Asset Allocation and Risk Management for Defined Benefit Retirement Plans

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Today’s Agenda

- Asset allocation for DB plans
  - Asset allocation by illustration
  - History and its discontents
  - Evolution of modern practice
  - Tools in the risk management kit

- Potential Takeaways
  - Asset allocation is a big part of DB plan risk management…
  - … that can be given too little attention
  - Do we understand why we are doing what we do?
  - If not, should we be looking at our options?
Timing of Risk Management

When is a good time to manage risk?

A. Now, because I need to
B. When things seem to be at their worst
C. When things seem to be at their best
D. When I can afford to do so

No single correct answer, but some answers may be better than others.

Not asking the question may be the biggest risk of all!
Asset Allocation by Illustration

- Asset allocation is an important part of risk management
  - Most of the risk in a DB plan is usually related to asset allocation
  - If liabilities are interest-rate sensitive, asset allocation can help reduce the volatility of the net funded position
  - Asset allocation also has big implications for long-term cost

- The following examples illustrate why and when it may make sense to invest more aggressively or conservatively.

Once the examples are concluded, we’ll have a list of factors that affect risk tolerance for an investor.
Example 1

Matching assets and liabilities reduces risk

- I am due to pay someone else $10 million next May. I have $10 million on hand today. I get to pocket any leftover, and I need to make up any difference from my own (comparatively modest) personal assets. Do I:
  - Park it in the market?
  - Buy a one-year government bond?
  - “Go for Gold?”
  - Put it all on red 19?

If I value my solvency, I let well enough alone and buy a one-year risk-free (well, hopefully) Treasury bond. I have decided to avoid risk and make good on my liability with modest gain.
Lessons from Example 1

- I decide to invest more conservatively if:
  - The liability is certain
  - The liability is imminent
  - I cannot afford to come up short (I don’t have the means)
  - I don’t need to take any risk

- As it happens, I get to keep the surplus
  - Generally not the case with pension plans
    (steep reversion taxes)
Example 2

Not all liabilities have matching assets

- I am due to pay someone else $1 million in 40 years’ time. I have $100,000 on hand today. I do not get to pocket any leftover, and I need to make up any difference from my own (comparable) personal assets. Do I:
  - Park it in the market?
  - Buy a 40-year government bond?
  - Start that little coffee shop I’ve been telling my spouse about?

Hint: I need a 5.9% compound annual return
Example 2

- Not all liabilities have matching assets
  - I am due to pay someone else $1 million in 40 years’ time. I have $100,000 on hand today. I do not get to pocket any leftover, and I need to make up any difference from my own (comparable) personal assets. Do I:
    - Park it in the market?
    - Buy a 40-year government bond?
    - Start that little coffee shop I’ve been telling my spouse about?

The answer here is less clear. A matching asset may not be readily available. I will need to take some investment risk to reach $1,000,000 without contributing my own cash. However, as I approach the due date and target amount, I want to reduce risk.
Lessons from Example 2

- I decide to invest *less* conservatively if:
  - The liability is distant (longer “investment horizon”)
  - I need significant investment income to meet the target
  - There is no matching asset
  - I can afford to take the risk

- As it happens, I cannot keep the surplus
  - So I have no reason to go higher than $1,000,000
  - As soon as I can park it in a government bond and guarantee a final payout of $1,000,000, I do so
Example 3

- Liability payouts can be uncertain
  - I am due to pay someone else $100 per sunny day over the next 20 years. I have enough money on hand today to cover the expected number of sunny days if I earn 6% interest, do I:
    - Park it in the market?
    - Buy a 20-year government bond?
    - Diversify and monitor?

