Investment Risk Management of a Defined Benefit Plan

Session Reef D  1:30 PM- 2:45 PM  October 28, 2013
Today’s Presenters

• **L Wayne Adams,**
  Director – Investments,
  AT&T

• **Mark Ruloff,**
  Director - Asset Allocation,
  Towers Watson Investment Services
Today’s Discussion

- Opening Thoughts
- Payout/Liability Hedging
- Better Diversification
- Risk Steering
- Risk Pricing
- Long-Termism Risk Return Concepts
- Beyond Investment Policy
- Closing Thoughts
Opening Thoughts

• Holistic approach considering risks to plan sponsor
• Many tools beyond diversification and liability hedging
• Risk and return management
Standard Efficient Frontier

Illustrative Efficient Frontier

Most Desirable

Efficient Frontier
Point Labels represent % fixed income
Asset/Liability Efficient Frontier

XYZ Retirement Plan
Asset/Liability Frontier - Year 2020

PV Contributions + PBO Deficits/(Surplus) ($M)

Most
Desirable

With Surplus

Without Surplus

PV Contributions + PBO Deficits/(Surplus) ($M)

95th Percentile

90% LGC
80% LGC
70% LGC
60% LGC
50% LGC
40% LGC
30% LGC
20% LGC
10% LGC
0% LGC

With Surplus

Without Surplus

50th Percentile

$375
$225
$75
$225

$75
$125
$275
$425
$575
$725
$875

AFP® Annual Conference

Association for Financial Professionals®
Liability Hedging

Asset/Liability Frontier - Year 2019

Cumulative PV of Plan Year Contributions ($M)

50th Percentile

95th Percentile

Desirable

Cumulative PV of Plan Year Contributions ($M)

95th Percentile

AFP® Annual Conference
Diversified Portfolio: Risk/Return Buckets

Sample Portfolio Construction Results

Attribution of Return*

- Equity
- Credit
- Illiquidity
- Insurance
- Term/Inflation
- Currency
- Skill

Current Return Seeking Portfolio
TWIS Recommended: Current Allocation
TWIS Recommended - Eq., Alt. b, Alt. Credit, HF
TWIS Recommended - Eq., Alt. B, Alt. Credit
Unconstrained Portfolio

*For illustrative purposes only
Risk Steering

• **Dynamic Asset Allocation**
  – Separating funded status trigger into interest rates, returns, and contributions
  – In declining markets

• **Enterprise Risk Management**
  – Compare investment portfolio options with core operations

• **Consideration of investments compared to core business risks**
  – Sponsor Beta
  – Commodities
  – Inflation
  – Cash contributions
Choosing a Two-Pronged Glidepath

Moving 12% into bonds when funded ratio improves by 5% due to rates rising further improves results.

With the 12% strategy already in place, consider an additional strategy of moving 4% into bonds when funded ratio improves due to contributions or RSA.

Increase Fixed Income by X% When Funded Ratio Improves by 5% due to Interest Rate Movement

Increase Fixed Income by X% When Funded Ratio Improves by 5% due to Contributions & RSA
Risk Pricing

• Puts, calls, and collars
• Swaps, swaptions, and swaption collars
• Generally would be a loss of value if done always and passively
• Requires good governance to know when to use and how to implement
• Could depend on connection with enterprise risks
  – Put on swaption to avoid “unbearable” situation, like breaking of bond covenants
Collared vs. Uncollared Domestic Equities: Annual Return
Development of Liability Hedging Elements

Approach is often to obtain the appropriate hedge for a certain risk exposure at the cheapest possible price.

However, markets are complex and we expect negative swap spreads to continue to persist in the near-term.

We outlined rationale for our view in a note to clients earlier this year.

Sources: BarCap, Towers Watson
Long-Termism Risk/Return Concepts in Model Portfolio

• Risk framework
  – Risk return framework
  – Risk return management, not just measurement
  – Long-term risk return management framework

• Risk scenarios
• Theme investing
• Extreme risks
Sustainability

Universal Owner
Social and Environmental Goals
Return Goals
Risk Management Goals

Sustainable Investing

The role of ‘Universal Owners’

“Our real problem then, is not our strength today; it is rather the vital necessity of action today to ensure our strength tomorrow.”

Dwight D. Eisenhower

In short

This paper reviews the Universal Owner’s concept and how practice may change in the future. It draws on a recent paper titled Universal Owners: Opportunity to Change and Leadership Culminating Roger Uren.

