Economic Consequences of the Transition from Disclosure to Recognition of Pension Funded Status Following SFAS 158

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ABSTRACT

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This paper examines the economic consequences of SFAS 158 which requires firms to recognize the full funded status of defined benefit pension plans in the balance sheet by investigating: 1) market reactions to relevant rulemaking events; 2) managers’ changes in making estimates for pension accounting and managing plan assets; and 3) firms’ lobbying behavior against the regulatory change in anticipation of the consequences. I find a more pronounced negative abnormal return around the SFAS 158 announcement date in underfunded firms when they have a higher probability of bankruptcy, when they belong to the financial industry where they have to meet capital requirements, or when they have more volatile plan assets. In addition, I find that more underfunded firms tended to increase their discount rate and proportion of equity in plan assets to a greater degree after the introduction of SFAS 158. Furthermore, I find that underfunded firms tended to lobby against the exposure draft during the rulemaking process. I also document the evidence that lobbying firms are more opposed to a provision in the exposure draft when they are more adversely affected.
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1. Introduction

This paper examines the economic consequences of the transition from disclosure to recognition introduced by Statement of Financial Accounting Standards (SFAS) No. 158, “Employers’ Accounting for Defined Benefit Pension and Other Postretirement Plans.” In September 2006, the Financial Accounting Standards Board (FASB) issued SFAS 158, whose most important provision is that the full funded status of all pension and other postretirement benefit plans should be recognized on sponsoring entities’ balance sheets.\(^1\) I investigate 1) how key rulemaking events affected firms’ stock prices; 2) how firms changed their investment decision in plan assets and estimates for pension accounting after the introduction of SFAS 158; and 3) whether firms lobbied against this accounting standard change in anticipation of the consequences for them.

This research question is important for a number of reasons. First, the debate on recognition versus disclosure is one of the most fundamental topics in accounting research. However, despite a long history of debate, accountants have not reached a consensus on whether recognition and disclosure cause differences in managerial behavior and market reaction especially due to the potential methodological problems (Bernard and Schipper 1994). The introduction of SFAS 158 provides researchers with a rare natural setting to avoid these methodological problems for the following reasons. First, there is no self-selection problem in this setting since 1) SFAS 158 was compulsory; and 2) there were few early adopters due to the little gap between the SFAS 158 announcement date and the effective date. Second, disclosure can be compared to recognition with the same information since funded status has already been disclosed in

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\(^1\) Funded status for defined benefit (DB) pension plans is measured as the difference between the fair value of the plan assets and the projected benefit obligation (PBO).
the footnotes of the financial statements before SFAS 158 and SFAS 158 does not require firms to provide additional information for information users.

Second, SFAS 158 influences only balance sheets, not income statements since the smoothing mechanism of the previous accounting regulation still applies to the calculation of net pension expenses and the one-time impact of the regulatory change directly goes to other comprehensive income. Considering prior studies mainly investigate accounting regulation changes that influence earnings, SFAS 158 provides a unique setting to examine the balance sheet effect for accounting researchers.

Finally, despite the decreasing trend of companies sponsoring defined benefit (DB) plans, this regulatory change is still important considering US single-employer DB pension funds held more than $1.59 trillion in assets and more than $1.86 trillion in liabilities in 2004 (PBGC 2007). Zion et al. (2006) estimate that companies in the S&P 500 index will report an aggregate increase in liabilities of $483 billion and an aggregate decrease in stockholders’ equity in excess of $248 billion. Bryan et al. (2007) also estimate that, for the Dow 30 companies with DB pension plans, the introduction of SFAS 158 will reduce aggregate owners’ equity by over 12%, reduce aggregate total retained earnings by almost 16%, and increase aggregate total liabilities by almost 4 %.

As a first stage, I examine the stock market reaction around the key SFAS 158 rulemaking events. If firms with DB pension plans are exposed to the possibility of debt covenant or other contractual arrangement violation due to their underfunded status after SFAS 158, those firms may suffer a negative market reaction around the key rulemaking events. That negative reaction will be more severe for firms which are more likely to suffer contractual arrangement violations. I find that a negative abnormal return around
the SFAS 158 announcement date is more pronounced in underfunded firms when they have a higher probability of bankruptcy or when they belong to the financial industry where they have to meet regulatory capital requirements. I also document that more underfunded firms with a larger proportion of plan assets invested in equity experience more negative abnormal returns around the SFAS 158 announcement date, implying that funded status concerns the market when the volatility of plan assets is high.

In addition, I examine how SFAS 158 affects firms’ pension policy and assumptions. It is likely that after the recognition of funded status, more underfunded firms would increase their discount rate for pension liabilities to reduce net pension liabilities that should be recognized. Also, more underfunded firms would manage their plan assets either more conservatively to mitigate the impact of volatility of their plan assets on balance sheets or more aggressively to make up their funded status faster due to the aspect of the pension liability as a contingent claim (Sharpe 1976; Bodie 1990). I find that 1) an increase in a discount rate is significantly larger for more poorly-funded firms; and 2) more underfunded firms tended to invest more in equity than better-funded firms, implying that those firms are more willing to make a risky investment.

Finally, I examine whether firms with DB pensions were aware of the above economic consequences during the rulemaking period and lobbied against the regulatory change to ensure that the status quo remains. I hypothesize that the lobbying firms (firms that sent comment letters to the FASB) are larger and more underfunded among firms with DB pension plans. Logistic and probit regressions show that funded status and firm size predicts the lobbying behavior after controlling for other firm characteristics. Further

2 For example, in Boeing’s 2006 annual report, the company mentions that it is increasing its allocation to fixed income securities and increasing the duration of its fixed income holdings in order to reduce the volatility between the value of pension assets and liabilities.
analysis reports that among lobbying firms, firms that would be more unfavorably affected by the regulatory change tended to oppose more strongly the issues in the exposure draft (ED). Specifically, firms that have a higher ratio of projected benefit obligation (PBO) over accumulated benefit obligation (ABO) tended to be more opposed to the recognition of funded status based on PBO while firms that have a more gap between measurement date and fiscal year end date were more likely to oppose the matching of measurement date and fiscal year end date.

In summary, this paper provides evidence that 1) the market reacts unfavorably to underfunded firms when they are more likely to violate contractual requirements, 2) more poorly funded firms tended to increase their discount rate and the proportion of plan assets invested in equity to a greater degree after SFAS 158, and 3) more poorly funded firms tended to lobby against the new regulation and lobbying firms took the position in accordance with the degree of adverse impact of regulatory change. This result indicates that firms are affected by the regulatory change differently across their firm characteristics even though the regulatory change neither provides any new information nor affects earnings. This finding enhances our understanding of the difference between recognition and disclosure in financial statements and has implications for policymakers and users of financial information. The same information means much more when recognized as opposed to disclosed.

The remainder of the paper is organized as follows. Section 2 explains the regulatory background in postretirement benefits. Section 3 discusses related research and develops hypotheses. Section 4 discusses research design. Results of the empirical tests of the hypotheses are discussed in Section 5. Section 6 concludes.
2. Regulation Background

One of the main objectives of financial reporting is to provide information that is useful to information users' decision making (FASB 1978). The informational usefulness of accounting for DB pensions and other postretirement plans may be compromised since this accounting requires complicated considerations as well as assessing probabilities of future events and their effects across the long-term horizons.

Accounting for postretirement benefit plans has evolved over time. SFAS 87, promulgated in 1986, requires that changes in the fair value of pension assets and liabilities be amortized over expected remaining employee service through a smoothing mechanism. Such a mechanism reduces the volatility of pension expense, but the balance sheet only recognizes an accrued or prepaid pension cost, not the fair value of net pension assets. Meanwhile, in December 1990, the FASB announced SFAS 106, which requires all companies providing post-employment benefits other than pensions to recognize the future costs of benefits in advance. Instead of the pay-as-you-go practice, these firms had to start accruing the postretirement benefits' future costs over the employee's years of service and disclose information such as the impact of the increase in the assumed health care trend rates on the accumulated postretirement benefit obligation (APBO). Reflecting requests for additional disclosure, the FASB issued SFAS 132 effective since 1997.

After accounting scandals such as Enron, the Securities and Exchange Commission (SEC) conducted a study on off-balance-sheet financing and observed that large amount of pension liabilities are not recognized on the balance sheet. Further, the SEC noted that the accounting for pension became of critical interest at the highest level of both the public and private sectors considering the current demographic and political
environment (Bryan et al. 2007). On November 10, 2005, in response to requests by the SEC staff, and the Pension Benefit Guaranty Corporation (PBGC) and other groups of interest, the FASB announced that it would add a comprehensive project to its agenda to reconsider accounting for postretirement benefits.

On March 31, 2006, the FASB issued the ED which would require companies 1) to recognize the full funded status of the pension (based on PBO) and other postretirement benefit plans (based on APBO) on the balance sheet as of the fiscal year end date, and 2) to take a retrospective approach to reflect the impact of the regulatory change for the comparability of financial statements.

After the issuance of ED, 246 comment letters were sent to the FASB. A majority of comment letters sent by plan sponsors and actuaries showed concerns over the use of PBO instead of ABO, the introduction of new measurement dates, and the application of a retrospective approach. On the other hand, financial statement users and auditors generally agreed with the objectives of the project while auditors suggested the retrospective approach and application of new measurement dates need to be reconsidered from a cost-benefit viewpoint.

On September 29, 2006, the FASB announced SFAS 158, which was effective for fiscal periods ending after December 15, 2006. SFAS 158 requires an employer 1) to recognize the funded status of a single-employer’s DB pensions in its statement of financial position and to recognize changes in that funded status in comprehensive income in the year in which the changes occur and 2) to measure the funded status of a plan as of the date of its year-end statement of financial position.\(^3\) There are a couple of

\(^3\) The introduction of new measurement date is effective for fiscal years ending after December 15, 2008.
differences between ED and SFAS 158; 1) prospective application was mandated under SFAS 158 while the ED adopted the retrospective application, and 2) the remaining transition obligation will be amortized as before under SFAS 158 while companies should recognize in retained earnings any remaining transition assets or obligation immediately under ED. The FASB expects that SFAS 158 will make financial statements easier to understand by recognizing information previously reported in the notes.

The next phase of the project will address issues such as determination of expenses, accounting for multi-employer plans and cash-balance plans, and convergence with the International Financial Reporting Standards (IFRS). 4 Another important regulatory change in pensions is the introduction of the Pension Protection Act of 2006 (PPA 2006) which requires 1) firms to fully fund their pension plans within seven years (previously firms are allowed thirty years to make up 90% of their pension liabilities), 2) severely underfunded firms to make the largest increase in contributions, and 3) firms receive a tax deduction for qualifying contributions of 150% (previously 100%) (Campbell et al. 2008).

3. Related Research and Hypothesis Development

3.1 Recognition versus Disclosure

The debate on recognition versus disclosure has a long history, as extensively discussed in Schipper (2007). Among others, Healy and Palepu (1993) and Bernard and Schipper (1994) mention the lack of empirical research on this issue. Bernard and Schipper (1994) also point out the reasons for the lack of research: 1) empirical tests for

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4 There is a ceiling for pension assets that can be recognized in the balance sheet under the International Accounting Standards (IAS) 19.
this issue require a high level of precision in methodology, research design and investigation and 2) there are few cases in which researchers can compare recognition with disclosure for the same information.

Despite those difficulties, there are studies that have compared the impact of recognition with that of disclosure. In the literature on postretirement benefits, Amir (1993) finds that after the introduction of SFAS 106, investors give a larger valuation multiple to expenses from other postretirement benefits while Choi et al. (1997) show that APBO is marginally significant in explaining cross-sectional differences in equity values. Davis-Friday et al. (1999) also provide model-sensitive evidence that the recognized other postretirement liability receives more weight than the disclosed liability in market value association tests. In addition, Mittelstaedt et al. (1995) find that, within a year of the introduction of SFAS 106, 89% of health care benefit liabilities were cut.

In an analytical setting, Barth et al. (2003) argue that the recognized amount, the disclosed information and the information revealed by price interact with the fraction of sophisticated investors to determine price informativeness. Hirshleifer and Teoh (2003) build a model where pricing outcomes are determined by the form of investors' attention and the relation between the recognized and the ignored information based on the assumption that some investors use only recognized information.

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5 Other studies suggest differences between recognition and disclosure with regard to lease (Imhoff and Thomas 1988), asset write-downs (Aboody 1996) and derivatives (Ahmed et al. 2006).

6 The Financial Accounting Standards Committee of the American Accounting Association (2006) notes that the mixed results might be attributed to the form of the parameters of the estimation models or the postretirement benefit variables included in models; for example, in Barth et al. (1992), the high correlation among pension variables may cause the wrong sign on service cost. In Coronado and Sharpe (2003), there is a high correlation between funded status and pension earnings. Choi et al. (1997) and Davis-Friday et al. (1999) discuss collinearity issues in this literature.
On the other hand, behavioral studies provide evidence that even sophisticated investors do not incorporate disclosed information appropriately. Harper et al. (1987) find that neither sophisticated nor unsophisticated information users treat pension information in a footnote, as they would a balance sheet liability. Hirst and Hopkins (1998) and Hirst et al. (2004) show that recognition enables analysts to reach the appropriate judgment. Finally, Libby et al. (2006) find that auditors permit more misstatement in disclosed as opposed to recognized items, implying information location affects reliability thresholds.

Overall, the above studies provide evidence that capital markets value disclosure and recognition differently and thus that they are not substitutes. In the literature on postretirement benefits, prior studies suggest that the market incorporates postretirement benefit information into prices (Landsman 1986; Barth 1991; Barth et al. 1992), but also imply that information is not fully valued (Landsman and Ohlson 1990).

Recently, Jin et al. (2006) document that equity risk reflects the risk of the firm's pension plan despite arcane accounting rules for pensions. However, they use ABO as a pension liability proxy. Hann et al. (2007a) compare fair value to smoothing under SFAS 87, and find that while fair-value improves the credit relevance of the balance sheet, it does not enhance its value relevance. However, Picconi (2006) documents that the stock market and analysts do not fully incorporate the information from pension footnote disclosures. Another recent study, Franzoni and Marin (2006), argue that the market overvalues severely underfunded firms. Coronado et al. (2008) also conclude that investors continued to misprice DB pensions and suggest that FASB’s reform efforts could substantially aid the market’s ability to value firms with DB pensions.
If SFAS 158 improves price informativeness, the market may react favorably to the key rulemaking events for SFAS 158. However, if SFAS 158 imposes severe costs on some firms with DB pension, the market may react unfavorably to those firms when the new regulation is introduced.

