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Evidence of Earnings Management and Managers' Choice of Actuarial Assumptions for the Accounting of Retiree Health Care Costs

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Evidence of Earnings Management and Managers' Choice of Actuarial Assumptions for the Accounting of Retiree Health Care Costs

Abstract

This study investigates whether or not managers select assumptions used to account for post retirement benefits enabling them to report annual earnings that meet/beat analysts' forecasts. We believe the assumptions used to account for post retirement benefit costs can be used as an earnings management tool because: (1) the accounting rules allow managers great flexibility in setting the assumptions; (2) the complexity of the accounting rules and related disclosures make it difficult for outside users to identify changes in assumptions and their economic effects; and (3) the liability is long-term in nature enabling small changes in assumptions to have a large impact on the financial statements. Our sample consists of 116 firms with six years of hand collected data from post retirement benefit plan disclosures included in annual reports from 2002 to 2007. We find firms reporting health care inflation rates below the sample median in year t-1, have an increased likelihood of achieving earnings benchmarks in year t. The empirical evidence is consistent with managers using long term accruals such as post retirement benefits to manage earnings in subsequent years and increase the likelihood of meeting earnings targets. Our results imply that the quality of investor reporting could be improved by revising current post retirement accounting rules, by taking away the flexibility allowed management in selecting health care inflation rates.

Key Words: Earnings management, Post-retirement benefits, Analysts' forecast errors, health care inflation rates.

