THE UNIVERSITY OF TEXAS AT SAN ANTONIO, COLLEGE OF BUSINESS

Working Paper SERIES

November 28, 2007

0025ACC-501-2007

DO HIGHLY COMPENSATED PARTICIPANTS INFLUENCE THE MANAGEMENT OF QUALIFIED PENSION PLANS?

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October 2007

I am grateful to Sharon Watson, US Department of Labor, Employee Benefits Security Administration for her help in making the data available and in its interpretation and to participants at the 2007 National AAA Meeting, Dr. Steve Balsam, Lucy Chen, Yinqi Zhang, Shelly Ye, and Yinghong Zhang for their comments and suggestions.

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ABSTRACT

This paper presents evidence of favorable management of qualified pension plans with large proportion of highly compensated employees. Defined-benefit pension plans that are dominated by highly compensated employees tend to contribute beyond the minimum amount required under Internal Revenue Code (flow effect) resulting in overfunded plans (stock effect) and then use aggressive actuarial assumptions to disguise the overfunding to avoid visibility costs (reporting effect). This favored treatment is less likely when the sponsoring firm has an active labor union (monitoring effect). These actions contradict the provisions under the Employee Retirement Income Security Act and the Internal Revenue Code, which prohibit favorable treatment for highly compensated employees.

KEYWORDS

Defined-Benefit Pension plans; highly compensated employees; funding; actuarial assumptions

JEL DESCRIPTORS:

C33; G23; J26; J51; M41, M590

DO HIGHLY COMPENSATED PARTICIPANTS INFLUENCE THE MANAGEMENT OF QUALIFIED PENSION PLANS?

The Internal Revenue Code of 1954 (IRC), as amended, designates corporate pension plans that meet certain requirements as "qualified." A qualified status carries several tax advantages, such as, deductibility of contributions as expenses, exemption of earnings on plan assets from tax for employers, and exemption of contributions from tax for employees till disbursement, among many others. The Employee Retirement Security Act (ERISA) 1974 provides that qualified pension plans must benefit employees in general and not a limited number of favored officers, shareholders, and highly compensated employees (henceforth, HCE)[1]. Thus, the plans cannot discriminate with respect to coverage, contributions, or benefits.[2] In an effort to implement this mandate, the Internal Revenue Service (IRS) has issued multiple regulations and rulings regarding benefit formula, salary base for benefit determination, vesting, employee contributions, and plan terminations.

This paper examines the effectiveness of existing rules and regulations in curbing favored treatment of HCE dominant plans. The US pension law is very complex and the actuarial assumptions needed to determine accrued pension liability and annual contributions are extremely difficult to interpret and monitor. Using IRS Form 5500 reports filed by private pension plans with the Department of Labor under provisions of ERISA, the paper shows that managers take advantage of this complexity and lack of

[1] ERISA defines a highly compensated employee as an employee who is (A) a five-percent owner, or (B) has compensation in excess of $80,000 (indexed for inflation from 1996) and (C) is in the top-paid-group of employees (top 20% by compensation).

[2] Firms can set up nonqualified deferred compensation plans for select executives or HCE. These are called top-hat or supplemental executive retirement plans. They are not qualified under ERISA and IRC, and are not subject to any funding, coverage, benefit, disbursement, or nondiscrimination rules. The current paper examines the management of qualified pension plans only.

transparency of pension law to manage their pension plans in a manner that benefits the HCE to the detriment of non-HCE.

More specifically, the paper provides evidence that defined-benefit (henceforth, DB) plans with higher proportion of HCE tend to over-contribute beyond the minimum required by the IRC. Over period of time, with the higher contributions, the plans end up as overfunded, but using actuarial manipulations the sponsoring firm disguises the overfunding and avoids political and visibility costs.

This paper provides useful findings for federal agencies, such as, the Department of Labor and Pension Benefit Guaranty Corporation (PBGC) that monitor the operation of private pension plans to ensure equitable coverage and distribution of benefits to all employees; the Department of Treasury and the IRS that ensure that the billions of dollars of tax benefits provided to such qualified plans are utilized for the intended objectives; and labor unions and employees who are interested in safeguarding the retirement income of the plan participants. The paper also adds to the existing literature on pension management and managerial manipulations to maximize personal gains.

The rest of the paper is organized as follows. The next section discusses the theory and develops the hypotheses. Sections 2 and 3 explain the sample selection procedure and research design, respectively. Section 4 presents the empirical results and section 5 the conclusion.

I THEORY AND DEVELOPMENT OF HYPOTHESES

In 2002, the total assets in qualified U.S. retirement income plans were over $10

trillion. Of this amount, over $1.5 trillion was in private DB plans.[3] The total benefits paid out by private pension plans were over $300 billion and the annual contribution was over $190 billion.[4] At the beginning of 2002, there were over 53 thousand DB plans with over 41 million participants (Rajnes 2002). The value of the tax benefits to qualified pension plans in terms of foregone Federal revenues was estimated over $100 billion.[5] Thus, private pension plans are a significant component of the U.S. economy.[6] The interest of regulators, investors, and employees in such plans has recently increased with the projected shortfalls in the Social Security system in the near future and PBGC deficits. The rest of the section discusses the extant research and develops the hypotheses.

A. Existing Research

This paper is related to two streams of research: One that looks at the determinants of pension plan management, and the other that examines managers' incentives to maximize their compensation through opportunistic discretionary decisions. A firm's pension policy has three major components: funding policy, reporting policy, and investment policy. Prior researchers have looked at the determinants of pension funding policy. This research shows that financial slack (Feldstein and Morck 1983; Bodie and Papke 1992); effective tax rates, capital availability, debt-equity ratios, and bonding of employees (Francis and Reiter 1987); corporate liabilities (Friedman 1983); and financial weakening and takeover threats (Mittelstaedt 1989) affect the funding

[3] Source: EBRI Pension Investment Report: First Quarter 2003. The remaining assets pertain to defined-contribution, Federal, State, and local government plans, and IRAs.
[4] Source: U.S. Department of Commerce, Bureau of Economic Analysis.
[5] Assuming a 35% corporate marginal tax rate with a 5% return on pension assets.
[6] Appendix 1 provides a brief overview of the US pension system.

decisions of firms. Thomas (1989) and Ippolito and James (1992) investigate the causes of plan termination.

Prior research has also examined the firm's strategic reporting choices of defined-benefit pension benefits. Firms can influence their reported defined-benefit pension obligations by adjusting their actuarial choices. Bodie et al (1987), Thomas (1988), Ghicas (1990), Thomas and Tung (1992), Godwin et al (1995), and Asthana (1999) study the determinants of actuarial choices for defined-benefit pension plans. They show that profitability, tax liability, working capital, debt, rate of undertaking of new investments, reimbursements to defense contractors, funded level, contribution level, excess cash from operations, and income management incentives motivate managers to strategically change their reported defined-benefit pension obligations. Bodie et al (1987), Friedman (1983), and others have examined firms' investment policies. McGill and Grubbs (1989) and Winklevoss (1993) discuss the various components of pension fund investment policy in detail. More recently, Bergstresser et al. (2004) conclude that managers manipulate assumed rates of return on pension assets as they exercise large amounts of stock options.

