Ryan ALM
Asset/Liability Management

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PENSION SOLUTIONS:

DOLLAR DURATION MATCHING + CDI (ENHANCED DURATION MATCHING AND CASH FLOW MATCHING)

Pension Solutions: Dollar Duration Matching + CDI (Enhanced Duration Matching and Cash Flow Matching)

Ronald J. Ryan, CFA
Founder & CEO

Pension management is an Assets vs. Liabilities objective rather than assets versus a generic index benchmark objective. Pension asset/liability management starts with understanding the pricing and interest rate sensitivity of liabilities, and then managing assets versus the unique liabilities of a plan sponsor. There are two primary asset/liability bond strategies in use today: Duration Matching and Cash Flow Matching… cash flow driven investing (CDI).

Duration Matching

The purpose of duration matching is for assets to match the interest rate sensitivity of liabilities (immunization). The objective is to have the market value or PV changes (growth rate) in the immunization bond portfolio match the market value or PV changes (growth rate) in liabilities for a given change in interest rates. Many LDI fixed income managers attempt to match the average duration of their bond portfolio to the average duration of a bond market index with a similar duration to liabilities (i.e., Bloomberg Barclays long Corporate index). They use the bond index as a proxy for liabilities. There are several problems with this strategy.

The flaws in this approach are:

1.) A generic bond index cannot replicate any clients' unique liabilities cash flows. Client's liabilities are like snowflakes: different labor force, salaries, mortality, and plan amendments.

2.) Average durations give erroneous information because there are an infinite number of combinations of maturities for a bond portfolio that can all have the same average duration, but they will not have the same risk/reward profile or interest rate sensitivity.
3.) Duration matching is only accurate for small parallel shifts in the yield curve. But the yield curve rarely moves an equal number of basis points at every point along the curve.
4.) FASB requires a single discount rate for financial statements. This single discount rate is not a proper target duration. You need to use the ASC 715 discount rate yield curve.

LDI bond management evolved to remedy these flaws by using Key Rate durations which attempt to match the duration of multiple points along the liability yield curve. Key Rate duration is an improvement over a single average duration, but still has several deficiencies:

1.) Actuaries usually do not provide the average duration of liabilities and the projected benefits in their annual actuarial report… reason why generic bond indexes are used.
2.) Matching key rate durations of a generic market index = wrong Key Rate Durations.
3.) Duration is a present value calculation requiring pricing each projected benefit with a discount rate yield curve (i.e., ASC 715 discount rates). As a result, 30 annual benefit payments require 30 separate discount rates and 30 key rate durations.
4.) Duration must be modified (duration/1+YTM) to use as a price return or interest rate sensitivity measurement.

Solution: Dollar Duration Matching (DDM)

DDM matches the dollar value change per basis point change in yield for assets with the dollar value change per basis point change in yield for liabilities. When the dollar duration of assets is matched to the dollar duration of liabilities for every year in the term structure of liabilities, then DDM is in its most precise form. That would be the equivalent of 30 Key Rate durations… one at every point along the liabilities yield cure or benefit payment schedule (30 years = 30 key rate durations). The Ryan ALM DDM approach offers several value-added differences:

1.) Actuarial Projections - We use the actuarial projected benefits of our clients and not a generic bond index benchmark.
2.) Modified durations - to be an effective price sensitivity measurement, duration must be modified. Modified Duration measures the percent change in market value or present value for future value cash flows given a 100-basis point movement in yield.
3.) Dollar duration - our objective here is to match the dollar value change per basis point in assets and liabilities in every annual liability maturity or duration.

The Ryan ALM DDM approach greatly improves the accuracy of Key Rate duration matching by matching the dollar value changes in liabilities with the dollar value changes in assets across the term structure and yield curve for liabilities. The liabilities are measured and monitored by using a Custom Liability Index (CLI) to more precisely calculate the dollar value (PV) movement in assets versus liabilities given any movement in interest rates.

Ryan ALM uses a turnkey system approach to asset liability management for defined benefit pensions:

1.) ASC 715 Discount Rates – Ryan ALM is one of few vendors providing ASC 715 discount rates (AA corporate zero-coupon bonds as a yield curve). We will price each annual actuarial projected benefit payment on a monthly basis.
2.) Custom Liability Index (CLI) - The CLI provides all of the calculations needed for either dollar duration matching or cash flow matching. The CLI will calculate YTM, modified duration, growth rate and interest rate sensitivity for each annual projected benefit as a term structure as well as total liabilities.
3.) Liability Beta Portfolio™ (LBP) – our LBP will cash flow match projected benefits either chronologically or as a dollar duration match using our proprietary LBP cost optimization model that will reduce funding costs significantly.

Solution: Cash Flow Matching (CDI)

Ryan ALM believes that the objective for a defined benefit pension is to fund and secure benefits when due in a cost-efficient manner. Ryan ALM does not believe that bonds are performance assets. The value in bonds is in their known and scheduled cash flows which is why cash flow matching has been used as a major strategy for hedging liabilities for many decades (i.e., dedication, defeasance). It is the matching and funding of benefits (future values) that is of primary concern. As such, future values are not interest rate sensitive… a major benefit of cash flow matching. Cash flow driven investing (CDI) dominates the way European pensions are managed under IASB accounting standards. Key Rate Duration and especially Dollar Duration matching are great for matching market value (PV) movements between assets and liabilities but what about funding liability payments (future values)?

Since the primary value in bonds is in the certainty of their cash flows, Ryan ALM will cash flow match (fund) projected benefit payments chronologically which provide the plan sponsor with numerous benefits:

1.) Secures the benefits.
2.) Significantly de-risks the plan
3.) Reduces funding costs significantly.
4.) Reduces volatility of funded ratio and contributions.
5.) Buys time for performance assets (Alpha) to grow unencumbered.
6.) Hedges pension inflation on Retired Lives, Active Lives and Expenses
7.) No interest rate risk since LBP is funding future values (benefit payments)

A major cash flow matching benefit is that it buys time for the performance assets (Alpha) to grow unencumbered. History tells us that given time Alpha assets perform better (i.e., S&P 500). History also tells us if the Alpha assets can grow without any dilution, they perform much better (dividends reinvested > 50% of the S&P 500 growth in the last 50 years). If interest rates rise, cash flow matching can reinvest any excess cash flows at the then higher yields (lower funding costs) while bonds managed with a purely total return focus would get hurt with lower price returns.

About Ryan ALM, Inc.

Ryan ALM was founded by Ronald J. Ryan, CFA on July 12, 2004 as an Asset/Liability Management firm. The firm builds a turnkey system of proprietary synergistic products designed to measure liabilities as a Custom Liability Index (CLI) and manage assets to the CLI as Liability Beta Portfolios.

Ryan ALM is unique in having its own proprietary Index company named ALM Research Solutions, LLC. This company builds both custom and generic bond indexes. Such indexes range from Custom Liability Indexes to ETF Indexes.

Our Liability Beta Portfolio™ is our proprietary cost optimization model that "cash flow matches" clients projected liability benefit payment schedules at the least cost using investment grade bonds. It is back-tested since 2009 showing a consistent cost savings of 8% to 15%. Our LBP best represents the core portfolio of a pension plan.

Our team has been recognized for our expertise and results including Ron Ryan having won the William F. Sharpe Index Lifetime Achievement Award.

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Contact Us

Russell D. Kamp
Managing Director
rkamp@ryanalm.com
+1 (201) 675-8797

500 Ocean Trail Way
Unit 410
Jupiter, FL 33477