

# MANAGING LIABILITIES: THE TRUE PENSION OBJECTIVE

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The objective of a pension fund is: 1) to pay or fund the pension liability; 2) at the lowest cost to the plan sponsor; 3) subject to sensible risk. Historically, pension plans have traditionally focused on the performance of assets with slight or no regard for the performance of a plan's liabilities. Plan sponsors, their advisors, and other stakeholders are now beginning to recognize that significant attention must also be given to the characteristics and performance of plan liabilities. Such an economic analysis will reduce cost and risk and therefore increase the likelihood that pension plans will satisfy their objective of being able to fulfill their benefit obligations as they become due. Moreover, asset/li-

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bility management, or Liability Driven Investment (LDI), is an appropriate tool whether a pension plan is over- or under-funded and can be utilized by both private sector and governmental plans.

Several factors have resulted in this increased interest in LDI. The Financial Accounting Standards Board's (FASB) new standards for reporting liabilities (FAS 158) will require public companies to recognize the funded status of their pension and other postretirement benefit plans on their balance sheets. FAS 158 represents the first phase of FASB's two-phase postretirement benefit accounting reassessment.

The Pension Protection Act of 2006 (PPA), signed into law by President Bush in August, reformed the rules for measuring pension liabilities and established new minimum funding standards for defined benefit plans. There will be consequences if employers fail to achieve funding benchmarks. This new regime will require plan sponsors to better assess the impact of potential balance sheet changes and consider the appropriateness of mitigating funding volatility.

In addition, litigation risk may be mitigated through utilization of an LDI strategy. Currently, some plan sponsors seek to maximize their plan's investment returns by allocating funds to those asset classes with the highest anticipated returns while others allocate assets based on generic investment targets, for example investing 60% in equities, 35% in bonds, and 5% in cash. In both cases, there has been little analysis of when the benefit payments that have accrued will be paid. For example, if a large percentage of plan assets will be paid in the near term, a large investment in more volatile asset classes may leave a plan with insufficient assets to pay accrued claims if those asset classes have diminished in value at the time large distributions have to be made. This situation may result in litigation by plan participants whose benefits may be reduced or by the PBGC or Department of Labor, which may find fault with the plan's investment management. This litigation risk may be mitigated if plan investments were coordinated with the particular plan's liability/benefit schedule. In that case, short-term li-

abilities would be matched with short-term assets, mid-term liabilities would be matched with mid-term assets, and so on. Thus the value of both assets and liabilities would move in tandem, and volatility and the risk that benefits could not be paid—the major cause of litigation—would be diminished. Moreover, plan investment fiduciaries would be able to defend their course of action by specific reference to their plan's unique characteristics and to the investment approach which was taken into account with regard to the plan's anticipated distribution requirements.

The new FASB requirement to mark-to-market pension assets could result in huge swings on financial statements. Increased recognition of funding volatility has become, for some, an additional reason to terminate pension plans. Volatility and resulting contribution increases may be minimized when anticipated benefit distributions drive asset allocation decisions. Consequently, the new legal and accounting environments are sparking a renewed interest in LDI for pension plans, with pension obligations driving the asset allocation decision.

An LDI strategy may pass muster under ERISA's fiduciary standards. The Department of Labor (DOL) recently ruled in Advisory Opinion 2006-08A that a plan fiduciary may consider the volatility of plan liability obligations when creating an investment strategy for a pension plan, notwithstanding the fact that the plan sponsor would also benefit by a reduction in the volatility of the plan's contribution level. The DOL decided that it would not violate ERISA's fiduciary standards to develop an investment strategy that attempts

to prevent an increase in underfunding levels. The agency noted that plan fiduciaries have broad discretion in defining investment strategies appropriate for their plans. In this regard, the DOL stated that there is nothing in ERISA or the regulations that would limit a plan fiduciary's ability to take into account the risks associated with benefit liabilities or how those risks relate to the portfolio management in designing an investment strategy. For these reasons, the DOL found that a fiduciary would not violate its fiduciary duties under ERISA solely because the fiduciary implements an investment strategy for a plan that takes into account the liability obligations of the plan and the risks associated with such liabilities and results in reduced volatility in the plan's funding requirements.

Ideally, investment returns on pension assets should be the primary source to fund liabilities, rather than pension contributions coming from either the employer, the employees, or in the case of public funds, current or future taxpayers.

