PORTFOLIO INSIGHTS

Corporate Pension Peer Analysis 2018

Pension strategy and analytics

March 2019

IN BRIEF

- Our proprietary analysis of trends among the largest corporate pensions found 2018 headline funded status improved 1.5%, to 87.2%, although with dramatic volatility: Average funded status declined an estimated 7.2% in Q4.
- The average plan returned -3.9% for the calendar year, the worst performance since 2008. The decline was the largest detractor from funded status during 2018. A tailwind from higher discount rates, thanks to rising interest rates and widening credit spreads, provided the largest lift to funded status, followed by sponsor contributions.
- Amid declines in public market returns, extended credit exposures (including agency mortgages, bank loans and other securitized assets) saw small gains. We anticipate increased utilization of these assets as hedge portfolio diversifiers among plans.
- The pace of pension risk transfers continued unabated despite actual PBGC premiums paid by plan sponsors decreasing for a second year; 2018 was the largest asset allocation de-risking year since 2011, amid rising rates, accelerated contributions, concerns about equity market valuations and improved funded status.
- One 2018 de-risking trend we expect to continue: the notable shift into fixed income assets.

ALL IT TAKES IS ONE QUARTER TO TURN HISTORY AROUND. JUST ASK THE 2016 ATLANTA FALCONS. At the beginning of the now-legendary fourth quarter of Super Bowl LI, the Falcons were ahead by a seemingly insurmountable 28-9. Then the Patriots made a miraculous comeback over the next 15 minutes of regulation, leading ultimately to the Falcons' defeat. Similarly, the markets made a historic turnaround in the fourth quarter of 2018. Entering Q3, corporate pension plans had broken through post-crisis highs and were on course to notch a second year of strong funded status gains. The S&P 500 had posted 10.6% year-to-date returns, GAAP discount rates had risen about 65 basis points (bps), and many plans had accelerated contributions to lock in higher deductions before the Tax Cuts and Jobs Act took effect (**EXHIBITS 1A** and **1B**). But as Tom Brady and the Patriots showed the Falcons, the fourth quarter can make all the difference.

Where do pensions go from here? This report highlights historical trends and future expectations for the industry, drawing on data from the largest 100 plans by assets as of the end of 2018,[1] as well as insights from our engagements with J.P. Morgan's corporate pension clients.

AUTHOR

Michael Buchenholz
Head of U.S. Pension Strategy, Institutional Strategy and Analytics

[1] By assets as of December 31, 2018. Analysis excludes international plans and/or non-qualified plans where data transparency makes this separation possible. Where transparency is not available, figures may include these elements. Plan sponsors with fiscal year-ends between May 28, 2017 and December 31, 2018 are included. Analysis includes only public companies. Because of rounding, some numbers (such as the percentage change from start- to end-of-year headline funded status) may appear not to add up.

J.P.Morgan
Asset Management

Funded status ended 2018 up 1.5% after hitting a post-crisis peak of 94.4% in September and subsequently falling 7.2% in Q4

EXHIBIT 1A: ANNUAL GAAP FUNDED STATUS

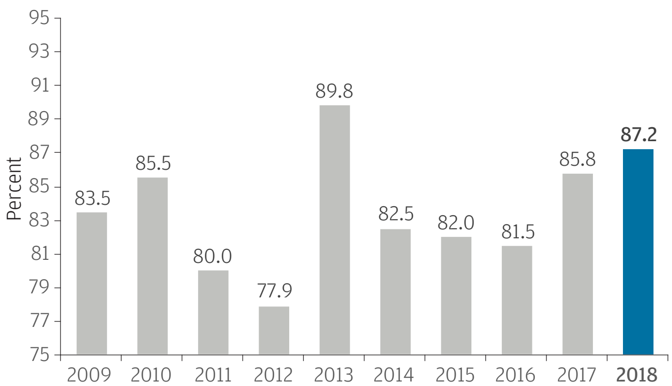
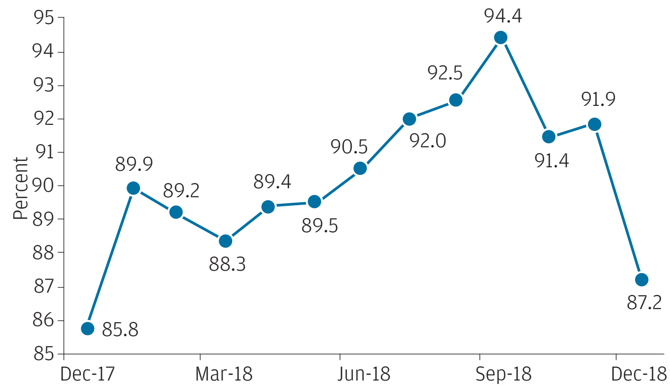