Agency theory predicts that management can fail to act in the best interests of shareholders (Jensen and Meckling 1976). Healy (1985), Gaver et al. (1995), and Holthausen et al. (1995) find evidence that managers make discretionary accounting decisions to manipulate earnings and maximize their multi-period bonus. Other empirical studies document the existence of CEOs' opportunistic behavior when setting their own compensation (Yermack 1997; Balsam 1998; Gaver and Gaver 1998; Aboody and Kasznik 2000). Mallette et al.(1995), Sridharan (1996), and Core et al. (1999) find that

CEO duality increases CEO's compensation. DeFond and Park (1997) argue that reputation concerns and the threat of displacement are likely to be incentives for managers to smooth earnings. Bens et al. (2003) investigate whether firms' share repurchases are due to incentives to manage diluted EPS. They report that firms manage EPS and increase their share repurchases when the effect of outstanding employees options on diluted EPS increases, and earnings are below the desired EPS growth level. Ericson et al. (2003) find that the likelihood of fraud increases with higher levels of bonus and stock-backed grants. Johnson et al. (2003) show that executives at fraud firms have greater potential payoffs via options and stock holdings from share price increase. Efendi et al. (2007) examine misstatements of financial statements and report evidence the likelihood of a misstatement increases greatly when the CEO has a sizable amount of stock options "in-the-money."

Bebchuk and Jackson (2005) synthesize the research in the areas of pension and executive compensation and correctly label postretirement benefits for HCE as "stealth compensation" due to its opacity. The current paper further extends the two streams of research by showing that highly compensated employees' incentives to secure their post-retirement benefits motivates them to overfund their pension plans through larger contributions and then avoid visibility costs by making aggressive actuarial choices. Since resources allocated to pension plans are limited, the actions of highly compensated employees are detrimental to the interests of less privileged employees.

B. Development of Hypotheses

DB plans with larger proportion of risk-averse HCE will use their influence to manage their pension plans to their advantage by using corporate funds to keep their

plans "safe" by overfunding them. Overfunded plans are safer since early termination of such plans will not result in participants losing their vested benefits. On the contrary, underfunded DB plans have to depend on PBGC in case of termination and the PBGC insures only a portion of the benefits.[7] Plan terminations are not uncommon. During 1997-2001, over 15 thousand DB plans terminated affecting over 2.7 million participants (Rajnes 2002). This provides motivation to highly compensated employees to use their influence to keep their plans overfunded. Overfunded status of DB plans can be achieved by over contributing to the plan each period. ERISA and IRC require that firms make the "minimum required contribution" per period. To lessen the burden on PBGC, the law also allows overfunding of DB plans.[8] Thus, plans can contribute to a "maximum tax-deductible" limit. Over time, this results in an overfunded plan. Thus, the first two hypotheses can be stated as:[9]

H1: Defined-benefit pension plans with larger proportion of highly compensated employees are more likely to have annual contribution in excess of the minimum contribution required by law. (FLOW EFFECT)

H2: Defined-benefit pension plans with larger proportion of highly compensated employees are more likely to be overfunded. (STOCK EFFECT)

Overfunded pension plans can attract attention resulting in visibility costs. Prior research shows that overfunded plans are candidates for takeovers (Mittelstaedt 1989; Ippolito and James 1992). Labor negotiations in overrfunded firms are likely to focus on granting additional benefits to employees (Bulow, Scholes, and Menell 1983).

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[7] For example, in 2001 PBGC guarantees a maximum of $3,392.05 per month per worker (Rajnes 2002). Any vested benefits in excess of this amount can be lost on plan termination.

[8] Under provisions of the Pension Protection Act which subsequently became part of the Omnibus Budget Reconciliation Act of 1987

[9] All hypotheses are stated in alternate form.

Stockholders also face increased investment risks in overfunded plans (Asthana 1999). Thus, management has incentives to disguise plan overfunding. Firms make several actuarial choices, such as discount rate, actuarial cost method, salary growth rate, withdrawal rate, retirement age, mortality rate, etc. to estimate the pension liabilities and annual contributions of DB plans. The complexity of the pension law and the flexibility of actuarial choices make the pension calculation "soft" and discretionary (Scholes and Wolfson 1992). Prior research, discussed above, shows that actuarial choices provide a convenient and safe tool for managers to disguise the overfunding of DB plans. In addition, immunity from being sued for damages (Barrett 1993) and fear of termination motivates the actuaries to be indifferent over a range of actuarial values (Asthana 1999). Thus, hypothesis 3 states:

H3: Defined-benefit pension plans with larger proportion of highly compensated employees are more likely to disguise their overfunded status through aggressive actuarial assumptions. (REPORTING EFFECT)

The DB plan is the major source of livelihood for employees after their retirement. Thus, employees will be interested in the proper management of the plans so that their benefits do not suffer. However, due to the very complex nature of pension accounting, individual employees will rarely possess the expertise to monitor the plans effectively. But if the employees are organized by labor unions, the monitoring will be more effective, given the increased resources and influence of unions over management. As a result, sponsoring firms with strong unions are less likely to mismanage DB plans in favor of HCE for fear of detection and ensuing visibility costs. The last hypothesis can now be stated as:

H4: The FLOW, STOCK, and REPORTING EFFECTS will be weaker in defined-benefit pension plans that are sponsored by firms with strong unions. (MONITORING EFFECT)

II DATA SOURCE AND SAMPLE SELECTION

ERISA (sections 104 and 4065) and IRC (sections 6047e, 6057b, and 6058a) require employee benefit plans to file individual annual reports on Form 5500 and corresponding schedules to the IRS. The IRS provides a copy of these reports to the Employee Benefits Security Administration division of the Department of Labor. Data pertaining to Form 5500 and Schedules B (actuarial information), H (financial information), and T (coverage information) for the period 1999-2003 were obtained from the Department of Labor under the Freedom of Information Act. For a qualified pension plan to be included in the sample:

1. The plan must have at least one year's information available.
2. The plan must be a single-employer plan
3. The plan must be a qualified DB plan.
4. The plan must have complete information on Form 5500, and Schedules B, H, and T

Multi-employer and multiple employer plans are dropped from the sample since it is difficult to model the individual firm's incentives to manage the actuarial choices. Defined-contribution plans are also dropped from the sample, since they do not make actuarial assumptions to estimate the minimum required funding levels. Table 1 shows the sample selection procedure. The final sample consists of 31,288 observations

sponsored by 16,142 firms.[10] Financial variables needed in the analysis were obtained from the Compustat database. Employer identification numbers (EIN) were used to merge the two databases. This results in the Compustat sample of 2,115 observations sponsored by 831 firms.[11]

(insert table 1 about here)

III RESEARCH DESIGN

To test the hypotheses, the paper defines a variable, HIPARTICIPANT to measure the proportion HCE in the plan as the number of benefiting employees who are HCE (item 4C(6) of Schedule T) divided by the total number of employees who benefit under the plan (item 4C(5) of Schedule T).

