Pension Investing

An Alternative Strategy for Public and Church Defined Benefit Plans

Public sector and church pension plan sponsors face unique but similar financial challenges. This paper covers an alternative approach to constructing investment portfolios that can better help meet their needs by seeking equal to or greater investment returns with less funded status volatility than conventional investment strategies.

Public and church plans’ financial challenges are generally:

- Funding ratios less than 100%;
- High levels of annual cash outflows (benefit payments often over 5% of the plan’s market value); and
- Limited ability.desire to materially vary cash contributions from year-to-year.

On the flip side, public and church pension plans typically have financial flexibility in how they can manage their pension obligations because they are able to:

- Use a liability discount rate which reflects the long term expected return on plan investments, resulting in lower, more predictable reported liability values;
- Establish relatively long amortization periods to pay back any underfunded liabilities which provides more contribution stability; and
- Smooth out investment gains and losses over a longer number of years.

Thus these plans’ year to year volatility is closely tied to the performance of the supporting investment portfolio.

An ideal investment strategy needs to take all of the above into account, while addressing two key overarching objectives:

1. Improve the funded status of the plan while managing the ups and downs of the funded status volatility; and
2. Avoid having the plan become underfunded to the point where the plan falls into a “death spiral” (see below for a discussion of this scenario), which would require a material increase in contributions and/or a reduction in future benefits to have the fund recover, even in very positive future investment markets.

These goals can be accomplished through a portfolio that consists of:

- An underlying fixed income investment strategy consisting of higher yielding investment grade securities; and
- Equity derivatives (put options and call options) that provide contractual exposure to the equity markets, but in a way where risk can be managed.

This portfolio stands in sharp contrast to other investment strategies that rely heavily on illiquid and “alternative” asset classes, many of which have been in vogue since the Great Financial Crisis of 2008. With a goal of controlling volatility while still seeking to earn a sufficient investment return, typical mainstream investment strategies have struggled to meet plans’ objectives while tending to have a higher fee structure and less transparent investment management than the alternative shown above.

Our alternative portfolio construction is designed to produce improved investment results:

- simpler, more cost effective investment management;
- greater funded ratio protection; and
- more predictable funded status improvements over time.

The rest of this article goes into more detail, starting with defining a “death spiral,” which is a critical risk that public sector and church plans face.

The ‘Death Spiral’

At a high level, a death spiral occurs when a plan experiences negative cash flow while being significantly underfunded. This is more common in mature plans where benefit payments plus the expenses that the plan pays out of the fund materially exceeds the expected investment income and cash contributions entering the plan. This negative cash flow typically causes the level of assets to fall and thus leaves the plan with fewer assets in the future to earn excess investment returns. This becomes especially pronounced in falling markets. Eventually, the decline in asset value and funded status becomes substantial and a severe action needs to occur in the form of higher cash contributions, lowering future benefit payments or a combination of both. The following two exhibits show this point.
The graph below illustrates the projected funded status over 10 years for a sample plan that is currently 60% funded, with relatively high annual benefit payments (9% of the asset value), annual contributions equal to 3% of the asset value, and the plan still accruing new benefits each year (assumed to be equivalent to 2% of the liability). In addition, we assume an investment return of 6% and a liability discount rate of 6% a year. While we have depicted an “open” pension plan, similar, but less pronounced results occur for a frozen pension plan.

This plan is making contributions roughly equivalent to the value of annual accruals and is earning the assumed liability return but because of its lower funded status, it is projected to be less than 45% funded 10 years from now. While most plans are above 60% funded today, any material longer-term market correction could leave many pension plans at or below 60%, and cause them to consider either significantly increasing contributions and/or cutting future benefits.

**What investment return is needed?**

The table below shows the approximate annual rate of investment return needed to maintain the current funded status for a similar pension plan to the one described above. As an example, the 60% funded plan discussed above needs to earn 9% per year to maintain its funded status, a full 3% every year above the assumed 6% return, even after taking into account the 3% contribution.
As the above illustration demonstrates, the worse funded the plan is, the higher the investment return needed to maintain the current funded status, let alone to improve upon it.

As a result, plan sponsors and trustees who have poorly funded pension plans need to invest not just to earn these rates of return but also to “protect” the plan as best they can from falling into the death spiral. These spirals are especially painful because a fall in funded status using a conventional asset allocation will most likely occur during a recession when the ability to increase revenue from tax payers or donors is likely to be limited.

### Current DB Investment Strategies

Most plan sponsors and trustees invest today by diversifying their asset holdings over many different asset categories, such as US and International equities, fixed income securities, real estate, hedge funds, and private equity. They will look to blend the allocation to create an investment strategy to meet or exceed their stated return objective, while controlling investment risk, generally expressed as asset volatility.

