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Volume 19 | Number 1 | Winter 2007

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ISSUE

Why liability-driven investing is gaining momentum.

## The Rise of Liability-Driven Investing

Traditionally, defined benefit pension plan sponsors have managed their plans' investment portfolios from an asset-only perspective, monitoring the value of plan assets while giving insufficient consideration to the risks and economic sensitivities of the liabilities.

While the defined benefit plan may be well diversified across different asset classes, it may not be the most efficient approach to hedge the future obligations.

Liability-driven investing (LDI) incorporates the value of a pension plan's liability into the portfolio construction process. In concept, the resulting investment portfolio will tend to experience changes in market value similar to changes in the liability value, thus keeping the plan's retirement benefits more closely aligned with the assets that will fund those benefits.

The defined benefit pension liability represents the present value of all future retirement benefits payments that must be paid to former, current, and future employees. The liability's value is influenced by many economic factors and can change greatly over time. Its value can be estimated by discounting the future payments by a series of interest rates that represents the yields on a series of high quality fixed income instruments with a payment structure that matches the structure of the benefits payments.

Shifts in the interest rate yield curve due to inflationary pressures or the business cycle will cause changes to the liability's present value. An increase in interest rates will reduce the liability, while a drop in rates will raise the liability<sup>1</sup>. LDI introduces this potential volatility into the portfolio construction process, enabling the plan sponsor to build a portfolio of assets that will move in line with the value of the liability.

### Why Now?

A shift toward LDI has recently been gaining momentum as a result of several factors, including recent changes to corporate regulatory and accounting provisions. The Pension Protection Act of 2006 and recent actions by the Financial Accounting Standards Board (FASB) have both contributed to the growing interest. These developments have accentuated the importance of managing the pension fund with an understanding of the economic characteristics of the liability. It must be stressed that plan sponsors retain the

<sup>1</sup> Single employer and not-for-profit plan sponsors are exposed to changes in interest rates resulting in changes to the liability's present value. For multi-employer and Public plans, the liability's present value is not exposed to changes in interest rates.

obligation of managing the plan for the exclusive benefit of the participants.

The Pension Protection Act, signed into law during August 2006, was drafted to provide new funding rules for single employer and not-for-profit plans and to modify funding rules for multi-employer plans. It has several principal goals. First, it imposes minimum plan funding targets, with a goal of 100% (where plan assets equal liabilities) over a specified period of time. Next, the Act aims to standardize pension asset and liability calculation. Assets will be valued on a fair value basis or a smoothing method basis. Under the Act, the guidelines for the smoothing method are more stringent than prior regulations. Liabilities will be valued using a term structure of interest rates specific to the length of the obligation<sup>1</sup>. Also, the Act requires plan sponsors to provide an annual funding notice to participants and the Pension Benefit Guarantee Corporation. The annual IRS Form 5500 will also require more detailed information regarding the plan.

In addition to the Pension Protection Act, FASB has supplemented its rules for reporting pension obligations. Recent actions<sup>2</sup> now require that sponsors record a pension plan's funded status (plan assets minus plan liability) in its statement of financial position. Sponsors with overfunded plans will report an asset on their balance sheet; sponsors with underfunded plans will report a liability. Also, plan sponsors must recognize on the income statement gains or losses not associated with annual pension costs. Many sponsors will experience more volatile earnings due to the changes regarding the expensing of benefit credits or prior service costs.

FASB issued the Standard to ensure that plan sponsors communicate the funded status of their plans in a more complete and understandable manner. Existing standards allowed sponsors to report funded status in the financial statement footnotes, rather than as an entry on the company's balance sheet. Additionally, prior standards did not

require the sponsor to fully recognize on the income statement the financial effects of certain events affecting the plan's funded status.

LDI promotes financial stability and may help sponsors meet the requirements of the Pension Protection Act by enabling them to build a portfolio that will reduce the volatility of the funded ratio (ratio of plan assets to liabilities).

## How is it Implemented?

Modeling a portfolio that incorporates plan liabilities can be very complex, given the uncertainties of future economic growth, employee demographics, and myriad other factors. Actuaries estimate future benefits payments using sophisticated models. Accurate estimates of the future payments are crucial to modeling the value of the liability and building a portfolio to offset this obligation. The overall goal is to build a portfolio that will have short-term cash flows that match any benefits payments and to generate long-term capital growth that will compensate for potential increases in the liability.

Estimating the future obligations is simplified by splitting the payments into pools of liabilities that have similar characteristics, such as: benefits owed to former employees and retirees, benefits already earned by current employees, and benefits yet to be earned by employees.

Benefits payments for former employees and retirees can be estimated with some certainty, since their employment service is complete and no more wages will be earned. These payments are similar to the coupon and principal payments of a bond. The asset that best matches such a liability is a portfolio of bonds with cash flows that approximate expected benefits payments.

Benefits that will be paid to current employees must be divided into two pools: benefits already earned and benefits yet to be earned. The benefits already

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<sup>2</sup> Statement of Financial Accounting Standards No. 158, Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans.

earned can be modeled similarly to the payments to retirees, by holding bonds with cash flows similar to the expected future payments.

