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Governance Mechanisms and Equity Prices

K. J. MARTIJN CREMERS and VINAY B. NAIR*

ABSTRACT

We investigate how the market for corporate control (external governance) and shareholder activism (internal governance) interact. A portfolio that buys firms with the highest level of takeover vulnerability and shorts firms with the lowest level of takeover vulnerability generates an annualized abnormal return of 10% to 15% only when public pension fund (blockholder) ownership is high as well. A similar portfolio created to capture the importance of internal governance generates annualized abnormal returns of 8%, though only in the presence of “high” vulnerability to takeovers. The complementarity effect exists for firms with lower industry-adjusted leverage and is stronger for smaller firms.

A VARIETY OF FIRM-LEVEL MECHANISMS ARE ASSOCIATED WITH the governance of the public corporation.¹ These firm-level mechanisms can be classified into two broad categories—internal and external governance mechanisms. Blockholders and the board of directors are often seen as the primary internal monitoring mechanism,² while takeovers and the market for corporate control are the primary external mechanism.³ These different mechanisms work together in a system to affect governance in firms. This paper attempts to provide a better understanding of how these governance mechanisms interact. We ask three questions: How do the internal and external governance mechanisms interact to affect equity prices? How does this interaction depend on firm characteristics such as size and leverage? What implications does this have for the design of corporate governance?

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¹ For a survey on corporate governance, see Shleifer and Vishny (1997). Also, see La Porta et al. (1998, 2000) for a legal macro-level approach to corporate governance.

² For evidence on the monitoring role of large shareholders, see Franks and Mayer (1994), Gorton and Schmid (1999), Kaplan and Minton (1994), and Kang and Shivdasani (1995).

³ See Easterbook and Fishel (1991) and Jensen (1993).

Two theoretical viewpoints guide us in our investigation of how internal and external governance mechanisms interact. On the one hand, internal and external governance mechanisms can be viewed as substitutes if internal control mechanisms evolve to offset changes in external control (Pound, 1992). Accordingly, a firm with strong monitoring by shareholders and a large number of takeover defense provisions would then have a similar quality of corporate governance as a firm with no monitoring shareholder but a low number of takeover defenses. Indeed, Gillan, Hartzell, and Starks (2003) document that greater board independence is found in firms that are less exposed to takeovers. However, this documented use of internal and external governance mechanisms does not answer the question of whether firms with both strong internal and external governance mechanisms perform differently from firms that have only one of these two mechanisms. On the other hand, the literature provides reasons why such performance differences may indeed exist.

As pointed out by Shleifer and Vishny (1986), a large shareholder has incentives to monitor the management and pay for part of the gains that occur through takeovers, thus making the appearance of a bidder more likely. Consequently, the presence of a large shareholder can be crucial to facilitate takeovers, and conversely, firms that lack a large monitoring shareholder might not be taken over even if they lack takeover defense provisions. Thus, large shareholders, by facilitating takeovers, may work in tandem with the market for corporate control (see also John and Kedia (2000)). In such a scenario, the internal governance mechanism is required for the external mechanism to function, which leads to a complementary relation between these mechanisms. As a result, firms that only have the external mechanism (lack of takeover defenses) could differ in their governance standards from firms that have both internal and external mechanisms. However, the argument above does not preclude the possibility that internal governance mechanisms still function in isolation: A firm with only strong internal governance mechanisms might not differ in performance from a firm with both strong internal and strong external governance mechanisms.

Jensen (1993) expresses skepticism about this latter case by noting the failure of the internal control mechanisms during the 1970s and 1980s. He suggests that the main form of governance is through the market for corporate control. In the current paper, we document the interaction between governance mechanisms and empirically investigate whether firms with either strong internal or strong external governance mechanisms perform differently from firms with both strong internal and strong external governance mechanisms.

Recent empirical work investigating this interaction has relied on top management turnover to detect the "effectiveness" of governance and conclude how these governance mechanisms interact. However, using top management turnover to detect the importance of corporate governance mechanisms leads to a selection bias: While effective corporate governance provides a higher *ex ante* threat of dismissal, using top management turnover detects only those firms where the threat is *ex post* exercised. Huson, Malatesta, and Parrino (2003) discuss other issues associated with the use of top management turnover to

detect the effectiveness of corporate governance. While these papers document interesting and insightful results on top management dismissal and performance changes, their conclusions relating to how governance mechanisms interact have been limited by the use of top management turnover. The results have been mixed as well. Hadlock and Lumer (1997) and Mikkelsen and Partch (1997) suggest that the effectiveness of internal mechanisms depends on external control (complements) whereas Denis and Kruse (2000) and Huson, Parrino, and Starks (2001) suggest that effectiveness of internal monitoring is independent of external control (substitutes).

In this paper, we investigate how internal and external governance mechanisms interact in being associated with equity returns. This enables us to circumvent the aforementioned issues of using top management turnover.⁴ Further, we document how governance mechanisms interact alongside two additional dimensions—firm values (Qs), and accounting measures of performance. To the best of our knowledge, this is the first study to document the interaction of governance mechanisms along these dimensions. This approach does have its limitations as well: The results are prone to different interpretations, which in turn have different implications for the effectiveness of governance. We discuss several alternative interpretations and provide evidence—using firm Qs, accounting measures of profitability, and data on mergers—to either support or reject the alternatives.

Following Gompers, Ishi, and Metrick (2003, henceforth GIM), we look at long-term equity prices to study how these governance mechanisms interact. Using the classifications from the governance index that they develop, GIM show that a portfolio that buys firms with the highest level of shareholder rights and sells firms with the lowest level of shareholder rights generates an annualized abnormal return of 8.5% from 1990 to 1999. They explain the result by suggesting that in 1990, investors were not aware of the gains to good governance. Using a similar approach, a new two-step methodology, and equity prices of firms from 1990 to 2001, we analyze the relation between abnormal returns and our governance proxies. We measure the takeover vulnerability of a firm (external governance) by using data on antitakeover provisions adopted by a firm. Our first external governance proxy uses the index developed by GIM as an antitakeover index.⁵ We corroborate our findings by constructing an alternative takeover protection index (ATI), which focuses on only three key antitakeover provisions—the presence of staggered boards, of a preferred blank check (“poison pill”), and of restrictions on shareholder voting to call special meetings or act through written consent. Furthermore, we consider two different proxies for internal governance: the percentage share ownership by institutional blockholders, defined to be an institutional shareholder with

⁴ However, we check whether there exists a different kind of sample bias in our test, namely whether the firms that get taken over leave the sample. We find that this bias is unlikely to affect our results, as there is no evidence of a systematic pattern between the firms leaving the initial sample and governance levels.

⁵ The data used in GIM are compiled from Rosenbaum, “Corporate Takeover Defenses,” IRRIC Inc. (1990, 1993, 1995, 1998).

equity ownership greater than 5%, and the percentage of share ownership by public pension funds, which tend to be active shareholders.

Our findings are easily summarized. The main finding of the paper is that internal and external governance mechanisms are complements in being associated with long-term abnormal returns. We find that public pension fund (blockholder) ownership is important only in the presence of takeover vulnerability. Similarly, we also find that the market for corporate control is important only in the presence of an active shareholder—firms with the highest quartile of blockholder (public pension fund) ownership. We find that a portfolio that buys firms with high takeover vulnerability and high public pension fund (blockholder) ownership and shorts firms with low takeover vulnerability and high public pension fund (blockholder) ownership generates an annualized abnormal return (alpha) of 10–15%, depending on which proxy is used for internal governance. On the other hand, a portfolio that buys firms with high takeover vulnerability and low public pension fund (blockholder) ownership and shorts firms with low takeover vulnerability and low public pension fund (blockholder) ownership does not generate any significant abnormal return. The complementary relation is confirmed using accounting measures of performance such as net profit margin, return on assets, and return on equity.

Further, we find that internal and external governance mechanisms are stronger complements in firms with low leverage. This supports theories proposed by Novaes and Zingales (1995), Zweibel (1996), Stulz (1988), and Harris and Raviv (1988), wherein higher debt reduces the probability of a takeover. Using our two-step weighted least squares (WLS) regression methodology, we also find some evidence that external mechanisms are more effective for small firms, suggesting that a larger firm size might reduce the quality of external governance (takeover vulnerability).

Generally, our paper shows that the results of the importance of corporate governance as presented by GIM are strengthened when the role of internal governance mechanisms is also considered. In particular, the simultaneous consideration of two different governance mechanisms—takeover vulnerability and shareholder activism—is crucial for the documented abnormal returns. Also, this additional channel of governance allows us to provide some new evidence on the possibility that these abnormal returns might be due to risk characteristics and an accompanying misspecification in the asset pricing model currently employed. We find that Qs of firms with both high takeover vulnerability and high public pension fund (blockholder) ownership are high, but lower than the Qs of firms where only one of the two governance mechanisms—takeover vulnerability or public pension fund holding—is high.

The next section of this paper describes our data and discusses the choice of proxies. In Section II, we present the results on the complementarity of the governance mechanisms. In Section III, we investigate the effect of leverage and size on this interaction using a two-step WLS method. Section IV deals with robustness of the results. Section V discusses alternative interpretations. The conclusion follows.

I. Data and Construction of the Proxies

The data used can be classified into one of three categories, namely, data used for the construction of the firm-specific internal governance proxies, data used for the construction of the firm-specific external governance proxies and data used to compute abnormal returns.

A. Internal Governance—Active Shareholders

We consider two proxies to measure the extent of internal governance in a firm.⁶ First, we use the percentage of shares held in each firm by the firm's largest institutional blockholder (BLOCK). Blockholders are shareholders with greater than 5% ownership of the firm's outstanding shares.⁷ To construct this measure, we use data on institutional share holdings. The data source is CDA Spectrum, which collects information on institutional shareholdings from the SEC 13f filings.⁸ Holdings are reported quarterly. For the holdings in the three months after each quarter-ending month, we use the holdings as reported in the previous quarter.