3.2 Market Reaction to SFAS 158 Rulemaking Events

The market reaction to changes in accounting regulations has been one of the main topics in accounting research. In the literature on postretirement benefits, Espabodi et al. (1991) examine the impact on equity prices of pronouncements related to SFAS 106 and report that the experimental firms exhibit significant negative abnormal returns around the issuance of the ED. The negative returns are more pronounced for firms with few retirees, high-levered firms, small firms, and firms currently adopting the pay-as-you-go basis. On the other hand, using the sample of public utilities, Khurana and Loudder (1994) and D'Souza (2000) find that the market reaction varies cross-sectionally in accordance with the market’s expectation of regulators’ actions and the resulting changes in revenues from the adoption of the accounting rule for ratemaking purposes.

Gopalakrishnan and Sugrue (1992) examine firms which were affected by the introduction of minimum pension liability recognition under SFAS 87 but find no significant returns around the events leading to SFAS 87. Harper (2005) examines the impact of the change in discount rate assumptions by the Pension Funding Equity Act. He finds that the effects are pronounced for underfunded firms, varying with plan sizes and industries. Campbell et al. (2008) report that there is a negative abnormal return when the

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7 In the literature outside postretirement benefits, among others, there are studies on the regulatory change in executive compensation (e.g. Lo 2003) and the Sarbanes-Oxley Act (e.g. Zhang 2007).
PPA 2006 was first voted by Congress and the effect is more negative for firms with larger underfunded status and larger capital expenditure requirements while firms with higher marginal tax rates experienced a positive effect.

Since most firms with DB pension were underfunded when SFAS 158 was introduced, SFAS 158 mostly resulted in declining shareholders’ equity of those firms and might even affect some companies’ ability to pay dividends or increase the possibility of debt covenant violation. However, if stakeholders have already fully understood underfunded status and made necessary measures in their covenants, adopting SFAS 158 would not be negative news for firms with DB pension. If investors consider SFAS 158 unfavorable news for business, abnormal returns around the key rulemaking events would be negative. Since more underfunded firms are more likely to suffer debt covenant violation, SFAS 158 would impose more net costs on those firms.

Ali and Kumar (1994) find that including interactions between firm characteristics and the financial statement effects of an accounting decision will both enhance the ability to explain accounting choice and facilitate distinction between omitted variables and hypothesized relations. Correspondingly, I consider the interaction between funded status and proximity to debt covenant violations.

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8 At the beginning of fiscal year 2006, among 1,205 firms with DB pensions in my sample, only 114 firms are overfunded.

9 Dichev and Skinner (2002) and Duke and Hunt (1990) argue that the costs of violations are low considering the frequency of private debt covenant violations. On the other hand, Roberts and Sufi (2007) and Nini et al. (2007) suggest that the costs are high since firms are sometimes forced to substantially concede to lenders when renegotiating private credit agreements that contain financial covenants.

10 Using the sample of S&P 500 firms, Zion et al. (2006) discover that older covenants, those created before 2001, generally use frozen GAAP while most covenant calculations since then have floated with GAAP, with the caveat that if a change in GAAP would cause a covenant default, both the company and lenders would have to renegotiate in good faith.
H1 (alternative form): Underfunded firms which are likely to violate debt covenants would experience more negative abnormal returns around the SFAS 158 rulemaking events.

Financial institutions have to meet their regulatory capital requirements\textsuperscript{11} and recognition of funded status may affect their risk-based capitals.\textsuperscript{12} Therefore, more underfunded financial firms are likely to have relatively more negative market reactions around SFAS 158 key rulemaking events.

H2 (alternative form): More poorly-funded financial institutions would experience more negative abnormal returns around the SFAS 158 rulemaking events.

After the introduction of SFAS 158, firms with a larger proportion of plan assets invested in equity would suffer more volatile fluctuations in their balance sheets. Therefore, more underfunded firms with a larger proportion of investments in equity would experience more negative market reactions around SFAS 158 key rulemaking events.

\textsuperscript{11} Banking and depository institutions have to meet Basel II internationally introduced by the Basel Committee on Banking Supervision as well as US regulations. Insurance companies are regulated at the state level and have to meet capital requirements. Also, the SEC has provisions of regulatory capital requirements for broker-dealers and investment banks since the introduction of the Market Reform Act of 1990. Besides, the Gramm-Leach-Bliley Act established sets of rules for investment bank holding companies and holding companies with the largest broker-dealers to voluntarily consent to consolidated supervision by becoming a consolidated supervised entity (GAO-05-61 2004).

\textsuperscript{12} Banks that sent comment letters to the FASB mentioned that the recognition of funded status would reduce their risk-based capital. Firms regulated by the Farm Credit Administration are also concerned about their capital requirements. Subsequent to the SFAS 158 announcement, the federal bank and thrift agencies announced an interim decision that SFAS 158 will not affect banking organizations' regulatory capital on December 14, 2006.
H3 (alternative form): More underfunded firms with a larger proportion of plan assets invested in equity would experience more negative abnormal returns around the SFAS 158 rulemaking events.

As Leftwich (1981) notes, the market response to individual events was determined by the implication of the regulation and how the news changed investors’ expectations of the probability of passing rules. Events that increased the probability of passing rules would be associated with significant returns.

3.3 Changes in Variable Estimation and Plan Asset Allocation after SFAS 158

Prior studies find that managers use more aggressive estimation parameters when leverage is increasing (Amir and Gordon 1996; Godwin et al. 1996; Asthana 1999), when they prepare to acquire other firms (Bergstresser et al. 2006), when they try to meet or beat earnings target (Asthana 2007), or when the assumptions affect their compensation (Bergstresser et al. 2006; Comprix and Muller 2006). However, Hann et al. (2007b) find no evidence that discretion in the choice of pension assumptions on the pricing of the PBO impairs the value relevance of PBO.

Through their choice of the discount rates, companies can influence the recognized funded status. For the choice of discount rates, the SEC staff suggests rates of return on fixed-income debt securities that receive one of the two highest ratings given by a recognized ratings agency (EITF D-36 1993). Zion and Carcache (2005) find that the median discount rate for companies in the S&P 500 has tracked the Moody’s Aa corporate bond index spot rate closely. However, they also report some variations in the
distribution of discount rates across S&P 500 companies. Subsequent to SFAS 158, I expect that firms will try to increase a discount rate to reduce the pension liability and this tendency is expected to be stronger among underfunded firms.

**H4 (alternative form):** More poorly funded firms will increase their discount rate for PBO to a greater degree after SFAS 158.

Prior studies have discussed several determinants for the plan asset allocation. Firms can develop a tax arbitrage strategy by borrowing money and investing in bonds within their fund, implying that holding 100% fixed-income assets would be optimal from a taxation perspective (Black 1980; Tepper 1981). However, there is another important dimension associated with the asset allocation choice. Sharpe (1976) and Treynor (1977) show that there are two option-like mechanisms in DB pension plans: 1) corporate guarantees provided by pension plan sponsors to their employees function like a put option protecting the downside risk of pension asset values, and 2) insurance provided by the PBGC gives sponsoring firms a put option. Following this risk-shifting argument, Harrison and Sharpe (1982) demonstrate that firms would invest completely in equity under some conditions. Bodie (1990) also argues that the risk-taking incentive, the put option effect due to the moral hazard introduced by the PBGC, may dominate for underfunded firms. Besides, firms may invest in equity when they try to hedge against increases in PBO, which are probably correlated with the stock market (Sundaresan and Zapatero 1997; Lucas and Zeldes 2006); when they try to justify a high expected long-term rate of return on plan assets (Bergstresser et al. 2006); and when they can provide employees with good performance in plan assets (Sweeting 2005).
Studies about plan asset allocation provide conflicting evidence. On the one hand, firms tend to prefer safer fixed-income investments when the recognition of additional minimum pension liability under SFAS 87 is imminent (Amir and Benartzi 1999), when they are poorly funded and have weak credit ratings (Rauh 2007), and when the smoothing mechanism was eliminated due to Financial Reporting Standard 17 in the UK (Mashruwala 2007; Amir et al. 2008). They tended to do so in those times probably since they are willing to increase the correlation between plan assets and obligations or to mitigate the impact of the volatility of their plan assets. On the other hand, Cocco and Volpin (2007) find a positive relation between firm leverage and allocation to risky assets, consistent with the risk-taking incentive argument.

Considering prior studies, it is an empirical question whether SFAS 158 may cause a re-allocation of assets from equities to bonds or vice versa. The answer will depend on the firm characteristics such as funded status. I make a hypothesis following the risk-shifting argument as follows.

**H5 (alternative form):** More poorly funded firms will re-allocate a higher proportion of their pension assets from bonds to equities after SFAS 158.

### 3.4 Lobbying Behavior

I examine whether firms lobbied against the accounting standard change in a way they anticipated the consequences of the regulatory change. Lobbying research can be viewed as a subset of accounting choice research (Francis 1987). Prior studies have found that 1) lobbying firms are expected to be larger (Watts and Zimmerman 1978), 2) lobbying firms are expected to have a relatively larger negative impact on financial
statements from the regulatory change (Ramanna 2008) and 3) the contract effects can predict lobbying by managers (Deakin 1989).

Francis (1987) suggests that firm-specific benefits of individual lobbying or collective action are proportional to firm size. Therefore, I examine whether the potential for adverse financial statement consequences explain the decision to lobby after controlling for size. I hypothesize that larger firms and highly underfunded firms are more likely to oppose the ED.

**H6 (alternative form):** The probability that a firm lobbies against the ED a) increases with its size and b) decreases with its level of funded status.

In addition, I examine the determinants of a lobbying firm’s position on issues in the ED. The FASB asked comment letter respondents to discuss the issues; 1) costs of implementing the recognition of funded status, 2) the measurement date, 3) impact on contractual arrangements, 4) effective dates and transition and 5) not-for-profit organization. Among others, I examine the issue of 1) recognition of funded status based on PBO instead of ABO; and 2) the matching of employer’s measurement date and fiscal year end date.

Most comment letters tended to agree on the full recognition of funded status in balance sheets. However, there is a significant difference in positions about the choice of pension liabilities for the measurement of funded status. Actuaries and plan sponsors tended to criticize the PBO in favor of the ABO while investors, credit rating agencies and auditors favored the PBO. Respondents who rejected the PBO argued that the estimated increases in future compensation are not present obligations and therefore, do
not meet the definition of liabilities contained in FASB Concepts Statement No. 6. Elements of Financial Statements. Russel Investment Group (comment letter #3) also argues that the ABO is the most appropriate measure considering the put option characteristic of the pension liability, consistent with Bodie (1990). On the other hand, the Financial Accounting Standards Committee of the American Accounting Association (comment letter #101A) argues that the PBO is an appropriate, although noisy, measure of the obligation as investors include expectations about future salary progression in assessing pension liabilities, based on Barth (1991). However, leaving aside the conceptual controversies among respondents, I hypothesize that firms with a higher ratio of PBO over ABO are more likely to oppose the recognition of funded status based on PBO.

For the issue of measurement date, most respondents, especially industries and actuaries opposed the proposed requirement to measure plan assets and benefit obligations as of the employer's fiscal year end date based on cost-benefit arguments. I hypothesize that firms with a larger gap between their measurement date and fiscal year end date tended to be more opposed to the matching of measurement date and fiscal year end date.

**H7 (alternative form):**

**A)** The probability that a firm opposes the recognition of funded status based on PBO instead of ABO increases with the ratio of PBO over ABO.

**B)** The probability that a firm opposes the matching of employer’s measurement date and fiscal year end date increases with the gap between measurement date and fiscal year end date.
4. **Research Design**

4.1 **Market Reaction to SFAS 158 Rulemaking Events**

Previous studies have hypothesized that key events relevant to the introduction of regulations will have the biggest influence on the likelihood of adoption (Leftwich 1981; Lo 2003; Zhang 2007). This study examines the following three events.

Event 1: The FASB announced that it will start a project to reconsider accounting for postretirement benefits on November 10, 2005;

Event 2: The FASB issued an ED on March 31, 2006; and


These are the three important events in the rulemaking process that are most likely to influence investors’ assessment of whether the FASB will adopt the new regulations.\(^\text{13}\) The power of the return tests depends on the extent to which these events are expected, or information was released outside these three event dates.

The short windows used to calculate the cumulative abnormal returns are the three days (-1, 0, +1) around each of the three dates identified above. I use Fama-French 3 factor model excess returns.\(^\text{14}\) Specifically, I estimate the Fama-French model parameters based on the period of 200 trading days before event 1. Abnormal returns are calculated as the prediction errors from this model.

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\(^{13}\) There are other events leading to the issuance of SFAS 158 such as the SEC’s completion of its study about off-balance-sheet financing, and meetings during the rulemaking process. However, considering their relevance and exposure to media, I focus on the above three events following Lo (2003).

\(^{14}\) I also use Fama-French 4 factor model excess returns, size-adjusted returns, market-model excess returns, and abnormal returns as the difference of the buy and hold return on a stock minus the buy and hold return on the portfolio of stocks with similar size and book-to-market ratio, and raw returns. The use of different measures does not change inferences.
To examine market reaction to the rulemaking events, I run the regression of cumulative abnormal returns based on Fama-French 3 factor model on funded status after controlling for industry dummies.\(^\text{15}\)

\[
CAR_i = \alpha_0 + \alpha_1 PF_{t-1} + \sum_{i=1}^{11} \beta_i Ind_i + \epsilon_i \quad ---- (1)
\]

Where \(CAR_i\) is an abnormal return accumulated around three days centered on each of the three events for firm \(i\) and time \(t\); \(PF\) is pension funded status, calculated by (plan assets minus PBO), scaled by market capitalization\(^\text{16}\); and \(Ind_i\)’s are industry dummies based on Fama-French 12 industry classification.\(^\text{17}\)

For the interaction analysis with the proximity to debt covenant violations, I employ leverage to consider debt contract effects following previous studies (Duke and Hunt 1990; Press and Weintrop 1990; Ali and Kumar 1994). Highly-levered firms are likely to be more sensitive to the recognition of their funded pension status due to the increasing probability of debt covenant violation. However, leverage is not a direct proxy for closeness to covenants (Dichev and Skinner 2002) and may represent other constructs.

To mitigate this problem, I also use the probability of bankruptcy as a proxy for the

\(^{15}\) When I additionally control for earnings and change in earnings following Easton and Harris (1991) and leverage, the results are not changed. Excluding the industry fixed effects does not alter inferences, either.