EXHIBIT 1B: 2018 ESTIMATED INTRAYEAR FUNDED STATUS VOLATILITY



Source: Company 10-K filings, J.P. Morgan Asset Management; data as of December 31, 2018. Numbers may not add due to rounding.

GAAP: Generally accepted accounting principles.

The 2018 headline funded status for the peer group in our analysis was slightly improved at 87.2%, up 1.5% from the prior year. Since both assets and liabilities shrank, dollar deficits were reduced for some plans, even in cases where the funded status percentage deteriorated. Under either measure, the headline figure masks an amplification of intrayear funded status volatility, with the average plan falling an estimated 7.2% in the fourth quarter alone. In terms of the divergence of funded status among sponsors, asset allocation and manager performance certainly played a role, but the largest driver was contributions; given the backdrop of heightened volatility, the amount, timing and allocation of capital injections all mattered. Incidentally, peak funded status for 2018 roughly coincided with the September contribution deadline for locking in the 35%, rather than the current 21%, corporate tax rate deduction. At one extreme, some plan sponsors likely balked at the idea of contributing at the highest funded status levels since the financial crisis. At the other, some plans plowed a significant amount of money into public equities moments before the S&P 500 fell 13.5% and the MSCI EAFE declined 12.5%.

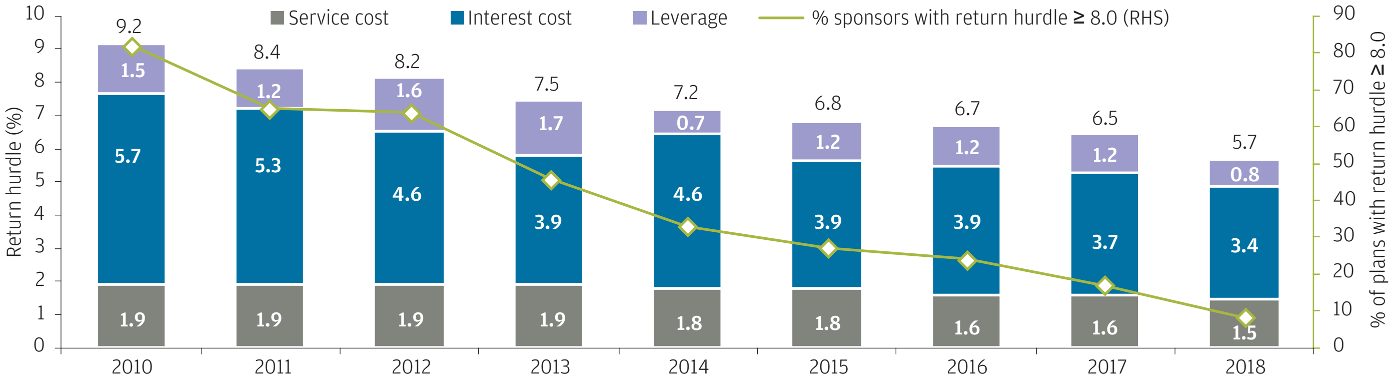
On the liability side of the equation, the average 65bps rise in discount rates provided a larger tailwind to longer duration plans while benefiting more mature plans only modestly. For our peer set, the liability actuarial gain/loss (the impact of changes in liability assumptions) contributed 6% to funded status, on average. This boost was largely attributable to the rise in discount rates but was also modestly supported by many plans updating to the less conservative MP-2018 mortality improvement scale. As is the case every year, plans with higher ongoing accruals have a larger persistent drag on funded status that must be overcome with either asset returns, contributions or a combination of the two. In aggregate, service cost as a percentage of liabilities has been declining as the defined benefit pension system has matured. However, almost 10% of plans still have a return hurdle in excess of 8% just to keep the deficit from widening—a target that, according to J.P. Morgan's 2019 Long-Term Capital Market Assumptions, will be exceedingly difficult to achieve (**EXHIBIT 2**).

