Ryan ALM
Asset/Liability Management

RYAN ALM QUARTERLY

1Q 2024

In This Issue:

Pension Performance Monitor (Total Returns %)

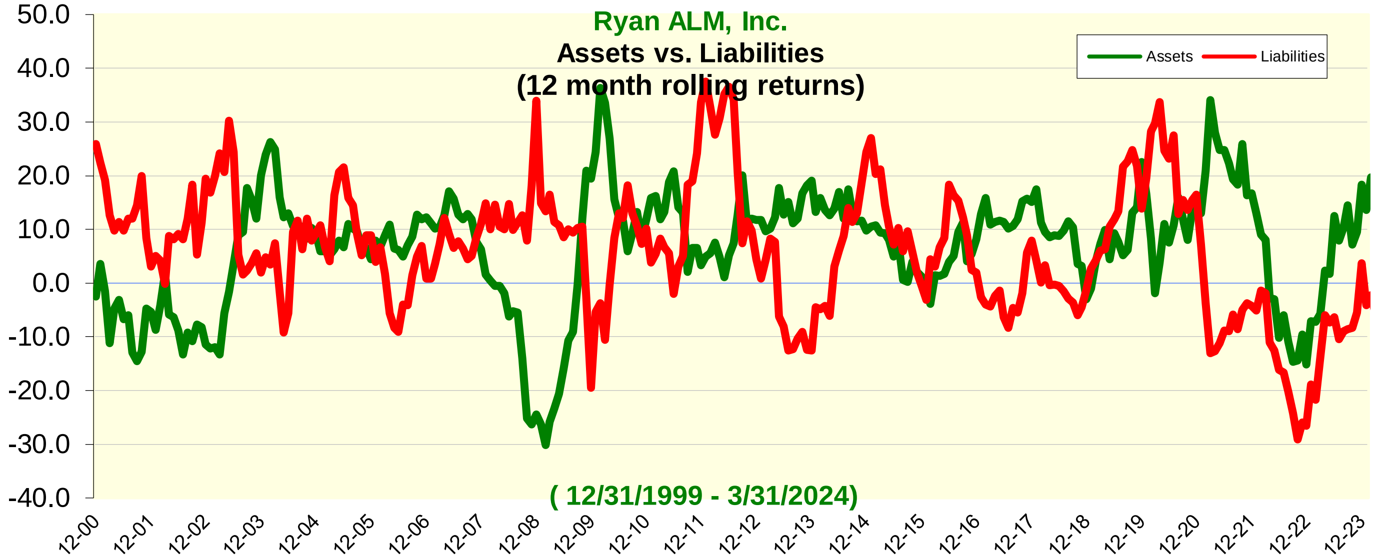
Pension Liabilities	1Q’24 (%)
Market (Treasury STRIPS)	-3.1
ASC 715 (FAS 158)	-1.5
PPA (MAP 21 = 3 Segments)	0.8
PPA (Spot Rates)	-2.4
GASB /ASOP (7.25% ROA)	1.8

Pension Assets	
Cash (Ryan Cash Index)	1.8
Bloomberg Barclay Aggregate	-0.8
S&P 500	10.6
MSCI EAFE International	5.9
Asset Allocation Model[1]	6.4

Pension Assets Minus Liabilities	
Market (Treasury STRIPS)	9.5
ASC 715 (FAS 158)	7.9
PPA (MAP 21 = 3 Segments)	5.6
PPA (Spot Rates)	8.8
GASB/ASOP (7.50% ROA)	4.6

