Does Discretion Improve or Impair Value Relevance?
Evidence from Pricing of the Pension Obligation

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DOES DISCRETION IMPROVE OR IMPAIR VALUE RELEVANCE? EVIDENCE FROM PRICING OF THE PENSION OBLIGATION

1. Introduction

There is an ongoing debate over "flexibility vs. uniformity" in Generally Accepted Accounting Principles (GAAP). Some argue flexibility afforded in GAAP allows managers to opportunistically manipulate financial reports, as evidenced by a large earnings management literature. Others believe flexibility facilitates efficient contracting (e.g., Watts and Zimmerman, 1986) and/or improves private information communication through financial reports (e.g., Holthausen, 1990; Healy and Palepu, 1993; and Sankar and Subramanyam, 2001). This tension is best described by Dye and Verrecchia (1995): "Whether expanding discretion in accounting choice is desirable appears to depend on whether the prospects for improved communication of the firm's financial condition are more than offset by the effects of managerial opportunism." In this paper, we examine whether allowing discretion in financial reporting choices improves or impairs the information content of financial statements by examining the pricing of the discretionary component of the defined benefit pension obligation (PBO).

We choose to study the PBO for several reasons. First, prior studies (e.g., Ahmed, 1996; Hunt, Moyer and Shevlin, 1998; Subramanyam, 1996) have addressed a similar research question by examining the pricing of discretionary accruals. The inferences from these studies, however, are questionable because discretionary accruals are subject to considerable measurement error (Bernard and Skinner, 1996; Guay, Kothari and Watts, 1996). The advantage of studying the discretionary component of the PBO is that assumptions used in determining the PBO are disclosed in footnotes; hence, it is possible to estimate a discretionary component that is less susceptible to measurement problems than discretionary accruals. Second, it is widely accepted that defined benefit pension accounting allows considerable managerial discretion and is a fertile area for manipulation (e.g., Schultz and Francis, 2003). Two assumptions that have a significant impact on the PBO, the discount rate and compensation growth rate, are essentially chosen by managers. Finally, pension obligations are large in magnitude and are sensitive to assumptions.

Taken together, the average magnitude of the PBO and its sensitivity to assumptions makes it economically significant to study for our purpose.

Our research question is as follows: Does allowing discretion in the choice of pension assumptions that determine the PBO improve or impair the value relevance of the balance sheet? To address this question, we first construct a measure of "non-discretionary" PBO by replacing the firms' discount and compensation growth rate assumptions with their respective industry medians. The difference between reported PBO and our measure of non-discretionary PBO is our estimate of the discretionary component. In other words, we assume that any deviation from the industry median in the choice of pension assumptions is discretionary. We then examine the value relevance of the estimated discretionary component of the PBO.

Using a large sample over the 1990-1997 period we perform both relative and incremental price association tests. Our relative price association tests compare the explanatory power of nested regressions that alternatively use the disclosed PBO and our measure of non-discretionary PBO. Our incremental price association tests examine whether the market attaches value to the discretionary component of the PBO. For each test, we adopt two model specifications: 1) an aggregate specification which regresses price on total assets and liabilities (along with other control variables), where our alternative measures of PBO are embedded in total liabilities; and 2) a disaggregate specification that separates the pension and non-pension components. While the disaggregate specification tests whether discretion improves or impairs the ability of the PBO in depicting the underlying economics of the pension plans *per se*, the aggregate specification tests the private information communication hypothesis, i.e., whether managers use pension assumptions to communicate value relevant information through summary balance sheet measures.

In the aggregate specification, we find the model using reported PBO (i.e., with discretion) has significantly higher explanatory power than the one using our non-discretionary measure. However, there is no difference in explanatory power across the discretionary and non-discretionary models in the disaggregate specification. In addition, we find that the discretionary component is valued by the market in a similar manner to the non-discretionary component (i.e., there is no significant difference in the coefficients between the discretionary and non-discretionary components). These results are robust to the inclusion of several control variables and are consistent with the notion that discretion in determining the PBO improves the information content of the financial statements.

An alternative explanation for our results is that the discretionary component of the PBO is priced because the market fixates on reported PBO. Aboody et al. (2002) show that market inefficiency does not materially affect inferences in value relevance studies that use a price specification such as ours (as opposed to a returns' specification). Nevertheless, we substitute price with a measure of *ex post* intrinsic value as a proxy for firms' fundamental value and show that our pricing results are robust to the functional fixation explanation, both for the relative and the incremental analyses.[1]

Finally, we also examine the effect of discretion on the *credit relevance* of the financial statements. We define credit relevance as the ability of financial measures in explaining contemporaneous default risk, which we proxy through Standard and Poor's long-term issuer credit rating (Heflin et al, 2004). Credit relevance examines usefulness of financial statements from a creditors' perspective, which is particularly important when examining the pension obligation. While the basic thrust of our credit rating results is similar to that using stock price, there are some significant differences. First, like the pricing results, we do find that credit raters attach weight to the discretionary component. However, unlike the pricing results, we find that the weight accorded to the discretionary component is only a third of the weight attached to the non-discretionary component. Also, allowing discretion does not appear to improve the relative explanatory power of the aggregate financial measures in explaining credit ratings. On the whole, our credit rating analyses weakly support the notion that discretion improves credit relevance.

Our findings contribute to the ongoing debate on "flexibility vs. uniformity" in accounting standard setting. First, we show that allowing flexibility in the choice of pension assumptions improves

[1] As in Subramanyam and Venkatachalam (2004) we measure *ex post* intrinsic values as the present value of three future years of dividends and marker price at the end of three years.

the value relevance of the PBO and the financial statements. Our results with respect to credit ratings, although similar, are weaker than those using stock prices (or intrinsic values). Overall, our results are consistent with the benefits of allowing discretion, i.e., private information communication, outweighing the costs, i.e., opportunistic manipulation. Second, our study complements prior research that focuses on the value relevance of discretionary accruals by examining discretionary choices in another setting, pension obligations, which is arguably less susceptible to the measurement error problems inherent in discretionary accruals. Finally, our results are in direct contrast to those of a recent paper by Brown (2004). Brown shows that manager's choices of pension assumptions are consistent with certain agency explanations and that the market discounts the discretionary component of the PBO, i.e., discretion impairs the value relevance of the PBO. Our sensitivity analysis (not reported) reveals that our contrasting results are due to differences in design, in particular the measurement of the discretionary component and the selection of control variables.

Our analyses are subject to several caveats. First, while the PBO offers several advantages for examining our research question, its major drawback is that it is not recognized on the financial statements.[2] Although, prior research (e.g., Barth, 1991) shows that footnote disclosures of pension obligations are priced by the market in similar manner to other liabilities on the balance sheet, it is possible that market pricing of disclosed items may differ from those recognized on the financial statements. Second, although our measure of the discretionary component of the PBO is less susceptible to measurement error than discretionary accruals, it is not a perfect measure. However, the measurement error in the discretionary component of the PBO is unlikely correlated with the non-discretionary component. Third, while we perform alternative tests that do not depend on the assumption of market efficiency, we can not completely rule out the stock market's functional fixation on reported PBO as an alternative explanation for our results. Due to data limitations, we are unable to use more than three future

[2] SFAS 87 uses a corridor method to smooth the effects of PBO assumption changes (and actual return on plan assets) on reported pension expense. In order to articulate the balance-sheet with the income statement, SFAS 87 therefore does not recognize the PBO (or the fair value of plan assets) on the balance sheet. What is recognized instead is accrued or prepaid pension cost. The PBO and changes to the PBO are disclosed in footnotes.

years in our *ex post* intrinsic value calculation. If the market mispricing of reported PBO (if any) is not reversed within that period, our results are still susceptible to this alternative explanation.

The rest of our paper is organized as follows. Section 2 motivates our research question. Section 3 discusses sample and data and provides descriptive analysis. Section 4 presents our research design and empirical results. Section 5 concludes.

2. Motivation

Beginning with Enron in 2001, a string of accounting scandals has rocked the U.S. securities' markets. In response, Congress passed the Sarbanes-Oxley Act in 2002. With the ostensible purpose of improving American corporate governance, the Sarbanes-Oxley Act tackles wide ranging issues from auditor independence to audit committee composition. However, despite the loss of public confidence in the financial reporting model, there have been no proposals to curtail discretion accorded under the U.S. GAAP. On the contrary, there have been suggestions that an accounting model like the International Accounting Standards (IAS) that allows more discretion is superior to the more rigid U.S. GAAP, prompting calls for increased discretion through the adoption of "principles-based" rather than the current "rules-based" standards (SEC, 2004; FASB, 2004). Given that a majority of the recent scandals have been precipitated by opportunistic use of the discretion accorded under GAAP, why haven't we seen a movement toward a more rigid GAAP? Undoubtedly, regulators see some merit to allowing flexibility in reporting rules.

