

DEVELOPING A LIABILITY BENCHMARK

Shifting pension plan performance measurement to a liability benchmark offers a clearer picture of a plan's ongoing health and viability.



In the wake of pension legislation passed in the United States, the United Kingdom and Europe, pension plan sponsors and trustees are looking at their plans in a new light. In a paradigm shift away from policy benchmarks, plan sponsors are beginning to measure asset performance relative to movements in liabilities. This trend has given rise to the need to create a new type of benchmark.

A liability benchmark represents the fair market value of a pension plan's obligations. In this context, it is similar to a standard market index that represents a collection of securities that can be used to analyze performance. In a liability driven investing (LDI) framework, however, the liability benchmark serves as the new scorecard for plan sponsors.

"At the end of the day, a pension plan exists for the purpose of providing benefits to pension plan participants. Therefore, the benchmark that measures the performance of plan assets should be the plan's liabilities," says Lee R. Freitag, product manager for liability driven investing strategies at Northern Trust. "Aligning the plan assets to make certain of these payments requires measuring their performance relative to the liabilities they are expected to support."

Creating the Benchmark

There are a number of steps to creating a liability benchmark, the first of which is to obtain the projected benefit cash flows from the plan trustees or plan actuary. By receiving the cash flows directly from these providers, all pertinent information is captured, such as service costs and projected salaries.

At this stage, the plan sponsor or trustee works with an advisor to determine the appropriate benefit payment profile to use in calculating the liability benchmark (see Typical Pension Benefits Profile chart). In the United States, this might be the accumulated benefit obligation or projected benefit obligation, while in the United Kingdom it is typically the defined benefit obligation.

It is important to note that no two plans are alike, and economic and demographic assumptions will differ for various plans by different actuaries. In addition, plan design will influence the liability benchmark result as the calculation takes into consideration factors such as cash balance plans and average pay plans. Also, because different countries have created distinct accounting rules and regulations that apply to their own market environment, the application of those rules and regulations will affect the calculation of benefit cash flows in various ways.



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Once all of these factors are taken into consideration, the cash flows need to be discounted to calculate their present value. "In the past, the discount rates used typically were not market-based and allowed for asset outperformance," notes Simon Cohen, senior pensions analyst at Northern Trust. "Stable and aggressive discount rates were used, resulting in stable and low plan liabilities." This led to plans reporting healthy funded statuses.

"If these same plans used a more 'conservative' discount estimate, then liability values would be much higher and plan funded status would be lower, and more conservatively estimated," adds Clint Cary, investment strategist at Northern Trust. "Today's regulatory environment has created a shift away from using non-market-based rates. Plans are being pushed

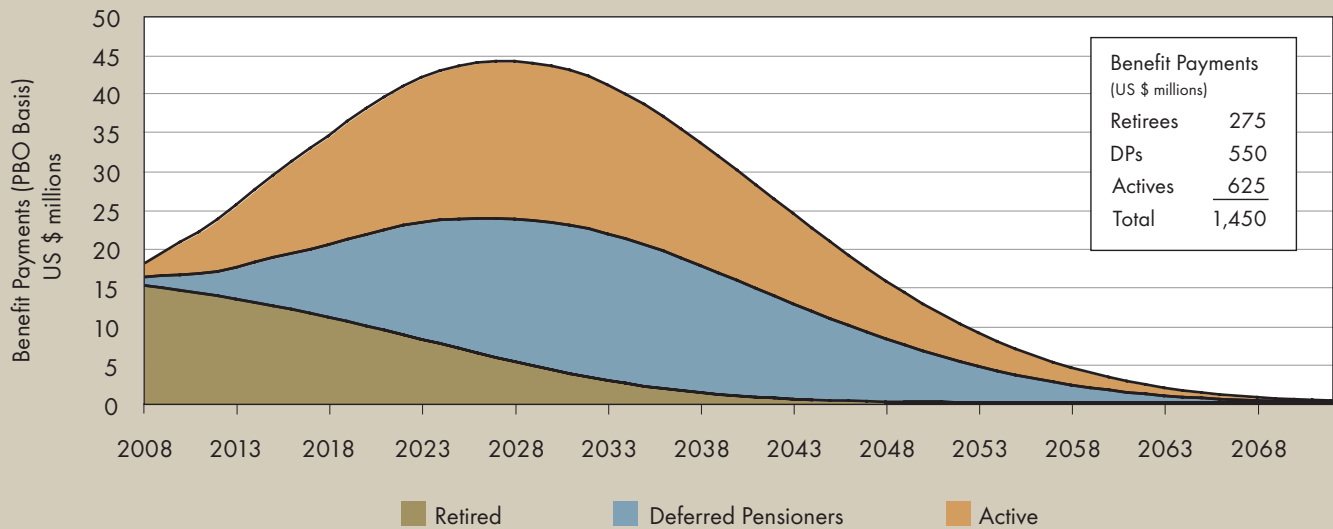
Building a Unique Benchmark

When creating and analyzing a liability benchmark, it is important to know that each plan has unique characteristics. Plan demographics, plan type, participant age, number of participants and many other factors come together to create a distinct liability cash flow profile.

