1)	(2)	(3)	(4)	(5)	(6)
Instrumental Variables						
NA PPF	1.011***	1.007***	0.056***	0.007	0.010***	0.004***
NA investment co.	0.002***	0.001***	0.951***	0.991***	0.004***	0.003***
NA insurance co.	0.002***	0.001***	0.060***	0.016***	1.003***	1.001***
NA private pension	0.003***	0.002***	0.058***	0.017***	0.009***	0.006***
NA banks	0.002***	0.001***	0.051***	0.011***	0.007***	0.002***
NA indep. advisors	0.002***	0.002***	0.035***	0.015***	0.007***	0.005***
Shareholder Rights						
Governance index	-0.004***	-0.002**	-0.073**	-0.012	-0.010***	-0.004*
Managerial Incentives						
Insider ownership	-0.000	-0.000*	0.015**	0.003*	0.001	0.000
CEO cash compensation	-0.003*	-0.001	-0.018	-0.005	-0.008*	-0.002
CEO options (% of total comp)	-0.000	-0.000	-0.000	-0.000	0.000	0.000
Firm Characteristics						
Prior M&A good	0.003	0.003**	0.115*	0.028	0.005	0.005
Prior M&A bad	0.000	0.002	-0.011	0.000	0.003	0.005
Size	0.009***	0.008***	0.176*	0.044*	0.025***	0.012**
Q ratio	-0.001*	-0.000	0.066***	0.016***	0.000	0.001
Cash flow ratio	0.000	0.000**	-0.001	-0.000	-0.000	0.000
Leverage ratio	0.000	-0.000	0.004**	0.001	0.000**	0.000
Capital expenditures ratio	-0.001***	-0.000*	0.020**	0.005**	-0.000	0.001
Prior Performance						
CAR, benchmarked	-0.000***	-0.000***	0.001**	0.000***	-0.000***	-0.000**
Industry Characteristics						
Ln(industrial concentration)	-0.003	-0.003	-0.130	-0.033	0.008	0.002
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm-level effects	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	6,681	6,681	6,681	6,681	6,681	6,681
# of firms	1,362	1,362	1,362	1,362	1,362	1,362
First Stage F-stat	75,953.80	200,000.00	16,030.47	100,000.00	210,000.00	410,000.00

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

Table IV: Likelihood of M&A and Different Types of Institutional Ownership

We report the marginal effects for the pooled logit regressions, and coefficients for the IV regressions with firm-level effects (a linear probability model). This table reports regressions in which institutional ownership is measured as the aggregate holding level (equation 1, 2, 5, and 6) or the largest individual holding level (equation 3, 4, 7, and 8). There are a total of 6,681 firm-years in the sample, out of which 2,022 are M&A observations. The dummy variable "prior M&A good" equals one if the firm had prior M&A activity which received positive announcement CAR, and equals zero if otherwise. The dummy variable "prior M&A bad" equals one if the firm had prior M&A activity which received negative announcement CAR, and equals zero if otherwise. Firm's prior M&A activity is split into two dummies to satisfy the strict exogeneity assumption of panel data analysis. The log of total assets is used as the measure for firm size because the Q ratio is strongly correlated with a firm's market capitalization. Results are similar if firm size is measured as the log of market capitalization.