In addition to wide-spread allegations in the financial press, a vast body of academic research documents evidence of opportunistic earnings management (see Schipper, 1989; Healy and Wahlen, 1999; and McNichols, 2000 for reviews of earnings management studies). Also, it is often presumed in the finance and economics literatures that earnings management reduces the integrity of accounting numbers (e.g., Holmstrom and Roberts, 1989). Even managers admit that they routinely manage earnings opportunistically (Graham, Harvey and Rajagopal, 2004). Thus, it is evident that managers misuse the discretion allowed by GAAP, which questions the desirability of allowing discretion in financial reporting. However, it is not clear whether the alternative, i.e., eliminating flexibility under GAAP through some form of "uniform accounting", will make accounting numbers more informative. This is because flexible accounting rules allow firms to contract more efficiently (Watts and Zimmerman, 1986) and to communicate value-relevant private information through accounting numbers (Schipper, 1989; Holthausen, 1990; Healy and Palepu, 1993; Sankar and Subramanyam 2001). Thus, the on-going "flexibility vs. uniformity" debate in accounting standard setting essentially involves trading off the relative benefits of allowing discretion, which is improved private information communication and/or more efficient contracting, with the costs of allowing managers to opportunistically manipulate accounting numbers (Dye and Verrecchia, 1995).

While a large literature documents myriad examples of opportunistic earnings management, there are surprisingly few empirical studies that examine whether discretion enhances or diminishes the quality of financial reporting.[3] Subramanyam (1996) documents that the stock market prices discretionary accruals, suggesting that discretion enhances the value relevance of earnings on average, while others (Hunt, Moyer and Shevlin, 1998; Ahmed, 1998) show that income smoothing is associated with a higher price-earnings multiple, which is consistent with signaling. More recently, Zarowin (2002) even suggests that discretionary income smoothing improves the informational efficiency of stock prices. The general conclusion from this literature is that, on average, discretion improves the value relevance of accounting numbers.

The evidence in these papers, however, is subject to the following two alternative explanations: (1) the stock market's functional fixation on reported earnings could lead to mispricing of discretionary accruals; (2) measurement error in the discretionary accruals' proxy could spuriously induce discretionary accruals to be priced. While there is evidence that the stock market misprices discretionary accruals (Xie, 2001), Subramanyam (1996) shows that discretionary accruals also predict future earnings and cash flows, suggesting that market mispricing is unlikely to explain his results. The measurement error

[3] In fact, a recent survey of the earnings management literature (Healy and Walhen, 2001) does not even acknowledge the possibility that there may be benefits to allowing discretion.

explanation, however, is impossible to rule out. Most papers in this genre of research use variations of the Jones (1991) model to measure discretionary accruals. Guay, Kothari and Watts (1996) show that models that decompose accruals into its discretionary and non-discretionary components (including the Jones model and its variants) are subject to such large measurement error that they are indistinguishable from a random decomposition of accruals. Bernard and Skinner (1996) point out that measurement error can induce the discretionary accruals proxy to contain a large non-discretionary component. In such case, the pricing regressions of Subramanyam (1996) and others are largely meaningless since their results could be explained simply by measurement error in the discretionary accruals proxy.

For the literature evaluating the effects of discretion to advance in any meaningful manner, it is imperative that the discretionary component is measured more accurately, or at least in a manner where the measurement error in the discretionary component is uncorrelated with the non-discretionary component. Such a requirement is not feasible given extant techniques for measuring the discretionary component of aggregate accruals. A more promising avenue may be modeling specific accrual choices (McNichols, 2000).[4] An advantage to using specific accruals is that the researcher can exploit knowledge of GAAP and economic determinants of the specific accrual to model the non-discretionary component more accurately. The disadvantage of the specific accruals' approach is that it is necessary to identify a specific accrual that is economically significant for this purpose. Such an approach has been employed for evaluating the value relevance of the discretionary component of loss reserves in the financial sector: commercial banks' loan loss provisions (e.g., Wahlen, 1994; Beaver and Engel, 1996) and property casualty insurance companies' loss reserves (e.g., Beaver and McNichols, 1998; Petroni et al, 2002). However, extant research has not employed such an approach for non-financial companies.[5]

[4] McNichols (2000) observes that empirical techniques for estimating the discretionary component of aggregate accruals lag both theory and our institutional knowledge of how accruals behave, which can result in misleading inferences about earnings management behavior. McNichols suggests that future progress in the earnings management literature is more likely to come from application of specific accrual based tests than from aggregate accruals tests.

[5] A recent exception is Brown (2004).

Motivated by the advantages of modeling specific accruals, in this paper we examine the value relevance of a specific item that is subject to managerial discretion: the projected benefit obligation (PBO) of defined benefit pension plans. We choose the PBO as our target of analysis for several reasons. First, defined benefit pension accounting allows considerable scope for managerial discretion, and is regarded as a fertile area for manipulation (Buffet and Loomis, 2002). For example, managers can exercise discretion in choosing discount rates and compensation growth rates, both which have significant impact on the PBO. Second, small changes in assumptions can generate significant variation in the PBO. For example, a one percent change in the discount rate could typically change PBO by 10% or more. Third, pension obligations are large in magnitude. For example, PBO can exceed 50% of total liabilities for many firms. Taken together, the average magnitude of the PBO and its sensitivity to assumptions makes it an economically significant item to study for our purpose. Finally (and most importantly), managerial choices of pension assumptions are disclosed in footnotes. Using these disclosures, we are able to measure the discretionary component of the PBO with reasonable accuracy, thereby ameliorating the measurement-error problem that plagues the discretionary accruals literature to a large extent.

While the PBO offers several advantages for examining our research question, its major drawback is that it is not recognized on the financial statements. Rather, the PBO and changes to the PBO are merely disclosed in footnotes.[6] Two problems arise when using an item that is merely disclosed to test our research question. First, users may not weight disclosed items. While possible, research evidence suggests that disclosed items are priced by the market. In particular, research (e.g., Barth, 1991) shows that PBO disclosures are priced by the market in similar manner to other liabilities on the balance sheet (in fact, the market accords higher weights on PBO, probably because it is more persistent). Second, managers may not be interested in manipulating items that are merely disclosed in footnotes. While this is

[6] SFAS 87 uses a corridor method to smooth the effects of PBO assumption changes (and actual return on plan assets) on reported pension expense. In order to articulate the balance-sheet with the income statement, SFAS 87 therefore does not recognize the PBO (or the fair value of plan assets) on the balance sheet. What is recognized instead is accrued or prepaid pension cost.

possible, again there is evidence that suggests that managers do manipulate pension assumptions that determine the PBO (e.g., Gopalakrishnan and Sugrue, 1995; Brown, 2004).

In this paper, we ask the following question: do the managers' choices of pension assumptions improve or impair the ability of the PBO to convey the real economic value of the firm in general and the pension plan obligation in particular. We test our research question by examining whether removing managerial discretion in pension assumptions improves or impairs the value relevance of the PBO. For this purpose, we develop a model to measure the discretionary component of the PBO. For determining the discretionary component of the PBO, we estimate a "non-discretionary" PBO by replacing the firms' choice of discount rate and compensation growth rate with their respective industry averages during that year. The difference between the firms' disclosed PBO and our measure of non-discretionary PBO gives us the discretionary component. Therefore, we assume that any deviation from the industry median in the choice of pension assumptions is discretionary.

3. Sample, Data and Descriptive Statistics

3.1 Sample

Our sample is drawn from all U.S. firms with necessary pension and stock price data available in the *Compustat* annual industrial, research and full coverage files and *CRSP's* monthly return file. Our sample is limited to the 1991-1997 period for the following reasons: (1) data on pension assumptions, such as compensation growth and discount rates, are available in *Compustat* only after 1990; (2) data on the accumulated benefit obligation (*ABO*), which is a key variable for estimating non-discretionary PBO, is unavailable in *Compustat* since 1998.[7] Our primary sample for the pricing tests consists of 5,880 firms-years comprising 1,326 unique firms. The sample for our credit rating tests are further restricted to the 1995-1997 period because we require four prior years of data to construct *STDROA* (standard deviation in return on assets), a known determinant of credit ratings.

[7] ABO disclosures were discontinued by SFAS 132 that became operational for 1998 onward.

3.2 Distribution of Pension Assumptions

Firms can increase (decrease) PBO by choosing a lower (higher) discount rate or a higher (lower) compensation growth rate. Under SFAS 87, firms are required to disclose these pension assumptions in footnotes. Table 1 reports the distribution of discount rate and compensation growth rate assumptions used by our sample firms over the 1991-1997 period. The mean discount rate (*r)* over our sample period is 7.78%, which is surprisingly close to the mean 30-year US treasury bonds rate of 6.83% (untabulated) over a comparable period. The mean compensation growth rate (*g)* is 5.13%. The cross-sectional variation in both *r* and *g* are fairly substantial throughout the sample period, with the by-year standard deviation of *r* (*g*) close to 0.50% (0.80%). Also, the by-year range of *r* (*g*) is greater than 5% (6%) in each of the seven years. In short, there is large cross-sectional variation in both *r* and *g*, which is much larger than the variation across time.