Both univariate and multivariate tests are conducted for hypotheses 1-4. Portfolio analysis is used for univariate tests. Multivariate analysis is carried out with the following system of five equations.

$$\begin{aligned}\text{CONTRIBUTION} = {} & \beta_{000} + \beta_{001}\,\text{DY0} + \beta_{002}\,\text{DY1} + \beta_{003}\,\text{DY2} + \beta_{004}\,\text{DY3} \\ & + \beta_{005}\,\text{HIPARTICIPANT} + \beta_{006}\,\text{HIPARTICIPANT*UNION} + \beta_{007}\,\text{DEFICIENCY} \\ & + \beta_{008}\,\text{FUNDINGRATIO} + \beta_{009}\,\text{DISCOUNTRATE} + \beta_{010}\,\text{WITHDRAWRATE} \\ & + \beta_{011}\,\text{COSTMETHOD} + \beta_{012}\,\text{PORTFOLIORISK} + \beta_{013}\,\text{ACTIVERATIO} \\ & + \beta_{014}\,\text{SALARYGROWTH} + \beta_{015}\,\text{SALARYBASED} + \beta_{016}\,\text{RETIREAGE} \\ & + \beta_{017}\,\text{PLANSIZE} + \beta_{018}\,\text{UNION} + \epsilon_0 \end{aligned} \quad (1)$$

$$\begin{aligned}\text{FUNDINGRATIO} = {} & \beta_{100} + \beta_{101}\,\text{DY0} + \beta_{102}\,\text{DY1} + \beta_{103}\,\text{DY2} + \beta_{104}\,\text{DY3} \\ & + \beta_{105}\,\text{HIPARTICIPANT} + \beta_{106}\,\text{HIPARTICIPANT*UNION} + \beta_{107}\,\text{CONTRIBUTION} \\ & + \beta_{108}\,\text{DISCOUNTRATE} + \beta_{109}\,\text{WITHDRAWRATE} + \beta_{110}\,\text{COSTMETHOD} \\ & + \beta_{111}\,\text{PORTFOLIORISK} + \beta_{112}\,\text{ACTIVERATIO} + \beta_{113}\,\text{SALARYGROWTH}\end{aligned}$$

[10] Plans have to clear one of the two nondiscriminatory tests, ratio percentage test or average benefit test, to be qualified. 90.56% of the sample plans passed the ratio percentage test and the rest the average benefit test. The two tests are discussed in detail in McGill and Grubbs (1989) and the instructions to Schedule T of Form 5500.

[11] The Compustat sample is approximately 7% of the full sample. This is consistent with the 8% sample obtained by Asthana (1999) with a manual merge.

$$+ \beta_{114} \text{SALARYBASED} + \beta_{115} \text{RETIREAGE} + \beta_{116} \text{PLANSIZE} + \beta_{117} \text{UNION} + \epsilon_1 \quad (2)$$

$$\text{DISCOUNTRATE} = \beta_{200} + \beta_{201} \text{DY0} + \beta_{202} \text{DY1} + \beta_{203} \text{DY2} + \beta_{204} \text{DY3} + \beta_{205} \text{HIPARTICIPANT} + \beta_{206} \text{HIPARTICIPANT*UNION} + \beta_{207} \text{CONTRIBUTION} + \beta_{208} \text{FUNDINGRATIO} + \beta_{209} \text{WITHDRAWRATE} + \beta_{210} \text{COSTMETHOD} + \beta_{211} \text{MNDISCOUNTRATE} + \beta_{212} \text{PORTFOLIORISK} + \beta_{213} \text{ACTIVERATIO} + \beta_{214} \text{SALARYGROWTH} + \beta_{215} \text{SALARYBASED} + \beta_{216} \text{RETIREAGE} + \beta_{217} \text{PLANSIZE} + \beta_{218} \text{UNION} + \epsilon_2 \quad (3)$$

$$\text{WITHDRAWRATE} = \beta_{300} + \beta_{301} \text{DY0} + \beta_{302} \text{DY1} + \beta_{303} \text{DY2} + \beta_{304} \text{DY3} + \beta_{305} \text{HIPARTICIPANT} + \beta_{306} \text{HIPARTICIPANT*UNION} + \beta_{307} \text{CONTRIBUTION} + \beta_{308} \text{FUNDINGRATIO} + \beta_{309} \text{DISCOUNTRATE} + \beta_{310} \text{COSTMETHOD} + \beta_{311} \text{MNWITHDRAWRATE} + \beta_{312} \text{PORTFOLIORISK} + \beta_{313} \text{ACTIVERATIO} + \beta_{314} \text{SALARYGROWTH} + \beta_{315} \text{SALARYBASED} + \beta_{316} \text{RETIREAGE} + \beta_{317} \text{PLANSIZE} + \beta_{318} \text{UNION} + \epsilon_3 \quad (4)$$

$$\text{LOGIT(COSTMETHOD)} = \beta_{400} + \beta_{401} \text{DY0} + \beta_{402} \text{DY1} + \beta_{403} \text{DY2} + \beta_{404} \text{DY3} + \beta_{405} \text{HIPARTICIPANT} + \beta_{406} \text{HIPARTICIPANT*UNION} + \beta_{407} \text{CONTRIBUTION} + \beta_{408} \text{FUNDINGRATIO} + \beta_{409} \text{DISCOUNTRATE} + \beta_{410} \text{WITHDRAWRATE} + \beta_{411} \text{MNCOSTMETHOD} + \beta_{412} \text{PORTFOLIORISK} + \beta_{413} \text{ACTIVERATIO} + \beta_{414} \text{SALARYGROWTH} + \beta_{415} \text{SALARYBASED} + \beta_{416} \text{RETIREAGE} + \beta_{417} \text{PLANSIZE} + \beta_{418} \text{UNION} + \epsilon_4 \quad (5)$$[12]

where (in order of appearance):

CONTRIBUTION is the employer's annual contribution (in $ 000) per participant to the DB plan

β are the regression coefficients and ϵ are the error terms

DY0...DY3 are annual dummies for 2000…2003 (1999 is included in the common intercept) and control for any year-specific effects or trends

UNION is a trichotomous variable that captures the degree of participation in unions. The coding is based on the percentage of employees that are members of unions published by US Department of Labor, Bureau of Labor Statistics. If the participation rate for the sponsoring firm's industry is 20% or more the variable is coded as 2; if the participation rate is 10% or more but less than 20% the variable is coded as 1; and 0 otherwise.

DEFICIENCY is the beginning-of-the year funding deficiency under the US Pension law

FUNDINGRATIO is the ratio of assets of the DB plan to its liabilities adjusted for actuarial biases (Appendix 2 discusses the debiasing procedure in detail)

DISCOUNTRATE is the assumed discount rate used by DB plans to estimate their current pension liabilities[13]

[12] Equation 5 is run as a Logit regression since the dependent variable is a 4-level dummy variable.

[13] Discount rate has the maximum impact on pension estimates. A 1% increase (decrease) in discount rate results in a 16-30% decrease (increase) in annual contribution (McGill and Grubbs 1989).

WITHDRAWRATE is the assumed rate of employee withdrawal from the DB plan at age of forty years

COSTMETHOD is a multilevel variables that denotes the liberalness of the actuarial cost method based on the classification used by Asthana (1999), Thomas and Tung (1992) and Winklevoss (1993). It takes the value three for unit credit/accrued benefit method; two for entry age normal method; one for attained age normal, frozen initial liability, individual aggregate, and aggregate methods; and zero for individual level premium method.[14]

PORTFOLIORISK is the riskiness of the DB plan investment portfolio and controls for the impact of firm's investment policy on pension plan management. Asthana and Lipka (2002) rank the different categories of pension asset investments by their riskiness. Using their classification, corporate stocks (preferred and common), master trust investment accounts, and common/collective trusts are the most risky investments. The remaining categories, such as, corporate debt instruments, mutual funds, US Government securities, interest bearing cash, are less risky. PORTFOLIORISK is the proportion of total pension assets invested in corporate stocks (preferred and common), master trust investment accounts, and common/collective trusts

ACTIVERATIO is the ratio of active to total plan participants and controls for participant profile

SALARYGROWTH is the estimated annual increase in salary and is included since it affects the contributions

SALARYBASED is a dichotomous variable with value of 1 if benefits are salary based and 0 if flat-dollar based. This variable controls for the differences arising out of benefits-formula

RETIREAGE is the assumed weighted average retirement age for the plan participants and controls for systematic variations with proportion of HCE.