We finish by commenting on the implications for Microtrust funds that are not Universal Owners.

The concept

A universal Owner is a large asset owner, as a consequence of its size, owns a slice of the whole economy and market through its portfolio. Universal Owners adapt their actions with the intent of improving long-term performance by benefiting the entire economy and market. This includes an intentional and prioritization of Sustainable Investing. They justify these actions on financial grounds.

Universal Owner principles include:

- Understanding context through their investment holdings, Universal Owners examine externalities which might impact long-term value.
- Developing and acting on beliefs: Risk exposure to externalities is managed through active ownership strategies and integration of ESG (environmental, social, and governance) factors into investment selection.
- Recognizing the ancillary benefits of ownership.

Very few institutions (even those with prominent green or activist rhetoric) truly implement the Universal Owner approach, with lack of familiarity with the concept and the pressures of short-termism being common obstacles. As a result, there is little evidence of Universal Owners improving investment outcomes or addressing environmental issues.

Universal ownership

Many institutional funds’ holdings are highly concentrated across the global market and global economy. Their ownership carries an opportunity to influence future outcomes. They are “universal” in the sense that their investments and the externalities of those investments are far reaching, and they are “universal” in the sense that their investment stakes are of sufficient size to affect change.

Externalities

Externalities are effects of economic activity (either production or consumption) on unrelated third parties, who could be other companies or society more generally. These effects could be positive or negative. An example of an externality is the long-term environmental impact of a polluting factory.

Association for Financial Professionals®
AT&T

Reducing Risk at the Total Plan Level
Background

- AT&T is considering a transition plan for implementation of an increased long duration bond allocation within the Master Pension Trust (MPT). AT&T is considering a two-phased approach.
  - **Phase 1**: Transition the long duration bond allocation from 10% to 35% specified time frame
  - **Phase 2**: Increase the long duration bond allocation to a higher target (ex: 45%) at some future unspecified date

- In the 2013 ALM study covering the AT&T Pension Benefit Plan, AT&T is considering between 30% and 50% long government/credit bonds which is attractive from an asset/liability modeling perspective. Long duration bonds provide a better match to the liability and improve most ALM results relative to AT&T’s current mix of aggregate and long duration bonds.
Long Duration Implementation Considerations

• AT&T’s goal should be a timely and cost effective transition that avoids any unintentional exposures that could add risk to the portfolio. To determine an appropriate transition strategy, AT&T must consider a number of important objectives
  • Managing duration exposure
  • Managing credit spread exposure
  • Limiting transaction costs
  • Avoiding any time “out of the market”
  • Avoiding any unintentional exposures
  • Timeliness of the transition

• Key decisions regarding implementation can be grouped into three broad categories
  • Portfolio: what should the new long duration portfolio look like?
  • Source of new assets: from which other strategies will assets be taken in order to increase the long duration allocation?
  • Timing and strategy: how quickly will the transition take place and what is the best way to accomplish it while meeting AT&T’s objectives?
Key Decisions: Portfolio

• **What type of fixed income should be in the long duration bond portfolio?**
  - Long physical bonds only? Allow core bonds with derivatives overlay?

• **What is the target duration of the new portfolio?**
  - The AT&T liability duration is 11-12 years while the Barclays Long Gov’t/Credit Index duration is almost 15 years. A custom benchmark constructed to match the duration profile of AT&T’s liability may improve the hedging benefits of the portfolio.

• **What is the split to government vs. credit?**
  - The Barclays Long Gov’t/Credit Index is approximately 39% Gov’t/61% Credit (3/31/13). The split varies over time based on market performance and new issuance.
  - A credit-tilted benchmark (ex: 25% Gov’t/75% Credit) may provide a better hedge to liabilities discounted using corporate bond rates.
Key Decisions: Source of New Assets

- What is the source of the new long bond assets?
  - AT&T has several incumbent long bond managers managing 10-14% to the total. Additional assets are needed to bring the total long bond allocation up to 35%
  - The remainder of the AT&T MPT fixed income segment are invested in active core bonds, passive fixed income, and private placements/alternatives
  - Active core bonds and passive fixed income are obvious candidates to transition into long duration bonds mandates, provided that there are no unusual liquidity constraints
  - Private placements/alternatives are typically illiquid but could serve as long duration allocations if combined with derivatives overlays to extend duration. Alternatively, these assets could continue as return-seeking assets and other return seeking assets (equities or alternatives) could be liquidated and shifted into long duration.
Key Decisions: Timing and Strategy

- What is the appropriate timing and strategy for the portfolio transition?
  - AT&T has specified a one-year transition period for Phase 1 (moving to 35% long duration). Timing for transition to a higher long duration target (Phase 2) is unspecified. Timing for each transition should be determined according to AT&T’s hedging objectives while also considering market liquidity and transaction costs.

