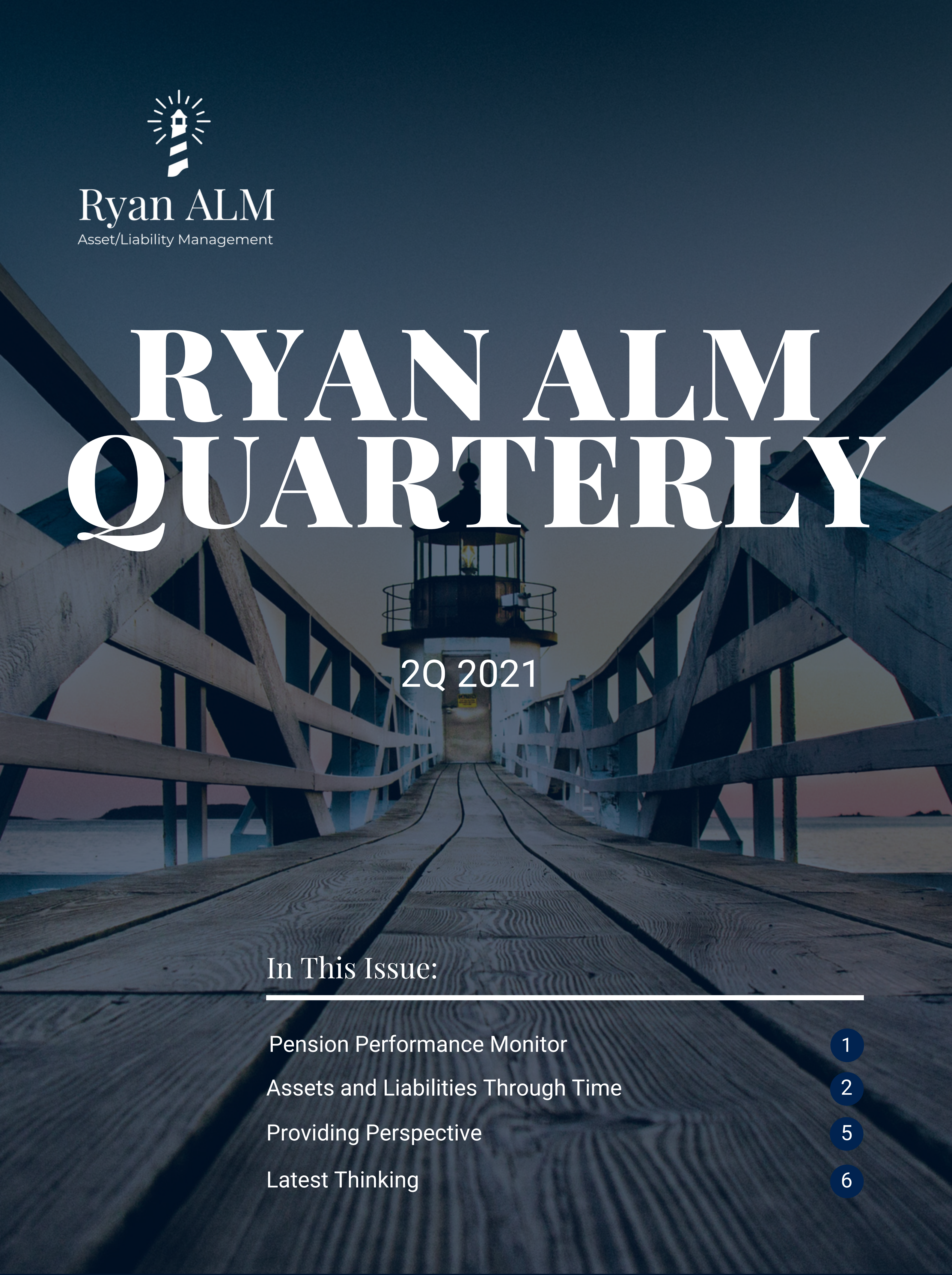


Ryan ALM
Asset/Liability Management

RYAN ALM QUARTERLY

2Q 2021

In This Issue:

Pension Performance Monitor

Pension Liabilities	YTD (%)
Market (Treasury STRIPS)	-6.8
ASC 715 (FAS 158)	-4.7
PPA (MAP 21 = 3 Segments)	2.7
PPA (Spot Rates)	-5.3
GASB /ASOP (7.50% ROA)	3.8

Pension Assets	
Cash (Ryan Cash Index)	0.1
Bloomberg Barclay Aggregate	-1.6
S&P 500	15.2
MSCI EAFE International	9.2
Asset Allocation Model[1]	8.9

