The Opportunistic Use of Pension Assumptions and Pension Cost Reporting

Mike Braswell
College of Charleston

Chun-Chia Amy Chang
San Francisco State University

Su-Jane Hsieh
San Francisco State University

We examine whether firms adopt more aggressive pension assumptions to increase the probability of reporting pension income and how the economic conditions affect firms' behavior in adopting pension assumption. Our study shows that firms are conservative in adopting the ERR but alter their behavior and use optimistic ERR assumptions when a recession affects profitability. In addition, we find that firms reporting pension income adopt more aggressive ERR than firms reporting pension expense. This behavior is exacerbated during economic hardship. We also find that companies reporting pension income have higher leverage but lower return on assets than firms reporting pension expense.

INTRODUCTION

Despite a growing trend to fund retirement programs through 401(k) plans and other alternative packages, this study shows that nearly 19% of public companies in the United States sponsored defined-benefit (DB) pension plans for their employees during 1991–2012, with some companies, such as Lucent Technologies, deriving 82% of reportable income from pension income.[1] However, a common perception among investors is that firms sponsoring DB pension plans mostly report pension expense, which reduces earnings. The Financial Accounting Standards Board has attempted to curtail variability in pension reporting practices, invoking the income-smoothing concept as the basis for its Accounting Standards Codification (ASC) 715: Compensation – Retirement Benefits. The ASC 715 adopts several mechanisms to reduce the volatility of pension cost and, therefore, the volatility of earnings.[2] DB plan sponsors would report pension income when the expected return on pension assets exceeds other components of pension expense.

Although ASC 715 was issued to standardize actuarial assumptions in estimating pension liabilities and establish a systematic method to measure pension costs, it still allows some degree of flexibility in the estimates necessary to measure the pension costs, especially the expected rate of return (ERR),[3] because it only requires the ERR to reflect the long-term average return on pension assets without any specific guidelines. Therefore, managers have considerable latitude in determining the ERR and can use their discretion opportunistically to manage pension costs, thus compromising the quality of earnings.

Prior studies (Coronado and Sharpe, 2003; Coronado, Mitchell, Sharpe and Nesbitt, 2008; Asthana, 2008; and An, Lee and Zhang, 2014) report that investors react indiscriminately to pension income and core recurring operating earnings.[4] Based on the findings of these studies, the value of firms reporting pension income would be mispriced if the ERR is used speculatively to inflate pension income. An efficient capital market is founded on the fair valuation of share price; thus, mispricing firm value caused by opportunistic use of ERR would deter capital market efficiency. Consequently, it is imperative for investors to assess whether this opportunistic behavior has contributed to pension income reporting.

Although several studies have documented the use of the ERR on pension assets as a tool of earnings management (Rauh 2006; Bergstresser, Desai and Rah, 2006; Comprix and Muller 2006, 2011; Asthana, 2008; and An, et al., 2014),[5] limited evidence indicates that the ERR has been employed opportunistically to report pension income. Our study fills this void by investigating whether firms reporting pension income more aggressively adopt a higher ERR than those presenting pension expense. In addition, we examine the characteristics of pension income and pension expense firms to determine whether firms' distinctive financial profiles incentivize them to report pension income.

Using a sample of 26,065 firm-year observations during the period 1991– 2012, we find that more than 17% of firms sponsoring DB plans report pension income. For our sample firms, the pension income, on average, accounts for a considerable 13.7% of their reported earnings, with a peak in 2001, when pension income contributed more than 25%. We also find that pension income firms are more prone to adopt an ERR that exceeds the actual rate of return (ARR) than pension expense firms. However, when excluding four recession years (i.e., 2001– 2002 and 2008– 2009) with exceptionally high positive return spread (i.e., ERR > ARR), [6] both groups exhibit conservative pension accounting as reflected by negative return spread (i.e., ERR < ARR). Nevertheless, the pension income group still exhibits more aggressive ERR adoption than the pension expense group (i.e., a smaller magnitude in the negative return spread for pension income group than for the pension expense group). For the recession years, both groups experienced substantial positive return spread, and the return spread of the pension income group is significantly greater than that of the pension expense group. In addition, we find that firms reporting pension income are associated with higher leverage but lower return-on-assets (ROA) ratio than firms reporting pension expense.

Our analysis indicates that, in general, firms are conservative in adopting the ERR but become more aggressive (i.e., ERR > ARR) when facing economic downturns. It appears that firms facing a weakened financial performance use the discretion of the ERR estimate afforded to them by pension accounting rules to ease the negative earnings impact from recession. In particular, the pension income group demonstrates more aggressive behavior in ERR assumptions than the pension expense group, and this aggressive behavior is exacerbated during recessions. Our study on the distinctive financial profiles of these two reporting groups suggests that debt constraints and weak profitability performances motivate managers to employ pension cost reporting strategies to improve their company's financial appearance.

Our findings contribute to the pension literature by providing empirical evidence that firms behave differently toward the ERR assumption in different states of the economy and that firms reporting pension income adopt ERR more aggressively than firms reporting pension expense in all states of the economy. We also contribute to pension studies by documenting the factors associated with pension-reporting behavior.

The remainder of the paper is organized as follows: Section 2 provides background and a literature review. Section 3 develops hypotheses and describes the research design, sample selection and data collection. We report empirical analyses in section 4, and Section 5 provides conclusions for the study.

BACKGROUND AND LITERATURE REVIEW

The stream of pension accounting research investigating the role of pension accounting in managing earnings[7] generally shows that managers exercise their managerial discretion regarding pension plan assumptions (Bergstresser et al., 2006; Comprix and Muller, 2006, 2011; Asthana 2008; and An et al., 2014) and choices (D'Souza, Jacob and Lougee, 2006) to facilitate earnings management. Bergstresser et

al. (2006) document that managers adopt a higher ERR on pension assets to inflate earnings when acquiring other firms, nearing a critical earnings threshold or exercising managers' stock options. Asthana (2008) and An et al. (2014) report that managers use the ERR on pension assets as a tool to meet or beat earnings targets. D'Souza et al. (2006) find that increasing reported income is a major reason for managers to convert DB pension plans to cash balance plans. Comprix and Muller (2006) provide evidence that the compensation committees of the 425 firms studied shield pension expense (but not pension income) from their CEO cash compensation formulas. They also find that firms with pension income have a higher *positive* return spread but a lower adjusted ROA ratio than firms with pension expense. The authors conclude that managers of these firms choose income–increasing assumptions such as a higher ERR in response to compensation committees' asymmetric treatment of pension income and expense.[8] In a separate study, Comprix and Muller (2011) provide evidence that managers of DB firms adopt downward estimates on the discount rate to inflate their DB liabilities and decrease their ERR to inflate pension expenses to gain labor concessions, such as freezing their DB pension plans. Also, Shivdasani and Stefanescu (2010) show that leverage ratios for firms with pension plans are about 35% higher when pension assets and liabilities are incorporated into the capital structure which implies the magnitude of the liabilities from the pension plans is substantial. Bauman and Shaw (2014) indicate the likelihood of providing a discount rate or expected asset return is positively associated with the following firm characteristics: firm size, the variability of pension plan funded status, firms in regulated industries, etc.