ASSET ALLOCATION: LARGE SHIFTS, LOWER EXPECTED RETURNS

Returns for almost every public market asset class fell in 2018. Notable exceptions were extended credit exposures. Agency mortgages/collateralized mortgage obligations (CMOs), commercial mortgage loans (CMLs), bank loans and other securitized assets had small positive returns. These asset classes are increasingly being utilized as hedge portfolio diversifiers and did their job in 2018. Generally, the only plan sponsors with positive total returns for the year were those whose fiscal year ended prior to the Q4 market rout. One exception was Weyerhaeuser, whose $4.9 billion plan notched a modestly positive return. This achievement may have been supported by timely de-risking and risk transfer preparation, likely raising cash in Q4 for a $660 million lump sum. A large allocation to illiquid alternatives (private equity and related investments represented over 20% of the portfolio) may also have smoothed out some of the year-end volatility, demonstrating the "accounting" benefits these asset types provide to pension portfolios. The peer set's average calendar year return, -3.9%, was the worst performance since a flat 2015 and, before that, the 2008 financial crisis.

Nearly 10% of plans still have a return hurdle in excess of 8%, to keep deficits from widening

EXHIBIT 2: REQUIRED RETURN TO MAINTAIN SURPLUS/DEFICIT AND % OF PLANS WITH HURDLE GREATER THAN 8%



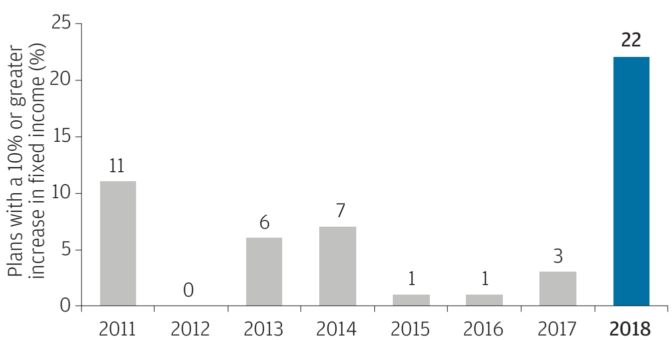
Source: Company 10-K filings, J.P. Morgan Asset Management; data as of December 31, 2018.

Service cost = PV of benefits accruing during the year as a % of PBO liability. Interest cost = Interest accrued on the liability during the year as a % of PBO liability. Leverage = Additional/(reduction in) required return due to underfunded/(overfunded) position. PV = present value. PBO = projected benefit obligation.

Preceding Q4, rising rates, accelerated contributions, improved funded status and concerns about equity market valuations led to the largest asset allocation de-risking year since 2011. While the pension industry has been steadily increasing fixed income duration every year since at least 2010, data from regulatory filings show that 2018 brought a large shift in actual fixed income allocation. More than 20 of the top 100 plans moved 10% or more of assets into fixed income over the year (**EXHIBIT 3**). These shifts, along with a modest boost to real assets, private equity and private credit, were funded almost entirely from public equity reductions and new money inflows. Expected return assumption correspondingly dropped 25bps, to 6.95%, with 20% of plans choosing to drop their assumptions by 50bps or more, year over year. We anticipate this trend will continue as plans look to de-risk allocations through multiple levers: increasing fixed income allocations while constructing more diversified hedge portfolios and shifting more assets into low-equity-beta alternatives like infrastructure equity. For comparison, the average expected return assumption for plans with 70% or more in fixed income assets was 5.70%. While asset allocation shifts and pension contributions were hot topics for many sell-side strategists trying to predict the impact of pension flows on the yield curve, the insurance industry continued its focus on the flow of pension risk transfers.

In 2018, there was a large shift in fixed income allocation, with correspondingly lowered return assumptions, as plans de-risked

EXHIBIT 3: % OF PLAN SPONSORS INCREASING FIXED INCOME BY 10% OR MORE



Source: PBGC, J.P. Morgan Asset Management; data as of December 31, 2018.

The chart plots the percentage of plan sponsors with a year-over-year increase in fixed income assets of 10% or greater. By this measure, 2018 saw more plans de-risk than the prior six years combined.