  - For the relatively short and fixed one-year transition period in Phase 1, we typically recommend a time-based dollar-cost averaging approach. However, AT&T may want to consider triggers based on market yield levels given the Fed’s latest statements regarding economic recovery and tapering of its quantitative easing program.

  - If the transition period for Phase 2 is sufficiently long and flexible, AT&T should consider developing a journey plan with a dynamic de-risking process based on funded status improvements. Triggers based on market yield levels should be considered only if AT&T has strong views on the direction and level of future yields. A journey plan that incorporates de-risking triggers can be enhanced by a dynamic risk overlay which factors in market conditions when a trigger is hit to assess whether the planned de-risking is attractive at that time.

- Once key decisions have been made about the target portfolio, sources of assets, and timing, AT&T should seek input from its current fixed income managers regarding market liquidity and potential trading costs associated with the transition activity. If other return seeking assets will be liquidated to provide funds, a liquidation plan should be developed with those managers.
Summary of Analysis

<table>
<thead>
<tr>
<th></th>
<th>Current AT&amp;T Lineup</th>
<th>Shift fixed income asset to 100% Long Government Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dollar Duration Hedge</td>
<td>26%</td>
<td>42%</td>
</tr>
<tr>
<td>Credit Hedge</td>
<td>20%</td>
<td>30%</td>
</tr>
<tr>
<td>Curve Hedge</td>
<td>24%</td>
<td>37%</td>
</tr>
<tr>
<td>Funded Status Sensitivity*</td>
<td>83% +18/-15</td>
<td>83% +16/-14</td>
</tr>
</tbody>
</table>

- Data as of 6/30/2013
  - Assets: App. $45 billion
  - Liabilities: App. $52 billion
### Liability Driven Investing Explained

<table>
<thead>
<tr>
<th><strong>Dollar duration hedge</strong>:</th>
<th><strong>Credit hedge</strong>:</th>
<th><strong>Curve hedge</strong>:</th>
<th><strong>Funded status sensitivity</strong>:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures the effectiveness of the hedging assets to match the change in the liability value due to changes in the overall level of interest rates.</td>
<td>Measures the effectiveness of the hedging assets to match the change in the liability value due to changes in the overall level of credit spread.</td>
<td>Measures the average effectiveness of the hedging assets to match the change in the liability value due to changes in the shape of the yield curve.</td>
<td>Also known as funded status volatility. Analysis is based on +/- 1% change in interest rates and +/- 20% change in asset values.</td>
</tr>
</tbody>
</table>

A 26% dollar duration hedge is interpreted as a $1,000 change in liabilities should produce a $260 change in assets. Increases as the duration of assets more closely match duration of the liabilities.

Liabilities are measured as an AA rated bond. Given an increase in credit spread, the value of the liability will increase. This measure gives an estimate of how closely the assets will track a movement of value given a change in credit spreads.

In an uneven shift in interest rates, assets and liabilities will be affected differently depending on duration and maturity. This measure gives an estimate on how well the assets will move line in with the liabilities given an uneven shift in rates.

Also known as funded status volatility. Analysis is based on +/- 1% change in interest rates and +/- 20% change in asset values. The higher the hedge percentage, the lower the funded status volatility.
Current

(in millions, except percentages)

Assets

<table>
<thead>
<tr>
<th>Current Lineup</th>
<th>Assets ($M)</th>
<th>Asset (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return Seeking</td>
<td>$29,355</td>
<td>65.0%</td>
</tr>
<tr>
<td>Aggregate Fixed Income</td>
<td>$9,484</td>
<td>21.0%</td>
</tr>
<tr>
<td>Long Govt/Credit</td>
<td>$6,323</td>
<td>14.0%</td>
</tr>
<tr>
<td>Preferred Equity</td>
<td>$0</td>
<td>0.0%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$45,162</strong></td>
<td><strong>100.0%</strong></td>
</tr>
</tbody>
</table>

