

# QUARTERLY FOCUS CUSTOMIZING LDI

By Aaron Meder

## LIABILITY DRIVEN INVESTING (LDI) IS EMERGING AS BEST PRACTICE FOR CORPORATE PLAN SPONSORS.

**L**DI approaches have been adopted by an increasing number of institutions. However, LDI solutions have not yet displaced the traditional asset-only approach in most plans due to general confusion about what LDI means exactly and, more importantly, a lack of clarity about how the practice can be tailored to each sponsor's unique situation.

In this article, we aim to make LDI more accessible by providing a simple definition and by showing how plans of different sizes and circumstances may adopt an appropriate LDI approach. To do so, we look at specific sectors of the S&P 500 and find that sectors' varying circumstances lead to significantly different LDI solutions in the areas of return generation, liability hedging and overall risk budgeting.

### INTRODUCTION: LIABILITY DRIVEN INVESTING (LDI)

The concept of managing risk and return relative to liabilities is not new. Stated simply, LDI involves taking compensated risks relative to a liability benchmark (a future stream of projected cash flows to plan participants). But LDI is not simply about investing in an LDI benchmark—typically long-duration bonds—but rather understanding the risks being taken relative to the liability, and then taking compensated risks while hedging uncompensated risks.

Moving from the traditional “65/35” (65 percent equities, 35 percent bonds) policy to the more efficient liability-relative frontier involves splitting the portfolio into two components: a liability-hedging component and a return-generation component:

- The allocation to hedging liabilities focuses on hedging risks in the liability that the sponsor does not wish to accept (i.e., interest rate risk and inflation). This component typically consists of long duration, inflation-linked bonds and derivatives.



- The return-generation component seeks to generate consistent returns in excess of the expected liability return (growth in the present value of the liability attributable to the passage of time, equal to the discount rate on the liability, which is about 5 percent to 6 percent in most countries today). Return generation typically consists of well-diversified asset classes with an emphasis on absolute return rather than benchmark-oriented return.

How can this generic LDI framework be applied to construct the right solution for each sponsor's unique situation?

### APPLICATIONS OF LDI ACROSS VARIOUS S&P 500 SECTORS

Our research has shown that three key factors—a sponsor's goals and objectives, funded status and time horizon—drive the customization of an LDI solution for individual plan sponsors.

To best illustrate a customized LDI approach, we will use actual, average data for plans within the 10 S&P 500 sectors as an example of how different situations (and sectors) lead to different solutions. While we focus on U.S. corporate plans in this article, the approach is applicable to corporate sponsors in many other countries and some public sector defined benefit plans as well, e.g., Canada and the United Kingdom.

Looking at the key data points in Table 1, we observe the following about the individual S&P 500 sectors with respect to goal, funded status and time horizon:

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**Table 1**  
Key LDI data points for S&P 500 sectors as of December 31, 2006

	Time Horizon Factors			Time horizon	Funding ratio	Beta
	Liability/market value	Credit rating	Excess liability growth (service cost/PBO) <sup>1</sup>			
Telecommunication Services	34.9%	BBB	1.8%	Short	121%	1.0
Consumer Discretionary	34.8%	BBB	1.7%		95%	1.2
Materials	32.5%	BBB	1.9%		93%	1.1
Industrials	28.0%	AA	2.6%	Average	97%	1.0
Utilities	27.6%	A	2.2%		96%	0.8
Information Technology	20.3%	A	2.2%		97%	1.5
Consumer Staples	10.5%	A	2.9%	Long	89%	0.5
Health Care	7.8%	AA	3.9%		88%	0.7
Energy	7.8%	A	2.7%		81%	1.0
Financials	6.6%	A	3.1%		105%	1.1
<b>S&amp;P 500 Sample (n = 360)</b>	<b>16.7%</b>	<b>A</b>	<b>2.4%</b>		<b>97%</b>	<b>1.0</b>

Source: UBS Investment Bank, UBS Global Asset Management, Bloomberg.  
For illustrative purposes only.  
<sup>1</sup> Projected Benefit Obligation.

return generation. In addition, funded status affects the tactical and behavioral aspects of hedging liabilities. It should be noted that only two sectors of the 10 S&P 500 sectors are in a surplus position.

*Time Horizon:* Is the sponsor concerned about the plan’s funded status over the next year, five years or 30 years? This is typically a function of the relative size of the plan (pension liability compared to company market value), the health of the sponsor (credit rating) and the maturity of the plan (liability growth). Based on

*Goals:* A sponsor must consider the short- and long-term goals for the plan. A few common examples can help illustrate how companies’ goals may differ. One common objective for a frozen plan is to reduce the year-to-year volatility of the surplus, while growing the surplus and funding ratio modestly over time. A plan may target a funding ratio of 100 percent to 120 percent—high enough to reach an annuity buyout level over a specific time frame (in this case, five to 10 years). Meanwhile, a common goal for an ongoing plan—most likely found in sectors with long time horizons—is to achieve a long-term return target while minimizing the volatility of contributions along the way.