JEL: M41, M48

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4 **1. Introduction**
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6 This study investigates whether or not managers select assumptions used to account for post
7 retirement benefits enabling them to report annual earnings that meet/beat analysts' forecasts. Statement
8 of Financial Accounting Standards No. 106, Accounting for Postretirement Benefits Other than Pensions
9 (SFAS106), was issued in December 1990 requiring companies to change from the pay-as-you-go to the
10 accrual method of accounting. Although the accounting requirements for post retirement benefits are
11 similar to those of pensions, the financial statement impact was more detrimental for other postretirement
12 benefits as management did not have any financial motivation to pre-fund the obligation and therefore were
13 required to record a large liability.
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22 Moore (2008) finds evidence supporting management's opportunistic use of pension accounting
23 assumptions to reduce reported pension expense. Specifically, Moore (2008) finds that managers' increase
24 the likelihood of earnings beating analysts' forecasts by using their discretion over discount rate
25 assumptions and contributions to their pension fund. In contrast, Adams et al's (2011) results suggest that
26 management does not opportunistically choose higher expected rates of returns on plan assets in order to
27 lower pension expense thereby increasing net income. We believe assumptions used to account for post
28 retirement benefit costs can be used as an earnings management tool because: (1) the accounting rules
29 allow managers great flexibility in setting the assumptions; (2) the complexity of the accounting rules and
30 related disclosures make it difficult for outside users to identify changes in assumptions and their economic
31 effects; and (3) the liability is long-term in nature enabling small changes in assumptions to have large
32 impacts on financial statements.
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45 Prior research has focused on the timing of the adoption of accounting for post retirement benefits
46 and assumptions used upon adoption, as well as the prevalence, magnitude and timing of post retirement
47 benefit reductions in response to the mandated accounting change (Mittlestaedt et al 1995; Amir and
48 Gordon 1996; Costello 1999). This study extends existing research by examining managements' actions to
49 reduce reported expenses subsequent to the mandated accounting change for post retirement benefits.
50 Specifically, we investigate the association between assumptions used to account for post retirement
51 benefits and the likelihood of meeting/beating analysts' forecasts. Because of the parallels with pension
52 accounting, this study also complements research examining management's decisions to opportunistically
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4 use assumptions to reduce pension expense. Pension research and this study provide evidence consistent
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6 with management selecting assumptions to influence the financial reporting process and the quality of
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8 reported earnings. In addition, we address the lack of research investigating earnings management using
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10 specific accounts versus aggregate accruals (McNichols 2000).
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12 Our sample consists of 116 firms with six years of hand collected data from post retirement
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14 benefit plan disclosures included in annual reports from 2002 to 2007. This sample represents over 30% of
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16 the total annual post retirement costs of all firms listed in COMPUSTAT during our sample period. After
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18 matching the data with COMPUSTAT and IBES we are left with 531 firm-year observations. We use post
19
20 retirement benefit disclosures of a broad sample of firms to directly determine whether the health care
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22 inflation rate (HI) and discount rate (DR) actuarial assumptions are selected by management to affect the
23
24 post retirement benefit expense reported on the income statement and the likelihood of meeting or beating
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26 analysts' forecasts of annual earnings. We find that the likelihood of a firm meeting/beating analysts'
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28 forecasts of annual earnings is negatively associated with the level of the HI assumption relative to the
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30 sample median. That is, firms that report HI below the sample median in year t-1, increase their likelihood
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32 of achieving earnings benchmarks in year t. In addition, we find that the magnitude of the difference of HI
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34 from the sample median is associated with the impact of the change in assumption on total post retirement
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36 benefit costs as a proportion of earnings when management expects a negative forecast error. However, in
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38 contrast to Moore (2008), we do not find an association between DR and the ability to meet or beat
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40 analysts' forecasts of annual earnings. This study provides empirical evidence consistent with managers
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42 using long term accruals such as post retirement benefits to manage earnings in subsequent years to
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44 increase the likelihood of meeting annual earnings targets. That is, managers do in fact make discretionary
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46 choices in year t-1 that increase the likelihood of the firm meeting earnings targets in year t, indicating
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48 policy makers may want to limit managements' discretion over selection of health care inflation rates or
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50 allocate resources to monitor firms for possible earnings management. The purpose of this study is to
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52 assist regulators and others by providing evidence of the potential for pervasive and materially inflated
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54 reported earnings attributed to managers' choices of health care inflation rates. Given that the International
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56 Accounting Standards Board (IASB) issued its revised standard on employee benefits, International
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58 Accounting Standard 19, in June 2011, these results should also have international application.
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4 **2. Background**
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6 The Financial Accounting Standards Board has issued several standards requiring companies to
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8 disclose deferred compensation promises to their employees. These benefits are in effect a loan by the
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10 employees to the company in exchange for their work. The most controversial of these standards, Statement
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12 of Financial Accounting Standards No. 106 Accounting for Postretirement Benefits Other than Pensions
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14 (SFAS106), was issued in December 1990. SFAS 106 required companies to change from the pay-as-you-
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16 go to the accrual method of accounting by 1993. The accrual method requires the recognition of an
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18 estimated liability for the total unfunded post retirement benefits earned and an annual expense based on
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20 the net cost of “exchanging a promise of deferred compensation in the form of post retirement benefits for
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22 employee service, the interest cost arising from passage of time until those benefits are paid, and the returns
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24 from the investment of plan assets.” (SFAS106, summary). The accrued post retirement cost is reported on
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26 the balance sheet as a long term liability. The past service or transition costs can be recognized immediately
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28 or amortized over 20 years. The accrued yearly expense and amortization of the past service and transition
29
30 costs are reported in the income statement.
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33 Although the accounting requirements for post retirement benefits are similar to those of pensions,
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35 the financial statement impact is quite different. That is, most of the pension plans were well-funded when
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37 the firms had to adopt accrual accounting; therefore, many firms actually recorded a net pension asset. This
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39 was not the case for post retirement benefits other than pensions, however, because with the passage of the
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41 Deficit Equity Financial Responsibility Act in 1986, companies do not have any financial motivation to
42
43 pre-fund the obligation. Unlike pensions (where management can set up a protected trust fund), money
44
45 pre-funded for post retirement benefits other than pensions has no legal protection to be utilized exclusively
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47 for post retirement benefits. Because the fund can be used for any purpose, the resulting large cash reserve
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49 makes the company an attractive target for takeover. The Act also removed the tax deductibility of cash
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51 contributions to funds.
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53 While SFAS 106 has no direct cash flow consequences it does affect reported net income and net
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55 assets. The affect of the adoption of SFAS 106 on the firm’s financial statements depends upon the
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57 employee and retiree composition as well as the plan features. In a Study Note on SFAS 106 for the
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59 Society of Actuaries, Yamamoto (1991) notes that the accounting rule would cause payroll expense to
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4 increase by 1 to 10%. Other postretirement benefits consist primarily of retiree health benefits. At the time
5 of issuance, 75.2% of full-time employees of medium and large firms participated in health insurance plans
6 that provided coverage after early retirement and 68.4% participated in plans that continued after retirement
7 at age 65 and over (Chollet 1988). In the late eighties, liability estimates for all companies ranged from a
8 high of \$2 trillion (Financial Accounting Standards Board 1990) to a low of \$169 billion, \$101 billion
9 associated with current workers and \$68 billion for current retirees (Employee Benefit Research Institute
10 1988). These are far greater than the unfunded liabilities of pension plans, which were \$30 billion at that
11 time (Mittlestaedt and Warshwsky 1993).
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20 In the time period studied, especially in the early 2000's, employer provided health insurance
21 premiums had high inflation and utilization rates. PreMedicare eligible retirees generally received the same
22 coverage as active workers, but the cost of care for retired individuals greatly exceeded that for active
23 workers. At the same time Medicare tried to control its escalating costs by increasing the retiree's share of
24 the costs and limiting payments to providers. The retirees who are Medicare eligible receive Medigap
25 forms of coverage for their retiree health-care plan and the government's actions increased the overall cost
26 of retiree health benefits. The health care inflation rate is one of the key assumptions used in estimating the
27 post retirement benefit liability and annual expense. The uncertainty regarding costs, utilization and
28 governmental intervention make the health care trend assumption extremely subjective and therefore
29 attractive to management as a manipulation tool. Based on an analysis of all firms that report non zero post
30 retirement benefit costs on COMPUSTAT during our sample period, these costs, as a percentage of income
31 before extraordinary items, range from a high of 4.3 percent in 2003 to a low of 2 percent in 2007.
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45 **3. Literature Review**