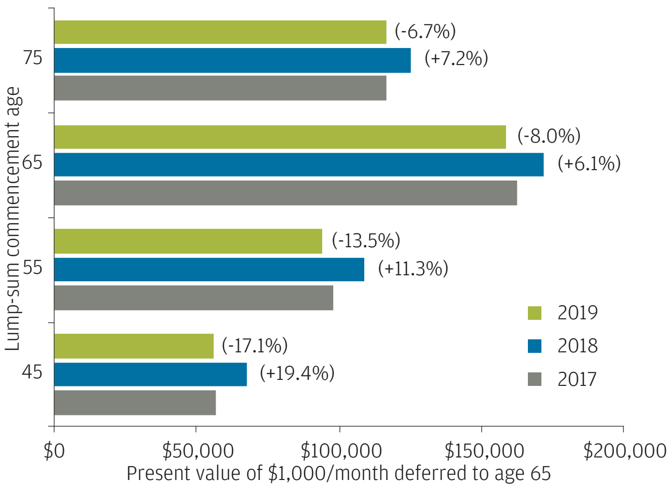
PENSION RISK TRANSFER CONTINUES UNABATED

The pace of pension risk transfer activity accelerated during 2018, with insurer annuitizations of $26.4 billion, topping last year's total of $23.0 billion, according to LIMRA. Lockheed Martin executed a particularly notable transaction in December by entering both a buyout ($1.8 billion of liabilities; 32,000 retirees) and a buy-in ($800mm of liabilities; 9,000 retirees) with separate insurers. A buy-in is similar to a buyout but instead of transferring assets and liabilities off balance sheet, the insurance contract is held as a plan asset and benefit payments are reimbursed by the insurer. The retirees subject to the buy-in were spun off into a new plan that will be terminated as early as 2020, allowing the sponsor to remove market and longevity risk, but avoiding accelerating the recognition of pension losses on the income statement through settlement accounting.[2]

[2] A settlement is a transaction that it is irrevocable, relieves the employer of the primary responsibility for a liability and eliminates significant risks related to the effected assets and liabilities. Settlement accounting is generally triggered when the amount of liability settled exceeds the service cost plus the interest cost and involves the immediate recognition of related unrecognized gains/losses held in accumulated other comprehensive income (AOCI).

Mandated mortality and interest rate assumptions used to value lump sums led to higher costs in 2018 but are projected to abate in 2019

EXHIBIT 4A: LUMP-SUM COSTS HIGHER IN 2018, LOWER IN 2019



Source: IRS, company 10-K filings, J.P. Morgan Asset Management; data as of December 31, 2018.

Analysis calculates lump-sum values under 417(e) mortality and interest rate assumptions varying by year. For each year the applicable prescribed IRS static unisex mortality table and 417(e) minimum present value segment rates from November of the prior year. Value represents a $1,000/month annuity deferred to age 65. Actual lump-sums costs will depend on the plan's specific stability and lookback periods, which may differ from this analysis.

EXHIBIT 4B: SELECT ANNUITIZATION TRANSACTIONS

	Date	Transaction (insurer)	Covered population	Details
Lockheed Martin	Dec 2018	Buyout (Prudential)	32,000 retirees	Paid $1.82bn to settle $1.76bn of PBO, an implied premium of 3.4%
Lockheed Martin	Dec 2018	Buy-in (Athene)	9,000 retirees	Paid $810mm to settle $770mm of PBO, an implied premium of 5.2%. Appears to be largest U.S. buy-in to date
FedEx	May 2018	Buyout (MetLife)	41,000 retirees	Settled $6bn of PBO, following $4.5bn of contributions the past two fiscal years
International Paper	Sep 2018	Buyout (Prudential)	23,000 retirees	Settled $1.6bn of PBO, targeting low balance retirees under $1,000/month
Raytheon	July 2018	Buyout (Prudential)	13,000 retirees	Settled $923mm of PBO related to discontinued operations, followed by a $1.25bn discretionary contribution in Q3
Bristol-Myers Squibb	2019	Plan termination (Athene)	TBD	Expect to settle remaining $3.6bn of PBO that doesn't elect to receive lump sum. Buyout will include both retirees and deferred vesteds

In contrast to annuitizations, lump-sum windows as a form of risk transfer seem to have abated during 2018, as costs were markedly higher than in previous years. This was due to a combination of plans adopting the more conservative RP-2014 mortality table (with Scale MP-2016 mortality improvements applied) and lower corporate bond segment rates (**EXHIBIT 4A** shows cost comparison across ages and years). The good news for plan sponsors is that lump-sum costs are expected to be lower in 2019, partially due to an additional year of less optimistic mortality improvements, but mostly due to the higher interest rate environment.[3] On March 6, 2019, the IRS released Notice 2019-18 allowing lump-sum offers to existing retirees, reversing an effective prohibition from 2015. This ruling expands the target demographic for lump-sums windows and may have further knock-on effects on hedge portfolio construction decisions around liquidity and duration needs.