However, the prior literature to our knowledge has not specifically examined the opportunistic behavior of pension income firms on determining critical pension assumptions. Furthermore, the impact of economic conditions was not discussed between pension income firms versus pension expense firms. Thus, we extend the pension–related earnings management literature by examining whether managers of pension income firms employ more aggressive ERR than those of pension expense firms to enhance the probability of reporting pension income. We also document firms' opportunistic use of ERR assumptions to shield reported earnings from the downward pressures faced during recession periods. Finally, we examine whether firms reporting pension income have distinctive financial profiles that motivate management to adopt assumptions that promote pension income.

HYPOTHESES, RESEARCH DESIGN, SAMPLE SELECTION AND DATA COLLECTION

Hypotheses Development

The expected return on pension assets contributes positively to pension cost (i.e., increases the probability of reporting pension income); therefore, we postulate that pension income firms are more likely to adopt an aggressive ERR than pension expense firms to improve their financial position or reach a desired level of earnings. Consequently, we hypothesize that pension income and pension expense firms differ in the *degree* of aggressiveness on the ERR. Accordingly:

H_1: Pension income-reporting firms adopt more aggressive ERR than pension expense-reporting firms.

We measure this aggressiveness by the return spread, calculated as the ERR less the ARR. Pension income-reporting firms exhibit more aggressive ERR if their *positive return spread* significantly exceeds that of pension expense firms. If a *negative return spread* is evident for both groups, our hypothesis will still hold if the *magnitude* of negative return spreads of pension income firms is less than that of pension expense firms.

We further explore the financial characteristics that distinguish pension income–reporting from pension expense–reporting firms. Prior research demonstrates that violations of accounting covenants are costly to debtors because creditors can increase the interest rate, demand early payment or reduce the loan amount, among other actions (Chen and Wei, 1993; DeFond and Jiambalvo, 1994). Other studies document the use of income-increasing accounting accruals to avoid debt covenant violation (e.g., Jaggi and Lee 2002). Therefore, firms with high or increasing debt-to-equity ratios may be more likely to use

discretions in reporting pension income to improve leverage positions and avoid debt covenant violations.[9] Accordingly:

H_2: Firms reporting pension income have more unfavorable leverage positions than firms reporting pension expense prior to accounting for pension cost effects.

Previous studies document that managers have incentives to use discretionary accounting choices to achieve certain financial reporting objectives, including loss avoidance and meeting or beating analysts' earnings expectations (DeGeorge, Patel and Zeckhauser, 1999; Kasznik and McNichols, 2002; Matsumoto, 2002; Bartov, Givoly and Hayn, 2002; Graham, Harvey and Rajgopal, 2005; Brown and Caylor, 2005; Chevis, Das and Sivaramakrishnan, 2007; Asthana 2008; and An et al. 2014). The ROA is a widely used measure of a firm's profitability. Thus, managers of firms with a low or deteriorating ROA may be motivated to exploit their discretion on pension assumptions to improve their ROA. Therefore, we hypothesize:

H_3: Pension income–reporting firms have a lower ROA than firms reporting pension before pension cost effects.

Similar to the approach taken in testing H_2, we perform our analysis after adjusting the ROA ratio by removing the net-of-tax pension cost effect from the ratio. Our hypothesis would be supported if we observe either a significantly lower adjusted ROA or a greater decline in adjusted ROA (ROA^{adj}) for pension income firms. Such a result would suggest that when management is unsatisfied with potential reported earnings, it is more likely to resort to pension assumptions to improve reported profitability.

Research Design

Univariate Analysis

We examine the degree of aggressiveness on the ERR exhibited by DB firms by testing the differences between the mean return spreads of pension income versus pension expense groups. We also perform t-tests on the mean differences of financial variables underlying H_2 (i.e., leverage) and H_3 (i.e., ROA) to determine whether significant differences in these variables exist between these two groups.

Multivariate Analysis

To assess the marginal contribution of each variable, we employed a multivariate model to include all three variables underlying our three hypotheses. The probit model is selected to predict probabilities of reporting pension income. The probit model regresses $PLAN_{it}$ (a binary variable equal to 1 if pension income was reported and 0 otherwise) on return spread (RSPREAD), D/E^{adj}, and ROA^{adj}. We also control for the size of pension assets in the probit model because pension assets are positively associated with the magnitude of the expected return given the same ERR and therefore are correlated with the probability of reporting pension income.

We specify the probit model as follows:

$$PLAN_{it} = \alpha_0 + \alpha_1 RSPREAD_{it} + \alpha_2 D/E^{adj}_{it} + \alpha_3 ROA^{adj}_{it} + \alpha_4 PenAsset_{it} + \varepsilon_{it}$$

$PLAN_{it}$ is an indicator variable equal to 1 for pension income firm–year observations, and 0 for pension expense firm-year observations; $RSPREAD_{it}$ is return spread calculated as (expected return – actual return) scaled by pension assets for firm i in year t; D/E^{adj}_{it} is the level adjusted debt-to-equity ratio for firm i in year t; ROA^{adj}_{it} is the level adjusted ROA ratio for firm i in year t; $PenAsset_{it}$ is a control variable that equals pension assets scaled by total assets for firm i in year t; and ε_{it} is the error term.

We use the maximum likelihood estimation to estimate the coefficients of the probit model. With the estimated coefficients and a normal distribution table, we derive probability changes in reporting pension income from a one-unit change of a specific independent variable.

Sample Selection and Data Collection

There are 47,414 firm-year observations with pension data available on Compustat in the period 1991–2012.[10,11] We further delete observations without pension cost (10,733), zero pension cost (3,948),

zero or negative total assets (6), common equity (2,583) and pension assets (4,079). Our final sample consists of 26,065 firm-year observations in the period 1991–2012. We classify a firm-year observation in the pension income group if the expected return on pension assets is greater than other pension cost components for a given year; otherwise, we classify it into a pension expense group for that year. [12] Following this rule, we partitioned our sample into a pension income group with 4,678 firm-year observations and a pension expense group with 21,387 firm-year observations.

EMPIRICAL RESULTS

Sample Distribution and Pension Reporting Behavior

Table 1 reports the sample distribution (Panel A) and the contribution of pension income to reported earnings (Panel B). Panel A reports that the average number of firms sponsoring DB pension plans during our study period is 1,185 firms per year, representing an average of 18.8% of Compustat firms. The percentage of firms sponsoring DB pension programs remains in the range of 16%–18% in the first half of our study period (1991–2001) and climbs gradually in the second half (2002–2012) to 24% in 2012.