By using institutional blockholding rather than institutional holdings, we mitigate the problem that institutions with minor stakes may have little incentive to monitor. In addition, a blockholder also has substantial voting control to pressure the management (see, e.g., Shleifer and Vishny (1986)). However, another issue remains: Different institutions have different objectives and different incentives to monitor. It has been argued that hedge funds, for example, avoid any direct management interaction to steer clear of any insider trading violations. Institutions such as corporate pension funds and bank trust departments are often written off as strong advocates of shareholder interests because they may suffer from strong conflicts of interest due to the commercial network of firms in which they own stock and debt. Pound (1988) documents that institutions such as banks and insurance companies are more likely to side with management in proxy contests due to conflicts of interest. Such criticism leads to our next proxy.

To construct the second proxy for internal governance, we use the percentage of shares held by the 18 largest public pension funds (PP).⁹ Public pension funds are generally more free from conflicts of interest and corporate pressure than other institutional shareholders. They are known to be aggressive shareholder

⁶ We view shareholder activism as an internal governance mechanism. Compensation schemes that could contribute to reducing agency costs are viewed as indirect governance mechanisms. There is some evidence that suggests that these indirect internal mechanisms are also stronger when there exists an active shareholder—for an example, see Bertrand and Mullainathan (2001).

⁷ The results using the total percentage of share ownership by all blockholders are consistent with the results documented here and are not presented in the paper.

⁸ The 1978 amendment to the Security and Exchange Act of 1934 requires all institutional investors with more than \$100 million under management to report their shareholdings to the SEC.

⁹ The list of the public pension funds is reported in the Appendix.

activists (Guercio and Hawkins (1999)).¹⁰ At the same time, public pension fund activism might be politically influenced and hence not contribute to shareholder value (Romano (1993)).

A concern that could be raised regarding our proxies of internal governance is that we do not consider noninstitutional blockholders.¹¹ We might find a size or leverage effect if the presence of noninstitutional outsider blockholders has a systematic relation with firm size or leverage. While we do not view this as a strong possibility, we discuss which of our results should be interpreted with care. However, if there is no systematic relation between noninstitutional outsider blockholders and firm size or firm leverage, our conclusions remain unchanged.

B. External Governance—Takeover Vulnerability

Takeovers and takeover threats are the source of external governance considered in this paper. A great deal of theory and evidence suggests that takeovers address governance problems (see, e.g., Jensen (1988) and Scharfstein (1988)). Takeovers also typically increase the combined value of the target and the acquiring firm, indicating that firm performance is expected to improve post-takeover (Jensen and Ruback (1983)). Moreover, it is generally poorly performing firms that are targeted (Morck, Shleifer, and Vishny (1989)). However, a poorly performing firm can resist a takeover by adopting antitakeover provisions (ATPs) in its charter. For our proxy of external governance, the main interest is in measuring the extent to which a firm is protected against a takeover. This protection can take the form of direct antitakeover provisions as well as other devices that provide managerial protection by restricting shareholder power to change charter provisions, to call for a shareholder meeting, or to overrule the management during a takeover attempt.

We incorporate the firm-specific defense mechanisms in place by using the index compiled by GIM from the Investor Responsibility Research Center (IRRC) publications. We view this index as a measure of antitakeover protection.¹² They consider 24 different provisions in five categories—tactics for delaying hostile bidders, voting rights, director/officer protection, other takeover defenses, and state laws. The index, G , is formed by adding one point if the firm has a specific defensive provision in place and zero otherwise, leading to values between 0 and 24. We simply use a linear transformation of this index, $EXT = 24 - G$, for ease in exposition. As a result, a larger value of EXT signifies a higher vulnerability to takeovers.

Poor shareholder voting rights affect takeover vulnerability since shareholders without significant voting rights are unable to change antitakeover clauses, or reduce delay in case of a value-increasing takeover attempt. State laws also alter the effectiveness of market control. For example, Daines (2001) shows

¹⁰ See Gillan and Starks (2000) for a discussion on the role of institutions in shareholder activism.

¹¹ Noninstitutional blockholders are omitted in the study due to difficulty in collecting reliable data for such a large sample over 11 years.

¹² Note that GIM use this index as a general measure of shareholder rights in their paper.

how Delaware law can make firms more prone to takeovers. The importance of delay tactics, especially in takeovers that require a proxy fight, has been acknowledged as crucial by some legal scholars. For striking results on the power of staggered boards as a takeover defense mechanism, see Coates, Subramanian, and Bebchuk (2002).¹³ High levels of protection can make takeovers prohibitively expensive and reduce the effectiveness of market control as well. As a result, the measure used by GIM can be used as a measure for the extent to which a firm is vulnerable to takeovers. A more detailed analysis of which of the 24 provisions are effective and how they interact is beyond the scope of this paper.¹⁴

To ensure that our results are not driven by any alternative interpretation of this index, we create a new and more narrow alternative takeover index, ATI, that accounts for only three components shown to be critical to takeovers. These three provisions are the existence of classified (staggered) boards, of blank check preferred stock (poison pill), and of restrictions on shareholders on calling special meetings or acting through written consent.¹⁵ We again remove a point for the existence of each of these three provisions to create a value between 0 and 3, where a lower value again implies better protection against takeovers and hence low quality of external governance. The choice of these three components merits some comment.

All firms that have a blank check preferred stock authorized can adopt a poison pill quickly, without shareholder approval, whether or not a hostile bid has been made or is imminent. Thus, the presence or absence of a pill at any given time is not sufficient information; rather, it is the existence of a blank check preferred (Daines and Klausner (2002)) that is key. In addition to the blank check preferred, we consider two main provisions that significantly delay a takeover attempt—classified board and inability of shareholders to vote by written consent or to call a special meeting.¹⁶

The IRR data, which are used to create both external governance proxies, are available only for the years 1990, 1993, 1995, and 1998. IRR does not update every company in each new edition, so some changes may be missed. However, as GIM point out, there is no reason to suspect any systematic bias in these data. Also, some provisions are inferred from proxy statements and other filings. In between updates and after the last update, the previously available data are used in our study.

C. Equity Prices

We use equity prices to study the interaction between internal governance mechanisms and external governance mechanisms. GIM, by using an event

¹³ Also see Daines and Klausner (2002).

¹⁴ For a detailed description of all 24 provisions in the takeover index EXT, we refer the reader to GIM.

¹⁵ See the appendix for additional discussion on these provisions.

¹⁶ Daines and Klausner (2001, p. 86) note that, "Since all firms implicitly have poison pills, some common ATPs are redundant with pills and therefore provide no additional protection. Only those ATPs that impose marginally greater delays or raise bidders' expected costs are therefore significant."

study methodology, have shown that high corporate governance is reflected in equity prices. As a result, we use equity prices as a starting point to detect the interaction between the governance mechanisms. However, in an event study, contemporaneous firm conditions might obscure inferences. As in GIM, we avoid this problem by taking a long horizon approach and interpret the price effect as simply suggesting that the firms with high corporate governance earned significantly higher returns from 1990 to 2001. This evidence does not necessarily imply market inefficiency, as it could be argued that in 1990, investors did not fully realize the importance of governance mechanisms and how they interact. In addition, we do not claim direct causality between governance and equity returns. Further discussion can be found in Section V.

Stock price data are obtained from CRSP. Our sample is restricted to those firms for which we have the takeover index available. However, that still leaves us with a larger sample than that used in previous papers that also look at the interaction of internal and external governance mechanisms. Among the firms for which we have takeover defense data, we further eliminate firms that have dual-class common stock.¹⁷ The period analyzed is from September 1990 to December 2001, which includes both a bull and a bear stock market. As we show later, our results are robust to the vast changes in stock market conditions during this period.

II. Internal and External Governance Mechanisms as Complements

A. Initial Analysis

Our sample includes an average of 1,500 firms per year from September 1990 to December 2001, with 136 monthly time-series data points. We categorize firms according to their takeover vulnerability (external governance) as measured by EXT (see Section I) into one of four groups. First, following GIM, firms with $EXT \geq 19$ are considered firms prone to takeovers or with “high” external governance and those with $EXT \leq 10$ are firms with the least takeover vulnerability, thus making external governance relatively “low.” Firms with $18 \geq EXT \geq 15$ and those with $14 \geq EXT \geq 11$ are the other two categories. Similarly, we also divide firms into one of four quartiles based on the proxy for internal governance. Those with greater blockholder ownership or greater public pension fund holdings are defined to have higher internal governance.

Table I reports some summary statistics on the number of firms in portfolios sorted on external governance, and the 25, 50, and 75 percentiles of the percentage of shares held by the largest blockholder, and the percentage of shares held by the group of 18 public pension funds. Note that there is an increase in the total number of firms in February of 1998—in this month, IRRC added firms that were mostly smaller in size. Also, the blockholder ownership is increasing from 1990 to 1998 as noted in the cutoff of the 75-percentile category, increasing from 9.3% in 1990 to 11.2% in 1998. This is consistent with the documented

¹⁷ The number of firms eliminated is less than 10% of the total.

Table I
Distribution of Firms Based on Takeover Vulnerability
and Active Shareholders

For each of the four dates for which the IRRC data are updated, this table reports some summary statistics of our sample of firms. The variable EXT denotes the level of takeover vulnerability for a firm, with higher values indicating greater vulnerability to takeovers, and is equal to $24 - G$, where G is the proxy created by Gompers et al. (2003) using the IRRC publications. The top panel reports the number of firms that are classified as having low and high EXT, using two different cutoff levels for these classifications. Further, we report the 25%, 50%, and the 75% percentiles of the proportion of the total shares outstanding of our sample of firms that is held by the largest institutional blockholder (BLOCK, middle panel) and by the group of the 18 largest public pension funds (PP, lower panel). Blockholders are defined as investors holding at least 5% of outstanding shares. See the appendix for the list of public pension funds.

	Sep-90	Jul-93	Jul-95	Feb-98
Number of Firms $EXT \geq 19$	148	131	112	195
Number of firms $EXT \geq 18$	262	212	215	346
Number of Firms $EXT \leq 10$	83	89	84	77
Number of firms $EXT \leq 11$	167	186	187	171
25% percentile of BLOCK	0%	0%	0%	0%
50% percentile of BLOCK	6.21%	6.92%	7.45%	8.11%
75% percentile of BLOCK	9.32%	9.91%	10.26%	11.22%
25% percentile of PP	0.66%	1.30%	1.58%	1.28%
50% percentile of PP	2.40%	2.88%	2.70%	2.16%
75% percentile of PP	4.25%	4.61%	3.86%	2.87%

evidence on increasing overall institutional ownership (Gompers and Metrick (2001)). It is also interesting to note that the dispersion in public pension fund holdings decreases over time, as suggested by the difference between the minimum for the 75-percentile and the 50-percentile ownership levels, from 1.85% ($=4.25 - 2.40\%$) in 1990 to 0.71% ($=2.87 - 2.16\%$) in 1998.