WHILE PBGC PREMIUMS RISE, SPONSORS ARE REDUCING OUTLAYS

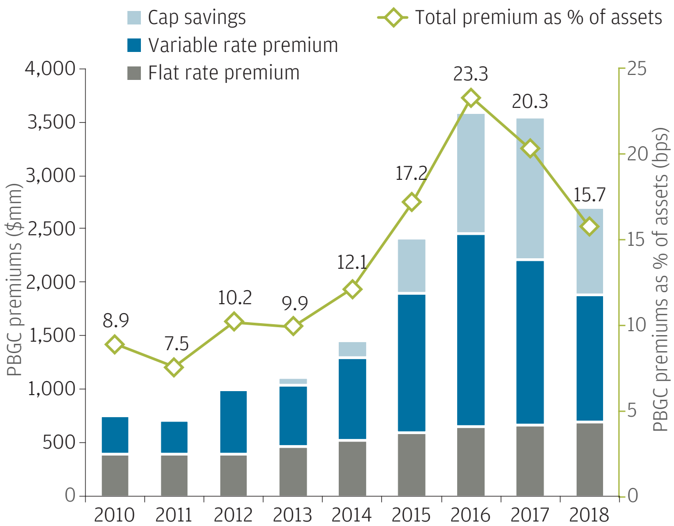
One of the major drivers of pension risk transfer activity over the last several years has been the accelerating costs of PBGC premiums, even though the single employer insurance program eliminated its deficit as of the end of fiscal year 2018. Sponsors have attempted to reduce these outlays by improving funded status, reducing head count, off-loading small balance participants to minimize the variable rate cap, and other "actuarial engineering" transactions, such as the reverse spinoff [4] (which prompted some negative PBGC staff guidance). PBGC data suggests that despite the continued march higher in premium levels, plan sponsors have been successful: The average premium paid as a percentage of assets declined two years in a row, to 16bps for the top 100

[3] Actual lump-sums costs will depend on the plan's specific stability and lookback periods, which may differ from this analysis.

[4] A reverse spinoff is a technique to reduce variable rate premiums. In it, nearly all of the plan participants are spun off into a new plan toward the end of the year, while the original plan and any remaining participants are terminated. The original plan owes no variable rate premiums as long as it terminates before the end of the year. The new spinoff plan is allowed to prorate any variable rate premiums owed due to a short plan year.

Despite higher PBGC premium rates, sponsors' costs are trending downward

EXHIBIT 5: PBGC PREMIUMS PAID IN $, AND AS % OF ASSETS (BPS)



Source: PBGC, J.P. Morgan Asset Management; data as of December 31, 2018. Cap savings represents the difference between the capped and uncapped variable rate premium.

plans, and closer to 20bps for all pension plans (**EXHIBIT 5**). For 2019, flat-rate premiums have increased 8%, from $74 to $80 per participant, while variable-rate premiums have increased 13%, from 3.8% to 4.3% of unfunded vested benefits.

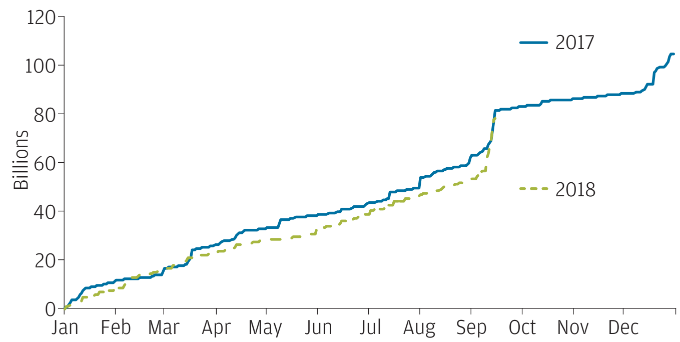
PENSION CONTRIBUTIONS VS. OTHER USES OF CASH

Share buybacks and dividends have been garnering attention in both financial and political spheres. To better understand these competing uses of corporate earnings, we analyzed how much cash has been returned to shareholders vs. how much has been contributed to underfunded pension plans. We found that since 2010, the amount this peer set contributed to pensions was about 11% of the amount dedicated to dividends and buybacks.