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47 Prior research focuses on three main areas of potential management manipulation surrounding the
48 adoption of SFAS 106; (1) timing of the adoption, (2) assumptions used at adoption to record the benefit
49 obligation, and (3) plan changes and amendments. Amir and Livnat (1996) examine earnings in the year of
50 adoption (excluding the effect of SFAS 106) compared to the prior year. They find that firms that adopted
51 later had significantly lower earnings in the year of adoption than the prior year. They also find that
52 management of firms that adopted in the last two years was more likely to negotiate plan amendments
53 reducing plan benefits. Costello (1999) finds late adopters are more likely to report restructuring charges in
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4 the year of adoption and adopt plan amendments to reduce retiree benefits. Both studies support the
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6 premise of earnings management by use of the “Big Bath” concept.
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8 Amir and Gordon (1996) examine the choice of actuarial assumptions required for the calculations
9
10 of the post retirement benefit liability. They find that management of firms with high leverage and large
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12 post retirement benefit obligations chose more aggressive assumptions, relative to the sample median,
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14 resulting in a decrease in the reported post retirement benefit obligation. Decreased leverage reduces firms’
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16 risk of violating debt covenants. On the other hand, management of firms that amend their post retirement
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18 benefit plans (to reduce benefit coverage) and firms with extreme E/P ratios (extremely good or poor
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20 financial health) select more conservative assumptions, relative to the sample median, thereby increasing
21
22 the reported post retirement benefit obligation. In addition, D’Souza (1998) finds that management of
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24 financially weaker utilities, that did not curtail benefits, chose more aggressive assumptions thereby
25
26 decreasing the post retirement obligations. In contrast, management of firms that cut benefits chose more
27
28 conservative assumptions, thereby increasing the postretirement obligation.
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30 Mittlestaedt et al. (1995) find that, in response to SFAS 106, management of 35% of their sample
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32 firms reduced health care benefits. Specifically, firms that reduce benefits have higher leverage before
33
34 considering effects of SFAS106 and/or experience greater increases in leverage from SFAS106 than other
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36 firms prior to reducing coverage. In addition, 89% of health care benefit reductions are made within one
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38 year of SFAS106 adoption and the effect of the standard on leverage is more negative for firms that reduce
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40 benefits than for other firms.
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42 This study extends prior research by investigating assumptions selected by management in the
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44 post adoption period, and examining their affect on the reported expense (previous research focused solely
45
46 on the liability side). Specifically, does the flexibility in setting the health care trend rate and discount rate
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48 assumptions allowed under SFAS106 provide management with an earnings management tool to achieve
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50 earnings benchmarks?
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52 **4. Hypothesis Development and Research Design**

53 This paper investigates whether or not management uses their discretion over actuarial
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55 assumptions selected to estimate the post retirement benefit obligation and related expense in order to
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57 achieve earnings benchmarks. Analysts’ forecasts of annual earnings are used as the earnings benchmark
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4 because Brown and Caylor (2005) find that investors reward firms for reporting quarterly earnings that
5 meet analysts' estimates more than they do for avoiding earnings decreases or avoiding quarterly losses.
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8 SFAS106 allows management considerable discretion over the following assumptions: health care
9 trend rate (HI), discount rate (DR), and expected return on plan assets as well as other actuarial
10 assumptions such as retirement age, tenure in company, etc.¹ We examine whether or not management
11 complies with the standard or manages the post retirement benefit expense by making assumptions that are
12 considered either too conservative or too aggressive. As we are limited to assessing the effect of
13 assumptions that are disclosed, we focus on HI and DR. We do not investigate management's discretion
14 over setting the expected return on plan assets as most firms do not fund their post retirement benefit
15 liability².
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24 When selecting HI, management should "consider estimates of health care inflation, changes in
25 health care utilization or delivery patterns, technological advances, and changes in health status of plan
26 participants" (FAS106, paragraph 39). Estimates of health care inflation, changes in health care utilization
27 or delivery patterns, and technological advances should be similar across firms each year. The only variable
28 used in the estimate that should vary across firms is health status of plan participants. Therefore, to
29 examine managements' use of this variable as an earnings management tool we determine whether firms
30 are above or below the sample median HI each year. We use the annual sample median HI rather than the
31 prior year firm specific HI as a benchmark because of volatility in health care costs and associated inflation
32 assumptions. A lower HI rate will result in a smaller expense being reported. This rate is disclosed in the
33 footnotes to the financial statements as well as the effect on the expense and liability of a 1% change in the
34 rate. The Standard requires that the company disclose the impact of a 1% change in HI to demonstrate the
35 sensitivity of the post retirement liability and expense reported to the HI assumption.
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49 When selecting the DR assumption, management "shall look to rates of return on high-quality
50 fixed-income investments currently available whose cash flows match the timing and amount of expected
51 benefit payments" (FAS106, paragraph 31). This is often referred to as the settlement rate. As the DR rate
52 selected by management should be associated with high-quality fixed-income investments, the variability
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57 ¹ Post retirement benefits include all benefits paid to employees after retirement. In most cases the benefits
58 consist of only health care costs. If other post retirement benefits are included it will make it more difficult
59 for us to find results.

60 ² In our sample, only 29 of the 116 firms report assets set aside for post retirement benefits.
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4 afforded management in selection of this rate is limited. The net effect of reducing the DR on post
5 retirement benefit expense, however, cannot be directly predicted. The interest cost component of post
6 retirement benefit expense is the estimated liability multiplied by DR. Decreasing DR increases the
7 estimated post retirement benefit liability and decreases the interest cost multiple resulting in a net change
8 in the expense that is not predictable.
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14 Measurement of the periodic post retirement benefit costs “shall be based on the assumptions
15 made at the beginning of the year (assumptions used for the previous year-end measurements of plan assets
16 and obligations)” (FAS106, paragraph 73). Therefore, management is making decisions about assumptions
17 the year prior to its effect on the income statement, and prior to their knowledge of the realization of pre-
18 managed earnings. We assume therefore that managers engage in multi-period earnings management using
19 other means such as current accrual accounts and/or deferred taxes as noted in prior literature. We don’t
20 assume that managers know the analysts’ forecasts for year t earnings when they make rate decisions in
21 year t-1. However, they do know that a lower HI will reduce the post retirement benefit expense and
22 therefore increase the likelihood of meeting/beating analysts’ forecasts of earnings in year t. This leads to
23 our first hypothesis stated in the alternative:
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34 H1: Firms with a reported HI in year t-1 that is below the sample median in year t-1 are more
35 likely to report a positive forecast error.
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39 Because the level of DR affects both the measurement of the liability and the expense,
40 management is unable to unilaterally determine the of changes in DR on subsequent year earnings in
41 isolation. This leads to our second hypothesis, stated in the alternative:
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45 H2: Firms with a reported DR in year t-1 that is different from the sample median in year t-1
46 will have a different likelihood of reporting a positive forecast error.
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49 We use the following probit model to determine if firms are more likely to meet/beat analysts’
50 forecast of earnings using discretion over HI or DR assumptions:
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$$52 \text{PosFE}_t = \beta_0 + \beta_1 \text{MeddiffXX}_1 \text{ }_{t-1} + \beta_2 \text{PosFE}_{t-1} + \beta_3 \text{Size}_t + \beta_4 \text{Totacc}_t + \beta_5 \text{Dcfo}_t + \beta_6 \text{Litrisk}_t + \beta_7 \text{Mb}_t \\ 53 + \beta_8 \text{Loss}_t + \varepsilon_t \quad (1)$$

