Pension Accounting Research Series

2018 UPDATE
FOR 2017 DISCLOSURES
By Jon Waite, SEI Institutional Group

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Corporate defined benefit plans continued to see improved funding levels in 2017 driven mostly by strong market returns. U.S. equities closed at record highs to start the fourth quarter of the year followed by a strong October and November. Despite uncertainty about the causes for a lack of inflation, the Federal Reserve continued to raise interest rates throughout the year and that was expected to continue heading into 2018.

The average funded status of the 100 largest corporate pension plans grew to more than 85% by the end of November driven mostly by market returns. Cumulative investment gains year-to-date were at 10.53%, representing more than $40 billion in assets. If the 100 largest U.S. corporate pension funds achieve a median 7.0% asset return and the discount rate was maintained at 3.67%, the funding ratio would increase to an aggregate 88.1% by the end of 2018, Milliman predicted.[1]

Now in its 16th year, SEI's Pension Accounting Research Series (updated for 2017 year-end disclosures) is designed to educate plan sponsors and officers on accounting methods for the liabilities of their pensions, as well as address issues regarding FASB ASC 715.

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[1] Milliman Pension Funding Index. "Milliman Analysis: Corporate pension funded status improved by $71 billion in November." December 2017. http://us.milliman.com/PFI.

What discount rate should plan sponsors use for year-end 2017?

At the end of each fiscal year, plan sponsors must select a yield curve and/or discount rate to use in valuing the liabilities of their pension plans for corporate accounting purposes. The liability must be valued at then current market conditions and will be disclosed in the footnotes to the financial statements.

In addition to determining the accounting liability at year-end 2017, the basis for the liability measurement (e.g., the yield curve or the single discount rate) will be used in determining the plan's pension expense/income for the 2018 fiscal year. The measurement of the liability requires a close review by plan sponsors of the specific indices and yield curve matching used to select the liability discount rate, more so than was required some years ago.

Liability measurement has changed significantly over the last several years. Years ago the discount rate for the current fiscal measurement date may have been determined by reviewing the change in various fixed-income indices and applying observed changes to the rate in use by the plan sponsor for the prior year. For example, if rates in general had fallen by 50 bps from the beginning to the end of the fiscal year then the pension discount rate will be reduced by 50 bps.

Methodology for the liability measurement then moved to use of a full yield curve to be matched against the projected liability payout stream, determining the resulting liability, and then calculating the single discount rate that produced the equivalent liability amount. The result from this exercise was then the disclosed discount rate. This disclosed discount rate was then used to determine the pension expense for the following year: the liability amount, the interest cost on the liability, and the service cost (or value of benefits accruing during the fiscal year). The underlying yield curve was generally representative of the fixed-income universe appropriate for measurement of the liability. However, it was not used after the single effective discount rate was determined at year-end. The single discount rate, the yield curve matching as well as other methods for liability determination are all still used for year-end liability measurement.

The most recent methodology has gained wide use and changes the determination of the **service cost** and **interest cost**. The new methodology for the service cost will measure the service cost against the same yield curve used for the liability, which will often produce a different effective single discount rate than used for the liability, and a different service cost than produced with the liability rate. For the interest cost, the newer method applies the year-end yield curve to the discounted liability cash flows to produce an interest accrual for the liability. This interest cost may be significantly different from what was produced previously by multiplying the total liability by the liability rate. While we will not be discussing the implications of these new methodologies in detail, we will note that it continues to be important for plan sponsors to understand the direction and magnitude of the changes in discount proxies, and the change in the shape of the yield curve. In this paper, we will focus on the U.S. high-quality corporate bond market.

In general, the 2017 disclosure will show discount rates set by incorporating the current high-quality bond yields and current curve shape. Plan sponsors with calendar fiscal years will typically need to wait until year-end before they can finalize their liability determination. Plans with a fiscal year-end of November 30 or earlier have enough information now to determine the liability for the 2017 disclosure.

Plan sponsors with a calendar-year fiscal year might want to look at how curves and resulting effective rates have changed from December 31, 2016, through November 30, 2017, to get a feel for how year-end liability measurement might be affected. Assumptions for the range of yield change that might be experienced in December 2017 will be needed to prepare a better picture of calendar year-end liability measure. Figure 1.1 (page 5) shows the changes in several yield metrics from December 31, 2016, through November 30, 2017.