Correlations of EXT and ATI with our various proxies of internal governance and firm size are documented in Table II. We find that EXT has a small negative correlation with firm size (-4%), confirming the finding by GIM that large S&P firms tend to be firms with lower vulnerability to takeovers. We also find that EXT is correlated with public pension fund holding (-16%). This might be an artifact of the high correlation between public pension fund holdings (PP) and firm size (26%). Since public pension funds tend to own higher proportions of shares in large firms and since large firms tend to have lower quality of external governance, the negative correlation between EXT and public pension fund holding (PP) is consistent.¹⁸ Also, EXT and ATI are highly correlated (64%). We discuss this further after explaining the rationale and the construction of our alternative takeover index (ATI), in Section IV.

Finally, the two measures of blockholder ownership—the percentage of share ownership by the largest blockholder and the percentage of share ownership by

¹⁸ See also, for example, Guercio and Hawkins (1999).

Table II
Correlation Matrix

The matrix below gives the pairwise correlations between quartile-groups of EXT, ATI, SIZE, BLOCK, TOTBLOCK, and PP. Here, EXT denotes the firm-specific level of takeover vulnerability based on the index developed by Gompers et al. (2003) that incorporates 24 takeover provisions; ATI is an alternative takeover vulnerability proposed in this paper that incorporates only three takeover provisions; SIZE is given by each firm's total market capitalization of outstanding stocks; BLOCK is the percentage of stocks held by the largest institutional blockholder (at least 5%); TOTBLOCK is the percentage of stocks held by all institutional blockholders; PP is the percentage of stocks held by the group of public pension funds (see the Appendix for the list of public pension funds); and finally, LEVERAGE is the industry median-adjusted leverage. The Fama–French 48-industry classifications are used for the adjustment. The correlations are those of the quartile dummies.

	EXT	ATI	SIZE	BLOCK	TOTBLOCK	PP
ATI	64%					
SIZE	−4%	−3%				
BLOCK	−3.4%	−1.9%	−9%			
TOTBLOCK	−4%	−2%	−12%	88%		
PP	−16%	−12%	26%	6%	6%	
LEVERAGE	−0.2%	−1.2%	43%	1.2%	1.9%	−0.2%

all blockholders—are negatively correlated with size (−9% and −12%, respectively) and highly correlated with each other (88%). The negative correlation of these measures with size is as expected—less capital is required to own 5% of a small firm than of a large firm. The high correlation (88%) between the two measures suggests that many firms have only one blockholder.¹⁹ An alternative interpretation is that there is free riding, herding, or information sharing between the institutions. Therefore, on average, larger firms tend to have higher public pension fund holdings (PP), a lower amount of blockholder ownership (BLOCK), and a higher degree of takeover protection (EXT or ATI).

Interestingly, the correlation between our two proxies for internal governance (PP and BLOCK) is a very low 6%. Further, they have opposite correlations with size, and PP is correlated with EXT while BLOCK is not. Therefore, while institutional blockholders might be a noisier proxy of internal corporate governance than public pension fund holding, using institutional blockholders avoids any bias toward larger firms. As a result, the use of both proxies offers a genuine robustness check, particularly with respect to any size effect.

B. Portfolios

In this section, we investigate the equity returns for the various portfolios created by sorting stocks according to the external and internal governance proxies. To ensure that differences in riskiness or “style” do not drive our results,

¹⁹ Out of all firm–quarter combinations for which there is at least one blockholder, in 48% of cases there is only one. In 30% of the cases there is no blockholder. So in 78% of the cases, there is no difference between total blockholder ownership and largest blockholder ownership.

we calculate abnormal returns using the four-factor model described below, which includes the three-factor Fama–French (1993) model augmented by the momentum factor (see Jegadeesh and Titman (1993) and Carhart (1997)). The estimated abnormal return is the constant, α , in the model

$$R_t = \alpha + \beta_1 \times MKT_t + \beta_2 \times SMB_t + \beta_3 \times HML_t + \beta_4 \times UMD_t + \varepsilon_t, \quad (1)$$

where R_t is the excess return over the riskless rate to some portfolio in month t , and MKT_t , SMB_t , HML_t , and UMD_t are the returns on the market portfolio and the three portfolios that capture the size, book-to-market, and momentum effects.

All firms are sorted into $4 \times 4 = 16$ portfolios, sorting all firms first on the external governance proxy EXT and then on their internal governance proxy.²⁰ We estimate the abnormal returns (alphas) for the 16 resulting portfolios and for two sets of long-short portfolios. First, keeping the level of internal governance fixed, we estimate the abnormal returns accruing to a portfolio that buys firms with the highest takeover vulnerability and sells firms with the lowest takeover vulnerability. We have four such portfolios, one for each of the four quartiles of public pension fund (blockholder) ownership. Second, keeping the level of takeover vulnerability fixed, we estimate the alphas to the portfolios that buy firms with the highest public pension fund (blockholder) ownership and sell firms with the lowest level of public pension fund (blockholder) ownership. Finally, both equally and value-weighted portfolios are considered.

In the context of abnormal returns, if the importance of external governance is independent of shareholder activism (substitutes), one should find significant abnormal returns for all four portfolios that mimic the importance of external governance. If they are complements, the abnormal return should be significant only for the portfolio for which shareholder activism is high as well. Similarly, if the governance mechanisms are substitutes, we should expect to find similar results across the four portfolios that mimic the importance of public pension fund (blockholder) ownership.

We start by replicating the main result in GIM using equity returns from 1990 to 1999. Our results are very similar and are not presented.²¹ Once extended from 1999 to 2001, the GIM results weaken slightly (Table III), producing abnormal returns of 7.5% to their “democracy minus dictatorship” portfolio instead of 8.5%. Since we later form portfolios by sorting firms on up to three dimensions (external governance, internal governance, and size), we reduce the cutoff for poor external governance firms from $EXT \leq 10$ to $EXT \leq 11$ and for high external governance from $EXT \geq 19$ to $EXT \geq 18$. This ensures that we

²⁰ Independent sorts on these two dimensions give basically the same results (due to generally low correlations between external and internal governance proxies). Finally, we also conduct 5×5 and 3×3 sorts. Splitting these two governance mechanisms into three or five categories also does not significantly affect the results. For the two-step WLS regression (see Section III.A) methodology, we use independent sorts.

²¹ They are not identical because we only use common shares traded on NYSE, AMEX, and NASDAQ that could be matched with the Thompson database.

Table III
Importance of External Governance (Takeover Vulnerability)
Conditional on the Level of Internal Governance

We report the annualized mean, the annualized abnormal return (alpha), and its *t*-statistic of a (value-weighted, VW, and equal-weighted, EW) portfolio that buys firms in the highest category and shorts firms in the lowest category of external governance as measured by EXT, for a given category of internal governance (1, 2, 3, or 4) or independent of internal governance (All). We consider two different proxies for internal governance: BLOCK (Panel A) and PP (Panel B). The variable EXT denotes the firm-specific level of takeover vulnerability based on the index developed by Gompers et al. (2003) that incorporates 24 takeover provisions; BLOCK is the percentage of stocks held by the largest institutional blockholder (at least 5%); and PP is the percentage of stocks held by the group of public pension funds (see the Appendix for the list of public pension funds). We also consider a portfolio that buys firms with both high takeover vulnerability and high internal governance and shorts firms with both low takeover vulnerability and low internal governance (HH–LL). External governance is measured using firm-specific takeover provisions in place. The time period used is 1990 to 2001, and the alphas are relative to the four-factor Carhart (1997) model.

Panel A: Using BLOCK as Proxy for Internal Governance							
VW Long-Short Portfolios				EW Long-Short Portfolios			
Mean	Alpha	<i>t</i> -stat	BLOCK	Mean	Alpha	<i>t</i> -stat	BLOCK
1.51%	2.64%	1.24	All	4.55%	7.08%	3.47	All
−0.24%	−0.51%	−0.15	1	4.90%	5.55%	1.55	1
3.09%	5.67%	1.4	2	0.73%	2.97%	0.8	2
2.36%	2.46%	0.54	3	5.59%	7.35%	2.36	3
8.94%	10.83%	3.13	4	8.50%	14.98%	4.8	4
9.80%	7.42%	1.60	HH–LL	10.46%	13.02%	4.01	

Panel B: Using PP as Proxy for Internal Governance							
VW Long-Short Portfolios				EW Long-Short Portfolios			
Mean	Alpha	<i>t</i> -stat	PP	Mean	Alpha	<i>t</i> -stat	PP
1.51%	2.64%	1.24	All	4.55%	7.08%	3.47	All
0.37%	1.94%	0.34	1	5.40%	10.18%	2.09	1
−1.84%	−0.95%	−0.24	2	4.16%	4.02%	1.19	2
2.93%	3.43%	0.96	3	3.25%	6.17%	2.39	3
6.79%	9.46%	2.11	4	7.26%	10.84%	3.08	4
2.51%	3.99%	0.82	HH–LL	4.87%	12.42%	2.92	

have a reasonable number of firms in the low external governance category in each of the three-dimensional sorts. With this categorization, a surprising result emerges. Changing the cutoffs removes any abnormal return that accrues to better external governance, once the sample is extended to 2001, in the value-weighted portfolio. We now find that a value-weighted portfolio that buys the firms with high external governance and shorts the firms with low external governance generates an annualized alpha of only 2.6% that is statistically insignificant. The GIM results remain significant for the equally weighted portfolio, generating an annualized alpha of 7%. This difference between

value-weighted and equal-weighted portfolios points to a possible size effect. We interpret this as reduced significance of the effect pointed out by GIM once the data is extended to 2001.