PLANSIZE is the natural logarithm of plan assets and controls for size related effects

MN prefixed to a variable implies the industry mean for the 2-digit NAICS code. This represents the unbiased components of the actuarial estimates (Asthana 1999)

These variables are summarized in Table 2.

(insert table 2 about here)

CONTRIBUTION is the annual cash flow to the pension plan and represents the flow effect. This variable should depend on the funding deficiency. Higher deficiency means accelerated contributions under ERISA. After controlling for other factors that may affect annual contributions to the plan, the coefficient on HIPARTICIPANT should capture the flow effect. H1 posits that the coefficient on HIPARTICIPANT will be

[14] The actuarial cost methods are discussed in detail in Winklevoss (1993).

positive (flow effect).

The firm's annual contribution will depend inversely on the firms funded status. Eventually, the firms funded status is the cumulative effect of annual contributions. Moreover, the annual contribution and funded status will depend mathematically on the actuarial assumptions. Conversely, the bias in actuarial assumptions may be a function of annual contribution and funded status. Finally, the actuarial assumptions may also be correlated with each other (Asthana 1999). As a result, the five dependent variables in equations 1-5 are not exogenous variables. To avoid this problem of endogeneity, the five equations are estimated as a system of simultaneous equations.

FUNDINGRATIO is the funded status of the plan at a given point in time and represents the pension stock. H2 predicts that DB plans with higher proportion of HCE will tend to be overfunded (stock effect). This implies a positive coefficient on HIPARTICIPANT in equation 2. The three actuarial variables, DISCOUNTRATE, WITHDRAWRATE, and COSTMETHOD are defined such that higher values denote liberal estimates (lower values of pension liability) and lower values denote aggressive or conservative estimates (higher values of pension liability). H3 predicts negative signs for HIPARTICIPANT in equations 3-5 (reporting effect). In other words, HCE dominated plans will use aggressive assumptions to disguise their overfunded status and justify their excess contributions.

Finally, H4 posits that the flow, stock, and reporting effects will be milder in the presence of active unions due to the increased visibility and political costs (monitoring effect). If the monitoring effect exists, the coefficients on HIPARTICIPANT in equations 1-5 will be closer to zero for firms with strong unions. This implies that the coefficients

on HIPARTICIPANT*UNION will be opposite to those on HIPARTICIPANT. Thus, HIPARTICIPANT*UNION will be negative in equations 1 and 2 and positive in equations 3-5.

IV EMPIRICAL RESULTS

A. Univariate Tests

Table 3 presents the results of univariate analysis. Hypothesis 1 predicts that HCE dominated plans will contribute in excess of the minimum required contribution with the intention of eventually overfunding the plan. Panel A of table 3 shows the portfolio test for the flow effect. Since contribution is a direct function of funding deficiency of the DB plan, the research design tries to control for the level of deficiency by splitting the sample into high and low deficiency groups (DEFICIENCY above and below median). Within each subgroup, two portfolios with proportion of HCE above and below median are further created. CONTRIBUTION is then compared for high and low HCE portfolios within each subgroup of high and low DEFICIENCY. CONTRIBUTION is always significantly greater for the high HCE portfolio, suggesting that HCE dominated plans push more contribution per employee, holding every thing else constant (flow effect). This finding is consistent with H1.

(insert table 3 about here)

Panel B compares two portfolios with HIPARTICIPANT above and below median value. As predicted by H2, FUNDINGRATIO is significantly higher for the HCE dominant group (HIPARTICIPANT > median), confirming that as the proportion of HCE in a DB plan increases they assert their influence to overfund the plan (stock effect). The

difference in FUNDINGRATIO between the two groups is 14.33%. For an average sample plan (with assets of $82 million) this translates to a difference of almost $12 million in pension assets. DISCOUNTRATE, WITHDRAWRATE, and COSTMETHOD are all significantly lower (more aggressive) for the high HCE group in comparison to the low HCE group. Thus, to avoid political and visibility costs, HCE dominated plans make aggressive actuarial assumptions and disguise the overfunding and excess contributions (reporting effect). This supports H3. Mean values of the actuarial assumptions for each quartile of HIPARTICIPANT are plotted in figure 1. The systematic choices of more aggressive actuarial estimates with increasing proportion of HCE in the plan is clear from the plots in panels A, B, and C.

(insert figure 1 about here)

B. Multivariate Tests

Multivariate tests of H1-4 are reported in table 4. Coefficients of HIPARTICIPANT are significantly positive in the first two and significantly negative in the last three regressions. These results are consistent with H1-3 and the univariate results. As the proportion of HCE in the DB plan grows, the plans tend to over-contribute (flow effect); end up overfunded (stock effect); and then use aggressive actuarial assumptions to mask the overfunding (reporting effect).[15] The coefficients of HIPARTICIPANT in regressions 1 and 2 imply that the employer's annual contribution goes up by $2,215 per participant and the funding ratio by 2% for every 10% increase in the proportion of HCE in the plan. HIPARTICIPANT*UNION is significantly negative

[15] In other words, as the proportion of HCE increases, firms make more aggressive actuarial assumptions, to inflate their pension liabilities. The inflated pension liabilities deflate their reported funding ratios and justify higher annual contributions by increasing the minimum-required and maximum tax deductible contributions, thereby, minimizing visibility costs.

in the first two regressions and significantly positive in regressions 3 and 4. The coefficient is insignificant in the last regression. This suggests that the flow, stock, and reporting effects are subdued in the presence of a strong union, consistent with H4 (monitoring effect).

(insert table 4 about here)

With regards to the control variables, DEFICIENCY is significantly positive (henceforth, positive) as expected. Higher shortfalls in the desired funding level result in accelerated annual contributions. ERISA requires this catch-up funding with the intent of securing the benefits for participants and minimizing potential losses to PBGC in case of premature plan termination. CONTRIBUTION and FUNDINGRATIO are inversely correlated in equations 1 and 2, signifying that overfunded plans have lower annual contributions, consistent with ERISA provisions. In equations 3-5, these two variables are negative (with one exception) implying that plans indulging in overfunding are likely to make aggressive actuarial estimates to hide the overfunding. Likewise, DISCOUNTRATE, WITHDRAWRATE, and COSTMETHOD are negative in equations 1 and 2. These three variables are positively correlated with each other in equations 3-5, suggesting that they are jointly determined (Asthana 1999) and tend to move together towards liberal or aggressive estimates.

Industry means (MNDISCOUNTRATE, MNWITHDRAWRATE, and MNCOSTMETHOD) in equations 3-5 are always positive implying co-movement with industry trends. PORTFOLIORISK is significant in 4 cases; ACTIVERATIO in 2 cases; SALARYGROWTH, RETIREAGE, PLANSIZE, and UNION in all five cases; and SALARYBASED in 3 cases.

