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Abstract

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Keywords: Pension funds, corporate governance, controlling shareholders, control premium

JEL Classifications: G3, G23

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Abstract: Sweden offers a unique natural experiment to analyze the microeconomic effects of institutionalized saving on ownership structure, corporate governance and performance of listed companies. First, the Swedish pension reform increased the participation of pension funds in the domestic stock market and caused a significant reshuffling in the ownership of the existing pension funds. Second, the availability of detailed data on firm ownership allows us to document the effects of the pension reform. We show that the effects of institutional investment on firm performance depend on the industry structure of pension funds. In particular, we find that firm valuation improves if large independent private pension funds and public pension funds increase their equity stakes in the firm, but not if smaller pension funds and pension funds related to financial institutions and industrial groups increase their shareholdings. Additionally, controlling shareholders appear reluctant to relinquish control and the control premium increases if public pension funds acquire shares.

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Introduction

A large literature in corporate finance analyzes the effects of ownership on firm performance. Thus far, this literature has not been successful in establishing whether institutional ownership enhances firm value. Partly this is because ownership and performance are jointly determined and an increase in institutional ownership may be positively correlated with performance merely because investors select firms that they expect to perform better. It is thus impossible to draw conclusions about causal relations simply by saturating firm performance regressions with a large number of firm characteristics in addition to ownership information (Demsetz and Lehn, 1985; Himmelberg et al., 1999; Coles et al., 2006). Alternatively, instrumental variables could be employed to assess the independent effect of ownership structure on performance and resolve questions about the direction of causality but the lack of valid instruments has limited the use of this approach (Coles et al., 2006).

In this paper, we propose a natural experiment to analyze the causal effects of institutional ownership on firm performance and corporate governance. The experiment exploits the substantial exogenous shock to institutional ownership caused by the Swedish pension reform. We believe this to be an ideal experiment for a number of reasons. First, in the implementation of the pension reform, one of the public pension funds that had traditionally been active in corporate governance was forced to sell most of its equity participations and to reallocate funds to the government and some newly created public pension funds. The reallocation of assets of this pension fund and the subsequent inflow of funds in public and private pension funds allow a clean natural experiment of how substantial changes in institutional ownership structure affect firm performance.

Second, we have access to detailed time-series data on the ownership structure of listed companies. Hence, we can explore the effects of the increased presence of pension funds not only on firm valuation but also on ownership structure.

To explore the causal effects of an increase in pension funds ownership, we exploit the dismissal of public pension funds' assets and the exogenous timing of their stockholdings' expansion to construct instrumental variables for pension fund holdings. Thus, having mitigated concerns that the relation between changes in ownership and firm outcomes may be due to stock picking on the part of pension funds, we show that an increase in the holdings of either public pension funds or large independent private pension funds is associated with an increase in shareholder value. In contrast, increases in equity stakes by pension funds affiliated with industrial groups or financial institutions, if anything, decrease firm value.

The empirical evidence suggests that the effects on firm valuation are due to differences in pension funds' monitoring activity and propensity to contrast controlling shareholders. For a given size of their equity stakes, both public and private pension funds are more likely to be represented in nominating committees and thus to contribute to the choice of directors, although the effect is particularly pronounced for public pension funds. Controlling shareholders appear reluctant to relinquish control to public and large independent private pension funds, but not to other types of pension funds. When public pension funds buy a participation in a firm, the value of a marginal vote increases and controlling shareholders either increase their control blocks or exploit the pension funds whose vote they indirectly control to increase their voting power. Controlling shareholders also appear to exploit their related pension funds to acquire more votes when large independent private pension funds increase their holdings, but not if pension funds related to financial institutions or other business groups do so. We also show that this reaction by controlling shareholders attenuates the positive effect of institutional ownership on firm valuation.

Overall, our results suggest that the effects of institutional investors on firm valuation depend on the characteristics and industrial structure of pension funds. In particular, only pension funds that are sufficiently large to acquire large blocks and that are independent from

industrial groups and financial institutions appear to enhance firm valuation. In contrast, pension funds related to business groups are used by their controlling families as a mechanism to enhance the entrenchment of corporate control. We also find that the increase in institutionalized saving following the pension reform did not bring about a decrease in ownership concentration, despite the fact that the pension reform broadened the investor base. Our results suggest that if private benefits of control are large, ownership concentration may even increase following the emergence of large institutional investors if these investors actively monitor controlling shareholders.

Our paper is related to the literature on shareholder activism and institutional ownership. The existing literature has mostly focused on pension funds and other institutional investors in the U.S. and the U.K. and has failed to identify systematic effects of institutional ownership on firm value (Karpoff, 2001). Existing empirical evidence lends support to competing views. Del Guercio and Hawkins (1999) find that pension funds are successful at monitoring and promoting changes in target firms, while others report that institutional owners are largely ineffective as monitors (Wahal, 1996; Gillan and Starks, 2000) and do not enhance shareholder value by monitoring firms (Karpoff et al., 1996). Some papers find that institutional shareholders reduce firm performance either because they do not have adequate monitoring skills or because their objectives conflict with value maximization (Carleton et al., 1998; Woidtke, 2002). Only a minority of studies finds evidence that institutional owners, in particular pension funds, increase shareholder value by monitoring firms (Smith, 1996).

We complement the literature as follows. First, unlike previous studies that have focused on the effects of investor activism on widely held firms in the U.S. or the U.K., we focus on a sample in which a large fraction of firms displays concentrated ownership, often through the use of dual class shares, pyramiding and cross-holdings.

Second, our contribution can be viewed as methodological. Previous studies rarely rely on changes in ownership and attempt to capture institutional investors' monitoring using specific episodes of activism. However, one generally does not observe institutional investors' attempts to affect firm policies as only a minority of such attempts consist of shareholder proxy proposals. This makes it difficult to go beyond clinical studies of specific institutional investors (Carleton et al., 1998; Becht et al., 2007). In our setting, we can proxy for changes in expected monitoring activity using changes in institutional ownership. This allows us to assess the effects of institutional ownership in a large scale experiment instead of evaluating specific episodes of shareholder activism. Also, by employing exogenous variation in ownership, we mitigate concerns of endogeneity that plague the existing literature.

The rest of the paper is organized as follows. Section I describes the institutional context of the Swedish pension reform. Section II summarizes the data on firm ownership by pension funds and other major shareholders. Section III introduces the methodology we employ to identify the effect of changes in ownership by pension funds on firm performance and other corporate governance outcomes. Section IV presents our empirical results on the effects of private and public pension fund ownership on firm valuation, ownership concentration, and control premia. Section V provides more direct evidence about pension funds' involvement in corporate governance. Section VI concludes.

I. Background

A. The Swedish environment

Sweden offers a unique context in which to analyze issues related to ownership structure and corporate governance, as information is available on almost all shareholders of listed companies, and from which one can draw general conclusions about governance and valuation that go well beyond the Swedish market.

Sweden has high standards of investor protection and, by continental European standards, a highly capitalized stock market (La Porta et al., 1998)[1]. In 1999, prior to the pension reform, domestic institutional investors (including banks, insurance companies, pension funds and mutual funds) held approximately 30 percent of the total market capitalization (International Federation of Stock Exchanges, 1999).[2]

B. The pension reform

On January 1, 2000, Sweden introduced a multi-tier pension system that incorporates elements of both defined benefit and defined contribution plans. Employers pay 18.5 percent of an employee's salary into the fund for future pension liabilities: 16 percent of this contribution goes into the *Income Pension* (IP) system, the defined-benefit component, and 2.5 percent goes into the *Premium Pension* (PP) system, the defined-contribution component.[3] The pension reform caused a significant reshuffling in the ownership of some existing public pension funds, created new, large shareholders in the Swedish stock market, and enhanced the resources available to the pension funds that are entitled to manage the pension savings.

The first phase of the pension reform was characterized by public pension funds' asset sales. Six public funds had been established in 1960 in order to provide a buffer for occasional deficits arising from situations in which social security disbursements would exceed income from contributions. Among the six buffer funds existing before 2000, only one, the AP4 fund (henceforth, AP4), was an active investor in the Swedish stock market, with a portfolio that consisted almost exclusively of Swedish equities. The AP6 fund's mandate was to invest primarily in private equity. The remaining four funds, AP1, AP2, AP3 and AP5, were constrained to invest primarily in fixed income securities.

[1] Sweden's stock market capitalization to GDP in 2002 was 85 percent, compared to 110 percent in the United States and 37 percent in Germany.

[2] In the same period, financial institutions held approximately 50 percent of the market capitalization in the U.S. and the U.K., 37 percent in Germany and 20 percent in Italy, France and the Netherlands.

[3] In addition, there exist private pension saving schemes, which consist of employer contributions to the pension savings of employees with relatively high salaries and of voluntary savings by individuals. Most of the private pension savings are invested in mutual funds.

As a part of the transition, the buffer funds transferred approximately SEK 150 billion to the government budget to compensate for increased transitory pension expenses. In the course of 2000, the buffer funds were merged and then reorganized into five independent public funds, also called AP funds (AP1, AP2, AP3, AP4, and AP6), which became separate legal entities on January 1, 2001. The new public pension funds received an investment mandate that required them to invest in domestic and foreign equity. Only a very small part of AP4's equityholdings were transferred to the other public funds before they were legally separated.[4] AP4 sold most of its equity participations between December 2000 and June 2001 to transfer assets to the government and acquire foreign equity as its new mandate required. The sale of AP4's equityholdings represents a significant exogenous decrease in institutional ownership that we use to study the effects on firm valuation and governance.