\(^{16}\) I also use total assets, PBO and book value of common equity as a denominator. Since the results based on different denominators are qualitatively similar, I mainly report the results based on the market capitalization following Franzoni and Marin (2006). An alternative measure is the funding ratio, defined as the ratio of plan assets over PBO. However, to measure the importance of the impact of the regulatory change, funded status is better considering the case of a firm with a large pension plan deficit according to the funding ratio, but very trivial according to the firm size (Cocco and Volpin 2007). For this reason, I employ funded status for my analysis. Also, when I decompose \(\log(funded\ status)\) into \(\log(funding\ ratio)\) and \(\log(PBO/Size)\), \(\log(PBO/Size)\) mainly derives my results.

\(^{17}\) I also use the industry classification based on the first-digit of SIC code and get similar results.
proximity to debt covenant violations based on Hillegeist et al. (2004). I employ the following specification.

\[ CAR_{it} = \alpha_0 + \alpha_1 PF_{it-1} + \alpha_2 Lev_{it-1} + \alpha_3 Lev_{it-1} \times PF_{it-1} + \sum_{i=1}^{11} \beta_i Ind_i + \epsilon_{it} \] ---- (2)

\[ CAR_{it} = \alpha_0 + \alpha_1 PF_{it-1} + \alpha_2 BSM_{it-1} + \alpha_3 BSM_{it-1} \times PF_{it-1} + \sum_{i=1}^{11} \beta_i Ind_i + \epsilon_{it} \] ---- (3)

Where \( Lev \) is a ratio of long-term debts over total assets; \( BSM_{it-1} \) is the score for the probability of bankruptcy for \( i \) and time \( t-1 \) developed by Hillegeist et al. (2004) in which equity is regarded as a call option on the value of a firm's assets. Following Hillegeist et al. (2004) and their SAS code, I estimate the probability of bankruptcy based on the Black-Scholes-Merton model. Then, I transform the probability into a score using the inverse logistic function. I winsorize the sample so that the minimum (maximum) value of the probability of bankruptcy equals 0.00001 (0.99999).

For the subsample analysis of the financial industry, I exclude the industry fixed effects. I also examine whether high-levered financial institutions with highly underfunded status would experience more negative cumulative abnormal returns around the key rulemaking events.

\[ CAR_{it} = \alpha_0 + \alpha_1 PF_{it-1} + \epsilon_{it} \] ---- (4)

\[ CAR_{it} = \alpha_0 + \alpha_1 PF_{it-1} + \alpha_2 Lev_{it-1} + \alpha_3 Lev_{it-1} \times PF_{it-1} + \epsilon_{it} \] ---- (5)

To test the interaction effect between the proportion of plan assets invested in equity and funded status, I run the following regression.

\[ CAR_{it} = \alpha_0 + \alpha_1 PF_{it-1} + \alpha_2 \%Equity_{it-1} + \alpha_3 \%Equity_{it-1} \times PF_{it-1} + \sum_{i=1}^{11} \beta_i Ind_i + \epsilon_{it} \] ---- (6)

Where \( \%Equity_{it-1} \) is the proportion of plan assets invested in equity for firm \( i \) and time \( t-1 \).

\[ \text{The analysis based on Shumway (2001) also provides similar results.} \]
There is a possibility that a significant proportion of the information associated with the regulation was disseminated outside main event dates. To address this issue, following Lo (2003), I also examine longer-term abnormal returns spanning the period between day -1 of the first event and day +1 of the third event.\textsuperscript{19} This long window can capture a higher proportion of the impact of the regulation, but the power of the test may be lower since the variance of long-term returns will be high and the possibility of misspecification is proportional to the length of the horizon (Barber and Lyon 1997). For the consistency of short-window and long-window tests, I use cumulative abnormal returns in the long-window test.\textsuperscript{20}

4.2 Changes in Variable Estimation and Plan Asset Allocation after SFAS 158

I compare the change in pension assets allocation and assumptions of the same firms between SFAS 132 and SFAS 158 with the 2-year data (2005-2006). There would be changes in macroeconomic environments across the periods. To mitigate this problem, I decompose firms with DB pensions into quintiles based on their level of funded status and examine whether more poorly-funded firms tend to reallocate their plan assets into bond and increase their discount rates to a greater degree. To control for industry effect, I rank firms based on their levels of variables within the industry.

In addition, I try to control for other determinants. Managers may decide discount rates based not only on funded status, but also on changes in firm size, earnings, leverage and duration of the pension liability. On the other hand, for the choice of plan asset

\textsuperscript{19} Considering the PPA 2006 was introduced on August 17, 2006, I also use the alternative long window from the first event -1 day (November 9, 2005) to the second event +1 day (April 3, 2006), to mitigate potential confounding effects. The results are quite similar.

\textsuperscript{20} Following Barber and Lyon (1997), I also use buy-and-hold returns instead of cumulative abnormal returns in both short and long window tests. The use of buy-and-hold returns does not alter inferences.
allocation, managers may consider tax incentives and the amount of employers’ contribution as well as factors for pension parameters. Furthermore, they would decide discount rates and plan asset allocation jointly with employers’ contribution and other pension parameters such as expected returns on plan assets and rates of compensation increase. To take care of potentially correlated errors between equations, I employ the SUR method developed by Zellner (1962) as follows.

\[
\Delta \text{Adj}_t \text{dis}_t = \alpha_0 + \alpha_1 \text{Size}_{t-1} + \alpha_2 \Delta \text{Size}_t + \alpha_3 \text{Earn}_{t-1} + \alpha_4 \Delta \text{Earn}_t + \alpha_5 \text{PF}_{t-1} + \alpha_6 \text{Lev}_{t-1} + \alpha_7 \Delta \text{Lev}_t + \alpha_8 \text{PHOR}_{t-1} + \alpha_9 \Delta \text{PHOR}_t + \alpha_{10} \text{Adj}_t \text{dis}_{t-1} + \alpha_{12} \Delta \text{RCI}_t + \alpha_{13} \Delta \text{ERR}_t + \alpha_{14} \Delta \% \text{Equity}_t + \sum_{i=1}^{11} \beta_i \text{Ind}_t + \epsilon_t
\]

\[
\Delta \text{RCI}_t = \alpha_0 + \alpha_1 \text{Size}_{t-1} + \alpha_2 \Delta \text{Size}_t + \alpha_3 \text{Earn}_{t-1} + \alpha_4 \Delta \text{Earn}_t + \alpha_5 \text{PF}_{t-1} + \alpha_6 \text{Lev}_{t-1} + \alpha_7 \Delta \text{Lev}_t + \alpha_8 \text{PHOR}_{t-1} + \alpha_9 \Delta \text{PHOR}_t + \alpha_{10} \text{RCI}_{t-1} + \alpha_{11} \Delta \text{Adj}_t \text{dis}_t + \alpha_{12} \Delta \text{RCI}_t + \alpha_{14} \Delta \% \text{Equity}_t + \sum_{i=1}^{11} \beta_i \text{Ind}_t + \epsilon_t
\]

\[
\Delta \text{ERR}_t = \alpha_0 + \alpha_1 \text{Size}_{t-1} + \alpha_2 \Delta \text{Size}_t + \alpha_3 \text{Earn}_{t-1} + \alpha_4 \Delta \text{Earn}_t + \alpha_5 \text{PF}_{t-1} + \alpha_6 \text{Lev}_{t-1} + \alpha_7 \Delta \text{Lev}_t + \alpha_8 \text{PHOR}_{t-1} + \alpha_9 \Delta \text{PHOR}_t + \alpha_{10} \text{ERR}_{t-1} + \alpha_{11} \Delta \text{Adj}_t \text{dis}_t + \alpha_{12} \Delta \text{RCI}_t + \alpha_{14} \Delta \% \text{Equity}_t + \sum_{i=1}^{11} \beta_i \text{Ind}_t + \epsilon_t
\]

\[
\Delta \% \text{Equity}_t = \alpha_0 + \alpha_1 \text{Size}_{t-1} + \alpha_2 \Delta \text{Size}_t + \alpha_3 \text{Earn}_{t-1} + \alpha_4 \Delta \text{Earn}_t + \alpha_5 \text{PF}_{t-1} + \alpha_6 \text{Lev}_{t-1} + \alpha_7 \Delta \text{Lev}_t + \alpha_8 \text{PHOR}_{t-1} + \alpha_9 \Delta \text{PHOR}_t + \alpha_{10} \% \text{Equity}_{t-1} + \alpha_{11} \Delta \text{Adj}_t \text{dis}_t + \alpha_{12} \Delta \text{RCI}_t + \alpha_{13} \Delta \text{ERR}_t + \sum_{i=1}^{11} \beta_i \text{Ind}_t + \epsilon_t
\]

\[
\text{CON}_t = \alpha_0 + \alpha_1 \text{Size}_{t-1} + \alpha_2 \Delta \text{Size}_t + \alpha_3 \text{Earn}_{t-1} + \alpha_4 \Delta \text{Earn}_t + \alpha_5 \text{PF}_{t-1} + \alpha_6 \text{Lev}_{t-1} + \alpha_7 \Delta \text{Lev}_t + \alpha_8 \text{PHOR}_{t-1} + \alpha_9 \Delta \text{PHOR}_t + \alpha_{10} \text{CON}_{t-1} + \alpha_{11} \Delta \text{Adj}_t \text{dis}_t + \alpha_{12} \Delta \text{RCI}_t + \alpha_{13} \Delta \text{ERR}_t + \sum_{i=1}^{11} \beta_i \text{Ind}_t + \epsilon_t
\]

--- (7) \(^{21}\)

Where \(A\) denotes a change; \(\text{Adj}_t \text{dis}\) is (a discount rate for PBO – an interest rate\(^{22}\)); \text{Size} is a natural logarithm of market capitalization; \text{Earn} is earnings before extraordinary items, scaled by market capitalization; \text{PHOR} is the number of years to

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\(^{21}\) Untabulated tests based on Dickey and Fuller (1979) show that a unit root is not present in a pure autoregressive model in each pension variable.

\(^{22}\) To control for the macroeconomic changes, I subtract an interest rate from a discount rate. Interest rates are the rates to value vested benefits for variable rate premium by the PBGC as of the company’s measurement date. However, the results are very similar when I use original discount rates.
retirement calculated as \( \log(\text{PBO}/\text{ABO})/\log(1+\text{the assumed salary growth rate}) \), a proxy developed by Amir and Benartzi (1999)\(^{23}\); RCI is a rate of compensation increase; ERR is an expected return of plan assets; MTR is a marginal tax rate from John Graham’s website\(^{24}\); and CON is an employer’s contribution scaled by market capitalization.

### 4.3 Lobbying Behavior

Following prior studies (Lo 2003; Ramanna 2008), I employ comment letters in examining firms’ lobbying behavior.\(^{25}\) To examine the determinants of lobbying behavior, I run the following logistic and probit regressions. I control for leverage as well as return-on-assets, industry and book-to-market ratio following prior studies (Lo 2003; Barber and Lyon 1997).\(^{26}\)

\[
\text{Comment}_t = \alpha_0 + \alpha_1 \text{BTM}_{t-1} + \alpha_2 \text{Size}_{t-1} + \alpha_3 \text{PFE}_{t-1} + \alpha_4 \text{Lev}_{t-1} + \alpha_5 \text{ROA}_{t-1} + \sum_{i=1}^{11} \beta_i \text{Ind}_n + \epsilon_t \quad (8)
\]

Where Comment is an indicator equaling one when a firm sent a comment letter to the FASB; BTM\(_{t-1}\) is a ratio of book value of equity over market capitalization for firm \(i\) and time \(t-1\); and ROA is a ratio of earnings before extraordinary items over total assets.

I also examine which firm characteristics explain the lobbying firm’s position about the issues on the ED. For the issue of the recognition of funded status based on PBO, I estimate the following logit (and probit) regression.

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\(^{23}\) The results are similar when I use the ratio of service cost to the sum of service cost and interest cost as a proxy for the duration of pension liabilities following Coronado and Liang (2006).

\(^{24}\) Graham and Mills (2008) describe detailed information regarding marginal tax rates. The results are similar when I also use the effective tax rate, defined as total tax expenses divided by pre-tax income.

\(^{25}\) There is a concern about the potential importance of non-observable forms of lobbying that may be used by firms. Georgiou (2004) documents that during the rulemaking process by Accounting Standard Board, the use of various lobbying methods is significantly associated with the use of comment letters; companies which submit comment letters are much more likely to use other methods than companies which do not.

\(^{26}\) An alternative research design is the matched sample design. However, it is difficult to develop a matched sample design based on all of the above four variables. I receive generally similar results from matched sample based on each control variable or two variables together.
\[ P_{\text{boo}}_{it} = \alpha_0 + \alpha_1 BTM_{it-1} + \alpha_2 Size_{it-1} + \alpha_3 \frac{PBO_{it-1}}{ABO_{it-1}} + \alpha_4 \text{Lev}_{it-1} + \alpha_5 ROA_{it-1} + \sum_{j=1}^{11} \beta_j ln d_{it} + \varepsilon_{it} \quad (9) \]

Where \( P_{\text{boo}} \) is an indicator equaling one when a firm opposed the use of PBO instead of ABO; and \( PBO/ABO \) is the ratio of PBO over ABO.

For the issue of matching the measurement date with the fiscal year end date, I estimate the following logit (and probit) regression.

\[ Meadum_{it} = \alpha_0 + \alpha_1 BTM_{it-1} + \alpha_2 Size_{it-1} + \alpha_3 \text{diff} \_\text{month}_{it-1} + \alpha_4 \text{Lev}_{it-1} + \alpha_5 ROA_{it-1} + \sum_{j=1}^{11} \beta_j ln d_{it} + \varepsilon_{it} \quad (10) \]

Where \( Meadum \) is an indicator equaling one when a firm opposed matching of measurement date and fiscal year end; and \( \text{Diff} \_\text{month} \) is the difference in months between fiscal year end date and measurement date.

5. Empirical Analysis

5.1 Sample

For the analysis of market reactions to key rulemaking events, I collect the sample from the merged Compustat-CRSP database from 2005-2006. I employ all firm-years with publicly traded equity securities in the U.S. I require my firm-year observations to have a non-negative book value of equity\(^{27}\) with available data for leverage and size, and follow US GAAP. The number of firm observations for the event study analysis and lobbying behavior is 1,205 while for analyses of asset allocation and pension variable estimation, the number varies across the analyses.