For many plan sponsors, pension liabilities are one of their largest liabilities. Traditionally, most pension asset managers are given a generic index as their benchmark, which may have no similarity to the behavior pattern of their unique stream of liabilities. Furthermore, actuaries often price liabilities differently than either the market does or the Financial Accounting Standards Board (FASB) would confirm as proper. Indeed, it has become common practice for actuaries to price all liabilities at the same interest rate regardless of their maturity or payment due date. Too often, this discount rate is much higher than the rate that

might be obtained in the market for obligations with identical maturities, causing a reduced valuation of liabilities. Moreover, liabilities are analyzed annually, with the data only available after a lag in time. Given all this confusion, it is difficult, if not impossible, for the asset side to "understand" the liability side. By losing sight of the true pension objective, several problems may develop.

### **FIRST DILEMMA: GENERIC OR IDENTICAL ASSET ALLOCATION**

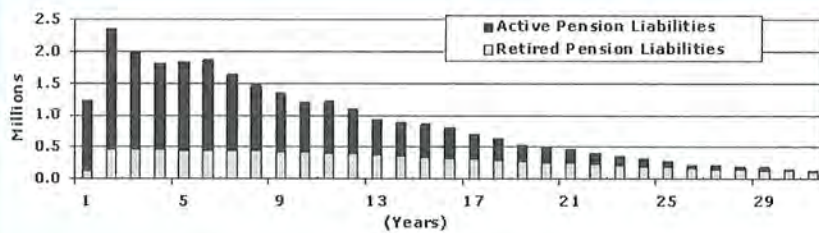
The goal of traditional asset allocation is to create the optimal absolute return. As a result, stocks are favored and plan sponsors are avidly exploring the introduction of additional asset classes with anticipated higher returns. However, the true objective of asset allocation should be to create the optimal relative return versus liabilities. Each plan has a unique liability term structure based on the plan's demographics, economic assumptions, and design. Similar to snowflakes, no two pension liability schedules are identical. FASB 87, Paragraph 199, recognizes this difference:<sup>1</sup>

A plan covering only retired employees would be expected to have significantly different discount rates from one covering a work force of 30-year-olds.

Logically, therefore, the liability term structure should dictate the shape of the asset allocation. Unfortunately, most asset allocation models have no input for a plan's liability characteristics. They only analyze historical generic market indices. Without an application of a plan's liability structure to its asset mix, all plans could be invested in a nearly identical manner.

## EXHIBIT 1

## Plan A: Liability Duration = 9.6 years



Let's take, for example Plan A and Plan B:

**Plan A: Liability Duration = 9.6 years**

Plan A is a mature company which has a complement of relatively old active employees and retirees, with pension liabilities heavily skewed to current retirees. Thus Plan A has a duration<sup>2</sup> of only 9.6 years with 58% of its liabilities coming due in the near to intermediate term. These shorter liabilities should be invested in Treasury bills or bonds with a duration similar to those of the maturing liabilities so that the funds are readily available to meet payouts and the plan does not have to liquidate assets at a loss to cover known distributions. Only 42 percent of its liabilities are long liabilities, suggesting an allocation of 42 percent to long assets, unless there is an unusual deficit/surplus situation.

**Plan B: Liability Duration = 14.5 years**

Plan B has a very young participant group with few retirees. Its liability duration is 14.5 years. Over 57 percent of Plan B's liabilities are greater than 10 years, suggesting an allocation of 57 percent to long assets, unless there is an unusual deficit/surplus situation. Again, the 43% of its liabilities that are due in the near to intermediate term should be invested in Treasury bills

or bonds with a duration similar to those of the maturing liabilities.

The assets of these two plans should not be invested in the same way. Rather, in order to prevent a funding mismatch of assets versus the liabilities, the term structure of each pension liability payout schedule should become the base for asset allocation, or LDI. Asset allocation should be tailored to each plan's unique liability situation and not based on generic models which may indiscriminately assign the same percentage of asset classes to plans with entirely different liability schedules.

**SECOND DILEMMA: INAPPROPRIATE PERFORMANCE MEASUREMENT**

Historically, asset performance has been measured against generic indices (e.g., S&P 500). Performance is measured by comparing the total return of an asset class (e.g., stocks, bonds) to the generic market index for that asset class. Money managers are hired and fired based on their performance versus an assigned generic asset index.

An important reason why this situation persists is that pension liabilities are traditionally calculated annually and reported months after the fact. Significantly, the present value pricing of liabilities is done in a way that the asset side does not understand (assuming the use of non-market rates) how

the liabilities are moving. It is extremely difficult, if not impossible, for an asset manager to manage against such an objective.