	Dependent variable — 1=M&A(30%); 0=no M&A							
	pooled logit				IV regression - linear probability			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Institutional Ownership	aggregate		largest		aggregate		largest	
PPF	[-0.009]***	[-0.007]**	[-0.022]***	[-0.012]***	-0.004*	-0.005**	-0.012***	-0.008***
Investment Co.	[0.005]***	[0.003]***	[0.007]***	[0.006]***	0.004***	0.002**	0.005***	0.004**
Insurance Co.	[0.009]***	[0.006]***	[0.006]***	[0.005]**	0.008***	0.005***	0.006***	0.003*
Private pension	[0.002]	[-0.000]	[0.000]	[-0.000]	-0.001	-0.001	-0.002	-0.001
Banks	[0.006]***	[0.002]**	[-0.001]	[-0.001]	0.005***	0.002**	-0.001	-0.000
Indep. advisors	[0.000]	[0.001]	[-0.003]**	[0.001]	0.000	0.000	-0.001	0.001
Shareholder Rights								
Governance index		[0.006]***		[0.007]***		0.004**		0.005**
Managerial Incentives								
Insider ownership		[-0.000]		[-0.001]		-0.001		-0.001**
CEO cash compensation		[0.000]		[0.001]		0.009		0.009
CEO options (% of total comp)		[0.001]**		[0.001]**		0.001***		0.001***
Firm Characteristics								
Prior M&A good		[0.239]***		[0.242]***		0.287***		0.290***
Prior M&A bad		[0.212]***		[0.216]***		0.260***		0.264***
Size		[0.033]***		[0.037]***		0.020***		0.024***
Q ratio		[0.007]**		[0.009]***		0.012***		0.013***
Cash flow ratio		[0.000]		[0.000]		0.000		0.000
Leverage ratio		[-0.000]		[-0.000]		-0.000**		-0.001**
Capital expenditures ratio		[-0.003]***		[-0.003]***		-0.005***		-0.005***
Prior Performance								
CAR, benchmarked		[0.001]***		[0.001]***		0.001***		0.001***
Industry Characteristics								
Ln(industrial concentration)		[-0.000]		[0.001]		-0.004		-0.003
Year Dummies		Yes				Yes		
Firm-level effects		No				Yes		
Industry Dummies		Yes				No		
Observations		6,681				6,681		
Number of firms		1,362				1,362		

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

Table V: Performance of Low Q and "Buying-growth" Acquirers

This table reports the means and medians of short-term and long-term M&A performance measures among subgroups of observations. Each year, firms with q ratios less than the sample median are defined to be low q firms. Cash richness is defined as the ratio of non-current-debt cash and cash equivalents to non-cash total assets. Each year, firms with above industry (by 4-digit SIC code) median cash richness are defined to be cash rich firms, otherwise they are cash poor firms. In the subsample of M&A observation for which target pre-M&A three-year sales growth rates are available, deals with target sales growth rates above the median are defined to be "buying-growth," otherwise "non-buying-growth."

	cash rich, low q		cash poor, low q	
# of obs	483		479	
	mean	median	mean	median
Announcement abnormal return	0.29	0.18	0.68***	0.46
Announcement value-weighted AR	−0.04		0.05	
Long-term CAR, benchmarked	0.54	0.01	0.64	0.25
Long-term CAR, 3-factor	−0.28	−1.82	4.45**	2.90
Long-term BHAR	−0.34	−5.54	0.67	−2.76
	"buying-growth" M&A		"non-buying-growth" M&A	
# of obs	156		154	
Announcement abnormal return	−0.90**	−0.27	−0.42	0.11
Announcement value-weighted AR	−0.73		−1.14	
Long-term CAR, benchmarked	−1.30	−1.62	0.55	−0.03
Long-term CAR, 3-factor	3.62	6.41	10.05**	5.37
Long-term BHAR	−4.04	−5.39	2.40	−6.37

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

Table VI: Low Q Firms

This table reports the marginal effects for the pooled logit regressions, and the coefficients for the IV regressions with firm-level effects. The subsample is restricted to low q firms with different cash holding levels. For equations 1, 3, 5, and 7, institutional ownerships are measured by the aggregate holding levels. For equations 2, 4, 6, and 8, they are measured by the largest individual holding levels. Other controls are the same as those used in Table IV. Each year, firms with q ratio less than the sample median are defined to be low q firms. Cash richness is defined as the ratio of non-current-debt cash and cash equivalents over non-cash total asset. Each year, firms with above industry median cash richness are defined to be cash rich firms, otherwise cash poor firms. There are a total of 1,550 cash-rich firm-years and 643 cash rich firms, and a total of 2,169 cash poor firm-years and 747 cash poor firms. Whether the median is defined as cash rich or cash poor does not matter.