To alleviate concerns about the robustness of our results, we hereafter report all results using this altered classification of what constitutes high and low external governance. As it turns out, none of our results are contingent on this categorization or choice of cutoffs. Moreover, the two-step WLS method described in the next section provides another robustness check by not only looking at extreme portfolios, but also the entire sample.

C. Results

The results on the impact of external governance conditional on the level of shareholder activism using the share ownership of the largest blockholder (public pension fund) are reported in Panel A (B) of Table III. We find that a portfolio that buys firms with the highest takeover vulnerability and shorts firms with the lowest takeover vulnerability generates annualized abnormal returns of 10.8% (9.5%) with a *t*-statistic of 3.13 (2.11) only when internal governance is high. This shows that even though external governance for the whole sample does not generate any abnormal returns, it produces significant and large abnormal returns in combination with internal governance. Furthermore, similar portfolios at all other levels of internal governance do not generate any significant abnormal returns, implying strong complementarity between internal and external governance.

Next, we turn our attention to the importance of internal governance, which is manifested by the returns accruing to a portfolio that buys firms with the highest level of blockholder ownership and shorts firms with the lowest level of blockholder ownership. We find that such a portfolio generates significant abnormal returns only when takeover vulnerability is high. The annualized abnormal return in this case is 7.9% (Table IV, Panel A). Even though we find a similar complementary trend using public pension fund holding, the returns are not significant. This is supportive of previous evidence that suggests that monitoring by public pension funds does not increase shareholder wealth (see Karpoff, Malatesta, and Walkling (1996), Wahal (1996), and Gillan and Starks (2000)). Overall, these results again suggest strong complementarity between internal and external governance.

The results using the equally weighted portfolios are even more striking in magnitude and are once again suggestive of a size effect. We find that a portfolio that buys firms with the highest takeover vulnerability and shorts firms with the lowest takeover vulnerability generates annualized abnormal returns even for lower levels of blockholder (public pension fund) ownership. These abnormal returns are statistically significant for the two highest internal governance groups. For example, for the case in which internal governance—measured by BLOCK (PP)—is highest, the annualized abnormal returns accruing to the external governance spread portfolio is a striking (and statistically significant) annualized 14.9% (10.83%). The results using portfolios that capture the spread

Table IV
Importance of Internal Governance (Active Shareholders)
Conditional on the Level of External Governance

We report the annualized mean, the annualized abnormal return (alpha), and its *t*-statistic of a (value-weighted, VW, and equal-weighted, EW) portfolio that buys firms in the highest category and shorts firms in the lowest category of internal governance as measured by BLOCK (Panel A) and by PP (Panel B), for a given category of external governance as measured by EXT (1, 2, 3, or 4) or independent of external governance (All). The variable EXT denotes the firm-specific level of takeover vulnerability based on the index developed by Gompers et al. (2003) that incorporates 24 takeover provisions; BLOCK is the percentage of stocks held by the largest institutional blockholder (at least 5%); and, PP is the percentage of stocks held by the group of public pension funds (see the Appendix for the list of public pension funds). External governance is measured using firm-specific takeover provisions in place. The time period used is 1990 to 2001, and the alphas are relative to the four-factor Carhart (1997) model.

VW Long-Short Portfolios				EW Long-Short Portfolios			
Mean	Alpha	<i>t</i> -stat	EXT	Mean	Alpha	<i>t</i> -stat	EXT
Panel A: Using BLOCK							
3.20%	-1.02%	-0.47	All	3.04%	1.85%	1.00	All
0.9%	-3.41%	-0.74	1	1.97%	-1.95%	-0.62	1
0.54%	-3.94%	-1.1	2	3.09%	1.9%	0.79	2
3.09%	-2.53%	-0.82	3	5.09%	2.21%	0.86	3
10.08%	7.94%	2	4	5.57%	7.48%	2.04	4
Panel B: Using PP							
1.10%	0.51%	0.19	All	-1.30%	-0.53%	-0.21%	All
-4.28%	-5.47%	-1.05	1	-2.39%	1.59%	0.44	1
-1.28%	-0.93%	-0.25	2	-3.3%	-1.39%	-0.52	2
1.75%	-0.2%	-0.04	3	2.26%	0.07%	0.02	3
2.14%	2.06%	0.42	4	-0.52%	2.24%	0.45	4

to internal governance are similar to the value-weighted results and are reported in Table IV.

One could view the value-weighted results as representative of large firms and the equally weighted results representative of the smaller firms. In that case, the abnormal returns documented suggest that external governance is more important in small firms, or more generally, that firm size appears to be a factor influencing the importance of takeovers and the interaction of the market for corporate control and shareholder activism. However, the comparison between the value-weighted and equal-weighted portfolios serves mainly as a robustness check to ensure our results are not driven by a few very large firms that dominate a particular portfolio. We investigate the role of firm size more directly in the next section.

III. The Effect of Firm Size and Leverage

In this section, we investigate how the documented complementary relation between the market for corporate control and public pension fund (blockholder)

ownership is affected by firm-level characteristics such as debt and size. Novaes and Zingales (1995) and Zweibel (1996) have pointed out that higher debt reduces the probability of a takeover since it commits the manager to performance improvements and reduces the opportunities for value creation. Consequently, effective takeover vulnerability of high leverage firms is low, even when such firms do not have a large number of defensive provisions.²² Thus, these theories would suggest that other governance mechanisms, especially the market for corporate control, should be active when debt is low. As an indication of whether a firm has high debt, we use industry median-adjusted leverage levels. Industry adjustments are made by subtracting the industry median, where medians are calculated by matching the four-digit SIC codes from December of each year to the 48 industries designated by Fama and French (1997).

The other aspect we look at is firm size, motivated by the possible takeover deterrent role of firm size: A larger firm size forces the bidder to expend a larger amount of resources.

To detect the effect of these interactions, we present a new two-step WLS method. The alternative—a panel regression using firm-specific abnormal returns regressed on firm characteristics—has very low power due to the noise in estimating the firm-specific alpha. Our method not only greatly reduces the idiosyncratic risk by estimating alphas of portfolios sorted along all relevant dimensions, rather than alphas of individual stocks, but also accounts for the estimation risk in the alphas. This methodology could be used as an alternative to a panel data approach in the general case of investigating the relation between alphas and firm characteristics.

The two-step weighted least squares methodology uses the information contained in all the 81 alphas rather than only focusing on long-short positions in the extreme portfolios. Even though the creation of additional sorts reduces the number of firms in each bucket and consequently reduces the significance of the alphas, we are able to detect significant relationships between these alphas, while taking into account their estimation risk by weighting the alphas by their appropriate significance. In addition to taking into account the estimation risk, we also account for the covariance matrix of these alphas. Additionally, the noise in our proxy for takeover vulnerability is of less importance since our results are based on groups and are robust to small changes in the firm's EXT. Finally, this methodology overrides the concern that firm's governance quality might change over time, while the panel method would use a constant abnormal return over time. In sum, our method greatly improves the power and robustness in detecting the effect of firm-level characteristics. The method is explained below.

A. Two-Step Methodology

In the first step, we estimate alphas of portfolios formed by independently sorting firms on four dimensions: external governance (EXT), internal

²² Stulz (1988) and Harris and Raviv (1988) also highlight the takeover deterrent role of debt due to concentration in managerial control.

governance (BLOCK or PP), industry-adjusted leverage (LEV), and market equity (SIZE). In order to ensure a reasonable number of firms in each portfolio, we form three portfolios along each of the four dimensions, creating $3^4 = 81$ portfolios.²³

A.1. *Estimating Alpha*

We first estimate the abnormal returns (i.e., alphas) that accrue to portfolios that are formed by independent sorts on proxies for internal and external governance as well as for firm size and industry-adjusted leverage. Toward this end, we estimate $\alpha_{k \times N}$ in the ordinary least squares regression

$$R_{T \times N} = D_{T \times k} \times \alpha_{k \times N} + FF4_{T \times 4} \times \beta_{4 \times N} + \varepsilon_{T \times N}, \quad (2)$$

where T is the number of months ($T = 136$), N is the number of portfolios, and $D_{T \times k}$ is a dummy matrix. Again, given that we divide the various firms into $3 \times 3 \times 3 \times 3$ buckets using independent sorts on our four dimensions, N is equal to 81. For the dummy matrix, we consider the case $k = 1$ such that the dummy matrix is a constant.²⁴ FF4 denotes the returns on the market portfolio and the three portfolios that capture the size, book-to-market, and momentum effects.

In the second step, we regress these alphas on portfolio groups assigning each portfolio a score of 1, 2, or 3 on the four relevant dimensions.

A.2. *Regressing Alphas on Portfolio Characteristics*

We use the kN estimated abnormal returns as the dependent variable in the regression

$$\alpha_{kN \times 1} = X_{kN \times m} \times \gamma_{m \times 1} + h_{kN \times 1}, \quad (3)$$

where X is a $(kN \times m)$ matrix of m dummies or dummy interactions. We construct groups for the four dimensions considered, each of which range in value from one to three with a higher value denoting higher levels. The groups for the level of external governance, internal governance, industry-adjusted leverage, and firm size are denoted by G_{EXT} , G_{INT} , LEV and SIZE, respectively. The coefficients on the interactions among these groups point us toward any effects of firm size and leverage. The specific form of the second-stage regression used will be presented along with the results.

The second-step coefficients are estimated using weighted least squares, with $V(\alpha_{kN \times 1})$ —the variance-covariance matrix of the alphas—as the weighting matrix. Instead of the usual ordinary least squares assumption, $\text{var}(h) = \sigma^2 \mathbf{I}_{kN \times 1}$,

²³ A possible concern is the high correlation between size and leverage. We find that less than 2% of the total observations have missing returns due to empty portfolios.

