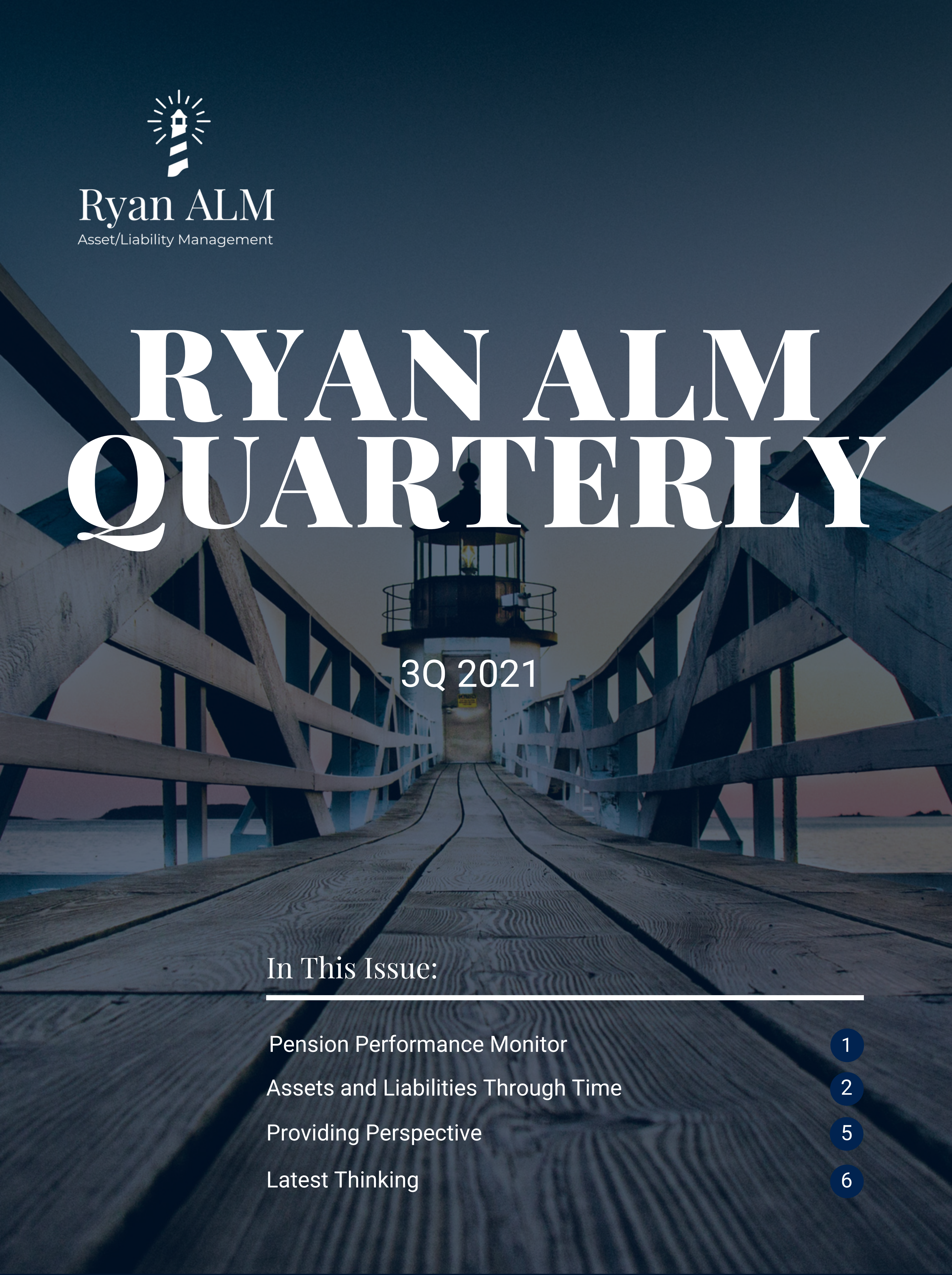


Ryan ALM
Asset/Liability Management

RYAN ALM QUARTERLY

3Q 2021

In This Issue:

Pension Performance Monitor

Pension Liabilities	YTD (%)
Market (Treasury STRIPS)	-6.3
ASC 715 (FAS 158)	-4.3
PPA (MAP 21 = 3 Segments)	4.3
PPA (Spot Rates)	1.1
GASB /ASOP (7.50% ROA)	5.6

Pension Assets	
Cash (Ryan Cash Index)	0.1
Bloomberg Barclay Aggregate	-1.6
S&P 500	15.9
MSCI EAFE International	8.8
Asset Allocation Model[1]	9.3

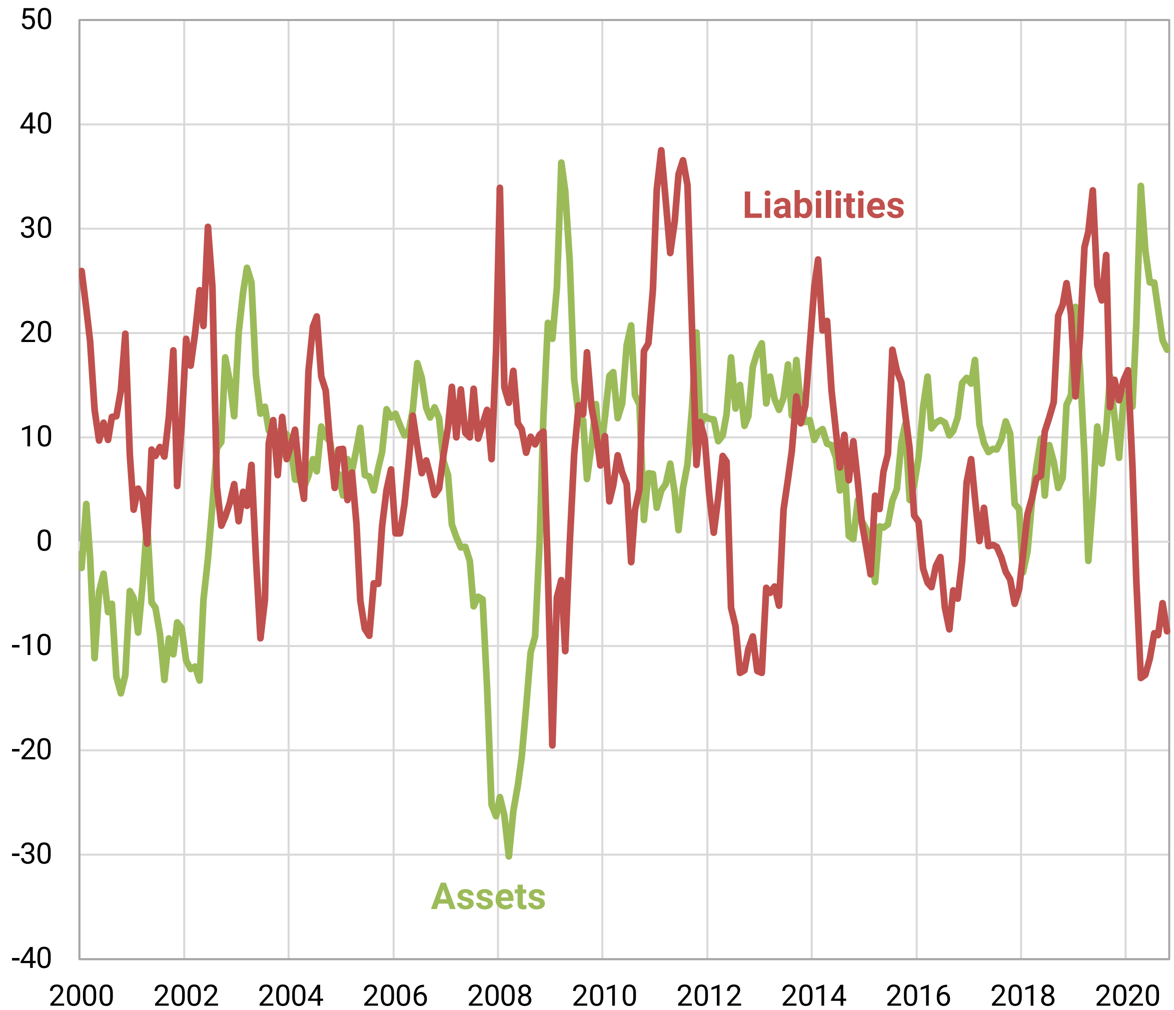
Pension Assets Minus Liabilities	
Market (Treasury STRIPS)	15.6
ASC 715 (FAS 158)	13.6
PPA (MAP 21 = 3 Segments)	5.0
PPA (Spot Rates)	8.2
GASB/ASOP (7.50% ROA)	3.7

