Governance Mechanisms and Equity Prices¹

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Abstract

We investigate how the market for corporate control (external governance) and shareholder activism (internal governance) interact. Looking at equity prices from 1990 to 2001, we find that these mechanisms are strong complements. 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 - 15% only when public pension fund (blockholder) ownership is high as well. A similar portfolio created to mimic the importance of internal governance generates annualized abnormal returns of 8%, though only in the presence of 'high' vulnerability to takeovers. Further, we show that the complementary relation exists for firms with lower industry-adjusted leverage and is stronger for smaller firms. The complementary relation is confirmed using accounting measures of profitability. Using data on acquisitions, firm level Q's and accounting performance, we explore possible interpretations, providing preliminary evidence for a risk effect as well.

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1 Introduction

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. In an attempt to do so 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?

Two theoretical viewpoints guide us in our investigation of how internal and external governance mechanisms interact. As per one view, internal and external governance mechanisms might be substitutes if internal control mechanisms evolve to offset changes in external control (Pound, 1992). Accordingly, a firm with strong monitoring 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 strong external governance mechanisms. In another viewpoint, the literature provides reasons why such performance differences may indeed exist.

¹For a survey on corporate governance, see Shleifer and Vishny (1997). Also, see La Porta et. al. (1998, 2000) and La Porta, Lopez-de-Silanes and Shleifer (1999) for a legal macro-level approach to corporate governance.

²For 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).

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

As pointed 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. Hence, the presence of a large shareholder can be crucial to facilitate takeovers. Consequently, 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, leading 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. Hence, 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.

Finally, Jensen (1993) expresses skepticism about this latter case by noting the failure of the internal control mechanisms during 1970's and 1980's. He suggests that the main form of governance is through the market for corporate control. In this paper, we document the interaction between governance mechanisms and empirically investigate if 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 to investigate this interaction has relied on top management turnover to detect the 'effectiveness' of governance and hence 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 et. al. (2003) discuss other issues associated with the use of top management turnover to detect the effectiveness of corporate governance. While these papers have documented interesting and insightful results on top management dismissal and performance changes, their conclusions on 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 Mikkelson and Partch (1997) suggest that the effectiveness of internal mechanisms depends on external control (complements) where as 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 these governance mechanisms interact in being associated with equity returns. This enables us to circumvent the aforementioned issues of using top management turnover to detect how these governance mechanisms interact.⁴ Further we document how governance mechanisms interact alongside two additional dimensions firm values (Q's) 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 has 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 Q's, 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 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 investors, in 1990, were not aware of the gains to good governance. Using a similar approach, a new 2-step methodology and equity prices of firms from 1990 to 2001, we analyze the relationship between abnormal returns and our governance proxies. We measure

⁴However, we check if there exists a different kind of sample bias in our test - that 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.

the takeover vulnerability of a firm (external governance) by using data on anti-takeover provisions adopted by a firm. Our first external governance proxy uses the index developed by GIM as an anti-takeover index.⁵ We corroborate our findings by constructing an alternative index of takeover protection (ATI), which focuses on only 3 key anti-takeover 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 equity ownership greater than 5%, and the percentage of share ownership by public pension funds - who 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 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.

 $^{^5{\}rm The}$ data used in GIM is compiled from Rosenbaum, 'Corporate Takeover Defenses', IRRC Inc. (1990, 1993, 1995, 1998).

Further, we find that internal and external governance mechanisms are stronger complements in firms with low leverage. This supports theories proposed by Servaes and Zingales (1995), Zweibel (1996), Stulz (1988) and Harris and Raviv (1988), where higher debt reduces the probability of a takeover. Using our 2-step weighted least squares 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 on the importance of corporate governance as presented by GIM are strengthened when the role of internal governance mechanisms is considered as well. In particular, the simultaneous consideration of two different governace 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 Q's of firms with both high takeover vulnerability and high public pension fund (blockholder) ownership are high, but lower than the Q's 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 the discusses the choice of proxies. In section 3, we present the results on the complementarity of the governance mechanisms. In section 4, we investigate the effect of leverage and size on this interaction using a 2-step WLS method. Section 5 deals with robustness of the results. Section 6 discusses alternative interpretations. The conclusion follows.

2 Data and Construction of the proxies

The data used can be classified in the following three categories: data used for the construction of the firm-specific internal and external corporate governance proxies and of equity prices.

2.1 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 its largest institutional blockholder (BLOCK). Blockholders are shareholders with an ownership greater than 5% 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 pressurize the management (see e.g. Shleifer and Vishny (1986)). However, another issue remains. 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) documented that institutions like banks and insurance companies

⁶We 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).

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

⁸The 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.

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were more likely to side with management in proxy contests due to conflicts of interest. Such criticism leads to our next proxy.

The second proxy for internal governance is constructed by 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 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 non-institutional blockholders.¹¹ We might find a size or leverage effect if the presence of non-institutional outsider blockholders has a systematic relationship 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 relationship between non-institutional outsider blockholder and firm size or firm leverage, our conclusions would remain unchanged.