For the analysis of changes in pension asset allocation and variable assumption in pension accounting after SFAS 158, I use the firms that adopt SFAS 158 in 2006 and

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\(^{27}\) Including firms with a negative book value of equity does not alter inferences.
make comparison between SFAS 132 and SFAS 158 with the 2-year data (2005-2006) obtained from the merged Compustat-CRSP database.

For the analysis of lobbying behavior, I hand-collect the firms who sent comment letters to the FASB from the FASB website and combine the data with the merged Compustat-CRSP database. In the analysis associated with pension funded status, 79 firms sent comment letters among 1,205 firms with DB pension.

Table 1 provides descriptive statistics for firms with DB pensions for fiscal year 2006. In Panel A of Table 1, I report the industry composition of my full sample based on Fama-French 12 industry classification. Panel B of Table 1 exhibits descriptive statistics. The statistics (and further analyses) are reported based on the beginning of fiscal year 2006. For further analyses, I also use the average of fiscal year of 2005 and 2006 or the average between 2004 and 2006 and generally receive consistent results. Mean pension funded status scaled by market capitalization for fiscal year 2006 under SFAS 158 is negative (-0.04). The comparison across different accounting regimes will be shown in later analyses.

Panel C of Table 1 shows the correlations among firm characteristics. Funded status is positively correlated with return on assets, sales growth and market capitalization and negatively correlated with the book-to-market ratio, leverage and PBO.

5.2 Market Reaction to SFAS 158 Rulemaking Events

Panel A of Table 2 reports the regression analyses for the market reaction to rulemaking events based on the full sample. I present the results based on event 1 (3 days around the project announcement date), event 2 (3 days around the ED announcement
date), event 3 (3 days around SFAS 158 announcement date), the sum of three events (9 days) and the long window (from the first event date -1 to the third event date +1).

To control for heteroscedasticity, I report t statistics based on White (1980). For studies of regulatory change, event returns are aligned with calendar time. Therefore, cross-sectional correlation of returns may create serious inference problems (Bernard 1987). To address this issue, I also calculate bootstrapped p-values following Lo (2003) and Zhang (2007).

In Panel A of Table 2, the coefficient on funded status ($a_1$) in equation (1) is not significant around the key rulemaking events. On the other hand, in the long window test, that coefficient is negatively significant. The market participants react favorably toward underfunded firms during this window maybe since they expect the enhancement in the transparency of financial statements due to this regulatory change would be more pronounced for those firms, or maybe since they are more relieved of the regulatory change because they might expect stricter regulations. This result is interesting since during the same period, when I run the regression of the credit rating on the same explanatory variables, the coefficient on funded status is significantly positive, implying that the debt market appropriately values funded status. Also, when I run this regression of market returns on the same explanatory variables during a year before or two years before with the same amount of time, the coefficients on funded status are significantly

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The calculation procedure is the following: One tailed p-values are the proportions of 1,000 repetitions that generated coefficients greater than the OLS coefficients in the table; each repetition uses sample firms’ abnormal returns from nine non-event days selected from the event 1 to the end of 2006. This procedure maintains the cross-sectional correlation structure of firms’ returns in the non-event period so that one can assess whether the event returns, which are also cross-correlated, are truly unusual (Lo 2003).
positive. However, since there is no such relation during the short window tests, it is
difficult to arrive at a convincing conclusion.

The interaction analysis with leverage based on Equation (2) is reported in Panel
A of Table 2. The interaction coefficient between funded status and leverage ($a_3$) is not
significant around the key rulemaking events and long window. However, Panel B of
Table 2 reports that the interaction coefficient between funded status and probability of
bankruptcy ($a_3$) around the SFAS 158 announcement date is significantly positive,
implying that funded status concerns the market among the firms with higher probability
of bankruptcy around the SFAS 158 announcement date, consistent with H1. Untabulated
regression analysis based on the subsample of firms with the probability of bankruptcy
higher than 0.999999 (n=101) also shows that funded status significantly explains the
market reaction among those firms around the SFAS 158 announcement date. Considering
that the short window test encounters less confounding effects and provides
more convincing results (Kothari and Warner 1997 and 2004), this result is relatively
more reliable than the one based on the full sample.

Panel C of Table 2 documents the same analysis based on the financial industry
where firms have to meet regulatory capital requirements. Around the SFAS 158
announcement date, there is a more pronounced negative abnormal return in underfunded
firms, consistent with H2. Another short window test based on the sum of three events
exhibits the same result. On the other hand, during the other key rulemaking event dates
and long window, the coefficient on funded status ($a_1$) in equation (4) is not significant.
The analysis based on equation (5) in Panel C of Table 2 also shows that around the
SFAS 158 announcement date, the coefficient on interaction between funded status and
leverage ($\alpha_3$) is significantly positive, implying that highly-levered financial institutions with more underfunded status tend to suffer more negative abnormal returns around the SFAS 158 announcement date.

Panel D of Table 2 exhibits the results based on the interaction analysis with a proportion of plan assets invested in equity. The coefficient on the interaction between funded status and the proportion of plan assets invested in equity ($\alpha_3$) is significantly positive, implying that funded status concerns the market among firms with volatile plan assets around the SFAS 158 announcement date, consistent with H3.

I also compare between firms with DB pensions and those without. For this analysis, I employ the full universe of merged Compustat-CRSP database. In untabulated analyses, I find that financial institutions with DB pensions experienced more negative market reactions than those without DB pensions around SFAS 158 announcement date and the sum of three events. On the other hand, there is no significant difference between firms with DB pensions and those without across all industries.

In other untabulated analyses, I also examine the interaction of funded status with lobbying behavior, dividend policy, credit rating, duration of pension liability, level of free cash flows, profitability, firm size and volatility of book value of equity, but do not generally receive consistent results across different windows. Also, multiple interaction analyses do not tend to provide additional intuition.

Overall, around the SFAS 158 announcement date, underfunded firms tend to suffer more negative abnormal returns when they have a high probability of bankruptcy,
when they have to meet capital requirement in the financial industry, or when they have more volatile plan assets.  

5.3 Changes in Variable Estimation and Plan Asset Allocation after SFAS 158

Panel A of Table 3 shows the change in firm characteristics for firms with DB pension between 2005 and 2006. Fiscal year 2006 is the first year that companies adopted SFAS 158. In my sample, returns on assets increased in 2006 while book-to-market ratios decreased. Pension funded status was improved after SFAS 158 while PBO decreased significantly. Among pension asset allocation, the proportion of real estate increased in 2006 while others did not significantly change. On the other hand, discount rates and rates of compensation increase became significantly larger in 2006, but expected returns on plan assets decreased in 2006. However, since interest rates and the risk premium increased in 2006, it is not clear whether the differences in pension estimates are due to these macroeconomic factors or managerial discretion. To mitigate this problem, in Panel B of Table 3, I decompose firms with DB pension into quintiles based on the level of funded status within the industry at the beginning of fiscal year 2006 and find that most

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29 There might be two kinds of explanations about why there is a pronounced abnormal return around the SFAS 158 announcement date. One explanation is that the formalization of the provisions is important news to the market since it is clearly more difficult to revise the SFAS in comparison with the ED. The other explanation is based on the behavioral finance literature which documents that enthusiastic public attention can induce a significant market reaction, even though no genuinely new information was presented (Huberman and Regev 2001). Of course, it is also possible that econometrical problems such as errors in variables might cause insignificant results during other rulemaking event dates.

30 However, this is a joint test of SFAS 158 and PPA 2006. Funded status may have improved due to the compulsory regulation of PPA 2006. PBO may have decreased due to the freeze of DB pensions and conversion from DB pensions to defined contribution (DC) pensions.

31 According to Fama and French’s website, a risk-free rate (2.94% in 2005 and 4.71% in 2006), the excess return on the market (4.51% in 2005 and 10.65% in 2006), the average return on the three small portfolios minus the average return on the three big portfolios (-1.37% in 2005 and 0.88% in 2006) and the average return on the two value portfolios minus the average return on the two growth portfolios (8.14% in 2005 and 12.13% in 2006) increased in 2006.
poorly funded firms tended to increase their discount rates for PBO after adjusting changes in interest rates (by 0.11%) significantly more than best funded firms (by 0.03%) (t=-2.42), consistent with H4. Most poorly funded firms also tended to increase their plan asset allocation on equity than best funded firms (t=-1.94), consistent with H5, implying that more poorly funded firms are trying to make up their funded status by making riskier investments following Bodie (1990). There is no significant difference in other pension parameters across firms with different funded status levels.

Panel C of Table 3 provides the results based on the SUR analysis. More underfunded firms increased their discount rates for PBO after adjusting changes in interest rates (t=-1.97), and proportions of plan assets invested in equity (t=-3.15), consistent with H4 and H5, respectively. They also increased employers’ contribution (t=-13.20). Untabulated Ordinary Lease Square (OLS) method provides similar results.

5.4 Lobbying Behavior

223 comment letters were submitted during the comment period (from March 31, 2006 to May 31, 2006) while 23 comment letters were submitted by August 9, 2006. Panel A of Table 4 documents that 246 respondents consist of 90 public companies, 70 private companies, 14 not-for-profit organizations, and others (such as industry associations, actuaries, individual investors, analysts, Big 4 accounting firms, and academics). Among public companies issuing comment letters, 79 firms have available financial information data.

Panel B of Table 4 reports the results of logistic and probit regression with size and funded status as independent variables. Consistent with H6, Panel B of Table 4
reports that large firms and underfunded firms tended to lobby against the ED after controlling for other firm characteristics. On the other hand, untabulated analyses exhibit that the interaction between funded status and other variables such as leverage, probability of bankruptcy, and volatility of plan assets do not explain the lobbying behavior.

For the issue of ABO versus PBO, Panel C of Table 4 documents that firms with a higher ratio of PBO over ABO were more likely to oppose the recognition of funded status based on PBO, consistent with H7 (A). Similarly, for the issue of new measurement date, Panel D of Table 4 exhibits that firms with a larger gap between their measurement date and fiscal year end date tended to be more opposed to the matching of measurement date and fiscal year end date, consistent with H7 (B).

5.5 Robustness Checks

To examine the market reaction to key rulemaking events, I alternatively use the Fama-French 4 factor model excess returns, size-adjusted returns, market-model excess returns and raw returns. I also use total assets, PBO or book value of common equity as a denominator when I scale pension funded status. I also examine the results after excluding the firm-year observations with a price smaller than $2 or market capitalization smaller than $1 million and get qualitatively similar results. The analysis excluding foreign firms also produces similar results. In addition, for the portfolio approach, inferences are similar when I use a non-parametric rank sum test (the Mann-Whitney-Wilcoxon test) instead of the t-test. Furthermore, when I consider both DB pensions and other postretirement plans instead of just DB pension, I receive similar results. The
results are also generally consistent when I employ proxies for estimating the impact of regulatory change\textsuperscript{32} as an alternative proxy for funded status.

For short event window tests, my results are unaffected when I exclude firms which made earnings announcements around short event windows. To address the possibility of cross-sectional correlation of returns, I also employ the method suggested by Sefcik and Thompson (1986), which accounts for cross-sectional correlation in the errors. The results do not alter the inference qualitatively, so the simpler results are presented.

Recently, pension plan freezes have gained momentum.\textsuperscript{33} Firms that froze or would freeze their DB plans may have different firm characteristics. However, Campbell et al. (2008) find that including or excluding these firms do not affect the impact of the PPA 2006. Although not comprehensive, I also exclude seventy-five firms with frozen their DB pensions, obtained from Milevsky and Song (2008) and find the results are unchanged.

The FASB encouraged firms to adopt SFAS 158 early. If some firms adopt SFAS 158 earlier than required, those firms might have different firm characteristics (Amir and Ziv 1997a and 1997b). SFAS 158 was announced on September 29, 2006 and effective since fiscal year ending after December 15, 2006. I examine the firms with fiscal year ending between SFAS 158 announcement date and SFAS effective date to detect early

\textsuperscript{32} I employ the difference between disclosed pension funded status and recognized pension amount. I also use the difference between pension funded status and (pension pre-paid benefit cost - accrued pension benefit liability + intangible pension assets), multiplied by (1 - marginal tax rate). In addition, I employ the difference between PBO and ABO. These are all estimated proxies based on available information around the event dates. Additionally I use the ex post proxy, calculated by (change in accumulated comprehensive income associated with pension - comprehensive income associated with pension) in fiscal year 2006.

\textsuperscript{33} A GAO report (GAO-08-817) exhibits that about half of all sponsors in their sample having one or more frozen DB plans. Overall, about 3.3 million active participants in their study population, who represent about 21 percent of all active participants in the single-employer DB system, are affected by a freeze.
SFAS 158 adopters. Among 104 firms with DB pensions with fiscal year ending during this period, only one firm adopted SFAS 158 earlier than required.

6. Discussion and Conclusion

This paper examines the economic consequences of SFAS 158. In the market reaction analysis, I find a more pronounced negative abnormal return around the SFAS 158 announcement date in underfunded firms when they have a high probability of bankruptcy. Also, I find underfunded financial institutions that should meet capital requirements experience more negative abnormal return around the SFAS 158 announcement date. Taken together, these results imply that the market reacts more negatively toward firms which are more likely to incur contractual violations subsequent to SFAS 158. In addition, I find a more pronounced negative abnormal return around the SFAS 158 announcement date in underfunded firms when they invest in equity to a larger degree. This result suggests that the market reacts more negatively toward underfunded firms which are more likely to suffer fluctuations in financial statements subsequent to SFAS 158.

In addition, I find that more underfunded firms tended to increase their discount rate to a greater degree after the introduction of SFAS 158, implying that they are more willing to reduce their liabilities than relatively better-funded firms. Consistent with the risk-shifting argument, I also find that more underfunded firms tended to reallocate plan assets from bonds to equities subsequent to SFAS 158 with a two-year (2005-2006) sample data. The results imply that underfunded firms are more inclined to invest in risky assets to increase the value of the put option provided by PBGC insurance. Together with
the analysis about pension parameter assumptions, the results would be driven by both SFAS 158 and PPA 2006.

Finally, analyses on firms' lobbying behavior show that underfunded firms and big firms tended to lobby against the ED during the comment period. I also find that firms with a higher ratio of PBO over ABO tended to lobby more strongly against the recognition of funded status based on PBO while those with a larger gap between pension measurement date and fiscal year end date were likely to lobby more strongly against matching the measurement date with the fiscal year end date. These results indicate that the probability of lobbying against SFAS 158 was increasing in the degree of SFAS 158's unfavorable impact on firms' financial statements.