In rising markets this has worked well. However, most plans maintain equity (public and private) holdings well above 50% of the plan assets, thus exposing them to potential material losses if equity markets were to experience a correction or prolonged recession. As noted earlier, this was seen during the recent financial crisis, where the level of funded status for state public plans went from an average of 92% funded in 2007 to 61% in 2009 according to a study by Wilshire. Unfortunately, many of these plans had high benefit payments and expenses relative to contributions and investment income, creating a negative cash flow situation. These plans had to sell off assets during the crisis in order to raise cash to

<table>
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<th>Funded Ratio</th>
<th>Investment Return</th>
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<tbody>
<tr>
<td>40%</td>
<td>11.0%</td>
</tr>
<tr>
<td>50%</td>
<td>10.0%</td>
</tr>
<tr>
<td>60%</td>
<td>9.0%</td>
</tr>
<tr>
<td>70%</td>
<td>8.0%</td>
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<tr>
<td>80%</td>
<td>7.0%</td>
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meet required benefit payments and as a result had fewer assets with which to participate in the subsequent market rebound; an example of a “death spiral”.

Consider a Different Investment Approach – Introducing Portfolio Transparency and Control

Given the characteristics of these plans and the heightened risks they face due to less than optimal funding ratios, a portfolio that consists of a combination of fixed income and synthetic equity derivatives can provide a higher likelihood of accomplishing the previously stated objectives:

- Providing the plan a steady increase in funded status over time;
- Meeting or exceeding the expected return assumption, net of fees and expenses;
- Mitigating the risk of a death spiral, especially during a market correction or recession; and
- Introducing transparency and risk control.

A portfolio holding fixed income and synthetic equity derivatives should also tie more closely to plan liabilities, resulting in greater control over plan outcomes.

Defining the Portfolio

**Fixed Income Allocation:**

The underlying assets are invested in a portfolio of higher yielding, higher quality fixed income securities which the plan would look to buy and hold. By using a buy-and-hold strategy, fixed income securities could be purchased with longer duration and thus typically earn higher yields. Higher yields would help fund income needs to meet benefit payments and the longer-dated duration helps to hedge against an economic regime change, such as a prolonged recession, which may bring lower expected returns and lower nominal interest rates.

**Equity Allocation:**

The equity portion of the portfolio would be created synthetically through the use of equity derivative instruments such as puts, calls, and futures. The key feature is creating an equity collar to best manage the future equity returns. This is accomplished by combining puts and calls to limit downside risk, while potentially having the option premium paid for by selling off some nice to have, but not needed, upside investment returns. A standard collar would look like the figure shown below.
Physical equities are represented by the MSCI World Index as the straight diagonal line; estimated option pricing as of 7/15/2019 using River and Mercantile data and pricing models.

Collars can be shaped to a specific plan's funded ratio objectives, bringing additional downside protection or additional upside participation. The cost to manage these collars for pension plans is relatively low because they will often use longer term structures with few interim changes to the strategy. Additionally, accessing equity synthetically, even with a collar, can represent cost savings for plan sponsors by replacing more expensive active strategies with options referencing passive equity indices.

We tested this alternative portfolio of long duration fixed income and a synthetic equity collar against a sample public pension plan allocation. Historically, this portfolio compares favorably to the sample public pension plan portfolio and a 100% passively managed global equity portfolio.

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1 Sample public pension plan allocation based on the public plans database compiled by the Center for Retirement Research at Boston College, the Center for State and Local Government Excellence, and the National Association of State Retirement Administrators.
We then examined how the proposed portfolio performed during market downturns in the 2004-2019 sample period. Out of the 20 quarters of negative equity returns during the 15-year sample period, the alternative portfolio outperformed the sample plan 14 times or 70% of the time.

A quick recap of the benefits of the portfolio:

- The portfolio would have an amount of downside protection in an equity market correction as a result of the equity collar.

<table>
<thead>
<tr>
<th>Average Annualized Returns for Various Asset Allocations</th>
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<tbody>
<tr>
<td>Sample Public Plan¹</td>
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<tr>
<td>---------------------</td>
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<tr>
<td>2004-2007</td>
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<tr>
<td>2007-2010</td>
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<td>2010-2013</td>
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<tr>
<td>2013-2016</td>
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<tr>
<td>2016-2019</td>
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<td>Average Annual Return</td>
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*Returns Shown are from 3/31/2004 - 3/31/2019

¹ Average Public Pension Plan consists of 50% MSCI World Index, 25% Barclays US Aggregate Bond Index, and 25% split equally between FTSE NAREIT Index, Credit Suisse Equity Market Neutral Hedge Fund Index, and Cambridge Associates US Private Equity Index. These allocations roughly reflect those of the average pension plan according to data from the Center for Retirement Research at Boston College, the Center for State and Local Government Excellence, and the National Association of State Retirement Administrators.