Certain providers in the marketplace offer liability indices that benchmark the average pension plan liability. Although these indices may give plan sponsors a sense of how the average pension plan is performing, there is no substitute for using the plan's own unique liability structure to understand the inherent risk plan sponsors face in their own plan.

Typical Pension Benefits Profile

In building a liability benchmark, plan sponsors should replicate each plan’s unique liability structure by creating a benefit payments profile to help gauge a plan’s future obligations. By analyzing this structure across a full yield curve, plan sponsors can better understand where the interest rate risk is within the plan and how that is driving the liability benchmark return. In the profile below, a good portion of the interest rate risk exists between years 2023 and 2033, where benefit payments are the largest and will contribute significantly to the liability valuation.



Source: Northern Trust



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toward measuring liabilities using a full yield-curve approach based on corporate or government yield curves,” Cary says.

In using the full yield-curve approach, each cash flow relative to its point on the yield curve (i.e., key rate duration) is discounted back to the present. This allows for the better measurement of each cash flow and its contribution to the

overall return (and volatility) of the cash flows (i.e., benchmark).

In addition, this approach is a better method for managing the assets required to service plan liabilities, as those fixed-income portfolios are managed to full yield curves and not flat rates. For overlay portfolios, swaps also take into account the full yield curve. “Plan sponsors might want to use a number of different curves to discount their liabilities and create multiple liability benchmarks in order to better understand the sensitivities embedded in different scenarios,” Freitag says.

Measuring Performance

Once the discount method is suggested and the plan benefit cash flows have been obtained from the actuary, the liability benchmark can be created and measured. Measurement can occur on a monthly basis, or daily if more timeliness is desired.

The liability benchmark consists of several components, of which time return and curve return are key. The product of these two components will equal the total return of the liabilities.

The time return component accounts for the monthly difference in the present value of the liability stream holding the yield curve constant between the start and end of each month. “This component typically resembles the return of a short-term bond and exhibits less volatility of returns,” Freitag explains.

The curve return component of the benchmark calculation accounts for the monthly differences in the present value of the liability stream, taking shifts in the yield curve into consideration. “This component tends to exhibit more return volatility as it accounts for changes in the yield curve, taking into consideration all points across the curve,” Cary adds.

The chart below shows the actual U.S. Swap Curve at year-end 2004 through year-end 2006, and at June 2007. The shifts in the curves during these time periods indicate the volatility that may occur when utilizing a full yield-curve approach to value the plan’s liabilities.

Once the time return and curve return components are calculated, the two results are used to produce the total return figure. This benchmark can be used to compare plan results using standard benchmark analysis. This analysis may include calculating standard deviation of the benchmark, tracking error relative to plan assets and periodic rates of return.



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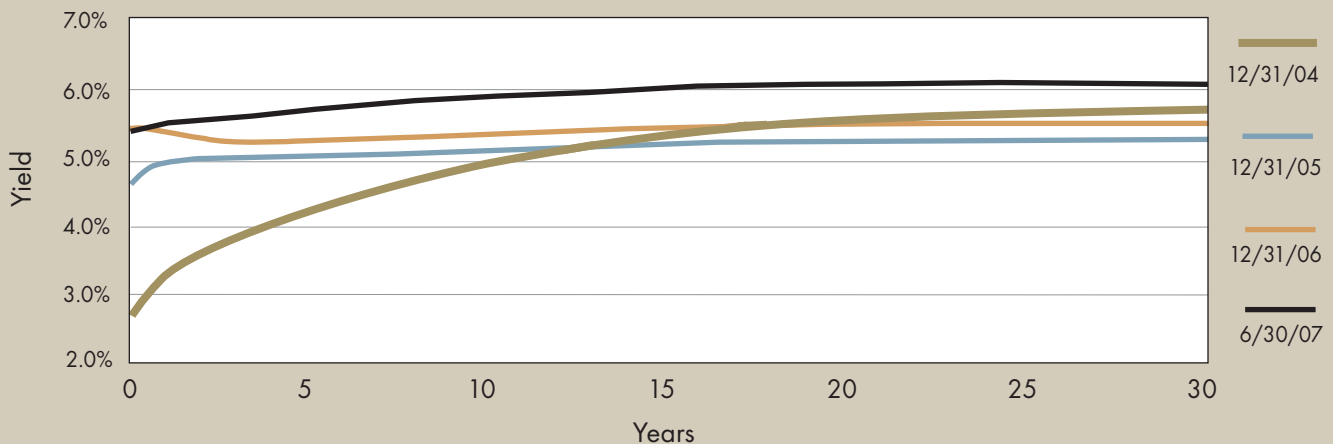
“Tracking error is the most important measure because it indicates how closely the returns of the plan assets are tracking the liability returns,” Freitag says. “The goal of LDI is to minimize tracking error by reducing unrewarded risk in the portfolio — namely interest rate and inflation risks. This frees up the risk budget for return-enhancing investment strategies. Working with this framework ensures that plans focus on the risk inherent in the liabilities while growing assets to close any funding gaps.”