2.2 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 afterwards (Jensen and Ruback (1983)). Moreover, it is mostly poorly performing firms that are targeted (Morck, Shleifer and Vishny (1988, 1989)). However, a poorly performing firm can resist a takeover by adopting anti-takeover provisions (ATPs)

 $^{^{9}}$ We thank Lily Xiaoli Qiu for the list of the public pension funds, reported in the appendix.

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

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

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 anti-takeover 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 IRRC publications. We view their index as a measure of anti-takeover protection.¹² They consider 24 different provisions in 5 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.

Firms where shareholders do not have significant voting rights are unable to change antitakeover clauses, or reduce delay in case of a value increasing takeover attempt. Voting rights therefore indirectly affect takeover defense. State laws significantly alter the effectiveness of market control as well. For example, Daines (2002) shows how Delaware law can make firms more prone to takeovers.¹³ 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 et al. (2002).¹⁴ 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

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

 $^{^{13}}$ Further discussion of state laws can be found in Allen and Kraakman (2003).

 $^{^{14}\}mathrm{Also}$ see Daines and Klausner (2001).

of this paper.¹⁵

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.¹⁶ We again remove a point each for the existence 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 check 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 the existence of a blank preferred check (Daines and Klausner, 2002). In addition to the blank preferred check 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.¹⁷

The IRRC data, which are used to create both external governance proxies, are available only for the years 1990, 1993, 1995 and 1998. IRRC 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 this data. Also, some provisions are inferred from proxy statements and other filings. In between the updates and after the last update, the previously available data is used in our study.

¹⁵For a detailed description of all 24 provisions in the takeover index EXT, we refer the reader to GIM.

¹⁶See the Appendix for additional discussion on these provisions.

¹⁷Daines and Klausner (2002) 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."

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$\mathbf{2.3}$ **Equity Prices**

We use equity prices to study the interaction between internal governance mechanisms and external governance mechanisms. GIM, by using an event 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 investors in 1990 did not fully realized 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 6.

Stock price data is obtained from CRSP. Our sample is restricted by the firms for which we have the takeover index available. However, that still leaves us with a larger sample than those used in previous papers that have looked at the interaction of internal and external governance mechanisms.¹⁸ Among the firms for which we have takeover defense data, we further eliminate firms that have dual class common stock.¹⁹ 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.

 $^{^{18}}$ We thank Andrew Metrick for providing us with the data and the perm numbers for this sample. ¹⁹The number of firms eliminated is less than 10% of the total.

3 Internal and External Governance Mechanisms as Complements

3.1 Initial Analysis

Our sample includes an average of 1500 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 2) into 4 groups. First, following GIM, firms with $EXT \ge 19$ are considered firms prone to takeovers or with 'high' external governance and those with $EXT \le 10$ are firms with the least takeover vulnerability, thus making external governance relatively 'low'. Firms with $18 \ge EXT \ge 15$ and those with $14 \ge EXT \ge 11$ are the other two categories. Similarly, we also divide firms into 4 quartiles based on the proxy for internal governance.

Table 1 reports some summary statistics: 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 of 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. At this date, 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 evidence on increasing overall institutional ownership (Gompers and Metrick (2001)). It is also interesting to note that the dispersion in public pension fund holdings reduces over time as suggested by the difference between the minimum for the 75 percentile and the 50 percentile ownership levels 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 2.²⁰ 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.²¹ Also, EXT and ATI are highly correlated (64%). We discuss this further after having explained the rationale and the construction of our alternative takeover index (ATI), in section 5.

Finally, the two measures of blockholder ownership - the percentage of share ownership by the largest blockholder and the percentage of share ownership by 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.²² 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, it is

 $^{^{20}\}mathrm{For}$ a detailed documentation of EXT, we refer the reader to GIM.

²¹See also, for example, Guercio and Hawkins (1999).

 $^{^{22}}$ Out of all firm-quarter combinations where 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.

free of being biased towards larger firms. As a result, the use of both proxies offers a genuine robustness check, particularly with respect to any size effect.

3.2 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 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, or α , in the model

$$R_t = \alpha + \beta_1 \times MKT_t + \beta_2 \times SMB_t + \beta_3 \times HML_t + \beta_4 \times UMD_t + \epsilon_t$$
(3.2.1)

where R_t is the excess return over the riskless rate to some portfolio in month t. MKT_t , SMB_t , HML_t and UMD_t are the returns on the factor mimicking portfolios designed to capture the market, 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.²³ 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 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 buys firms with the highest public pension fund (blockholder) ownership and sells firms with the lowest level of public

 $^{^{23}}$ Independent sorts on these 2 dimensions give basically the same results (due to generally low correlations between external and internal governance proxies). Finally, we also conduct 5x5 and 3x3 sorts. Splitting these two governance mechanisms into 3 or 5 categories also did not significantly affect the results. For the 2-step WLS regression (see section 4.1) methodology we use independent sorts.