	Cash rich, low q				Cash poor, low q			
	Dependent variable — 1=M&A (25.2%); 0=no M&A				Dependent variable — 1=M&A (26.7%); 0=no M&A			
	pooled logit		IV regression		pooled logit		IV regression	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Insti. Ownership	aggregate	largest	aggregate	largest	aggregate	largest	aggregate	largest
PPF	[-0.015]***	[-0.021]***	-0.011***	-0.015***	[-0.003]	[-0.001]	-0.002	-0.001
Investment Co.	[0.003]*	[0.006]**	0.003*	0.007**	[0.003]**	[0.005]*	0.001	0.003
Insurance Co.	[0.004]*	[0.003]	0.004	0.002	[0.009]***	[0.009]***	0.008***	0.007**
Private pension	[-0.003]	[-0.001]	-0.003	-0.003	[-0.002]	[-0.006]	-0.005	-0.008
Banks	[0.003]	[0.001]	0.002	-0.000	[-0.003]	[-0.003]	-0.001	-0.002
Indep. Advisors	[0.001]	[0.001]	0.001	0.001	[0.001]	[0.002]	0.001	0.002
Governance index	[0.013]***	[0.013]***	0.012***	0.012***	[0.004]	[0.004]	0.004	0.004
prior performance	[0.000]	[0.000]	0.000	0.000	[0.001]***	[0.001]***	0.001***	0.001***
Other controls & year dummies	Yes			Yes	Yes			Yes
Industry dummies	Yes			No	Yes			No
Firm-level effects	No			Yes	No			Yes

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

Table VII: "Buying-Growth" M&A

This table reports the marginal effects from logistic regressions on the subsample with target sales growth rates available. Target sales growth rate is the three-year growth rate prior to takeover. The median growth rate of the sample is used as the benchmark. The dummy variable "prior M&A good" equals one if the firm had prior M&A activity which received positive announcement CAR, and equals zero if otherwise. The dummy variable "prior M&A bad" equals one if the firm had prior M&A activity which received negative announcement CAR, and equals zero if otherwise. Controls in Table IV other than the governance index, prior M&A activity, and industry concentration, are not significant and not included in this table.

Dependent variable — 1=target sales growth rate above median;
0=target sales growth rate below median

	Aggregate	largest
Institutional Ownership		
PPFs	[-0.032]*	[-0.080]**
Investment companies	[0.007]**	[0.015]*
Insurance companies	[0.008]	[-0.000]
Private pension funds	[0.005]	[-0.008]
Banks	[0.003]	[0.002]
Independent advisors	[0.004]	[0.002]
Controls		
Governance index	[-0.010]	[-0.011]
Prior M&A good	[0.120]*	[0.125]*
Prior M&A bad	[0.155]**	[0.165]**
Ln(industry concentration)	[-0.094]***	[-0.093]***
Observations	310	310
Pseudo R-square	0.058	0.057

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

Table VIII: Announcement Abnormal Returns

This table reports the coefficients from random effects regressions on factors affecting announcement abnormal returns. Announcement abnormal returns are measured using a market model during a three-day window (-1, 1). The variable "cash" measures the payment method, i.e., the percentage of total deal value that is paid by cash. The inclusion of this variable limits the sample to disclosed value deals only. Consequently the M&A sample size is reduced from 2,022 to 873. P-values from the Hausman specification test are reported. An insignificant test result indicates that the random effects specification is appropriate.

Dependent variable - announcement abnormal returns		
	Aggregate	Largest
PPF	−0.068	−0.100
Investment companies	−0.068**	−0.118**
Insurance companies	0.059	0.055
Private pension funds	−0.275*	−0.310**
Banks	−0.040	−0.039
Independent advisors	0.014	−0.006
Governance index	−0.124	−0.124
Insider ownership	−0.044	−0.042
CEO cash compensation	−0.370	−0.553*
CEO options (% of total compensation)	−0.006	−0.007
Cash (% of total deal value)	0.021***	0.021***
Year Dummies	Yes	
Firm-level effects	Yes	
Observations	873	
Number of firms	572	
R-squared overall	0.046	0.045
The Hausman Test P-value	0.909	0.806

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

Table IX: Long-term Abnormal Returns

This table reports the coefficients from regressions examining the relation between institutional ownership and long-term M&A performance. Long-term performance is measured using three different methods. The "cash" variable, which measures the method of payment, is not significant and reduces the sample by over 56%. Hence this variable is not included in this table. The estimations on the ownership variables do not change materially with or without this variable. P-values from the Hausman test are reported. An insignificant test result indicates that the random effects specification is appropriate.