This panel also reveals that an average of 17.21% (213 firms) report pension income during our study period. This percentage grows continuously from 18.66% (237 firms) in 1994 to a peak of 38.49% (498 firms) in 2000. It declines slightly to 34.85% (420 firms) in 2001 before dropping to 21.20% (247 firms) in 2002, when the Securities and Exchange Commission (SEC) publicly stated concerns about aggressive rate of return assumptions.[13] This percentage declines markedly starting in 2003 to a low of 4.21% (40 firms) in 2012, with the exception of 17.64% (182 firms) in 2008 (a recession year). The data indicate that pension income reporting is most prevalent during 1996–2001, with an annual average of 28.74% (untabulated)[14] of DB firms reporting pension income during that period. The annual percentage of pension income-reporting firms declines significantly to an average of 8.53% (untabulated) during 2003–2012, possibly reflecting the influence of the SEC's concerns about aggressive pension assumptions. We also observe a spike in pension income reporting in the first year of both economic recessions during our study period (i.e., 34.85% of firms reporting pension income in 2001 and 17.64% in 2008).[15]

TABLE 1
SAMPLE DISTRIBUTION AND CONTRIBUTION OF PENSION INCOME BY YEAR

Panel A: Sample Distribution

Year	All Obs.	DB Plan Sponsors	Sponsor/ All Observations	Report Income[a]	Report Expense	% of Report Income
1991	6656	1185	17.80%	236	949	19.92%
1992	7002	1327	18.95%	291	1036	21.93%
1993	7284	1264	17.35%	256	1008	20.25%
1994	7534	1270	16.86%	237	1033	18.66%
1995	7993	1261	15.78%	239	1022	18.95%
1996	8067	1315	16.30%	265	1050	20.15%
1997	7939	1320	16.63%	299	1021	22.65%
1998	7878	1358	17.24%	374	984	27.54%
1999	7686	1359	17.68%	400	959	29.43%
2000	7357	1294	17.59%	498	796	38.49%
2001	6802	1205	17.72%	420	785	34.85%
2002	6450	1165	18.06%	247	918	21.20%
2003	6336	1177	18.58%	127	1050	10.79%
2004	6074	1168	19.23%	95	1073	8.13%
2005	5839	1140	19.52%	82	1058	7.19%
2006	5645	1139	20.18%	81	1058	7.11%
2007	5407	1093	20.21%	130	963	11.89%

2008	5156	1032	20.02%	182	850	17.64%
2009	5029	1030	20.48%	77	963	7.48%
2010	4835	1022	21.14%	47	975	4.60%
2011	4469	992	22.20%	55	937	5.54%
2012	3954	949	24.00%	40	909	4.21%
Total	**141,392**	**26065**		**4678**	**21387**	
Average	**6426.91**	**1184.76**	**18.80%**	**212.64**	**972.14**	**17.21%**

Note:

[a.] Firm-year observation is classified as pension income (expense) reporting if pension cost (PPC or DATA 295) on Compustat is less (greater) than zero.

Variable definitions:

All Obs. = firm-year observations available in Compustat;
DB Plan Sponsors = number of firms sponsoring DB pension plans;
Sponsor/All observations = percentage of firms sponsoring defined-pension plans among all firms;
Report Income = firm-year observations reporting pension income;
Report Expense = firm-year observations reporting pension expense;
% of Report Income = percentage of pension income–reporting firms among firms sponsoring DB pension plans;
Total = sum of the firm-year observations during the test period of 22 years;
Average = total amount divided by 22 (years).

Panel B: Contribution of Net Pension Income to Net Income or Net Loss[a]

	Net Pension Income/ Net Income			Net Pension Income/ Net Loss		
Year	**Obs.[b]**	**Mean**	**Median**	**Obs.**	**Mean**	**Median**
1991	196	13.82%	4.66%	40	-60.82%	-4.17%
1992	241	14.49%	4.90%	50	-25.01%	-8.30%
1993	210	13.07%	5.70%	45[c]	-120.65%	-5.95%
1994	210	11.15%	4.36%	27	-80.81%	-5.88%
1995	213	13.68%	4.09%	26	-29.73%	-9.02%
1996	238	9.94%	4.59%	27	-14.47%	-5.49%
1997	269	10.48%	4.85%	30	-76.88%	-9.20%
1998	319	15.92%	5.14%	55	-51.44%	-3.99%
1999	349	18.70%	4.79%	51	-41.59%	-7.83%
2000	430	18.52%	6.46%	68	-44.71%	-3.49%
2001	340	25.91%	7.56%	80	-50.32%	-5.47%
2002	212	22.24%	8.22%	35	-53.17%	-5.05%
2003	108[d]	14.83%	5.21%	17	-71.02%	-8.80%
2004	85	13.20%	5.52%	10	-10.15%	-6.95%
2005	73	10.63%	4.29%	9	-6.96%	-5.36%
2006	67	12.03%	3.99%	14	-14.96%	-4.66%
2007	106	8.58%	3.86%	24	-34.40%	-2.44%
2008	125	17.84%	2.30%	57	-5.00%	-1.60%
2009	56	9.34%	1.99%	21	-30.84%	-1.92%
2010	43	14.55%	2.77%	4	-4.82%	-2.59%
2011	49	5.43%	1.66%	6	-22.91%	-2.86%
2012	35	8.57%	1.41%	5	-5.32%	-2.70%
Total	**3974**			**701**		
Average	**180.64**	**13.72%**	**4.47%**	**31.86**	**-38.91%**	**-5.17%**

[a.] Pension income–reporting firm-year observations are partitioned to net income versus net loss firms for the purpose of assessing the contribution of pension income to reporting earnings (or losses).

[b.] The yearly observations have been Winsorized for the top and bottom 1%.

[c.] One observation with zero net income is excluded.

[d.] We delete two extreme observations from 2003 (Tecumseh Products Co. [Gvkey = 66300] and Ladish Co. [Gvkey=10386]) because their ratios of Pension Income/Net Income were 129 and 195.89, respectively.

Panel B reports the contribution of net pension income to net income or net loss.[16] For pension income firms with earnings, the net pension income, on average, contributes a considerable 13.72% to the earnings during the 22–year study period. The individual year's contribution varies with an upward trend from 9.94 % in 1996 to 25.91% in 2001. This contribution declines slightly to 22.24% in 2002 and gradually reduces to 8.57% in 2012, despite a spike of 17.84% in 2008. Overall, our analysis suggests that pension income contributes considerably to reported earnings, especially in 2001, 2002 and 2008, when the U.S. economy experienced severe recessions.

For pension income firms reporting net losses, many of them would have reported more losses without pension income. On average, net pension income helps this subset of sample firms reduce a substantial 38.91 cents per $1 of net loss reported during our study period.

Descriptive Statistics of Firm Characteristics and Variables for Hypothesis Tests

Table 2 provides descriptive statistics of variables representing firm characteristics (e.g., pension costs, pension assets, sales growth) as well as variables used to test our hypotheses (i.e., return spread [17], D/E [adj] and ROA [adj]). Table 2 also reports the pension asset allocation in equity investments (available since 2003) to gauge the pension asset allocation. Panel A reports the descriptive statistics for the total sample, and Panel B presents these statistics for pension income and pension expense subsamples.

Firm Characteristics of the Total Sample

Table 2, Panel A, reveals that our total sample is characterized by firms with pension assets constituting 15.1% of total assets. The firms also experienced modest annual sales growth (8.4%) during the test period and are highly valued by investors: The book-to-market and price-to-earnings ratios are 0.79 and 24.1, respectively. Our sample firms also carry heavy debt loads, with mean D/E ratio of 2.81. The firms' moderate economic growth is also evident in a 3.7% mean ROA.

The mean of the ERR (8.1%) is significantly higher than that of the ARR (6.5%), and the t-value (untabulated) of the mean difference equals 22.03 during the 22-year study period. Similarly, the mean for the ERR (8.9%) is also significantly greater than the mean for the ARR (–7.5%) during the recession periods. However, we observe a contrasting phenomenon for the nonrecession period: The mean of the ERR (8.0%) is significantly lower than that of the ARR (9.6%), with a t-value of –33.75 (untabulated). In addition, we observe a stable pension asset allocation in equity investments (approximately 57%) throughout all economic states. [18]

Our findings indicate that firms are conservative in estimating the ERR in the nonrecession period (i.e., setting ERR < ARR) and only become aggressive when facing a dire economic state (i.e., setting ERR > ARR). In addition, the aggressiveness in the adoption of the ERR during the four recession years is substantial and dominates the ERR behavior during the 22-year study period.