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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 would be significant only for the portfolio where shareholder activism is high as well. Similarly, if the governance mechanisms are substitutes, we would 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.²⁴ Once extended from 1999 to 2001, the GIM results slightly diminishes (Table 3), now 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 ≤ 10 to EXT \leq 11 and for high external governance from EXT \geq 19 to EXT \geq 18. This ensures that we 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 accruing to better external governance, once extended to 2001, in the value weighted portfolio. We now find that a value weighted portfolio that holds 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 equally-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.

²⁴They are not identical because we ignore stocks with ADRs.

To alleviate concerns about any 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 2-step weighted least squares method described in the next section provides another robustness check by not only looking at extreme portfolios but the entire sample as well.

3.3 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 3. We find that a portfolio that buys firms with highest takeover vulnerability and shorts firms with lowest takeover vulnerability generates annualized abnormal returns of 10.8% (9.5%) with a t-stat 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 4, 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 Wahal (1996), Gillan and Starks (2000) and Karpoff et al. (1996)). 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 highest takeover vulnerability and shorts firms with lowest takeover vulnerability generates annualized abnormal returns even for lower levels of blockholder (public pension fund) ownership. These abnormal returns are statistically significant for two highest internal governance groups. For example, for the case when internal governance - measured by BLOCK (PP) is highest the annualized abnormal returns accruing to the external governance mimicking portfolio is a striking (and statistically significant) annualized 14.9% (10.83%). The results to the internal governance mimicking portfolio are similar to the value weighted results and are reported in Table 4.

One could view the value weighted results representative of large firms and 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 and equally weighted portfolios serves mainly as a robustness check to ensure our results are not driven a few very large firms that dominate a particular portfolio, and we investigate the role of firm size more directly in the next section.

4 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.²⁵ 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 greater amount of resources.

To detect the effect of these interactions, we present a new 2-step weighted least squares method. The alternative - a panel regression using firm-specific abnormal return regressed on firm characteristics - has very low power due to the noise in estimating 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 relationship between alphas and firm characteristics.

The 2-step weighted least squares methodology uses the information contained in all the 81 alphas rather than simply focus on 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 now since our results are based on groups and are

 $^{^{25}}$ Stulz (1988) and Harris and Raviv (1988) also highlight the takeover deterrent role of debt due to concentration in managerial control.

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.

4.1 Two Step Methodology

In the first step, we estimate alphas of portfolios formed by independently sorting firms on four dimensions: external governance (EXT), internal governance (BLOCK or PP), industryadjusted leverage (LEV) as well as market equity (SIZE). In order to ensure a reasonable number of firms in each portfolio, we form 3 portfolios along each of the four dimensions, creating $3^4 = 81$ portfolios.²⁶

4.1.1 Estimating Alpha

We first estimate the abnormal returns (i.e. alphas) accruing 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. To this end we estimate $\alpha_{k\times N}$ in the ordinary least squares regression

$$R_{T \times N} = D_{T \times k} \times \alpha_{k \times N} + FF4_{T \times 4} \times \beta_{4 \times N} + \epsilon_{T \times N}, \tag{4.1.1}$$

where T is the number of months (T = 136), N is the number of portfolios and $D_{T\times k}$ is a dummy matrix. As 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 when k = 1 such that the dummy matrix is a constant.²⁷ FF4 denotes the returns on the market portfolio and the size, book-to-market and momentum mimicking portfolios.

 $^{^{26}}$ 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.

 $^{^{27}}$ The methodology also allows for yearly dummies (k=11), which can be interpreted as year fixed effects.

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

4.1.2 Regressing Alphas on Portfolio Characteristics

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

$$\alpha_{kN\times 1} = X_{kN\times m} \times \gamma_{m\times 1} + h_{kN\times 1},\tag{4.1.2}$$

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 1 to 3 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 interaction between these groups point us to any effects of firm size and leverage. The specific form of the second stage regression used will be presented alongside 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, $var(h) = \sigma^2 \mathbf{I}_{kN\times 1}$, we now assume that $var(h) = s^2 V(\alpha_{kN\times 1})$, where the variance-covariance matrix of the alphas is estimated in the first step. Further details of the weighted least squares estimation and its heteroscedasticity correction are given in the Appendix. In the discussion of the results we report only the second stage regression estimates.²⁸

²⁸For each set of proxies, the first stage results are the same and are available on request. We note that the use of portfolios and the functional forms in the second stage make it difficult to interpret the quantitative estimates of the regression. However, our goal in the second stage regression is to detect patterns of complementarity or substitution by seeing if the coefficients are positive and statistically significant or not.