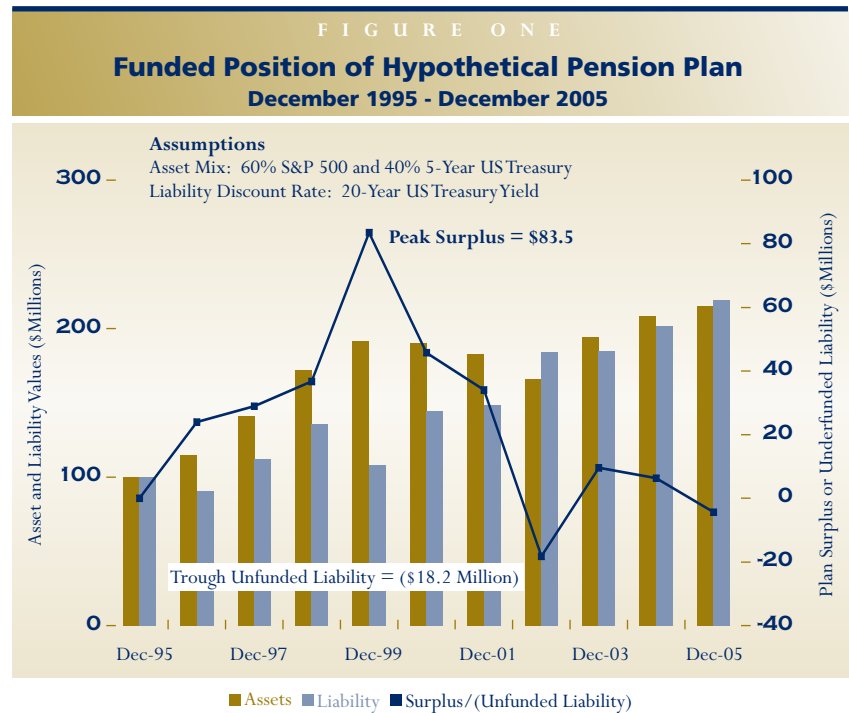
Benefits yet to be earned are typically driven by length of service and future earnings growth<sup>3</sup>. Future earnings may be impacted by inflation and real wage growth<sup>4</sup>. Future benefit payments attributable to inflation can be mimicked using bonds that make payments which rise with inflation. The US Treasury issues inflation-indexed bonds called Treasury Inflation Protected Securities, or TIPS.

Real wage growth has historically been correlated with productivity increases and economic growth. Economic and real wage growth are both difficult to predict with precision, so it is not feasible to model future payments with a fixed income strategy. Because equity returns are driven by economic growth, a stock portfolio might hedge future benefits payments.

Asset/liability software can divide the plan's total liability into its various exposures and determine an effective asset allocation. For a typical defined benefit plan, the portfolio will have a meaningful exposure to fixed income, which will help offset part of the liability's volatility. A long duration (a measure of sensitivity to interest rate changes) exposure to fixed income will help to stabilize the plan's funded ratio if the liability duration is long. The portfolio might also have allocations to inflation-indexed bonds and equities to match the exposure to wage growth. If properly constructed, the portfolio should generate returns that correspond to changes in the liability, meaning that the plan's funded ratio will maintain a degree of stability over time.

However, implementing this type of strategy poses challenges. First, the model is heavily dependent on estimates for plan demographic experience, which may differ greatly from actuarial assumptions. Also, investments currently available cannot perfectly

replicate all future benefits payments. Finally, the portfolio described above would be considered the "low risk" approach, which has the highest chance of tracking the current liability. If the defined benefit pension plan is currently underfunded, the sponsor may still be required to contribute funds to boost the funded status.



A similar, simpler approach is to split the current portfolio into two sub-portfolios: one that hedges the inflation and interest rate risk inherent in the liability and one that generates a return above the liability. To be most effective, the hedging portfolio's duration must be similar to the liability's duration. This will minimize the impact that interest rate fluctuations have on the funded ratio. The second sub-portfolio should be invested in higher-yielding assets that are not significantly correlated to the liability, such as equities and alternative assets. The higher return potential of these asset classes may help to reduce the contributions required by the plan sponsor.

<sup>3</sup> For frozen plans, there are no future benefit accruals.

<sup>4</sup> Future benefits for multi-employer plans accrue subject to negotiated collective bargaining agreements.

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Finding the optimal asset allocation that hedges a significant portion of the liability, while allowing for sufficient investment returns is key to the process. A higher allocation to fixed income will reduce the expected return, but will also reduce the dispersion of future funded ratios. And longer portfolio duration will likely curtail the risk of the funded ratio declining, as portfolio assets experience changes in market value similar to the liabilities.

*Figure One* provides the historical perspective of the variability of a pension plan's funded ratio. This example illustrates how asset and liability values can diverge without a close link between the investment strategy and liability structure. The investment strategy allocates 60% to equities and 40% to fixed income. The current investment strategy does not align closely with the long-term liability. Fluctuations in liability values stem from changes in the discount rate and the passage of time. Asset values fluctuate in response to variability in capital market returns. Pension plans with similar asset allocations and interest rate exposures may also be exposed to this funding risk.

A sponsor with an overfunded plan may prefer a portfolio with longer duration, in order to neutralize as much interest rate risk as possible, thus maintaining the plan's overfunded status. According to Yanni Partners' current capital market assumptions, an underfunded plan might benefit from a portfolio with a shorter duration. For an underfunded plan, decoupling the performance of the assets from the liabilities might improve the plan's prospects (in the current environment) for an increase in the funded ratio.

## Conclusion

Several factors have contributed to the growth in LDI, among them recent changes to pension plan regulatory procedures and accounting methods. At a minimum, a plan sponsor can lengthen the duration of the plan's portfolio, in order to offset some volatility in the liability. Or a plan sponsor can neutralize the liability's volatility through a cash flow matching strategy. Both approaches require a careful analysis of the plan's assets and liabilities, as well as frequent communication with the plan actuary and investment managers. Yanni Partners' portfolio modeling capabilities give us the resources to help our clients implement the appropriate strategy for their pension plans, whether it is a liability-driven process or a traditional asset allocation.



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Yanni Partners provides a full range of consulting services vital to the management of various portfolios. Our ultimate goal is to offer a basis for improved investment monitoring and performance.

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