Accounting for defined benefit pension plans

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Defined Benefit Plan - Overview
Defined benefit pension plan overview

- Compensation plan that provides a defined amount of periodic payments (usually monthly) upon retirement for services rendered while working.

- Payments made at a future time for services performed in the current period—the matching principle of accrual accounting requires employers to account for these expenses to be incurred in the current period.

- Periodic payments usually based on one or more factors such as age, years of service, or compensation.

Defined benefit pension plan

- Employer
  - Services
  - Wages and Salaries
  - Contributions

- Pension Trust
  - Defined Benefits

- Current Employees

- Retired Employees
**Basic accrual accounting model**

- An employee will receive monthly payments between retirement from the company and death, in exchange for working for the company.
- The accounting model for pension benefits is accrual accounting.
- The cost of the payments to be made after retirement should be reflected as compensation expense over the employee’s working career.

**Example:**
- Mary Smith joined the company at age 22 and will retire at age 62.
- She will receive a pension payment of $1,800 per month after retirement.
- She is expected to live until age 88.
- At retirement, the present value of those pension payments (discounted at a 5% interest rate) is $350,000.
- The $350,000 compensation cost should be allocated over Mary’s 40 year working career.

**Measurement of costs and obligations for defined benefit plans**

Measuring pension cost and pension obligation entails consideration of projections and assumption since amount of pension benefits to be ultimately paid depends on future events, such as length of service, future compensation levels and mortality.

**Key assumptions**

- **Long term rate of return**: impacts measurement of income expected to be earned by plan assets.
- **Discount rate**: used to calculate the present value of pension benefit obligation (i.e., present value of the future obligation).
Plan Assets Overview

- Employers will purchase stocks, bonds, and other investments that accumulate interest and investment return with the purpose of paying for the future expense of the retirees.
- These assets are segregated and restricted, usually in a trust.
- Cannot be withdrawn by employer.

Costs Overview – Projected Benefit Obligation

- Projected benefit obligation (PBO) - actuarial present value of vested and nonvested benefits earned from employee service to date, based upon future salary expectations.
- The PBO is calculated by actuary - based on the following assumptions:
  - Future compensation levels (pay related, final-pay, final-average pay)
  - Compensation increases
  - Turnover
  - Mortality
  - Plan continues into perpetuity
  - Discount rate
- The calculation occurs at the annual measurement date—a company’s year end.
- That measurement establishes the pension cost for the subsequent year.

Measurement of PBO requires that each significant assumption used reflects the best estimate of the plan’s future experience solely with respect to that assumption.
Measures of pension liability

Benefits for **vested and nonvested** employees at **future** salaries

Benefits for **vested and nonvested** employees at **current** salaries

Benefits for **vested** employees at **current** salaries

PV of Expected Cash Flows

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Measurement of the PBO – Discount rate

**Discount rate** - measurement of actuarial present value of PBO should be based upon the time value of money

- Rate at which the pension benefits could be effectively settled (i.e., settlement rate)
- May be based upon:
  - Current prices of annuity contracts that could be used to effect settlement, or
  - Rates of return on high-quality fixed-income investments currently available and expected to be available over the period pension benefits will be paid

**In practice…**

- Prices on annuity contracts rarely used
- Common to use a method that reflects the rates available on high-quality corporate bonds
Discount Rate

Discount rate:

- A higher discount rate reduces the PBO and lower discount rate increases the PBO

Volatility of costs

- The economics of an employer offering pension benefits can result in significant volatility
  - For example, the total return on investment assets can be 19% one year and minus 27% the next year

- While the accounting rules provide for smoothing mechanisms, once actuarial gains or losses exceed the corridor, those gains and losses are amortized into pension costs over the average remaining service period of active employees

- Many companies have accumulated sizable actuarial losses in recent years, as a result of
  - The market downturn in the 2007-2008 time period
  - The significant decrease in discount rates due to the very low interest rate environment in recent years

- The amortization of those actuarial losses increases pension expense
Discount Rate - Sensitivity

- Based upon a constant duration of 10 years (most public companies range from 5-18 years), a 1% change in the discount rate would increase the pension obligation measurement by about 10%.

- The change in discount rate at the year-end measurement will also impact the next year’s cost. That impact can vary by company based on whether or not existing actuarial gains and losses exceed the “corridor” and other factors. For some companies, the impact on the subsequent year’s cost could be a change of 5 to 10 percent for a 1% change in discount rate.