TABLE 2
DESCRIPTIVE STATISTICS OF FIRM CHARACTERISTICS AND VARIABLES FOR HYPOTHESIS TESTS

Panel A: Total sample

Variable[a, b]	Total Sample N	Mean	Median	Std
Firm Characteristics Variable:				
Pension Cost	26065	14.983	2.006	51.585
Pension Assets	26065	769.617	114.114	2063.010
Pension Assets Scaled	26065	0.151	0.102	0.158
Market Value	22590	6507.200	1121.900	16501.880
Total Assets	26065	5094.910	1287.070	10245.840
Sales Growth	22620	0.084	0.055	0.561
Book-to-Market	22590	0.790	0.458	1.644
Price-to-Earnings	22464	24.098	17.110	55.747
EPS *	23306	1.174	1.030	2.634
EPS^{adj}	23300	1.295	1.083	2.794
D/E	26035	2.812	1.697	4.453
ROA	26063	0.037	0.039	0.065
ERR	24443	0.081	0.081	0.020
ARR	24122	0.065	0.088	0.111
$ERR^{Recession}$	4361	0.089	0.092	0.025
$ARR^{Recession}$	4311	-0.075	-0.068	0.160
$ERR^{Nonrecession}$	20082	0.080	0.080	0.018
$ARR^{Nonrecession}$	19811	0.096	0.097	0.064
Pension Asset Allo.- EQ	9266	0.576	0.610	0.166
Pension Asset Allo.- $EQ^{Recession}$	1975	0.571	0.600	0.161
Pension Asset Allo.- $EQ^{Nonrecession}$	7291	0.577	0.610	0.167
Hypothesis Test Variables:				
Return Spread	22748	0.018	-0.080	0.119
Return $Spread^{Recession}$	4298	0.164	0.159	0.174
Return $Spread^{Nonrecession}$	18450	-0.016	-0.019	0.065
D/E^{adj}	26030	2.711	1.686	4.039
$\Delta D/E^{adj}$	22587	0.040	-0.014	1.850
ROA^{adj}	26060	0.039	0.040	0.066
ΔROA^{adj}	22623	-0.001	0.001	0.061

Notes:
[a.] Pension cost, pension assets, market value and total assets are in millions.
[b.] We excluded negative values in debt-to-equity ratio, common stock equity, book-to-market ratio, pension assets, total assets, and price-to-earnings ratio from the mean calculation.
Variable definitions:
Pension Cost = pension expense or pension income (DATA295);
Pension Assets = the fair value of pension assets disclosed in footnotes calculated as [DATA287 (overfunded)+DATA296(underfunded)];
Pension Assets Scaled = pension assets scaled by total assets;

Market Value	=	market price per share (DATA199) times number of shares outstanding (DATA25*DATA27) as of the end of a fiscal year;
Total Assets	=	proxied for size (DATA 6);
Sales Growth	=	the difference of sales (DATA12) between year t and t-1 divided by sales of t-1;
Book-to-Market	=	equity (DATA60) divided by market value ((DATA199*DATA25);
Price-to-Earnings	=	market price per share (DATA199) divided by earnings-per-share (DAT58/DATA27);
EPS	=	earnings-per-share calculated as [(DATA58)/(DATA27)];
EPS^{adj}	=	EPS less net pension cost impact on EPS calculated as (income before extraordinary item – net pension cost)/shares outstanding or [(DATA18 – DATA295, net of tax) / (DATA54*DATA27)];
D/E	=	debt-to-equity ratio; calculated as total debt (DATA181) divided by equity (DATA60);
ROA^{adj}	=	adjusted ROA calculated as [DATA18 - pension income net of tax (or + pension expense net of tax)] divided by total assets (DATA 6);
ERR	=	expected rate of return derived as expected return on pension assets divided by pension assets. The expected return on pension assets is computed as (DATA 287 + DATA296) x (DATA336) for pre-1998 period, while it is determined by the absolute value of (DATA333) for the post-1998 period;
ARR	=	actual return on pension assets divided by pension assets; actual return is the absolute value of DATA333 and pbarat for the pre- and post-1998 period, respectively;
$ERR^{Recession}$	=	ERR of observations from recession years (i.e., 2001,2002,2008, and 2009);
$ARR^{Recession}$	=	ARR of observations from recession years;
$ERR^{Nonrecession}$	=	ERR of nonrecession period that is ERR excluding observations from recession years;
$ARR^{Nonrecession}$	=	ARR of nonrecession period that is ARR excluding observations from recession years;
Pension Asset Allo.-EQ	=	the percentage of pension assets invested in equity;
Pension Asset Allo.-$EQ^{Recession}$	=	the percentage of pension assets invested in equity of observations from recession years;
Pension Asset Allo.-$EQ^{Nonrecession}$	=	the percentage of pension assets invested in equity of observation from nonrecession years;
Return Spread	=	expected rate of return less actual rate of return calculated as the difference between the expected return and actual return on pension assets scaled by pension assets;
$Return\ Spread^{Recession}$	=	return spread of observations from recession years;
$Return\ Spread^{Nonrecession}$	=	return spread excluding observations from recession years.
D/E^{adj}	=	adjusted debt-to-equity ratio calculated as D/E excluding the impact of net pension cost;
$\Delta D/E^{adj}$	=	$(D/E^{adj}_{t} – D/E^{adj}_{t-1})$;
ROA	=	ROA ratio calculated as income before extraordinary item (DATA18) divided by total assets (DATA 6);
ΔROA^{adj}	=	$ROA^{adj}_{t} – ROA^{adj}_{t-1.}$

Panel B: Pension Income Subgroup

	Section I: Pension Income Subgroup[b]			
Variable[a]	N	Mean	Median	Std
Firm Characteristics Variable:				
Pension Cost	4678	-20.156	-2.579	55.896
Pension Assets	4678	1289.28	226.696	3458.79
Pension Assets Scaled	4678	0.249	0.18	0.239
Market Value	3840	5703.67	1065.6	13976.56
Total Assets	4678	5167.21	1324.22	10075.4
Sales Growth	4096	0.065	0.041	0.215
Book-to-Market	3840	0.761	0.47	1.168
Price-to-Earnings	3815	24.635	16.746	53.105
EPS	3984	1.173	1.04	2.772
EPSadj	3983	1.117	1.013	2.844
D/E	4675	2.817	1.842	4.015
ROA	4678	0.035	0.038	0.059
ERR	4523	0.089	0.089	0.018
ARR	4233	0.055	0.089	0.018
ERR Recession	915	0.102	0.101	0.019
ARR Recession	910	-0.109	-0.087	0.143
ERR Nonrecession	3608	0.0855	0.085	0.015
ARR Nonrecession	3323	0.101	0.104	0.071
Pension Asset Allo.-EQ	747	0.575	0.61	0.172
Pension Asset Allo.- EQ Recession	300	0.573	0.6	0.157
Pension Asset Allo.-EQ Nonrecession	447	0.577	0.61	0.181
Hypothesis Testing Variable:				
Return Spread	4099	0.035	0.002	0.135
Return Spread Recession	908	0.21	0.19	0.073
Return Spread Nonrecession	3191	-0.015	-0.021	0.073
D/Eadj	4673	2.842	1.855	4.029
ΔD/Eadj	4091	0.171	-0.004	2.049
ROAadj	4676	0.032	0.036	0.061
ΔROAadj	4095	-0.003	0	0.056