	Dependent variable - abnormal returns 12 months including announcement month					
	CAR, benchmarked		CAR, 3-factor		BHAR	
	Aggregate	Largest	Aggregate	Largest	Aggregate	Largest
PPF	0.146	0.413**	0.921	3.007**	0.597	2.254
Investment companies	−0.063**	−0.034	−0.973***	0.044	−1.308***	−0.809*
Insurance companies	−0.024	−0.028	−0.278	0.377	−0.211	0.244
Private pension funds	0.048	0.102	0.548	2.319*	1.182	3.184**
Banks	−0.063	0.060	−0.386	1.409**	−0.963**	0.807
Independent advisors	−0.035	−0.015	−0.707***	0.553	−0.181	1.386**
Year Dummies	Yes		Yes		Yes	
Firm-level effects	Yes		Yes		Yes	
Observations	2,013		2,013		2,013	
Number of firms	825		825		825	
Hausman Test P-value	0.998	0.821	0.001	0.004	0.000	0.000

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

Table X: Asset Turnover and Institutional Ownership

This table reports the coefficients from panel data regressions. The dependent variable, abnormal asset turnover rate, is the change in industry-adjusted asset turnover rate (IAAT) post M&A completion. The left panel follows the method in Healy, Palepu, and Ruback (1992). The right panel follows the method in Barber and Lyon (1996). P-values from the Hausman specification test are reported. An insignificant test result indicates that the random effects specification is appropriate.

	Dependent variable - abnormal asset turnover			
	$IAAT_{post,i}$ - $(-0.358 + 0.850 IAAT_{pre,i})$		$IAAT_{post,i}$ - $IAAT_{pre,i}$	
	Aggregate	Largest	Aggregate	Largest
PPF	1.627***	2.851***	1.756***	2.809***
Investment Co.	0.090	0.239	0.090	0.172
Insurance Co.	−0.712**	−0.562*	−0.807**	−0.579*
Private pension	−0.075	−0.241	−0.039	−0.168
Banks	−0.273	−0.236	−0.254	−0.305
Independent advisors	−0.400***	−0.205	−0.443***	−0.330
Governance index	1.168	−0.006	1.352	−0.168
Insider ownership	0.203	0.031	0.205	0.055
CEO cash compensation	−0.459	−2.019**	−0.379	−2.070**
CEO options (% of total compensation)	0.034	0.017	0.038	0.029
Year Dummies	Yes			
Firm-level effects	Yes			
Observations	1,743			
Number of firms	734			
R-squared overall	0.012	0.042	0.010	0.038
The Hausman-test P-value	0.005	0.104	0.012	0.187

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

Table XI: For The Referee — Comparison between M&A Firm-years and Non-M&A Firm-years

This table reports the mean values of variables for M&A firm-year observations and non-M&A firm-year observations. P-values from ranksum tests on the means are reported in parentheses. There are 2,022 M&A firm-years, and 4,659 non-M&A firm-years.

	mean values		P-value
	M&A	non-M&A	
Aggregate public pension ownership (%)	2.98	3.10	(0.030)
Aggregate investment co. ownership (%)	14.01	11.93	(0.000)
Aggregate insurance co. ownership (%)	5.57	4.82	(0.000)
Aggregate private pension ownership (%)	1.16	0.97	(0.000)
Aggregate bank ownership (%)	11.04	9.82	(0.000)
Aggregate indep. advisor ownership (%)	25.29	24.65	(0.023)
Largest public pension ownership	1.23	1.50	(0.000)
Largest investment co. ownership	5.91	5.42	(0.000)
Largest insurance co. ownership	2.66	2.47	(0.000)
Largest private pension ownership	1.01	1.03	(0.003)
largest bank ownership	3.28	3.34	(0.000)
Largest indep. advisor ownership	5.48	5.70	(0.003)
Governance index	9.49	9.16	(0.000)
Insider ownership (%)	3.44	4.79	(0.000)
Total assets (millions, CPI-adjusted)	3,698.11	2,695.93	(0.000)
Market capitalization (millions, CPI-adjusted)	6,903.50	3,587.34	(0.000)
Cash flow ratio (%)	11.31	9.42	(0.000)
Q ratio	2.16	1.76	(0.000)
Leverage ratio (%)	24.72	26.26	(0.063)
Capital expenditures ratio (%)	7.27	8.17	(0.000)
Sales growth(%)	16.02	12.40	(0.000)
CAR, benchmarked (June, year t - July, year t+1)	5.77	−1.09	(0.000)
CAR, 3-factor (June, year t - July, year t+1)	7.17	0.67	(0.000)
BHAR (June, year t - July, year t+1)	8.08	−1.21	(0.000)
# of obs	2,022	4,659	