<table>
<thead>
<tr>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding all other variables constant, and based upon a 10 year duration, a 2% decrease in the discount rate at year end compared to the prior year would increase Company X’s pension liability from $300 million to $363 million, and Company X’s pension cost for next year would increase from $12.7 million to $14.7 million.</td>
</tr>
</tbody>
</table>

Another assumption that has resulted in increasing pension costs for many companies—the mortality assumption

- On October 27, 2014, the Society of Actuaries released a new mortality study confirming mortality improvements in the U.S. have significantly outpaced typical assumptions.
  - New mortality table and projections must be considered for year end 2014 measurements
  - IRS adoption likely in 2016 or 2017 for ERISA funding
  - Expected 5.0% – 8.0% increase in liabilities for traditional plans.

The good news—we are living longer!

The bad news—pension costs go up when retirees live longer.
**Funded Status**

- On a plan by plan basis, recognize net funded status of each plan
- Net Funded Status = Fair Value of Plan Assets – Projected Benefit Obligation (PBO)
- FV of Plan Assets > PBO = Pension Asset (overfunded)
- FV of Plan Assets < PBO = Pension Liability (underfunded)

**Defined Benefit Plan – Expenses Incurred**
Components of net periodic pension cost

<table>
<thead>
<tr>
<th>Components</th>
<th>Effect on Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Service Cost</td>
<td>+</td>
</tr>
<tr>
<td>2. Interest on the Liability (PBO)</td>
<td>+</td>
</tr>
<tr>
<td>3. Expected Return on Plan Assets</td>
<td>-</td>
</tr>
<tr>
<td>4. Amortization of Prior Service Cost (Credit)</td>
<td>+ -</td>
</tr>
<tr>
<td>5. Amortization of Unrecognized Gain or Loss</td>
<td>+ -</td>
</tr>
</tbody>
</table>

FASB decision to permit smoothing of costs

- Current accounting rules have been in place since 1987, with one major update in 2007

- When considering the rules for pension accounting in the early 1980’s, the FASB recognized that the economics of pension plans can result in significant volatility in pension costs from year to year

- In establishing the method of accrual accounting while reducing year to year volatility in costs, FASB utilized three concepts:
  - Delayed recognition (smoothing of costs)
  - Net cost presentation (pension expense is a single line item in the income statement despite multiple components of this net cost)
  - Offsetting on the balance sheet of pension trust assets and the obligation to make future payments

- Information about amounts not yet recognized in the income statement due to smoothing is available in the disclosures in the notes to the financial statements
Smoothing of net periodic pension cost

- GAAP pension expense allows a company to "smooth" differences in assumptions and changes in plan benefits into pension cost
  - Differences in return on plan assets
  - Effects in changes in turnover, mortality or discount rate
  - Modifications to plan benefits

- The goal for the FASB was to not have volatility in earnings due to changes in actuarial assumptions

- GAAP allows companies to select accounting policy to smooth recognition of gains/losses into income by requiring only a minimum amortization outside the corridor

Smoothing of net periodic pension cost – The corridor approach

Actuarial gains and losses can be recognized through two methods:

- The deferral method (i.e. corridor approach) where amounts in excess of the corridor are recognized over an amortization period or

- A systematic method that results in faster recognition

For differences between actual and assumed investment returns, companies may elect an accounting policy to have an additional layer of smoothing before the investment gains and losses are subject to amortization

- By using a "market related" value of plan assets rather than the actual market value of plan assets to compute actuarial gain or loss subject to amortization

- Essentially, the difference between actual and assumed return is amortized over five years in determining "market related" value of plan assets
Net periodic pension cost – Impact to income

<table>
<thead>
<tr>
<th>Net Periodic Pension Cost Component*</th>
<th>Immediate Recognition</th>
<th>Delayed Recognition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Cost (1st component)</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Interest Cost (2nd component)</td>
<td>+</td>
<td></td>
</tr>
<tr>
<td>Expected Return on Plan Assets (3rd component)</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Amortization of Prior Service Cost/(Credit) (4th component)</td>
<td>+/-</td>
<td></td>
</tr>
<tr>
<td>Amortization of Net (Gain)/Loss (5th component)</td>
<td>-/+</td>
<td></td>
</tr>
</tbody>
</table>

* See Appendix A

Pension Accounting Overview

Components of Net Benefits Cost (FASB: ASC 715)

An entity recognizes the Net Periodic Benefit Cost as expense or income for the year. The Net Periodic Benefit Cost is the sum of components (1) through (6) below.