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/funded ratios for most pension plans during this YTD 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

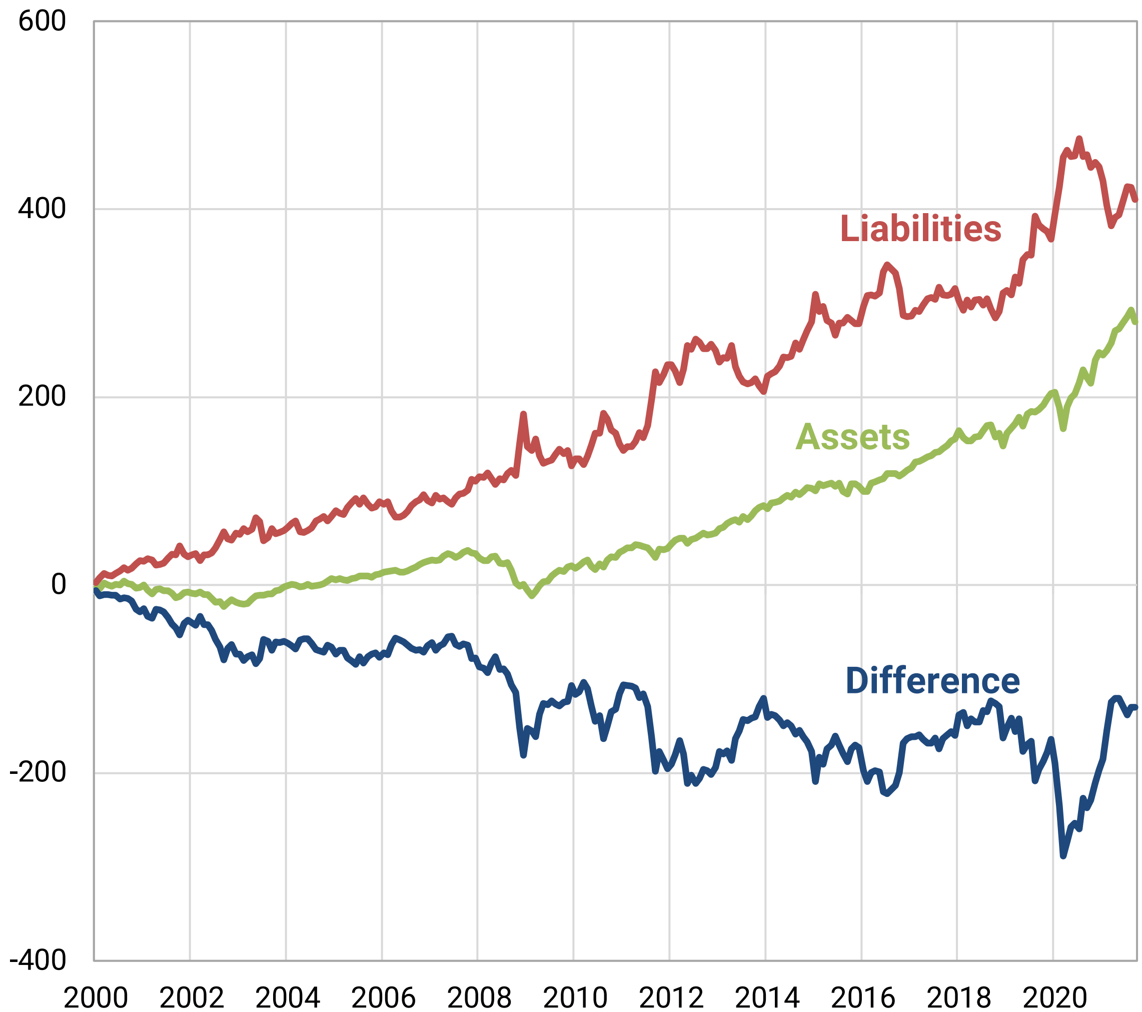
Rolling 12-month asset versus liability growth