4.2 Results

In this section, we report the results of two separate regressions (Table 5). 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 $(G_{INT} = 1)$ and high external governance $(G_{EXT} =$ 3), such that $\max\{G_{EXT}, G_{INT}\} = 3$ and $\min\{G_{EXT}, G_{INT}\} = 1$. If this portfolio has high abnormal returns it would be evidence suggesting that governance through the market for corporate control is independent of internal governance mechanisms. Conversely, if its alpha is low it would 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).

4.2.1 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

$$\alpha_i = K + \gamma_0 \times max\{G_{EXT}, G_{INT}\}I_{SIZE=1} + \gamma_1 \times max\{G_{EXT}, G_{INT}\}I_{SIZE\geq2} + \gamma_2 \times min\{G_{EXT}, G_{INT}\}I_{SIZE=1} + \gamma_3 \times min\{G_{EXT}, G_{INT}\}I_{SIZE\geq2} + \epsilon_t$$

$$(4.2.1)$$

where $I_{SIZE\geq2}$ and $I_{SIZE=1}$ are dummy variables that take the value 1 for portfolios formed out of the largest two-third and the smallest third of the firms, respectively.²⁹

The results from regression (4.2.1) confirm our previous findings (Table 5). 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 2).

We can now address our concern that we do not account for non-institutional outsider blockholders. If these existed in firms where there was no public pension fund holding or large institutional blockholders, we would incorrectly find a substitution effect. However, if there was no systematic relation between this missing variable and our proxies of shareholder monitoring, we would 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.

4.2.2 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 5. Specifically, we estimate the following second-step regression,

$$\alpha_{i} = K + \gamma_{0} min\{G_{EXT}, G_{INT}\}I_{SIZE=1}I_{LEV=1} + \gamma_{1} min\{G_{EXT}, G_{INT}\}I_{SIZE\leq1}I_{LEV=3} + \gamma_{0} min\{G_{EXT}, G_{INT}\}I_{SIZE>1} + \gamma_{0} min\{G_{EXT}, G_{INT}\}I_{SIZ=1} + \gamma_{0} min\{G_{EXT}, G_{INT}\}I_{SIZ=1} + \gamma_{0} min\{G_{EXT},$$

$$\gamma_2 \min\{G_{EXT}, G_{INT}\}I_{SIZE \ge 2}I_{LEV=1} + \gamma_3 \min\{G_{EXT}, G_{INT}\}I_{SIZE \ge 2}I_{LEV=3} + \epsilon_4$$

²⁹The majority of firms in our sample are large (S&P large-cap and mid-cap funds), especially before 1999. In 1999 IRRC added around 600 firms mainly from the S&P small-cap fund.

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. This supports Novaes and Zingales (1995) and Zweibel (1996) by suggesting that takeover vulnerability is low when debt is high, and hence the external governance mechanism is not functioning.

Concluding, 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 complementary effect is stronger in small firms and exists only when leverage is low.

5 Robustness

5.1 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. Consequently, 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 anti-takeover provisions that are available to a public firm to regulate its exposure to the market for corporate control are not equally effective.³⁰ 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.³¹ In these firms, the presence or absence of a pill at any given time, therefore, is not useful information. In addition, the existence of

³⁰We refer the reader to the appendix for more details of the anti-takeover provisions that we discuss here.

³¹Managers 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

a pill in these firms also makes some common anti-takeover provisions redundant.³² Considering all the 24 provisions in EXT as equally important, therefore, leads to a noisy proxy of anti-takeover protection.

In order to reduce the noise in our proxy, we refine our measure by focusing on three common anti-takeover 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 takeover probability (Ambrose and Megginson (1992)). Classified boards and restrictions on calling special meetings and action through written consent create significant delays. Due to these delays, a bidder's solution to the pill is now more costly. These provisions, therefore, create barriers in addition to the 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.³³ 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 would prevent an aggressive pursuer to easily remove current directors and stack the board of directors in their favor. Restriction on calling special meetings coupled with 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

³²For 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)).

 $^{^{33}}$ In the sample analyzed by Bebchuk et al (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 2 years.

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 2, the correlation between ATI and EXT is a surprisingly high 64%. Table 7 shows some summary statistics.

Note that the majority of firms have ATI equal to 1 or 2. The average number of firms with high internal and external governance is only about 26 out of a total average of 1500. 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 3, we compute the returns to portfolios that mimic the importance of the governance mechanisms but now using ATI instead of EXT. The results, which are not reported in the interests of space, remain consistent. Next, we repeat the two step method presented in section 4 and the two regressions described there with the new measure of takeover protection. The results are presented in Table 7. Inspite 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 complementary effect is evident from the regression 4 model, where we investigate the complement effect in isolation. The estimated coefficient on the min() variable is significant at the 1 percent level (t-stat 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 percent level (t-stat of 2.97).

5.2 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 (EXT ≥ 18) and short in the firms with the lowest level of external governance (EXT ≤ 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 1.³⁴ 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 mimicking portfolio do not show any obvious relation with the returns to the external governance mimicking 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.³⁵ 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 is a noticeable increasing trend suggesting an increase in public pension fund activism over the decade.