The wide cross-sectional variation in the assumed discount and compensation growth rates suggests that there is substantial discretion being exercised in determining the PBO numbers. Several studies (e.g., Blankley and Swanson, 1995; Godwin et al., 1996; Petersen, 1996; Asthana, 1999; Gopalakrishnan and Sugrue, 1995; Brown, 2004) find that the choice of pension assumptions is influenced by reporting incentives associated with agency considerations. To mitigate such opportunistic behavior, some argue that all firms should use the same assumed rates at each point of time (e.g., Brown, 2004).

On the other hand, discretion in pension assumptions may be exercised by management to reflect real economic differences among pension plans (e.g., Blankley and Swanson, 1995). For example, SFAS 87 indicates that the selection of discount rates should be based on current prices for settling pension obligation.[8] Hence, there are at least two economic reasons to justify the discretion afforded in the discount rate assumption. First, the age of the workforce can differ across firms. A company with an older

[8] In determining the discount rate, SFAS No. 87 permits consideration of a broad range of factors, including annuity or Pension Benefit Guaranty Corporation (PBGC) interest rates and interest rates on long-term, high-quality, fixed-income investments. In a letter to the EITF in 1993, the SEC specifically suggested using high-quality corporate debt yields as assumed discount rates for pension plans.

workforce would generally use a lower discount rate than a company with a younger workforce due to the shorter maturity of their pension obligations. Second, interest rates vary from country to country. Hence, companies with international pension plans would use different discount rates depending on their relative exposures in various countries. There are also similar economic reasons to allow discretion in compensation growth rates. Labor markets may not be perfectly competitive and there can be specific skills required in different companies and industries.

3.3 Computation of the Discretionary Component of PBO and Non-Discretionary PBO

As mentioned earlier, we compute the discretionary component of the PBO as the difference between reported PBO (as disclosed in the pension footnote) and an estimate of "non-discretionary PBO". Our estimate of non-discretionary PBO is determined by substituting the company's assumed discount rate (*r)* and compensation growth rate (*g*) with their respective industry medians for each year. The construction of this measure is discussed below.

The projected benefit obligation (*PBO*) is expressed as:

$$PBO = \frac{P_{r,L}\left(KW(1+g)^N\right)}{(1+r)^N} \tag{1}$$

where $P_{r,L}$ is the present value of an *L* period annuity at a discount rate of *r* and equals $r^{-1}\left(1-(1+r)^{-L}\right)$, *L* is the employees' post-retirement life expectancy, *K* is the proportion of the employees' wages that are payable as pension benefits given current service and vesting, *W* is the current wage, *g* is the wage (i.e. compensation) growth rate and *N* is the number of years to retirement. Conceptually, *PBO* is the present value of the projected pension benefit annuity of $KW(1+g)^N$ that is expected to be paid annually over a *L* year period after the date of retirement that is expected to occur *N* years hence. The projected benefit annuity is simply the proportion of current pension wage component, *KW,* projected as of the retirement date. Our objective is to estimate the change in *PBO* due to changes in the discount rate (*r*) and the compensation growth rate (*g*). In order to do this, we need to determine the three unknowns in equation (1): life expectancy (*L*), years to retirement (*N*) and the pension wage component (*KW*).

We assume that life expectancy after retirement is 15 years, i.e. L =15.[9] We then estimate N by inverting the following relation between *PBO* and *ABO* (see Subramanyam and Zhang, 2001):

$$PBO = ABO(1+g)^N \tag{2}$$

and solving for *N:*

$$\hat{N} = \frac{Ln(PBO / ABO)}{Ln(1+g)} \tag{3}$$

where *ABO* is the accumulated benefit obligation disclosed in footnotes.

Using each firm's current g and r from financial statement footnotes, along with our estimates of L and N , we determine *KW* as follows:

$$\hat{KW} = \frac{PBO(1+r)^{\hat{N}}\, r}{\left(1-(1+r)^{-15}\right)(1+g)^{\hat{N}}} \tag{4}$$

With an estimate of *KW*, we can generate estimates of *PBO* under various discount and compensation growth rate assumptions by substituting various values for r and g in equation (1). In our case, we substitute g and r with their respective annual industry medians to estimate our measure of non-discretionary PBO (*PBO-X*), where industry is defined based on Fama and French's (1997) industry classifications. The discretionary component of the PBO (*PBO-D*) is therefore the difference between *PBO* and *PBO-X.*

2.4 Descriptive Statistics

Table 2 provides descriptive statistics for our primary sample for the pricing tests. The upper panel reports undeflated ($ million) and the lower panel reports sales-deflated sample statistics for all variables used in our analyses. The mean total assets is $6.2 billion (median $1 billion) which indicates a bias towards larger firms, as with other studies examining defined benefit pension plans. Overall, our descriptive data is comparable to those of earlier papers studying pension accounting (e.g., Barth, 1991; Hann et al., 2004; Brown, 2004). Not surprisingly, our estimate of non-discretionary PBO (*PBO-X*: $502

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[9] The life expectancy for age 65 males during the mid 1990's was between 15 and 16 years. We round down to 15 years. See the Centers for Medicare and Medicaid Services web site, www.cms.hhs.gov.

million) is on average higher than the disclosed PBO (*PBO*: \$479 million). This result is consistent with the conjecture that firms tend to use their discretion to lower their PBOs. While negative, the average *PBO-D* is small (mean: -\$23 million, median: -\$4 million). However, the standard deviation (\$269 million) is large and equal almost 20% the standard deviation of reported PBO, suggesting that there is significant variation in the discretionary component.

4. Results

4.1 Stock Price Association Tests

We assess the value relevance of the discretionary component of the PBO through price association regressions, where the market value of equity is regressed on contemporaneous accounting measures. We adopt a levels (price) rather than a changes (returns) specification because it is economically better specified (Kothari and Zimmerman, 1995), consistent with prior pensions' research (Landsman, 1986; Barth, 1991; Barth et al. 1992) and appropriate for our research question, which examines the value relevance of a balance sheet item. However, the price specification suffers from econometric problems, especially heteroskedasticity (Kothari and Zimmerman, 1995) and inferences from R^2s can be problematic due to scale bias (Brown et al., 1999). To mitigate these problems, we report results from both undeflated (\$ million) and deflated (deflated by sales) versions of our models.

Specifically, we estimate variations of the following model (subscripts *i* and *t* represent firm and year):

$$P_{it} = \sum_{t=1}^{6} a_t I_{91+t} + b_1 TA_{it} + b_2 TL_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \qquad (5)$$

where P_{it} is stock price; and TA_{it} and TL_{it} are total assets and total liabilities *appropriately adjusted for the fair-values of the pension plan assets and liabilities as per footnote disclosures*.[10] As noted earlier, all

[10] Note that, per SFAS 87, only the accrued or prepaid pension cost is featured on the face of the balance sheet, rather than the funded status of the plan which is the difference between the fair value of the pension assets and the pension obligation (PBO). We assume the fair value of net pension assets (hereafter, *fair-value NPA*: the difference between pension assets and PBO), as opposed to the accrued or prepaid pension cost prescribed under SFAS 87

variables are measured either undeflated ($ million) or on a sales-deflated basis. We provide for separate intercepts for each year from 1991 through 1997.

In addition to the variables of interest, we include a vector of control variables: NI_{it} is income from continuing operations, $SALEGRW_{it}$ is the average sales growth over the previous three years, $R\&D_{it}$ is research and development expense, and EMP_{it} is number of employees. We include NI_{it} because Ohlson (1995) shows that, when income is neither perfectly persistent nor transitory, the correct specification of the price association model is one that includes both the book value of equity and income.[11] $SALEGRW_{it}$ is included to control for growth opportunities not reflected in the financial statements. Finally, we include EMP_{it} and $R\&D_{it}$ as control variables to mitigate the effects of the service cost anomaly (Subramanyam and Zhang, 2001).[12] Although service cost is never featured as a separate explanatory variable in any of our models, it is embedded in our measures of the pension liability and thus may affect our inferences in the absence of these control variables. For brevity, we do not report coefficients on our control variables. Generally, the coefficients are in the predicted direction and statistically significant for most specifications.

We present two sets of analyses: an aggregate and a disaggregate specification. In the *aggregate specification*, we include the aggregate values of total assets and liabilities, without breaking them into their respective pension and non-pension components. The aggregate specification tests whether discretion improves the value relevance of bottom-line assets or liabilities, which is consistent with the private information communication (e.g., Sankar and Subramanyam, 2001). In the *disaggregate*

(hereafter, *SFAS-87 NPA*), is included in total assets and total liabilities. Because it is in general difficult to identify where net pension assets are included in the balance sheet, we assume that net pension assets are always included in total liabilities. Specifically, TL_{it} is reported total liabilities minus *SFAS-87 NPA* plus *fair-value NPA*.

[11] Lo and Lys (2001) argue Ohlson's (1995) model suggests dividends and net capital contributions are also important. However, comparing the results of Lo and Lys (2001), who include dividend and net capital contribution variables, with those of Collins et al. (1997), who exclude dividend and net capital contribution variables, suggests that omitting dividends and net capital contributions does not materially bias coefficients.