<table>
<thead>
<tr>
<th>Component</th>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Service Cost</td>
<td>$80</td>
<td>Value of Benefits Earned this Year</td>
</tr>
<tr>
<td>(2) Interest Cost*</td>
<td>100</td>
<td>Interest on PBO</td>
</tr>
<tr>
<td>(3) Expected Return on Assets*</td>
<td>(140)</td>
<td>Expected Earnings on Assets</td>
</tr>
<tr>
<td>(4) Amortization of Past Service Cost*</td>
<td>40</td>
<td>Recognition of Plan Improvements</td>
</tr>
<tr>
<td>(5) Amortization of (Gain)/Loss*</td>
<td>20</td>
<td>Recognition of Differences in Experience</td>
</tr>
<tr>
<td>(6) Curtailments/Settlements*</td>
<td>15</td>
<td>Non-recurring special charges/(credits)</td>
</tr>
<tr>
<td>(7) Net Periodic Benefit Cost</td>
<td>$115</td>
<td>Total Expense for Post-employment Plan</td>
</tr>
</tbody>
</table>
Pension Accounting Overview
Balance Sheet Presentation

The following shows the presentation of the balance sheet liability under IAS 19 for a sponsor of a defined benefit plan.

<table>
<thead>
<tr>
<th>Component</th>
<th>Sample</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Defined Benefit Obligation (DBO)</td>
<td>$2,000</td>
<td>Actuarial Present Value of Liability</td>
</tr>
<tr>
<td>(2) Fair Value of Assets (FVA)</td>
<td>(1,500)</td>
<td>Value of Dedicated Assets</td>
</tr>
<tr>
<td>(3) Unfunded Status</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>(4) Unrecognized Past Service Cost*</td>
<td>(200)</td>
<td>Value of Plan Improvements</td>
</tr>
<tr>
<td>(5) Unrecognized Actuarial gains/(losses)*</td>
<td>(400)</td>
<td>Experience different from assumed</td>
</tr>
<tr>
<td>(6) Net Recognized Amount*</td>
<td>($100)</td>
<td>Balance Sheet Liability</td>
</tr>
</tbody>
</table>

Pension Accounting Overview
Pension and OPEB Ratemaking Practices

Ratemaking practice is to generally forecast expenses based on historic or future test period costs, and to recover the forecasted expenses in base rates. Because pension/OPEB expenses change annually, those costs are not know until the year begins since the annual measurement takes place at year-end and the changes in costs can be volatile from year to year, there can be significant differences between the pension expense reflected in test year cost of service and the amount of pension expense incurred.

Several rate design options are available for recovering expenses associated with pension and OPEB costs that utilities incur after rates are set:

- **Deferral account**
  - Most common type of mechanism
  - Differences between actual cost and test year amount is deferred to next rate case
  - Sometimes if amounts incurred exceed a threshold level, the excess is deferred
  - Costs are amortized and recovered in rates starting with the next rate order

- **Cost trackers**
  - Adjustments to rates that have been pre-approved by regulators
  - Changes are tracked and flowed to customers as they occur

- **Formula rates**
  - Update rates with use of a true-up mechanism for all expense items, including pension expense
Pension Accounting Overview

Settlement accounting is an issue for some utilities, as it can be challenging to anticipate the settlement cost component of pension expense in the rate setting process.

Due to adverse capital market experiences over the past decade, most plans have large unrecognized actuarial losses currently sitting in AOCI. Certain actions could trigger a settlement, which could require those losses to be recognized in earnings under US GAAP:

<table>
<thead>
<tr>
<th>Settlement Triggers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• A settlement is a transaction that meets the following 3 criteria</td>
</tr>
<tr>
<td>- Irrevocable action (cannot be revoked, recalled, or undone)</td>
</tr>
<tr>
<td>- Relieves the employer or plan of primary responsibility for providing benefits to participants</td>
</tr>
<tr>
<td>- Eliminates significant risks related to the benefit obligation and assets</td>
</tr>
<tr>
<td>• Settlement accounting is triggered when the settlement amounts that have accumulated through the year are greater than the sum of the service cost and interest cost—companies may have an accounting policy to not recognize settlements unless the cost exceeds the total of service plus interest cost for the year</td>
</tr>
<tr>
<td>• 2 common examples of a settlement</td>
</tr>
<tr>
<td>- Insurance company unconditionally takes on obligation to provide benefits to retirees</td>
</tr>
<tr>
<td>- Participants are paid a lump-sum distribution (either through one-time offering or aggregate payments during year)</td>
</tr>
<tr>
<td>• For utilities, settlements are often triggered by lump-sum payments to participants</td>
</tr>
<tr>
<td>• The percentage of unrecognized losses that must be recognized is equal to the percentage of liability settled</td>
</tr>
</tbody>
</table>