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57 PosFE is 1 if analysts’ forecast error, defined as IBES actual earnings per share minus the median analysts’
58 forecast on the last forecast date, scaled by IBES price on the last day prior to the earnings announcement
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4 date³, is ≥ 0 and zero otherwise. MeddiffXX_1 equals HI (DR) in year t-1 less the sample median HI
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6 (DR) in year t-1. These are our variables of interest. If management is decreasing HI below the sample
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8 median to generate more earnings in year t, then we expect the coefficient estimate on MeddiffHI_1 to be
9
10 negative. However, if management is changing DR relative to the sample median to generate more
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12 earnings in year t, then we expect the coefficient estimate on the MeddiffDR_1 to be different from zero.
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14 We include the following control variables that were found in previous studies to be associated
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16 with a firm's forecast error or ability to meet earnings targets. To control for the serial correlation of
17
18 analysts' forecast errors documented in prior literature (e.g., Abarbanell and Bernard 1992; Mendenhall
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20 1991) we include PosFE_{t-1}. Total accruals (Totacc_t) are included as Phillips et al (2003) find a positive
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22 association between total accruals and a firms ability to meet earnings targets. The changes in cash flows
23
24 from operations, scaled by total assets (Dcfo_t) is included as a control for changes in performance as
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26 improvements in performance will reduce managers' incentive to increase earnings to meet earnings targets
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28 (Phillips, et al. 2003). We include size (Size_t), measured as the log of total assets, as larger firms are more
29
30 likely to make different accounting decisions and have different post retirement benefit plans than smaller
31
32 firms. Amir and Gordon's (1996) results indicate that managers of large firms choose more aggressive
33
34 assumptions to lower post retirement benefit obligations and expenses. In addition, managers of large firms
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36 are expected to defer earnings to future years due to increasing political costs (Watts and Zimmerman,
37
38 1990). Market to book (Mb_t) value is included to control for growth. We include an indicator variable for
39
40 loss years (Loss_t) as loss firms are less likely to report positive earnings surprises than non-loss firms
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42 (Brown 2001). We control for litigation risk (Litrisk_t) by setting an indicator variable equal to 1 if the firm
43
44 is in a high risk industry as defined by Francis et al (1994) and zero otherwise (Matsumoto 2002).
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46 5. Data

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48 We start with the sample of firms used in Costello (1996). This initial sample consisted of 281
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50 firms that disclosed a post retirement benefit liability and expense. The sample was subsequently reduced
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52 to 156 firms because of mergers, acquisitions, plan terminations, and plan changes (that is capping
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54 employer contributions). Additional firms were lost when combining the hand collected data with
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56 COMPUSTAT and IBES. The final sample consists of 116 firms and 531 firm-year observations for the
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59 ³ In order to exclude stale forecasts from the measure of market expectations, the median forecast on the
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61 last date is used as established in Brown and Caylor (2005).
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4 six years beginning in 2002 and ending in 2007. Our final sample of firms includes over 30% of the total
5 annual post retirement costs of all firms listed in COMPUSTAT allowing us to select firms with cost that
6 will have a material impact on their financial statement. In addition, the post retirement benefit costs range
7 from three to six percent of income before extraordinary items. See Table 1 for details of the sample
8 derivation.
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14 Table 2 provides details of the industry composition. Consistent with prior research (e.g.,
15 Buckmueller et al 2006), the sample consists primarily of manufacturing firms. Buckmeuller et al (2006)
16 find that postretirement benefits are more likely to be available in industries with lower turnover, higher
17 wages and unionization. In our sample, Chemicals and Allied Products and Industrial Commercial
18 Machinery and Computer Equipment represent the largest industries at 16.38% and 13.79% of the sample,
19 respectively. These are followed by Food and Kindred Products, Printing, Publishing and Allied Services,
20 Food Stores and Transportation Equipment, each representing 8.62% of the sample.⁴
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28 **6. Testing of Hypotheses and Results**