Table XII: For The Referee — Correlations Among Key Variables

Aggregate institutional ownership within each category

	Public pension	Invt. Co.	Insu. Co.	Private pension	Banks	Indep. advisors	Gover. index	Future M&A	Prior good M&A	Prior bad M&A	Ln(Mkt Cap)
Public pension	1.00										
Investment Co.	−0.11	1.00									
Insurance Co.	0.04	0.15	1.00								
Private pension	0.06	−0.04	0.03	1.00							
Banks	0.14	−0.05	0.11	0.13	1.00						
Indep. advisors	0.08	0.14	0.14	−0.02	0.02	1.00					
Governance index	0.08	−0.02	0.07	0.07	0.19	0.06	1.00				
Future M&A	0.09	0.09	−0.02	0.04	0.10	0.03	0.06	1.00			
Prior good M&A	0.04	0.03	−0.03	−0.01	0.06	0.03	0.02	0.22	1.00		
Prior bad M&A	0.04	0.05	−0.02	0.04	0.06	0.01	0.04	0.17	−0.18	1.00	
Ln(Market Cap)	−0.02	0.24	0.16	0.16	0.35	−0.14	0.11	0.19	0.10	0.11	1.00

Table XIII: For The Referee — Predicting M&A Frequency in the Long-run

This table reports the percent changes in Incident Rate Ratios (IRR) and P-values from negative binomial regressions. The dependent variable is the number of M&A years during the eight years of the sample (July 1993 - June 2001). The independent variables are for observations in year 1992. Negative binomial regression is used because the goodness-of-fit test indicates overdispersion of the Poisson model. IRR ($e^{\text{coefficient}}$) represents the factor change in the expected count for unit increase in the independent variable. Percent change in IRR = (IRR-1)*100. Other controls include the governance index, leverage ratio, insider ownership, CEO cash compensation, Q ratio, prior CAR, and industrial concentration. Their coefficients are not significant.

	Dependent var — # of M&A years during the period of study			
Institutional Ownership	Aggregate	Top indiv.	5% block	Concentration
PPF	−1.68	−4.08*	−22.71	−4.92*
	(0.255)	(0.059)	(0.110)	(0.060)
Investment Co.	0.09	−0.37	−6.78	−0.37
	(0.908)	(0.769)	(0.446)	(0.819)
Insurance Co.	2.46**	1.58	17.6	1.28
	(0.010)	(0.210)	(0.203)	(0.390)
Private Pension	2.32	2.28	19.21	2.11
	(0.101)	(0.147)	(0.445)	(0.228)
Banks	1.16**	0.11	−4.16	−0.23
	(0.031)	(0.891)	(0.653)	(0.834)
Indep. Advisor	−0.10	0.99	4.37	1.05
	(0.794)	(0.398)	(0.590)	(0.658)
CEO options (% of total compensation)	0.33**	0.31*	0.33**	0.31*
	(0.044)	(0.061)	(0.047)	(0.055)
Prior M&A +ve announcement CAR	85.33***	88.35***	91.23***	88.57***
	(0.000)	(0.000)	(0.000)	(0.000)
Prior M&A -ve announcement CAR	64.84***	66.4***	67.96***	67.71***
	(0.000)	(0.000)	(0.000)	(0.000)
Cash flow ratio	1.07*	1.14**	1.1*	1.16**
	(0.064)	(0.043)	(0.051)	(0.039)
Size	9.68**	11.95***	11.92***	11.63***
	(0.014)	(0.002)	(0.002)	(0.004)
Capital expenditures ratio	−2.73***	−2.72***	−2.79***	−2.73***
	(0.002)	(0.002)	(0.002)	(0.002)
Prior CAR, benchmarked	0.31**	0.29**	0.31**	0.28**
	(0.022)	(0.031)	(0.017)	(0.032)
Other controls			Yes	
# of Observations			566	
Pseudo R-squared	0.05	0.05	0.05	0.05
Overdispersion P-value	0.00	0.00	0.00	0.00

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

Table XIV: For The Referee — Simultaneous Equations Analysis on PPF Impact

This table reports the coefficients and standard errors from the simultaneous equations estimations. The linear system assumes that both the PPF ownership variable and the M&A activity dummy variable are endogenous. The control variables are the same as in Table III and Table IV. Their coefficients and significance are also similar to those reported in Table III and Table IV.