Panel B (Continued): Pension Expense Subgroup

	Section II: Pension Expense Subgroup				t-Value of Mean Diff. (Pension Income-Pension Expense)
Variable[a]	N	Mean	Median	Std	
Firm Characteristics Variable:					
Pension Cost	21387	21.889	3.62	58.673	-46.18**
Pension Assets	21387	665.651	96.531	1760.38	12.00**
Pension Assets Scaled	21387	0.131	0.09	0.133	32.68**
Market Value	18750	6673.52	1132.45	16994.48	-3.77**
Total Assets	21387	5084.33	1277.4	10314.83	0.51
Sales Growth	18524	0.074	0.057	0.189	-2.76**
Book-to-Market	18750	0.791	0.456	1.705	-1.33
Price-to-Earnings	18649	23.964	17.175	56.151	0.7
EPS	19322	1.175	1.02	2.607	-0.04
EPSadj	19317	1.334	1.101	2.801	-4.40**
D/E	21360	2.82	1.663	4.614	-0.04
ROA	21385	0.038	0.039	0.066	-3.08**
ERR	19920	0.08	0.08	0.02	29.72**
ARR	19889	0.068	0.089	0.107	-16.10**
ERR Recession	3446	0.0859	0.089	0.025	21.22**
ARR Recession	3401	-0.066	-0.062	0.164	-7.80**
ERR Nonrecession	16474	0.0783	0.08	0.018	25.14**
ARR Nonrecession	16488	0.095	0.096	0.062	4.54**
Pension Asset Allo.-EQ	8519	0.576	0.610	0.165	-0.08
Pension Asset Allo.-EQ Recession	1675	0.571	0.600	0.161	0.24
Pension Asset Allo.-EQ Nonrecession	6844	0.577	0.61	0.166	-0.05
Hypothesis Testing Variable:					
Return Spread	18649	0.014	-0.010	0.115	9.25**
Return Spread Recession	3390	0.151	0.151	0.178	15.13**
Return Spread Nonrecession	15259	-0.016	-0.019	0.063	0.72
D/Eadj	21357	2.682	1.643	4.042	2.46**
ΔD/Eadj	18496	0.010	-0.016	1.825	4.64**
ROAadj	21384	0.041	0.041	0.067	-8.97**
ΔROAadj	18528	-0.001	0.001	0.062	-2.03**

Notes:
a. See Panel A for variable definitions.
b. If pension cost is greater (less) than zero, the observation is classified as a pension expense (pension income) observation. Observations with zero pension cost are deleted.
**,* denote significance at the 0.01, and 0.05 levels, respectively, using a two-tailed test except for hypotheses testing variables to which a one-tailed test is applied.

Descriptive Statistics of Subgroups and Empirical Results of Univariate Analysis

Panel B in Table 2 provides descriptive statistics of firm characteristics and variables used for hypotheses testing for pension income and pension expense groups. Although these two groups are similar in size (measured by total assets), book-to-market ratio, price-to-earnings ratio and D/E ratio, firms in the pension income group have significantly higher pension assets but lower market value, sales

growth, EPS^{adj} and ROA. In addition, both groups have a similar percentage of pension assets allocated in equity investments, but the pension income group's ERR is significantly higher than that of the pension expense group in all states of the economy. Given that pension asset allocation is an implicit factor used to determine the ERR (ASC 715-30), this finding suggests that the pension income group adopts a higher ERR than the pension expense group without proper justification, such as a higher portion of pension assets invested in equity investments.[19]

Aggressiveness in Pension Assumptions: The ERR and Pension Cost Reporting

Our first hypothesis postulates that pension income firms adopt a more aggressive ERR than pension expense firms to achieve the goal of reporting pension income to improve their financial profiles. Panel B in Table 2 reports that the mean return spreads during the 22–year study period is 3.5 % and 1.4% for the pension income and pension expense groups, respectively. The difference in these two spreads is statistically significant at the 0.01 level (t–value = 9.25), suggesting that pension income–reporting firms are more aggressive in setting their ERR assumptions than pension expense–reporting firms. However, a review of the individual year's return spread (untabulated) reveals that, except for the four recession years, the spread is *negative* (i.e., ERR < ARR) for 17 of the 18 nonrecession years. This finding suggests that during the 22-year study period, firms are mostly conservative toward the adoption of the ERR.

Our analysis continues by deriving the return spreads for the nonrecession years (i.e., 1991–2012, excluding four recession years) and return spreads during the four recession years (i.e., 2001, 2002, 2008 and 2009). For the recession period, the mean return spreads are a substantial 21% and 15% for the pension income and pension expense groups, respectively, and the difference in the return spread of these two groups is statistically significant at the .01 level (t-value = 15.13). This finding indicates that the pension income group is more aggressive in adopting the ERR than the pension expense group during recessions.[20] Panel B of Table 2 reports that the mean return spreads for the nonrecession years are –1.5% and –1.6% (indicating ERR < ARR, a conservative behavior in estimating the ERR) for the pension income and pension expense groups, respectively. A smaller magnitude in the negative return spread for the pension income group indicates that this group is less conservative (or more aggressive) in adopting the ERR than the pension expense group. However, the difference is not statistically significant.

Return Spreads and the Long-Term Nature of ASC715-30-35-47

The distinctive signs of the return spreads for our sample firms during the nonrecession versus the recession periods lead us to conclude that the observations of the recession periods influence our initial finding of *positive* return spreads for both groups during the entire 1991–2012 period. To gain insight into firms' ERR choices, we subdivide the single 22-year interval into multiple 11-year intervals to be in line with guidelines of ASC715-30-35-47 that the ERR is estimated on a long-term basis covering different economic states. Panel B of Table 3 indicates that the return spread is significantly positive for all intervals, suggesting that firms in both groups are aggressive in setting the ERR over a long period for both pension income and pension expense groups. Moreover, the pension income group's spread is significantly greater than that of the pension expense group for all intervals, suggesting that the pension income group is more aggressive in adopting the ERR than the pension expense group. This finding for multiple 11-year intervals corroborates with the results of return spread difference from the single 22-year interval discussed previously and is most likely also distorted by the observations in the four-recession years.

Consequently, we exclude the four-recession years from all intervals. The results, reported in Panel C of Table 3, reveal a very different phenomenon. The return spreads of all intervals for both groups are significantly negative (except for one), suggesting that firms in both groups are conservative in adopting the ERR during the nonrecession period.[21] The magnitude of the negative spreads for the pension income subgroup is smaller (i.e., more aggressive) than that of the pension expense group for 10 of the 12 intervals, and the return spread difference of the two groups is statistically significant in three consecutive intervals (i.e.,1998–2008, 1999–2009 and 2000–2010).

These empirical results indicate that firms typically behave conservatively (i.e., ERR < ARR) during nonrecession years but alter their behavior to be more aggressive when facing economic downturns. The flexibility in the estimation of the ERR provides an opportunity for firms to mitigate the negative earnings impact from recessions, and the pension income group was more aggressive than the pension expense group in recessions. For the nonrecession period, although a conservative behavior in adopting the ERR prevailed for both groups, the pension income group is still more aggressive than the pension expense group. These findings provide moderate support for H_1.