²⁴ The methodology also allows for yearly dummies ($k = 11$), which can be interpreted as year fixed effects.

we now assume that $\text{var}(h) = s^2 V(\alpha_{kN \times 1})$, where the variance–covariance matrix of the alphas is estimated in the first step. Further details of the WLS estimation and its heteroskedasticity correction are given in the Appendix. In the discussion of the results, we report only the second-stage regression estimates.²⁵

B. Results

In this section, we report the results of two separate regressions (Table V). To detect dependence between the two different governance mechanisms we use the $\min()$ function and to detect independence we use the $\max()$ function, where the $\min$ and the $\max$ denote the minimum and the maximum, respectively, among the groups for takeover vulnerability and shareholder activism. We use these functional forms as they capture, in a simple manner, the main difference between the two possibilities. If these mechanisms are dependent, an increase in the level of either mechanism, keeping the other fixed, would not change the output. Thus, the coefficient on the $\max$ variable would be insignificant. Further, if the levels of both governance mechanisms increase, an increase in output would be reflected in a significant coefficient on the $\min()$ variable. For example, consider a portfolio of firms that belong to the category of low internal governance ($G_{\text{INT}} = 1$) and high external governance ($G_{\text{EXT}} = 3$), such that $\max\{G_{\text{EXT}}, G_{\text{INT}}\} = 3$ and $\min\{G_{\text{EXT}}, G_{\text{INT}}\} = 1$. If this portfolio has high abnormal returns, it should be evidence suggesting that governance through the market for corporate control is independent of internal governance mechanisms. Conversely, if its alpha is low, it should support the hypothesis that internal and external governance mechanisms are complements.

The results when public pension holdings (blockholder ownership) are used as a proxy for internal governance are reported in Panel A (Panel B).

B.1. Regression I: Substitutes, Complements, and Size

In the first regression, we investigate the effect of firm size. Specifically, the second-step regression we run is

$$\alpha_i = K + \gamma_0 \times \max\{G_{\text{EXT}}, G_{\text{INT}}\} I_{\text{SIZE}=1} + \gamma_1 \times \max\{G_{\text{EXT}}, G_{\text{INT}}\} I_{\text{SIZE} \geq 2} \\ + \gamma_2 \times \min\{G_{\text{EXT}}, G_{\text{INT}}\} I_{\text{SIZE}=1} + \gamma_3 \times \min\{G_{\text{EXT}}, G_{\text{INT}}\} I_{\text{SIZE} \geq 2} + \varepsilon_t, \quad (4)$$

where $I_{\text{SIZE} \geq 2}$ and $I_{\text{SIZE}=1}$ are dummy variables that take the value 1 for portfolios formed out of the largest two-thirds and the smallest third of the firms, respectively.²⁶

²⁵ For each set of proxies, the first-stage results are the same and are available on request. Note that our goal in the second-stage regression is to detect patterns of complementarity or substitution by verifying whether the coefficients are positive and statistically significant.

²⁶ The majority of firms in our sample are large (S&P large-cap and mid-cap funds), especially before 1999. In 1999, IRRG added around 600 firms mainly from the S&P small-cap fund.

Table V
The Interaction between Governance Mechanisms
and Firm Characteristics

This table presents the regression results for the alphas of 81 equal-weighted portfolios created from independent $3 \times 3 \times 3 \times 3$ sorts on EXT, PP/BLOCK, SIZE, and LEVERAGE (see Table II for a description of these variables). Panel A gives the results using PP, and Panel B using BLOCK. We first estimate portfolio alphas and their variance–covariance matrix using the Carhart (1997) four-factor model. We then estimate a weighted least squares regression of these alphas on Max and Min times size dummies (I) and on Min times both size and leverage dummies (II), with the variance–covariance matrix of the alphas as the weighting matrix. The variable Max denotes the maximum of the level of EXT and PP/BLOCK, and captures the substitution effect; Min denotes the minimum of the level of EXT and PP/BLOCK, and captures the complementarity effect. Here, the level of EXT, PP or BLOCK equals 1, 2, or 3, based on the $3 \times 3 \times 3 \times 3$ sorting of firms into portfolios. The variables Small and Large denote the dummies for the smallest third and the largest two-thirds of firms, respectively, and LowLev and HighLev denote dummies for the firms with the lowest third and highest third LEVERAGE, respectively. We present the regression coefficients and their *t*-statistics in parentheses.

	I	II
Panel A: Using PP		
Max * Small	–0.13 (–0.11)	
Min * Small	3.15 (2.35)	
Min * Small * LowLev		4.30 (3.59)
Min * Small * HighLev		2.29 (1.91)
Max * Large	0.10 (0.12)	
Min * Large	2.31 (2.79)	
Min * Large * LowLev		3.61 (3.94)
Min * Large * HighLev		0.42 (0.46)
Panel B: Using BLOCK		
Max * Small	–0.27 (–0.26)	
Min * Small	5.26 (4.39)	
Min * Small * LowLev		3.52 (3.09)
Min * Small * HighLev		1.82 (1.59)
Max * Large	0.69 (0.88)	
Min * Large	2.43 (2.92)	
Min * Large * LowLev		3.70 (4.24)
Min * Large * HighLev		0.93 (1.07)

The results from regression (4) confirm our previous findings (Table V). Among the four estimated coefficients, only the two coefficients on the min() dummy are statistically significant for both public pension fund and blockholder ownership as proxies of internal governance. While the complement effect between the two governance mechanisms is robust across firm size, the significance of the coefficient suggests that they have a stronger interaction in smaller firms. Consistent results using both public pension fund holding and blockholder ownership as proxies point to a robust finding, especially since they are correlated with size in opposite directions (see Table II).

We can now address our concern that we do not account for noninstitutional outsider blockholders. If these existed in firms for which there is no public pension fund holding or large institutional blockholders, we should incorrectly find a substitution effect. However, if there is no systematic relation between this missing variable and our proxies of shareholder monitoring, we should only find it difficult to find any significant relation. Therefore, the fact that we neither find a substitution effect nor an insignificant relation reduces this concern.

B.2. Regression 2: Substitutes, Complements, Size and Leverage

The second regression considers the complementary interaction between external and internal governance in the presence of both size and leverage effects. The results are presented in the second column of Table V. Specifically, we estimate the following second-step regression,

$$\alpha_i = K + \gamma_0 \min\{G_{EXT}, G_{INT}\} I_{SIZE=1} I_{LEV=1} + \gamma_1 \min\{G_{EXT}, G_{INT}\} I_{SIZE \leq 1} I_{LEV=3} \\ + \gamma_2 \min\{G_{EXT}, G_{INT}\} I_{SIZE \geq 2} I_{LEV=1} + \gamma_3 \min\{G_{EXT}, G_{INT}\} I_{SIZE \geq 2} I_{LEV=3} + \varepsilon_i,$$

where $I_{LEV=1}$ and $I_{LEV=3}$ are dummy variables that take the value 1 for portfolios formed out of firms with the lowest and highest 33% of industry-adjusted leverage, respectively.

For both proxies of internal governance, BLOCK and PP, we find that the mechanisms are complements only when leverage is low. Although many of the 81 alphas from the first-stage regression are statistically insignificant, they too support a complementary relation between the governance mechanisms for firms with low leverage. In fact, for small firms with low leverage, the increase in alpha when takeover vulnerability changes from low to high is 3.2% when there is no blockholder, while the increase is 6.2% when there is a large blockholder. Similarly, the increase in alpha when blockholder ownership changes from the lowest category to the highest is -0.2% when takeover vulnerability is low, and 3.1% when takeover vulnerability is high. On the other hand, there is no such complementary relation for large firms with high leverage. Here, the quantitative improvement in alpha when takeover vulnerability goes from low to high equals 10.7% when there is no blockholder, while the improvement is 6.1% when there is a large blockholder (rejecting complementarity). Similarly, the improvement in alpha when blockholder ownership goes from the lowest

category to the highest is 8.3% when takeover vulnerability is low and 3.8% when takeover vulnerability is high (again rejecting complementarity). This supports Novaes and Zingales (1995) and Zweibel (1996) by suggesting that takeover vulnerability is low when debt is high, and hence that the external governance mechanism is not functioning.

To conclude, the overall results for these two regressions clearly indicate that the two mechanisms of governance are complements in being associated with abnormal equity returns. Furthermore, it appears that the complementarity effect is stronger in small firms and exists only when leverage is low.

IV. Robustness

A. An Alternative Measure for Takeover Defense

In this section, we ensure that our results are not driven by any alternative interpretation of the GIM index. Accordingly, we create a much more parsimonious measure of takeover defense, which we call the alternative takeover index (ATI). Such a robustness test is particularly useful since the various antitakeover provisions that are available to a public firm to regulate its exposure to the market for corporate control are not equally effective.²⁷ As an example, consider the case of poison pills. All firms that have a preferred blank check authorized effectively have a poison pill all the time.²⁸ In these firms, the presence or absence of a poison pill at any given time, therefore, is not useful information. In addition, the existence of a poison pill in these firms also makes some common antitakeover provisions redundant.²⁹ Considering all the 24 provisions in EXT equally important, therefore, leads to a noisy proxy of antitakeover protection.

In order to reduce the noise in our proxy, we refine our measure by focusing on three common antitakeover provisions that create significant obstacles for takeovers—preferred blank check, staggered boards, and restrictions on calling special meetings and action through written consent.

The existence of the preferred blank check not only implicitly equips the firm with a poison pill, but also enables the management to issue new classes of stock without shareholder approval and significantly reduces the takeover probability (Ambrose and Megginson (1992)). Classified boards and restrictions on calling special meetings and on action through written consent create significant delays. Due to these delays, a bidder's solution to the poison pill is now more costly. These provisions, therefore, create barriers in addition to the poison

²⁷ We refer the reader to the Appendix for more details of the antitakeover provisions that we discuss here.

²⁸ Managers of all firms that have a preferred blank check authorized are free to adopt a pill quickly, without shareholder approval, whether or not a hostile bid has been made or is imminent. For all practical purposes, managers of a firm with a preferred blank check authorized and without a pill can be expected to quickly adopt one when needed.

²⁹ For example, a bidder's attempts to get around the poison pill—waging a proxy fight to remove the board—also removes the obstacles posted by the Business Combination statute (Daines and Klausner (2002)).

Table VI
Summary Statistics: Alternative Measure for Takeover Defense (ATI)

This table reports the number of firms for each of the four possible values of the alternative takeover vulnerability index, ATI, which incorporates three takeover provisions (blank check preferred, staggered boards, and restrictions on calling special meetings or acting by written consent). Firms with ATI = 3 are classified as having the highest external governance and are most vulnerable for takeovers, and firms with ATI = 0 are classified as being least vulnerable. The four dates are those for which the IRRC database containing firm-specific takeover provisions are updated.