Overall, this evidence indicates that firms are affected by the regulatory change differently across their firm characteristics even though the regulatory change neither provides any new information nor affects earnings. Policymakers should be cautious about their policy effects even when they introduce new regulations with no new additional information. Financial information users also need to understand the implication of those regulatory changes. This study will help them to deepen their understanding of the difference between recognition and disclosure in financial statements.

The analysis based on the market reaction is subject to the fundamental limitations of event studies. As Schwert (1981) notes, it is difficult to identify when the market first anticipates the effects of regulatory change. Also, other contemporaneous news may be confounded in stock prices. Especially in this study, the PPA 2006 is an important confounding event. Although I try to mitigate the confounding effect by
employing the short window and an alternative long window and making the cross-sectional analyses, the results may be driven by both SFAS 158 and the PPA 2006 to some extent.

In addition, employing more rigorous proxies for the costs of debt (dividend) covenant violations may improve the power of the tests. Besides, the proportion of sophisticated investors may be associated with the cross-sectional difference in the market reaction during the rulemaking period.

The findings in this study provide a basis for several research extensions. The current financial crisis and economic downturn have had a major impact on pension assets and put pressure on funding levels for pension plans. Also, pensions play an important role during the process of restructuring or bankruptcy due to their considerable size, as shown in the recent bankruptcy process of General Motors and the restructuring of US automobile industry. Under these circumstances, studies which examine how to additionally improve the information usefulness in pension accounting and their potential economic consequences are in high demand.

Also, comparing trading profits based on funded status across different accounting regimes or examining differences in value relevance after regulatory changes can provide more insights. In addition, it will be interesting to examine the debt market reaction to the introduction of SFAS 158 considering that debts are closely correlated to the stock market reaction toward funded status.
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**Table 1: Descriptive Statistics**

**Panel A: Industry Classification of Sample Firms**

<table>
<thead>
<tr>
<th>Industry classification</th>
<th>Number of firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer nondurables – Food, Tobacco, Textiles, Apparel, Leather, Toys</td>
<td>89</td>
</tr>
<tr>
<td>Consumer durables – Cars, TV’s, Furniture, Household Appliances</td>
<td>45</td>
</tr>
<tr>
<td>Manufacturing -- Machinery, Trucks, Planes, Paper, Printing</td>
<td>209</td>
</tr>
<tr>
<td>Energy - Oil, Gas, and Coal Extraction and Products</td>
<td>56</td>
</tr>
<tr>
<td>Chemicals and Allied Products</td>
<td>53</td>
</tr>
<tr>
<td>Business Equipment -- Computers, Software, and Electronic Equipment</td>
<td>107</td>
</tr>
<tr>
<td>Telecommunication - Telephone and Television Transmission</td>
<td>31</td>
</tr>
<tr>
<td>Utilities</td>
<td>103</td>
</tr>
<tr>
<td>Shops - Wholesale, Retail, and Some Services (Laundries, Repair Shops)</td>
<td>84</td>
</tr>
<tr>
<td>Healthcare, Medical Equipment, and Drugs</td>
<td>47</td>
</tr>
<tr>
<td>Finance</td>
<td>273</td>
</tr>
<tr>
<td>Other -- Mines, Construction, Transportation, Hotels, Business Service, Entertainment</td>
<td>108</td>
</tr>
<tr>
<td><strong>Total number of firms</strong></td>
<td><strong>1,205</strong></td>
</tr>
</tbody>
</table>

Firms are classified based on Fama-French 12 industry specification. I collect the sample firms from the merged Compustat-CRSP database from 2005-2006. I employ all firm-years which follow US GAAP and have publicly traded equity securities in the U.S. I require my firm-year observations should have non-negative book value of equity with available data of leverage and size.
### Table 1: Descriptive Statistics, Continued

**Panel B: Distribution of Variables**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>25th percentile</th>
<th>Median</th>
<th>75th percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1,205</td>
<td>4.36%</td>
<td>6.17%</td>
<td>1.18%</td>
<td>3.69%</td>
<td>7.11%</td>
</tr>
<tr>
<td>BTM</td>
<td>1,205</td>
<td>0.52</td>
<td>0.28</td>
<td>0.32</td>
<td>0.48</td>
<td>0.66</td>
</tr>
<tr>
<td>SG</td>
<td>1,205</td>
<td>13.65%</td>
<td>20.21%</td>
<td>3.37%</td>
<td>10.45%</td>
<td>20.11%</td>
</tr>
<tr>
<td>Size</td>
<td>1,205</td>
<td>7.42</td>
<td>1.83</td>
<td>6.17</td>
<td>7.46</td>
<td>8.66</td>
</tr>
<tr>
<td>Lev</td>
<td>1,205</td>
<td>0.18</td>
<td>0.14</td>
<td>0.07</td>
<td>0.16</td>
<td>0.27</td>
</tr>
<tr>
<td>PF</td>
<td>1,205</td>
<td>-0.04</td>
<td>0.08</td>
<td>-0.05</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>PBOM</td>
<td>1,205</td>
<td>0.22</td>
<td>0.36</td>
<td>0.04</td>
<td>0.09</td>
<td>0.24</td>
</tr>
<tr>
<td>%Discount</td>
<td>1,181</td>
<td>5.50%</td>
<td>0.40%</td>
<td>5.48%</td>
<td>5.50%</td>
<td>5.75%</td>
</tr>
<tr>
<td>%Equity</td>
<td>1,076</td>
<td>62.30%</td>
<td>15.17%</td>
<td>58.00%</td>
<td>64.80%</td>
<td>70.39%</td>
</tr>
<tr>
<td>%Debt</td>
<td>1,068</td>
<td>31.87%</td>
<td>14.15%</td>
<td>25.00%</td>
<td>31.00%</td>
<td>37.00%</td>
</tr>
<tr>
<td>%RealE</td>
<td>1,057</td>
<td>1.04%</td>
<td>2.51%</td>
<td>0.00%</td>
<td>0.00%</td>
<td>0.00%</td>
</tr>
<tr>
<td>ERR</td>
<td>1,133</td>
<td>7.91%</td>
<td>1.10%</td>
<td>7.50%</td>
<td>8.10%</td>
<td>8.50%</td>
</tr>
<tr>
<td>RCI</td>
<td>1,026</td>
<td>3.97%</td>
<td>0.95%</td>
<td>3.50%</td>
<td>4.00%</td>
<td>4.50%</td>
</tr>
</tbody>
</table>

The descriptive statistics are reported for firms with DB pension as of the beginning of fiscal year 2006. This sample consists of firms which have DB pensions both in 2005 and in 2006. Fiscal year 2006 is the year that the firms firstly adopted SFAS 158.

ROA is the ratio of earnings before extraordinary item over total assets.

BTM is the ratio of book value of equity over market capitalization.

SG is the sales growth rate, calculated by the difference between sales in fiscal year 2006 and sales in fiscal year 2005, scaled by sales in fiscal year 2005.

Size is the natural logarithm of market capitalization.

Lev is the ratio of long-term debt over total assets.

PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.

PBOM is PBO, scaled by market capitalization.

%Discount is a discount rate for PBO.

%Equity is the proportion of plan assets invested in equity.

%Debt is the proportion of plan assets invested in debts.

%RealE is the proportion of plan assets invested in real estate.

ERR is an expected return of plan assets.

RCI is a rate of compensation increase.

All explanatory variables are winsorized each year at their 0.5 and 99.5 percentiles.
Table 1: Descriptive Statistics, Continued

Panel C: Correlations between Firm Characteristics for the Full Sample (n=1,205)

<table>
<thead>
<tr>
<th></th>
<th>ROA</th>
<th>BTM</th>
<th>SG</th>
<th>Size</th>
<th>Lev</th>
<th>PF</th>
<th>PBOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1.000</td>
<td>-0.446***</td>
<td>0.140***</td>
<td>0.260***</td>
<td>-0.172***</td>
<td>0.231***</td>
<td>-0.247***</td>
</tr>
<tr>
<td>BTM</td>
<td>-0.504***</td>
<td>1.000</td>
<td>-0.128***</td>
<td>-0.393***</td>
<td>-0.002</td>
<td>-0.291***</td>
<td>0.303***</td>
</tr>
<tr>
<td>SG</td>
<td>0.152***</td>
<td>-0.147***</td>
<td>1.000</td>
<td>0.062**</td>
<td>0.059**</td>
<td>0.106***</td>
<td>-0.143***</td>
</tr>
<tr>
<td>Size</td>
<td>0.311***</td>
<td>-0.375***</td>
<td>0.084***</td>
<td>1.000</td>
<td>0.041</td>
<td>0.220***</td>
<td>-0.147***</td>
</tr>
<tr>
<td>Lev</td>
<td>-0.129***</td>
<td>0.005</td>
<td>0.011</td>
<td>0.083***</td>
<td>1.000</td>
<td>-0.173***</td>
<td>0.188***</td>
</tr>
<tr>
<td>PF</td>
<td>0.130***</td>
<td>-0.209***</td>
<td>0.217</td>
<td>0.205***</td>
<td>-0.186***</td>
<td>1.000</td>
<td>-0.843***</td>
</tr>
<tr>
<td>PBOM</td>
<td>-0.174***</td>
<td>0.241***</td>
<td>-0.248***</td>
<td>-0.102***</td>
<td>0.237***</td>
<td>-0.717***</td>
<td>1.000</td>
</tr>
</tbody>
</table>

Numbers above diagonals are Pearson correlations while those under diagonals are Spearman correlations.

*, **, and *** denote, respectively, significance levels of 10%, 5% and 1%

ROA is the ratio of earnings before extraordinary item over total assets.
BTM is the ratio of book value of equity over market capitalization.
SG is the sales growth rate, calculated by the difference between sales in fiscal year 2006 and sales in fiscal year 2005, scaled by sales in fiscal year 2005.
Size is the natural logarithm of market capitalization.
Lev is the ratio of long-term debt over total assets.
PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.
PBOM is PBO, scaled by market capitalization.
Table 2: Market Reaction to Key Rulemaking Events

Panel A: Interaction Analysis with Leverage

\[
CAR_n = \alpha_0 + \alpha_1 PF_{n-1} + \sum_{i=1}^{11} \beta_i Ind_{n,i} + \epsilon_n \quad (1)
\]

\[
CAR_n = \alpha_0 + \alpha_1 PF_{n-1} + \alpha_2 Lev_{n-1} + \alpha_3 Lev_{n-1} \times PF_{n-1} + \sum_{i=1}^{11} \beta_i Ind_{n,i} + \epsilon_n \quad (2)
\]

<table>
<thead>
<tr>
<th>Event 1</th>
<th>Intercept</th>
<th>PF</th>
<th>Lev</th>
<th>Lev × PF</th>
<th>Adj. R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>0.0066</td>
<td>0.0157</td>
<td></td>
<td></td>
<td>0.0386</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(1.98)**</td>
<td>(0.63)</td>
<td></td>
<td></td>
<td>(0.079)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.097]*</td>
<td>[0.123]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>0.0075</td>
<td>0.0297</td>
<td>-0.0047</td>
<td>-0.0563</td>
<td>0.0375</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(1.98)**</td>
<td>(0.82)</td>
<td>(-0.51)</td>
<td>(-0.33)</td>
<td>(0.067)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.067]*</td>
<td>[0.117]</td>
<td>[0.209]</td>
<td>[0.658]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>0.0007</td>
<td>-0.0112</td>
<td></td>
<td></td>
<td>0.0000</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(0.60)</td>
<td>(-0.40)</td>
<td></td>
<td></td>
<td>[0.0466]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.064]*</td>
<td>[0.466]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>0.0078</td>
<td>-0.0316</td>
<td>-0.0002</td>
<td>0.0820</td>
<td>0.0075</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(2.21)</td>
<td>(-0.84)</td>
<td>(-0.03)</td>
<td>(0.46)</td>
<td>(0.06)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.060]*</td>
<td>[0.717]</td>
<td>[0.372]</td>
<td>[0.268]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>0.0052</td>
<td>0.0001</td>
<td></td>
<td></td>
<td>0.0352</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(2.09)</td>
<td>(0.00)</td>
<td></td>
<td></td>
<td>[0.295]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.149]</td>
<td>[0.295]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>0.0050</td>
<td>-0.0126</td>
<td>0.0004</td>
<td>0.0480</td>
<td>0.0343</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(1.85)*</td>
<td>(-0.47)</td>
<td>(0.06)</td>
<td>(0.61)</td>
<td>(0.06)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.143]</td>
<td>[0.519]</td>
<td>[0.393]</td>
<td>[0.357]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of 3 events</td>
<td>0.0196</td>
<td>0.0060</td>
<td></td>
<td>0.0341</td>
<td>1,205</td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>(3.43)***</td>
<td>(0.12)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.000]***</td>
<td>[0.218]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>0.0204</td>
<td>-0.0146</td>
<td>-0.0045</td>
<td>0.0736</td>
<td>0.0331</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(3.35)***</td>
<td>(-0.21)</td>
<td>(-0.27)</td>
<td>(0.22)</td>
<td>(0.22)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.001]***</td>
<td>[0.542]</td>
<td>[0.215]</td>
<td>[0.289]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Window</td>
<td>-0.0189</td>
<td>-0.7333</td>
<td></td>
<td>0.1237</td>
<td>1,205</td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td>(-0.50)</td>
<td>(-4.25)***</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td>-0.0463</td>
<td>-0.6966</td>
<td>0.1489</td>
<td>-0.0134</td>
<td>0.1250</td>
<td>1,205</td>
</tr>
<tr>
<td></td>
<td>(-1.10)</td>
<td>(-2.22)**</td>
<td>(1.33)</td>
<td>(-0.01)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T-statistics using the White (1980) estimation procedure are reported in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%.

Bootstrapped p-values are reported in brackets. The calculation procedure is the following: One-tailed p-values are the proportions of 1,000 repetitions that generated coefficients greater than the OLS coefficients in the table; each repetition uses sample firms' abnormal returns from three non-event days for each event analysis (nine non-event days for the analysis of the sum of three events) selected from the event 1 to the end of 2006. *, **, and *** denote, respectively, one-tail significance levels of 10%, 5% and 1%.