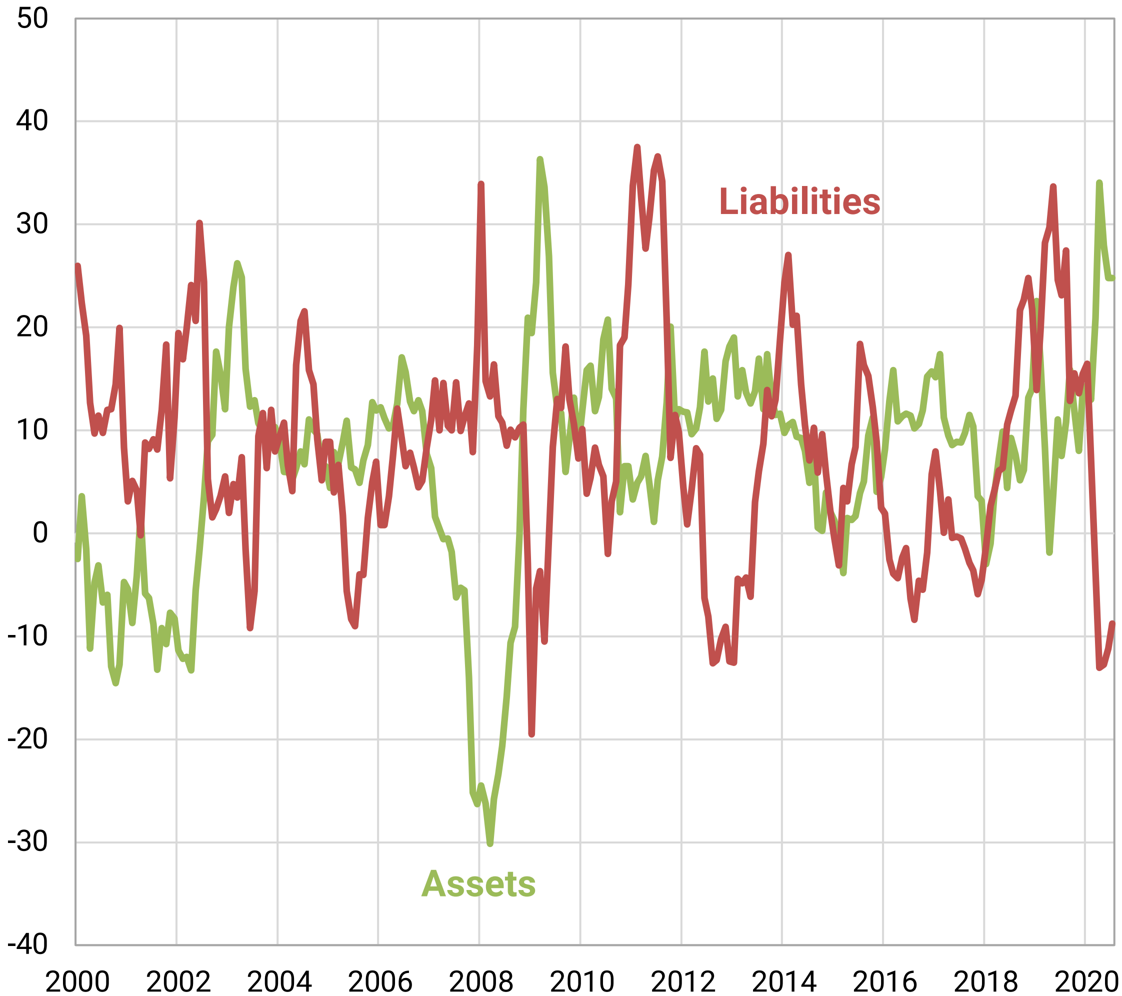
Pension Assets Minus Liabilities	
Market (Treasury STRIPS)	15.7
ASC 715 (FAS 158)	13.6
PPA (MAP 21 = 3 Segments)	6.2
PPA (Spot Rates)	14.9
GASB/ASOP (7.50% ROA)	5.1

Based on the weights of the Asset Allocation Model[1], the difference in pension asset versus liability growth so far in 2021 is dramatically improved from that which we witnessed in 2020 and for many years before. Corporate, Public, and Multiemployer plans showed significant outperformance versus their liability benchmarks. Rising interest rates had a positive impact on liabilities (discount rates), while assets returns were generally positive leading to improved funded status for most pension plans during this period.