	Number of Firms			
	Sep-90	Jul-93	Jul-95	Feb-98
ATI = 0	328	378	412	482
ATI = 1	410	427	459	563
ATI = 2	446	381	344	428
ATI = 3	145	129	99	92

pill. In fact, some legal scholars have pointed to the presence of classified boards as the single most important factor in takeover defense due to the long delay it causes.³⁰ Similarly, a bidder's attempt to wage a proxy fight to remove the board is hindered if there are restrictions to calling special meetings or shareholder action through written consent is prohibited. These provisions can play a very important role in the outcome of a takeover attempt, as they can prevent an aggressive pursuer from easily removing current directors and stacking the board of directors in their favor. A restriction on calling special meetings coupled with a restriction on acting through written consent can delay the acquiror by 12 to 18 months, depending on state laws (Daines and Klausner (2002)).

For our alternative and narrower alternative takeover index (ATI), we use only these three components and deduct a point for each provision. That produces an index of external governance that varies from 0 to 3, giving four categories of external governance or one for each possible value. We classify firms with ATI = 0 as having low takeover vulnerability (poor external governance) and those with ATI = 3 as being prone to takeovers (high external governance). As we document in Table II, the correlation between ATI and EXT is a surprisingly high 64%. Table VI shows some summary statistics.

Note that the majority of firms have an ATI equal to one or two. The average number of firms with high internal and external governance is only about 26 of a total average of 1,500. Using this proxy for external governance we also find that the total number of firms with high external governance is now lower than for the case with our former proxy. Conceptually, this will only make it more difficult for us to find any statistically significant results.

First, as in Section II, we compute the returns to portfolios that mimic the importance of the governance mechanisms, but we now use ATI instead of EXT.

³⁰ In the sample analyzed by Bebchuk, Coates, and Subramanian (2002), an effective staggered board doubled the odds of remaining independent for an average target. They found that a classified board can impose a delay of up to two years.

The results, which are not reported in the interest of space, remain consistent. Next, we repeat the two-step method presented in Section III and the two regressions described there with the new measure of takeover protection. The results are presented in Table VII. In spite of the much lower number of firms in the extreme categories, we still find significant and consistent results.

An indication of the strength of the complementarity effect is evident from the regression (4) model, where we investigate the complementarity effect in isolation. The estimated coefficient on the $\text{min}()$ variable is significant at the 1% level (t -statistic of 3.88) when using public pension fund ownership as a proxy for internal governance. Using blockholder ownership as a proxy, the estimated coefficient is significant at the 5% level (t -statistic of 2.97).

B. Intertemporal Patterns

How consistent over time is the importance of corporate governance? In this section we attempt to answer this question by calculating 36-month moving averages of the abnormal returns (alphas) accruing to the value-weighted long-short portfolios that mimic the importance of the different governance mechanisms. Even though the statistical significance of the various abnormal returns varies over time, the pattern yields valuable information.

We calculate the 36-month moving average of the alpha for a portfolio that is long in the firms with the highest level of external governance ($\text{EXT} \geq 18$) and short in the firms with the lowest level of external governance ($\text{EXT} \leq 11$). Similarly, we also calculate the moving average of the alpha for a portfolio that buys firms with the highest level of internal governance and sells firms with the lowest level of internal governance, for both our proxies of internal governance. The results for the value-weighted portfolios using public pension fund ownership are presented in Figure 1.³¹ While the importance of external governance in isolation is insignificant in the value-weighted portfolio over the 11 years (2.6%), there is an interesting downward trend over the decade. Note that the importance of external governance disappears in 2000 and 2001.

The returns accruing to the internal governance spread portfolio do not show any obvious relation with the returns to the external governance spread portfolio nor do they exhibit any strong pattern over time. We now look at the consistency of the complementary portfolio. Figure 1 (EXT-PP4) charts the moving average of the alpha for the portfolios that buy firms in the high external governance category and sell firms in the low external governance category, for the highest category of internal governance.³² Figure 1 also plots the moving average of the alpha for a portfolio that buys firms in the high internal governance category and sells firms in the low internal governance category, for the highest category of takeover vulnerability (PP-EXT4). When public pension fund holding is in the highest category, all the alphas are positive and there

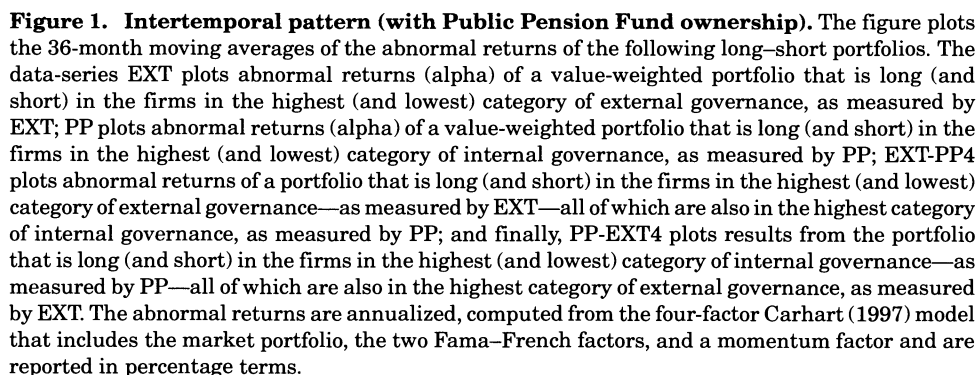
³¹ The figure using blockholders is similar and is omitted here.

³² The variable PP4 denotes the group with the highest level of public pension fund ownership. Similarly, EXT4 denotes the highest level of takeover vulnerability.

Table VII
The Effect of Size and Leverage—Using ATI

This table presents the regression results for the alphas of 81 equal-weighted portfolios created from independent $3 \times 3 \times 3$ sorts on ATI, PP/BLOCK, SIZE, and LEVERAGE (see Table II for a description of these variables). Panel A gives the results using PP, and Panel B using BLOCK. We first estimate portfolio alphas and their variance–covariance matrix using the Carhart (1997) four-factor model. We then estimate a weighted least squares regression of these alphas on Max and Min times size dummies (I) and on Min times both size and leverage dummies (II), with the variance–covariance matrix of the alphas as the weighting matrix. The variable Max denotes the maximum of the level of ATI and PP/BLOCK, and captures the substitution effect; Min denotes the minimum of the level of ATI and PP/BLOCK, and captures the complementarity effect. Here, the level of ATI, PP, or BLOCK equals 1, 2, or 3, based on the $3 \times 3 \times 3$ sorting of firms into portfolios. The variables Small and Large denote the dummies for the smallest third and the largest two-thirds of firms, respectively, and LowLev and HighLev denote dummies for the firms with the lowest third and highest third LEVERAGE, respectively. We present the regression coefficients and their *t*-statistics in parentheses.

	I	II
Panel A: Using PP		
Max * Small	–0.10 (–0.09)	
Min * Small	3.29 (2.20)	
Min * Small * LowLev		1.56 (1.18)
Min * Small * HighLev		1.30 (0.99)
Max * Large	–0.34 (–0.37)	
Min * Large	2.62 (2.45)	
Min * Large * LowLev		2.68 (2.65)
Min * Large * HighLev		0.54 (0.53)
Panel B: Using BLOCK		
Max * Small	0.50 (0.38)	
Min * Small	2.50 (1.78)	
Min * Small * LowLev		1.57 (1.16)
Min * Small * HighLev		0.37 (0.27)
Max * Large	0.66 (0.87)	
Min * Large	1.84 (1.77)	
Min * Large * LowLev		2.55 (2.46)
Min * Large * HighLev		–0.35 (–0.34)



Investigating the yearly alphas, we find that there are a few periods in which firms with better external governance enjoy striking abnormal returns.³³ In the years of heightened stock market activity (1998 and 1999), the alphas are very high for the external governance spread portfolio. This shows that extending the data is important to ensure robustness of the results for changing market

³³ A caveat is in order since these estimates are based on only 12 monthly data points.

conditions. In addition, there is a potential alternative reason for this pattern that is unrelated to stock market conditions. In 1998, IRRG added a number of firms, increasing the sample by 25%. These were mostly smaller firms and firms with high institutional ownership. Therefore, if external governance is more important for small firms, we would observe a higher abnormal return post-1998. As shown earlier, we find some support for this view. The equally weighted results strengthen the importance of external governance, further suggesting that the takeover market is more effective for smaller firms. The yearly alphas for the complements portfolio are consistent across the bull and the bear market. The yearly alphas are all positive when BLOCK is used as a proxy and 10 out of the 11 yearly alphas are positive when PP is used as a proxy.

The results in this section strongly indicate that the complementary relation between the governance mechanisms is consistent over time. More importantly, they show that the importance of external governance mechanisms in isolation exhibits a falling trend and the importance of internal governance in isolation is inconsistent. A caveat is that we ignore the overall external market conditions.³⁴

V. Interpretation and Implications

We have documented a strong and striking complementary empirical relation between the two different governance mechanisms—takeovers and active shareholders—in being associated with long-term abnormal returns that is consistent over time and robust across various proxies. The finding is also consistent with the governance role of debt, with stronger results for low leverage firms. What implications does this have for the design of corporate governance? To answer this, we first consider various plausible interpretations of the evidence.

A. *Excluding Targets/Bidders*

Hypothesis (H1): The documented abnormal returns are caused due to the abnormal returns accruing to future targets on the acquisition announcement date.

To verify whether these are the cause of the abnormal returns documented here, we remove from our initial sample all firms that were targets between

³⁴ In an environment where that there are no mergers and takeovers, a firm with high takeover protection might have a similar external governance as that of a firm with no takeover defenses, and they both have little threat of a takeover. The pattern of yearly abnormal returns and yearly merger activity appears generally consistent with this, with returns accruing to the external governance spread portfolio peaking during 1998 and 1999. However, with only 11 data points, it is not possible to come to any robust conclusions. The patterns of abnormal returns combined with changing market conditions are an interesting avenue to pursue and are left for future research and a longer time-series of data.