In the second phase of the pension reform, public and private pension funds started to expand their assets. Each of the five public pension funds was endowed with assets of approximately SEK 125 billion and started to trade in the Swedish stock market in the course of 2001.[5] In addition, about 500 private pension funds, including mutual funds, were approved by the government to accept contributions from employees under the PP system. Employees have the choice to direct their PP money into any of these private pension funds. If an employee does not select a fund, the money is managed by the default public pension fund, AP7, which was also newly created and started trading at the beginning of 2001.[6]

The pension reform generated substantial reshuffling in the holdings of public and private pension funds. Between December 2000 and June 2001, during the first phase of the pension reform, AP4, which in December 2000 held more than 3 percent of the market

[4] This probably has to do with the government's stated desire to have public pension funds with independent strategies.

[5] The five public pension funds are supposed to manage the "defined benefits" pension assets and are subject to a number of investment restrictions, including: (i) at least 30% of assets must be invested in low-risk interest-bearing securities, and (ii) no more than 10% of a fund's assets may be invested in a single company or issuer. Overall, they invest about 60 percent of their assets in domestic and foreign equities.

[6] The default AP7 pension fund is the single largest PP investor with 31 percent of total PP investments. The return earned on PP investments depends on the performance of the selected funds.

capitalization, sold participations equivalent to 2.5 percent of the votes in 51 of the 238 Swedish listed companies (Table 1).[7] The sales affected all firms in AP4's portfolio to a similar extent and the holdings were only in part transferred to the other public pension funds. On average, the other public pension funds increased their participations in these 51 companies by only 0.9 percent over this period. No other category of investors systematically increased its holdings in these firms at the time of AP4's sales, suggesting that these holdings were largely sold in the open market.

During the second phase of the reform, all private and public pension funds experienced increases in funds under management due to inflows of compulsory contributions and voluntary savings. The increase of new investments in domestic and foreign equity has been on average SEK 20 billion per year. Even though this is less than 1 percent of Swedish stock market capitalization in 2001, it is large considering that in 2000 only SEK 100 million of the public pension funds' assets was held in equity. The increase in domestic equity investments, though substantial, has been limited by the fact that foreign equity holdings by especially the public pension funds increased to an even greater extent, as the reorganization of the public pension system coincided with the removal of foreign investment restrictions. In addition, the PP system includes several mutual funds specializing in foreign equity.

Table 1 describes the consequences of these inflows on the Swedish stock market. In terms of cash flow rights, the public and private pension funds gradually increased their stockholdings from 13.6 percent in 2000 to 19.1 percent of total equity in mid-2005, an increase of nearly 40 percent. The increase of pension funds' stockholdings in terms of voting rights is less pronounced. This is because most of the multiple voting shares (A shares) that confer superior voting rights to its holders compared to limited voting shares (B shares) are not listed. Consequently, pension funds buy predominantly limited voting shares. By mid-

[7] By June 2001, as a result of these sales, AP4 held participations equivalent to only 1.5 percent of the votes in 52 listed companies.

2005, public pension funds owned about 4 percent of the market capitalization while private pension funds owned close to 15 percent of it.

C. The pension funds

The pension reform created new actors in the Swedish stock market. Though government owned, the new public pension funds enjoy substantial independence from political influence. While board members are in part nominated by the government, the board recruits a professional management, mostly from the financial industry. The stated objective of guaranteeing the highest possible return to pension assets is emphasized by the fact that the managers are compensated on the basis of the funds' performance (as in private funds). Their salaries are not subject to caps as is common in public pension funds in the United States.[8]

For several reasons, public pension funds are likely to have become among the most active players in corporate governance in the Swedish stock market. First, they are relatively large in size. The total Swedish equity holdings of the average public pension fund are SEK 15.2 billion (approximately USD 2.5 billion). Table 2 also shows that the average holdings in domestic companies for some public pension funds amounts to more than 2 percent of voting rights. Not surprisingly, they have relatively low portfolio turnover (i.e., new positions as a percentage of total positions) than other pension funds. Given their relatively sizeable investments, public pension funds may have difficulties in "voting with their feet" when they are dissatisfied with company performance and may be forced to take a long-term view on their investment. This should make them more inclined to actively monitor firms (Shleifer and Vishny, 1986; Maug, 1988; Kahn and Winton, 1998).

Second, the public pension funds are independent from financial institutions and industrial groups. Hence, they are unlikely to have objectives that are in conflict with monitoring and maximization of shareholder value, contrary to other institutional investors

[8] The independence of the Swedish public pension funds from political influence is also revealed by their substantial investments in foreign equities. This confirms that their objective is to guarantee high returns and diversification to pension assets rather than fostering employment or investment in strategic sectors in Sweden.

whose monitoring costs may be higher due to fears of damaging relationships with firm management and principal shareholders and of losing potential business (Chen et al., 2007).

Anecdotal evidence suggests that the public pension funds indeed have been active in corporate governance and that they tend to coordinate in episodes of activism.[9] Public pension funds have become active members of board nominating committees and have attempted to influence corporate policies. For instance, in April 2002, the public pension funds, supported by some private pension funds, together strongly opposed a three-year employee stock option scheme at Skandia, a large insurance company, because the scheme was judged too generous. As a consequence the board withdrew the initial proposal and offered a less generous one-year scheme, accepted by the pension funds and a vast majority of the company's shareholders.[10]

Table 2 shows that the magnitude of public pension funds' positions in Swedish listed companies is quite different. Nevertheless, we analyze the effects of public pension fund ownership without distinguishing between the different public pension funds because, as discussed above, they tend to coordinate their attempts to affect corporate policies.[11]

The pension reform also caused an inflow into private funds. We obtain the full list of eligible private pension funds from the Financial Supervisory Authority of Sweden.[12] At the end of 2000, a total of 462 investment funds managed by 67 different fund managers were available to PP investors. By 2004, the number of funds reached 681, the number of assets managers exceeded 80, and total PP funds under management exceeded SEK 137 billion.[13]

Private pension funds include a heterogeneous set of institutions. First, funds greatly differ in size. While funds acquiring large positions in firms may have an incentive to become

[9] Black and Coffee (1994) argue that in Europe, where differently from the U.S. communication between institutional investors is unregulated, coordination among investors with similar incentives is more frequent.
[10] In general, the public pension funds tend to be mentioned as a group when episodes of shareholders activism become public information.
[11] We find similar effects for the different public pension funds on corporate valuation (unreported).
[12] Whether mutual funds and other investment companies qualify to participate in the PP system depends mostly on their fee structure.
[13] About 60 percent of fund managers are based outside of Sweden but they manage less than 10 percent of total investment.

active investors, smaller funds, especially domestic and foreign mutual funds, tend to acquire small positions and have high portfolio turnover. We expect these funds to remain passive and to exercise negligible effects on corporate governance.

Second, funds differ in terms of ownership. Some private pension funds are independent from industrial groups and financial institutions. We refer to these funds as independent private pension funds. If private pension funds acquire large positions and have low portfolio turnover, they are likely to have similar incentives to those of public pension funds that are also large and independent. However, most of the independent private pension funds are quite small with only SEK 1.3 billion in Swedish stocks on average. Other funds are related to Swedish banks, insurance companies or industrial groups. We refer to these pension funds as related private pension funds. These funds are likely to be subject to conflicts of interest and thus may monitor firms to a lesser extent (Brickley et al., 1988). Importantly, these funds are controlled by the same shareholders that control listed companies. When investing in the latter, related pension funds can potentially make control more entrenched.

Table 2 reveals that in comparison to independent private pension funds, related private pension funds are larger in size, tend to have larger stakes, and tend to invest in a broader set of firms (although they also have substantial investments in the related firms). Portfolio turnover for related pension funds is much lower than that of independent pension funds, implying that related pension funds have longer horizons on their investments.

Table 2 also reports the number of companies for which a pension fund is among the largest five shareholders, by type of pension fund. While pension funds tend to be significant shareholders in most firms, they rarely are the principal shareholder. In total there are 4 firms for which a public pension fund and 16 firms for which a private pension fund were the principal shareholder at some point during the period 2000-2005. We exclude companies

where pension funds are the principal shareholder from the empirical analysis when analyzing the effects of changes in pension funds holdings on ownership concentration.

The principal shareholders in most firms tend to be individuals, followed by financial institutions. Still, public pension funds frequently are among the top-5 largest shareholders. For example, in June 2005, AP2 was among the top-5 largest shareholders in 13 firms, AP3 in 8 firms, and AP4 in 11 firms. In mid-2001, AP4 was the 10th largest shareholder for the median firm. Private pension funds are also among the largest shareholders.

II. Data and Descriptive Statistics

A. Data Sources

Under Swedish law, *Värdepapperscentralen AB* (VPC), the Central Security Registry, is required to publish biannual lists of all stockholders owning more than 500 shares of Swedish listed companies. Using these records, we obtain biannual information on the top 200 shareholders of listed companies from December 1999 to June 2005.[14] Overall, these records provide information on the owners of over 95 percent of the market capitalization. For the average company, we have ownership information on 83 percent of total equity, and for all companies taken together we have information on 87 percent of total equity.[15]

Our ownership data contains holdings held both directly by the owner and indirectly via brokerage houses and custodian banks, allowing us to trace the identity of shareholders and compute ultimate ownership. The ownership data are broken down by class of shares and we also have information on the voting ratio applicable to each class of shares.

Using these data, we compute the number of stocks controlled by a single investor that are held directly and indirectly through other listed companies. We also obtain information

[14] Unfortunately, we have no information about the actual dates of the ownership changes, which are most likely known to the market before the publication of the biannual lists. This prevents us from evaluating the announcement effects of ownership changes through an event study.

[15] We also have ownership information on several firms that de-listed during the sample period. We include these firms in the analysis.

that allows us to identify the shares held by family members and other closely related owners.[16] We can thus compute direct and indirect holdings of the controlling groups.