² The option collar strategy is similar to graph above and references the MSCI World Index, with protection down to 20% price falls and total return capped over 3 years. The level of the cap is set such that the overall premium is approximately equal to the cost of funding the structure over three years. All assets not used to pay the premiums on the options strategy are invested in 25% Barclays Bellweather 10 year, 25% Barclays Bellweather 30 year, and 50% Barclays Long Credit Index.

³ Backtested performance returns are developed from the retroactive application of a model, with the benefit of hindsight and do not reflect actual trading or the effect of material economic and market factors on the decision-making process. Such performance does not include the deduction of advisory fees and is not an indicator of future actual results. Investors in such a model may experience financial loss.
- If yields fell, as is often the case with equity market corrections, the fixed income portfolio would likely also rise in value, providing additional protection.

- Pension benefit payments can be funded from the fixed income portfolio dividends, avoiding the possibility of forced sale of public equities at depressed prices.

Using derivatives in this way may enable the plan to better control bond and equity exposure, and not be forced to change these exposures due to cash flow needs.

**Looking Forward**

We also examined this portfolio on a forward-looking basis using a stochastic projection. Here we only allocated 50% equity (instead of 100% above) to the synthetic portfolio position, which would approximately match the expected return of the average public pension portfolio noted above. The chart below illustrates the results after a three year period:

![Chart showing funding level in 3 years]

**Assumptions:** Funding level = 70%, benefits 4% of liabilities, Contribution of 3% of assets per annum, Benefit payments of 9% of assets per annum, fixed Liability discount rate of 6%. Bond duration of 12 years in the synthetic equity strategy.

You will note that the median returns are equivalent, which was the intention, but the “tails” of the results are less pronounced, thus showing the more predictable nature of the portfolio. Also, these
projections do not reflect any investment management cost savings which may run as high as 100 basis points a year for the Sample Public Plan.

On further analysis, under the Sample Public Plan portfolio, the scenarios where the funding level is lowest (e.g., 59% at the lower 5th percentile) is where equity markets and alternative assets historically have performed very poorly, likely accompanied by lower interest rates. In the Synthetic Equity Strategy, the scenarios where the funding level is the lowest (e.g., 63% in the lower 5th percentile) is where historically equity markets have performed poorly and interest rates have risen. In such a higher interest rate environment, the plan will be more likely to outperform the liabilities on a go forward basis from that point and the plan's discount rate may be able to be increased as a result of the higher expected returns.

Pros and Cons

The pros are straight forward:

- More predictable investment returns and an amount of protection in a market downturn.
- Lower management fees than today's more traditional diversified portfolio.
- Lower level of governance once established with fewer managers.

The cons are:

- No participation in equity markets above the upper limit of the collar.
- Extra administration is needed short term to establish the synthetic equity structure which requires collateral accounts and coordination with the plan's custodian.

The upper collar limitation can be partially managed through the active management of the structure and deciding when to sell the structure early and repurchase a new structure (known as rolling the structure).

Summary

A vast number of pension plans rely on diversified portfolios dominated by global equity allocations and a significant percentage of alternative investments (hedge funds, private equity, private debt), yet funding ratios have remained stagnant even in the face of the longest equity bull market in history. We believe there is a different way to accomplish the goal of ensuring a secure retirement. We believe that an investment strategy which encompasses more predictable returns and increases protection against
shocks to its funded ratio via a recession or economic downturn is most prudent for plans to consider on behalf of their participants.

The approach above is less reliant on investment manager skill and diversification principles holding true. As such, the standard investment policy and governance structure is greatly simplified. It should allow plan sponsors and Trustees to more confidently establish cash contribution strategies, gradually increase the funded ratio over time, and lessen the appearance and likelihood of a plan death spiral. Finally, we believe the above portfolio would incur less expense to manage than the typical over-diversified, multi asset class portfolio being recommended by industry and consumed by plan sponsors today.
**About the Author**

**Tom Cassara** is a Managing Director in River and Mercantile’s New York office. In his role he consults with institutional clients across the investment and actuarial spectrum. This includes defined benefit, defined contribution, not for profit and retiree medical. Tom works with clients to bring his 30 years of experience across a wide range of institutional organizations to provide custom solutions.

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