Hedge Summary

- Dollar Duration Hedge %: 26%
- Hedge Port. Yld.: 3.2%
- Credit Hedge %: 20%
- Liability Yield: 5.0%
- Curve Hedge %: 24%
- Stress Test Decline: -28%
- FS Sensitivity: -15% to +18%

Analysis of Funded Status Sensitivity

<table>
<thead>
<tr>
<th>Change in Discount Rate</th>
<th>Return Seeking, 65%</th>
<th>Assets Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1%</td>
<td>68%</td>
<td>78%</td>
</tr>
<tr>
<td>0%</td>
<td>72%</td>
<td>83%</td>
</tr>
<tr>
<td>+1%</td>
<td>77%</td>
<td>89%</td>
</tr>
<tr>
<td>-20%</td>
<td>87%</td>
<td>94%</td>
</tr>
<tr>
<td>+20%</td>
<td>87%</td>
<td>101%</td>
</tr>
</tbody>
</table>

Reflects instantaneous changes to assets and liabilities and parallel shifts in the yield curve.

Asset Allocation Policy

Key Rate Duration Distribution

- Government Bonds, 21%
- Long Govt/Credit, 14%
- AT&T Preferred Equity, 0%
- Return Seeking, 65%

Dollar Duration (DV01)

- Liabilities
- Credit
- Gov't
- Swaps
## Shift To Long Gov't Credit

*(in millions, except percentages)*

### Assets

<table>
<thead>
<tr>
<th>Current Lineup</th>
<th>After Long Gov't / Credit Shift</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Assets ($M)</td>
</tr>
<tr>
<td>Return Seeking</td>
<td>$ 29,355</td>
</tr>
<tr>
<td>Aggregate Fixed Income</td>
<td>$ 9,484</td>
</tr>
<tr>
<td>Long Govt/Credit</td>
<td>$ 6,323</td>
</tr>
<tr>
<td>Preferred Equity</td>
<td>$ -</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$ 45,162</td>
</tr>
</tbody>
</table>

### Hedge Summary

- **Dollar Duration Hedge %**: 42%
- **Credit Hedge %**: 30%
- **Curve Hedge %**: 37%
- **Hedge Port Yld.**: 4.5%
- **Liability Yield**: 5.0%
- **Stress Test Decline**: -28%
- **FS Sensitivity**: -14% to +16%

### Analysis of Funded Status Sensitivity

<table>
<thead>
<tr>
<th>Change in Discount Rate</th>
<th>Return Seeking</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1%</td>
<td>69%</td>
</tr>
<tr>
<td>0%</td>
<td>72%</td>
</tr>
<tr>
<td>+1%</td>
<td>76%</td>
</tr>
</tbody>
</table>

Reflects instantaneous changes to assets and liabilities and parallel shifts in the yield curve.

### Asset Allocation Policy

- **Return Seeking**: 65%
- **Credit**: 35%
- **Gov’t**: 0%
- **Agg Bonds**: 0%
- **AT&T Pref Equity**: 0%

### Key Rate Duration Distribution

- **Liabilities**
- **Credit**
- **Gov’t**
- **Swaps**

---

© 2010 Association for Financial Professionals®
Closing Thoughts

• Holistic approach considering risks to plan sponsor
• Many tools beyond diversification and liability hedging
• Risk and return management
Questions
Disclaimer

• The information included in this presentation is general information only and should not be relied upon without further review by the appropriate professional advisors. Towers Watson is not a law firm or accounting firm, and we are not providing legal, accounting or tax services or advice. Some of the information included in this presentation might involve the application of law; accordingly, we strongly recommend that audience members consult with and involve their legal counsel and other professional advisors as appropriate to ensure that they are fully advised concerning such matters. Additionally, material developments may occur subsequent to this presentation rendering it incomplete and inaccurate. Towers Watson assumes no obligation to advise you of any such developments or to update the presentation to reflect such developments.
Contact Details

• L Wayne Adams
  – 208 S. Akard, Rm 2715, Dallas, TX  75202
  – 214-757-5034
  – wayne.adams@att.com

• Mark Ruloff
  – 901 N. Glebe Road, Arlington, VA 22203
  – 703-258-8058
  – mark.ruloff@towerswatson.com