What is needed is a liability index system that correctly prices plan liabilities (in conformity with the FASB) as a tangible, frequent (i.e., daily) system for investment management. The asset side must know the liability growth rate and the liability term structure. Performance measurement can then be properly assessed as the growth rate of assets versus the growth rate of liabilities that each asset class is funding (i.e. short assets vs. short liabilities, long assets vs. long liabilities, etc.).

Frequently, plan sponsors and their actuaries and investment advisors do not recognize that their plans may be losing ground despite experiencing good investment returns in excess of those assumed in their actuary's projections. The following exhibit is based on a hypothetical plan's asset allocation and assumes the plan was fully funded in the base year 1997. The table illustrates how, over time, a plan's assets could lose ground to the liabilities because of the mismatch of assets to the duration of the liabilities. Over the ten-year period illustrated, the funding level decreased from more than 100% to only 88.6% with significant fluctuations in the interim.

Note that in 2004 this hypothetical plan earned 8.93% on its assets. Most plans assume that plan investments will earn between 7% and 8% per year. In 2004, a typical plan sponsor would have focused on the investment returns and have been satisfied because the investment return exceeded the plan's ROA assumption. However, liabilities increased by 10.25% that year and the plan was less well

## EXHIBIT 2

Incorrect Single Discount Rate	Correct Liability Rate (Average Rate)	Yield Difference	Average Liability Duration (Years)	Present Value Difference
7.50%	5.00%	2.50%	15	37.50%

Note: Present Value Difference = Yield Difference  $\times$  Duration

funded at the end of the year. This would have come as a shock to most plan sponsors which disregard the performance of their plan's liabilities.

### THIRD DILEMMA: PRICING ALL LIABILITIES IDENTICALLY

The Financial Accounting Standards Board (FASB) specifies the financial statement reporting of pension liabilities for private sector businesses and has become the model that all pension funds should follow. FASB requires that the market value of assets be compared to the present value of liabilities marked to current market rates. In addition, the FASB requires that the present value of liabilities be calculated (priced) using individual discount rates for each liability payment date rather than on some "blended" basis.

FASB 87, paragraph 44 reads:

Assumed discount rates shall reflect the rates at which the pension benefits could be effectively settled ... In making those estimates, employers may look to rates of returns on high quality fixed income investments currently available and expected to be available during the period to maturity of the pension benefits.

FASB 87, paragraph 199 continues:

Interest rates vary depending on duration of investments; for example, Treasury Bills, 7-year bonds and 30-year bonds have different interest rates. The disclosures required by this Statement regarding components of

the pension obligation will be more representationally faithful if individual discount rates applicable to various benefit deferral periods are selected.

According to FASB 106, Paragraph 186:

The obligation would equal the current market value of a portfolio of high-quality zero coupon bonds whose maturity dates and amounts would be the same as the timing and amounts of the expected future benefit payments.

Under FASB rules, pension liabilities should be priced like a high-quality zero-coupon bond portfolio whose par values match the liability payment amount and whose maturities match the liability payment dates.

However, most plans use a single discount rate to price all liabilities. This single discount rate is normally around 100 basis points or more higher than the market rate. To convert this yield difference to a present value difference (\$), multiply the yield difference by the average duration of the plan's liabilities:

### EXAMPLE OF CONVERSION OF DISCOUNT RATE DIFFERENCE INTO PRESENT VALUE DIFFERENCE

According to the above exhibit, if liabilities were priced 250 basis points above the market (yield), this would translate into a 37.50% lower valuation, i.e., mispricing, of the liabilities. Shorter duration

pension plans (skewed to retirees or "new" cash balance plans) may experience even higher disparities, as the weighted average discount rate could be lower in a "normal" upwardly-sloped yield curve environment. This undervaluation is critical if it results in lower plan contributions in the short term, which will consequently require: higher future contributions; higher investment returns than historical data suggest; and/or diminution of future benefit accruals.