We complement this information on stockholdings with data on corporate return and risk characteristics from *SIX Trust*, and with accounting variables from *Market Manager*. Finally, we hand-collect data on shareholders' participation in board nominating committees.

B. Firm Ownership and Control Structures

Swedish firms have relatively concentrated ownership: On average, the principal shareholders hold more than 30 percent of the votes. Additionally, principal shareholders often employ dual class shares, pyramiding and cross-holdings to enhance their control rights. As a consequence, a large difference can arise between control rights and cash flow rights of the principal shareholder, leading to significant agency costs (Cronqvist and Nilsson, 2003).

Besides dual class shares, we take pyramiding and cross-holdings into account to determine the control rights of the principal shareholder, as is now common in the literature (e.g., Claessens et al., 2002, Faccio and Lang, 2002, and Laeven and Levine, 2007).[17] When tracing indirect ownership, we maintain pension funds as independent entities, although in some instances they are controlled by the same shareholders that control listed companies. Because of our distinct interest in their role as shareholders, we analyze the investment policies of pension funds and their effects separately. We also compute the direct and indirect cash flow rights of the controlling shareholder.[18]

C. Descriptive Statistics on Pension Fund Holdings and Control of Listed Companies

Table 3 presents summary statistics for the 287 firms in our sample. The table highlights that pension funds, in particular public pension funds, tend to invest in firms that

[16] See Sundin and Sundqvist (2001) for a detailed description of the methodology.

[17] We classify a firm as having a controlling owner if the largest shareholder has direct and indirect voting rights that sum to 10 percent or more. Since 10 percent of voting rights is frequently sufficient to exert control, this cut-off is used extensively in the literature (e.g., La Porta et al., 1999; La Porta et al., 2002). If there are several chains of ownership, we sum the control rights across all of these chains. When multiple shareholders have over 10 percent of the votes, we pick the largest controlling owner.

[18] If there is a chain of controlling ownership, then we use the products of the cash flow rights along the chain. To compute the controlling shareholder's total cash flow rights we sum all direct and indirect cash flow rights.

are larger than average.[19] This is consistent with the findings of previous literature showing that institutional investors prefer to hold stocks of large and liquid companies (Grinblatt and Keloharju, 2000; Kang and Stulz, 1997) and, as we show in Section III, will help us to identify the causal effect of pension fund ownership on firm valuation. The wedge between voting and cash flow rights tends to be positive for principal shareholders, averaging about 9 percent. This suggests that principal shareholders and pension funds differ in an important way as the wedge tends to be negative for pension funds (averaging about -0.7 percent).

Mean difference tests further indicate that firms with pension fund shareholdings tend to have higher market to book ratios than other firms, although there is no difference in return on assets between these two groups of firms. Other variables of interest, such as leverage ratio, stock returns, ownership concentration, R&D expenses, and stock turnover do not differ across these two groups of investors.

III. Identification

In order to identify the causal impact of changes in pension fund ownership on firm performance and ownership structure, we need to mitigate concerns that an eventual correlation between the two is due to the fact that pension funds select firms on the basis of expected changes in firm performance and ownership structure. In other words, we need to show that the correlation is not due to reverse causality.

These concerns are less pronounced for the first phase of the reform as AP4's sales were forced by the implementation of the pension reform. Given that AP4 sold most of its stockholdings, it seems reasonable to assume that it was unable to choose to sell only those stocks whose value it expected to decrease for other factors. Also, the size of the sales was unlikely to be large enough to cause a significant drop in stock prices for a protracted period.

[19] The table reports mean difference tests based on pre-existing differences in firm characteristics in June 2000.

To further mitigate concerns that AP4 sold to a larger extent shares in companies that were expected to perform more poorly, we instrument the change in AP4 holdings between December 2000 and June 2001 with a dummy variable that takes a value of 1 if in June 2000 AP4 held any stocks in the firm. Column (1) of Table 4 shows that our instrument has a strong negative correlation with the change in AP4 holdings between December 2000 and June 2001.

Contrary to the dismissal of shareholdings by AP4, the increase in shareholdings by private and public pension funds in the second phase of the pension reform was gradual. In particular, while the timing in the expansion of shareholdings was largely determined by the implementation of the pension reform and thus exogenous with respect to the evolution of firm characteristics, pension funds clearly select stocks on the basis of expectations of future performance. Hence, a mere correlation between pension funds' shareholdings and the evolution of valuation or ownership concentration would not imply causality. For instance, pension funds and principal shareholders could both have a long horizon on their investments and could therefore increase their shareholdings when stocks are temporarily undervalued.

To overcome these concerns, we exploit the exogenous timing of the Swedish pension reform to construct instruments as follows. First, we notice that after 2001, pension funds started to acquire positions in the Swedish stock market. The timing of expansion in their assets can be considered exogenous because after January 2001 pension funds looked for opportunities to buy blocks of various sizes without putting a price pressure on the market.

Second, a number of empirical papers exploring investor behavior have shown that institutional investors' preferences for stocks are not only driven by conventional proxies for risk and return (Grinblatt and Keloharju, 2001; Gompers and Metrick, 2000; Kang and Stulz, 1997). In particular, institutional investors appear to share similar preferences and to be more inclined to invest in the stocks of large and liquid companies.

We thus conjecture that pension funds may have attempted to build a portfolio comparable to that of domestic mutual funds and, like most other institutional investors, may have favored stocks of large and liquid companies. Hence, increases in pension funds' holdings over time should have been related to (i) the average rate of expansion of pension funds' assets, (ii) whether or not a stock is included in the OMX30 index of the 30 most frequently traded stocks in the market[20], (iii) the company's market capitalization, and (iv) the company's weight in the portfolio of other mutual funds. In particular, in periods of strong asset expansion, pension funds may have predominantly bought companies that had a large market capitalization and carried a significant weight in the index or in the portfolios of domestic mutual funds.

We exploit this intuition to construct two sets of instruments for the changes in pension funds' holdings as follows. First, we use a company's market capitalization, its weight in the portfolios of mutual funds, and a dummy variable that indicates whether a firm's stock was included in the OMX30 index, all calculated at year-end 2000 (the year preceding the pension reform), as instruments to capture that pension funds had a stated preference for these stocks. Second, we use time fixed effects interacted with these three variables, again calculated at year-end 2000, as instruments to capture the deterministic component of changes in mutual funds holdings. In this way, we exploit variation due to the fact that, depending on the inflow in pension assets over time, pension funds expanded their holdings faster in companies with the characteristics that they prefer.

The variation in pension funds' holdings we capture with our instruments is likely to be exogenous since, as we discuss above, the rate of asset expansion across all firms was largely deterministic, and the firm's predetermined market capitalization, weight in mutual

[20] Faulkender and Petersen (2006) use whether or not a firm is included in the S&P 500 index as an instrument for a firm's bond rating to explain firm leverage. Like Faulkender and Petersen, we presume that being part of a stock market index does not affect future stock returns and performance. Shleifer (1986) shows that stocks enjoy an abnormal positive return around the time of their inclusion in the S&P 500 index. However, this is a temporary increase in returns that lasts about 20 days since the announcement of index inclusion.

funds' portfolios, and whether or not a firm is included in the OMX30 index in 2000 are unlikely to be related to the changes of the largest shareholders' blocks or to changes in firm performance after the pension reform. In fact, all these firm characteristics were already public knowledge in 2001 (the start of our sample when we explore the second phase of the pension reform). Hence, any information about future firm performance should already have been incorporated in prices and in the actions of market participants. The results we present are also invariant to the inclusion of firm fixed effects, time-varying firm characteristics, and time fixed effects, which control for systematic factors that may have affected firms around the time of the pension reform. In practice, using our instruments, we compare any changes in firm valuation and ownership concentration across companies for which different categories of pension funds show different propensity to invest following more or less large inflows into the pension system. We see no reason why firm characteristics in 2000 should have an independent effect on future *changes* in performance and ownership concentration.

Columns (2) and (3) in Table 4 are examples of the first stage regressions that we use in the second stage to instrument for pension funds' holdings during the second phase of the pension reform. These regressions show that in some years, private and public pension funds predominantly increased their holdings in firms that in 2000 were included in the OMX30 index, that had larger market capitalization, and in which mutual funds had a larger ownership share. The F-test of excluded instruments developed by Bound et al. (1995) supports the choice of our instruments.

IV. Results

A. Firm valuation

Panel A of Table 5 shows that an increase in public pension funds' holdings positively affects firm valuation, as measured by the firm's market to book value, both when we use the

forced dismissal of the AP4's holdings and the post June 2001 increase in holdings. The effect is highly significant from an economic point of view. Based on the estimates in column (1), a one standard deviation increase in the cash flow rights of public pension funds (about one 3.5 percentage points) results in an increase in average firm valuation that amounts to 2.0 standard deviations of the valuation measure. The result is robust to controlling for the equity stake and the difference between control and cash flow rights of the principal shareholder, referred to as the wedge, which proxies for the entrenchment effect of ownership concentration. Other control variables include firm size, proxied by the logarithm of the number of employees, the ratio of R&D expenses to total assets, financial leverage, and stock turnover.

This result is also robust to estimating the regression in first differences and using a dummy variable that takes a value of one if AP4 had holdings in a given firm in June 2000 (and zero otherwise) as instrument for the change in the cash flow rights of AP4 (column 2).[21] Note that, since we compare changes in firm valuation of firms with and without AP4 stockholdings, our results in column (2) cannot be interpreted to depend on market-wide movements. Also, we include industry and year fixed effects, so we control for any systematic industry level differences in exposure to business cycles and market movements.