C. Regression Diagnostics

The Belsley, Kuh, and Welsch (1980) test for multicollinearity is conducted on all the regressions reported in panel A of table 4 and the highest variance inflation factor (VIF) are reported. The highest VIF in all regressions are below the critical level of 10. Therefore, multicollinearity does not appear to be a problem. White's (1980) test for heteroskedasticity is also conducted on all the regressions. The null of homoskedastic errors is rejected for all of them. Consequently, White's heteroskedasticity corrected t statistics are also estimated (not reported). The conclusions are unaltered. Finally, the conclusions do not change when Belsley, Kuh, and Welsch's (1980) procedure is used to remove outliers, therefore, all regressions are reported without outlier removal. These diagnostic procedures are also conducted on all subsequent regressions with similar conclusions. However, the results are not reported for the sake of brevity.

D. Intra-Firm Matched-Pair Design

In addition to the full sample tests discussed above, the paper also conducts intra-firm matched-pair tests. Only firms with two or more DB plans in one year are retained in the test. The highest HIPARTICIPANT is matched with the lowest HIPARTICIPANT for that firm-year. The second-highest HIPARTICIPANT is matched with the second-lowest HIPARTICIPANT, and so on, till only one or no plans are left for that firm-year. The matched-pair design insures that for every high HCE plan there is a matching low HCE plan from the same firm in the same year. This helps in controlling firm characteristics that may be omitted in the previous regressions. This results in a reduced sample of 2,770 observations (1,385 matched pairs). Regressions 1-5 are rerun with this sub-sample

and reported in table 5. The results are similar to those of tables 4, suggesting that the earlier conclusions are robust with respect to omitted firm characteristics.

(insert table 5 about here)

E. Additional Tests

Controls for Sponsoring Firm's Financial Characteristics

Prior research (Friedman 1983,; Bodie et al. 1987; Francis and Reiter 1987; Thomas 1988; Ghicas 1990; and Asthana 1999) has shown that the firm's financial characteristics, such as, profitability, cash availability, tax rates, corporate debt, and growth opportunities can affect the plan funding and management. The Compustat subsample is used to run regressions 1-5 with the following additional control variables:

DEBTRATIO is the ratio of sponsoring firm's long-term debt to its total assets at the end of the fiscal year;

MARKET2BOOK is the ratio of sponsoring firm's market value to book value at the end of the fiscal year;

PROFITABILITY is the net income of the sponsoring firm during the fiscal year deflated by its total assets at the end of the fiscal year;

CASH is the net cash from operating activities of the sponsoring firm during the fiscal year deflated by its total assets at the end of the fiscal year;

TAXRATE is the total income tax deflated by the pretax income during the fiscal year.

The results for this modified system of equations are presented in table 6. Panel A provides the distribution of these 5 financial variables and panel B the regression

estimates. Mean long term debt of sponsoring firms is 24.07% of the total assets and the market value is more than twice the book value. Mean net income (cash from operations) per dollar of assets is $0.0263 ($0.0770). On average, sponsoring firms pay taxes at the rate of 30.21%. The regression estimates corroborate earlier results and HIPARTICIPANT is in the predicted direction for all five cases. The significance level, however, are lower than those in table 4 (panel A). The smaller sample size could be one reason. Another reason could be that the subsample comprises only large firms due to merging with Compustat, and higher visibility costs for such firms result in less significant results. DEBTRATIO has negative impact on CONTRIBUTION and FUNDINGRATIO. One explanation can be that as firms get closer to debt-covenant violations they minimize pension funding and divert the cash to pay debts. Similarly, MARKET2BOOK is negative in regressions 1 and 2 implying that high growth firms may have alternate uses for cash. PROFITABILITY, CASH, TAXRATE are positive as expected in regressions 1 and 2. More profitable firms and those with surplus cash are likely to overfund. Similarly firms with high tax rates are likely to maximize tax benefits by overfunding their pension plans. These control variables have, generally, opposite signs in the last three regressions because of the inverse relationship between funding and actuarial assumptions.

(insert table 6 about here)

Top Heavy Plans

As plans become "top-heavy," ERISA imposes extra restrictions with regards to

funding, vesting, etc. to safeguard the interests of non-HCEs.[16] To make sure such firms are not driving the results, all plans with HIPARTICIPANT in the upper quartile are deleted (results not reported). The conclusions are unchanged.

Stock Market Trends

The poor stock market performance during the 2000-2002 could affect the relative funded status of the sponsoring firm. Assume an investment portfolio that invests heavily in stocks. At the end of the bull market in 1999, the plan could be overfunded due to good performance of stocks. Eventually the bear market could reduce the same plan to an underfunded status in 2003 due to poor performance of stocks. On the other hand, a portfolio that invested in risk free assets will be relatively immune to the stock market volatility. Thus, FUNDINGRATIO might be systematically related to the investment profile and market performance. To determine if the market performance influenced the conclusions in any way, the test are conducted separately (not reported) for 1999 (end of bull market period) and 2003 (end of bear market period). The conclusions are not affected.

V SUMMARY AND CONCLUSIONS

This paper examines the effect of HCE membership on the management of qualified pension plans. Since HCE have the ability to influence corporate decisions, the paper posits that plans dominated by HCE will be provided favorable treatment. Using a sample of plans that report on Form 5500 to the IRS/DOL for the period 1999-2003, the paper reports evidence that HCE dominated DB plans are more likely to have higher

[16] IRC (§ 416) defines "top-heavy" plan as a plan under which the value of accrued benefits for key-employees exceeds 60% of the accrued benefits for all employees. Key-employees include officers and owners as defined under IRC (§ 416 i).

contributions (flow hypothesis) and be overfunded (stock hypothesis) in comparison to non-HCE dominated plans. HCE prefer overfunded plans since such plans are less dependent on PBGC for benefits in case of plan termination. HCE dominated plans also manage the actuarial assumptions to hide the overfunding with the intention of avoiding visibility costs (reporting hypothesis). These manipulations are less evident when the sponsoring firm has a strong and active labor union (monitoring hypothesis) because of the costs involved on detection.

Overall, the evidence is consistent with HCE exercising their influence to maximize their postretirement benefits and to minimize the associated detection risks. Given that the resources available for funding pension plans are limited, the preferential management of HCE dominated plans tends to adversely affect the expected postretirement benefits of non-HCE dominated plans. This violates the letter and spirit of ERISA and IRC that prohibit any actions that benefit a privileged group of employees to the detriment of other less privileged employees. The evidence also suggests that the current level of monitoring by regulatory agencies, such as the IRS, Department of Labor, Department of Treasury, and the PBGC is not enough to check the manipulation of postretirement benefits. The paper develops tests that can help regulatory agencies strengthen the monitoring process.

Additional disclosures based on predetermined uniform actuarial values provided by the DOL could also be mandated. Though minimal in costs, such additional disclosures would significantly reduce the opaqueness of pension disclosures and reduce the opportunistic management of HCE dominated pension plans.

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APPENDIX 1
BRIEF OVERVIEW OF THE PENSION LAW IN THE UNITED STATES

The United States currently has one of the most extensively developed and complex pension systems that incorporates three major elements: (1) Public Social Security system under the Old-Age, Survivors, and Disability Insurance (OASDI) program; (2) Private pension system; and (3) Individual retirement savings (Hinz 2000). US Government has always tried to encourage private pension plans that supplement public Social Security. Private pension benefits provide a critical component to the income security of today's Americans, especially with the current problems facing the Social Security system.