[12] Service cost anomaly refers to the anomalous positive relation between service cost (an expense) and stock price. This was first reported by Barth et al. (1992). Subramanyam and Zhang (2001) argue that the positive relation between service cost and price occurs because service cost proxies for value created by human capital. They control for this effect by adding number of employees and research and development expense in the regression and show that the coefficient on service cost becomes negative (which is theoretically correct) after their inclusion.

specification we break-up total assets and liabilities into their respective pension and non-pension components. The disaggregate specification tests whether discretion specifically improves the value relevance of the PBO *per se*, which is also consistent with efficiency (Watts and Zimmerman, 1986).

Within each specification, we examine the relative *and* incremental value relevance of the discretionary component. For the relative value relevance tests, we compare the explanatory power (and coefficients) of a model where discretion is allowed to one where *TL* (or *PBO*) are computed without discretion. For the incremental value relevance tests, we include both the discretionary and non-discretionary components of *TL* (or *PBO*) in the same model and examine the sign and significance of the coefficient on the discretionary component.

4.1.1 Aggregate Stock Price Association Tests

We begin our analysis with the *relative* value relevance tests of the aggregate specification by comparing the following two models:

$$P_{it} = \sum_{t=1}^{6} a_t I_{91+t} + b_1 TA_{it} + b_2 TL_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D + c_4 EMP_{it} + e_{it} \quad (5a)$$

$$P_{it} = \sum_{t=1}^{6} a_t I_{91+t} + b_1 TA_{it} + b_2 TL\text{-}X_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \quad (5b)$$

where $Tl\text{-}X_{it}$ is non-discretionary total liabilities, i.e., TL_{it} minus the discretionary component of the *PBO* (as defined in Section 3.3). All other variables are as defined earlier.

Table 3 Panel A reports the results of models (5a: with discretion) and (5b: without discretion). For both the undeflated and deflated specifications, the explanatory power of model (5b) is lower than that of (5a). Specifically, the reduction in adjusted R^2 by removing the discretionary component for the undeflated and deflated specifications are 0.5% and 3.4% respectively. Both differences are statistically significant and the difference for the deflated specification is also economically significant. In addition, the coefficients of *TL-X* are lower then those of *TL* in both specifications, although their differences are not statistically significant. In short, the results from our relative association tests are consistent with discretion in the PBO improving the value relevance of total liabilities

We next examine the *incremental* value relevance of the discretionary component in an aggregate specification through the following two models:

$$P_{it} = \sum_{i=1}^{6} a_t I_{91+t} + b_1 TA_{it} + b_2 TL\text{-}X_{it} + b_3 TL\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \tag{6a}$$

$$P_{it} = \sum_{i=1}^{6} a_t I_{91+t} + b_1 TA_{it} + b_2 TL_{it} + b_3 TL\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \tag{6b}$$

where $TL\text{-}D_{it}$ is the discretionary component of TL_{it} and all other variables are as defined earlier. Note that the only difference between the two equations is that equation (6b) replaces the explanatory variable $TL\text{-}X_{it}$ in equation (6a) with TL_{it}. Because $TL_{it} = TL\text{-}X_{it} + TL\text{-}D_{it}$, the two models are equivalent. We report both models because it allows us to draw tighter inferences regarding the market pricing of the discretionary component.

Table 3 Panel B presents the results from regressions (6a) and (6b). For both the undeflated and deflated specifications, the pricing coefficients of $TL\text{-}D_{it}$ in model (6a) are negative and significant: -0.62 for the undeflated and -1.13 for the deflated specifications (both are significant at $p \leq 0.01$, two-tailed). This suggests that the discretionary component of pension liabilities has incremental information content over non-discretionary total liabilities, which is consistent with the market attaching weight to the discretionary component. Further, the magnitude of the coefficient of $TL\text{-}D_{it}$ (-0.62) is very similar to that of $TL\text{-}X_{it}$ (-0.67), suggesting that the market views the discretionary component equally value relevant as the non-discretionary component. Note that the difference between these two coefficients ($TL\text{-}D_{it}$ and $TL\text{-}X_{it}$) in model (6a) is equal to the coefficient of $TL\text{-}D_{it}$ in model (6b), which is insignificant at conventional levels in both the deflated and undeflated specifications. Therefore, while model (6a) reveals that the coefficient of $TL\text{-}D_{it}$ is significantly negative, model (6b) suggests that the coefficient on $TL\text{-}D_{it}$ is indistinguishable from that on $TL\text{-}X_{it}$.

Overall, our aggregate price association tests are consistent with the market valuing the discretionary component in similar vein as the non-discretionary component and discretion improving the value relevance of aggregate balance sheet measures. These results provide support for the private information communication hypothesis.

4.1.2 Disaggregate Stock Price Association Tests

We next examine price association tests using the disaggregate specification, i.e., when the pension and non-pension components are separated. The disaggregate specification is useful for two reasons. First, as discussed earlier, while the aggregate specification tests the information communication hypothesis, the disaggregate specification tests for efficiency (Watts and Zimmerman, 1986). Second, to the extent that pricing weights on the pension and non-pension components of assets and liabilities are unequal, the aggregate specification can lead to loss of efficiency. We first examine the *relative* value relevance of the disaggregated pension components by comparing the following two models:

$$P_{it} = \sum_{t=1}^{6} a_t I_{91+t} + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \quad (7a)$$

$$P_{it} = \sum_{t=1}^{6} a_t I_{91+t} + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO\text{-}X_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \quad (7b)$$

$NPTA_{it}$ and $NPTL_{it}$ are non-pension assets and liabilities, respectively. PBO_{it} is the projected benefit obligation disclosed in the pension footnote; $PBO\text{-}X_{it}$ is non-discretionary pension obligation (as defined in section 3.3).

Panel C of Table 3 reports the regression results of equations (7a) and (7b). Unlike the aggregate specification, we only find weak and mixed evidence that discretion improves the value relevance of PBO. While the R^2 for the undeflated specification is marginally (although statistically significantly) higher for model (7a), there is no difference in explanatory power across the two models for the deflated specification. The coefficient weights on PBO_{it} are higher than that on $PBO\text{-}X_{it}$, but once again the difference is significant only for the undeflated specification.

Next, we perform *incremental* association tests on the disaggregated pension and non-pension components using the following models:

$$P_{it} = \sum_{t=1}^{6} a_t I_{91+t} + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO\text{-}X_{it} + b_5 PBO\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \quad (8a)$$

$$P_{it} = \sum_{t=1}^{6} a_t I_{91+t} + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO_{it} + b_5 PBO\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it} \quad (8b)$$

Similar to models (6a) and (6b), models (8a) and (8b) are equivalent models. We report results from both models in Panel D of Table 3 for inferential purposes. For the undeflated version of the regressions, the coefficients of *PBO-X* and *PBO-D* in equation (8a) are -1.67 and -1.93 (both significant at the 0.00 level) respectively, which suggests that the market places more weight on *PBO-D* than on *PBO-X*. This finding is also reflected by the negative and significant coefficient on *PBO-D* in model (8b). The results of the deflated specification are weaker. While the coefficient of *PBO-D* is negative, its magnitude is marginally smaller than that of *PBO-X* in model (8a) and it is not statistically significant. The coefficient of *PBO-D* in model (8b) is also insignificant, which suggests that the coefficient weight on the discretionary component is not different from that of the non-discretionary component. Overall, the results are generally consistent with the market pricing the discretionary component of the PBO.

In summary, the results from our price association tests suggest that the discretionary component of the pension liability is priced by the market and therefore has incremental information content beyond the non-discretionary component. This suggests that discretionary choices made by managers in selecting pension assumptions provide valuable information to the market. Such discretion appears to improve the value relevance (explanatory power) of aggregate balance sheet measures (total assets and total liabilities).

4.2 Ex Post Intrinsic Value Association Tests

Our price association tests reveal that the market prices the discretionary component of the PBO. One interpretation of this result is that value relevant information is communicated through the discretionary component. However, an alternative explanation for this finding is that the market fails to properly distinguish the discretionary and nondiscretionary components of the PBO, probably because it fixates on reported PBO numbers, in a similar manner as it fixates on bottom line earnings, without separating out accruals and cash flows (Sloan, 1996). In such a case, our results could arise simply from market mispricing, rather than through the value relevance of the discretionary component.

Aboody et al. (2002) examine the implications of possible market inefficiency for value relevance studies and conclude that the economic significance of any bias that may arise from market mispricing for a price (i.e., levels) specification is unlikely to be material. Therefore, since our study adopts a price specification, market inefficiency is unlikely to materially affect our results. Nevertheless, in this section we adopt an alternative approach that is in the spirit of the remedy Aboody et al. propose to overcome the market inefficiency problem. Specifically, we define value relevance as the mapping from accounting information to *intrinsic value*, i.e., the present value of expected future dividends conditional on all available information. Accordingly, we replace price with a measure of *ex post* intrinsic value proposed by Subramanyam and Venkatachalam (2004):

$$IV_{it} = \sum_{\tau=1}^{3} \frac{d_{t+\tau}}{(1+r)^{\tau}} + \frac{P_{t+3}}{(1+r)^{3}} \qquad (9)$$

where IV_{it} is the *ex post* intrinsic value for firm *i* in year *t*; $d_{t+\tau}$ is dividend for year $t+\tau$; *r* is the discount rate; and P_{t+3} is stock price in year *t+3*. Because currently there is no consensus on the estimation of expected rates of return, we use a constant discount rate of 10% for all firms. For the terminal value, we use the market value at the end of year *t+3*.