We further explore the effect of the dismissal of AP4 holdings on firm valuation using the market's anticipation of its sales. Since market participants could not know whether AP4 participations would be sold to other public pension funds or to what extent (and which) stockholdings would be sold, the effects of AP4 sales were largely unanticipated. However, at the end of December 2000 when it was clear that AP4's equity stakes would not simply have been transferred to the newly created public pension funds, market participants should have revised upwards the probability of open market sales for firms that were still in AP4's portfolio. Hence, we compare cumulative abnormal returns of firms that were in AP4 portfolio

[21] When using first differences or firm fixed effects, we do not control for firm characteristics that exhibit low variation over time, such as the number of employees and the R&D expenses. However, results are similar when we include these controls.

at the end of December 2000 with firms that were not and expect the returns of firms that were still in the AP4 portfolio to be negative.

The release date of the ownership information, December 31, 2000, coincides with the end of AP4's reorganization and the last date to transfer any stockholdings to the new public pension funds that became separate legal entities on January 1, 2001. Using December 31, 2000 as the event date, we find that during an event window that extends from the day preceding the release of ownership information to 10 days thereafter, the cumulative abnormal returns (calculated using a market model with an estimation window that goes from 365 days to 30 days before the event) of the 51 firms still in the AP4 portfolio is -1 percent on average and significantly different from zero at 5 percent level. The other 178 firms that did not have AP4 as a shareholder have cumulative abnormal returns that are not statistically different from zero. The difference in cumulative abnormal returns between firms with AP4 as a shareholder and other firms is -2 percent and statistically significant at 5 percent.[22] This result corroborates our previous findings based on AP4's actual sales. Interestingly, the effect is smaller than the one estimated in column (1) confirming that the extent of the sales was not fully anticipated.

During the second phase of the pension reform, an increase in public pension funds' holdings appears to positively affect firm valuation as well (column 3). This result is robust to using firm fixed effects (column 4) and the instrumentation strategy described in Section III (columns 5), although the size of the effect drops somewhat with instrumental variables.

Overall, these findings suggest that the market expects public pension funds to improve firm valuation. The causal effect of pension fund should be concentrated in firms in which public pension funds have a sufficiently large stake so that they are able to influence corporate policies. Consistent with this prior, we find that the effect on firm valuation is larger for firms in which public pension funds hold more than 1 percent of cash flow rights than for

[22] These results are independent of whether we compute cumulative abnormal returns using the market adjusted model or the constant-mean-return model and for event windows that extend from the day preceding the release of ownership information to anything between 2 and 10 days after the announcement.

firms in which they have smaller participations (column 6 and 7). The difference is not only economically but also statistically significant at 10 percent. Additionally, the improvements in valuation following an increase in pension funds shareholdings appear concentrated in companies in which public pension funds increase their holdings significantly (column 8). Public pension funds have no statistically significant effect on valuation if they increase their holdings by small amounts (column 9).

Only public pension funds appear to have a consistently positive effect on firm valuation. This is consistent with U.S. empirical evidence showing that public pension funds, such as Calpers, are more active in corporate governance than private mutual funds, such as Fidelity because they tend to hold larger blocks in listed companies than the typical private pension fund. Hence, they should have stronger incentives to monitor. Also, public pension funds are less subject to management influence than private funds, especially those related to industrial groups or financial institutions (Brickley et al., 1988; Davis and Kim, 2007).

The reason why we do not find a consistent effect of private pension funds on firm valuation may be because this category of funds includes a heterogeneous group of institutional investors. Some private pension funds are mutual funds with diversified portfolios and small positions in each company. Other private pension funds are related to industrial groups and domestic banks, and, for this reason, may be vulnerable to conflicts of interest that influence their monitoring activity. Some private pension funds are even controlled by the same shareholders who are in control of the firms in which they invest.[23] It should not be surprising that these funds do not attempt to affect corporate policies.

In Panel B of Table 5 (column 1), we distinguish between the holdings of private pension funds that are independent from domestic financial institutions and industrial groups (referred to as independent private pension funds) and pension funds that are ultimately

[23] There are six business groups that control pension funds. Each business group controls several funds.

owned by the same shareholders in control of the industrial companies in which they invest (related pension funds). We continue to find that only public pension funds positively affect firm valuation. We find similar effects when using instruments for the holdings of pension funds (column 2). In column (3) we use instruments and also include firm fixed effects. Hence, our results are not subject to the criticism that the predetermined firm characteristics we use as instruments may affect firm valuation. We again find that only public pension funds positively affect firm valuation.

A possible concern with the interpretation of our results is that public pension fund holdings affect firm valuation due to their relative large size compared to many private pension funds. This is unlikely, however, since both private and public pension funds tend to invest in large companies. Nevertheless, we test whether our results are due to price pressure or simply the result of an increase in stock prices due to a higher demand for stocks. First, we look at companies in which private pension funds increase their stockholdings by a large amount. If demand effects matter, we should observe a positive correlation between firm valuation and private pension fund stockholdings, as we do for public pension funds. Instead, we observe that large changes in private pension funds stockholdings continue to have no statistically significant effect on firm valuation and, if anything, the effect is negative (results not reported). Even in this subsample, only the changes in the holdings of public pension funds positively affect firm valuation. Second, in all regressions, we directly include stock turnover, defined as the ratio of stock traded to the total number of stocks, to control for liquidity. Our estimates are unaffected by the exclusion of this control variable.[24]

Next, we look at firm operating performance as measured by return on assets (column 4). This measure does not depend on stock prices and therefore cannot be affected by pension funds demand for equity. We still observe that only public pension funds have a positive and

[24] In unreported regressions, we use the bid-ask spread as proxy for stock turnover and obtain similar results.

significant effect on firm performance. We can thus rule out that the effects we observe depend on an increase in the demand for equity.

In columns (5) and (6) we explore the possibility that the relative size of pension funds matters for the effect of their stakes on firm valuation. Specifically, we distinguish between private independent pension funds that are large investors in the Swedish stock market (top-10 pension fund investors in terms of total holdings) and the rest. We find that these large independent pension funds enhance firm valuation in a statistically significant way, while large non-independent pension funds and smaller private pension funds do not. This is the case also for private pension funds that on average take large positions in listed companies (not reported). Only if they are independent from industrial groups and banks, large private pension funds positively affect firm valuation. Hence, from a corporate governance perspective, private pension funds that are both large and independent appear comparable to public pension funds.

Besides providing insights on the characteristics of pension funds that are more likely to enhance corporate governance, these findings corroborate our causal interpretation of the empirical evidence. The differences in the valuation effects of public and private pension funds are robust and easy to rationalize on the basis of their incentives to monitor. To dismiss this interpretation, one should believe that public and large independent private fund managers are consistently more skilled than others in selecting firms. We consider this unlikely.

B. Ownership structure

The effects of pension funds' ownership are not confined to firm valuation. As shown in Panel A of Table 6, in the first phase of the pension reform, the principal shareholder's percentage of voting rights decreases for firms in which public pension funds decrease their holdings. Hence, an increase in institutional investment seems to lead to an increase in ownership concentration. The effect is also economically significant. Taking the instrumental

variables estimates in Column (2), a one standard deviation increase in the holdings of public pension funds explains approximately 21 percent of the standard deviation of the change in the holdings of the principal shareholder.

In the second phase of the pension reform, we find no effect of changes in the holdings of public and private pension funds on the control rights of the principal shareholder. Only when public pension funds increase their holdings by a significant amount and have initially only a small stake, the effect becomes marginally significant (column 4). There are no reactions for smaller increases or when pension funds vary their holdings but already hold large stakes.

As noted before, several private pension funds are controlled by the same shareholders that control listed companies. On average, when these related pension funds invest in the same companies that these shareholders control, they hold a stake of about 3.5 percent of the company's cash flow rights (while their average stake is only 2.5 percent of firm equity). Principal shareholders could increase their voting rights by increasing the shareholdings of related pension funds in the companies they control. Hence, we test whether the pension funds related to the controlling shareholder of a given firm increase their control block when the public pension funds increase their shareholdings.

In columns (6) and (7), we find that principal shareholders indeed use their related pension funds to increase their holdings when public pension funds do so. On average, if public pension funds increase their holdings by one standard deviation, related pension funds increase their holdings in related firms by 4.5 percent. Related pension funds also increase their holdings if independent pension funds do so. Consistent with the results on firm valuation suggesting that large pension funds have stronger incentives to monitor, we find that controlling shareholders accumulate votes through the related pension funds especially when

large private independent pension funds increase their holdings. We find no evidence of a similar reaction to changes in holdings of other private pension funds.[25]

In Panel B of Table 6, we investigate to what extent the reaction of controlling shareholders and their related mutual funds, and more generally the concentration of control, may hinder the pension funds that so far we have identified as being more active in corporate governance. We find that public pension funds are less likely to increase their holdings in firms where the principal shareholder controls a larger fraction of capital. Even though we do not find an analogous effect of ownership concentration for private pension funds, independent private pension funds avoid increasing their holdings in firms with more related pension funds (columns 1 to 5).

Additionally, it appears that the reaction of controlling shareholders hampers public pension funds' attempts to affect corporate policies as the effect of an increase in public pension funds holdings is significantly lower (and statistically not distinguishable from zero) when the principal shareholder or related pension funds increase their holdings in response to the public pension funds' equity purchases (column 6).[26]

Overall, our results indicate that controlling shareholders may use the pension funds they control to secure more votes at low additional cost. Conflicts of interest appear more pronounced at related pension funds as they are used by principal shareholder to protect their own control benefits (rather than the security benefits accruing to all shareholders pro-rata). This finding is consistent with the results in Cocco and Volpin (2005) who find that U.K. pension funds that are not independent from corporate managers are run in the interest of the firm's shareholders instead of the pension fund's trustees.

