Morningstar EnCorr

Liability-Based Asset Allocation Modeling
Asset Only vs. Total Portfolio

- Traditional optimization focuses on standard deviation of the assets, ignoring liabilities
  - Asset Only
- Surplus optimization focuses on the standard deviation of the total portfolio, taking into account liabilities
  - Total Portfolio = Assets - Liabilities
Who should use Liability-Modeling?

- *Defined Benefit Pension*
- Defined Contribution Pension
- Foundations and Endowments
- Life Insurance Companies
- Non-Life Insurance Companies
Sample Exercise

- XYZ Company has a Defined Benefit Pension Plan. The company is growing and its retirees are living longer. XYZ wants to stay ahead of the game and use the Liability Based Optimization approach to plan out its payments. It’s initial value is $50,000,000 with outgoing payments of $100,000 for the next 10 years.
  - At this time, they are fully funded and want to forecast next year’s total assets.
  - XYZ also wants to do a under funded and over funded scenario to evaluate the results.
Key Definitions

- **Current Relative Value**
  - Defined as the relative size of a liability to the asset (liability/assets)
  - $= 100$ where pension fund is fully funded
  - $> 100$ where pension fund is underfunded
  - $< 100$ where pension fund is overfunded
Key Definitions Cont …

- **Net Worth**
  - Difference between a pension plan’s assets and liabilities
    - Positive net worth = surplus (increased through plan contributions or investment earnings)
    - Negative net worth = unfunded liability (increased through plan withdrawals and investment losses)

- **Expected Surplus**
  - Forecast of future net worth
    - Excess of the asset return over the liability return, expressed as a % of the initial value of the fund’s assets
Process

- Determine your Asset Class Assumptions
- Determine the asset(s) to model the liability of your portfolio
- Determine the portfolio’s current funding level
- Sample Results Using $50,000,000 (initial value)

<table>
<thead>
<tr>
<th>Expected Surplus</th>
<th>Forecast for Future Net Worth (1Yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50,000,000</td>
<td>Positive Net Worth</td>
</tr>
<tr>
<td></td>
<td>Fully Funded</td>
</tr>
<tr>
<td></td>
<td>3.3</td>
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<tr>
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<td>$51,650,000</td>
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</tbody>
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Sample Output

- Simulated Results: Liability Outflows of $100,000 Annually