TABLE 3
RETURN SPREAD OF THE ERR AND THE ARR
Panel A: Return Spread for Total Sample during the Entire 1991–2012 and Nonrecession Periods

Total Samples								
11 -Year Intervals	During the Entire 1991-2012 Period				During the Nonrecession Period			
	Obs	Mean	Std	t-stat.	Obs	Mean	Std	t-stat.
1991- 2001	11112	0.001	0.164	0.31	9963	-0.017	0.145	-12.17**
1992 - 2002	11243	0.024	0.173	14.75**	8952	-0.013	0.151	-8.02**
1993 - 2003	11260	0.02	0.176	12.34**	8969	-0.017	0.155	-10.49**
1994 - 2004	11318	0.02	0.184	11.52**	9027	-0.018	0.166	-10.09**
1995 - 2005	11359	0.012	0.183	7.15**	9068	-0.027	0.162	-15.87**
1996 - 2006	11418	0.016	0.173	9.72**	9127	-0.022	0.149	-14.39**
1997 - 2007	11397	0.02	0.187	11.24**	9106	-0.018	0.169	-9.94**
1998 - 2008	11313	0.056	0.207	28.68**	8017	-0.011	0.169	-6.07**
1999 - 2009	11744	0.055	0.205	29.06**	7446	-0.011	0.166	-5.77**
2000 - 2010	12009	0.053	0.203	28.49**	7711	-0.012	0.163	-6.54**
2001 - 2011	11866	0.053	0.203	28.45**	7568	-0.013	0.163	-6.82**
2002 - 2012	11636	0.036	0.192	20.21**	8487	-0.015	0.156	-8.91**

Panel B: Return Spread for Pension Income & Pension Expense Groups during the Entire 1991 - 2012 Period

During the Entire 1991-2012 Period									
	Pension Income Group				Pension Expense Group				Pension Income - Pension Expense
	Obs	Mean	Std	t-stat.	Obs	Mean	Std	t-stat.	t-stat (Pooled)
1991- 2001	2592	0.012	0.162	4.13**	8160	-0.004	0.165	-2.08	4.58**
1992 - 2002	2976	0.034	0.169	10.83**	8267	0.021	0.174	10.77**	3.51**
1993 - 2003	2830	0.033	0.175	10.16**	8430	0.016	0.177	8.41**	4.49**
1994 - 2004	2679	0.036	0.179	10.47**	8639	0.015	0.185	7.47**	5.23**
1995 - 2005	2540	0.032	0.183	8.72**	8819	0.007	0.183	3.44**	6.08**
1996 - 2006	2397	0.039	0.185	10.29**	9021	0.01	0.169	5.38**	7.39**
1997 - 2007	2286	0.044	0.188	11.18**	9111	0.014	0.186	6.95**	6.99**
1998 - 2008	2197	0.085	0.213	18.77**	9116	0.049	0.205	22.69**	7.47**
1999 - 2009	2093	0.095	0.22	19.80**	9651	0.046	0.2	22.64**	10.02**
2000 - 2010	1911	0.109	0.225	21.09**	10098	0.042	0.197	21.56**	13.22**
2001 - 2011	1520	0.126	0.246	20.01**	10346	0.042	0.194	22.21**	15.13**
2002 - 2012	1147	0.1	0.196	17.20**	10489	0.029	0.19	15.61**	11.93**

Panel C: Return Spread for Pension Income and Pension Expense Groups during the Nonrecession Period

During the Noncession Period									
	Pension Income Group				Pension Expense Group				Pension Income - Pension Expense
	Obs	Mean	Std	t-stat.	Obs	Mean	Std	t-stat.	t-stat (Pooled)
1991- 2001	2541	-0.016	0.082	-9.74**	7422	-0.018	0.161	-9.81**	0.77
1992 - 2002	2321	-0.011	0.081	-6.40**	6631	-0.013	0.168	-6.52**	0.76
1993 - 2003	2175	-0.014	0.086	-7.57**	6794	-0.018	0.171	-8.76**	1.11
1994 - 2004	2024	-0.014	0.088	-7.02**	7003	-0.019	0.182	-8.60**	1.19
1995 - 2005	1885	-0.023	0.085	-11.91**	7183	-0.028	0.177	-13.40**	1.08
1996 - 2006	1742	-0.018	0.084	-8.99**	7385	-0.023	0.160	-12.57**	1.37
1997 - 2007	1631	-0.015	0.085	-7.01**	7475	-0.018	0.182	-8.64**	0.74
1998 - 2008	1363	-0.004	0.078	-2.03*	6654	-0.013	0.182	-5.79**	1.71*
1999 - 2009	1185	-0.001	0.080	-0.51	6261	-0.013	0.178	-5.78**	2.24*
2000 - 2010	1003	0.007	0.080	2.63**	6708	-0.015	0.172	-7.12**	3.91**
2001 - 2011	612	-0.015	0.067	-5.53**	6956	-0.013	0169	-6.21**	-0.36
2002 - 2012	650	-0.016	0.066	-6.07**	7837	-0.015	0.161	-8.25**	-0.12

Leverage and Pension Cost Reporting

H_2 postulates that firms sponsoring DB pension plans have an incentive to report pension income when facing relatively high or deteriorating leverage. We conducted a t-test to determine the mean difference of D/E^{adj} and Δ D/E^{adj} (the change in D/E^{adj}) between the pension income and pension expense groups). Panel B of Table 2 reports that mean D/E^{adj} is 2.842 and 2.682 for the pension income and pension expense subgroups, respectively, and the mean difference of D/E^{adj} is significant at the 0.01 level (t value = 2.46). Panel B of Table 2 also reports that the mean Δ D/E^{adj} increases 0.171 and 0.10 for pension income and pension expense firms, respectively, and the t-value of the mean Δ D/E^{adj} difference is also significant at the 0.01 level (t-value = 4.64).

These findings suggest that a higher leverage ratio may motivate managers to adopt pension income–driven assumptions to increase earnings and therefore reduce the leverage ratio and the probability of violating any debt covenants. The evidence from the univariate analysis thus provides support for H_2.

Profitability and Pension Cost Reporting

A relatively low ROA^{adj} or a deteriorating ROA^{adj} may incentivize managers to report pension income to manage earnings upwards. Panel B of Table 2 reports that the ROA^{adj} of the pension income group (3.2%) is significantly lower than that of the pension expense group (4.1%) (t value = –8.97). Moreover, the mean change in ROA^{adj} is –.3% and –.1% for the pension income and pension expense groups, respectively, with a more significant decline for the pension income group (t-value = –2.03).

The univariate analysis reveals not only that pension income–reporting firms have a lower ROA^{adj} than pension expense firms but also that the deterioration of ROA^{adj} is more extreme. This finding provides evidence to support H_3. These results suggest that financial conditions prompt managers to report pension income to improve profitability.

Multivariate Analysis for Hypotheses

The Marginal Impact of Key Variables Underlying Pension Reporting

Table 4 reports the results of applying the probit model, which regresses a dichotomous variable on a series of level variables, including return spread (RSPREAD), adjusted debt ratio (D/E^{adj}) and adjusted profitability proxy (ROA^{adj}). These level variables are key factors that either affect pension cost (i.e., ERR) or distinguish pension income from pension expense firms (i.e., leverage and ROA). We include the pension assets (PenAsset) variable as a control variable because its size is associated with the estimated ERR and, therefore, the probability of reporting pension income. For the dependent variable, a value of 1 indicates pension income firm-year observation and 0 indicates otherwise.