Investigating the yearly alphas, we find that there are a few periods where firms with

³⁴The figure using blockholders is similar and is omitted here.

³⁵PP4 denotes the group with the highest level of public pension fund ownership. Similarly EXT4 denotes the highest level of takeover vulnerability.

better external governance enjoy striking abnormal returns.³⁶ In the years of heightened stock market activity (1998 and 1999), the alphas are very high for the external governance mimicking portfolio. This shows that extending the data is important to ensure robustness of the results for changing market conditions. In addition, there is a potential alternative reason for this pattern that is unrelated to stock market conditions. In 1998, IRRC 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.³⁷

³⁶A caveat is in order since these estimates are based on only 12 monthly datapoints.

³⁷In an environment where 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 mimicking 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.

6 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.

6.1 Excluding Targets/Bidders

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

To see if these are the cause of the abnormal returns documented here, we remove from our initial sample all firms that were targets between 1990 and 2001 and compute abnormal returns accruing to the different portfolios discussed in Section 3. For this purpose, acquisition data was collected from SDC. A total of 811 firms were removed out of 2264 unique firms. Inspite of this large reduction, our results remain consistent and of surprisingly similar magnitude.³⁸ 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 all firms from our sample that made acquisitions between 1990 and 2001. Almost 1200 firms from our initial sample made acquisitions during this time period. Our results still remain consistent and

³⁸Results are not reported, available upon request.

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 was causing these abnormal returns we would 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.³⁹

6.2 Profitability

Hypothesis (H2): These 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 90's, say for some non-fundamental reason such as media attention, then governance-related abnormal returns could potentially arise to a long term portfolio that holds firms considered as wellgoverned. To see if 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%).⁴⁰ We use the low leverage firms since, as shown in Section 4, our results are mainly applicable to firms with low debt. We divide this sample into simply 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

³⁹However, 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 the ex-ante beliefs of being a target or a bidder generate these abnormal returns.

 $^{^{40}}$ Outliers are adjusted, as is common when using these measures, by truncating the top and bottom 2.5% of the distribution.

Governance Mechanisms and	Equity Prices	
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(External-Internal) - and the simple non-parametric differences-in-means tests are presented in Table 8.

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 complementary interaction. Along the dimension of internal governance, we find a similar complementary 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.

6.3 Model Mis-specification and Risk?

One of the hypotheses - with some supportive evidence - pointed out in Gompers, Ishii and Metrick (2003) suggests that (H3) investors, in 1990, did not know the outcome of the improved governance standards and hence did not price it in. An alternative to this mispricing hypothesis is that (H4) these abnormal returns are infact 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.⁴¹ Instead, we try to see if we can find any

⁴¹The intertemporal pattern of the alphas does not indicate any learning behavior along the complementary portfolio although the gradually reducing importance of external governance by itself can be due to the

evidence for H4.

As per 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 would expect to find higher valuations for firms with both active mechanisms relative to firm with only one active mechanism, since firms with both active mechanisms are associated with higher profitability measures. To see if we have any evidence of this, we look at firm Q's as a measure of valuation.

We estimate cross sectional regressions using industry adjusted firm Q's as our dependent variable and our proxies for takeover vulnerability, internal governance and an interaction term of internal and external governance as independent variables. We control for the inclusion in the S&P 500, assets and firm age. The Fama-Macbeth estimates are reported in Table 9. 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 non-complementary 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 vulnera-

learning behavior of investors. This pattern in the importance of external governance by itself is consistent with the view in Gompers, Ishii and Metrick (2003).

bility (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 Q's suggests that valuation of firms with both active mechanisms is lower than the valuation of firms with only one active mechanism. Since Q's are crude indicators of differences in the discount rate used for valuation, we further see if this is indeed associated with risk by looking at the standard deviation of the profitability measures in each governance category. 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 would have further evidence supportive of a risk hypothesis. Table 10 presents these results. We find evidence consistent with the risk hypothesis, with the results being the strongest when using 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 Q's. We find that firms with only one active mechanism don't 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 Q's and abnormal returns for the complementary portfolios produces a surprising picture.

Two interpretations arise. First, our results suggests 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 investors, in 1990, realized the importance of each mechanism in isolation but didn't price in the complementary 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.⁴² 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.

7 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.⁴³ The proxies for external governance used are the index developed by Gompers, Ishi and Metrick (2003) and an alternative takeover index (ATI) proposed in this paper that incorporates only three key anti-takeover 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 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

 $^{^{42}}$ Adams et al. (2003) document that firms with powerful CEO's 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 et al. (2003)) or corporate liquidity (Holmstrom and Tirole (2001)), might affect the discount factor.

⁴³We also use percentage of share ownership by all blockholders.