Replicating Liability Cash Flows

Another way to replicate the liability benchmark is to create

The Shifting U.S. Swap Curve

Unlike past actuarial valuation in which one discount rate was used to value liabilities, the swap curve could be used to more accurately value liabilities where they actually reside — across the entire yield curve. The shifts in the curve between January 2005 and July 2007 demonstrate the inherent volatility that exists when using a full yield curve approach to value a plan’s liabilities.



Source: Northern Trust

a liability index using index provider swap securities. The industry offers many swap securities as stand-alone indices that can be combined across the curve to replicate a scenario similar to the cash flow profile of a pension plan.

“Since the liability benchmark is simply the liability cash flows discounted at a specific curve, the securities that comprise that curve can be used to replicate the benchmark,”

Cary says. “This way all of the typical index characteristics of the benchmark can be generated and provide more insight into the liability cash flows.”

Whichever way a plan sponsor chooses to create, maintain and analyze a liability benchmark, the benefits of doing so are certain. The pension plan can be managed in a much more efficient manner, helping ensure its viability long into the future. ❖

Benchmark Characteristics

In creating a liability benchmark, it is useful to examine the development of existing market-based portfolio benchmarks and make comparisons to how those indices are established relative to the formulation of a liability benchmark. In this way, there is a consistency in methodology, which translates into a better understanding of the components and the calculation of the liability benchmark.

According to a study by Bailey, Richards and Tierney, a typical portfolio benchmark should exhibit certain characteristics. Those characteristics, as well as how liability benchmarks share those characteristics, are presented below.

SIX CHARACTERISTICS THAT DEFINE MARKET INDICES AND HOW LIABILITY BENCHMARKS MEET THOSE CRITERIA		
Characteristics	Definitions	Liability Benchmarking: Meeting the Definition
Unambiguous	The names and weights of securities comprising the benchmark are clearly delineated.	Liability cash flows contain a great deal of information on plan participants including their expected retirement dates, service costs, vested percentages, etc. These components represent the building blocks to create the cash flow profile of the liability stream, which can then be valued periodically like any other benchmark.
Investable	The option is available to forgo active management and simply hold the benchmark.	Pension plans essentially are “investing” in this benchmark today as it represents future pension obligations. The streams of cash flows expected from specific plan obligations can be replicated using physical securities and/or interest rate and inflation swaps, making this liability benchmark investable.
Measurable	It is possible to calculate the return on the benchmark on a reasonably frequent basis.	Cash flows, calculated by the plan’s actuary, are discounted to their present value. After they are discounted, they can be measured on a monthly or even a daily basis to provide information on how the plan is performing relative to its liabilities.
Appropriate	The benchmark is consistent with the manager’s investment style or biases.	There is no more appropriate benchmark for plan assets than its liability cash flows. The plan assets exist to pay pension obligations, and it is less meaningful to measure the risk/return profile of the total plan assets to any other benchmark besides its liabilities.
Reflective of current investment opinions	The manager has current investment knowledge of the securities that make up the benchmark.	Since the liability cash flows are projected and discounted by the plan actuaries based on a host of plan and actuarial information, the LDI portfolio manager has access to detailed information with regard to its components.
Specified in advance	The benchmark is constructed prior to the start of an evaluation period.	Plan actuaries analyze and estimate the plan cash flows each year and thereby establish the basis for benchmark construction.

Source: *Investment Analysis & Portfolio Management*, 7th edition, Reilly & Brown, pp. 1140