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30 The primary variables of interest are HI and DR. The HI and DR were hand collected from the
31 notes to the annual financial statements for each firm year. Table 3 reports the minimum and maximum
32 rates each year to demonstrate the much greater variation in the annual HI over that of the DR. The annual
33 range for the HI has a high of 17.20% in 1993 and a low of 7.5% in 2006. The annual range for the DR,
34 however, only has a high of 3.5% in 1993 and a low of 1.4% in 2006. The greater variability in HI
35 provides more opportunity for management to use the HI assumption to manage earnings.
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43 If management uses the assumptions in year t-1 to change net income in year t, then we expect the
44 frequency of firms meeting or beating analysts' forecasts of annual earnings in year t to be greater when the
45 assumptions are more aggressive. If earnings meet or beat analysts' annual forecasts then the forecast error
46 is positive or zero (PosFE=1). If earnings do not exceed analysts' forecasts then the forecast error is
47 negative (PosFE=0). MeddiffHI_1 (DR_1) is the firm reported HI (DR) in year t-1 less the sample median
48 HI (DR) in year t-1. Table 4, panel A ranks MeddiffHI_1 and MeddiffDR_1 where rank 0 represents the
49 most negative differences (i.e., the lowest or most aggressive assumptions) and rank 4 includes the most
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58 ⁴ We performed additional sensitivity analyses where industry fixed effects were included in the model and
59 the largest industry groups were dropped. The results do not change indicating that they are not industry
60 driven.
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4 positive differences (i.e., the highest or most conservative assumptions). The frequency of PosFE is then
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6 presented by rank. The total sample frequency of PosFE is 71%. For HI ranks 0, 1 and 2, the frequency of
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8 PosFE is greater than 71%. These are the groups where management has selected actuarial assumptions for
9
10 HI that are smaller than the sample median. For DR, only ranks 1 and 2 have frequencies of PosFe greater
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12 than the sample average of 71%. Chi Square tests indicate that the frequency of PosFe does vary
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14 significantly with the rank of HI but not for DR.
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16 In addition to disclosing the HI assumption, management must also disclose the impact of a one
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18 percent change in the HI on the post retirement benefit liability and expense. This disclosure should reduce
19
20 manager's ability to mislead stockholders because investors can adjust reported earnings to reflect what
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22 EPS would be without the implemented change, provided the necessary information is clearly displayed
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24 and users of financial statements have knowledge of the relevant issue. This information was also hand
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26 collected from the notes to the annual financial statements for each firm. To get a better understanding of
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28 the potential impact of changes in assumptions on earnings, we calculate an estimate of the change in
29
30 earnings in year t from changing the HI assumption from year t-2 to t-1. Recall that the post retirement
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32 benefit expense recorded in year t is a function of the assumptions set in t-1. The actual change in the HI
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34 from year t-2 to year t-1 is multiplied by the disclosed impact of a one percent change in the assumption,
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36 less taxes, to estimate the after-tax effect on earnings in year t. If management is changing the HI
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38 assumption in t-1 to increase the likelihood of meeting or beating analysts' forecasts in year t we expect to
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40 see more negative changes in the post retirement benefit expense for firms that meet or beat analysts'
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42 forecasts than those that do not.
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45 As noted earlier, the change in HI from the prior year is not a good benchmark because of large
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47 annual variation in the assumption. Therefore, we use the sample specific annual medians as the
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49 benchmark. Table 4, panel B, reports the mean and median of the estimated managed post retirement
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51 expense by sign of analysts' forecast error (PosFE). For comparison purposes income before extraordinary
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53 items and total accruals are also presented. Consistent with our expectations, the estimated managed post
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55 retirement costs are significantly negative in the positive forecast error group (PosFE=1). In the negative
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57 forecast error group (PosFE=0) the estimated managed post retirement costs are not different from zero.
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59 However, our test of differences across groups is not significant.
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4 Considering that there are many ways to manage earnings, the long-term nature of post retirement
5 benefit costs and the requirement to set assumptions one year ahead of the earnings impact, it is not
6 surprising that we do not find significant results in Table 4, panels A or B, using univariate tests.
7
8 Therefore, we test the association between the HI and DR assumptions and the likelihood of meeting or
9 beating analysts' forecasts of earnings using a multivariate probit model. The descriptive statistics of the
10 variables included in model (1) are presented in Table 5. Seventy one percent of the observations meet or
11 beat analysts' forecasts. The firms are generally large consistent with the industry composition discussed
12 in Table 2 and prior research indicating that post retirement benefits are more likely to be available in
13 larger firms than smaller firms. The market to book ratio is relatively small indicating that these are not
14 growth firms. Once again this is consistent with the sample composition and prior research. Finally, only
15 nine percent of the firm-year observations are coded as loss years. This is consistent with the positive mean
16 change in cash flows indicating that the firms are fairly stable and healthy.
17
18

19 Table 6 presents the probit analyses. After controlling for other factors identified as being
20 associated with a firm's ability to meet earnings targets, the coefficient estimate on MeddiffHI_1 from the
21 median in year t-1 is significantly negative (p-value=0.047). Consistent with our hypothesis, firms that
22 report an HI in year t-1 lower than the median rate are more likely to meet/beat analysts' forecasts of
23 annual earnings in year t. Due to the ambiguous effect of the changes in DR on the post retirement benefit
24 expense, we have no directional expectation for the coefficient estimate on MeddiffDR_1. Our results
25 indicate differences in DR relative to the sample median are not associated with the likelihood of meeting
26 or beating analysts' forecasts. While our findings related to DR are in contrast to the results found by
27 Moore (2008) in relation to pension expense, we find that in the post retirement benefit context
28 management appears to use HI to opportunistically manage reported earnings.
29

30 **7. Additional Analyses**

31 The cross sectional results presented above provide indirect evidence consistent with managers
32 manipulating assumptions up to one year ahead of earnings realizations. A more direct test is to identify
33 firms in which management expects to miss analysts' forecasts of annual earnings one year ahead and
34 analyze MeddiffHI_1 within this group. These firms are more likely to manage earnings. We then identify
35 firms where changes made to the level of HI will have a material effect on reported net income as these
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4 firms are more likely to use HI as an earnings management tool over other earnings management options
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6 identified in prior research. Management is expected to have a lower HI when the expected forecast error
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8 is negative (expected earnings – analysts’ forecast < 0), in particular in cases where HI will have the
9
10 largest impact on reducing post retirement benefit costs and thereby increasing net income. Where positive
11
12 forecasts are expected, management has no incentives to change HI as they are already expected to beat
13
14 analysts’ forecasts regardless of the potential impact of the assumption on net income.
15