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 complementary 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) that investors discount complementary portfolios at a greater discount rate not captured in current asset pricing models or that 2) in 1990, investors did not realize the importance of these dual governance mechanisms or 3) investors did not realize the importance of some other factor that the complementary portfolio is simply proxying. Using firm Q's 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 between 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 2 stage W.L.S regression

First note that the variance covariance matrix of α is

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

where

$$\Sigma_{\epsilon} = var(\epsilon_{T \times N}) = \frac{\epsilon'_{T \times N} \cdot \epsilon_{T \times N}}{(T-1)}$$

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

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

and

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

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

Discussion of anti-takeover 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 targets board, and if the proxy fight is successful, to have the new board to 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 boards 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 may call a special meeting or vote by written consent, an acquiror can use these mechanisms to replace a target board quickly. If a firms charter or bylaws disallow these avenues by which to call a shareholder vote, the acquiror must wait until the targets next annual meeting to seek a vote.

Blank check preferred stock (poison pills): A charter provision authorizing blank check preferred stock permits a corporations 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 shareholders consent, it can be assumed that management will adopt a pill whenever it is 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 firms 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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Table 1: Descriptive Statistics

For each of the four dates for which the IRRC data are updated, this table reports some summary statistics of our sample of firms. EXT' denotes the level of takeover vulnerability for a firm and is equal to '24-G', where G is the proxy created by Gompers, Ishi and Metrick (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 blockholder (middle panel) and by the group of the 18 largest public pension funds in US (lower panel). 'BLOCK' is the percentage of stocks held by the largest blockholder (at least 5%) and 'PP' is the percentage of stocks held by the group of public pension funds (see the Appendix).

	$\operatorname{Sep-90}$	Jul-93	Jul-95	Feb-98
Number of Firms EXT ≥ 19	148	131	112	195
Number of firms EXT ≥ 18	262	212	215	346
Number of Firms EXT ≤ 10	83	89	84	77
Number of firms EXT ≤ 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%

Table 2: Correlation Matrix

The matrix below gives the pairwise correlations between quartile-groups of EXT, ATI, SIZE, BLOCK, TOTBLOCK and PP. Here, 'EXT' denotes the proxy of external governance as given by the index developed by Gompers, Ishi and Metrick (2003), 'ATI' is an alternative index proposed in this paper, 'SIZE' is given by each firm's total market capitalization of outstanding stocks, 'BLOCK' is the percentage of stocks held by the largest blockholder (at least 5%), 'TOTBLOCK' is the percentage of stocks held by all blockholders combined, and finally 'PP' is the percentage of stocks held by the group of public pension funds (see the Appendix). 'LEVERAGE' is the industry median-adjusted leverage. The Fama-French 48 industry classifications are used for the adjustment. For each quarter, we calculate the quartile-dummy, ranging in value from 1 to 4, for all firms that have all data available in that quarter.

	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%

Governance Mechanisms and Equity Prices .	
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Table 3: Alphas for external governance mimicking long-short portfolios conditional on level of internal governance

We report the annualized mean, the annualized abnormal return (alpha) and its t-statistic of a (valueweighted, VW, and equally-weighted, EW) portfolio that is long in the firms in the highest category and short in the firms in the lowest category of external governance (takeover vulnerability), for a given category of internal governance (1,2,3 or 4) and independent of internal governance (All). At the end of each panel we report the annualized mean, annualized abnormal return and its t-statistic for a portfolio that is long in firms with both high takeover vulnerability and high internal governance and short in firms with both low takeover vulnerability and low internal governance (HH-LL). External governance is measured using firm specific takeover provisions in place. We consider two different proxies for internal governance: the proportion of stocks held by the largest blockholder (Panel A) and by group of public pension funds (Panel B). 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	t-stat	BLOCK	Mean	Alpha	t-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	t-stat	PP	Mean	Alpha	t-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			

Governance Mechanisms and Equity Prices	
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Table 4: Alphas for internal governance mimicking long-short portfolios conditional on level of external governance

We report the annualized mean, the annualized abnormal return (alpha) and its t-statistic of a (valueweighted, VW, and equally weighted, EW) portfolio that is long in the firms in the highest category and short in the firms in the lowest category of internal governance, for a given quartile of takeover vulnerability (1,2,3 or 4) and independent of external governance (All). We consider two different proxies for internal governance: the proportion of stocks held by the largest blockholder (Panel A) and by group of public pension funds (Panel B). The time period used is 1990 to 2001, and the alphas are relative to the four-factor Carhart (1997) model.