1990 and 2001 and compute abnormal returns accruing to the different portfolios discussed in Section II. For this purpose, acquisition data are collected from SDC. A total of 811 firms are removed out of 2,264 unique firms. In spite of this large reduction, our results remain consistent and of surprisingly similar magnitude.³⁵ A portfolio that buys firms with high takeover vulnerability and high public pension fund (blockholder) ownership and shorts firms with low takeover vulnerability and high public pension fund (blockholder) ownership generates annualized abnormal returns of 11.12% (12.31%) with a *t*-statistic of 2.32 (3.20).

A mirror hypothesis (H1a) is that poor governance portfolios have bidder firms and thus the long-short portfolio benefits from the negative abnormal returns that bidders receive on the announcement of an acquisition. To test this explanation, we remove from our sample all firms that made acquisitions between 1990 and 2001. Almost 1,200 firms from our initial sample made acquisitions during this time period. Our results still remain consistent and statistically significant, while the magnitude of the abnormal returns surprisingly becomes larger. A portfolio that buys firms with high takeover vulnerability and high public pension fund (blockholder) ownership and shorts firms with low takeover vulnerability and high public pension fund (blockholder) ownership now generates annualized abnormal returns of 15.46% (21.36%) with a *t*-statistic of 2.36 (3.17). If the ex post announcement effect during acquisitions is causing these abnormal returns, we should expect to see a reduction in the significance and magnitude of abnormal returns accruing to our complementary portfolios. However, we do not find any such effect.³⁶

B. Profitability

Hypothesis (H2): The abnormal returns are unrelated to fundamental firm performance and are based on the market's views of the importance of corporate governance.

If the market has attached an increasing importance to governance over the 1990s, say for some nonfundamental reason such as media attention, then governance-related abnormal returns could potentially accrue to a long-term portfolio that holds firms considered to be well governed. To verify whether governance is related to firm performance, we use accounting measures of performance. We compute the return on assets (ROA), return on equity (ROE), and net profit margin (NPM)—all industry adjusted—for the firms that have the lowest leverage (bottom 33%).³⁷ We use the low leverage firms since, as shown in Section III, our results are mainly applicable to firms with low debt. We divide

³⁵ Results are not reported and are available upon request.

³⁶ However, note that we can only rule out the fact that the empirical results are not due to an ex post effect of announcement returns. We cannot rule out the fact that ex ante beliefs of being a target or a bidder generate these abnormal returns.

³⁷ We remove outliers, as is common when using these measures, by truncating the top and bottom 2.5% of the distribution.

Table VIII
Governance Mechanisms and Firm Profitability

The table reports the industry-adjusted average profitability of four different governance-level groups using the accounting measures return on assets (ROA), return on equity (ROE), and net profit margin (NPM), each in percentage points. We only use firms with the lowest third of LEVERAGE. Further, high and low refer to above and below the median, respectively, for the relevant governance variable. Panel A compares firms that have a high level of internal governance as measured by either PP or BLOCK but differ in their levels of external governance, as measured by EXT (see Table II for a description of these variables). Panel B compares firms that have a low level of internal governance but differ in their levels of external governance. Net profit margin is the ratio of income before extraordinary items available for common equity to sales; return on equity is the ratio of income before extraordinary items available for common equity to the sum of the book value of common equity and deferred taxes; return on assets is the ratio of income before extraordinary items to total assets. Each variable is adjusted for the industry median using the Fama and French (1997) industry classifications. The average for each group is reported, removing outliers (bottom and top 2.5%). The *t*-statistic for the differences in means test is also reported.

EXT-INT	ROA	ROE	NPM
Panel A: Different Takeover Vulnerabilities When Internal Governance Is HIGH			
Using PP			
HIGH-HIGH	21.95	7.57	8.01
LOW-HIGH	16.55	5.92	5.16
<i>t</i> -statistic			
Difference in Means	(5.91)	(2.69)	(4.09)
Using BLOCK			
HIGH-HIGH	18.54	5.47	6.93
LOW-HIGH	13.71	3.38	3.28
<i>t</i> -statistic			
Difference in Means	(5.90)	(3.54)	(5.72)
Panel B: Different Takeover Vulnerabilities When Internal Governance Is LOW			
Using PP			
HIGH-LOW	16.55	4.15	4.99
LOW-LOW	16.32	4.65	5.64
<i>t</i> -statistic			
Difference in Means	(0.25)	(−0.72)	(−0.81)
Using BLOCK			
HIGH-LOW	19.85	6.29	5.94
LOW-LOW	19.49	7.69	7.82
<i>t</i> -statistic			
Difference in Means	(0.35)	(−1.99)	(−2.21)

this sample into high and low external governance (takeover vulnerability) and high and low internal governance (public pension fund holding or blockholder ownership) based on medians. The average of the profitability measures for each of the four resulting categories—High-High, High-Low, Low-High, Low-Low (External-Internal)—and the simple nonparametric differences-in-means tests are presented in Table VIII.

We find that firms with higher takeover vulnerability are associated with better performance only when internal governance is high. The differences in the average measures across differing takeover protection firms for high internal governance are approximately 5.5% for return on assets, 2.5% for return on equity, and 3% for the net profit margin. There is no such pattern when internal governance is low. This confirms the previously documented complementarity interaction. Along the dimension of internal governance, we find a similar complementarity interaction, though blockholder ownership is no longer associated with higher profitability measures.

Further, when blockholder ownership is used, there is evidence that a single strong mechanism (either internal or external) is associated with lower profitability measures than when both mechanisms are weak. This is consistent with the view that these are costly inputs in a complementary production function. Since we find some consistent patterns in fundamental performance measures, we lean away from the interpretation that these governance mechanisms are unrelated to any performance changes. However, since these results only document associations, rather than causality, we cannot completely rule out this possibility.

C. Model Misspecification and Risk?

Hypothesis (H3): One of the hypotheses pointed out in Gompers et al. (2003) suggests that in 1990, investors did not know the outcome of the improved governance standards and hence did not price in such information.

Hypothesis (H4): An alternative to this mispricing hypothesis is that these abnormal returns are in fact the premium associated with some omitted risk factor related (or unrelated) to governance.

We do not seek to provide evidence on (H3) as GIM have already done so.³⁸ Instead, we try to see if we can find any evidence for H4. According to this hypothesis, the portfolio with both high takeover vulnerability and high public pension fund (blockholder) ownership is associated, for some reason, with higher risk, whereas the existence of any one governance mechanism is not associated with higher risk. If this is not the case, we should expect to find higher valuations for firms with both active mechanisms relative to firms with only one active mechanism, since firms with both active mechanisms are associated with higher profitability measures. To verify whether we have any evidence of this, we look at firm Qs as a measure of valuation.

We estimate cross-sectional regressions using industry-adjusted firm Qs as our dependent variable and our proxies for takeover vulnerability, internal

³⁸ The intertemporal pattern of the alphas does not indicate any learning behavior along the complementary portfolio although the gradually decreasing importance of external governance by itself can be due to the learning behavior of investors. This pattern in the importance of external governance by itself is consistent with the view in Gompers et al. (2003).

Table IX
Governance Mechanisms and Firm Valuations

The table reports the average of the 11 cross-sectional estimates (Fama–Macbeth estimates) for regressions that use firm *Q* as the dependent variable. We include as controls the log of assets in the current fiscal year, firm age, and a dummy variable for inclusion in the S&P 500 as of the end of the previous year. The coefficients on the controls and the constant are omitted from the table. See Table II for a description of EXT and ATI, the proxies for takeover vulnerability, and BLOCK and PP, the proxies for internal governance. The variable *Q* is the ratio of the market value of assets to the book value of assets: The market value is calculated as the sum of the book value of assets and the market value of common stock less the book value of common stock and deferred taxes. The market value of equity is measured at the end of the current calendar year, and the accounting variables are measured in the current fiscal year. Industry adjustments are made by subtracting the industry median, where medians are calculated by matching the four-digit SIC codes from December of each year to the 48 industries designated by Fama and French (1997). The time-series averages (in percentage) and time-series *t*-statistics of the coefficients are reported in the table.

Panel A: Using EXT as Proxy for Takeover Vulnerability					
	EXT	BLOCK	BLOCK × EXT	PP	PP × EXT
I.	3.93 (7.28)	1.05 (2.82)	−0.09 (3.45)		
II.	5.67 (6.00)			4.33 (2.60)	−0.78 (−3.86)
Panel B: Using ATI as Proxy for Takeover Vulnerability					
	ATI	BLOCK	BLOCK × ATI	PP	PP × ATI
I.	9.71 (5.47)	0.47 (2.29)	−0.21 (−3.31)		
II.	12.20 (5.91)			−1.51 (1.34)	−1.29 (−2.50)

governance, and an interaction term of internal and external governance as independent variables. We control for inclusion in the S&P 500, assets, and firm age. The Fama–Macbeth (1973) estimates are reported in Table IX. We find that a higher level of takeover vulnerability is associated with a higher valuation. Our alternative takeover index (ATI) produces surprisingly strong results. A firm that is completely protected from takeovers (ATI = 0) is valued at a discount of 29.1% relative to a firm most prone to takeovers (ATI = 3). These results are consistent over time as well. Similarly, we find that a higher level of public pension fund ownership or blockholder ownership is associated with a higher valuation. The existence of a 10% blockholder is associated with a 10.5% (when using EXT) premium in valuation.

Since the coefficient on the interaction term is negative and significant across all possible combinations of the proxies for internal and external governance, there is no evidence of similar risk factors along the complementary and the noncomplementary portfolios. This translates to a firm with only high takeover vulnerability but no public pension fund (blockholder) ownership having a higher *Q* than a firm with both high takeover vulnerability and high public

pension fund (blockholder) ownership. A firm that has high takeover vulnerability ($ATI = 3$) and a 10% blockholder is valued 6.3% lower than a firm with high takeover vulnerability and no blockholder, but 22.8% higher than a firm with no takeover vulnerability ($ATI = 0$) and no blockholder.