16 We calculate the potential impact of the assumption on net income as the absolute value of the
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18 disclosed change in post retirement benefit costs from a one percentage point change in HI divided by
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20 income before extraordinary items. We partition the measure of impact into 3 equal groups and create a
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22 variable called ImpactRank. ImpactRank is 0, 1 or 2, where 0 are the firms with the smallest impact and 2
23
24 are the firms with the largest impact. Next, we partitioned our sample into two groups; (1) expected
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26 forecast error is positive or (2) expected forecast error is negative. In order to calculate the expected
27
28 forecast error we need a measure of expected earnings. We obtain an estimate of expected earnings by
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30 taking actual earnings before extraordinary items in year t less abnormal accruals estimated using the
31
32 Modified Jones Model (Dechow, et al 1995) for year t. Expected forecast error is then calculated as
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34 expected earnings less analysts’ forecasts of annual earnings for year t made at the end of year t-1. Using
35
36 the Modified Jones Model as our expected earnings measure results in 145 firm-years having positive
37
38 expected forecast errors and 315⁵ firm-years having negative expected forecast errors.⁶
39

40 To test our expectations, we perform ANOVAs of MeddiffHI_1 and ImpactRank by expected
41
42 forecast error. The ANOVA results are reported in Table 7. Consistent with our expectations, when the
43
44 expected forecast error is positive MeddiffHI_1 is not different from zero and there is no association with
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46 ImpactRank. However, when expected forecast error is negative, MeddiffHI_1 is negative and there is a
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48 significant association with ImpactRank with an F= 7.58 and a p-value <0.001. Therefore, the likelihood of
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50 management using post retirement costs to manage earnings is not only a function of expected forecast
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52 errors but also takes into consideration the potential impact of the assumption on net income. The ANOVA
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55 ⁵ Estimation of the Modified Jones Model result in the loss of 55 firm year observations. The final sample
56 for the ANOVA consists of 458 firm year observations.

57 ⁶ Another measure of expected earnings is management forecasts. Management forecasts exist for 70 of the
58 458 firm-years. Of these only 34 firms reported management forecasts that were above analysts’ forecasted
59 earnings and 36 firms reported management forecasts that were below analysts’ forecasted earnings. In
60 running ANOVA, we were unable to obtain any significant results due to such a small sample size.
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4 results provide temporal evidence of earnings management as the expectation of the forecast error is based
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6 on year t-1, the same year HI is determined by management. These results, combined with our cross
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8 sectional results support the notion that managers use long-term accruals, such as post retirement benefits,
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10 to manage earnings in subsequent years and increase the likelihood of meeting earnings targets.

11 **8. Conclusion**

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14 This study investigates whether or not managers select assumptions used to account for post
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16 retirement benefits (specifically HI and DR) enabling them to report annual earnings that meet/beat
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18 analysts' forecasts. Prior research focuses on three main areas of potential management manipulation
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20 surrounding the adoption of SFAS 106; (1) timing of the adoption, (2) assumptions used at adoption to
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22 record the benefit obligation, and (3) plan changes and amendments. We extend this line of research by
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24 examining managements' actions subsequent to the mandated accounting rules and by examining the effect
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26 of their actions on the reported expense and likelihood of meeting annual earnings targets. Firms that
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28 report HI in year t-1 lower than the median HI are more likely to meet or exceed analysts' forecasts of
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30 annual earnings in year t. However, we find no evidence that management uses DR to increase the
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32 likelihood of meeting or beating analysts' forecasts.

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35 We believe that our findings have implications for corporate executive post-retirement-benefit
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37 packages. Taken together with other studies examining opportunistic management of pension accounting
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39 assumptions, our results imply that the quality of investor reporting could be improved by either (1)
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41 revising current post retirement accounting rules, that is taking away the flexibility allowed management in
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43 selecting HI rates or (2) having regulatory agencies institute programs to monitor the HI assumption,
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45 similar to those instituted by the National Association of Insurance Commissioners to monitor loss reserves
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47 reported by Insurance companies. For example, Gaver and Paterson (2000) find that accounting discretion
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49 decreases in states where monitoring is present.

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51 Our findings contribute to the existing literature investigating opportunistic reporting by
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53 management effecting earnings quality (e.g. Boone and Raman 2007). In addition, our results support the
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55 notion that managers use long-term accruals, such as post retirement benefits, to manage earnings in
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57 subsequent years and increase the likelihood of meeting earnings targets. Future research may want to
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59 examine the use of several earnings management tools over the long-run.

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Table 1
Sample Selection

	<u>Firms</u>	<u>Firm years</u>
Hand collected six years	156	936
Missing HI, HI_1	<u>(0)</u>	<u>(209)</u>
Hand collected sample	156	727
Missing FE, FE_1	<u>(40)</u>	<u>(196)</u>
Combined sample	116	531

HI and HI_1 are the health care cost trend rates disclosed in the notes to the financial statements in years t and t-1, respectively.
FE and FE_1 is analysts' forecast error, defined as IBES actual earnings per share minus the median analysts' forecast on the last forecast date scaled by IBES price on the last day prior to the earnings announcement date for year t and t-1.