There are two limitations with the above approach. First, *ex post* intrinsic value is derived from future realizations of dividends and price; hence, such measure would likely contain information that is not yet available in year *t*. However, Aboody et al. argue that while unanticipated future information causes measurement errors in the intrinsic value proxy, it is unlikely to cause bias in the coefficients. Second, the implicit assumption in using three-year-hence price is that the market inefficiency with respect to pricing of current financial statement information is likely to be reversed in three years. To the extent that the current mispricing is not resolved within the next three years, there is still some likelihood that market mispricing may contaminate our results.

We replicate the aggregate specification of the price association tests by replacing current price with our measure of *ex post* intrinsic values. The results are presented in Table 4. Panel A reports results from the relative association tests while panel B reports results from the incremental association tests. Overall, the results from the *ex post* intrinsic regressions are qualitatively similar to those from the price regressions. Specifically, the coefficients of *TA* and *TL* in the *ex post* intrinsic value regressions are similar to the corresponding coefficients in the price regressions. Further, allowing discretion improves the explanatory power of the model, in particular for the deflated specification, and the discretionary component is weighted in a similar manner as the non-discretionary component. These findings are consistent with Aboody et al's observation that market inefficiency does not result in significant coefficient bias for a price (levels) specification and that it is unlikely to be material for price (levels) specifications. These findings also corroborate our primary findings, that discretion improves the value relevance of the PBO.

4.3 Credit Rating Association Tests

In their critique of the value relevance literature, Holthausen and Watts (2000) observe that, while financial accounting is geared to satisfy the needs of a multitude of users, the stock price (or returns) focus of the value relevance literature limits its applicability only to the needs of equity investors. In particular, extant value relevance literature has rarely addressed the differential needs of creditors, who are another important class of users. Creditors are particularly important for our paper since we examine issues relating to defined benefit pension liabilities.[13] Accordingly, in this section we examine the effect of allowing discretion in pension assumptions on the *credit relevance* of the PBO.

Specifically, as in Heflin et al (2004), we define credit relevance as the ability of accounting measures to correlate with probability of default, which we proxy through credit ratings. We use Standard and Poor's long-term issuer credit rating (Compustat annual data item 280) as our measure of default

[13] For example, credit rating agencies have recently lowered debt ratings for some major U.S. corporations because of their large off-balance sheet pension liabilities (e.g. Porretto, 2003). Also, Martin and Henderson (1983), Maher (1987) and Carroll and Niehaus (1998) find that the off-balance sheet funded status of a firm's pension plans, i.e., net pension assets under the fair value model, incrementally helps explain credit ratings.

probability. The correlation between debt ratings and default probabilities is well established (e.g., Altman, 1992). Kaplan and Urwitz (1979) develop a statistical model to explain bond ratings using several accounting variables and it has been used in prior research (e.g. Ahmed et al. 2002) to model Standard and Poor's long term credit ratings. We embed our alternative measures of discretionary and non-discretionary PBO into the ratios used in the Kaplan-Urwitz model. As with the price association tests, we first examine the *relative* credit relevance of in an aggregate specification by comparing the following two models (subscripts *i* and *t* represent firm and year):

$$RATE_{it} = \sum_{t=1}^{2} a_t I_{95+t} + b_1 LEV_{it} + b_2 ROA_{it} + b_3 SDROA_{it} + b_4 COV_{it} + e_{it} \qquad (10a)$$

$$RATE_{it} = \sum_{t=1}^{2} a_t I_{95+t} + b_1 LEV\text{-}X_{it} + b_2 ROA_{it} + b_3 SDROA_{it} + b_4 COV_{it} + e_{it} \qquad (10b)$$

where $RATE_{i,t}$ ranges from one through 19, corresponding to the 19 distinct Standard and Poor's ratings present in our sample, starting from CCC- (not likely to make interest or principal payments) through AAA (extremely strong capacity to pay interest and principal). Thus, higher values of $RATE_{i,t}$ correspond to better credit ratings. $LEV_{i,t}$ is leverage (long-term liabilities divided by total assets).[14]

The main variable of interest in this analysis is leverage (*LEV)*. As in the case of total liabilities in the price models, $LEV_{i,t}$ (deflated by total assets) is *adjusted for the funded status of the pension plans as per footnote disclosures*. $LEV\text{-}X_{i,t}$ is non-discretionary leverage, i.e., $LEV_{i,t}$ minus $PBO\text{-}D_{i,t}$ divided by $TA_{i,t}$. $ROA_{i,t}$ is return on assets (income before extraordinary items divided by total assets) and $SDROA_{i,t}$ is the standard deviation of return on assets over the current and preceding four years. $COV_{i,t}$ represents interest coverage and is measured as cash flow from operations plus cash interest paid divided by cash interest paid. Finally, we allow the intercept to vary by year and include indicator variables for years 1996 through 2002.

[14] Although the dependent variable is an ordered categorical variable, we use OLS rather than multinomial logit for our tests. The primary reason for using OLS is because we are not aware of any tests of explanatory power under a logit framework. Given the large number of categories in the dependent variable, use of OLS is unlikely to affect our results. In fact, Kaplan and Urwitz (1979), conclude that multinomial logit and OLS produce similar results.

Table 5 Panel A presents results from regressions (10a) and (10b). We do not find any significant difference in the explanatory power across the two models. Also, while the coefficient of LEV_{it} (-7.16) is of larger magnitude than that of $LEV\text{-}X_{it}$ (-6.78), the difference is not statistically significant. Thus, the relative credit association tests do not support the hypothesis that discretion improves the information communicated through balance sheet ratios. However, it is important to note that discretion does not impair the relevance of balance sheet ratios to creditors.

We next test for incremental credit relevance by examining the following two models:

$$RATE_{it} = \sum_{t=1}^{2} a_t I_{95+t} + b_1 LEV\text{-}X_{it} + b_2 LEV\text{-}D_{it} + b_3 ROA_{it} + b_4 SDROA_{it} + b_5 COV_{it} + e_{it} \qquad (11a)$$

$$RATE_{it} = \sum_{t=1}^{2} a_t I_{95+t} + b_1 LEV_{it} + b_2 LEV\text{-}D_{it} + b_3 ROA_{it} + b_4 SDROA_{it} + b_5 COV_{it} + e_{it} \qquad (11b)$$

$LEV\text{-}D_{it}$ is the discretionary component of leverage. As in the incremental price association tests, models (11a) and (11b) are equivalent. The results of these regression models are reported in Panel B of Table 5. For regression (11a), the coefficient of $LEV\text{-}X_{it}$ and $LEV\text{-}D_{it}$ are -7.08 and -2.51, respectively. The coefficient of $LEV\text{-}D_{it}$ is statistically significant (at p=0.02, two-tailed), suggesting that the discretionary component of PBO is weighted by credit raters. However, the coefficient on the discretionary component is only about a third as large as that of the non-discretionary component. This difference (4.57) is statistically significant (at $p \leq 0.01$, two-tailed) as can be seen from the coefficient of $LEV\text{-}D_{it}$ in model (11b). This suggests that, while credit raters do weight the discretionary component, they attach a substantially lower weight on the discretionary component relative to the weight on the non-discretionary component.

Overall, the credit association tests are not as strong as the price relevance tests. While there is evidence that the credit raters do consider the discretionary component when assessing default probabilities, the weight attached to it is lower than that on the discretionary component. Also, the relative association tests show that there is no difference in the explanatory power across two models (with and without discretion), which suggests that the discretionary component neither improves nor impedes the ability of leverage in predicting default probabilities.

5. Conclusion

U.S. and International accounting standards are going through major changes as a result of the recent waves of accounting scandals. One of the issues that is at the heart of the debate is the degree of flexibility that should be allowed under GAAP. While many criticized that the flexibility afforded under GAAP allows managers to opportunistically manipulate accounting numbers, others believe that it allows managers to better communicate private information to financial statement users. Whether flexibility improves or impairs the value relevance of financial statements is ultimately an empirical question. In this study, we examine this issue in the context of pension obligations. Specially, we examine whether allowing discretion on pension assumptions on the PBO improves or impairs the value relevance of the balance sheet.

Our results show that discretion in the PBO improves the value relevance of the balance sheet and that the discretionary component of pension liability is priced by the stock market. Overall, these findings suggest that the benefits of allowing flexibility, which is more efficient communication of private information, outweighs the costs of opportunistic manipulation. Our results have implications for the recent debate on principles-based versus rules-based standards (e.g., FASB, 2004).

References

Aboody, D., J. Hughes, and J. Liu, 2002. Measuring Value Relevance in a (Possibly) Inefficient Market. *Journal of Accounting Research* 40, 965-986.

Altman, E., 1992. Revising the high-yield bond market. *Financial Management* 21, 89-92.