Based on this analysis, and assuming no change occurs during December 2017, plans with a December 31 measurement date will likely experience a further decrease in rates, and an increase in liability determination, due to changes in market yield curves.

A review of Figures 1.1. and 1.2 finds that the indices have decreased 33 to 43 bps. This decrease is representative of a steady march lower through 2017 for high-quality corporate yields. While this steady rate of change may appear somewhat predictive, making assumptions about the direction and level of rates is notoriously difficult, such that accurate assumptions about the level and shape of the yield curve (and thus effective discount rates) cannot be made prior to year-end. Further, we again have new mortality assumptions that will likely be adopted by many plan sponsors for accounting purposes, decreasing liabilities slightly (under 2%). The Treasury also has released new mortality for cash funding purposes; however, these will only indirectly affect the corporate accounting expense calculations considered in this paper.

Plan sponsors will select the discount rate using a method that matches plan cash flows to a yield curve. To do so, projections of each future year of the benefit payouts for a plan are used. In a given year, the benefit payout is then discounted by that point on the yield curve (i.e., the seven-year maturity point on the yield curve discounts benefits expected to be paid out seven years from now). This will make the selection of the discount rate specific for each plan due to the differing shapes of the benefit payouts in the future and the specific yield curve used.

The service cost will be determined in a similar manner using just the benefit payout projection for the current year's accrual. This would result in a service cost with its own effective discount rate, different from using the pension benefit obligation (PBO) effective discount rate. This methodology could be extended to different tranches of the PBO (actives, retirees, etc.) to result in different liability cost determinations from using the single PBO discount rate.

FIGURE 1.1 CHANGE IN YIELDS, YEAR-END 2016 TO NOVEMBER 30, 2017

BOND INDEX	12/2016 YIELD	11/2017 YIELD	CHANGE (BPS)
Barclays AA Long Credit	4.04	3.61	-43
Merrill Lynch AA 15+ Corporate	4.13	3.78	-35
Citigroup Pension Liability Index	4.14	3.78	-36
SEI Pension Liability Index*	3.96	3.63	-33

*The SEI Pension Liability Index is made of the SEI benefit payment stream, which is an equally weighted average of our clients' benefit payment streams, discounted by Citigroup Pension Discount Curve. The Citigroup Pension Discount Curve is a spot curve derived from investment grade bonds.

As of November 30, 2017, Figure 1.2 shows that the yield curve has decreased relative to last year at most maturity points, with slight increases up until year 5 (as defined by the Citigroup Pension Liability Curve). As a result, any change in effective discount rate will be very dependent on the structure of the benefit payout projection to be discounted.

FIGURE 1.2 RECENT AA CORPORATE BOND YIELD CURVES

RECENT AA CORPORATE BOND YIELD CURVES
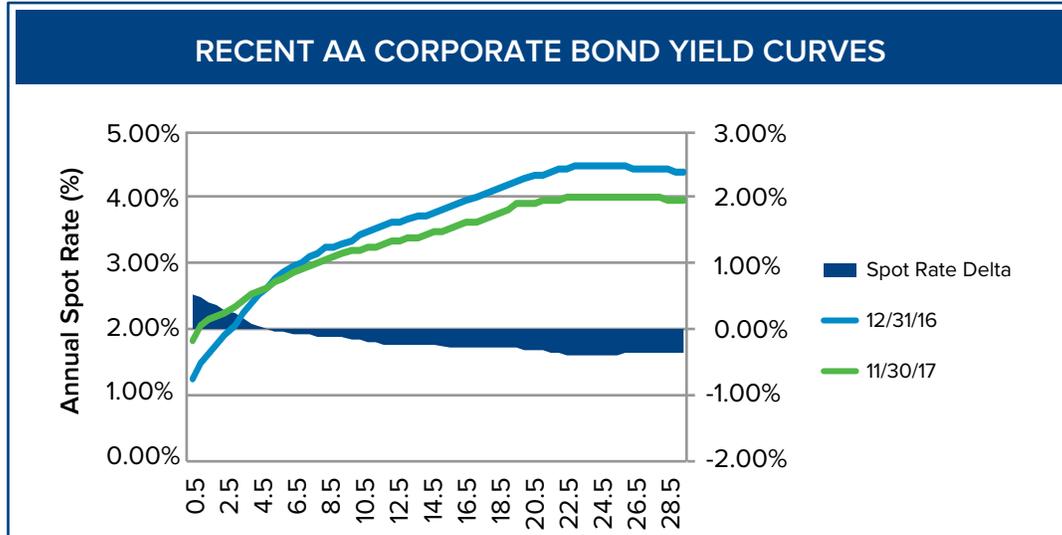
Source: Citigroup Pension Liability Curve.