1. Model weights are: 5% Ryan Cash, 30% Bloomberg Barclay Aggregate, 60% S&P 500, and 5% MSCI EAFE International

Assets and Liabilities Through Time

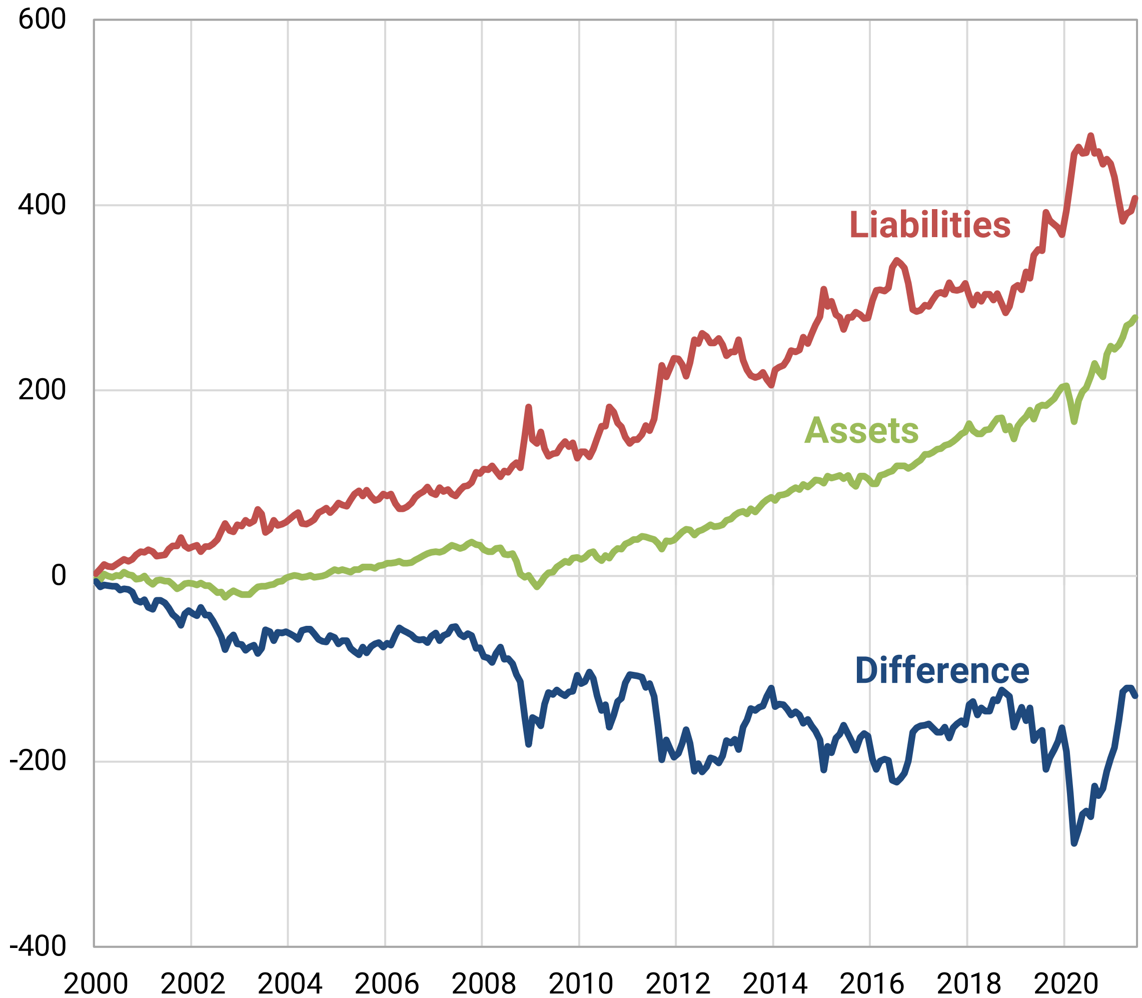
Rolling 12-month asset versus liability growth



Source: Ryan ALM, Inc.

The bull market for equities that lasted more than 10 years did little to help assets versus liability growth, as indicated by the red line in the graph below. While equities were rallying, US fixed income continued one of the longest bull-market runs in history, which began in 1982. Failure to manage plan assets relative to plan liabilities lead to significant volatility in both contribution costs and the funded ratio. Fortunately, US interest rates have begun to rise. Despite stretched valuations, US equities continue to rally, too. A continuation in these trends would be very favorable for US pension plans.

Cumulative returns of assets versus liabilities



Source: Ryan ALM, Inc.

Most pension funds enjoyed a funded ratio surplus in 1999, but pension asset growth has underperformed liability growth (based on the Ryan ALM Treasury STRIPS discount rate) fairly consistently since then by an estimated -129.1% on a compound index basis starting at 100 on 12/31/99. Starting at a funded ratio of 100 on 12/31/99, the estimated funded ratio today would be **74.6%, but that is dramatically improved from last quarter's 64%.** We believe that a lack of focus on plan liabilities is one of the reasons why plans continue to be underfunded.