Again, there is no matching asset. I will need to take some investment risk to make the payments without contributing my own cash. Because the liabilities are somewhat uncertain, there is only so much risk I can take off the table.
Lessons from Example 3

- I may decide to invest less conservatively if:
  - The liability is uncertain
- If the liability is spread out over time, I may need a mix of low-risk short-term assets and riskier long-term assets

A pension plan’s liabilities are a stream of predictable but uncertain future payments.
Example 4: Cash Balance Plan

- Most benefits are paid in lump sums upon termination
  - The payments are nearer-term than an annuity payment plan
  - The timing of the payouts is highly uncertain
  - The payouts are “lumpy” and large, not smooth and gradual

- Conclusion: All else equal, want to invest more conservatively
  - Have cash to cover lumpy benefit payments
  - Have shorter investment horizon than an annuity plan

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Takeaways from Examples

- Best-fit asset allocation depends upon a number of factors
  - Timing of potential payments
  - Certainty or variability of payments
  - Availability of matching assets
  - Amount of investment income or contributed cash needed
  - Ability to make up shortfall with contributed cash
  - Ability to receive refund of any surplus
  - … and that’s before we get to the actuarial measurements

This is a complicated issue!
The Role of Actuarial Valuations

- On top of the cash flow asset / liability matching examples, you have an actuary providing valuation numbers.
- If the numbers jump up, you need to contribute more cash or recognize more expense.
- Valuations measure the present-day value of uncertain future payments.
  - Budget the cost of those payments to past, present, and future years.
  - Regulations and laws try to capture this, but have their limits.
- Valuation rules and outcomes vary by:
  - Plan sponsor type: corporate, gov’t, multiemployer/union, church.
  - Benefit type: pension, medical, life.
  - Purpose: cash funding, financial reporting.
Valuations and Asset / Liability Management

- Asset / liability management involves considering:
  - What valuation rules apply to the case
  - The sponsor’s goals and constraints
  - How assets move in tandem with actuarial liabilities
  - How liabilities will mature over time
  - How changes to asset allocation affect valuation outcomes
    - Often a decrease in risk comes with an increase in expected cost
    - However, some win-win situations may present themselves
  - How changes to valuation outcomes affect asset allocation
    - “Dynamic asset allocation” – Investment policy responds to funded status
    - Common example: Glide path to annuitization for frozen plans
  
  ➢ Which is why actuaries are integral to the discussion of asset allocation and risk management
Asset Allocation – What to Do?

- If asset allocation is so important, what are we doing?
  - Whatever our predecessors did (60% equities / 40% bonds)
  - Whatever everyone else is doing (60% equities / 40% bonds)
  - Making adjustments at the margins (to 60% equities / 40% bonds)
    * Selection of asset managers
    * Active vs passive investments
    * Lengthening duration of bond portfolio
    * Moving into some alternative investments
    * But not starting from the ground up
  - Is this a thorough approach?

- I would argue that the complicated issue of asset allocation has been underaddressed in part because it is complicated

- A walk through history may be instructive
A Brief History of Asset Allocation

- Through the 1960s, many plans just bought insurance contracts
  - Guaranteed but moderate returns
- By the 1980s, many plans were invested in the financial markets
- The 60% equity / 40% bonds eventually became a “standard” asset allocation
  - Considerations may have included maximizing risk-adjusted returns
  - But as noted above, other criteria can be very important too
- Investment experience from 2000 onward has demonstrated that “60/40” was too risky for many plans and plan sponsors
  - Among other factors, the covered populations had matured
- Many pension plans closed to new hires or froze accruals
  - Chastened plan sponsors are migrating to less equity exposure

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Into the Brave New World

- Computing power has improved vastly since the 1980s
  - We can put this power to use, and answer questions that couldn’t be addressed back when the “60/40 consensus” came into being
  - ALM = Asset / liability modeling (or management)
  - LDI = Liability-driven investing
    - Putting the findings of ALM into your investment policy
- And there have been advances in other areas
  - Alternative investments
  - Alternative plan designs

These are some of the newer tools at plan sponsors’ disposal. The following slides discuss these tools in turn.
Actuarial Modeling Tools

- ALM studies are useful for answering questions
  - Where are we headed?
  - What is the range of future potential expense or cash outcomes?
  - How does this align with our goals and constraints?
    - Possibility the pension plan endangers the sponsor’s viability
  - How might changes to asset allocation relieve risk and affect long-term costs?
  - What is the best approach to funding the plan?

