

*Chartwell Consulting*

# CHARTWELL VIEWS

February 29, 2016

## Current investing ideas

A continuing series

## Liability Driven Investing

Recent defined benefit strategy has been about "de-risking" plan assets. This focuses on reducing the risk that any newly earned increase in funded status might deteriorate. In turn, this means adopting a liability-driven investment (LDI) strategy, with its primary focus on decreasing the variability of a plan's funded ratio. Accomplishing this requires an increase in the correlation of Plan asset returns with those of plan liability "returns".

Matching the sensitivity of plan assets and liabilities to changes in interest rates is the first step in the process, and the most important. It can be done with some combination of Treasury coupon bonds, Treasury STRIPS, investment grade credit bonds and derivatives of various maturities, by matching the overall interest rate duration and convexity of plan assets with the overall duration and convexity of plan liabilities.

Closely matching the liability's sensitivity to changes in credit bond spreads, on the other hand, is normally more of a challenge. Future benefit outflows are required to be discounted to present value based on the blended yield of a high-quality corporate bond index. But, this index is effectively un-investable, because many of the bonds in it are unavailable for investment (held permanently off market by pension plans).

As a result, fully implementing an LDI strategy covering all plan assets requires the manager(s) have an understanding of not only the pension liability calculation, but also the size, liquidity and duration of the corporate bond markets and the construction of a well-diversified portfolio of fixed income strategies. Even so, liability hedging portfolios will inherently exhibit some tracking error vis a vis the liabilities being hedged.

### A 3-Layer Framework for Defined Benefit Pension Plans



A **"Liability Hedge"** portfolio, designed to remove the interest rate and credit risks inherent in a plan's liabilities

**PLUS**



A desired amount of a return-seeking **"Growth"** portfolio, comprised of:

A diversified set of market exposures (market betas), spanning a variety of high return sources, including stocks and alternative assets

**PLUS**



Diverse exposure to active management skill (alpha) through effective mandates. This may involve long-short mandates with a broad opportunity set.

## **Implementing an LDI Strategy**

Step 1, or the **first layer**, is the Liability Hedge Portfolio. The ideal liability hedging portfolio consists of a well-diversified basket of A to Aaa-rated short, medium, and long-term government and credit bonds with an overall interest rate duration, credit spread duration, convexity, and yield profile matching that of the plan liabilities. Such an optimized basket of plan assets will track with, or hedge, plan liabilities when the latter is discounted to net present value (Present Benefit Obligation). If plan assets rise and fall in the same manner and degree as plan liabilities, the risk of a decrease in the Plan's **funded status** and **funded ratio** is minimized. Unfortunately, so is the "risk" that the funded status improves. And, underfunded defined benefit plans (Plan Assets < PBO), ultimately need to make up that ground.

Thus, the next step for many plans is to increase the basis risk of the liability hedging portfolio, in hopes of increasing its return profile without changing its correlation with plan liabilities. Most often, this involves extending the bond portfolio to include a sizable allocation to BBB bonds (higher credit spread duration), while keeping the maturity profile unchanged. More aggressive plan sponsors will sometimes also include high yield bonds, Dollar-denominated sovereign bonds, and Treasury Inflation Protected Securities in the hedging portfolio.

Allocations to each of these extended bond categories add to basis risk, and reduce the portfolio's liability hedging effectiveness. In exchange for that, the hoped for outcome is an increase in the return of the liability hedging portfolio versus the blended liability discount rate, which is the same as "good" tracking error. That said, the primary focus of the Liability Hedge remains: reduce adverse outcomes versus plan liabilities. Generating excess asset returns from the hedging portfolio is a secondary focus. This is the case even if the Liability Hedge returns are negative in the short term, or expected to be. The reasoning is that if plan assets are declining in value, then so are plan liabilities.

The next step, the **second layer**, is to move some assets completely away from the high correlation liability hedge, seeking out a diversified set of market exposures with substantially higher expected returns than the long duration investment grade corporate bond index. This is the bedrock concept of the Growth Portfolio. The natural first allocation for this return-seeking portfolio is a diversified basket of U.S. stocks.

This is followed by investments in developed market non-US stocks, and then emerging markets stocks. The stocks allocation normally extends to include all "growth" and "value" strategies as well as small-, mid-, and large-cap exposures.

The basic concept is to create an appropriately sized and diversified return-seeking portfolio to exist alongside the liability hedge portfolio. The liability hedge allocation will provide an anchor for the funded ratio, depending on its size, while the returning-seeking portfolio helps to close the funding gap over time by producing long-term returns greater than that of the blended liability discount rate. Much of the second layer Growth Portfolio can be accomplished with index funds, because it's really the market betas you are initially trying to collect. Conservative plan sponsors will sometimes include asset-backed, high yield and global bonds in the basic growth portfolio mix, in order to bring down expected volatility.

The **third layer** in our investment framework refers to stepping up the Growth Portfolio's diversification and management. The objective here is to further boost expected return relative to its expected volatility, by augmenting the investable universe and adding active management (i.e., Alpha potential). Alternative investment strategies comprise the biggest element of this third layer, nearly all of which are "actively managed" in the broadest sense of the term. These include investments in private equity, real estate, commodities/natural resources, and hedge funds.