Panel A: Using BLOCK								
VW Long-Short Portfolios EW Long-Short Portfolios								
Mean	Alpha	t-stat	EXT	Mean	Alpha	t-stat	EXT	
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							
VW Long-Short Portfolios EW Long-Short Portfolios						ios	
Mean	Aean Alpha t-stat EXT Mean Alpha t-stat EX						EXT
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

Table 5: 2 Step WLS : The effect of Size and Leverage

Weighted-least-squares (WLS, see the text for a description) results for the 81 value-weighted portfolios created from independent 3x3x3x3 sorts on Internal Governance, External Governance (EXT), Leverage (ADJLEV) and size (ME). Panel A presents results when PP, the percentage share ownership of public pension funds, is the proxy for internal governance. Panel B presents results when BLOCK, the percentage share ownership of the largest blockholder is used as proxy for internal governance. The dummy for the smallest 33.33% of the firms is 'Small' and for the largest 66.67% is 'Large'. 'LowLev' is the dummy for the firms that are in the lowest third of industry median-adjusted leverage and 'HighLev' is the dummy for the firms that are in the highest third of industry median-adjusted leverage. 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 dependent variables are the annualized abnormal returns from the Carhart (1997) model in the first step. 'Max' denotes the higher of the two internal and external governance indices. 'Min' denotes the lower of the two internal and external governance indices.

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	(1.01)
Max Barge	(0.12)	
Min*Largo	(0.12)	
Mill Large	(2.51)	
Min*I ango*I and ar	(2.19)	2 61
Milli Large LowLev		(2.04)
אני אד אדדי ו ד		(3.94)
Min*Large*HighLev		0.42
		(0.46)
Panel B: Using BLOC	CK	
Panel B: Using BLOC Max*Small	CK -0.27	
Panel B: Using BLOC Max*Small	CK -0.27 (-0.26)	
Panel B: Using BLOC Max*Small Min*Small	-0.27 (-0.26) 5.26	
Panel B: Using BLOC Max*Small Min*Small	CK -0.27 (-0.26) 5.26 (4.39)	
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLey	$\begin{array}{r} -0.27 \\ (-0.26) \\ 5.26 \\ (4.39) \end{array}$	3 52
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev	-0.27 (-0.26) 5.26 (4.39)	3.52
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLey	CK -0.27 (-0.26) 5.26 (4.39)	3.52 (3.09) 1.82
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev	CK -0.27 (-0.26) 5.26 (4.39)	3.52 (3.09) 1.82 (1.59)
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev	CK -0.27 (-0.26) 5.26 (4.39)	3.52 (3.09) 1.82 (1.59)
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev Max*Large		$3.52 \\ (3.09) \\ 1.82 \\ (1.59)$
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev Max*Large		$3.52 \\ (3.09) \\ 1.82 \\ (1.59)$
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev Max*Large Min*Large	$\begin{array}{c} \hline & \\ \hline & \\ -0.27 \\ (-0.26) \\ 5.26 \\ (4.39) \\ \hline \\ 0.69 \\ (0.88) \\ 2.43 \\ 2.43 \\ (0.20) \\ \end{array}$	3.52 (3.09) 1.82 (1.59)
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev Max*Large Min*Large	$\begin{array}{c} \hline \\ -0.27 \\ (-0.26) \\ 5.26 \\ (4.39) \\ \hline \\ 0.69 \\ (0.88) \\ 2.43 \\ (2.92) \\ \end{array}$	3.52 (3.09) 1.82 (1.59)
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev Max*Large Min*Large Min*Large	$\begin{array}{c} \hline \\ \hline \\ -0.27 \\ (-0.26) \\ 5.26 \\ (4.39) \\ \hline \\ 0.69 \\ (0.88) \\ 2.43 \\ (2.92) \\ \end{array}$	3.52 (3.09) 1.82 (1.59) 3.70
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev Max*Large Min*Large Min*Large	$\begin{array}{c} \hline & \\ \hline & & \\ -0.27 \\ (-0.26) \\ & \\ 5.26 \\ (4.39) \\ \hline \\ & \\ (4.39) \\ \hline \\ & \\ 0.69 \\ (0.88) \\ & \\ 2.43 \\ (2.92) \\ \end{array}$	$3.52 \\ (3.09) \\ 1.82 \\ (1.59) $ $3.70 \\ (4.24)$
Panel B: Using BLOC Max*Small Min*Small Min*Small*LowLev Min*Small*HighLev Max*Large Min*Large Min*Large Min*Large*LowLev Min*Large*HighLev	$\begin{array}{c} \hline \\ \hline & -0.27 \\ (-0.26) \\ & 5.26 \\ (4.39) \\ \hline \\ & 0.69 \\ (0.88) \\ & 2.43 \\ (2.92) \end{array}$	$3.52 \\ (3.09) \\ 1.82 \\ (1.59) $ $3.70 \\ (4.24) \\ 0.93$

Table 6: Descriptive Statistics : Alternative Measure for Takeover Defense (ATI)

The table reports the number of firms in the four portfolios that are sorted according to our alternative proxy of external governance, 'ATI' (see section 5). With the alternative measure, firms with ATI = 3 are classified as having the highest external governance, and firms with ATI = 0 are classified as having the lowest external governance.

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		

Table 7: 2 Step WLS : Results With New alternative takeover Index (ATI) and Public Pension Fund Ownership.