[25] It is important to note the results concerning the related pension funds have to be interpreted with caution because these funds are affected by the pension reform to the same extent as other pension funds and our estimates are thus subject to endogeneity problems. However, the fact that we observe a positive reaction only for pension funds that are supposedly active in corporate governance suggests that our results are unlikely to be explained by omitted factors (e.g., pension funds having similar investment strategies).

[26] We cannot identify an analogous effect for independent pension funds even if they are large, probably due to the high correlation between the changes in the holdings of these funds and the interaction term capturing the dynamic reaction of principal shareholders.

C. Control premium

The positive correlation between changes in the stockholdings of some pension funds and the principal shareholders' direct or indirect shareholdings may be driven by the desire of the latter to maintain control on corporate policies. If the presence of these pension funds indeed increases the probability of disagreement on corporate policies, we should observe that the value of a marginal vote is larger after an increase in these funds' stockholdings.

It is common to measure the market value of a marginal corporate vote implicitly as the difference between the prices of multiple and limited voting shares (see, for instance, Zingales, 1995, Rydqvist, 1996, and Nenova, 2003), also known as the control premium. The premium of multiple voting shares is commonly believed to depend on the likelihood that a vote will be pivotal in a proxy contest and the price it will fetch in case of such a contest (Zingales, 1995). The likelihood that a vote will be pivotal in a proxy contest clearly depends on ownership concentration because the probability that a marginal vote is pivotal is zero if the largest owner holds more than 50 percent of the votes. The price of such shares at a proxy contest depends on the magnitude of private benefit of control.

Pension funds' stockholdings may affect the control premium in several ways: First, the premium of control may be an increasing function of the size of pension funds' shareholdings because votes become more valuable as controlling shareholders attempt to resist pension funds' influence during proxy contests. Second, pension funds may affect the value of a marginal vote by changing the probability of a takeover. The latter could in turn change either because pension funds significantly affect the ownership concentration of firms or because they are more or less likely to tender their shares in the event of a takeover. In either case, the control premium should increase if principal shareholders attempt to resist interferences in corporate policies or takeovers.[27] Finally, pension funds may monitor

[27] In effect, takeovers can be seen as a severe form of interference in corporate policy.

management and controlling shareholders in a way that decreases private benefits of control. This would result in a decrease of the control premium.

To assess the effect of AP4's shareholding dismissals on the value of control during the first phase of the pension reform, we identify a total of 29 listed companies with dual-class shares, for which both A and B shares are listed. We then calculate the control premium for these 29 companies as the ratio between one voting right and one cash flow right, corrected to make voting premiums comparable across companies with different voting arrangements, similarly to Zingales (1995) and Rydqvist (1996). Next, we run a regression of the changes in the voting premium during a six months period on contemporaneous changes in the cash flow rights of public pension funds.[28] To capture contemporaneous changes in ownership structure that may affect the probability that the marginal vote is pivotal, we control for changes in the share of votes of the principal shareholder (see also Zingales, 1994, and Nenova, 2003).[29]

Given the small number of observations the results are only marginally statistically significant. In Table 7, however, we find that the control premium decreases between December 2000 and June 2001 in firms in which public pension funds decrease their participations. Most importantly, the effect is highly significant from an economic point of view: a one standard deviation change in the holdings of public pension funds explains 20 percent of the standard deviation of the changes in the control premium.[30] Hence, our results suggest that the effects of the AP4 dismissals on firm valuation are related to corporate

[28] The average change in the control premium is not statistically different from zero over the sample period.

[29] In non-reported specifications we also control for changes in the Shapley value (instead of changes in the voting rights of the principal shareholder). The Shapley value is defined as the Milnor and Shapley (1978) power index for oceanic games of a given shareholder. The Shapley value measures the extent to which each large owner is pivotal to the voted decision. The results using the Shapley value are broadly consistent with those obtained when we use the changes in voting rights of the principal shareholder.

[30] We also explore whether the decrease in the control premium may depend on price pressure on A shares due to the fact that AP4 may have sold more A shares than B shares. In particular, we check whether the effect of AP4 dismissals on the control premium is concentrated in companies in which AP4 held a larger proportion of A shares, by including the proportion of A shares relative to total shares AP4 held in December 2000. Our estimates are qualitatively invariant.

governance and that principal shareholders attempted to resist AP4's influence. As a consequence, when AP4 sold its stakes, the value of an additional vote decreased.

The effects of public pension funds on the value of a vote are similar in the second phase of the pension reform. Private pension funds irrespective of their type do not appear to have an analogous effect on the control premium. This suggests that public pension funds may affect corporate policies to a larger extent.

Overall, principal shareholders appear averse to the dilution of control benefits. This is consistent with the findings of Cronqvist and Nilsson (2005) who show that controlling shareholders avoid equity issue methods that dilute control benefits.

D. Additional robustness tests

All results we present are robust to various robustness checks that for brevity we do not tabulate. First, all our results are qualitatively similar if instead of the cash flow rights we use the voting rights of different categories of pension funds. Moreover, the wedge between cash flow and control rights of pension funds does not appear to have an independent effect on valuation. This is unsurprising because A shares are often non-traded and therefore pension funds do not have the option to buy A shares if they want to affect corporate policies.

Second, based on the anecdotal evidence that public pension funds tend to coordinate their actions we thus far have measured their influence using the sum of their cash flow rights. In unreported regressions, we include the Herfindahl index of individual public pension fund shareholdings to capture the inequality of the distribution of equity stakes between public pension funds. This variable does not enter significantly, suggesting that public pension funds indeed tend to vote jointly.

Third, we further explore the hypothesis that some pension funds being active in corporate governance mitigate agency problems as follows. Several studies have shown that agency problems are more pronounced in family-controlled firms (Giannetti and Simonov,

2006; Cronqvist and Nilsson, 2003). We investigate whether the pension funds that are supposedly more active in corporate governance have a larger positive effect on firm valuation in family-controlled firms. We find that this is indeed the case. Interestingly, the related pension funds have significant negative effects on the valuation of family-controlled firms. Also, the beneficial effects of public and large independent pension funds are smaller for companies with A and B shares and for companies that are indirectly controlled through other companies. To the extent that control is more entrenched in these companies, our results suggest that the positive effects of institutional investor activism may be limited to countries where complex ownership structures are prevalent.

Finally, since we are concerned that our results may be affected by new equity listings, we repeated all the exercises using a balanced panel of firms. The results are qualitatively similar to the ones we present.

V. Are pension funds really active in corporate governance?

So far, we have shown that public pension funds and large independent pension funds enhance firm valuation. Moreover, an increase in the holdings of public pension funds is correlated with an increase in the value of marginal votes and principal shareholders attempt to control more votes either directly or indirectly if public pension funds or large independent private pension funds increase their stakes. This evidence *implicitly* suggests that these pension funds are active in corporate governance. We now provide more explicit evidence that indeed they are.

An important way in which shareholders influence corporate policies is by nominating board members. In order to capture shareholder involvement, we hand-collect data on board

nominating committees from 2005 firm annual reports and explore using Probit regressions which shareholders are more likely to be represented in these committees.[31]

In Table 8, as expected, we find that the probability that any shareholder is represented in the nominating committee is increasing in her cash flow rights. For given shareholdings, private and especially public pension funds are more likely to be represented on nominating committees than other shareholders; in contrast, foreign investors are less likely to be represented on nominating committees. These differences are statistically and economically significant. Following a marginal increase in their shareholdings, public pension funds are twice as likely as other private pension funds to gain a seat in the firm's board nominating committee. Possibly, public pension funds are more successful than private pension funds in gaining representation because they coordinate their actions to a larger extent.

These estimates also reveal why large independent private pension funds may have more limited effects on the control premium. It appears that these pension funds are not more likely than other pension funds to obtain representation in nominating committees. This may limit their ability to contrast controlling shareholders in comparison to public pension funds.

Finally, representation of pension funds on nominating committees matters for firm valuation (columns 4 and 5). Firms with public pension funds or large independent private pension funds on their nominating committees have higher valuation, suggesting that pension funds' ability to nominate board members is an important indicator of whether they are expected to enhance firm performance through improved monitoring.

VI. Concluding remarks

We exploit an exogenous shock caused by the Swedish pension reform as a natural experiment to explore how substantial changes in institutional ownership affect firm valuation

[31] On average, about 1 percent of the top 200 shareholders are represented in nominating committees.

and corporate governance. By employing this exogenous shock, we mitigate concerns about endogeneity affecting much of the existing literature on corporate ownership and performance. We further address endogeneity concerns by exploiting the time-series dimension of our ownership data, which are much more detailed than data generally used in the literature. This allows us to assess the effects of institutional ownership in a large scale experiment instead of evaluating specific episodes of shareholder activism.

We find that an exogenous increase in the holdings of public pension funds is associated with an increase in shareholder value. Private independent pension funds with the ability of taking large equity stakes have similar positive effects on firm valuation. In contrast, for pension funds affiliated to industrial groups, we find, if anything, the opposite. Thus, independence from financial institutions and family interests appears to be a prerequisite for value-enhancing monitoring activity by pension funds.

We also find that the control premium increases when public pension funds buy a participation in a firm and that the controlling shareholders either increase their control blocks or exploit the affiliated pension funds to increase their voting power when public pension funds and large independent private pension funds increase their holdings. This suggests that controlling shareholders are reluctant to relinquish control to pension funds and that related pension funds are used by controlling families as a mechanism to enhance the entrenchment of corporate control.

Overall, the increase in institutionalized saving did not result in a decrease in ownership concentration. Our results suggest that if private benefits of controls are large, ownership concentration may even increase in response to institutional investors' monitoring. These findings go against the conventional wisdom that an increase in institutionalized saving decreases ownership concentration and private benefits of controls, and offer a more malign view of the impact of institutional holdings on ownership concentration and corporate control.