As early as 1921, favorable tax treatment of the employment-based retirement programs encouraged the expansion of U.S. pension system (Salisbury 2000). The Revenue Acts of 1921 and 1926 granted additional tax breaks for tax-qualified plans. Thus, the origin of private pension system pre-dates the introduction of Social Security in the 1930's. As pensions plans and participants grew in number after World War II, the Congress enacted The Revenue Act of 1942 that required that pension plans had to cover a broad cross-section of employees, not just executives, and could not discriminate in the benefits paid or contributions made for officers, stockholders or other highly compensated employees. The Internal Revenue Code of 1954 further strengthened the statutory base for the tax treatment of private pension plans. The Welfare and Pension Plans Disclosure Act of 1958 tried to provide employees with more information to make the management of pension plans more transparent. However, abuse and mismanagement in the private pension system still existed and was dramatically highlighted by the Studebaker case in 1963 when the company stopped producing automobiles and over 4,000 workers lost significant portion of their vested pension benefits (Coleman 1993). This resulted in the adoption of ERISA that affected plans from a legal, tax, investment, and actuarial standpoint, and included new reporting disclosure and fiduciary requirements (Rajnes 2002).

Pension plans are an important device to attract, retain, and ultimately encourage employees to retire (Bodie and Papke 1992). Pension plans are of two types: defined contribution (DC) and defined benefit (DB). In DC plans, a formula determines

contributions. The employee bears all the investment risk, and the firm has no formal obligation beyond making its annual contributions. In a DB plan, a formula that usually takes into account years of service and wages defines benefits. The investment risk is borne by the sponsoring firm or an insurance agency hired by the firm. The PBGC, guarantees the vested pension benefits up to specified limits.

The IRC regulates the tax treatment of private pension plans. Private pension plans that meet the requirements of the IRC and federal regulations, issued from time to time, are said to be "qualified" for several tax benefits.[17] Employer contributions to qualified plans are deductible, subject to a maximum tax-deductible limit, as ordinary and necessary business expenses for federal income tax purposes.[18] These contributions are not taxable to participants as income until paid out as benefits.[19] The earnings on the pension plan assets, including realized capital gains, are not taxable for the sponsoring firm.[20] Moreover, certain distributions from qualified plans are entitled to favorable tax treatment.[21] Finally, under the tax rules, firms are allowed to over-fund their DB pension plans by up to the statutory limit with tax benefits.[22] For these reasons, "qualified" status is highly coveted by firms. But in return for the tax benefits, a "qualified" plan has responsibilities in regards to coverage, contribution, and benefits. The plan cannot differentiate in favor of officers, shareholders, and highly compensated employees in regards to membership.[23] In addition to coverage, the plan cannot differentiate with respect to contributions or benefits.[24]

[17] IRC § 401(a)
[18] IRC § 404
[19] Treasury Regulations 1.402(a)-1(a)
[20] IRC § 501(a)
[21] IRC § 402(e)(4)(A) and IRC § 402(a)(2). For a more detailed discussion of the tax benefits available to qualified pension plans and its participants, see McGill and Grubbs (1989)
[22] Under provisions of the Pension Protection Act which subsequently became part of the Omnibus Budget Reconciliation Act of 1987
[23] IRC § 410 (b) requires that the plan pass either the "percentage test" or the "average benefit test"
[24] IRC § 401(a)(4)

APPENDIX 2
ESTIMATION OF UNBIASED FUNDING RATIO

Asthana (1999) uses a linear regression model to remove the bias arising from manipulation of actuarial assumptions. An extension of that method is used to estimate FUNDINGRATIO. The reported funding ratio (RFUNDINGRATIO) is the ratio of pension assets to pension liabilities, and pension liabilities are a function of the actuarial assumptions. Thus, RFUNDINGRATIO can be expressed as:

$$\begin{aligned}\text{RFUNDINGRATIO} = {} & \beta_0 + \beta_1\,\text{DISCOUNTRATE} + \beta_2\,\text{WITHDRAWRATE} \\ & + \beta_3\,\text{COSTMETHOD} + \beta_4\,\text{SALARYBASED} + \beta_5\,\text{SALARYGROWTH} \\ & + \beta_6\,\text{ACTIVERATIO} + \beta_7\,\text{RETIREAGE} + \text{error} \qquad \text{(A)}\end{aligned}$$

The remaining variables are as defined in the text and table 2. Unbiased FUNDINGRATIO can then be estimated, as in Asthana (1999), by removing the effects of manipulated actuarial assumptions and replacing with the mean actuarial assumptions for the industry (2-digit NAICS code) in that year (denoted by the prefix MN) in equation (A).

$$\begin{aligned}\text{FUNDINGRATIO} = {} & \text{RFUNDINGRATIO} + \beta_1\,(\text{MNDISCOUNTRATE} - \text{DISCOUNTRATE}) \\ & + \beta_2\,(\text{MNWITHDRAWRATE} - \text{WITHDRAWRATE}) \\ & + \beta_3\,(\text{MNCOSTMETHOD} - \text{COSTMETHOD}) \qquad \text{(B)}\end{aligned}$$

DISCOUNTRATE, WITHDRAWRATE, and COSTMETHOD are all inversely related to pension liability, and, therefore, positively related to RFUNDINGRATIO (Winklevoss 1993). Thus, to disguise overfunding, HCE dominated plans will make aggressive actuarial assumptions (lower values of DISCOUNTRATE, WITHDRAWRATE, and COSTMETHOD) resulting in lower RFUNDINGRATIO.

TABLE 1
SAMPLE SELECTION PROCEDURE

Procedure	Plan-Year Observations
Available plan-year observations on 1999-2003 ERISA files	662,387
Single-Employer pension plans	634,289
Qualified Defined-benefit plans	35,594
Complete Data on Form 5500 and Schedules B, H, and T	†31,288
Data also available on COMPUSTAT	††2,115

† Sponsored by 16,142 firms.

†† Sponsored by 831 firms.

TABLE 2
VARIABLE DEFINITIONS
(in alphabetical order)

Variable	Definition
ACTIVERATIO	The ratio of active plan participants to total plan participants (active, retired, and deceased participants entitled to benefits)
CASH	Net cash from operating activities deflated by total assets
CONTRIBUTION	The annual contribution (in $ 000) per participant by the employer to the defined–benefit pension plan
COSTMETHOD	A multilevel variable with value of 3 for unit credit method; 2 for entry age normal method; 0 for individual level premium method; and 1 for all other actuarial cost methods
DEBTRATIO	Ratio of long-term debt to total assets
DEFICIENCY	The funding deficiency per plan participant (in $ 000) at the beginning of the year
DISCOUNTRATE	The assumed discount rate used by defined-benefit pension plans to estimate their current pension liability
DYi	Dummy variable for year i
FUNDINGRATIO	The ratio of current assets of the defined-benefit pension plan to its total liabilities adjusted for actuarial biases
HIPARTICIPANT	The ratio of highly compensated participants (as defined under ERISA) to the total number of plan participants
MARKET2BOOK	Market to book ratio
MN---------	When prefixed to a variable implies the mean for the two-digit NAICS industry code in that year
PLANSIZE	Natural logarithm of pension assets of plan
PORTFOLIORISK	The riskiness of the defined-benefit pension plan investment portfolio
PROFITABILITY	Return on assets
RETIREAGE	The assumed weighted-average retirement age of plan participants
SALARYBASED	Dummy variable with value of 1 if defined benefits are salary based; and 0 if benefits are flat dollar based
SALARYGROWTH	The estimated annual increase in salary
TAXRATE	Total income tax deflated by pretax income.
UNION	Trichotomous variable with value of 2 (1) if 20% (10%) or more employees in the industry are members of union; and 0 otherwise
WITHDRAWRATE	The assumed rate of withdrawal from the defined-benefit pension plan