Cumulative returns of assets versus liabilities (%)

	Assets	Liabilities	Difference	Cumulative Difference	Funded Ratio
2000	-2.5	26.0	-28.5	-28.5	77.4
2001	-5.4	3.1	-8.5	-37.6	71.0
2002	-11.4	19.5	-30.9	-73.4	52.7
2003	20.0	2.0	18.1	-60.1	62.0
2004	8.9	9.4	-0.4	-66.1	61.8
2005	4.4	8.9	-4.4	-76.8	59.2
2006	12.3	0.8	11.4	-64.6	66.0
2007	6.4	11.0	-4.6	-77.5	63.2
2008	-24.5	33.9	-58.4	-181.6	35.7
2009	15.7	-19.5	35.3	-106.9	52.9
2010	11.9	10.1	1.8	-115.7	53.8
2011	3.3	33.8	-30.5	-195.7	41.5
2012	11.8	4.5	7.3	-194.3	44.4
2013	19.0	-12.6	31.6	-120.7	60.5
2014	9.7	24.4	-14.6	-177.1	53.4
2015	1.2	-0.5	1.7	-172.8	54.3
2016	8.1	1.9	6.2	-163.4	57.6
2017	15.2	7.9	7.2	-160.3	60.9
2018	-3.0	-1.3	-1.7	-162.7	60.4
2019	22.8	13.9	8.9	-163.9	65.0
2020	14.4	16.5	-2.1	-197.1	63.8
YTD 2021	8.9	-6.8	15.7	-129.1	74.6

Source: Ryan ALM, Inc.

Providing Perspective

Pension Solutions: Dollar Duration Matching and CDI

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). Read here

Pension Oversight Boards

Pension Oversight Boards are getting some press recently, and in many cases the coverage is pretty negative. Many US states have adopted independent oversight boards to monitor the activities of state-sponsored defined benefit pension systems. Read here

Public DB Plans Should Heed Their Advice

Moody's has recently published a very balanced analysis on the current state of public pension systems. Most of the article discusses the outstanding, perhaps historic, performance results achieved during fiscal year-to-date 2020-2021. Let's hope that the last couple of weeks in this fiscal year don't bring any surprises. Read here

Another Arrow in Their Quiver

The Illinois State Assembly has passed HB0417, a piece of legislation designed to provide funding flexibility in support of the Chicago Park District pension fund. According to the brief explanation of the bill, the legislation "amends the Chicago Park District Act and authorizes the Chicago Park District to issue bonds in the principal amount of $250,000,000 for the purpose of making contributions to the Chicago Park District Pension Fund". Read here

Why it is Better Not to Wait

We are working with a public fund prospect on a cash flow matching project to secure benefit payments as far out as the current fixed income allocation will permit. In our normal implementation we would cash flow match each monthly benefit payment (and expenses, if desired) chronologically. This particular project is unique in that this plan is cash flow positive through 2028. The current allocation to fixed income would allow for the matching of benefits from 2029 to 2033. Read here

If You Are going to Duration match – Consider…

The purpose of duration matching is an attempt to match the interest rate risk sensitivity of assets to liabilities. The objective is to have the market value or present value (PV) changes (growth rate) in the bond portfolio match the market value or PV changes (growth rate) in liabilities for a given change in interest rates. But duration matching is only accurate for small ***parallel shifts*** in the yield curve. Read here

Latest Thinking

Ryan ALM is engaged in a number of exciting conversations with major public pension systems regarding the appropriateness of using a Pension Obligation Bond (POB) to help close the funding gap, improve liquidity to meet near-term benefit payments and expenses, while also reducing the stress on state and municipal budgets that have been impacted by the disruptive Covid-19 virus. The use of POBs can dramatically improve the plan's economics longer-term, while significantly reducing the volatility of the funded status and contribution expenses.

We are thrilled that the American Rescue Plan Act was passed as part of the $1.9 trillion stimulus package. This legislation has some of the elements of the Butch Lewis Act. Importantly, any Special Financial Assistance (SFA) received must be kept separate and managed conservatively to ensure that the funds necessary to pay the promised benefits (through 2051) are actually available. The PBGC has recently provided (7/9) their guidance on how this landmark legislation should be implemented. There is a 30 day comment period associated with the "interim final rules" (seems like an oxymoron). We'll report on any changes to the legislation in the next Ryan ALM Quarterly newsletter.

Lastly, we have recently been retained by a corporate pension plan sponsor to use our cash flow matching skills to do a vertical cut of the plan's liabilities. We have historically used our cash flow matching capabilities to fund and match liabilities from the most current month as far out as the allocation permits. This provides 100% of the cash flow necessary to meet benefits and expenses. In this latest implementation, we are being asked to manage both cash flow and duration (about 12% of projected liabilities over 80 years). By using this approach, we can give our client an incredible 30%+ funding cost savings on the plan's liabilities.

Ryan ALM's mission is to solve liability driven problems through low cost, low risk solutions.

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.

Ryan ALM
Asset/Liability Management

Contact Us

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

500 Ocean Trail Way
Unit 410
Jupiter, FL 33477