	Dependent Variables			
	system (1)		system (2)	
	Aggregate PPF Ownership	M&A Activity (1=Yes)	PPF concentration (normalized)	M&A Activity (1=Yes)
	(1)	(2)	(3)	(4)
M&A Activity Dummy	0.258		0.158	
	(0.218)		(0.116)	
Aggregate PPF		-0.013***		
		(0.004)		
Largest PPF				-0.021***
				(0.005)
Instrument for aggregate PPF	0.795***			
	(0.018)			
Instrument for largest PPF			0.749***	
			(0.013)	
Controls	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Industry dummies (3-digit SIC)	Yes	Yes	Yes	Yes
Observations	6,686	6,686	6,686	6,686
R-squared	0.654	0.143	0.629	0.144

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

Table XV: For The Referee — Post-M&A Operating Performance

Panel A reports the median operating cash flow return on market value of assets, median cashflow margin, and median asset turnover rate for the M&A firms in years surrounding the M&A completion year. Panel B reports the summary statistics on abnormal operating performance. The first method looks at the changes of industry-adjusted measures (operating cash flow return, cash flow margin on sales, and asset turnover rate). The second method is regression-based, with standard errors reported in parentheses. The median value of firm-level industry-adjusted operating performance from the three years after M&A are regressed on the median value from the three years prior to M&A. The difference between post-M&A performance and the predicted performance measures the abnormal performance.

Panel A

	Operating cash flow returns			Cash flow margin on sales			Asset turnover ratio		
Year relative to M&A	Firm median	Industry-adj median	# of obs	Firm median	Industry-adj median	# of obs	Firm median	Industry-adj median	# of obs
all M&A firm-years									
-3	14.66%	2.72%	1,963	23.21%	6.71%	1,970	68.76(c/$)	−3.86(c/$)	1,965
-2	14.61	2.83	1,991	23.81	7.24	1,995	65.08	−3.79	1,992
-1	14.83	3.13	2,002	24.76	8.02	2,005	62.92	−4.72	2,002
1	15.72	3.84	1,746	26.57	9.39	1,746	61.22	−4.66	1,749
2	16.07	3.99	1,404	26.14	9.24	1,404	60.94	−4.94	1,408
3	15.85	3.86	1,028	25.67	9.21	1,028	61.56	−5.76	1,031
public targets only									
-3	13.86%	2.47%	295	25.06%	7.65%	296	58.36(c/$)	−8.12(c/$)	297
-2	13.76	1.99	335	26.79	8.97	335	55.64	−5.13	338
-1	13.84	2.37	311	26.85	8.37	311	50.07	−7.74	315
1	13.71	2.73	276	29.32	13.95	279	46.47	−8.98	279
2	12.55	3.44	216	27.69	11.33	219	49.92	−9.72	219
3	12.75	3.91	145	27.91	10.65	147	51.75	−7.89	148

Panel B

Abnormal industry-adjusted post-M&A operating performance - method 1

	all M&A firm-years			public targets only		
	mean	median	# of obs	mean	median	# of obs
$IACF_{post,i} - IACF_{pre,i}$	1.53***	0.64	1,741	1.94***	0.88	322
$IACFM_{post,i} - IACFM_{pre,i}$	5.38***	2.01	1,743	16.41***	3.59	321
$IAAT_{post,i} - IAAT_{pre,i}$	−1.00	0.06	1,743	−2.30	0.74	323

Abnormal industry-adjusted post-M&A operating performance - method 2

all M&A firm-years							
$IACF_{post,i}$	=	2.586***	+	0.767***	$IACF_{pre,i}$	R^2=0.41	N=1,741
		(0.219)		(0.022)			
$IACFM_{post,i}$	=	8.357***	+	0.714***	$IACFM_{pre,i}$	R^2=0.24	N=1,743
		(0.775)		(0.031)			
$IAAT_{post,i}$	=	−0.358	+	0.850***	$IAAT_{pre,i}$	R^2=0.71	N=1,743
		(0.719)		(0.013)			
public targets only							
$IACF_{post,i}$	=	2.146***	+	0.949***	$IACF_{pre,i}$	R^2=0.52	N=322
		(0.460)		(0.051)			
$IACFM_{post,i}$	=	22.834***	+	0.007	$IACFM_{pre,i}$	R^2=0.00	N=321
		(3.304)		(0.037)			
$IAAT_{post,i}$	=	−2.468*	+	0.857***	$IAAT_{pre,i}$	R^2=0.74	N=323
		(1.422)		(0.029)			

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