CAR is a cumulative Fama-French model excess return three days around Event 1 (November 10, 2005, when the FASB announced it will add a comprehensive project to its agenda to reconsider accounting for pension and other postretirement benefits), Event 2 (March 31, 2006 when the FASB issued an exposure draft) that Event 3 (September 29, 2006, when the FASB announced SFAS 158), the sum of Event 1, Event 2, and Event 3, or returns accumulated from event 1 to event 3.
PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.
Lev is the ratio of long-term debt over total assets.
Ind’s are dummies based on Fama-French 12 industry classification.
All explanatory variables are winsorized each year at their 0.5 and 99.5 percentiles.
Table 2: Market Reaction to Key Rulemaking Events, Continued

Panel B: Interaction Analysis with the Probability of Bankruptcy

\[ CAR_t = \alpha_0 + \alpha_1 PF_{t-1} + \alpha_2 BSM_{t-1} + \alpha_3 BSM_{t-1} \times PF_{t-1} + \sum_{j=1}^{11} \beta_j Ind_{tj} + \epsilon_t \]  ---- (3)

<table>
<thead>
<tr>
<th>Event</th>
<th>Intercept</th>
<th>PF</th>
<th>BSM</th>
<th>BSM ( \times ) PF</th>
<th>Adj. R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>0.0067</td>
<td>-0.0148</td>
<td>0.0000</td>
<td>-0.0030</td>
<td>0.0402</td>
<td>1,196</td>
</tr>
<tr>
<td>(1.80)*</td>
<td>(-0.36)</td>
<td>(0.11)</td>
<td>(-0.84)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[0.098]*</td>
<td>[0.587]</td>
<td>[0.456]</td>
<td>[0.888]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>0.0076</td>
<td>-0.0025</td>
<td>0.0000</td>
<td>0.0008</td>
<td>0.0067</td>
<td>1,196</td>
</tr>
<tr>
<td>(2.11)**</td>
<td>(-0.13)</td>
<td>(-0.22)</td>
<td>(0.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[0.079]*</td>
<td>[0.432]</td>
<td>[0.345]</td>
<td>[0.456]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>0.0068</td>
<td>0.0374</td>
<td>0.0002</td>
<td>0.0039</td>
<td>0.0373</td>
<td>1,196</td>
</tr>
<tr>
<td>(2.63)***</td>
<td>(2.12)***</td>
<td>(1.61)</td>
<td>(2.51)***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[0.084]*</td>
<td>[0.082]*</td>
<td>[0.816]</td>
<td>[0.089]*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of 3 events</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>0.0211</td>
<td>0.0201</td>
<td>0.0002</td>
<td>0.0016</td>
<td>0.0036</td>
<td>1,196</td>
</tr>
<tr>
<td>(3.44)***</td>
<td>(0.37)</td>
<td>(0.62)</td>
<td>(0.35)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>[0.0001]**</td>
<td>[0.211]</td>
<td>[0.749]</td>
<td>[0.345]</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Window</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(3)</td>
<td>0.0083</td>
<td>-0.3732</td>
<td>0.0028</td>
<td>0.0361</td>
<td>0.1248</td>
<td>1,196</td>
</tr>
<tr>
<td>(0.21)</td>
<td>(-1.30)</td>
<td>(1.77)*</td>
<td>(1.45)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T-statistics using the White (1980) estimation procedure are reported in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%.

Bootstrapped p-values are reported in brackets. The calculation procedure is the following: One-tailed p-values are the proportions of 1,000 repetitions that generated coefficients greater than the OLS coefficients in the table; each repetition uses sample firms’ abnormal returns from three non-event days for each event analysis (nine non-event days for the analysis of the sum of three events) selected from the event 1 to the end of 2006. *, **, and *** denote, respectively, one-tail significance levels of 10%, 5% and 1%.

CAR is a cumulative Fama-French model excess return three days around Event 1 (November 10, 2005, when the FASB announced it will add a comprehensive project to its agenda to reconsider accounting for pension and other postretirement benefits), Event 2 (March 31, 2006 when the FASB issued an exposure draft) that Event 3 (September 29, 2006, when the FASB announced SFAS 158), the sum of Event 1, Event 2, and Event 3, or returns accumulated from event 1 to event 3.

PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.

BSM is the score for the probability of bankruptcy developed by Hillegeist et al. (2004) in which equity is regarded as a call option on the value of a firm’s assets. Following Hillegeist et al. (2004) and their SAS code, I estimate the probability of bankruptcy based on the Black-Scholes-Merton model. Then, I transform the probability into a score using the inverse logistic function. I winsorize the sample so that the minimum (maximum) value of the probability of bankruptcy equals 0.00001 (0.99999).

PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.

Ind’s are dummies based on Fama-French 12 industry classification.

All explanatory variables (except for BSM) are winsorized each year at their 0.5 and 99.5 percentiles.
Table 2: Market Reaction to Key Rulemaking Events, Continued
Panel C: Market Reaction in the Financial Industry

\[ CAR_u = \alpha_0 + \alpha_1 PF_{t-1} + \varepsilon_u \quad (4) \]
\[ CAR_u = \alpha_0 + \alpha_1 PF_{t-1} + \alpha_2 Lev_{t-1} + \alpha_3 Lev_{t-1} \times PF_{t-1} + \varepsilon_u \quad (5) \]

<table>
<thead>
<tr>
<th>Event</th>
<th>Intercept</th>
<th>PF</th>
<th>Lev</th>
<th>Lev &amp; PF</th>
<th>Adj. R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event 1</td>
<td>(4) 0.0085</td>
<td>0.0983</td>
<td></td>
<td></td>
<td>0.0091</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(4.62)***</td>
<td>(3.36)***</td>
<td></td>
<td></td>
<td>[0.033]***</td>
<td>[0.079]*</td>
</tr>
<tr>
<td></td>
<td>(5) 0.0069</td>
<td>0.1514</td>
<td>0.0113</td>
<td>-0.8590</td>
<td>0.0098</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(2.42)***</td>
<td>(2.11)***</td>
<td>(0.84)</td>
<td>(-0.93)</td>
<td>[0.100]*</td>
<td>[0.071]*</td>
</tr>
<tr>
<td>Event 2</td>
<td>(4) -0.0005</td>
<td>0.0008</td>
<td></td>
<td>-0.0037</td>
<td>273</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(-0.43)</td>
<td>(0.02)</td>
<td></td>
<td></td>
<td>[0.478]</td>
<td>[0.525]</td>
</tr>
<tr>
<td></td>
<td>(5) 0.0035</td>
<td>0.0491</td>
<td>-0.0343</td>
<td>-0.5000</td>
<td>0.0307</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(1.86)*</td>
<td>(0.42)</td>
<td>(-2.55)**</td>
<td>(-0.40)</td>
<td>[0.245]</td>
<td>[0.310]</td>
</tr>
<tr>
<td>Event 3</td>
<td>(4) -0.0024</td>
<td>0.0955</td>
<td></td>
<td></td>
<td>0.0233</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(-2.11)**</td>
<td>(3.09)***</td>
<td></td>
<td></td>
<td>[0.316]</td>
<td>[0.084]*</td>
</tr>
<tr>
<td></td>
<td>(5) -0.0021</td>
<td>-0.0447</td>
<td>0.0014</td>
<td>2.0688</td>
<td>0.0507</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(-1.47)</td>
<td>(-0.81)</td>
<td>(0.17)</td>
<td>(2.80)***</td>
<td>[0.0361]**</td>
<td>[0.313]</td>
</tr>
<tr>
<td>Sum of 3 events</td>
<td>(4) 0.0055</td>
<td>0.1945</td>
<td></td>
<td></td>
<td>0.0186</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(2.06)**</td>
<td>(2.48)**</td>
<td></td>
<td></td>
<td>[0.122]</td>
<td>[0.007]***</td>
</tr>
<tr>
<td></td>
<td>(5) 0.0083</td>
<td>0.1559</td>
<td>-0.0216</td>
<td>0.7097</td>
<td>0.0181</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(2.03)**</td>
<td>(0.89)</td>
<td>(-0.96)</td>
<td>(0.35)</td>
<td>[0.061]*</td>
<td>[0.065]*</td>
</tr>
<tr>
<td>Long Window</td>
<td>(4) 0.0121</td>
<td>0.6806</td>
<td></td>
<td></td>
<td>0.0032</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(0.70)</td>
<td>(1.43)</td>
<td></td>
<td></td>
<td>[0.12]</td>
<td>[0.28]</td>
</tr>
<tr>
<td></td>
<td>(5) 0.0031</td>
<td>0.2892</td>
<td>0.0857</td>
<td>5.2605</td>
<td>-0.0028</td>
<td>273</td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
<td>(0.28)</td>
<td>(0.52)</td>
<td>(0.39)</td>
<td>[0.061]*</td>
<td>[0.086]*</td>
</tr>
</tbody>
</table>

T-statistics using the White (1980) estimation procedure are reported in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%. Bootstrapped p-values are reported in brackets. The calculation procedure is the following: One-tailed p-values are the proportions of 1,000 repetitions that generated coefficients greater than the OLS coefficients in the table; each repetition uses sample firms' abnormal returns from three non-event days for each event analysis (nine non-event days for the analysis of the sum of three events) selected from the event 1 to the end of 2006. *, **, and *** denote, respectively, one-tail significance levels of 10%, 5% and 1%. CAR is a cumulative Fama-French model excess return three days around Event 1 (November 10, 2005, when the FASB announced it will add a comprehensive project to its agenda to reconsider accounting for pension and other postretirement benefits), Event 2 (March 31, 2006 when the FASB issued an exposure draft) that Event 3 (September 29, 2006, when the FASB announced SFAS 158), the sum of Event 1, Event 2, and Event 3, or returns accumulated from event 1 to event 3. PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization. Lev is the ratio of long-term debt over total assets. All explanatory variables are winsorized each year at their 0.5 and 99.5 percentiles.
Table 2: Market Reaction to Key Rulemaking Events, Continued

Panel D: Interaction Analysis with the Proportion of Plan Assets Invested in Equity

\[ CAR_n = \alpha_0 + \alpha_1 PF_{n-1} + \alpha_2 %Equity_{n-1} + \alpha_3 %Equity_{n-1} \times PF_{n-1} + \sum_{j=1}^{11} \beta_j Ind_{n} + \epsilon_n \]  

--- (6) 

<table>
<thead>
<tr>
<th>Event</th>
<th>Intercept</th>
<th>PF</th>
<th>%Equity</th>
<th>%Equity* PF</th>
<th>Adj. R²</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Event 1</td>
<td>0.0087</td>
<td>0.1408</td>
<td>-0.0000</td>
<td>-0.0019</td>
<td>0.0562</td>
<td>1,076</td>
</tr>
<tr>
<td></td>
<td>(1.58)</td>
<td>(1.35)</td>
<td>(-0.27)</td>
<td>(-1.20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.105]</td>
<td>[0.047]**</td>
<td>[0.366]</td>
<td>[0.900]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event 2</td>
<td>0.0071</td>
<td>-0.1006</td>
<td>0.0000</td>
<td>0.0015</td>
<td>0.0100</td>
<td>1,076</td>
</tr>
<tr>
<td></td>
<td>(1.30)</td>
<td>(-0.80)</td>
<td>(0.16)</td>
<td>(0.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.137]</td>
<td>[0.840]</td>
<td>[0.513]</td>
<td>[0.142]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Event 3</td>
<td>0.0018</td>
<td>-0.2164</td>
<td>0.0000</td>
<td>0.0035</td>
<td>0.0496</td>
<td>1,076</td>
</tr>
<tr>
<td></td>
<td>(0.45)</td>
<td>(-2.66)***</td>
<td>(0.78)</td>
<td>(2.69)***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.346]</td>
<td>[0.012]**</td>
<td>[0.365]</td>
<td>[0.007]***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sum of 3 events</td>
<td>0.0175</td>
<td>-0.1762</td>
<td>0.0000</td>
<td>0.0030</td>
<td>0.0403</td>
<td>1,076</td>
</tr>
<tr>
<td></td>
<td>(1.80)</td>
<td>(-0.77)</td>
<td>(0.27)</td>
<td>(0.94)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>[0.008]***</td>
<td>[0.956]</td>
<td>[0.615]</td>
<td>[0.017]**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Long Window</td>
<td>-0.1104</td>
<td>-1.3044</td>
<td>0.0010</td>
<td>0.0082</td>
<td>0.1437</td>
<td>1,076</td>
</tr>
<tr>
<td></td>
<td>(-1.71)</td>
<td>(-1.51)</td>
<td>(1.20)</td>
<td>(0.64)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

T-statistics using the White (1980) estimation procedure are reported in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%.

Bootstrapped p-values are reported in brackets. The calculation procedure is the following: One-tailed p-values are the proportions of 1,000 repetitions that generated coefficients greater than the OLS coefficients in the table; each repetition uses sample firms' abnormal returns from three non-event days for each event analysis (nine non-event days for the analysis of the sum of three events) selected from the event 1 to the end of 2006. *, **, and *** denote, respectively, one-tail significance levels of 10%, 5% and 1%.

CAR is a cumulative Fama-French model excess return three days around Event 1 (November 10, 2005, when the FASB announced it will add a comprehensive project to its agenda to reconsider accounting for pension and other postretirement benefits), Event 2 (March 31, 2006 when the FASB issued an exposure draft) that Event 3 (September 29, 2006, when the FASB announced SFAS 158), the sum of Event 1, Event 2, and Event 3, or returns accumulated from event 1 to event 3.

PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.

%Equity is the proportion of plan assets invested in equity.

Ind's are dummies based on Fama-French 12 industry classification.