Applying all observations (n = 22,718), Panel A of Table 4 reports a significant and positive coefficient for return spreads, in support of H_1. We observed a negative significant coefficient for ROA^{adj}, which is consistent with the prior finding that a decline in ROA^{adj} increases the probability of reporting pension income to alleviate undesirable financial performance. Unlike the coefficients of return spread and ROA, the coefficient of D/E^{adj} is insignificant. Panels B and C of Table 4 report the probit model result applying observations from the nonrecession years (n = 18,432) and recession years (n = 4,286), respectively, showing similar results to those from the entire period.[22]

Thus, the multivariate analysis indicates that both return spread and ROA are associated with the probability of reporting pension income, and each has a marginal contribution beyond other factors. The level D/E^{adj} is associated only with the reporting of pension income probability in the univariate study and has no significant marginal impact when the other two relevant factors are present.

TABLE 4
RESULTS OF PROBIT MODELS AND THE IMPACT OF VARIABLES ON THE PROBABILITY OF REPORTING PENSION INCOME

Probit Model[a]: $PLAN_{it} = \alpha_0 + + \alpha_1 D/E^{adj}{}_{it} + \alpha_2 ROA^{adj}{}_{it} + \alpha_3 RSPREAD_{it} + \alpha_4 Log\ (PenAsset)_{it} + \varepsilon_{it}$

	Intercept	RSPREAD	D/E^{adj}	ROA^{adj}	Log(PenAsset)
Panel A: All Observations[a] (N=22,718)					
Estimated Coefficients	-1.3865**	0.7593**	-0.005	-1.4654**	0.1054**
Changes in Probability *		0.2536	-0.0025	-0.1633	0.0266
Adjusted R^2 = 0.047					
Panel B: Observations in nonrecession period (N= 18,432)					
Estimated Coefficients	-1.3546**	0.4961**	-0.0072*	-1.6288**	0.1018**
Changes in Probability *		0.1496	-0.0025	-0.1614	0.0261
Adjusted R^2 = 0.038					
Panel C: Observations in recession period (N=4,268)					
Estimated Coefficients	-1.5293**	1.0321**	0.000459	-1.1587**	0.1150**
Changes in Probability *		0.3738	0	-0.1754	0.035
Adjusted R^2 = 0.074					

**, * denote significance at the 0.01 and 0.05 levels, respectively, using maximum likelihood estimates.
a. Variables have been Winsorized at the top and bottom 1% to mitigate the potential impact of outliers.

Variable definitions:
PLAN = an indicator variable which equals one for pension income firm-year observations and zero otherwise;
RSPREAD = return spread; see variable definitions in Table 2 for details;
D/Eadj = adjusted debt-to-equity ratio;
ROAadj = adjusted ROA ratio;
Log (PenAsset) = nature log of pension assets.

Probability Change from a One-Unit Increase of an Explanatory Variable

Panel A of Table 4 also presents how a one-unit change in an explanatory variable of the probit model changes the probability of reporting pension income using the entire study period. To estimate the probability change on pension income reporting with a unit change of an explanatory variable, we must estimate a reference probability to serve as a baseline. Thus, we derive it using a reference Z-score.[23] Our sample has a reference Z-score of –0.95, which translates to a 17.11% probability of reporting pension income using a normal distribution table.[24] The probability decreases to 0.78% with a one-unit increase in the level ROA^{adj}. Thus, a one-unit increase in the level ROA^{adj} leads to a 16.33% (i.e., 17.11% – 0.78%) *decrease* in the probability of reporting pension income. We followed similar procedures to derive the impact of a one-unit change in the return spread on the probability of reporting pension income. Panel A reports that the probability of reporting pension income increases a substantial 25.36% with a one-unit increase in the return spread. We conclude that the return spread has more impact on the pension income–reporting probability than the level ROA^{adj}.

We also derive the probability changes of reporting pension income from a unit change of an explanatory variable for observations of nonrecession as well as recession periods (Panels B and C of Table 4). While the probability change from a unit change in ROA^{adj} for both subsamples is similar to that of using all observations, it is very different for the return spread. The probability change of the return spread for the recession years is substantially higher than that for the full study period (i.e., 37.38% for recession years and 25.36% for all years), but it is much lower for the nonrecession years (i.e., 14.96%). Therefore, the return spread has a greater impact on the probability of reporting pension income during the recession period than the nonrecession period.

CONCLUSION

With investors responding to recurring operating earnings and pension income indiscriminately, stocks would be mispriced if pension assumptions such as the ERR were adopted opportunistically rather than to reflect the true value of pension obligations. As more than 17% of DB firms report pension income in 1991–2012 and pension income contributes an average of 13.7 cents to every $1 of earnings reported by these firms, it is important for investors to know whether a devious use of the ERR plays a role in reporting pension income. Likewise, regulators and standard setters have an interest in the arbitrary use of ERR assumptions when considering alternative pension accounting guidance intended to result in transparent financial reporting practices.

Overall, our results suggest that firms adopt conservative pension reporting practices during the nonrecession period but exploit their flexibility in the ERR assumptions to improve earnings when the economic climate becomes direr. Pension income–reporting firms engage in a more aggressive adoption of the ERR assumption than the pension expense–reporting firms, especially during recessions.

Our findings are relevant to regulators and financial statement users who want to understand the nature of pension accounting practices of companies sponsoring DB pension plans. We provide standards setters and regulators with more insight into the economic environment and the type of firms that may warrant a closer oversight for potentially opportunistic use of pension accounting assumptions. Moreover, our finding of a greater likelihood of opportunistic use of the ERR by firms reporting pension income, especially in recessions, indicates that investors should consider the contribution of pension income to core operating earnings and weigh these components differently.

Our findings also have implications for external auditors who are burdened by the lack of definitive, quantitative Generally Accepted Accounting Principles guidance regarding ERR assumptions but must provide assurance on financial statements with material levels of pension income or pension expense. It is important for auditors to consider the nature of pension accounting when verifying the integrity of the assumed rates for pension costs estimation. In particular, precautions should be taken when clients increase ERR assumptions to achieve pension income or when the firm would have otherwise faced higher leverage and lower profitability, especially during recession periods. Our finding is relevant for auditors since *AU 342.09* (PCAOB 2015) requires auditors to consider the likelihood that estimates are manipulated and *Auditing standard 16, Communications with Audit Committees*, mandates auditors to report to the audit committee any estimation method changes made by managers.

This study raises a few possibilities for future research and practical implementations. One research area is to examine how managers choose between pension accrual and other earnings management mechanisms for firms offering defined benefit pension plans, especially reporting pension income. Research on this issue can lead to a more completed understanding of how firms utilize pension assumptions to manage earnings. With regards to practical implication, this study can help auditors establish a precaution procedure for firms reporting pension income to scrutinize the possibility of using pension assumptions to manage earnings.

ENDNOTES

1. *The Wall Street Journal*, December 28, 2005.

2. ASC 715 requires the DB pension costs to be calculated using an expected rate of return (ERR) on pension assets less the sum of other components of pension costs (e.g., the service cost and interest expense on pension liabilities, etc.). Using the expected rate of return on pension assets instead of the realized rate of return and the amortization of prior service cost instead of an immediate write-off to calculate pension cost are among the income smoothing mechanisms available to managers.