*Funded Status:* A sponsor must consider the plan’s current level of assets to meet its future obligations. All else being equal, the greater the value of assets, the less return is needed to meet future obligations. In other words, the plan’s funded status drives the need for long-term

these factors, we have split the S&P 500 sectors into two groups: those likely to have short time horizons, and those with average to long time horizons.

Six factors help determine LDI policy		
1. Balance between alpha and beta	}	Return generation
2. Allocation to alternatives		
3. Policy hedge ratio	}	Liability hedging
4. Tactical implementation		
5. Allocation to return generation	}	Overall risk budgeting
6. Management of risk budget		

## FINDING THE RIGHT LDI APPROACH

We believe there are six key considerations that must be addressed for a sponsor to find the right LDI strategy. These considerations are partially driven by the key factors discussed above, and can be classified under three broader categories:

### *1. Return Generation Considerations*

Balance between market risk (beta) and active risk (alpha): Alpha has the much-desired quality of being uncorrelated with beta. When combined with beta, alpha can reduce overall risk while maintaining or even increasing return expectations. Unlike alpha, beta risk on average will compensate the investor who takes it. There are two factors that cause sponsors to persistently tilt their return-generation component toward either alpha or beta:

- Ability to tolerate equity market volatility: Plans with shorter time horizons have less ability to tolerate equity market risk and to wait for markets to revert after a period of sharp downside deviation. Plans in this situation should consider a higher allocation to alpha to reduce annual volatility of asset returns.
- Link between company's financial health and the health of the overall economy: A company's beta serves as a good indicator. For example, a company with a beta significantly greater than one is very sensitive to economic swings. If such a sponsor has a large allocation to equities, and equity markets fall significantly, the sponsor may be required to make a large contribution at precisely the time when the financial health of the company is in a weakened state.

Allocation to alternatives: Alternative assets, such as real estate, private equity, hedge funds and natural resources offer the investor an opportunity to further diversify sources of return and enhance risk-adjusted performance. But the benefits do not come free, as these

asset classes decrease the liquidity of the overall pension fund. Since pension plans have different liquidity needs and time horizons, their allocation to alternatives should be adjusted accordingly. Sponsors with shorter time horizons and greater liquidity needs would typically allocate a smaller amount to alternatives. Likewise, mature pension plans that are paying out large sums in benefit payments should avoid large allocations to alternatives, as their allocation to such assets can rise to an undesirable level.

### *2. Liability-hedging Considerations*

Policy liability hedge ratio: The hedge ratio is the duration of the hedging component—typically domestic investment grade fixed income and derivatives) divided by the duration of the liability, indicating the percentage of the liability being hedged by the hedging component of the overall LDI solution. For example, suppose 50 percent of a plan's assets are allocated to a liability-hedging component with a duration of 20 years and the duration of the liability is 10 years. The hedge ratio for this investment strategy would be 100 percent  $((20 \times 0.50) / 10)$ . A hedge ratio of 100 percent implies that the investor assigns no "hedging credit" to the other 50 percent of the portfolio invested in the return-generation component.

But should any hedging credit be assigned to the return-generation component? The answer to this question is primarily a function of the time horizon on which the plan sponsor is focused. Most long-term asset-liability models assume a positive correlation between return generation assets (i.e., equities) and liabilities, which implicitly assigns long-term hedging credit to equities. For sponsors with long time horizons, it may be reasonable to rely on this long-term hedging credit of the return-generation portfolio and therefore desire a hedge ratio of less than 100 percent. For companies in S&P 500 sectors with short time horizons, the focus is more on the short-term relationship between assets and

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liabilities. In these cases, it is not appropriate to assign a long-term hedging credit to the return-generation component because, over the short term, the correlation (and corresponding hedging credit) between the liability and equities, for example, is unstable and sometimes negative. Therefore, plans with short time horizons should desire a policy hedge ratio of 100 percent.

Tactical implementation of a liability hedge: Whatever the policy hedge ratio, a plan sponsor must decide how it is best implemented. Today, most plans have only a very small hedged position (roughly 10 percent hedged), so it is important to consider how to bridge the very large gap of a position that is 10 percent hedged to one that is, for example, 100 percent hedged. We believe that in many cases a sound plan of layering the hedge over time should be implemented, as opposed to moving to the desired hedge position all at once.