This evidence from Qs suggests that the valuation of firms with both active mechanisms is lower than the valuation of firms with only one active mechanism. Since Qs are crude indicators of differences in the discount rate used for valuation, we further verify whether this is indeed associated with risk by looking at the standard deviation of the profitability measures in each governance category (Table X). If in the presence of both active governance mechanisms, the standard deviation of these measures is consistently higher than when only one mechanism is active, we should have further evidence supportive of a risk hypothesis. Table X presents these results. We find evidence consistent with

Table X
Governance Mechanisms and Cash Flow Risk

The table reports the standard deviations of the four different governance quality groups using accounting measures of return on assets, return on equity, and net profit margin (in percentages). All firms with low leverage (bottom 33% of industry-adjusted leverage) are sorted on their level of takeover vulnerability (external governance) as well as on their level of public pension fund (blockholder) ownership (internal governance), with high and low corresponding to above—and below—median, respectively. The resulting four groups are labeled as High–High, High–Low, Low–High, and Low–Low based on their level of external–internal governance, as measured by EXT, ATI, BLOCK, and PP (see Table II for a description). Net profit margin is the ratio of income before extraordinary items available for common equity to sales; return on equity is the ratio of income before extraordinary items available for common equity to the sum of the book value of common equity and deferred taxes; and return on assets is the ratio of income before extraordinary items to total assets. Each variable is net of the industry median, which is calculated by matching the four-digit SIC codes of all firms in the CRSP-Compustat merged database in December of each year to the 48 industries designated by Fama and French (1997). The average standard deviations for each group are reported, removing outliers (bottom and top 2.5%).

EXT-INT	ROA	ROE	NPM
Panel A: Different Takeover Vulnerabilities When Internal Governance Is HIGH			
Using PP			
HIGH–HIGH	17.40	12.71	16.13
LOW–HIGH	16.85	11.52	11.97
Using BLOCK			
HIGH–HIGH	16.39	12.35	16.51
LOW–HIGH	14.44	11.06	9.96
Panel B: Different Takeover Vulnerabilities When Internal Governance Is LOW			
Using PP			
HIGH–LOW	16.79	12.77	15.90
LOW–LOW	16.32	12.35	14.10
Using BLOCK			
HIGH–LOW	18.24	13.40	15.55
LOW–LOW	18.27	12.45	15.41

the risk hypothesis, with the results being the strongest when using the net profit margin. The standard deviation of the category when both mechanisms are active is almost 6.5% points higher than when blockholder ownership is high but takeover vulnerability is low.

We conclude this section by jointly viewing our results using abnormal returns and Qs. We find that firms with only one active mechanism do not exhibit any abnormal returns, but have a higher valuation. This suggests that investors price the importance of each individual governance mechanism correctly and consequently there are no abnormal returns. However, combining the evidence using Qs and abnormal returns for the complementary portfolios produces a surprising picture.

Two interpretations arise. First, our results suggest that investors use a higher discount rate for firms with both mechanisms active and the documented “abnormal returns” are in fact an artifact of this higher discount rate, which is not captured in the asset pricing model. Second, the alternative mispricing hypothesis can still be invoked, that in 1990, investors realized the importance of each mechanism in isolation but did not price in the complementarity effect. This paper provides some evidence supportive of the risk hypothesis but, in the absence of any theory, is unable to distinguish between the two possibilities.³⁹ The possibility that investors did not realize the importance of some other factor that the complementary portfolio is simply proxying also remains, though in that case the “unknown factor” is associated with low leverage as well, in the same direction as suggested by theoretical frameworks based on corporate governance.

VI. Conclusion

We investigate how internal governance mechanisms (shareholder activism) interact with external governance mechanisms (market for corporate control). The proxies for internal governance used are the percentage of share ownership by public pension funds and the percentage of share ownership by the largest blockholder.⁴⁰ The proxies for external governance used are the index developed by Gompers et al. (2003) and an ATI proposed in this paper that incorporates only three key antitakeover provisions. Several important empirical findings are documented. We find that external and internal governance mechanisms are strong complements in being associated with long-term abnormal returns and accounting measures of profitability. The importance of internal governance crucially depends on the extent of external governance and vice versa. This complementary interaction is also stronger for low leverage firms.

In particular, we find that a portfolio that buys firms with high takeover vulnerability and high public pension fund (blockholder) ownership and shorts

³⁹ Adams, Almeida, and Ferreira (2003) document that firms with powerful CEOs are more risky. Also, papers that link corporate finance with asset pricing provide some rationale as to why variables affected by governance, such as free cash flow (Dow, Gorton, and Krishnamurthy (2003)) or corporate liquidity (Holmstrom and Tirole (2001)), might affect the discount factor.

⁴⁰ We also use percentage of share ownership by all blockholders.

firms with low takeover vulnerability and high public pension fund (blockholder) ownership generates an annualized abnormal return (alpha) of 10% to 15%, depending on which proxy is used for internal governance. On the other hand, a portfolio that buys firms with high takeover vulnerability and low public pension fund (blockholder) ownership and shorts firms with low takeover vulnerability and low public pension fund (blockholder) ownership does not generate any significant abnormal return. A similar portfolio created to mimic the importance of internal governance using blockholder ownership generates annualized abnormal returns of 8%, but only in the presence of high external governance. The complementarity effect is confirmed using accounting measures of profitability, with both active mechanisms of governance being associated with a 5.5% higher ROA in low leverage firms.

In interpreting these results, we rule out the plausible explanation that announcement effects to bidders and targets cause our results and that our results are an artifact of some behavioral phenomena in the markets unrelated to any fundamental effect. We are left with three interpretations: (1) investors discount complementary portfolios at a greater discount rate not captured in current asset pricing models; (2) in 1990, investors did not realize the importance of these dual governance mechanisms; and, (3) investors did not realize the importance of some other factor that the complementary portfolio is simply proxying. Using firm Qs and profitability measures, we provide some evidence consistent with the first interpretation. For example, a firm that has high takeover vulnerability ($ATI = 3$) and a 10% blockholder is valued 6.3% lower than a firm with high takeover vulnerability and no blockholder, but 22.8% higher than a firm with no takeover vulnerability ($ATI = 0$) and no blockholder. However, any further differentiation among these interpretations hinges on the development of a theory that would explain why (and if) governance should be associated with any priced risk. In either case, future empirical work that proxies for corporate governance should incorporate the complementary interaction between the market for corporate control and shareholder activism.

Appendix

List of Public Pension Funds

California Public Employees Retirement System
California State Teachers Retirement
Colorado Public Employees Retirement Association
Florida State Board of Administration
Illinois State Universities Retirement System
Kentucky Teachers Retirement System
Maryland State Retirement and Pension System
Michigan State Treasury
Montana Board of Investment
New Mexico
Educational Retirement Board

New York State Common Retirement Fund
 New York State Teachers Retirement System
 Ohio Public Employees Retirement System
 Ohio School Employees Retirement System
 Ohio State Teachers Retirement System
 Texas Teachers Retirement System
 Virginia Retirement System
 State of Wisconsin Investment Board

Details of the Two-Stage WLS Regression

First note that the variance-covariance matrix of α is

$$\text{var}(\alpha_{kN \times 1}) = \Sigma_{\alpha} = \Sigma_{\varepsilon} \times (D'_{T \times (k+4)} \cdot D_{T \times (k+4)})^{-1}_{[1:k, 1:k]},$$

where

$$\Sigma_{\varepsilon} = \text{var}(\varepsilon_{T \times N}) = \frac{\varepsilon'_{T \times N} \cdot \varepsilon_{T \times N}}{(T - 1)}$$

and $(D'_{T \times (k+4)} \cdot D_{T \times (k+4)})^{-1}_{[1:k, 1:k]}$ denotes the upper $k \times k$ block of the matrix $(D'_{T \times (k+4)} \cdot D_{T \times (k+4)})^{-1}$. Assumption of known heteroskedasticity: $\text{var}(h_{kN \times 1}) = \sigma^2 \Sigma_{\alpha}$. Therefore,

$$\gamma_m = (X' \Sigma_{\alpha}^{-1} X)^{-1} X' \Sigma_{\alpha}^{-1} \alpha_{kN \times 1}$$

and

$$\text{var}(\gamma_m) = \sigma^2 \cdot (X' \Sigma_{\alpha}^{-1} X)^{-1},$$

where σ^2 is estimated by $\frac{h'_{kN \times 1} \cdot \Sigma_{\alpha}^{-1} \cdot h_{kN \times 1}}{(kN - 1)}$.

Discussion of Antitakeover Provisions Considered

Classified (Staggered) Board

When used in combination with a poison pill, a charter provision calling for a classified, or staggered, board poses a substantial barrier to hostile acquisition. A common way for an acquiror to defeat a pill is to mount a proxy contest to replace the target's board, and if the proxy fight is successful, to have the new board redeem the pill. If a target has a classified board, however, this tactic requires proxy contests at two meetings. With a classified board, the directors are typically divided into three equal classes, the terms of each to expire in consecutive years. One class of directors is elected each year. Between shareholder meetings directors may be removed only for cause. Thus, to gain control of a classified board without the board's cooperation, an acquiror must mount successful proxy contests at two meetings, replacing one third of the directors at each meeting.

*Restrictions of Shareholders' Ability to Call a Special Meeting
or to Act by Written Consent*

Restrictions on shareholder voting at special meetings or by written consent can also be used in combination with a poison pill to create a barrier to hostile acquisition. If special meetings and votes by written consent are disallowed, shareholder votes can be taken only at an annual meeting (which is mandatory). If shareholders can call a special meeting or vote by written consent, an acquiror can use these mechanisms to replace a target board quickly. If a firm's charter or bylaws disallow these avenues by which to call a shareholder vote, the acquiror must wait until the target's next annual meeting to seek a vote.

Blank Check Preferred Stock (Poison Pills)

A charter provision authorizing blank check preferred stock permits a corporation's board to issue preferred shares at its discretion. By the terms of a typical blank check provision, voting, conversion, and other rights appurtenant to the shares are determined at the time of issuance. Blank check preferred stock is the most common source of the securities used to create a poison pill. Almost all firms have blank check preferred stock authorized to quickly adopt a poison pill. As a pill can be issued without shareholder consent, it can be assumed that management will adopt a pill whenever it is in its interest. Thus, effectively, all firms with blank check preferred stock should be seen as having a poison pill. The presence or absence of a poison pill at any particular point in time does not affect the firm's vulnerability to a takeover. In addition, a blank check provision can be used to issue stock with special voting features to shareholders friendly toward management.

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