TABLE 3
PORTFOLIO ANALYSIS BY PROPORTION OF HIGHLY COMPENSATED PARTICIPANTS

Panel A: Portfolio Test for Flow Effect

Variable	High Deficiency (DEFICIENCY > Median)		Low Deficiency (DEFICIENCY < Median)	
	Proportion of Highly Compensated Participants			
	> Median (N = 7,822)	< Median (N = 7,822)	> Median (N = 7,822)	< Median (N = 7,822)
CONTRIBUTION	19.1500	4.3549	13.2110	1.8769
t Statistic †	***41.75		***46.35	
(p Value)	(0.0001)		(0.0001)	

Panel B: Portfolio Tests for Stock and Reporting Effects

Variable	Proportion of Highly Compensated Participants		† t Statistics (p Value)
	HIPARTICIPANT > Median (N=15,644)	HIPARTICIPANT < Median (N=15,644)	
FUNDINGRATIO	1.0743	0.9310	***23.43 (0.0001)
DISCOUNTRATE	5.9729	6.2235	***-44.23 (0.0001)
WITHDRAWRATE	0.8104	3.2065	***-91.48 (0.0001)
COSTMETHOD	1.4623	1.8259	***-38.18 (0.0001)

See table 2 for variable definitions.
† Satterthwaite t statistics (all variances are significantly different)
*** implies significance at 1% level (two-sided).

TABLE 4
REGRESSION TESTS FOR FLOW, STOCK, REPORTING, AND MONITORING EFFECTS

Independent Variables	Dependent Variables				
	CONTRIBUTION	FUNDINGRATIO	DISCOUNTRATE	WITHDRAWRATE	COSTMETHOD
Intercept	***36.0943	***0.5349	***3.2344	***4.0790	***4.5498
HIPARTICIPANT	***24.4616	***0.1054	***-0.2029	***-1.8075	***-0.6887
HIPARTICIPANT*UNION	***-7.7986	**-0.0427	*0.0359	**0.2378	0.0884
DEFICIENCY	**0.0330				
CONTRIBUTION		***-0.0044	***-0.0021	-0.0001	***-0.0078
FUNDINGRATIO	***-0.8250		***-0.0569	***-0.1560	***-0.1215
DISCOUNTRATE	***-1.7894	***-0.0512		***0.4247	***0.3396
WITHDRAWRATE	***-0.0732	***-0.0024	***0.0220		***0.0366
COSTMETHOD	***-0.4266	***-0.0114	***0.0471	***0.1464	
MNDISCOUNTRATE			***0.3639		
MNWITHDRAWRATE				***0.3705	
MNCOSTMETHOD					***1.3063
PORTFOLIORISK	0.2137	***-0.1243	**0.0214	***0.3822	***1.6506
ACTIVERATIO	***6.5007	***0.2017	-0.0002	0.0003	-0.0005
SALARYGROWTH	***-0.1084	***-0.0054	**0.0035	***0.4383	***0.1062
SALARYBASED	***1.5226	0.0008	***0.0355	0.0055	***0.8922
RETIREAGE	***-0.3631	***-0.0021	***0.0083	***0.0198	***0.0153
PLANSIZE	***-0.3835	***0.0677	***0.0135	***0.0423	***0.0191
UNION	***0.5910	***0.0348	***-0.0258	***-0.3215	***-0.2325
Observations	31,288	31,288	31,288	31,288	31,288
Adjusted R Square	0.5034	0.5750	0.1697	0.4449	0.2821
F / Wald Chi-Sqr Value	1,684.33	2,221.67	356.23	1,394.25	6.168.23
Probability > F / Chi-Sqr	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Highest VIF	2.3351	2.2471	2.3249	2.2149	2.9831
White's Chi-Sqr	4,194.34	2,196.30	5,109.84	8,227.48	5,622.08
Probability > Chi-Sqr	0.0001	0.0001	0.0001	0.0001	0.0001

TABLE 4 (continued)

See table 2 for variable definitions. MN prefixed to a variable implies the mean for two-digit NAICS industry code. Annual dummy variables are not reported for the sake of brevity.

*** implies significance at 1% level; ** implies significance at 5% level; * implies significance at 10% level (all two-sided).

TABLE 5
INTRA-FIRM MATCHED PAIR REGRESSION ANALYSIS

Independent Variables	Dependent Variables				
	CONTRIBUTION	FUNDINGRATIO	DISCOUNTRATE	WITHDRAWRATE	COSTMETHOD
Intercept	***22.9922	***0.3304	***5.8583	**2.1320	**2.4787
HIPARTICIPANT	***23.9692	***0.1234	**-0.1557	***-2.2755	**-0.7568
HIPARTICIPANT*UNION	***-13.8525	*-0.0244	**0.2282	*0.7953	0.0731
CONTRIBUTION		***-0.0022	***-0.0047	**-0.0092	*-0.0095
FUNDINGRATIO	*-0.2770		-0.0175	*-0.1771	***-0.2288
DISCOUNTRATE	***-1.6233	*-0.0198		***0.4643	***0.4318
WITHDRAWRATE	***-0.0832	-0.0008	***0.0164		*0.0309
COSTMETHOD	***-0.2644	***-0.0216	***0.0534	***0.1695	
UNION	***1.2593	***0.0329	**-0.0492	***-0.4931	-0.0130
Observations	2,770	2,770	2,770	2,770	2,770
Adjusted R Square	0.6197	0.5442	0.1634	0.2703	0.2991

See table 2 for variable definitions. Annual dummy variables and other control variables are not reported for the sake of brevity.
*** implies significance at 1% level; ** implies significance at 5% level; * implies significance at 10% level (all two-sided).

TABLE 6
ADDITIONAL TESTS WITH CONTROLS FOR FIRMS' FINANCIAL CHARACTERISTICS

Panel A: Distribution of Financial Characteristics
(N = 2,115)

Variable	Mean	Median	Standard Deviation
DEBTRATIO	0.2407	0.2291	0.2050
MARKET2BOOK	2.0531	1.6047	2.1367
PROFITABILITY	0.0263	0.0267	0.0879
CASH	0.0770	0.0724	0.0747
TAXRATE	0.3021	0.3455	0.1168

TABLE 6 (continued)