3. The assumed discount rate used to estimate the pension liabilities and their associated interest expense can also affect the magnitude of pension costs. However, the accounting standard (ASC715-30-35-43) requires employers to follow the interest rate of high-quality fixed-income investments (i.e., government bonds), which gives them little latitude.

4. Coronado and Sharpe (2003) and Coronado et al. (2008) use S&P 500 firms to examine how investors respond to the disclosed funded status of pension plans and pension expense (excluding service costs). They report that investors cannot place accurate values of these pension-related financial variables on firm valuation. In particular, investors respond to core earnings and pension expense indistinguishably. Asthana (2008) empirically documents that managers use the ERR on pension assets to inflate earnings when facing missing earnings target. In addition, Asthana (2008) reports that investors make decisions based on the partially adjusted inflated earnings, not the true earnings. Using a different measure of ERR manipulation from Asthana, An et al. (2014) also find that a significant number of firms used the ERR to inflate earnings to meet or exceed analyst earnings forecasts. Similar to Asthana's finding, investors responded to these inflated earnings positively.

5. Researchers also report that managers change the composition of pension asset allocation (i.e., increase the percentage of equity investment) to justify the increase of the ERR (Amir, Guan and Oswald 2010; Chuk 2013).

6. Although the National Bureau of Economic Research (NBER) determined that the 2001 recession started in March 2001 and officially ended in November 2001, the stock market crashed again in the last two quarters of 2002 and did not recover permanently until the last three quarters of 2003. Therefore, the first recession period in our study is 2001–2002, when the extremely high positive return spread is well in line with the NBER's definition. Similarly, the NBER officially designated the 2008 recession as December 2007 through June 2009; however, for 2009, the pension income group continued to experience substantial negative actual returns and, therefore, a considerable positive return spread. As a result, we designate both 2008 and 2009 as the second recession period in our study.

7. Another stream of pension accounting research examines the market's response to pension disclosures. Studies in this area report conflicting results: Whereas Barth, Beaver and Landsman (1992) and Werner (2011) find that the market responds to disclosed pension assets and pension liabilities and Brown and Caylor (2005) report that

the market adjusts a firm's value downward for using unjustifiable income-increasing pension assumptions, Picconi (2006) reports that neither financial analysts nor investors capture the earnings effect of pension costs disclosed in footnotes in making earnings forecasts. Coronado and Sharpe (2003) and Coronado et al. (2008) also report similar findings. Moreover, Franzoni and Marin (2006) find that investors overvalued firms with underfunded DB pension plans for up to five years. More recently, Yu (2013) reports that the market's response to pension disclosures is positively associated with the number of analysts following a firm and its institutional ownership.

8. Comprix and Muller (2006) use S&P 1,500 firms with both pension and CEO cash compensation data available, and their final sample consists of only 425 firms with 3,032 firm-year observations during 1993–2002. They focus on the asymmetric treatment of a corporation's executive compensation committee on pension expense versus pension income. In contrast, we focus on the association between an opportunistic use of the ERR and pension income reporting in different economic states as well as financial profile differences between firms reporting pension income and pension expense. In addition, we use all publicly traded firms in the United States with pension data available and cover an extensive period (1991–2012) with two recession cycles.

9. We perform our analysis after adjusting the debt-to-equity ratio by removing the net-of-tax pension cost effect from the ratio. We refer to this variable as the adjusted D/E ratio or D/E^{adj}.

10. We start the test year in 1991 when pension data became available on Compustat. Firms without pension cost (PPC or DATA295) are firms that either do not sponsor DB pension plans or have no pension plans.

11. The observations of financial institutions, insurance and real estate industries are excluded from our sample due to their unique characteristics.

12. The pension cost variable on Compustat reflects the sum of the expected return on pension assets and other components of pension costs. A negative pension cost indicates pension income reporting while a positive pension cost represents pension expense reporting.

13. At the 30th Annual Conference of the American Institute of Certified Public Accountants held in December 2002, the SEC staff indicated that it might challenge companies with 9% or higher ERR on pension assets.

14. The untabulated average percentage of firms reporting pension income for a period is calculated as the sum of the firms reporting pension income during that period (e.g., 1996–2001 or 2003–2012) divided by the total number of firms sponsoring DB pension plans in the same period.

15. This percentage is relatively high compared with an average of 8.53% in the post-SEC remark era (i.e., 2003–2012).

16. The net pension income is calculated by removing the impact of income tax from pension income.

17. Because Compustat data were not uniformly available in our study period, the return spread is derived using different variables on Compustat in pre and post–1998 periods. For 1998– 2012, it is derived as (expected return on pension assets – actual return on pension assets) / pension assets when both expected and actual return on pension assets are available on Compustat. Prior to 1998, the expected return is not available on Compustat, and therefore, it has to be derived as (the assets of underfunded pension plans + the assets of overfunded pension plans) x the expected rate of return on pension assets).

18. The pension asset allocation in equity is only available on Compustat starting in 2003.

19. The allocation in equity investment during the period 2003–2012 is 57.5% and 57.6% for pension income and pension expense groups, respectively, and the difference is insignificant. The equity investment remains stable around 57% for both groups in the nonrecession period as well as the recession period.

20. This finding is further bolstered by analyzing the ERR: While both groups raise their ERR during the recession periods without justification (e.g., an increase in the pension asset allocation in equity investments, a better outlook in the actual returns), the ERR of the pension income firms increased more than twice that of the pension expense group during the recession period (i.e., an increase of 1.65% for the pension income firms versus .76% increase for the pension expense firms).

21. Our finding of a negative 11-year mean return spread for all intervals from 1991 to 2012 when excluding observations in four-recession years is consistent with the finding of Adams, Frank, and Perry (2011), who find that 10 of 15 years of their test period (1991–2005) have the expected rate of return lower than the actual rate of return and conclude that managers adopted ERR conservatively (i.e., ERR < ARR), except in 2001 and 2002. Conversely,

Comprix and Muller (2006) report positive mean return spreads for firms reporting either pension income or expense, and the spread is greater for the pension income firms. We believe Comprix and Muller's result is biased because of including observations from 2001 and 2002. Note that when we exclude only 2001 and 2002 observations from our 22-year study period, the ERR behavior and the return spread (untabulated) of both groups are similar to those using all 22-year observations. Thus, it is important to consider the second recession period (i.e., 2008–2009) in the study to obtain unbiased empirical results regarding the ERR behavior of firms sponsoring DB pension plans.

22. The leverage has a marginal (but negative) contribution to the reporting probabilities of pension income in the nonrecession period.

23. Because the coefficients of a probit model correlate the effect of a one-unit change in the independent variables on the Z-score when the dependent variable equals 1 (i.e., reporting pension income in our study), the reference Z-score equals the constant plus the sum of the coefficient of each independent variable times the correspondent variable mean.

24. The 17.11% of observations reporting pension income are close to the mean percentage (i.e., 17.21%) of total firm-year observations reporting pension income as presented in Panel A of Table 1.

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MAILING INFORMATION

Chun-Chia Amy Chang
1600 Holloway Ave. SCI342
San Francisco State University
College of Business/ Accounting Department
San Francisco, CA94132
415-405-0963 (W) 415-418-4498(Cell)