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Table 1

Equity market shares for different classes of pension funds

This table reports the stockholdings (as a percentage of the total market) for different types of public and private pension funds. Stockholdings are reported in terms of voting rights (panel A) or cash flow rights (panel B) and weighted by firm market capitalization. We include only firms for which we have ownership information.

	Date	Public pension funds	Of which:						Private pension funds	Total pension funds
			AP1	AP2	AP3	AP4	AP6	AP7		
Panel A: Voting rights	Jun 2000	2.81	0	0	0.40	2.08	0.33	0	9.18	11.99
	Dec 2000	3.27	0	0	0.55	2.30	0.41	0	9.75	13.03
	Jun 2001	3.07	0.42	0.74	0.67	0.77	0.38	0.10	9.84	12.91
	Dec 2001	3.28	0.45	0.77	0.78	0.90	0.27	0.10	10.32	13.60
	Jun 2002	3.93	0.61	0.88	0.83	1.12	0.34	0.15	11.27	15.21
	Dec 2002	3.85	0.62	0.88	0.92	1.15	0.15	0.13	10.63	14.48
	Jun 2003	4.05	0.73	0.99	0.94	1.19	0.03	0.17	10.89	14.94
	Dec 2003	3.86	0.67	0.98	0.96	1.10	0.01	0.14	11.30	15.16
	Jun 2004	3.50	0.61	0.95	0.93	0.87	0.00	0.14	11.14	14.64
	Dec 2004	3.69	0.65	1.05	0.89	0.93	0.00	0.17	12.00	15.69
	Jun 2005	3.78	0.68	1.05	0.87	0.94	0.01	0.23	11.97	15.75
Panel B: Cash flow rights	Jun 2000	4.05	0	0	0.49	3.13	0.43	0	9.57	13.62
	Dec 2000	4.23	0	0	0.59	3.15	0.49	0	10.93	15.16
	Jun 2001	3.84	0.60	0.93	0.73	0.96	0.45	0.17	12.02	15.86
	Dec 2001	4.13	0.66	0.96	0.84	1.14	0.36	0.17	12.74	16.87
	Jun 2002	4.46	0.76	0.98	0.88	1.24	0.38	0.22	13.58	18.04
	Dec 2002	4.55	0.78	1.03	1.05	1.33	0.18	0.18	12.94	17.49
	Jun 2003	4.85	0.91	1.12	1.11	1.43	0.03	0.25	13.52	18.37
	Dec 2003	4.55	0.82	1.12	1.09	1.31	0.01	0.20	14.34	18.89
	Jun 2004	4.43	0.81	1.15	1.08	1.17	0.01	0.21	14.65	19.08
	Dec 2004	4.24	0.74	1.16	0.98	1.14	0.00	0.22	14.61	18.85
	Jun 2005	4.38	0.77	1.15	0.97	1.17	0.01	0.31	14.68	19.06

Table 2
Pension fund holdings

This table presents averages across the sample and sample period (2000-2005) of pension funds' percentage of voting rights; percentage of cash flow rights; number of stocks in their portfolios; portfolio turnover, calculated as the value-weighted turnover rate of all positions; total size of Swedish stockholdings (in billions of SEK); share of Swedish stockholdings in the total market capitalization (expressed in %); and number of times each type of pension fund is either the largest shareholder or one of the five largest shareholders (in terms of voting rights) in a listed company distinguishing by type of pension fund. For private pension funds, we also report statistics on the subgroups of independent and related private pension funds. Independent private pension funds are private pension funds that are independent from industrial groups and financial institutions. Related private pension funds are private pension funds that are related to Swedish banks, insurance companies or industrial groups and that hold stakes in companies controlled by the same principal shareholder that indirectly controls their votes. Portfolio turnover rate *T* of pension fund i at time t is computed as:

$$T_{it} = \frac{\sum_{j=1}^{L} \left| N^{A}_{i,j,t} P^{A}_{j,t} + N^{B}_{i,j,t} P^{B}_{j,t} - (N^{A}_{i,j,t-1} P^{A}_{j,t-1} + N^{B}_{i,j,t-1} P^{B}_{j,t-1}) - (N^{A}_{i,j,t-1} \Delta P^{A}_{j,t} + N^{B}_{i,j,t-1} \Delta P^{B}_{j,t}) \right|}{\sum_{j=1}^{S} (N^{A}_{i,j,t} P^{A}_{j,t} + N^{B}_{i,j,t} P^{B}_{j,t} + N^{A}_{i,j,t-1} P^{A}_{j,t-1} + N^{B}_{i,j,t-1} P^{B}_{j,t-1}) / 2}$$

, where *i* denotes pension fund i, *j* denotes listed company j, and *t* denotes time t, *N* denotes the number of shares, *P* denotes the share price, *A* indicates A shares, *B* denotes B shares, and *L* denotes the number of listed companies.

Type of investor	Voting rights (in %)	Cashflow rights (in %)	Number of stocks in portfolio	Portfolio turnover	Stockholdings (in billions of SEK)	Total market share of Swedish stockholdings (in %)	Number of firms in which investor is largest shareholder	Number of firms in which investor is a top-5 shareholder
AP1	0.83	0.97	26	0.36	13.01	0.61	0	1.0
AP2	0.92	1.05	88	0.41	18.78	0.90	0.5	5.9
AP3	1.71	1.91	53	0.25	17.60	0.80	2.0	11.6
AP4	2.41	2.74	48	0.24	31.96	1.29	0	17.1
AP6	2.61	2.57	34	0.43	6.72	0.27	0	7.0
AP7	0.14	0.19	50	0.45	3.19	0.15	0	0
Private pension funds	1.27	1.57	35	0.37	14.56	0.63	13.2	295.5
-- Independent private pension funds	0.82	1.11	22	0.67	1.31	0.06	0	17.8
-- Related private pension funds	1.76	2.20	49	0.29	24.79	1.10	9.3	149.5

Table 3
Firm characteristics

This tables reports averages across the sample firms and the sample period of the main variables used in the empirical analysis. Data are biannual. * indicates 5% significance of t-test of mean differences between the following two groups: firms with no pension fund shareholdings and firms with public pension fund shareholdings. ** indicates 5% significance of t-test of mean differences between the following two groups: firms with no pension funds and firms with private pension funds. We perform the tests of mean differences for firm characteristics in June 2000.

Group of firms	Variable	Average	Median	Standard deviation	# of obs	t-test of mean differences
All firms:	CF rights of public pension funds	1.71	0.00	3.44	3135	
	CF rights of private pension funds	9.70	7.55	9.35	3135	
	Voting rights of the largest shareholder (in %)	32.76	28.77	21.64	3135	
	Wedge for the largest shareholder (in %)	9.17	0.00	12.96	2942	
	6-month return (in %)	7.89	3.33	51.59	2980	
	Log of market capitalization (in SEK)	20.44	20.19	2.16	4024	
	Log of the number of employees	3.03	2.83	1.79	2498	
	Ratio of R&D expenses to total assets	0.03	0.00	0.14	2721	
	Leverage	0.32	0.29	0.24	2721	
	Stock turnover (in %)	0.26	0.17	0.33	1802	
	Market to book ratio	4.45	1.79	63.49	2589	
	Return on assets (ROA)	0.27	0.05	0.50	2721	
No pension fund shareholdings:	Voting rights of the largest shareholder (in %)	35.16	31.40	23.47	409	
	Wedge for the largest shareholder (in %)	10.19	0.71	16.21	408	
	6-month return (in %)	8.06	0.00	59.99	389	
	Log of market capitalization (in SEK)	18.00	18.01	1.29	393	*, **
	Log of the number of employees	2.14	1.79	1.34	312	*, **
	Ratio of R&D expenses to total assets	0.08	0.00	0.30	345	
	Leverage	0.36	0.33	0.26	345	
	Stock turnover (in %)	0.21	0.08	0.33	192	
	Market to book ratio	1.41	1.06	1.24	333	*, **
	Return on assets (ROA)	0.40	0.06	0.61	345	
Public pension fund shareholdings:	CF rights of public pension funds	3.73	2.80	4.28	1438	
	CF rights of private pension funds	14.17	13.26	9.24	1438	
	Voting rights of the largest shareholder (in %)	30.76	25.20	21.18	1438	
	Wedge for the largest shareholder (in %)	8.45	0.00	12.52	1251	
	6-month return (in %)	1.90	1.40	34.54	1387	
	Log of market capitalization (in SEK)	21.78	21.67	2.01	1415	
	Log of the number of employees	3.66	3.30	1.94	1112	
	Ratio of R&D expenses to total assets	0.02	0.00	0.10	1210	
	Leverage	0.33	0.33	0.22	1210	
	Stock turnover (in %)	0.30	0.22	0.38	630	
	Market to book ratio	7.01	2.12	93.39	1194	
	Return on assets (ROA)	0.21	0.02	0.41	1210	
Private pension fund shareholdings:	CF rights of public pension funds	1.95	0.07	3.61	2681	
	CF rights of private pension funds	11.34	9.75	9.14	2681	
	Voting rights of the largest shareholder (in %)	32.40	28.33	21.35	2681	
	Wedge for the largest shareholder (in %)	9.07	0.00	12.39	2491	
	6-month return (in %)	8.04	4.24	50.42	2546	
	Log of market capitalization (in SEK)	20.84	20.53	2.02	2575	
	Log of the number of employees	3.24	3.00	1.79	2043	
	Ratio of R&D expenses to total assets	0.02	0.00	0.09	2203	
	Leverage	0.31	0.29	0.22	2203	
	Stock turnover (in %)	0.27	0.18	0.35	1170	
	Market to book ratio	5.08	1.98	69.92	2134	
	Return on assets (ROA)	0.25	0.04	0.46	2203	