Table 2
Industry Composition

<u>SIC Code</u>	<u>Description</u>	<u># of Firms</u>	<u>% of Total</u>
1300	Oil and Gas Extraction	5	4.31
2000	Food and Kindred Products	10	8.62
2600	Paper and Allied Products	4	3.45
2700	Printing, Publishing and Allied Services	10	8.62
2800	Chemicals and Allied Products	19	16.38
2900	Pete Refining and Related Industries	2	1.72
3000	Rubber and Miscellaneous Plastic Products	4	3.45
3300	Primary Metal Industries	4	3.45
3400	Fabricated Metals	4	3.45
3500	Industrial Commercial Machinery, Computer Equipment	16	13.79
3600	Electronics	9	7.76
3700	Transportation Equipment	10	8.62
3800	Measuring Instruments, Photographic Goods, Watches	2	1.72
3900	Miscellaneous Manufacturing Industries	2	1.72
4400	Water Transportation	3	2.59
5400	Food Stores	2	1.72
Miscellaneous		<u>10</u>	<u>8.62</u>
Total		116	100.00

Table 3
Health Care Cost Trend and Discount Rates by Year

Year	Health Care Cost Trend Rate		Discount Rate	
	<u>Minimum</u>	<u>Maximum</u>	<u>Minimum</u>	<u>Maximum</u>
1992	4.50%	20.00%	6.50%	9.00%
1993	1.30	18.50	6.00	9.50
1994	4.50	17.00	6.25	9.50
1995	3.50	16.00	6.25	8.80
1996	3.50	15.00	6.50	9.00
1997	3.50	13.00	6.50	8.50
1998	4.00	15.00	6.00	8.00
1999	4.00	13.00	5.90	8.25
2000	4.00	12.50	6.20	8.25
2001	4.00	14.00	6.50	8.00
2002	4.85	15.00	6.25	8.00
2003	5.00	15.00	5.00	6.75
2004	4.50	12.56	5.00	6.50
2005	4.00	13.30	4.00	6.70
2006	4.00	11.50	5.00	6.40

The health care cost trend and discount rates are hand collected from the notes to the financial statements. 1992 to 2001 are from Costello (2006). 2002 to 2006 are from the current data set. The assumptions are set in the year reported and are used to calculate the current year liability and the subsequent year expense.

Table 4
 Panel A: Frequency of PosFE by Ranked Differences in Assumptions from Annual Median

<u>Rank</u>	<u>MeddiffHI 1</u>			<u>MeddiffDR 1</u>		
	<u>PosFE=0</u>	<u>PosFE=1</u>	<u>Total</u>	<u>PosFE=0</u>	<u>PosFE=1</u>	<u>Total</u>
0						
Frequency	22	69	91	31	73	104
Percent	4.14	12.99	17.14	5.84	13.75	19.59
Row Pct	24.14	75.82		29.81	70.19	
Col Pct	14.29	18.30		20.13	19.36	
1						
Frequency	29	91	120	21	60	81
Percent	5.46	17.14	22.60	3.95	11.30	15.25
Row Pct	25.17	75.83		25.93	74.07	
Col Pct	18.83	24.14		13.64	15.92	
2						
Frequency	37	102	139	39	101	140
Percent	6.97	19.21	26.18	7.34	19.02	26.37
Row Pct	26.62	73.38		27.86	72.14	
Col Pct	24.03	27.06		25.32	26.79	
3						
Frequency	35	50	85	32	70	102
Percent	6.59	9.42	16.01	6.03	13.18	19.21
Row Pct	41.18	58.82		31.37	68.63	
Col Pct	22.73	13.26		20.78	18.57	
4						
Frequency	31	65	96	31	73	104
Percent	5.84	12.24	18.08	5.84	13.75	19.59
Row Pct	32.29	67.71		29.81	70.19	
Col Pct	20.13	17.24		20.13	19.36	
Total	154	377	531	154	377	531
	29.00	71.00	100.00	29.00	71.00	100.00
Chi-Square Statistic		Value	Prob		Value	Prob
		9.3985	0.0519		0.8053	0.9377

Table 4
Panel B: Total Accruals, Income Before Extraordinary Items and Estimated Change in Post Retirement Costs

<u>Variable</u>	<u>PosFE=1 (n=290)</u>		<u>PosFE=0 (n=124)</u>		<u>Tests of Differences Across Groups</u>	
	<u>Mean</u>	<u>Median</u>	<u>Mean</u>	<u>Median</u>	<u>t-value</u>	<u>Z-value</u>
Totacc	-0.044***	-0.038***	-0.036***	-0.040***	1.47	0.79
IB	970.242***	237.546***	813.989***	218.695***	-0.64	-2.42
EstMgdPRB	-2.266*	0.000	-1.050	0.000	0.85	1.78

Variable Definitions:

MeddiffHI_1 is the firm specific difference in health care cost trend rate from the sample median in t-1.

MeddiffDR_1 is the firm specific difference in the discount rate from the sample median in t-1.

Rank is the rank of MeddiffHI_1 and MeddiffDR_1 where rank 0 are the most negative differences and rank 4 are the most positive differences.

PosFE is 1 if analysts' forecast error, defined as IBES actual earnings per share minus the median analysts' forecast on the last forecast date scaled on IBES price on the last day prior to the earnings announcement date, is ≥ 0 and zero otherwise.

Totacc is total accruals in millions calculated as income before extraordinary items less cash flows from operations.

IB is income before extraordinary items in millions.

Est Δ PRB is the estimated change in post retirement costs in millions calculated as the change in the health care cost trend rate from t-2 to t-1 multiplied by the disclosed change in post retirement costs for a one percent change in the health care cost trend rate in year t multiplied by one less the effective tax rate.

*, **, or *** Mean or median is significantly different from zero with p-values less than 0.05, 0.01 or 0.001.