- ALM studies can be expensive, so need to plan ahead
  - Important to have clear focus and goals at the outset
  - A good consultant will start by taking your goals and constraints, combine it with study and professional knowledge, and produce key observations and/or potential action items

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A Thought Experiment

- If in the late 1990s, when everything seemed rosy,
  - An actuary came to you and noted:
    - Your pension plan is quite well funded
    - There are restrictions on your even making contributions
    - Your covered population of baby boomers isn’t getting any younger
  - The actuary prepared an ALM study that suggested
    - Taking some investment risk off the table
    - Making the actuarial assumptions more conservative
    - Plan’s funding requirements increase; plan can now take contributions
- 15 years later you have saved
  - A lot of heartache
  - Quite possibly, a fair amount of money

What might a similar conversation today lead to?

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New and Exciting Investment Products!

- Understand the transaction
  - How will this add value?
    - Can I get a similar value elsewhere at lower cost?
  - Keep your eye on the fiduciary ball

- Fee considerations
  - What will we get for this extra cost?
  - Fees are certain; performance is not

- Counterparty risk – will everyone make good on the bargain?

- Liquidity and cash flow management
  - Can I make payments when needed without incurring losses?

- Independent, expert evaluation
  - People sell products to make money
  - Get expert input from someone who does not stand to profit
Sample Product: Alternative Investments

- Types of Alternative Investments
  - Hedge funds (there are many “kinds” of these!)
  - Private equity
  - Tactical asset allocation

- The value proposition is some combination of higher expected investment return and/or lower volatility, set in the context of the total pension portfolio
  - For corporate sponsors, long-duration bonds may provide at lower cost

- Fee considerations can be significant
  - High fixed fees are common
  - Gain-sharing provisions and managers’ incentive structures

- Counterparty risk can be significant in some cases

- Liquidity is often low for these types of products

- Independent advisors can screen and assess managers
Sample Product: Pension Obligation Bonds

- Basic concept: sponsor borrows money and invests it in the Trust
  - A POB can be an attempt to lower costs, by earning more on invested assets than the interest *plus* origination fees paid on account the issued debt
  - A POB might be used to seek improvements in short-term financial accounting or cash funding requirements
  - Even if a POB is anticipated to lower expected short-term or long-term costs, *it does so by increasing risk; it is a leveraging transaction*
  - Blue sky: If you want to go shorter on fixed income and longer on equities, why not just increase the equity position of the pension trust assets?

- Even with all those caveats, POBs may be a fair fit in some cases
  - E.g., corporate sponsors might issue debt to reduce PBGC premiums
    - Avoid paying 2.9% interest on unfunded liabilities

- POB issuers *cannot* provide an independent, expert opinion
  - But actuaries can!
Sample Product: Milliman Managed Risk Strategy

- Uses equity index futures to protect pension trusts from severe market downturns
  - Aims to preserve 80% of equity upside potential, while experiencing only 25% of the downside exposure in a crisis
- Futures contracts are “overlaid” on existing pension assets
- Best fit for plan sponsors / trusts with
  - Minimal ability to absorb losses
  - Negative trust cash flow (more benefit payments than contributions)

I’m happy to introduce you, but get an expert, independent opinion, such as from your investment advisor

The cost of this coverage for midsize plans is 15-35 bps/yr, depending on amount of protected assets

RESHAPE THE DISTRIBUTION OF RETURNS

![Graph showing distribution of returns for Underlying Fund and Managed Risk Fund. The Managed Risk Fund shows a reduction in volatility and a similar return compared to the Underlying Fund.](image-url)