## **Managing an LDI Strategy**

An LDI strategy presents a number of "moving parts" for plan sponsors -

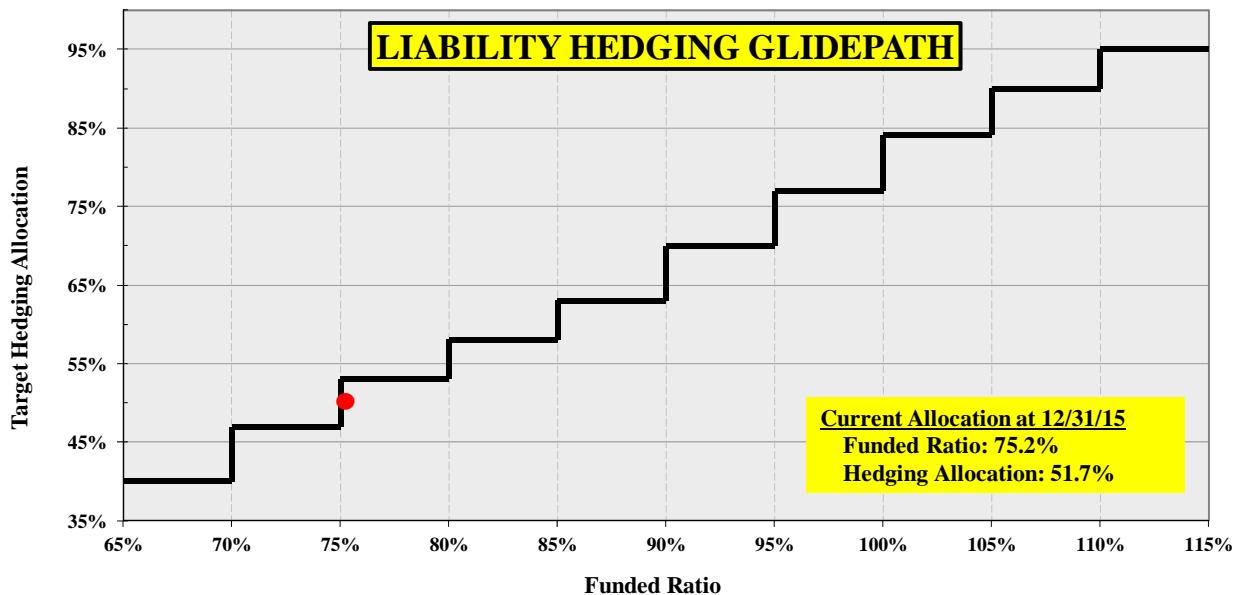
- Having built an optimized Liability Hedge, you will need to maintain over time the hedge portfolio's appropriate exposure to your plan's liability risk factors, which change over time. This involves periodically re-optimizing the Liability Hedge;
- The Growth Portfolio can be straightforward (a basket of diversified index stock funds, allocated along some market metric such as global market cap) or an extremely complex brew of actively managed public equity mandates, private equity and real asset positions, high yield and unconstrained bond funds, etc. The latter comes with many more opportunities for improved returns, and many more ongoing management challenges and costs along the way;

- Perhaps the most important ongoing management issue is bringing everything together, by determining the size of the Liability Hedge relative to the size of the Growth Portfolio. One offers risk reduction specific to funded status *variability*, while the other offers to ultimately reduce the size of the funding gap. Both are critical;
- In theory, the target allocation between the Liability Hedging and Growth portfolios varies as a direct function of the plan's Funded Ratio. The higher the FR gets, the greater the plan's exposure to hedging investments needs to be, in order to increasingly de-risk plan assets. The lower the FR falls, the greater the allocation to growth assets, in order to (hopefully) close the funding gap. To keep things rational and organized, plan sponsors often rely on a "Glidepath", an example of which is depicted below.

The glidepath brings LDI management into stark relief. It normally requires a strong commitment to contrarian rebalancing. If high growth asset returns outpace liability valuation, causing the FR to rise, plan sponsors need to de-risk and "sell high," rebalancing funds into the underperforming Liability Hedge portfolio. This is usually not too difficult for risk adverse plan sponsors to execute. However, when the FR drops because of some degree of equity market correction, the glidepath invariably indicates "buying low", selling lower volatility high quality bonds to increase the plan's exposure to the underperforming Growth Portfolio. Often easier said than done.

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## **POTENTIAL ASSET CATEGORIES**

### **Layer One**

U.S. Cash  
U.S. Intermediate Treasuries \*  
U.S. Long Treasuries \*  
TIPS \*  
U.S. Aggregate Bonds \*  
U.S. Intermediate Gov't/Credit Bond\*  
U.S. Long Duration Government/Credit\*  
U.S. Inv Grade Corporate Bonds \*  
U.S. Long Corporate Bonds \*

### **Layer Two**

US Large Cap, G & V  
US Mid Cap, G & V  
US Small Cap, G & V  
Europe ex-UK  
Japanese Equity  
UK Large Cap  
Asia ex-Japan Equity  
EAFE Equity  
World ex-U.S. Equity  
Emerging Markets Equity  
US High Yield Bonds  
Global Aggregate Bonds  
Global Aggregate Bonds, hedged  
World Government Bonds  
Emerging Markets Sovereign Debt  
Emerging Markets Corporate Bonds

### **Layer Three**

Private Equity  
US Direct Real Estate  
US REITs  
Global Real Estate Securities  
Diversified Hedge Funds  
Long Bias Hedge Funds  
Commodities/Nat Res

\* These Asset Categories generally reflect lower-tracking error versus Plan Liabilities. Suitable for Hedging Portfolios