All explanatory variables are winsorized each year at their 0.5 and 99.5 percentiles.
Table 3: Changes in Variable Estimation in Pension Accounting and Investment Decisions in Plan Assets after SFAS 158

Panel A: Changes in Firm Characteristics after SFAS 158

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Y2006 (1)</th>
<th>Y2005 (2)</th>
<th>Difference (1)-(2)</th>
<th>Mean</th>
<th>T-stat</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1,027</td>
<td>4.82%</td>
<td>4.14%</td>
<td>0.68%</td>
<td>(4.82)***</td>
<td></td>
</tr>
<tr>
<td>BTM</td>
<td>1,027</td>
<td>0.49</td>
<td>0.52</td>
<td>-0.03</td>
<td>(-5.53)***</td>
<td></td>
</tr>
<tr>
<td>SG</td>
<td>1,027</td>
<td>12.39%</td>
<td>13.77%</td>
<td>1.38%</td>
<td>(-1.94)*</td>
<td></td>
</tr>
<tr>
<td>Lev</td>
<td>1,027</td>
<td>0.19</td>
<td>0.19</td>
<td>0.00</td>
<td>(-0.26)</td>
<td></td>
</tr>
<tr>
<td>PF</td>
<td>1,027</td>
<td>-0.025</td>
<td>-0.041</td>
<td>0.016</td>
<td>(14.11)***</td>
<td></td>
</tr>
<tr>
<td>PBOM</td>
<td>1,027</td>
<td>0.187</td>
<td>0.212</td>
<td>-0.025</td>
<td>(-6.57)***</td>
<td></td>
</tr>
<tr>
<td>%Discount</td>
<td>998</td>
<td>5.72%</td>
<td>5.54%</td>
<td>0.18%</td>
<td>(28.01)***</td>
<td></td>
</tr>
<tr>
<td>%Equity</td>
<td>916</td>
<td>62.17%</td>
<td>62.48%</td>
<td>-0.30%</td>
<td>(-0.98)</td>
<td></td>
</tr>
<tr>
<td>%Debt</td>
<td>906</td>
<td>31.87%</td>
<td>31.80%</td>
<td>0.08%</td>
<td>(0.25)</td>
<td></td>
</tr>
<tr>
<td>%RealE</td>
<td>900</td>
<td>1.23%</td>
<td>1.06%</td>
<td>0.17%</td>
<td>(4.67)***</td>
<td></td>
</tr>
<tr>
<td>ERR</td>
<td>955</td>
<td>7.88%</td>
<td>7.96%</td>
<td>-0.08%</td>
<td>(-5.08)***</td>
<td></td>
</tr>
<tr>
<td>RCI</td>
<td>842</td>
<td>4.01%</td>
<td>3.99%</td>
<td>0.03%</td>
<td>(1.70)*</td>
<td></td>
</tr>
</tbody>
</table>

Characteristics of firms with DB pension for both fiscal year 2005 and fiscal year 2006 are reported in Panel A. Fiscal year 2006 is the year that the firms firstly adopted SFAS 158. I only include firms that adopted SFAS 158 in 2006.

*, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%
ROA is the ratio of earnings before extraordinary item over total assets.
BTM is the ratio of book value of equity over market capitalization.
SG is calculated by the difference between sales in fiscal year 2006 and sales in fiscal year 2005, scaled by sales in fiscal year 2005.
Lev is the ratio of long-term debt over total assets.
PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.
PBOM is PBO, scaled by market capitalization.
%Discount is a discount rate for PBO.
%Equity is the proportion of plan assets invested in equity.
%Debt is the proportion of plan assets invested in debts.
%RealE is the proportion of plan assets invested in real estate.
ERR is an expected return of plan assets.
RCI is a rate of compensation increase.
All explanatory variables are winsorized each year at their 0.5 and 99.5 percentiles.
Table 3: Changes in Variable Estimation in Pension Accounting and Investment Decisions in Plan Assets after SFAS 158, Continued

Panel B: Portfolio Analysis on Changes in Pension Variables from the Decomposition Based on Funded Status

<table>
<thead>
<tr>
<th>Variable</th>
<th>Q1</th>
<th>Q2</th>
<th>Q3</th>
<th>Q4</th>
<th>Q5</th>
<th>Q5-Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adj dis</td>
<td>0.11%</td>
<td>0.09%</td>
<td>0.08%</td>
<td>0.05%</td>
<td>0.03%</td>
<td>-0.08%</td>
</tr>
<tr>
<td>(n=998)</td>
<td>(5.43)***</td>
<td>(4.30)***</td>
<td>(3.10)***</td>
<td>(1.76)*</td>
<td>(1.26)</td>
<td>(-2.42)**</td>
</tr>
<tr>
<td>RCI</td>
<td>0.06%</td>
<td>0.05%</td>
<td>0.03%</td>
<td>-0.04%</td>
<td>0.10%</td>
<td>0.04%</td>
</tr>
<tr>
<td>(n=842)</td>
<td>(1.50)</td>
<td>(1.60)</td>
<td>(1.13)</td>
<td>(-0.98)</td>
<td>(1.23)</td>
<td>(0.40)</td>
</tr>
<tr>
<td>Equity</td>
<td>0.47%</td>
<td>0.48%</td>
<td>-0.40%</td>
<td>-0.58%</td>
<td>-1.59%</td>
<td>-2.06%</td>
</tr>
<tr>
<td>(n=916)</td>
<td>(1.09)</td>
<td>(0.81)</td>
<td>(-0.60)</td>
<td>(-0.80)</td>
<td>(-1.64)</td>
<td>(-1.94)*</td>
</tr>
<tr>
<td>Debt</td>
<td>-0.94%</td>
<td>-0.66%</td>
<td>0.74%</td>
<td>0.31%</td>
<td>0.99%</td>
<td>1.94%</td>
</tr>
<tr>
<td>(n=906)</td>
<td>(-2.44)**</td>
<td>(-1.01)</td>
<td>(1.18)</td>
<td>(0.43)</td>
<td>(1.06)</td>
<td>(1.91)*</td>
</tr>
<tr>
<td>RealE</td>
<td>0.14%</td>
<td>0.02%</td>
<td>0.20%</td>
<td>0.28%</td>
<td>0.18%</td>
<td>0.03%</td>
</tr>
<tr>
<td>(n=900)</td>
<td>(1.99)**</td>
<td>(0.61)</td>
<td>(2.16)**</td>
<td>(1.67)*</td>
<td>(1.72)*</td>
<td>(0.25)</td>
</tr>
<tr>
<td>ERR</td>
<td>-0.10%</td>
<td>-0.08%</td>
<td>-0.08%</td>
<td>-0.10%</td>
<td>-0.09%</td>
<td>0.01%</td>
</tr>
<tr>
<td>(n=955)</td>
<td>(1.50)</td>
<td>(-2.20)**</td>
<td>(-3.51)***</td>
<td>(-2.36)***</td>
<td>(-1.78)*</td>
<td>(0.14)</td>
</tr>
</tbody>
</table>

T-statistics are reported in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%.

Firms are assigned to quintiles based on the level of pension funded status at the beginning of the year within the industry. Q1 is the quintile of poorest-funded firms while Q5 is the quintile of best-funded firms.

ΔAdj dis is a change in (a discount rate for PBO – an interest rate). An interest rate is the rate to value vested benefits for variable rate premium by PBGC as of the company’s measurement date.

ΔRCI is a change in a rate of compensation increase.

ΔEquity is a change in the proportion of plan assets invested in equity.

ΔDebt is a change in the proportion of plan assets invested in debts.

ΔRealE is a change in the proportion of plan assets invested in real estate.

ΔERR is a change in an expected return of plan assets.
Table 3: Changes in Variable Estimation in Pension Accounting and Investment Decisions in Plan Assets after SFAS 158, Continued

Panel C: Seemingly Unrelated Regression Analysis of Changes in Pension Variables on Funded Status

<table>
<thead>
<tr>
<th>Independent variables</th>
<th>ΔAdj_dis</th>
<th>ΔRCI</th>
<th>ΔERR</th>
<th>Δ%Equity</th>
<th>CON</th>
</tr>
</thead>
<tbody>
<tr>
<td>α₀</td>
<td>0.242</td>
<td>0.411</td>
<td>0.208</td>
<td>6.515</td>
<td>0.002</td>
</tr>
<tr>
<td></td>
<td>(2.37)**</td>
<td>(3.54)***</td>
<td>(1.00)</td>
<td>(2.56)**</td>
<td>(0.84)</td>
</tr>
<tr>
<td>α₁(Sizeₜ₋₁)</td>
<td>-0.005</td>
<td>0.003</td>
<td>0.009</td>
<td>0.054</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(-0.47)</td>
<td>(0.32)</td>
<td>(0.74)</td>
<td>(0.24)</td>
<td>(1.63)</td>
</tr>
<tr>
<td>α₂(ΔSizeₜ)</td>
<td>0.050</td>
<td>0.040</td>
<td>0.030</td>
<td>-1.773</td>
<td>-0.010</td>
</tr>
<tr>
<td></td>
<td>(0.74)</td>
<td>(0.67)</td>
<td>(0.36)</td>
<td>(-1.16)</td>
<td>(-4.91)***</td>
</tr>
<tr>
<td>α₃(Earnₜ₋₁)</td>
<td>0.200</td>
<td>0.092</td>
<td>0.346</td>
<td>-4.948</td>
<td>0.005</td>
</tr>
<tr>
<td></td>
<td>(0.83)</td>
<td>(0.43)</td>
<td>(1.19)</td>
<td>(-0.93)</td>
<td>(0.72)</td>
</tr>
<tr>
<td>α₄(ΔEarnₜ)</td>
<td>-0.096</td>
<td>0.166</td>
<td>0.313</td>
<td>-5.256</td>
<td>0.010</td>
</tr>
<tr>
<td></td>
<td>(-0.41)</td>
<td>(0.80)</td>
<td>(1.13)</td>
<td>(-1.03)</td>
<td>(1.42)</td>
</tr>
<tr>
<td>α₅(PFₜ₋₁)</td>
<td>-0.410</td>
<td>0.264</td>
<td>0.330</td>
<td>-21.094</td>
<td>-0.114</td>
</tr>
<tr>
<td></td>
<td>(-1.97)**</td>
<td>(1.44)</td>
<td>(0.89)</td>
<td>(-3.15)***</td>
<td>(-13.20)***</td>
</tr>
<tr>
<td>α₆(Levₜ₋₁)</td>
<td>-0.064</td>
<td>0.081</td>
<td>0.089</td>
<td>-3.710</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(-0.56)</td>
<td>(0.80)</td>
<td>(0.65)</td>
<td>(-1.48)</td>
<td>(-1.74)*</td>
</tr>
<tr>
<td>α₇(ΔLevₜ)</td>
<td>-0.085</td>
<td>-0.191</td>
<td>-0.050</td>
<td>-6.303</td>
<td>-0.009</td>
</tr>
<tr>
<td></td>
<td>(-0.32)</td>
<td>(-0.81)</td>
<td>(-1.16)</td>
<td>(-1.09)</td>
<td>(-1.14)</td>
</tr>
<tr>
<td>α₈(PHORₜ₋₁)</td>
<td>0.007</td>
<td>-0.001</td>
<td>0.000</td>
<td>0.040</td>
<td>0.000</td>
</tr>
<tr>
<td></td>
<td>(1.19)</td>
<td>(-0.21)</td>
<td>(-0.00)</td>
<td>(0.32)</td>
<td>(0.68)</td>
</tr>
<tr>
<td>α₉(ΔPHORₜ)</td>
<td>0.000</td>
<td>-0.005</td>
<td>0.003</td>
<td>-0.192</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(0.06)</td>
<td>(-0.72)</td>
<td>(0.35)</td>
<td>(-1.07)</td>
<td>(-0.10)</td>
</tr>
<tr>
<td>α₁₀(Lagged)</td>
<td>-0.334</td>
<td>-0.096</td>
<td>-0.061</td>
<td>-0.062</td>
<td>0.127</td>
</tr>
<tr>
<td></td>
<td>(-6.91)***</td>
<td>(-4.92)***</td>
<td>(-2.58)**</td>
<td>(-2.31)**</td>
<td>(3.33)***</td>
</tr>
<tr>
<td>α₁₁(ΔAdj_disₜ)</td>
<td>0.008</td>
<td>0.020</td>
<td>1.275</td>
<td>-0.001</td>
<td>-0.011</td>
</tr>
<tr>
<td></td>
<td>(0.18)</td>
<td>(0.34)</td>
<td>(1.21)</td>
<td>(-0.81)</td>
<td></td>
</tr>
<tr>
<td>α₁₂(ΔRCIₜ)</td>
<td>0.014</td>
<td>-0.086</td>
<td>-1.507</td>
<td>0.000</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.25)</td>
<td>(-1.27)</td>
<td>(-1.22)</td>
<td>(0.18)</td>
<td></td>
</tr>
<tr>
<td>α₁₃(ΔERRₜ)</td>
<td>0.031</td>
<td>-0.047</td>
<td>11.224</td>
<td>0.002</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.70)</td>
<td>(-1.23)</td>
<td>(13.45)***</td>
<td>(1.92)*</td>
<td></td>
</tr>
<tr>
<td>α₁₄(Δ%Equityₜ)</td>
<td>0.003</td>
<td>-0.002</td>
<td>0.034</td>
<td>-0.000</td>
<td>-0.000</td>
</tr>
<tr>
<td></td>
<td>(1.23)</td>
<td>(-1.19)</td>
<td>(13.77)***</td>
<td>(-4.91)***</td>
<td></td>
</tr>
<tr>
<td>α₁₅(MTRₜ₋₁)</td>
<td>0.213</td>
<td>-3.156</td>
<td>-0.007</td>
<td>-0.007</td>
<td>-0.007</td>
</tr>
<tr>
<td></td>
<td>(1.48)</td>
<td>(-1.19)</td>
<td>(-1.86)*</td>
<td>(-1.86)*</td>
<td></td>
</tr>
<tr>
<td>α₁₆(ΔMTRₜ)</td>
<td>0.039</td>
<td>-2.978</td>
<td>-0.015</td>
<td>-0.015</td>
<td>-0.015</td>
</tr>
<tr>
<td></td>
<td>(0.20)</td>
<td>(-0.84)</td>
<td>(-3.12)***</td>
<td>(-3.12)***</td>
<td></td>
</tr>
<tr>
<td>α₁₇(CONₜ)</td>
<td>3.578</td>
<td>-161.717</td>
<td></td>
<td>-161.717</td>
<td>-161.717</td>
</tr>
<tr>
<td></td>
<td>(1.77)*</td>
<td>(-4.38)***</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

N= 398, System Weighted R² = 0.4484
Table 3: Changes in Variable Estimation in Pension Accounting and Investment Decisions in Plan Assets after SFAS 158, Continued