Table 4
First stage regressions

In regressions (1) the dependent variable is the change in cash flow rights of AP4 between December 2000 and June 2001 (first phase of pension reform). In regressions (2) and (3), the dependent variable is the share of cash flow rights of public and private pension funds, respectively, and all observations starting from June 2001 are included (second phase of pension reform). Regressions are estimated using ordinary least squares. AP4 is a dummy variable that indicates whether AP4 is a shareholder in the firm in June 2000 or not. OMX30 in 2000 is a dummy variable that indicates whether the stock is part of the OMX 30 index in June 2000 or not. The constant is included in all regressions, but the coefficient is omitted. Standard errors between parentheses. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)	(3)
	First phase of pension reform	Second phase of pension reform	
AP4	-1.625***		
	(0.273)		
CF rights of AP funds except AP4	-0.180**		
	(0.086)		
CF rights of private pension funds	0.013		
	(0.027)		
Log of market capitalization	-0.070	0.453***	1.391***
	(0.060)	(0.039)	(0.133)
6-month return		-0.542***	-1.509***
		(0.141)	(0.407)
OMX30 in 2000		0.105	-2.745***
		(0.414)	(0.979)
OMX30 in 2000*2002		0.421	-1.320
		(0.480)	(1.357)
OMX30 in 2000*2003		1.130**	-0.525
		(0.444)	(1.430)
OMX30 in 2000*2004		0.774*	-0.503
		(0.415)	(1.457)
OMX30 in 2000*2005		0.629	-1.328
		(0.475)	(1.792)
Market cap in 2000		0.000	0.000
		(0.000)	(0.002)
Market cap in 2000*2002		-0.001	-0.008***
		(0.001)	(0.003)
Market cap in 2000*2003		-0.001	-0.001
		(0.001)	(0.003)
Market cap in 2000*2004		0.000	0.000
		(0.000)	(0.000)
Market cap in 2000*2005		0.001	0.002
		(0.001)	(0.003)
CF rights of mutual funds in 2000		0.073***	0.547***
		(0.015)	(0.060)
CF rights of mutual funds in 2000*2002		0.037*	0.097
		(0.019)	(0.067)
CF rights of mutual funds in 2000*2003		0.007	0.019
		(0.016)	(0.063)
CF rights of mutual funds in 2000*2004		0.003	0.011
		(0.016)	(0.064)
CF rights of mutual funds in 2000*2005		0.000	0.000
		(0.000)	(0.000)
Time fixed effects	No	Yes	Yes
Industry fixed effects	No	Yes	Yes
Observations	230	2058	2058
R-squared	0.39	0.32	0.56
F-test of excluded instruments	--	14.47	29.08
F-test of excluded instruments (p-value)	--	0.000	0.000

Table 5
Firm valuation

Panel A. Public pension funds

The dependent variable is the market to book ratio. In Columns (2), (8) and (9), we use the change in market to book ratio and the changes in ownership of various pension funds as dependent variables. In all other columns, all dependent and independent variables are in levels. In Column (2), the instrument for the cash flow rights of AP4 variable is a dummy that takes value equal to 1 if AP4 had equity stakes in the company in June 2000. Instruments for the instrumental variables estimates in Columns (5) are defined as in Columns (2) and (3) of Table 3. The first phase of pension reform refers to December 2000 and June 2001 when the dismissal of AP4 funds took place. The second phase of pension reform refers to the expansion of pension funds holdings starting in June 2001. In Column (6) we use only observations relative to firms in which the public pension funds have at least 1 percent of the cash flow rights. In Column (7) we use only observations in which public pension funds have less than 1 percent of the cash flow rights. In Column (8) we use only observations for firms in which public pension funds increase their holdings by more than 1 percent. In Column (9), we use only observations of firms in which public pension funds increase their holdings by less than 0.5 percent. The constant is included in all regressions, but the coefficient is omitted. The coefficient of stock turnover is multiplied by 1,000,000. Standard errors between parentheses are corrected for heteroskedasticity and clustering at the firm level. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	First phase of pension reform		Second phase of pension reform						
	Levels	First differences	Levels					First differences	
	OLS	IV	OLS	OLS	IV	OLS	OLS	OLS	OLS
CF rights of AP4	2.676*	0.351*							
	(1.570)	(0.175)							
CF rights of AP	1.219	-0.032							
funds except AP4	(1.257)	(0.139)							
CF rights of public			1.878**	2.924***	2.324***	3.232**	1.262***	1.754**	0.122
pension funds			(0.832)	(0.389)	(0.712)	(1.526)	(0.318)	(0.819)	(0.358)
CF rights of private	-0.059	-0.130**	-0.100	-0.195	-0.270	-0.181	0.032**	-0.348	-0.002
pension funds	(0.139)	(0.058)	(0.066)	(0.137)	(0.107)	(0.242)	(0.014)	(0.602)	(0.017)
CF rights of the	-0.049	0.026	0.066**	0.058***	0.059***	0.228***	0.006	-0.140	0.006
largest shareholder	(0.044)	(0.039)	(0.024)	(0.069)	(0.017)	(0.075)	(0.009)	(0.474)	(0.007)
Wedge for the largest	-0.006***	-0.002**	-0.000	-0.001	-0.002*	0.002	-0.039	0.401	-0.007
shareholder	(0.002)	(0.001)	(0.006)	(0.000)	(0.001)	(0.003)	(0.058)	(0.902)	(0.010)
Log of the number of	-0.049		-0.266		0.048	-0.841	0.085		
employees	(0.044)		(0.687)		(0.088)	(1.412)	(0.180)		
R&D expenses to	-0.007***		-3.545		-2.708	-6.834	-3.176		
total assets	(0.001)		(4.178)		(1.670)	(6.795)	(2.881)		
Leverage	-0.886	2.276**	0.826	15.26***	-0.365	6.516	-0.009	17.593	0.090
	(0.752)	(0.861)	(1.658)	(4.063)	(0.565)	(3.937)	(0.436)	(13.768)	(0.222)
Stock turnover	1.080*	-0.229	-0.334	-0.188	-0.242	-889.2***	15.00	1196.8	-15.86
	(0.616)	(0.114)	(0.315)	(0.369)	(0.126)	(269.4)	(75.80)	(1149.7)	(32.03)
Industry fixed effects	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	No	No	No	Yes	No	No	No	No	No
Time fixed effects	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	420	221	1761	1915	1566	478	1283	244	1505
R-squared	0.03	0.33	0.05	0.29	0.26	0.08	0.21	0.09	0.12

Panel B. Private Pension funds

The dependent variable is the market to book ratio, except in Column (4) where the dependent variable is the return on assets. Regressions in Columns (1), (4), and (5) are estimated using ordinary least squares. Regressions in Columns (2), (3), and (6) are estimated using instrumental variables. Instruments for the instrumental variables estimates are defined as in Columns (2) and (3) of Table 3. Large private pension funds are those that are among the ten largest pension fund investors in the Swedish stock market, while small pension funds are those that are not among the ten largest pension fund investors. The constant is included in all regressions, but the coefficient is omitted. The coefficient of stock turnover is multiplied by 1,000,000. Standard errors between parentheses are corrected for heteroskedasticity and clustering at the firm level. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)
	Second phase of pension reform					
	Market to Book Ratio			ROA	Market to Book Ratio	
	Levels					
	OLS	IV	IV	OLS	OLS	IV
CF rights of public pension funds	1.908**	0.851**	2.053**	0.008*	2.346***	0.990*
	(0.848)	(0.291)	(0.669)	(0.004)	(0.327)	(0.519)
CF rights of independent private pension funds	0.181	-0.306	-0.282	-0.001		
	(0.156)	(0.342)	(0.520)	(0.003)		
CF rights of related private pension funds	-0.330	1.507	-2.314	-0.004		
	(0.727)	(2.860)	(2.079)	(0.005)		
CF rights of other private pension funds	-0.258	0.185	0.229	0.001		
	(0.173)	(0.124)	(0.246)	(0.002)		
CF rights of large, independent private pension funds					1.616***	1.376*
					(0.368)	(0.804)
CF rights of large, private pension funds that are NOT independent					-0.611**	-0.222
					(0.271)	(0.384)
CF rights of small, private pension funds					-0.330*	-0.278
					(0.170)	(0.179)
CF rights of the largest shareholder	1.908**	0.038***	0.015	0.008*	0.086*	0.051***
	(0.848)	(0.009)	(0.036)	(0.004)	(0.052)	(0.016)
Wedge for the largest shareholder	-0.001	-0.0001	-0.001	-0.002**	-0.002	-0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.005)	(0.001)
Log of the number of employees	-0.231	-0.081			-0.732	0.010
	(0.681)	(0.122)			(0.584)	(0.129)
R&D expenses to total assets	-3.313	-4.100***			-6.440	-4.380**
	(3.791)	(1.394)			(9.340)	(1.926)
Leverage	1.031	0.354	0.634		3.022	0.369
	(1.827)	(0.643)	(1.140)		(3.777)	(1.159)
Stock turnover	-0.273	-0.069	-0.449		-0.478	0.425
	(0.027)	(0.127)	(0.092)		(0.415)	(0.131)
Industry fixed effects	Yes	Yes	No	No	Yes	Yes
Firm fixed effects	No	No	Yes	Yes	No	No
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1761	1566	1686	990	1263	1150
R-squared	0.06	0.33	0.51	0.93	0.09	0.13