An acceleration in 2017 likely reflected the tax law change late in the year, which for some sponsors presented a high return-on-investment use for cash. In fact, contributions totaled about $50 billion annually for our peer set, the 100 largest plans by assets, in both calendar years 2017 and 2018, suggesting that there was not a huge wall of money flowing into pensions at the September tax deadline.[5] This supposition is underpinned

Regulatory data through September 15, 2018, shows 2018 calendar year contributions roughly in line with 2017

EXHIBIT 6: CUMULATIVE CALENDAR YEAR CONTRIBUTIONS; ALL PLANS OVER $100 MILLION OF ASSETS*



Source: Form 5500, Schedule SB, J.P. Morgan Asset Management; data as of December 31, 2018. For illustrative purposes only.

*Our peer set elsewhere in this paper is the 100 largest plans by assets. This exhibit reflects a different data source: an expanded list of all pension plans over $100mm.

by regulatory data for the 2017 plan year, which shows contributions through September 15, 2018 were roughly on par with the prior year (**EXHIBIT 6**).

IMPACT OF ACCOUNTING CHANGES

On the pension accounting front, several updates impacted 2018 annual pension reporting. In August 2018, FASB issued an accounting standards update, ASU 2018-14, which outlined disclosure changes. These included reporting the weighted-average interest crediting rate for cash balance plans, and narrations of the major drivers of actuarial gains/losses over the period. While these changes are not effective until fiscal years ending December 15, 2020, some plans elected to adopt them earlier. We estimate that 55% of the top 100 plans have some form of cash balance liabilities; approximately 35% of them reported the cash balance interest crediting rate in GAAP disclosures for fiscal year 2018.

The most noticeable accounting change for those not solely focused on the pension footnotes (read: pension actuaries) was ASU 2017–07, which requires disaggregating pension expense, recording all non-service cost elements outside of operating income, and applying these retrospectively.[6] For about 65% of the top 100 plan sponsors, this presentation update results in improved operating earnings for 2018. Importantly, this standard has no economic impact or effect on bottom-line net income.

[5] Of the roughly $50 billion contributed in 2018, almost $9 billion was a reclassification of a preferred equity interest by AT&T that had been contributed in 2013 but had not previously been recognized as a GAAP pension asset.

[6] Additionally, service cost is the only component of pension expense that can be capitalized in inventory or other balance sheet assets.

FORWARD-LOOKING TRENDS FOR 2019 AND BEYOND

Every year without fail, a handful of sports analysts and carelessly outspoken opponents proclaim that Tom Brady is too old and his career is over, triggering a "Nobody believes in us" rally. Likewise, every year there seems to be a "This time it's different" mentality in the pension industry that fails to materialize, whether because of rising rates or a wave of risk transfers that is said to be poised to end the defined benefit pension system once and for all. While 41% of the plans in our sample are frozen, and a further 22% are closed, we see an interesting and evolving future rather than a demise. Over the last several years, plan sponsors have become increasingly liability-aware and focused on more holistic risk management solutions, while incorporating a wider opportunity set beyond public equity and traditional fixed income. Annual reports disclosed about $15.5 billion of expected 2019 contributions for the top 100 plans, significantly less than in prior years. Against this backdrop, and an environment of lower expected returns, we expect the innovation to continue as sponsors lean on their portfolios to close remaining funding deficits, while staying vigilant against lurking downside risks. The Patriot's Super Bowl victory set the record for the largest fourth quarter deficit overcome in NFL playoff history. With the recent de-risking trend, we hope plan sponsors won't be faced with a similar challenge in the future.

GAAP: Generally accepted accounting principles; PBGC: Pension Benefit Guarantee Corp.; MSCI EAFE: Europe, Australasia and Far East Index of equities; LIMRA: The Life Insurance Management Research Association; FASB: the Financial Accounting Standards Board; IRS: Internal Revenue Service; PBO: projected benefit obligation.

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