FIGURE 1.3 LIABILITY DISCOUNT RATES

LIABILITY DISCOUNT RATES
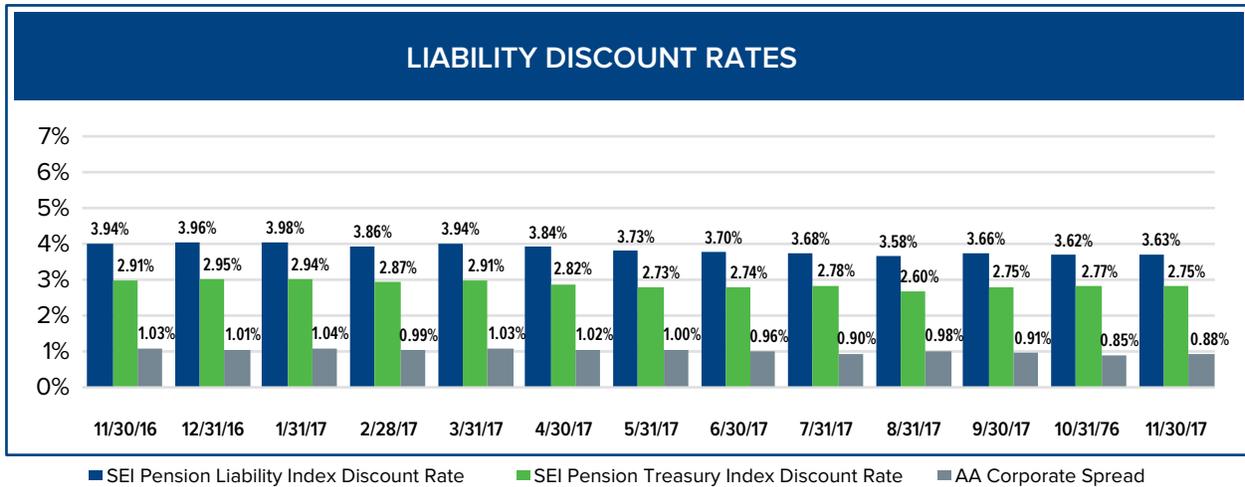
Source: SEC Filings, CapIQ. The SEI Pension Liability Discount Rate is a proxy for the discount rates actuaries use to calculate accounting pension liabilities. It is the single rate that when used to discount the SEI Benefit Payment stream results in the same present value as discounting the SEI Benefit Payment Stream by the Citigroup Pension Discount Curve. The Citigroup Pension Discount Curve is a spot curve derived from investment grade bonds. The SEI Pension Treasury Discount Rate is a proxy for the treasury component of the discount rate actuaries use to calculate accounting pension liabilities. It is the single rate that when used to discount the SEI Benefit Payment Stream results in the same present value as discounting the SEI Benefit Payment Stream by U.S. STRIP yield to maturities.

Balance sheet impact: Gain or loss relative to assumptions during 2017 will vary dramatically by plan but generally result in net gains during the year. As discussed, the yield curve used to measure liabilities has dropped materially at most durations, which will result in a higher liability and a loss to the funded status of the plan. However, due to the positive experience in global capital markets during 2017, the asset portion of the plan may produce material gains. For many plans, this will result in a net gain being added to the plan (if the asset gains outpace the liability losses) and improvement in funded status. This result will vary significantly across plans, however, based on specifics of the liability and on the portfolio allocation. Plans with de-risked portfolios may see asset gains not offsetting the liability losses at the same level as a plan fully invested in the markets.

Impact on 2018 pension expense

The yield curve used for liability measurement selected for the 2017 disclosure is generally the same as what will be used in the calculation of the 2018 pension expense. This yield curve will affect three of the five components of pension expense:

1. **Service cost** or the present value of benefits attributed to service to be rendered in 2018

2. **Interest cost** or the increase in PBO liability due to the passage of time

3. **Amortization** of unrecognized gains/losses, which arise when actual experience deviates from what was assumed, including assumption changes

The other two components, **expected return on assets** and **amortization of prior service** cost (value of unamortized plan amendments) are relatively independent of the yield curve.