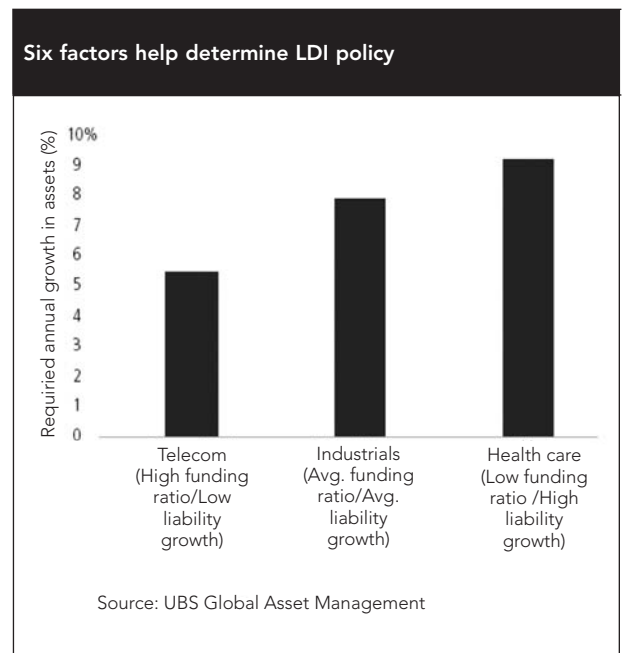
Two factors drive the decision how to implement: the plan’s funded status and the plan sponsor’s overall interest rate view. If a plan has a funding deficit and the plan sponsor believes interest rates will rise, it will be reluctant to lengthen the duration of assets. Here, the sponsor maintains that rising interest rates will improve the funded status of the plan as the present value of liabilities fall by a greater amount than the assets do. For sponsors in this situation—typical for eight out of the 10 S&P 500 sectors—we would recommend a hedging implementation plan that layers the hedge in stages as the funded status improves and/or interest rates rise over time. However, in cases when the plan has a significant surplus—such as in the telecommunications sector—we recommend protecting the surplus and moving quickly to the desired policy hedge position.

**3. Overall Risk Budget Considerations**

Allocation to return generation: The plan’s current funding ratio and expected liability growth determine the level of required growth in assets needed to meet the plan’s obligations over its entire lifetime. All else being equal, the higher the funding ratio, the lower the need for

asset growth. Liability growth refers to how fast liabilities are expected to grow due to the passage of time and the additional benefits earned (service cost). The higher the expected liability growth is, the higher the need for asset growth.

Exhibit 1 provides an illustrative example of the level of long-term growth needed for certain S&P 500 sectors.



In this example, the telecommunications sector with its high funding ratio and low expected liability growth needs the lowest amount of growth in assets to meet its obligations. The industrials sector represents a typical required growth of 7.9 percent with its average funding ratio and liability growth. The health care sector is an example of a sponsor with a high need for asset growth long term, approximately 9.2 percent, due to its low funded status and very high liability growth.

Dynamic risk budgeting: As a sponsor’s funding ratio, time horizon and goals change, its risk/return needs and preferences can change as well. Assuming no change in a plan’s contribution and benefits policies, an increase in its funding ratio would require the plan to generate less return and take less risk. As the time horizon shrinks, the plan will become even more risk averse and demand more return for a given level of risk. Additionally, as the strategic goal of the plan changes, the need for return and risk taking change as well.

For example, freezing a pension plan reduces the need for return, shrinks the time horizon and provides incen-

tives to transfer the obligations elsewhere. Overall, we find that sponsors with shorter time horizons and well-defined funding ratio targets reap the most reward from a dynamic approach to managing the overall risk budget.

### PUTTING IT ALL TOGETHER: DIFFERENT SITUATIONS LEAD TO DIFFERENT SOLUTIONS

Table 2 summarizes the S&P 500 sectors with respect to the key considerations discussed. It is apparent that the circumstances for the 10 sectors vary significantly and lead to very different solutions, which is a strong indica-

Table 2: Summary of Key considerations for companies in S&P 500 sectors

Sector	Telecom	Consumer discretionary	Materials	Industrials	Utilities	IT	Consumer staples	Health care	Energy	Financials
<b>Return generation</b>										
Balance between active management and market risk	Active tilt	Active tilt	Active tilt	Balanced	Balanced	Active tilt	Market tilt	Market tilt	Market tilt	Market tilt
Allocation to illiquid assets	Low	Low	Low	Average	Average	Average	High	High	High	High
<b>Hedging</b>										
Strategic hedge ratio	100%	100%	100%	<100%	<100%	<100%	<100%	<100%	<100%	<100%
Tactical hedging	Quickly	Staged	Staged	Staged	Staged	Staged	Staged	Staged	Staged	Quickly
Hedging focus	Surplus	Funding ratio	Funding ratio	Funding ratio	Funding ratio	Funding ratio	Funding ratio	Funding ratio	Funding ratio	Surplus
<b>Overall risk budget</b>										
Allocation to return generation	Low	Low	Low	Average	Low	Low	High	High	High	High
Management of risk budget	Dynamic	Dynamic	Dynamic	Less Dynamic	Less Dynamic	Less Dynamic	Least Dynamic	Least Dynamic	Least Dynamic	Least Dynamic

For illustrative purposes only.  
 Source: UBS Global Asset Management.  
 The information and recommendations contained herein are a reflection of UBS Global Asset Management’s best judgment based on current market assumptions.

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tor that there will be no one-size-fits-all LDI solution for plan sponsors.

LDI can thus be described as the recognition of a plan's liability as an efficient benchmark around which risk budgeting should occur. We believe that as LDI is better understood, it will not only continue to gain acceptance,

but will be adopted by plan sponsors as best practice. Sponsors will need to break from traditional "65/35" ways of thinking in favor of new approaches. To that end, we believe that a plan equipped with a comprehensive LDI approach, reflective of its specific situation, will provide the best chance for success. **3**



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