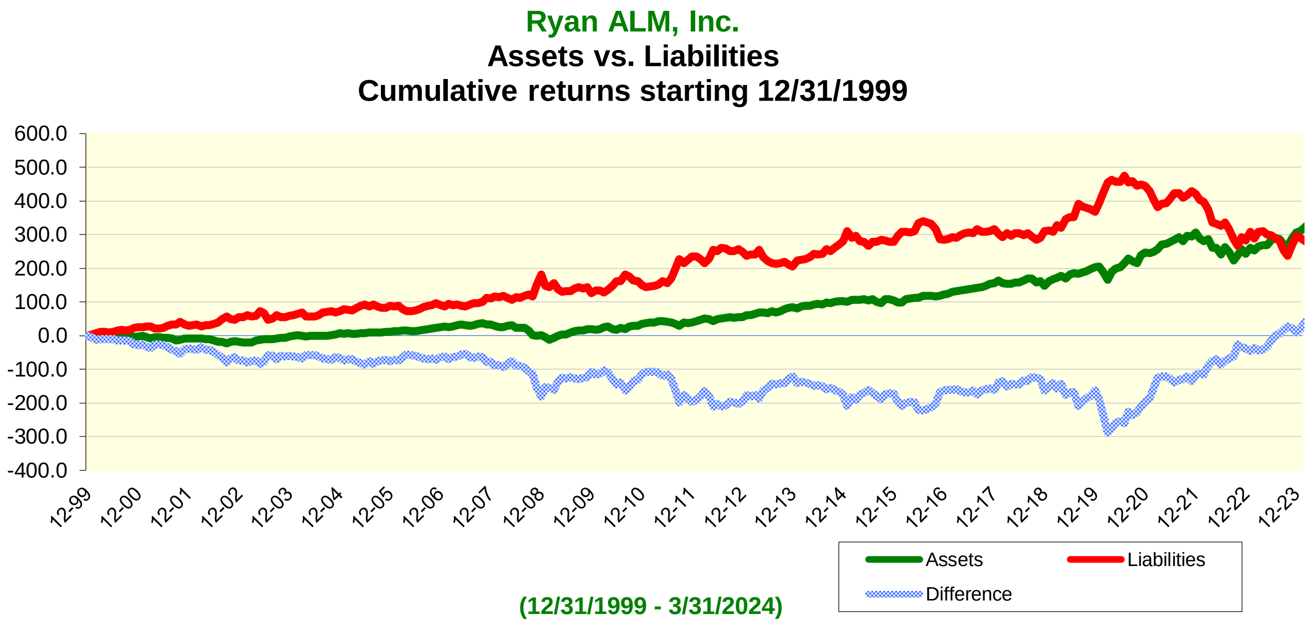
Based on the weights of the Ryan ALM Asset Allocation Model*, the difference in pension asset growth versus liability growth for 1Q’24 reveals a significantly positive comparison of pension assets minus pension liabilities no matter how pension liabilities are calculated. Corporate plans showed more robust funding gains (7.9%) versus their liability benchmarks (ASC 715), while Public and Multiemployer plans using the ROA as the discount rate had more modest outperformance versus their liability growth rates (4.6%). Strong asset growth in equities, both domestic and international, continued into the first quarter, while a steady rise in interest rates weighed on bonds in the 1st quarter.

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



2023 certainly surprised a lot of investors, and the surprises kept coming into the new year, especially for those invested in equity markets, both domestic and abroad. US equities as measured by the S&P 500 were up 10.6% in the first quarter. Most of the gain was attributable to the Magnificent 7 Tech stocks in 2023. Large cap stocks, both growth and value, advanced nicely during the quarter, but small cap stocks continue to dramatically underperform. International stocks enjoyed a dose of good performance, too, with the EAFE Index advancing nearly 6.0%.

Longer-dated US interest rates rode their own rollercoaster during 2023, rising rapidly into October only to quickly reverse during the last 2+ months of the year, as market participants concluded that the Fed had achieved its goal. As 2024 began, US rates trended higher and the US Treasury curve is up roughly 40 bps YTD. A strong US labor market and continuing economic growth create challenges for the US Fed, as they monitor the progress made to date on inflation. The market certainly believes that the Fed will cut rates at some point this year, but those expectations have been modified from as many as 6-7 cuts to perhaps three later this year. We still don't see that occurring based on the underlying fundamentals.



Most pension funds enjoyed a funded ratio surplus in 1999, but pension asset growth had underperformed liability growth (based on the Ryan ALM Treasury STRIPS discount rate) fairly consistently for much of the past two decades. We are pleased to report that the deficit has recently been eliminated as a result of the Fed's tightening campaign. The cumulative difference is now 48.3 on a compound index basis starting at 100 on 12/31/99. The difference had been as much as -197 in 2020. Starting at a funded ratio of 100 on 12/31/99, the estimated funded ratio today would be 112.6%**,** which is based on the Ryan ALM liability calculations and hypothetical asset allocation**.** It is also very close to the estimated funded ratio provide by Milliman in Milliman 100 Pension Funding Index (PFI) which stood at 105.6% at the end of March. Strong market returns during during the quarter and US interest rates that rose relative to the end of 2023 have combined to support the funded ratio for the various types of DB plans, which have improved from the end of 2022 challenging market environment.

US interest rates are not high relative to history, but they do provide the plan sponsor community with the opportunity to reduce the risk within their plans by defeasing a portion of the liabilities such as the Retired Lives Liability (RLL). This is an opportunity that hasn't been available in decades as US rates plummeted to historic lows. We encourage you to act today before this opportunity fades.

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
2021	17.4	-4.2	21.6	-116.1	77.8
2022	-15.2	-26.6	11.4	-39.0	89.8
2023	18.3	3.7	14.6	9.9	102.5
1Q'24	6.4	-3.1	9.5	48.3	112.6

Source: Ryan ALM, Inc.