Ahmed, A., 1996. Discretionary Accruals, Earnings Management and the Valuation of Earnings. Working paper, University of Florida.

Ahmed, A.S., B.K. Billings, R.M. Morton, and M. Stanford-Harris, 2002. The role of accounting conservatism in mitigating bondholder-shareholder conflicts over dividend policy and in reducing debt costs. *The Accounting Review* 77, 867-890.

Asthana, S., 1999. Determinants of funding strategies and actuarial choices for defined-benefit pension plans. *Contemporary Accounting Research* 16, 39-74.

Barth, M.E., 1991. Relative measurement errors among alternative pension asset and liability measures. *The Accounting Review* 66, 433-463.

Barth, M.E, W. H. Beaver, and W. R. Landsman, 1992. The market valuation implications of net periodic pension cost components. *Journal of Accounting and Economics* 15 (March): 27-62.

Barth, M.E, W. H. Beaver, and W. R. Landsman, 1993. A structural analysis of pension disclosures under SFAS 87 and their relation to share prices. *Financial Analysts Journal* 49, 18-26.

Beaver, W. and E.E. Engel, 1996. Discretionary behavior with respect to allowance for loan losses and the behavior of security prices. *Journal of Accounting and Economics* 22(1-3), 177-206.

Beaver, W. and M. McNichols, 1998. The characteristics and valuation of loss reserves of property casualty insurers. *Review of Accounting Studies* 3 (1-2), 73-95.

Bernard, V.L. and D.J. Skinner, 1996. What motivates managers' choice of discretionary accruals? *Journal of Accounting and Economics* 22: 313-325.

Blankley, A. I.,Swanson, E. P., 1995. A longitudinal study of SFAS 87 pension rate assumptions. *Accounting Horizons* 9, 1-21.

Brown, S., 2004. The impact of pension assumptions on firm values. Working Paper, Goizueta Business School at Emory University.

Brown, S., K. Lo, and T.Z. Lys, 1999. Use of R^2 in accounting research: Measuring changes in value relevance over the last four decades. *Journal of Accounting Economics* 28 (2), 83-115.

Buffet, W. and K. Loomis, 2002. Warren Buffet on the Stock Market. *Fortune.com.*

Carroll, T.J. and G. Niehaus, 1998. Pension plan funding and corporate debt ratings. *The Journal of Risk and Insurance* 65, 427-441.

Collins, D.W, E.L. Maydew, and I.S. Weiss, 1997. Changes in the value-relevance of earnings and book values over the past forty years. *Journal of Accounting and Economics* 24 (1), 39-67.

Dye, R.A. and R.E. Verrecchia, 1995. Discretion vs. uniformity: choices among GAAP. The Accounting Review 70-3 (July): 389-415.

Financial Accounting Standards Board, July 2004. Response to SEC Study on the Adoption of a Principles-Based Accounting System.

Godwin, J. H., Goldberg, S. R.,Duchac, J. E., 1996. An empirical analysis of factors associated with changes in pension-plan interest-rate assumptions. *Journal of Accounting, Auditing and Finance* 11, 305-322.

Gopalakrishnan, V. and T.F. Sugrue, 1995. The determinants of actuarial assumptions under pension accounting disclosures. *Journal Of Financial And Strategic Decisions* 8-1, 35-41.

Graham, J., C. Harvey and S. Rajgopal, 2004. The Economic Implications of Corporate Financial Reporting. Forthcoming, *Journal of Accounting and Economics.*

Guay, W.R., S.P. Kothari, and R.L. Watts, 1996. A market-based evaluation of discretionary-accruals models. *Journal of Accounting Research* 34 (supplement): 83-105.

Healy, P.M. and K.G. Palepu, 1993. The effect of firms' financial disclosure policies on stock prices. *Accounting Horizons* 7, 1-11.

Healy, P.M. and J.M. Wahlen, 1999. A review of the earnings management literature and its implications for standard setting. *Accounting Horizons* 13-4: 365-383.

Heflin, F., R. Hann and K.R. Subramanyam, 2004. Fair Value Based Pension Accounting. Working Paper, University of Southern California.

Holmstrom, B. and J. Roberts, 1998. The Boundaries of the Firm Revisited. *The Journal of Economic Perspectives*, Fall, 73-94.

Holthausen, R.W., 1990. Accounting method choice: opportunistic behavior, efficient contracting and information perspectives. *Journal of Accounting and Economics* 12, 207-218.

Holthausen R. and R. Watts. 2000. The relevance of the value relevance literature for financial accounting standard setting. *Journal of Accounting and Economics, 22.*

Hunt, A., S. Moyer and T. Shevlin, 1998. Earnings Smoothing and Equity Value, Working Paper, University of Washington, Seattle.

Jones, J.J.,1991. Earnings management during import relief investigations. *Journal of Accounting Research* 29: 193-228.

Kaplan, R.S. and G. Urwitz, 1979. Statistical models of bond ratings: A methodological inquiry. *The Journal of Business* 52, 231-261.

Kothari, S.P., Zimmerman, J., 1995. Price and return models. *Journal of Accounting and Economics* 20, 155–192.

Landsman W. R. 1986. An empirical investigation of pension fund property rights. *The Accounting Review* 61 (October): 622-691.

Lo, K. and T.Z. Lys, 2001. Bridging the gap between value relevance and information content. Working paper, University of British Columbia and Northwestern University.

Maher, J.J., 1987. Pension obligations and the bond credit market: An empirical analysis of accounting numbers. *The Accounting Review* 62, 785-798.

Martin, L..J. and G.V. Henderson, Jr., 1983. On bond ratings and pension obligations: A note. *Journal of Financial and Quantitative Analysis* 18, 463-470.

McNichols, M., 2000. Research design issues in earnings management studies. *Journal of Accounting and Public Policy* 19: 313-345.

Ohlson J.A., 1995. Earnings, book values, and dividends in equity valuation. *Contemporary Accounting Research* 11 (Spring): 661-688.

Petersen, M. A., 1996. Allocating assets and discounting cash flows: pension plan finance. *Pensions, Savings, and Capital Markets.*

Petroni, K. R., S.G. Ryan and J. Wahlen, 2002. Discretionary and Non-discretionary Revisions of Loss Reserves by Property-Casualty Insurers: Differential Implications for Future Profitability, Risk and Market Value. *Review of Accounting Studies*, Vol. 5, No. 2: 95-107.

Poretto, J., 2003. Moody's cuts GM's long-term debt rating. *The Associated Press State and Local Wire*.

Schultz, E.E. and T. Francis, 2003. For pension plans, risky is fine; accounting rules let companies benefit from investment upside, escape consequences of mistakes. *The Wall Street Journal* (December 10), C1.

Securities and Exchange Commission, 2004. *Study Pursuant to Section 108(d) of the Sarbanes-Oxley Act of 2002 on the Adoption by the United States Financial Reporting System of a Principles-Based Accounting System.*

Sankar, M. and K.R. Subramanyam, 2001. Reporting discretion and private information communication through earnings. *Journal of Accounting Research* (August):

Schipper, K., 1989. Commentary on earnings management. *Accounting Horizons* (December): 91-102.

Sloan, R., 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting Review* 71: 305-333.

Subramanyam, K.R, 1996. The Pricing of Discretionary Accruals. *Journal of Accounting and Economics* 22: 249-281.

Subramanyam, K.R. and M. Venkatachalam 2004. Earnings, Cash Flows and Ex post Intrinsic Value of Equity. Working paper, University of Southern California and Duke University.

Subramanyam, K.R. and Y. Zhang, 2001. Does stock price reflect future service effects not included in the projected benefit obligation as defined in SFAS 87 and SFAS 32? Working paper, University of Southern California and Columbia University.

Vuong, Q.H., 1989. Likelihood ratio tests for model selection and non-nested hypotheses. *Econometrica* 57 (2), 307-333.

Watts, R. and J. Zimmerman, 1986. *Positive Accounting Theory*. Prentice Hall, Upper Saddle River, New Jersey.

Wahlen, J., 1994. The Nature of Information in Commercial Banks Loan Loss Disclosures. *The Accounting Review*, Vol. 69, Iss. 3: 455-479.

Xie, H., 2001, The mispricing of abnormal accruals. *The Accounting Review* 76 (July): 357-73.

Zarowin, P., 2002. Does income smoothing make stock prices more informative? Working Paper, New York University.