Service cost component: Service cost is the portion of the present value of participants' accrued benefits that is attributable to having worked during the year. With no change in the discount rate, service cost will generally increase 2% to 10% from year to year due to the methods used to value the plan (the funding method) and the aging of the population. Increases in any expense assumption added into the service cost accrual should be considered separately as that increase will generally not be the same as for benefit accrual. The impact of a change in the discount rate depends on the duration of the service cost. For plans with a service cost, most have a service cost duration that ranges between 12 and 18 years. A 25-basis-point drop in discount rates is expected to increase service cost by an additional 3% to 5%, and a 25-basis-point increase in discount rates is expected to decrease service cost by 3% to 5%, all beyond the "natural" increase of 2% to 10%.

Interest cost component: Interest cost is the cost of the plan due to the passage of time. It is determined by applying the full yield curve to the discounted benefit payouts, as previously discussed. Without changing the yield curve, interest cost will generally increase with time. However, the year-to-year changes in interest cost will be highly plan-dependent considering the application of the full yield curve methodology as well as even small changes in the shape of the curve. Given the growing large number of closed and frozen pension plans as well as the effects of the benefit payout projection rolling down the yield curve, plus the impacts of changing curves, generalities about the change in interest cost from year to year cannot be readily made.

Amortization of unrecognized gain/loss: When assumptions are not met regarding liability experience and asset returns, the differences are accumulated with prior-year gains and losses and are recognized as an amortization credit or charge. The minimum recognized amount is based on the excess of the gain/loss over 10% of the greater of assets or PBO, and divided by the plan's future working lifetime or future lifetime. Faster recognition may also be used.

Amortization of gain/loss will vary dramatically from plan to plan based on several factors, including:

› Recognition method used (e.g., 10% corridor method)

› Amount of gain or loss on the balance sheet as of December 31, 2017

› Relative size of gain or loss to the PBO and asset amounts

› Demographic changes during 2017

› Assumption changes under consideration

› Asset smoothing method used

› Impact of the yield curve method on the interest rate component of pension expense versus the liability increase during 2017 (losses or gains may accrue at various rates based on the structure of the benefit payout projection and the shape of the yield curve)

Therefore, no generalized effect of a yield curve change on the gain/loss recognition can be made. However, a few rules of thumb may be used in an analysis:

› If already amortizing a loss (gain) for 2018 and the yield curve declines (rises), the full amount of the PBO increase (decrease) will be subject to amortization into expense

› If amortizing a loss (gain) for 2018 and the yield curve rises (declines), the loss (gain) amortization will decrease (increase) and could be eliminated

› If no gain or loss amortization is occurring for 2018, a closer examination of the specifics of the plan should be made

In summary, plan expense will typically increase from year to year due to the required funding method used and the passage of time. In addition to this "natural" growth, if the yield curve declines, plan expense can be expected to increase and vice versa; if the yield curve rises, expense will likely fall (relative to no liability change). A close analysis of your plan's specific situation will be required to narrow in on impacts for your 2018 pension expense.

Accounting standards other than U.S. GAAP

Many organizations report financial results under accounting standards other than ASC 715. While discount rates and yield curves for U.S. pension plans might be set in a manner similar to that for ASC 715 filers, note that the impact of a change in rates or curves on 2018 pension expense may be very different from what is outlined here.

Addendum information

In January 2018, SEI will be issuing an addendum to this study that will update this research with year-end numbers relative to December 31, 2017. If you are interested in receiving a copy of the addendum, please visit **seic.com/ASC2017** to request it.

About the author

Jon Waite, F.S.A., E.A., director of Investment Management Advice and chief actuary for the SEI Institutional Group, is responsible for providing advice regarding defined benefit plan design, actuarial methods and assumptions, and funding policies for our institutional relationships. With more than 450 institutional clients worldwide, SEI is a recognized pioneer in developing first-to-market retirement solutions that integrate investment management strategies with overall business goals.

To learn more about the FASB assumptions discussed in this paper, contact Jon at 610-676-3493 or jbwaite@seic.com

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