Source: Ryan ALM, Inc.

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. Although, given the improved funded status, we suggest that pension plans remove some risk from their asset allocation exposures at this time. It has been the failure to manage plan assets relative to plan liabilities that has led to significant volatility in both contribution costs and the funded ratios since 1999.

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) 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 year-end 2020'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	9.3	-6.3	15.6	-130.2	74.5

Source: Ryan ALM, Inc.

Providing Perspective

Discount Rates: ASC 842 Lease Accounting and ASC 715 Pensions

FASB requires corporations and nonprofit organizations to price their liabilities at certain discount rates. Ryan ALM provides these discount rates in conformity to ASC 842: Lease Accounting and ASC 715: Pensions. Read here

Like a Bridge Over Troubled Waters

Pension America has benefited from an amazing period of performance since the Great Financial Crisis ended in early 2009. Funded ratios have improved for all DB plan types. It would be sinful to see this improved funding wasted as a result of inaction. Read here

What's the Impact Should Interest Rates Rise?

The US Federal Reserve has just released a report stating that inflation is running "hotter" than expected. That probably won't come as a surprise to anyone buying nearly anything today. So, what happens to your fixed-income portfolio should we get continuing inflation that ultimately leads to higher rates? Read here

Why POBs? Reason #2: Reversion to the Mean

We remain very concerned about the underlying fundamentals of the US equity market and the extended blow-out performance for the last 10 years that would suggest (regression to the mean). As we wrote yesterday, the dividend yield on the S&P 500 (1.28% as of 9/1) has only been lower in 1999 (1.17%) and 2000 (1.22%). Read here

What is Risk?

There are many definitions of risk, but the one that we think is appropriate for pensions is that risk is the ***UNCERTAINTY*** of achieving the objective. In the case of a defined benefit pension plan, risk is not the volatility of returns, but the uncertainty of paying the promised benefits! Read here

The Custom Liability Index (CLI) – A Necessary DB Pension Tool

I stumbled onto an article from 2008 that spoke to Ron Ryan's **"genius"** when it comes to indexing. As most of you know, Ron was the Director of Research at Lehman in the '70s and he has been credited with creating many of the world's leading fixed income indexes, most notably the Aggregate, now known at the Bloomberg Barclays US Aggregate Bond Index. 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 recently spoke at the FPPTA on this subject. We would welcome the opportunity to discuss this strategy with you.

We are thrilled that the American Rescue Plan Act (ARPA) 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 provided (on 7/9) their guidance on how this landmark legislation should be implemented. There was a 30 day comment period associated with the "interim final rules" (seems like an oxymoron). According to the PBGC's website, 102 comments were received (including those received from Ryan ALM). We are waiting to see if any changes to the legislation will be forthcoming as a result of those comments.

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.

Finally, we were asked to produce ASC 842 discount rates for a hospital client of ours. ASC 842 discount rates address lease accounting. There are unique aspects to this modeling that differ from our work in producing ASC 715 discount rates for pension plans. We'd be happy to discuss our recent effort.

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.

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