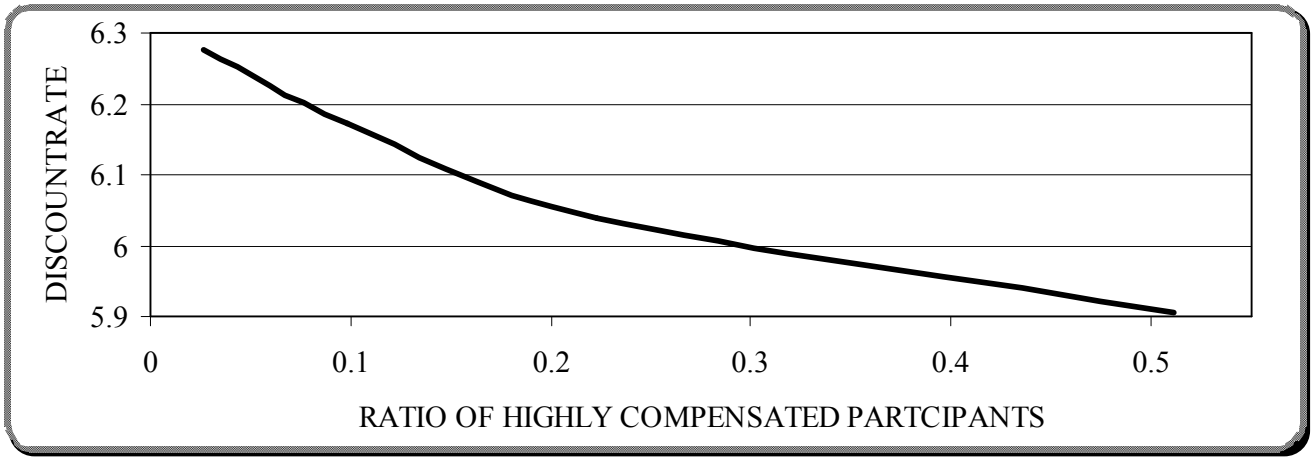
Panel B: Regression Analysis with Controls for Financial Characteristics

Independent Variables	Dependent Variables				
	CONTRIBUTION	FUNDINGRATIO	DISCOUNTRATE	WITHDRAWRATE	COSTMETHOD
Intercept	***7.0356	***0.8385	***3.1187	*2.5967	***5.9612
HIPARTICIPANT	***3.8411	*0.1042	**-0.3453	*-1.2886	*-1.0154
HIPARTICIPANT*UNION	***-1.4640	**-0.1548	*0.2251	*0.4807	0.4877
CONTRIBUTION		***-0.0253	-0.0393	-0.0191	**-0.0462
FUNDINGRATIO	***-0.4928		-0.0014	-0.0693	-0.1500
DISCOUNTRATE	***-1.2459	*-0.0185		0.0961	0.1516
WITHDRAWRATE	0.0032	***-0.0098	0.0036		-0.0277
COSTMETHOD	***-0.1571	***-0.0215	0.0118	0.0884	
DEBTRATIO	*-0.1998	**-0.0555	***0.1973	0.8541	***1.5753
MARKET2BOOK	*-0.0327	*-0.0019	***0.0184	***0.0297	0.0011
PROFITABILITY	*0.7313	**0.1536	***-0.5748	-0.2499	-0.0438
CASH	***1.6360	*0.0666	-0.2384	-1.2767	***-2.1134
TAXRATE	**0.5841	**0.0977	-0.0946	-0.7599	-0.3304
UNION	***0.2418	*0.0214	-0.0106	-0.1811	-0.1951
Observations	2,115	2,115	2,115	2,115	2,115
Adjusted R Square	0.4331	0.3854	0.1690	0.0940	0.0725

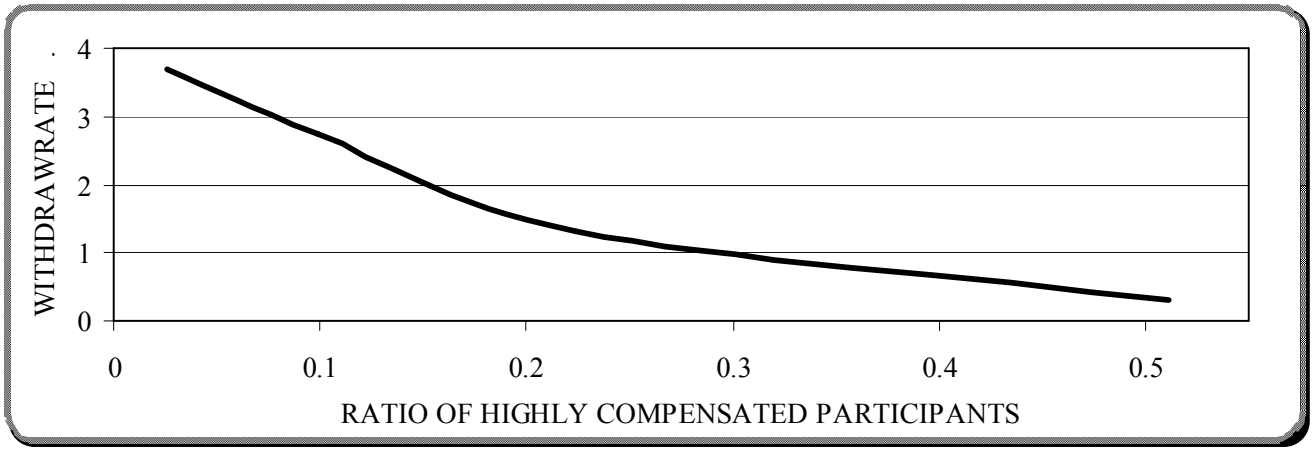
See table 2 for variable definitions. Annual dummy variables and other control variables are not reported for the sake of brevity.
*** implies significance at 1% level; ** implies significance at 5% level; * implies significance at 10% level (all two-sided)

FIGURE 1
PLOTS OF ACTUARIAL ASSUMPTIONS VERSUS HIGHLY COMPENSATED PARTICIPANTS

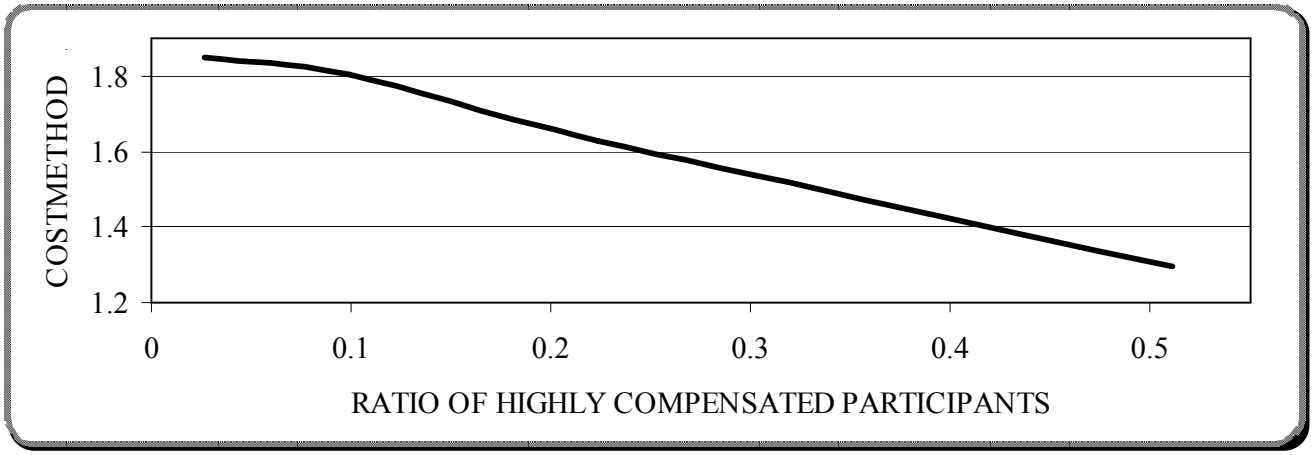
Plot A:



Plot B:



Plot C:



See Table 2 for variable definitions.