Panel C: Seemingly Unrelated Regression Analysis of Changes in Pension Variables on Funded Status, Continued

\[ \Delta Adj \_dis_{it} = \alpha_0 + \alpha_1 Size_{it-1} + \alpha_2 \Delta Size_{it} + \alpha_3 Earn_{it-1} + \alpha_4 \Delta Earn_{it} + \alpha_5 PF_{it-1} + \alpha_6 Levin_{it-1} + \alpha_7 \Delta Levin_{it} + \alpha_8 PHOR_{it-1} + \alpha_9 \Delta PHOR_{it} + \alpha_{10} Adj \_dis_{it-1} + \alpha_{12} \Delta RCI_{it} + \alpha_{13} \Delta ERR_{it} + \alpha_{14} \Delta %Equity_{it} + \sum_{i=1}^{11} \beta_i Ind_{it} + \varepsilon_{it} \]

\[ \Delta RCI_{it} = \alpha_0 + \alpha_1 Size_{it-1} + \alpha_2 \Delta Size_{it} + \alpha_3 Earn_{it-1} + \alpha_4 \Delta Earn_{it} + \alpha_5 PF_{it-1} + \alpha_6 Levin_{it-1} + \alpha_7 \Delta Levin_{it} + \alpha_8 PHOR_{it-1} + \alpha_9 \Delta PHOR_{it} + \alpha_{10} RCI_{it-1} + \alpha_{11} \Delta Adj \_dis_{it} + \alpha_{12} \Delta RCI_{it} + \alpha_{13} \Delta ERR_{it} + \alpha_{14} \Delta %Equity_{it} + \sum_{i=1}^{11} \beta_i Ind_{it} + \varepsilon_{it} \]

\[ \Delta ERR_{it} = \alpha_0 + \alpha_1 Size_{it-1} + \alpha_2 \Delta Size_{it} + \alpha_3 Earn_{it-1} + \alpha_4 \Delta Earn_{it} + \alpha_5 PF_{it-1} + \alpha_6 Levin_{it-1} + \alpha_7 \Delta Levin_{it} + \alpha_8 PHOR_{it-1} + \alpha_9 \Delta PHOR_{it} + \alpha_{10} \Delta %Equity_{it-1} + \alpha_{11} \Delta Adj \_dis_{it} + \alpha_{12} \Delta RCI_{it} + \alpha_{13} \Delta ERR_{it} + \alpha_{15} MTR_{it-1} + \alpha_{16} \Delta MTR_{it} + \sum_{i=1}^{11} \beta_i Ind_{it} + \varepsilon_{it} \]

\[ \Delta %Equity_{it} = \alpha_0 + \alpha_1 Size_{it-1} + \alpha_2 \Delta Size_{it} + \alpha_3 Earn_{it-1} + \alpha_4 \Delta Earn_{it} + \alpha_5 PF_{it-1} + \alpha_6 Levin_{it-1} + \alpha_7 \Delta Levin_{it} + \alpha_8 PHOR_{it-1} + \alpha_9 \Delta PHOR_{it} + \alpha_{10} \Delta %Equity_{it-1} + \alpha_{11} \Delta Adj \_dis_{it} + \alpha_{12} \Delta RCI_{it} + \alpha_{13} \Delta ERR_{it} + \alpha_{15} MTR_{it-1} + \alpha_{16} \Delta MTR_{it} + \sum_{i=1}^{11} \beta_i Ind_{it} + \varepsilon_{it} \]

\[ CON_{it} = \alpha_0 + \alpha_1 Size_{it-1} + \alpha_2 \Delta Size_{it} + \alpha_3 Earn_{it-1} + \alpha_4 \Delta Earn_{it} + \alpha_5 PF_{it-1} + \alpha_6 Levin_{it-1} + \alpha_7 \Delta Levin_{it} + \alpha_8 PHOR_{it-1} + \alpha_9 \Delta PHOR_{it} + \alpha_{10} CON_{it-1} + \alpha_{11} \Delta Adj \_dis_{it} + \alpha_{12} \Delta RCI_{it} + \alpha_{13} \Delta ERR_{it} + \alpha_{14} \Delta %Equity_{it} + \alpha_{15} MTR_{it-1} + \alpha_{16} \Delta MTR_{it} + \sum_{i=1}^{11} \beta_i Ind_{it} + \varepsilon_{it} \]

--- (7)
Lagged is a level of dependent variable at the beginning of year; for each equation, an adjusted discount rate for PBO, a rate of compensation increase, an expected return of plan assets, the proportion of plan assets invested in equity and an employer’s contribution, respectively.

MTR is a marginal tax rate from John Graham’s website.

Δ MTR is a change in a marginal tax rate from John Graham’s website.

Ind’s are dummies based on Fama-French 12 industry classification.
Table 4: Lobbying Behavior

Panel A: Sample Selection of Lobbying Firms

<table>
<thead>
<tr>
<th>Constituent type</th>
<th>Letters submitted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>246</td>
</tr>
<tr>
<td>Not-for-profit organizations</td>
<td>(14)</td>
</tr>
<tr>
<td>Private companies</td>
<td>(70)</td>
</tr>
<tr>
<td>Industry associations</td>
<td>(38)</td>
</tr>
<tr>
<td>Big 4 accounting firms</td>
<td>(4)</td>
</tr>
<tr>
<td>Others (i.e., individual investors and academics)</td>
<td>(30)</td>
</tr>
<tr>
<td>Public companies</td>
<td>90</td>
</tr>
<tr>
<td>Firms without available data</td>
<td>(11)</td>
</tr>
<tr>
<td>Lobbying firms with available data</td>
<td>79</td>
</tr>
</tbody>
</table>

I hand-collect the firms which sent comment letters to the FASB from the FASB website and combine the data with the merged Compustat-CRSP database.
Table 4: Lobbying Behavior, Continued

Panel B: Determinants of Lobbying Behavior

\[ \text{Comment}_t = \alpha_0 + \alpha_1 BTM_{t-1} + \alpha_2 \text{Size}_{t-1} + \alpha_3 \text{PF}_{t-1} + \alpha_4 \text{Lev}_{t-1} + \alpha_5 \text{ROA}_{t-1} + \sum_{i=1}^{11} \beta_i \text{Ind}_i + \epsilon_t \quad \text{(8)} \]

<table>
<thead>
<tr>
<th>Predicted sign</th>
<th>Intercept</th>
<th>BTM</th>
<th>Size</th>
<th>PF</th>
<th>Lev</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistic regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimates</td>
<td>-11.36</td>
<td>0.85</td>
<td>0.91</td>
<td>-6.29</td>
<td>0.58</td>
<td>1.00</td>
</tr>
<tr>
<td>T-stat</td>
<td>(-9.52)***</td>
<td>(1.38)</td>
<td>(9.16)**</td>
<td>(-4.10)***</td>
<td>(0.52)</td>
<td>(0.33)</td>
</tr>
<tr>
<td>Marginal effect</td>
<td>2.06%</td>
<td>2.21%</td>
<td>-15.23%</td>
<td>1.41%</td>
<td>2.43%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Predicted sign</th>
<th>Intercept</th>
<th>BTM</th>
<th>Size</th>
<th>PF</th>
<th>Lev</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Probit Regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimates</td>
<td>-5.76</td>
<td>0.41</td>
<td>0.45</td>
<td>-3.19</td>
<td>0.40</td>
<td>0.52</td>
</tr>
<tr>
<td>T-stat</td>
<td>(-10.09)***</td>
<td>(1.34)</td>
<td>(9.07)**</td>
<td>(-3.93)***</td>
<td>(0.73)</td>
<td>(0.35)</td>
</tr>
<tr>
<td>Marginal effect</td>
<td>2.42%</td>
<td>2.68%</td>
<td>-18.85%</td>
<td>2.38%</td>
<td>3.09%</td>
<td></td>
</tr>
</tbody>
</table>

I run logistic and probit regressions and report t statistics in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%.

Pseudo R² for logit model and probit model are 0.2401 and 0.2375, respectively. Pseudo R² is the ratio of the value of the maximized log likelihood function for the model over the value of the maximized log likelihood for the Bernoulli.

Comment=1 when a firm sent a comment letter to FASB. 79 among 1,205 firms issued comment letters; 0 otherwise.

BTM is the ratio of book value of equity over market capitalization.
Size is the natural logarithm of market capitalization.
PF is funded status (fair value of plan assets minus PBO), scaled by market capitalization.
Lev is the ratio of long-term debts over total assets.
ROA is the ratio of earnings before extraordinary item over total assets.
Ind's are dummies based on Fama-French 12 industry classification.
All explanatory variables are winsorized at their 0.5 and 99.5 percentiles.
The marginal effect of a continuous variable is the change in outcome probability when the continuous variable is increased from one standard deviation below its mean value to one standard deviation above its mean value. Marginal effects of continuous variables are calculated at the means of the independent variables. The marginal effect of a dummy variable is the change in outcome probability when the dummy variable is increased from zero to one.
Table 4: Lobbying Behavior, Continued

Panel C: Determinants of Companies’ Position about the Provision of Full Funded Status Recognition Based on PBO

\[ P_{boo,t} = \alpha_0 + \alpha_1 BTM_{t-1} + \alpha_2 Size_{t-1} + \alpha_3 \frac{PBO_{t-1}}{ABO_{t-1}} + \alpha_4 Lev_{t-1} + \alpha_5 ROA_{t-1} + \sum_{r=1}^{11} \beta_r Ind_{r,t} + \varepsilon_{t} \]  

<table>
<thead>
<tr>
<th>Predicted sign</th>
<th>Intercept</th>
<th>BTM</th>
<th>Size</th>
<th>PBO/ABO</th>
<th>Lev</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logistic regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimates</td>
<td>-43.33</td>
<td>1.38</td>
<td>-1.65</td>
<td>53.35</td>
<td>-5.69</td>
<td>11.52</td>
</tr>
<tr>
<td>T-stat</td>
<td>(-2.03)**</td>
<td>(0.52)</td>
<td>(-2.28)**</td>
<td>(2.36)**</td>
<td>(-0.95)</td>
<td>(0.78)</td>
</tr>
<tr>
<td>Marginal effect</td>
<td>0.71%</td>
<td>-0.84%</td>
<td>27.26%</td>
<td>-2.91%</td>
<td>5.89%</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Probit Regression</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimates</td>
<td>-24.42</td>
<td>0.88</td>
<td>-0.96</td>
<td>30.38</td>
<td>-3.58</td>
<td>6.01</td>
</tr>
<tr>
<td>T-stat</td>
<td>(-1.96)*</td>
<td>(0.56)</td>
<td>(-2.31)**</td>
<td>(2.33)**</td>
<td>(-0.99)</td>
<td>(0.70)</td>
</tr>
<tr>
<td>Marginal effect</td>
<td>3.47%</td>
<td>-3.77%</td>
<td>11.91%</td>
<td>-1.40%</td>
<td>2.36%</td>
<td></td>
</tr>
</tbody>
</table>

I run logistic and probit regressions and report t statistics in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%.

Pseudo R² for logit model and probit model are 0.4643 and 0.4694, respectively. Pseudo R² is the ratio of the value of the maximized log likelihood function for the model over the value of the maximized log likelihood for the Bernoulli.

\( P_{boo}=1 \) when a firm oppose the use of PBO instead of ABO. 52 among 72 firms opposed the use of PBO; 0 otherwise. (Among 79 lobbying firms, 7 firms did not disclose ABO, and 6 of them opposed the use of PBO.)

BTM is the ratio of book value of equity over market capitalization.

Size is the natural logarithm of market capitalization.

PBO/ABO is a ratio of PBO over ABO.

Lev is a ratio of long-term debts over total assets.

ROA is the ratio of earnings before extraordinary item over total assets.

Ind’s are dummies based on Fama-French 12 industry classification.

All explanatory variables are winsorized at their 0.5 and 99.5 percentiles.

The marginal effect of a continuous variable is the change in outcome probability when the continuous variable is increased from one standard deviation below its mean value to one standard deviation above its mean value. Marginal effects of continuous variables are calculated at the means of the independent variables. The marginal effect of a dummy variable is the change in outcome probability when the dummy variable is increased from zero to one.
### Table 4: Lobbying Behavior, Continued

#### Panel D: Determinants of Companies' Position about the Introduction of New Measurement Date

\[
\text{Meadum}_t = \alpha_0 + \alpha_1 \text{BTM}_{t-1} + \alpha_2 \text{Size}_{t-1} + \alpha_3 \text{diff \_month}_{t-1} + \alpha_4 \text{Lev}_{t-1} + \alpha_5 \text{ROA}_{t-1} + \sum_{i}^{11} \beta_i \text{Ind}_i + \epsilon_t
\]

<table>
<thead>
<tr>
<th>Intercept</th>
<th>BTM</th>
<th>Size</th>
<th>Diff _month</th>
<th>Lev</th>
<th>ROA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted sign</td>
<td>(+)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Logistic regression</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Estimates</td>
<td>17.95</td>
<td>1.68</td>
<td>-0.01</td>
<td>1.08</td>
<td>-3.01</td>
</tr>
<tr>
<td>T-stat</td>
<td>(4.97)**</td>
<td>(1.09)</td>
<td>(-0.03)</td>
<td>(2.23)**</td>
<td>(-0.70)</td>
</tr>
<tr>
<td>Marginal effect</td>
<td>12.89%</td>
<td>-0.06%</td>
<td>8.27%</td>
<td>-23.11%</td>
<td>-21.61%</td>
</tr>
</tbody>
</table>

| Probit Regression |      |       |              |      |      |
| Estimates | 5.93  | 1.11  | 0.01         | 0.60 | -1.88| -2.02|
| T-stat    | (3.66)**| (1.18)| (0.06)      | (2.53)**| (-0.71)| (-0.39)|
| Marginal effect | 27.21% | 0.24%| 14.69%       | -45.89%| -49.35%|

I run logistic and probit regressions and report t statistics in parentheses. *, **, and *** denote, respectively, two-tail significance levels of 10%, 5% and 1%.

Pseudo $R^2$ for logit model and probit model are 0.2211 and 0.2213, respectively. Pseudo $R^2$ is the ratio of the value of the maximized log likelihood function for the model over the value of the maximized log likelihood for the Bernoulli.

Meadum=1 when a firm oppose the matching of fiscal year end date and measurement date. 52 among 77 firms opposed the matching of measurement date with the fiscal year end date; 0 otherwise. (Among 79 lobbying firms, 2 firms did not disclose their measurement date, and one of them opposed the matching.)

BTM is the ratio of book value of equity over market capitalization.

Size is the natural logarithm of market capitalization.

Diff \_month is the difference in months between fiscal year end and measurement date.

Lev is a ratio of long-term debts over total assets.

ROA is the ratio of earnings before extraordinary item over total assets.

Ind's are dummies based on Fama-French 12 industry classification.

All explanatory variables are winsorized at their 0.5 and 99.5 percentiles.

The marginal effect of a continuous variable is the change in outcome probability when the continuous variable is increased from one standard deviation below its mean value to one standard deviation above its mean value. Marginal effects of continuous variables are calculated at the means of the independent variables. The marginal effect of a dummy variable is the change in outcome probability when the dummy variable is increased from zero to one.