Q&A
Appendix A - Components of net periodic pension cost

- Service Cost (1st component)
- Interest Cost (2nd component)
- Expected Return on Plan Assets (3rd component)
- Amortization of Prior Service Cost/(Credit) (4th component)
- Amortization of Net (Gain)/Loss (5th component)
- The corridor approach

Appendix A - Service cost (component 1)

Service Cost
- Cost of benefits earned by employees in the current period. Based on attributing pension cost to the periods of employee service as well as the use of actuarial assumptions.
- Actuarial assumptions reflect both the time value of money (discount rate) and probability and timing of payment (assumptions as to mortality, turnover, early retirement, etc.)
- Actuarial present value of compensation attributed by the plan’s benefit formula to services rendered by employees during the period
- Requires use of an attribution method and assumptions
Appendix A - Interest cost (component 2)

Interest Cost

• The increase in the PBO due to the passage of time

• Calculated based on beginning-of-year PBO multiplied by the discount rate used to measure PBO in previous year

Appendix A - Expected return on plan assets (component 3)

Expected return on plan assets

• Return amount directly included in net periodic pension cost

• Based on estimate of average rate of earnings on plan assets over the plan life, i.e., actuarial assumption of the average long-term rate of return earned on funds already invested or to be invested

• To estimate expected rate of return of plan assets, consideration shall be given to returns being earned by plan assets and the rates of return expected to be available. Following factors may be considered when developing the assumption:
  − Assumed asset allocation of pension plan assets (common stock, bonds, etc.)
  − Assumed volatility of portfolio
  − Investment manager performance
  − Investment policy
Appendix A - Expected return on plan assets (component 3) – cont.

Expected return on plan assets (cont.)

• To estimate expected rate of return of plan assets, consideration shall be given to returns being earned by plan assets and the rates of return expected to be available. Following factors may be considered when developing the assumption (cont.):
  − Historical return data
  − Rolling five- and ten-year averages
  − Current trends with respect to economic conditions, inflation, and market sentiment.

Difference between actual and expected returns is used in calculating gain/loss on plan assets

Appendix A - Prior service cost (component 4)

• Prior service cost - cost of additional retroactive benefits normally granted in a plan amendment, which attributes additional benefits to prior periods of service
  − Plan amendment represents a change in the terms of an existing plan or the initiation of a new plan

• As opposed to recognizing prior service cost immediately in net periodic pension cost, the employer is required to amortize the prior service cost, based on the presumption that the employer will recognize the economic benefits of the plan amendment in future periods

• Prior service cost is initially recognized as a charge to other comprehensive income (OCI) at the date of the amendment and then subsequently amortized to net periodic pension cost. Prior service cost is amortized over:
  − the future service periods of those employees active at the date of the amendment (active plan accounting), or
  − the remaining life expectancy of the participants if “all or almost all” participants are inactive (i.e., retired or no longer accruing benefits)
Appendix A - Amortization of gains/losses (component 5)

Amortization of gains/losses

• Gains and losses are defined as changes in the amount of either the PBO or of plan assets resulting from experience different from that assumed, and from changes in actuarial assumptions, and can result from the following:
  1) difference between expected and actual fair values of plan assets (asset-related gain or loss) and/or
  2) difference between the expected and actual PBO (i.e. actuarial liability-related gain or loss)

• Gains and losses are initially recognized in OCI (for nonregulated operations) or as regulatory assets/liabilities (for rate regulated operations). Unamortized gain or loss at any given measurement date represents the cumulative total of unamortized gains or losses from both asset-related and liability-related sources. Unamortized gain or loss from both sources at the beginning of the year, excluding any asset gains or losses not yet reflected in market-related value (i.e., difference between fair value of plan assets and calculated market-related value), is subject to amortization.

Appendix A – The corridor approach

• ASC 715-30 allows companies to select accounting policy to smooth recognition of gains/losses into income by requiring only a minimum amortization outside the corridor

• The corridor is the greater of 10% (a) PBO or (b) market-related value of assets (MRVA) at the beginning of the year

• The corridor determines if amortization is required (i.e., no amortization if net gain/loss is within the corridor)

• If amortization is required, the minimum amortization shall be the gain/loss excess outside the corridor divided by the average remaining service period of active employees expected to receive benefits under the plan, or average remaining life expectancy if all or almost all of the plan participants are inactive
  − Minimum amortization of a net gain/loss included in AOCI shall exclude asset gains/losses not yet reflected in MRVA