Table 1
Distribution of Discount Rate and Compensation Growth Rate Assumptions

Panel A: Cross-Sectional Distribution over Time

Discount rate (*r*)

Year	1991	1992	1993	1994	1995	1996	1997	Total
Mean	8.33%	8.16%	7.45%	8.14%	7.45%	7.59%	7.29%	7.78%
Standard Dev.	0.60%	0.57%	0.49%	0.52%	0.47%	0.34%	0.40%	0.63%
Minimum	4.50%	4.50%	5.00%	5.00%	5.50%	4.00%	4.00%	4.00%
1st Percentile	6.70%	6.50%	6.50%	7.00%	6.50%	6.75%	6.50%	6.50%
5th Percentile	7.25%	7.00%	7.00%	7.10%	7.00%	7.00%	7.00%	7.00%
25th Percentile	8.00%	8.00%	7.10%	8.00%	7.25%	7.50%	7.00%	7.25%
50th Percentile	8.50%	8.24%	7.50%	8.25%	7.50%	7.50%	7.25%	7.75%
75th Percentile	8.75%	8.50%	7.50%	8.50%	7.50%	7.75%	7.50%	8.25%
95th Percentile	9.00%	9.00%	8.30%	8.75%	8.25%	8.00%	8.00%	8.90%
99th Percentile	9.50%	9.50%	9.00%	9.00%	9.00%	8.50%	8.30%	9.25%
Maximum	10.00%	10.00%	11.00%	11.00%	13.00%	8.50%	12.00%	13.00%
N	835	898	834	848	826	833	806	5880

Compensation growth rate (*g*)

Year	1991	1992	1993	1994	1995	1996	1997	Total
Mean	5.73%	5.56%	5.09%	5.07%	4.88%	4.81%	4.72%	5.13%
Standard Dev.	0.83%	0.76%	0.79%	0.74%	0.83%	0.68%	0.70%	0.84%
Minimum	1.00%	1.00%	1.00%	2.50%	2.00%	2.00%	1.30%	1.00%
1st Percentile	3.60%	3.60%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
5th Percentile	4.50%	4.50%	4.00%	4.00%	4.00%	3.90%	3.85%	4.00%
25th Percetile	5.00%	5.00%	4.50%	4.70%	4.50%	4.50%	4.25%	4.50%
50th Percentile	6.00%	5.50%	5.00%	5.00%	5.00%	5.00%	4.75%	5.00%
75th Percentile	6.00%	6.00%	5.50%	5.50%	5.10%	5.00%	5.00%	5.50%
95th Percentile	7.00%	6.60%	6.00%	6.00%	6.00%	6.00%	6.00%	6.50%
99th Percentile	8.50%	8.00%	7.50%	7.00%	7.00%	6.50%	6.50%	7.50%
Maximum	9.11%	8.50%	10.00%	10.00%	15.00%	8.00%	8.50%	15.00%
N	835	898	834	848	826	833	806	5880

Table 2
Descriptive Statistics

	Mean	Std Dev	25^{th} Percentile	Median	75^{th} Percentile
Undeflated:					
TA	6169.84	14908.07	283.36	1127.23	4762.43
TL	4943.38	13282.75	147.47	671.40	3451.74
TL-X	4972.40	13307.40	147.71	673.93	3485.64
TL-D	-29.02	645.93	-3.98	-0.08	1.23
NPTL	5007.66	13376.35	151.20	702.49	3490.92
PA	531.70	1472.11	22.11	85.93	358.27
PBO	478.89	1274.84	21.62	81.18	328.28
PBO-X	502.42	1372.37	21.71	83.13	332.26
PBO-D	-23.53	268.92	-4.00	-0.04	1.24
Sales-Deflated:					
TA	2.67	3.46	0.74	1.16	2.58
TL	2.09	3.28	0.38	0.70	1.65
TL-X	2.10	3.29	0.38	0.71	1.66
TL-D	-0.01	0.19	0.00	0.00	0.00
NPTL	2.11	3.28	0.39	0.73	1.67
PA	0.18	0.17	0.07	0.13	0.25
PBO	0.16	0.14	0.06	0.12	0.22
PBO-X	0.17	0.15	0.07	0.12	0.22
PBO-D	-0.01	0.03	0.00	0.00	0.00
No. of observations	5880				

This table provides descriptive statistics about total assets, total liabilities, and pension assets and liabilities with and without discretion. The sample is drawn from all Compustat firms with non-missing pension and share price data from 1991 to 1997. *TA* is total assets. TL_{it} is reported total liabilities minus *SFAS-87 NPA* plus *fair-value NPA*, where *SFAS-87 NPA* represents the accrued or prepaid pension cost prescribed under SFAS 87 and *fair-value NPA* is the difference between pension assets and projected benefit obligation (*PBO*) as disclosed in the pension footnote. *TL-X* is total liabilities assuming no discretion is given in computing *PBO*, i.e., *TL* minus reported *PBO* plus *PBO-X* , where *PBO-X* is *PBO* without discretion. Non-discretionary PBO is estimated using industry-medians of assumed discount rate and assumed compensation growth rate. *TL-D* is the discretionary portion of *TL* resulting from discretion in reporting *PBO*, i.e., *TL* minus *TL-X*. *NPTL* is non-pension portion of total liabilities, i.e., *TL* minus *PBO*. *PA* is the fair value of pension assets. *PBO-D* is the discretionary component of projected benefit obligation, i.e., the difference between *PBO-X* and *PBO*. The definitions of the variables in the lower panel are the same as those in the upper panel, except that all variables are deflated by sales revenue.

Table 3
Price Association Tests

	Undeflated (N=5,880)				Sales Deflated (N=5,880)			
	TA	TL/TL-X	TL-D	R^2%	TA	TL/TL-X	TL-D	R^2%
Panel A: Aggregated Pension and Non-Pension Components—Relative Association Tests								
Model: $P_{it} = \sum a_t + b_1 TA_{it} + b_2 TL_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$								
$P_{it} = \sum a_t + b_1 TA_{it} + b_2 TL\text{-}X_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$								
With Discretion	0.65	-0.67		88.3%	1.15	-1.16		47.1%
(TL)	(0.00)	(0.00)			(0.00)	(0.00)		
Without Discretion	0.54	-0.56		87.8%	0.93	-0.93		43.7%
(TL-X)	(0.00)	(0.00)			(0.00)	(0.00)		
Difference	0.10	-0.11		0.5%	0.22	-0.23		3.4%
	(0.24)	(0.23)		(0.02)	(0.13)	(0.13)		(0.08)
Panel B: Aggregated Pension and Non-Pension Components—Incremental Association Tests								
Models: $P_{it} = \sum a_t + b_1 TA_{it} + b_2 TL\text{-}X_{it} + b_3 TL\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$								
$P_{it} = \sum a_t + b_1 TA_{it} + b_2 TL_{it} + b_3 TL\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$								
TL-X and TL-D	0.65	-0.67	-0.62	88.3%	1.15	-1.16	-1.13	47.1%
	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	
TL and TL-D	0.65	-0.67	0.05	88.3%	1.15	-1.16	0.02	47.1%
	(0.00)	(0.00)	(0.22)		(0.00)	(0.00)	(0.63)	

(*Table 3 continues next page*)

	Undeflated (N=5,880)						Sales-Deflated (N=5,880)					
	NPTA	NPTL	PA	PBO	PBO-D	R^2%	NPTA	NPTL	PA	PBO	PBO-D	R^2%
Panel C: Disaggregated Pension and Non-Pension Components—Relative Association Tests												
Models: $P_{it} = \sum a_t + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$												
$P_{it} = \sum a_t + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO\text{-}X + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$												
With Discretion	0.63	-0.65	1.36	-1.57		88.0%	1.18	-1.19	0.32	-0.46		47.3%
	(0.00)	(0.00)	(0.00)	(0.00)			(0.00)	(0.00)	(0.14)	(0.00)		
Without Discretion	0.61	-0.64	0.41	-0.38		87.8%	1.18	-1.19	0.20	-0.31		47.3%
	(0.00)	(0.00)	(0.00)	(0.00)			(0.00)	(0.00)	(0.25)	(0.11)		
Difference	0.02	-0.01	0.95	-1.19		0.2%	0.00	-0.00	0.12	-0.15		0.0%
	(0.85)	(0.85)	(0.03)	(0.01)		(0.07)	(0.98)	(0.98)	(0.66)	(0.60)		(0.70)
Panel D: Disaggregated Pension and Non-Pension Components—Incremental Association Tests												
Models: $P_{it} = \sum a_t + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO\text{-}X_{it} + b_5 PBO\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$												
$P_{it} = \sum a_t + b_1 NPTA_{it} + b_2 NPTL_{it} + b_3 PA_{it} + b_4 PBO_{it} + b_5 PBO\text{-}D_{it} + c_1 NI_{it} + c_2 SALEGRW_{it} + c_3 R\&D_{it} + c_4 EMP_{it} + e_{it}$												
PBO-X & PBO-D	0.63	-0.66	1.43	-1.67	-1.93	88.0%	1.18	-1.19	0.31	-0.46	-0.40	47.3%
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.15)	(0.00)	(0.40)	
PBO & PBO-D	0.63	-0.66	1.43	-1.67	-0.26	88.0%	1.18	-1.19	0.31	-0.46	0.06	47.3%
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.15)	(0.00)	(0.87)	

(*Table 3 continues next page*)

(*Table 3 continued*)

The column "Undeflated" reports results from estimating regressions using non-deflated independent variables. The column "Sales Deflated" reports results from estimating regressions using independent variables deflated by current-year sales. The dependent variable in all the regressions is stock price at current fiscal yearend.