Economic Snapshot as of March 31, 2024

	2023	Q1'24
U.S. GDP	2.6%*	2.8%*
US Debt	$34.0 T	$34.6 T
CPI - U	3.1%^	3.1%^
Unemployment Rate	3.7%	3.8%
30-Year Treasury Yield	4.08%	4.35%
10-Year Treasury Yield	3.94%	4.21%
2-Year Treasury Yield	4.33%	4.63%
3 Mo. T-Bills Yield	5.37%	5.36%
S&P 500	4,742.83	5,263.30
Nasdaq 100	14,765.94	16,396.83
R2000	2,012.80	2,124.55
Gold	2,075.20	2,075.20
Oil	$71.31	$83.31
Existing Single Family sales	3.41M**	4.38M**

*GDPNow forecast as of Apri 1, 2024, ^annual # through February 29, 2024, ** as of February 29, 2024

Year-to-date change in the Treasury Yield Curve

	Curve Id	1M	2M	3M	6M	1Y	2Y	3Y	5Y	7Y	10Y	20Y	30Y
11)	I25 03/31/24	5.345	5.356	5.362	5.315	5.024	4.620	4.409	4.212	4.208	4.200	4.452	4.343
12)	I25 12/31/23	5.398	5.402	5.332	5.246	4.762	4.250	4.009	3.847	3.881	3.879	4.191	4.028
13)	I25 (03/31/24-...	-5.3	-4.6	2.9	6.9	26.2	37.0	40.0	36.5	32.7	32.1	26.1	31.4

Sharing Perspective

The Importance of Liquidity

I recently came across an article written by a friend of mine in the industry. Jack Boyce, former Head of Distribution for Insight, penned a terrific article for Treasury and Risk in July 2020. The title of Jack's article was "We Need to Talk About the Armadillo in the Room".

Financial Conditions Are Not Tight

Yesterday we received the latest update from the Federal Reserves and the message was pretty straightforward. They indicated that they are observing "higher growth and slower deceleration of inflation". They once again stressed the "possibility" of three rate cuts later this year.

A Contrarian Approach That is Becoming More Common

I suspect that some (perhaps) many folks in our industry are becoming a little tired of my constant drum beat requesting a change in how pension plans are managed. I'm sorry if that is the case, but I have a reason to speak out often, if not loudly.

It's Different This Time! Is It Really?

Having spent more than four decades in the investment pension/industry, I've seen more than enough cycles to know that history does repeat. The specifics of the trend/cycle may be different from one event to the next, but the outcomes are normally quite similar.

The Funded Status Should Absolutely Drive Asset Allocation

I had the opportunity to listen in on a conference panel yesterday in which the individuals of several public pensions were asked if the asset allocation frameworks for their pension systems were based on the return on asset assumption (ROA) or the plan's funded status.

The Psychology of Uncertainty

When I was managing the Invesco quantitative group (>$30 billion in AUM), we attempted to take advantage of human biases that keep us from being great investors. By capturing those biases in a systematic framework, we were able to consistently apply our insights.

Latest Thinking

We continue to be thrilled that the American Rescue Plan Act (ARPA) was passed as part of the $1.9 trillion stimulus package. This legislation has many of the elements of the Butch Lewis Act which Ryan ALM's Ron Ryan was instrumental in providing the defeasance language. As a reminder, any Special Financial Assistance (SFA) received must be kept separate and managed conservatively to ensure that the funds received and earmarked to pay the promised benefits (through 2051) are actually available. The PBGC has approved the SFA applications for 72 multiemployer plans through March 31, 2024, totaling just about $53.9 billion (including supplemental filings and interest) in government grants. The PBGC provided the "Final, Final Rules" related to the implementation of this legislation in Jul 2022. Several items within the original Interim Final Rules have been altered, including permissible investments for the SFA assets. We disagreed with some of these elements, particularly the allowance for 33% of the SFA to be invested in return-seeking assets (RSA), which would include investment grade bonds that aren't used to defease a plan's liabilities (benefits and expenses).

We are very committed to educating plan sponsors and their advisors about the positive impact of rising interest rates and the impact those have on the ability to de-risk DB pensions through Cash Flow Matching (CFM). The US Federal Reserve is determined to conquer inflation and the multiple rounds of Fed Funds Rate increases has the rate at 5.25%-5.50%. The data (as of 2/28/24) below is a representative client. The projected cost savings through defeasing the plan's liabilities is incredible. In this example, it is 31.4% covering a period through 6/30/36 and limiting the universe to BBB+ or better.

LBP Summary

	STRIPS	LBP Model	Difference ($ and %)	
Future Value	$206,632,363	$206,632,363		
Present Value	$149,896,476	$141,770,798	-$64,861,565	31.390%
YTM	4.512%	5.212%		
Discount Rate	4.447%	5.273%		
MDuration	6.822	6.658		
LBP Model Efficiency		100.002%		
Total Assets		$141,773,422		

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 June 15, 2004 as an Asset/Liability Management firm. The firm has built 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. In this higher interest rate environment, our portfolios are producing cost savings of >2%/year. Our LBP best represents the core portfolio (or liquidity bucket) of a pension plan or endowment/foundation.

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

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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