Reported results are the WLS results for the value-weighted portfolios using the new proxy for takeover defense (ATI), that varies from 0 to 3 (See Table 5). Panel A presents results when PP, the percentage share ownership of public pension funds, is the proxy for internal governance. Panel B presents results when BLOCK, the percentage share ownership of the largest blockholder is used as proxy for internal governance. The dummy for the smallest 33.33% of the firms is 'Small' and for the largest 66.67% is 'Large'. 'LowLev' is the dummy for the firms that are in the lowest third of industry median-adjusted leverage and 'HighLev' is the dummy for the firms that are in the highest third of industry median-adjusted leverage. 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 dependent variables are the annualized abnormal returns from the Carhart (1997) model in the first step. 'Max' denotes the higher of the two internal and external governance quartile indices. 'Min' denotes the lower of the two internal and external governance quartile indices.

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Table 8: Accounting Measures of Profitability

The table reports the average profitability 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 labelled as High-High, High-Low, Low-High and Low-Low based on their level of external-internal governance. The calculations of EXT, ATI, PP and BLOCK are described in Section II. 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 database in December of each year to the 48 industries designated by Fama and French [1997]. The average for each group are reported, removing outliers (bottom and top 2.5%). The t-statistic for the differences in means test is also reported.

Different takeover vu	lnerabiliti	es when internal governance is HIGH	
EXT-INT	ROA	ROE	NPM
Using PP			
HIGH-HIGH	21.95	7.57	8.01
LOW-HIGH	16.55	5.92	5.16
t-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
t-statistic			
Difference in Means	(5.90)	(3.54)	(5.72)
Different takeover vu	lnerabiliti	es when internal governance is LOW	
EXT-INT	ROA	ROE	NPM
Using PP			
HIGH-LOW	16.55	4.15	4.99
LOW-LOW	16.32	4.65	5.64
t-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
t-statistic			
Difference in Means	(0.35)	(-1.99)	(-2.21)

Table 9: Regressions using Q

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 SP 500 as of the end of the previous year. The coefficients on the controls and the constant are omitted from the table. The calculation of EXT and ATI - the proxies for takeover vulnerability-, BLOCK and PP - the proxies for internal governance - are described in Section 2. 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

I)	EXT 3.93 (7.28)	BLOCK 1.05 (2.82)	BLOCK x EXT -0.09 (-3.45)	PP	PP x EXT
II)	5.67 (6.00)			4.33 (2.60)	-0.78 (-3.86)

\mathbf{I} and \mathbf{D} . Using \mathbf{M} is prove to bactore vulnerability	Panel B	: Usin	g ATI a	as proxv	for	takeover	vulnerability
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I)	ATI 9.71 (5.47)	BLOCK 0.47 (2.29)	BLOCK x ATI -0.21 (-3.31)	PP	PP x ATI
II)	12.20 (5.91)			-1.51 (-1.34)	-1.29 (-2.50)

Table 10: Standard Deviation of Accounting Measures of Profitability

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 labelled as High-High, High-Low, Low-High and Low-Low based on their level of external-internal governance. The calculations of EXT, ATI, PP and BLOCK are described in Section II. 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 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%).

Different take over vulnerabilities when internal governance is HIGH				
EXT-INT	ROA	ROE	NPM	
Using PP				
HIGH-HIGH	17 40	12 71	16 13	
LOW-HIGH	16.85	11.52	11.97	
0		-		
Using BLOCK				
HIGH-HIGH	16.39	12.35	16.51	
LOW-HIGH	14.44	11.06	9.96	
Different taked	over vulnerabilities when int	ternal governance is LOW		
EXT-INT	ROA	ROE	NPM	
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	

Figure 1 Intertemporal Pattern (with Public Pension Fund ownership)

The figure plots the 36-month moving averages of the abnormal returns of the following long-short portfolios. 'EXT' plots abnormal returns (alpha) of a value-weighted portfolio that is long (and short) in the firms in the highest (and lowest) category of external governance, as measured by EXT. 'PP' plots abnormal returns (alpha) of a value-weighted portfolio that is long (and short) in the firms in the highest (and lowest) category of external governance, as measured by EXT. 'PP' plots abnormal returns (alpha) of a value-weighted portfolio that is long (and short) in the firms in the highest (and lowest) category of internal governance, as measured by PP. 'EXT-PP4' plots results from the portfolio that is long (and short) in the firms in the highest category of internal governance, as measured by EXT - all of which are in the highest category of internal governance, as measured by PP, as well. Finally, 'PP-EXT4' plot results from the portfolio that is long (and short) in the firms in the highest (and lowest) category of internal governance – as measured by PP - all of which are in the highest (and lowest) category of external governance, as measured by EXT, as well. The abnormal returns are annualized, computed from the fourfactor Carhart (1997) model that includes the market portfolio, the two Fama-French factors and a momentum factor and are reported in percentage terms.