The sample is drawn from all Compustat firms with non-missing pension and share price data from 1991 through 1997. The number of firm-year observations for all regressions is 5880. a_t is intercept for each year. *TA* is reported total assets. TL_{it} is reported total liabilities minus *SFAS-87 NPA* plus *fair-value NPA*, where *SFAS-87 NPA* represents the accrued or prepaid pension cost prescribed under SFAS 87 and *fair-value NPA* is the difference between pension assets and projected benefit obligation (*PBO*) as disclosed in the pension footnote. *TL-X* is total liabilities assuming no discretion is given in computing *PBO*, i.e., *TL* minus reported *PBO* plus *PBO-X* , where *PBO-X* is *PBO* without discretion. Non-discretionary PBO is estimated using industry-medians of assumed discount rate and assumed compensation growth rate. *TL-D* is the discretionary portion of *TL* resulting from discretion in reporting *PBO*, i.e., *TL* minus *TL-X*. *NPTL* is non-pension portion of total liabilities, i.e., *TL* minus *PBO*. *PA* is the fair value of pension assets. *PBO-D* is the discretionary component of projected benefit obligation, i.e., the difference between *PBO-X* and *PBO*. *NI* is income before extraordinary items. *SALEGRW* is the average sales growth over the previous three years. *R&D* is research and development expense. *EMP* is number of employees. *NPTA* is non-pension total assets, which is total assets minus the fair value of pension assets. *NPTL* is non-pension total liabilities, which is *TL* minus reported *PBO*. *PA* is the fair value of pension assets. P-values for coefficient estimates and their differences are two-sided and White (1980) adjusted. P-values for R-square differences are based on Vuong's (1989) test statistic.

Table 4
Ex-Post Intrinsic Value Association Tests

	Undeflated (N=5,031)				Sales Deflated (N=5,031)			
	TA	TL/TL-X	TL-D	R^2%	TA	TL/TL-X	TL-D	R^2%
Panel A: Aggregated Pension and Non-Pension Components—Relative Association Tests								
Model: $P_{it} =\sum a_t + b_1TA_{it} + b_2TL_{it} + c_1NI_{it} + c_2SALEGRW_{it} + c_3R\&D_{it} + c_4EMP_{it} + e_{it}$								
$P_{it} =\sum a_t + b_1TA_{it} + b_2TL\text{-}X_{it} + c_1NI_{it} + c_2SALEGRW_{it} + c_3R\&D_{it} + c_4EMP_{it} + e_{it}$								
With Discretion	0.79	-0.76		77.9%	1.26	-1.18		39.8%
(TL)	(0.00)	(0.00)			(0.00)	(0.00)		
Without Discretion	0.69	-0.65		77.7%	1.02	-0.93		38.0%
(TL-X)	(0.00)	(0.00)			(0.00)	(0.00)		
Difference	0.10	-0.11		0.2%	0.24	-0.25		1.8%
	(0.49)	(0.48)		(0.20)	(0.15)	(0.15)		(0.09)
Panel B: Aggregated Pension and Non-Pension Components—Incremental Association Tests								
Models: $P_{it} = \sum a_t + b_1TA_{it} + b_2TL\text{-}X_{it} + b_3TL\text{-}D_{it} + c_1NI_{it} + c_2SALEGRW_{it} + c_3R\&D_{it} + c_4EMP_{it} + e_{it}$								
$P_{it} = \sum a_t + b_1TA_{it} + b_2TL_{it} + b_3TL\text{-}D_{it} + c_1NI_{it} + c_2SALEGRW_{it} + c_3R\&D_{it} + c_4EMP_{it} + e_{it}$								
TL-X and TL-D	0.74	-0.70	-0.59	77.7%	1.25	-1.18	-1.11	39.9%
	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	
TL and TL-D	0.74	-0.70	0.17	77.7%	1.25	-1.18	0.07	39.9%
	(0.00)	(0.00)	(0.05)		(0.00)	(0.00)	(0.39)	

(*Table 4 continues next page*)

(*Table 4 continued*)

The column "Undeflated" reports results from estimating regressions using non-deflated independent variables. The column "Sales Deflated" reports results from estimating regressions using independent variables deflated by current-year sales. The dependent variable in all the regressions is "ex-post intrinsic value" at current fiscal yearend, which is calculated from the following equation:

$$IV_{it} = \sum_{\tau=1}^{3} \frac{d_{t+\tau}}{(1+r)^{\tau}} + \frac{P_{t+3}}{(1+r)^{3}}$$

where: *d* is dividend, *r* is discount rate, *P* is stock price.

The sample is drawn from all Compustat firms with non-missing pension and share price data from 1991 through 1997. The number of firm-year observations for all regressions is 5,031. a_t is intercept for each year. *TA* is reported total assets. TL_{it} is reported total liabilities minus *SFAS-87 NPA* plus *fair-value NPA*, where *SFAS-87 NPA* represents the accrued or prepaid pension cost prescribed under SFAS 87 and *fair-value NPA* is the difference between pension assets and projected benefit obligation (*PBO*) as disclosed in the pension footnote. *TL-X* is total liabilities assuming no discretion is given in computing *PBO*, i.e., *TL* minus reported *PBO* plus *PBO-X* ¸ where *PBO-X* is *PBO* without discretion. Non-discretionary PBO is estimated using industry-medians of assumed discount rate and assumed compensation growth rate. *TL-D* is the discretionary portion of *TL* resulting from discretion in reporting *PBO*, i.e., *TL* minus *TL-X*. *NPTL* is non-pension portion of total liabilities, i.e., *TL* minus *PBO*. *PA* is the fair value of pension assets. *PBO-D* is the discretionary component of projected benefit obligation, i.e., the difference between *PBO-X* and *PBO*. *NI* is income before extraordinary items. *SALEGRW* is the average sales growth over the previous three years. *R&D* is research and development expense. *EMP* is number of employees. *NPTA* is non-pension total assets, which is total assets minus the fair value of pension assets. *NPTL* is non-pension total liabilities, which is *TL* minus reported *PBO*. *PA* is the fair value of pension assets. P-values for coefficient estimates and their differences are two-sided and White (1980) adjusted. P-values for R-square differences are based on Vuong's (1989) test statistic.

Table 5
Credit Rating Association Tests (N=2,535)

	LEV	LEV-D	ROA	SDROA	COV	R^2%
Panel A: Aggregated Pension and Non-pension Components—Relative Association						
Model: $RATE_{it} = a + b_1LEV_{it} + b_2ROA_{it} + b_3SDROA_{it} + b_4COV_{it} + e_{it}$						
$RATE_{it} = a + b_1LEV\text{-}X_{it} + b_2ROA_{it} + b_3SDROA_{it} + b_4COV_{it} + e_{it}$						
With Discretion	-7.16		16.17	-36.9	0.04	44.4%
	(0.00)		(0.00)	(0.00)	(0.00)	
Without Discretion	-6.78		16.08	-36.6	0.04	44.7%
	(0.00)		(0.00)	(0.00)	(0.00)	
Difference	-0.38		0.09	-0.30	0.00	-0.3%
	(0.47)		(0.96)	(0.66)	(0.92)	(0.19)
Panel B: Aggregated Pension and Non-pension Components—Incremental Association						
Model: $RATE_{it} = a + b_1LEV\text{-}X_{it} + b_2LEV\text{-}D_{it} + b_3ROA_{it} + b_4SDROA_{it} + b_5COV_{it} + e_{it}$						
$RATE_{it} = a + b_1LEV_{it} + b_2LEV\text{-}D_{it} + b_3ROA_{it} + b_4SDROA_{it} + b_5COV_{it} + e_{it}$						
LEV-X & LEV-D	-7.08	-2.51	16.11	-35.92	0.04	44.8%
	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	
LEV & LEV-D	-7.08	4.57	16.11	-35.92	0.04	44.8%
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	

The dependent variable in all the regressions is stock price at current fiscal yearend. *RATE* equals one through 19, corresponding to the 19 distinct Standard and Poor's ratings, present in our sample.

The initial sample is drawn from all Compustat firms with non-missing pension and S&P credit rating data from 1995 through 1997. The number of firm-year observations for all regressions is 2,535. a_t is intercept for each year. *LEV* is leverage (deflated by total assets), which is reported long-term liabilities minus *SFAS-87 NPA* plus *fair-value NPA*, where *SFAS-87 NPA* represents the accrued or prepaid pension cost prescribed under SFAS 87 and *fair-value NPA* is the difference between pension assets and projected benefit obligation (*PBO*) as disclosed in the pension footnote. *LEV-X* is *LEV* minus *PBO* plus *PBO-X* , where *PBO-X* is *PBO* without discretion. Non-discretionary PBO is estimated using industry-medians of assumed discount rate and assumed compensation growth rate. *LEV-D* is the discretionary component of leverage, i.e., *LEV* minus *LEV-X*. *ROA* is return on assets (income before extraordinary items divided by total assets). SDROA is the standard deviation of return on assets over the current and preceding four years. *COV* represents interest coverage and is measured as cash flow from operations plus cash interest paid divided by cash interest paid. P-values for coefficient estimates and their differences are two-sided and White (1980) adjusted. P-values for R-square differences are based on Vuong's (1989) test statistic.