### FOURTH DILEMMA: INAPPROPRIATE BENCHMARKS

The appropriate benchmark for pension assets is a custom liability index that properly represents the present value growth of the plan sponsor's unique liability schedule. Generic indices that measure asset classes (e.g., S&P 500) are inappropriate measurements of liability growth. Only a liability index that matches the plan sponsor's unique benefit payment schedule can accurately reflect the plan's future obligations. Particular attention should be paid to the liability schedule, and appropriate, timely changes should be made to it if the plan sponsor's circumstances deteriorate or if actuarial assumptions are out-of-date. For example, a significant reduction in the workforce might result in larger distributions in the near term than had been previously anticipated. Similarly an increase in longevity may necessitate an increase in liabilities. In these cases, the distribution schedule should be updated and the investment mix reevaluated to reflect the new circumstances. Moreover, future contributions might prove to be lower than had been anticipated in that situation. It is important for the assumptions



## EXHIBIT 4

## Asset / Liability Watch

Index	Weight	Total Returns										
		'97	'98	'99	'00	'01	'02	'03	'04	'05	Dec '06	
RL Cash	5%	5.72	5.48	4.24	6.49	4.97	1.75	1.04	1.22	3.17	4.89	
LB Aggregate	30%	9.65	8.69	-0.80	11.63	8.44	10.25	4.10	4.34	2.43	4.33	
S&P 500	60%	33.34	28.55	21.03	-9.09	-11.88	-27.00	28.69	10.87	4.89	15.81	
MSCI EAFE Int'l	5%	2.08	20.24	27.32	-13.87	-21.11	-41.44	39.17	20.70	14.02	26.87	
Assets	100%	22.99	21.39	13.72	-2.49	-5.40	-11.40	20.05	8.93	4.60	12.26	
RL Liability	100%	19.57	16.42	-12.00	26.56	3.20	18.78	2.25	10.25	10.64	1.46	
Assets - Liabilities		3.42	4.97	25.74	-29.05	-8.60	-50.18	17.80	-1.32	-6.04	10.80	
Surplus/(Deficit)		100.00	102.86	107.25	138.62	106.80	97.90	73.03	85.74	84.71	80.08	88.60

Assumptions: Pension plan is fully funded on January 1, 1997  
 Service costs = annual contributions  
 No benefit enhancements  
 Assets portfolio rebalanced monthly

versus the liability growth these assets are funding. Thus, the performance of each asset class should be measured against the segment of liabilities it is meant to fund.

### Solution III: Fund Liabilities by Matching the Asset Class to the Liabilities

Short assets, such as cash, should be matched against short liabilities with a similar duration. Treasury and corporate bonds are more suitable for intermediate liabilities. For investors willing to tolerate the additional volatility risk, investments in equities, international assets, real estate, and other alternatives may be included in the portfolio as a hedge against long and very long liabilities.

For asset managers and plan consultants to function effectively, a liability index should be updated frequently. The index should conform to FASB pricing requirements. Asset allocation and performance measurement can best be understood once the weight and growth rate of each liability maturity sector

(term structure) is calculated. Term structure precision is a critical calculation. Without accurate liability term structure definitions and measurements, plan sponsors face ambiguous asset allocation and performance measurements.

Pension plans do not have infinite duration, as the large number of recent plan terminations demonstrate. Plan sponsors, particularly those in declining businesses, should therefore seek to analyze their plans' funding statuses based on valid economic assumptions and data rather than on conventional factors which have small relationship to their plans.

If asset managers can better understand the risk/reward behavior pattern of the liability opponent, they can better strategize how to outperform such an opponent. If consultants can understand the term structure of liabilities, they can build proper assets allocations for each term structure area (e.g. long assets versus long liabilities).

## CONCLUSION

Without accurate liability term structure measurements, plan sponsors face the greatest risk there is: i.e., having insufficient assets to fund liabilities when the sponsor does not have the capacity to continue the plan. The S&L crisis is too vivid an example of what can happen with mismatched term structure exposure.

In conclusion, different asset classes are correlated with different risk and reward characteristics. Without accurate liability term measurements, plan sponsors and their advisors are limited in their ability to properly match their assets to their pension and other postemployment liabilities. This, in turn, prevents them from satisfying their objective of funding benefit obligations when they come due at reasonable expense and minimal risk.

## NOTES:

- 1 The citations to FASB standards have not been amended by the new FAS 158 which explains how employers are required to account for pension and other postemployment benefits.
- 2 The duration of any security or series of securities provides a measure of the risk with which the sensitivity of bonds or bond portfolios to interest rate changes can be estimated. The calculation is based on the weighted average present values for all cash flows in the portfolio. It represents the weighted average length of time that a plan will pay benefits to an average participant. A 1% increase (or decrease) in the interest rate accordingly produces a percentage fall (or rise) in the price in proportion to the duration. In the above example, if the duration (discounted present value) of Plan A's liabilities is 9.6 years and the interest rate drops by 1%, the price of Plan A's liabilities will increase by approximately 9.6%.
- 3 Graphics supplied by Crandall and Pierce