<table>
<thead>
<tr>
<th></th>
<th>Underlying Fund</th>
<th>Managed Risk Fund</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return</td>
<td>7.09%</td>
<td>7.14%</td>
</tr>
<tr>
<td>Volatility</td>
<td>18.65%</td>
<td>9.36%</td>
</tr>
</tbody>
</table>

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Other Risk Management Tools

- **Annuity purchases**
  - Relieve sponsor of financial uncertainty
  - Arguably “high cost”
  - May come with accounting impacts
  - Best suited for retiree liability
  - Developing options such as buy-ins may gain traction

- **Lump sum offers**
  - Usually best with limits on amount paid or timeframe offered
  - Significant administrative preparation advisable

- **Alternative plan designs**
  - Defined contribution
  - Cash balance
  - Variable DB plans
DC Plan Rewards and Risks

- DC-only plans are relatively low-risk to plan sponsors in terms of direct costs, but…

- Participant investment underperformance
  - Absolute terms and/or relative to DB plans
    - Personal anecdotes welcome
  - Significant leakage: withdrawals and loans

- Benefit inadequacy leads to later retirement
  - Participants need to save enough…
  - then invest it wisely and with reasonable good fortune…
  - then mete it out through retirement (self-insure)
  - Oops – didn’t work out as planned. So why not work longer?
  - … even if I am not quite as productive
Cash Balance Plans

- Cash balance plans often appeal to plan sponsors as a way to lower costs and risk relative to traditional DB plans.
- Participants can build their personal investment portfolio around the cash balance benefits.
  - If the cash balance interest credits are low but predictable, can invest DC plan assets more aggressively.
- Less generous benefits may lead to later retirement.
- Benefits usually paid as lump sums.
  - As a practical matter, most participants may be better off with lifetime income (can’t self-insure, don’t have expert financial advice).
  - Lack of income certainty may also incent later retirement.
- Cash balance and DC plans can be a piece of the retirement puzzle, but usually are not the cornerstone the way traditional DB plans were.

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Meeting Retirement Needs with DB Plans

- Sponsors have been strained and occasionally broken by pension risks
- Participants still need retirement income
  - DC and cash balance plans may be nice sidecars and contingency funds, but they won’t reliably pay the bills for most retirees
- Past 40 years has seen several vastly different economic climates
  - Stagflation of 1970s
  - Recession and high interest rates of early 1980s
  - Low yield, low growth 21st century
  - These different climates treat fixed-dollar obligations very differently

Instead of liability-driven investments, what about asset-driven liabilities?
Variable DB Plans

- Variable DB Plans might be a way to address these challenges...
  - Participants are guaranteed a life annuity (valuable to them)
  - Sponsor underwrites a pool of mortality risk
    - Sponsor can bear this pooled risk far more easily than each individual
  - Amount of benefits is determined by investment performance
    - Greatly reduces sponsor’s investment risk

- ... but several unknowns remain
  - What are the best designs?
  - How much risk to share with participants?
  - What risks remain and how best to address?
  - How can various design options fit into ERISA or state law?
    - PPA renewal may provide an opportunity to get clearer Congressional approval
  - How to value for funding and accounting purposes?

A range of plan sponsors are already taking action

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What to Take Away from Today

- Asset allocation is a central part of risk management for DB pension plans
  - Your father’s Oldsmobile may not be the best fit
  - Contemporary computing power makes it possible to answer questions and explore potential changes
  - Doing nothing may be ignoring an important issue

- Other risk management tools are out there
  - Investment products
  - Financial transactions (e.g. lump sums and annuity purchases)
  - Alternative plan designs

- Actuaries are here to help as part of a team effort
  - Work with investment advisor, legal counsel, and management
Where do I Start?

- Call an actuary
- Discuss goals and concerns
- Spec out a potential plan
  - Can be an ALM study
  - Could potentially be more limited scope
- One size and one approach does not fit all!
Questions?

and Answers!