Table 6

Changes in the holdings of the largest shareholder and related pension funds

Panel A. Contemporaneous effects

The dependent variable in Columns (1) to (5) is the change in voting rights of the largest shareholder; in Columns (6) and (7) the dependent variable is the voting rights of related private pension funds in related firms. In Columns (1) and (2) we use the change in the holdings of the largest shareholder and the changes in ownership of various pension funds between December 2000 and June 2001 (first phase of the pension reform). In Columns (3) to (7), we use changes in ownership after June 2001 (second phase of the pension reform). In Column (4), we include only observations of firms for which at t-1 public pension funds had less than 0.1 percent of the cash flow rights and in the aggregate increase their holdings by 0.5 percent (large increases in public pension funds holdings). In Columns (6) and (7), we include only observations relative to firms in business groups that control some pension funds. In Column (1) and Columns (3) to (7), estimates are obtained by ordinary least squares. In Column (2), estimates are obtained using instrumental variables and the instrument is a dummy that takes value equal to 1 if AP4 had holdings in the company in June 2000. The constant is included in all regressions, but the coefficient is omitted. Standard errors between parentheses are corrected for heteroskedasticity and clustering at the firm level. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	First phase of pension reform		Second phase of pension reform				
	Change in the holdings of the principal shareholder					Change in the holdings of related pension funds in related firms	
	OLS	IV	OLS	OLS	OLS	OLS	OLS
Δ CF rights of public pension funds	0.487*	0.832**	0.066	1.510*	0.055	0.278***	0.282***
	(0.295)	(0.369)	(0.146)	(0.869)	(0.119)	(0.077)	(0.077)
Δ CF rights of private pension funds	0.038	0.559	0.094	0.943			
	(0.069)	(0.402)	(0.100)	(0.870)			
Δ CF rights of independent private pension funds						0.081*	-0.053
						(0.050)	(0.069)
Δ CF rights of other private pension funds						-0.257***	-0.249***
						(0.032)	(0.032)
Δ CF rights of large, independent private pension funds					-0.020		0.250***
					(0.098)		(0.069)
Δ CF rights of large private pension funds that are NOT independent					0.119		
					(0.089)		
Δ CF rights of small, private pension funds					0.112		
					(0.113)		
Log of market capitalization	0.134	0.137	0.108**	0.769	0.107**	0.031	0.031
	(0.266)	(0.143)	(0.054)	(1.078)	(0.054)	(0.046)	(0.046)
Return	0.591	1.824**	-0.436	-2.717	-0.429	0.152	0.122
	(1.481)	(0.830)	(0.338)	(5.040)	(0.321)	(0.404)	(0.407)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	193	193	1909	27	1909	300	300
R-squared	0.02	0.05	0.02	0.49	0.22	0.21	0.23

Panel B. Dynamic Effects

Counter-influence is a dummy variable that takes value equal to 1 if controlling shareholders or their related pension funds change their holdings in the firms they control in the same direction as public pension funds. Observations refer to changes in ownership after June 2001 (second phase of the pension reform). Parameters are estimated by ordinary least squares. A constant is included in all regressions, but not reported. Standard errors between parentheses are corrected for heteroskedasticity and clustering at the firm level. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1) Δ CF rights of public pension funds	(2) Δ CF rights of private pension funds	(3) Δ CF rights of independent private pension funds	(4) Δ CF rights of large, independent private pension funds	(5) Δ CF rights of large private pension funds that are NOT independent	(6) Market to Book ratio (First differences)
CF rights of the largest shareholder at t-1	-0.005**	-0.000	0.002	0.001	-0.001	
	(0.002)	(0.004)	(0.002)	(0.001)	(0.002)	
Wedge for the largest shareholder at t-1	-0.000	-0.000	-0.000	0.000	0.000	
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	
CF rights of related private pension funds at t-1	0.002		-0.084***	-0.033*		
	(0.027)		(0.030)	(0.017)		
Log of market capitalization	-0.000	0.136***	0.071***	0.014	0.032	
	(0.021)	(0.040)	(0.023)	(0.013)	(0.020)	
Return	0.002	-0.204	-0.128	-0.059	0.077	
	(0.087)	(0.184)	(0.104)	(0.059)	(0.091)	
OMX30	0.157	-0.624**	-0.246	0.004	-0.128	
	(0.159)	(0.307)	(0.175)	(0.099)	(0.152)	
CF rights of public pension funds						1.879***
						(0.304)
CF rights of public pension funds x Counter-influence						-1.883***
						(0.523)
CF rights of private pension funds						-0.047
						(0.098)
CF rights of the largest shareholder						0.042
						(0.043)
Wedge for the largest shareholder						0.001
						(0.070)
Leverage						1.487
						(1.389)
Turnover						114.90
						(179.60)
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	No	No	No	No	No	Yes
Observations	2304	2304	2304	2304	2304	1892
R-squared	0.01	0.01	0.02	0.01	0.01	0.03

Table 7
Change in the control premium

The dependent variable is the change in control premium. In Column (1) we consider the change between December 2000 and June 2001 (first phase of pension reform). In Column (2), we consider the change after June 2001 (second phase of pension reform). All regressions are estimated by ordinary least squares. A constant is included in all regressions, but the coefficient is omitted. Standard errors between parentheses are corrected for heteroskedasticity. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)
	First phase of pension reform	Second phase of pension reform
Δ CF rights of public pension funds	0.001*	0.001*
	(0.000)	(0.001)
Δ CF rights of private pension funds	0.001**	
	(0.001)	
Change in voting rights of the largest shareholder	-0.001*	-0.000
	(0.000)	(0.000)
Δ CF rights of large, independent private pension funds		0.000
		(0.000)
Δ CF rights of small, independent private pension funds		0.000
		(0.000)
Δ CF rights of small private pension funds		-0.000
		(0.000)
Observations	29	261
R-squared	0.08	0.03

Table 8
Nominating committees

In Columns (1) to (3) the dependent variable is a dummy that takes value 1 if shareholder *i* has a seat on the nominating committee of firm *j* and value zero otherwise (nominating committee). In Columns (4) and (5) the dependent variable is the market to book ratio. CF rights is the percentage of cash flow rights of shareholder *i* in firm *j*. Public pension fund is a dummy that takes value 1 if shareholder *i* is a public pension fund and value zero otherwise. Private pension fund is a dummy that takes value 1 if shareholder *i* is a private pension fund and value zero otherwise. Top 10 private pension funds is a dummy that takes value 1 if shareholder *i* is a private pension fund which ranks at least 10th for its holdings in Swedish listed companies and value zero otherwise. Top 10 independent private pension funds is a dummy that takes value 1 if shareholder *i* is an independent private pension fund which ranks at least 10th for its holdings in Swedish listed companies and value zero otherwise. Foreign is a dummy that takes value 1 if shareholder *i* is foreign and value zero otherwise. Public (Private) pension fund in nominating committee is a dummy that takes value 1 if a public (private) pension fund is in the nominating committee and zero otherwise. Large (not) independent private pension fund in nominating committee is a dummy that takes value 1 if a Large (not) independent private pension fund is in the nominating committee and zero otherwise. Small private pension fund in nominating committee is a dummy variable that takes value 1 if small private pension funds are in the nominating committee and zero otherwise. In Columns (1) to (3), parameters are estimated using a Probit model and we report marginal effects. In Columns (4) and (5), parameters are estimated by ordinary least squares. A constant is included in all regressions. Standard errors between parentheses are corrected for clustering at the firm level. * significant at 10%; ** significant at 5%; *** significant at 1%.

	(1)	(2)	(3)	(4)	(5)
	Nominating committee			Market to book ratio	
CF rights	0.002***	0.002***	0.002***		
	(0.000)	(0.000)	(0.000)		
Public pension fund * CF rights	0.008***	0.008***	0.008***		
	(0.001)	(0.001)	(0.001)		
Private pension fund * CF rights	0.004***	0.004***	0.004***		
	(0.001)	(0.001)	(0.001)		
Top 10 private pension funds * CF rights		0.002**	0.002**		
		(0.001)	(0.001)		
Top 10 independent private pension funds * CF rights		-0.002**	-0.002**		
		(0.001)	(0.001)		
Foreign * CF rights			0.000		
			(0.000)		
Log of market capitalization	0.000***	0.000***	0.000***		
	(0.000)	(0.000)	(0.000)		
Voting rights of the largest shareholder	-0.000***	-0.000***	-0.000***	0.074**	0.090*
	(0.000)	(0.000)	(0.000)	(0.033)	(0.046)
CF rights of public pension funds				0.242	0.249
				(0.176)	(0.207)
CF rights of public pension funds*Public pension funds in nominating committees				2.369***	1.505***
				(0.303)	(0.373)
CF rights of private pension funds				-0.085	
				(0.077)	
CF rights of private pension funds*Private pension funds in nominating committees				0.054	
				(0.077)	
CF rights of large, independent private pension funds					0.350
					(0.295)
CF rights of large, independent private pension funds* Large, independent private funds in nominating committee					7.833***
					(0.741)
CF rights of large, not independent private pension funds					-0.507*
					(0.275)
CF rights of large, not independent private pension funds* Large, not independent private funds in nominating committee					0.693**
					(0.302)
CF rights of small private pension funds					0.069
					(0.210)
CF rights of small private pension funds*Small private pension funds in nominating committee					-0.373*
					(0.193)
Wedge for the largest shareholder				0.000	-0.002
				(0.004)	(0.004)
Log of the number of employees				-0.139	-0.775
				(0.382)	(0.511)

R&D expenses to total assets				-3.016	-7.396
				(5.253)	(8.512)
Leverage				-1.527	2.504
				(2.343)	(3.299)
Turnover				-219.29	-529.70
				(263.13)	(340.41)
Observations	45775	45775	45775	1879	1380
R-squared				0.07	0.16

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