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Table 5
Descriptive Statistics (n=531)

<u>Variable</u>	<u>Mean</u>	<u>Median</u>	<u>Minimum</u>	<u>Maximum</u>	<u>Standard Deviation</u>
PosFE	0.710	1.000	0.000	1.000	0.454
MeddiffHI_1	-0.001	0.000	-0.055	0.050	0.014
MeddiffDR_1	0.000	0.000	-0.016	0.013	0.003
Size	8.525	8.387	4.113	12.505	1.600
Totacc	-0.044	-0.040	-0.746	0.267	0.057
Dcfo	0.010	0.008	-0.380	0.321	0.056
Litrisk	0.141	0.000	0.000	1.000	0.349
Mb	3.568	2.722	-105.186	55.113	8.827
Loss	0.089	0.000	0.000	1.000	0.284

Variable Definitions:

PosFE is 1 if analysts' forecast error, defined as IBES actual earnings per share minus the median analysts' forecast on the last forecast date scaled on IBES price on the last day prior to the earnings announcement date, is ≥ 0 and zero otherwise.

MeddiffHI_1 is the firm specific difference in health care cost trend rate from the sample median in t-1.

MeddiffDR_1 is the firm specific difference in the discount rate from the sample median in t-1.

Size is log of market value of equity.

Totacc is income before extraordinary items less cash flows from operations divided by total assets.

Dcfo is the change in cash flows from operating activities from year t-1 to year t divided by total assets.

Litrisk is a dummy variable equal to one if the firms four digit SIC code is equal to 2832-2837, 3509-3578, 3599-3675, 5199-5962 or 7369-7375 and zero otherwise.

Mb is the market to book ratio.

Loss is a dummy variable equal to one if income before extraordinary items is less than zero and zero otherwise.

Table 6
Probit Analyses

$$\text{Model: PosFE}_t = \beta_0 + \beta_1 \text{MeddiffXX}_1 \text{ }_{t-1} + \beta_2 \text{PosFE}_{t-1} + \beta_3 \text{Size}_t + \beta_4 \text{Totacc}_t + \beta_5 \text{Dcfo}_t + \beta_6 \text{Litrisk}_t + \beta_7 \text{Mb}_t + \beta_8 \text{Loss}_t + \varepsilon_t \quad (1)$$

Independent Variable	Expected Sign	Coefficient Estimates and (p-values)	
		MeddiffHI_1	MeddiffDR_1
Intercept	?	-0.3417 (0.388)	-0.2890 (0.482)
MeddiffXX_1	-	-8.843 (0.047)	-17.5400 (0.422)
PosFE_1	+	0.2122 (0.173)	0.2418 (0.123)
Size	+	0.0777 (0.102)	0.0713 (0.149)
Totacc	-	-2.4376 (0.082)	-2.3349 (0.098)
Dcfo	+	0.0473 (0.973)	0.1732 (0.900)
Litrisk	-	0.1299 (0.397)	0.0998 (0.485)
Mb	-	-0.0006 (0.945)	-0.0014 (0.853)
Loss	-	-0.4190 (0.073)	-0.3777 (0.120)
Observations		531	531
Wald Chi ²		18.37	15.66
Prob > Chi ²		0.0491	0.1097
Pseudo R ²		0.0328	0.0264

Table 6 (Continued)

Variable Definitions:

PosFE is a dummy variable equal to one if the forecast error defined as actual earnings reported in IBES less the mean IBES forecast on the last date before the earnings announcement date, scaled by price is greater than or equal to zero and zero otherwise.

MeddiffXX_1 is the firm specific difference in health care cost trend rate (HI) or discount rate (DR) from the sample medians in t-1.

Leverage is total debt divided by total assets.

Extep is a dummy variable equal to one if the earnings price ratio in year t is in the extreme 1st or 99th percentile of the distribution of the sample earnings price ratio in year t and zero otherwise.

Size is log of market value of equity.

Totacc is income before extraordinary items less cash flows from operations divided by total assets.

Dcfo is the change in cash flows from operating activities from year t-1 to year t divided by total assets.

Litrisk is a dummy variable equal to one if the firms four digit SIC code is equal to 2832-2837, 3509-3578, 3599-3675, 5199-5962 or 7369-7375 and zero otherwise.

Mb is the market to book ratio.

Loss is a dummy variable equal to one if income before extraordinary items is less than zero and zero otherwise.

Table 7
ANOVA Analyses of MeddiffHI_1 and ImpactRank by Expected Forecast Error

Panel A: Firm-years with positive expected forecast error

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Impact Rank	2	0.0006	0.0003	1.49	0.228
Error	142	0.0287	0.0002		
Corrected Total	144	0.0293			

	R-Square	Coeff Var	Root MSE	MeddiffHI_1 Mean
	0.021	-2,335.982	0.014	-0.0006

Panel B: Firm-years with negative expected forecast error

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Impact Rank	2	0.0033	0.0017	7.58	<0.001
Error	312	0.0680	0.0002		
Corrected Total	314	0.0713			

	R-Square	Coeff Var	Root MSE	MeddiffHI_1 Mean
	0.046	-692.326	0.015	-0.0021

Variable definitions:

MeddiffHI_1 is the firm specific difference in health care cost trend rate (HI) from the sample median in t-1.

ImpactRank is the rank (0,1,2) of impact calculated as the absolute value of the disclosed change in post retirement benefit cost from a one percentage point change in HI divided by income before extraordinary items in year t, where 0 (2) are the firm year observations with the smallest (largest) impact on income.

Expected forecast error is expected earnings in year t (actual earnings before extraordinary items in year t less abnormal accruals estimated using the Modified Jones model) less analysts' forecasts of earnings for year t made at the end of year t-1.