



Ronald Ryan, CEO, CFA

The Ryan ALM Pension Letter™

June 30, 2016

(Copyright Ryan ALM, Inc. 2016 ...All Rights Reserved)

Index	Returns YTD 2016	Weights
Pension Liabilities:		
Market (Tsy STRIPS)	14.60%	100 %
ASC 715 (FAS 158)	13.95	
PPA (MAP 21 = 3 Segments)	3.33	
PPA (Spot Rates)	10.46	
GASB /ASOP (8% ROA)	3.91	
Pension Assets:		
Ryan Cash	0.39 %	5 %
Barclay (Lehman) Aggregate	5.31	30
S&P 500	3.81	60
MSCI EAFE Int'l	-4.07	5
Asset Allocation Model	3.78 %	100 %
Pension Assets – Liabilities:		
Market	-10.82	
ASC 715 (FAS 158)	-10.17	
PPA (MAP 21 = 3 Segments)	0.45	
PPA (Spot Rates)	-6.68	
GASB/ASOP (8% ROA)	-0.13	

William F. Sharpe
Lifetime Achievement Award

Money Management Letter
Lifetime Achievement Award

Capital Link
Most Innovative ETF Award

IMN
ETF of the Year Award

Bernstein Fabozzi/Jacobs Levy
Research Paper of the Year Award



Using the Asset Allocation above, the difference in pension asset growth vs. liabilities in 2016 was: **-10.82%** (market valuation STRIPS), **-10.17%** (ASC 715), **0.45%** (PPA 3 segment rates), **-6.68%** (PPA-Spot Rates) and **-0.13%** (GASB/ ASOP). Such valuations show the significant difference in not using *market* valuations. Most pension funds enjoyed a funded ratio surplus in 1999 but **pension asset growth has underperformed liability growth since by an estimated -203.37%** on a compounded index basis starting at 100 on 12/31/99!

	Total Returns (Market Values)											
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009		
Assets	-2.50	-5.40	-11.41	20.04	8.92	4.43	12.25	6.82	-24.47	19.43		
Liabilities	25.96	3.08	19.47	1.96	9.35	8.87	0.81	11.76	33.93	-19.52		
Difference:												
Annual	-28.46	-8.48	-30.89	18.08	-0.43	-4.44	11.44	-4.94	-58.40	38.95		
Cumulative		-37.60	-73.40	-60.08	-66.13	-76.75	-64.60	-77.50	-181.53	-106.9		
	2010	2011	2012	2013	2014	2015	2016					
Assets	11.89	3.27	11.79	19.04	9.74	1.22	3.78					
Liabilities	10.13	33.77	4.46	-12.59	24.35	-0.49	14.60					
Difference:												
Annual	1.76	-30.50	7.33	31.63	-14.61	1.71	-10.82					
Cumulative	-115.67	-195.73	-194.30	-120.74	-177.14	-172.78	-220.19					

Lower Interest Rate Trend Killing Pensions in 2016

As of June 30, the Ryan Liability Index Benchmark (equal weighting of Treasury STRIPS) had a growth rate of **14.60%** for the first six months of 2016. Our ASC 715 liability index had a growth rate of **13.95%**. This suggests another bad year for pensions as asset growth has underperformed liability growth by **10.82%** (market) and **10.17%** (ASC 715) so far in 2016.

Pension WARNING... Remove All Long Bonds!

Interest rates have been in a secular trend to lower rates starting on October 27, 1981 when the 30-year Treasury hit an all-time high of 15.25%. The 30-year Treasury closed June 30, 2016 at 2.31%... an amazing rally of 1294 basis points. Just as important is that the duration of the 30-year Treasury has increased from 7.79 years to 21.11 years over this time. This has increased the interest rate sensitivity to a very unfavorable risk/reward position. If interest rates go up just 11 basis points on the 30-year Treasury, it would produce a 0% return over a 1-year horizon while it would have taken a 195 basis point move upward in 1981. Most long bonds have a similar risk/reward profile. We urge all pensions to reconsider long bonds and remove them from both their portfolio and from Index Benchmarks.

Pension Deficits High but S&P 500 High... What's Wrong with the Picture?

The March 31 Milliman pension index for the top 100 US corporate pension plans showed a funded ratio of 78% and a funded status of -\$390 billion based on assets of \$1.37 trillion and liabilities of \$1.76 trillion. This deficit is close to the all-time high underfunding at a time that the S&P 500 is at an all-time high. Milliman calculates that in order to reach 100% funded status, these plans will have to earn an average annual return of 11.2%. With the S&P 500 P/E ratio around 26x this is well above the historical average P/E of around 15x suggesting that the S&P 500 may be overvalued. To earn 11.2% annually from these valuations... is this Mission Impossible? What's missing in all of this is the liability growth rate. Pension asset growth is relative to liability growth. Isn't that how we calculate the funded ratio and funded status. Since 1982, liability growth has been 8.2% annually (as measured by the Ryan Liability Index of Treasury STRIPS). The reason for the Milliman study decline in funded ratios is that liability growth exceeded asset growth. Going forward, there is a high probability that liability growth should be low to negative especially if interest rates rise. Corporations use AA corporate discount rates under ASC 715 (formerly FAS 158) accounting rules. Ryan ALM is one of the few vendors providing these discount rates. Assuming a 3.30% average YTM on liabilities (equates to a 3.87% discount rate) and a 12-year duration, if interest rates go up 28 bps in a year, liability growth would be zero. Assuming 5% asset growth, then didn't assets earn 5% liability alpha and enhance the funded ratio? If interest rates were to trend upward just 30 to 40 bps per year and assets earn a small positive return of just 5% a year, funded ratios would improve nicely. Over a five-year horizon a 78% funded ratio would improve to 100%. Pensions is all about relative growth of assets vs. liabilities. Without a Custom Liability Index to measure liability growth accurately, how could any pension function effectively?

Pension COLA... A Growing Cost

Einstein once said that compound interest is the eighth wonder of the universe and the most powerful economic force on earth. He who understands it... earns it. He who doesn't.. pays it. Yes, compound interest can make assets grow significantly over time. But when applied to debt and liabilities it can be the snowball from hell. Most public pensions offer a COLA (Cost Of Living Adjustment) of around 3% annually to offset the cost of inflation. But if the CPI is the gauge of inflation then a 3% COLA is an inappropriate inflation adjustment. In only six of the

last 24 years has the rate of inflation been higher than 3%. For example, an employee with a pension of \$40,000 in 1999 would receive \$66,114 today versus \$57,445 if based on the CPI... a 15% increase and growing. At any rate, a COLA is a cost that compounds and adds to pension expense. According to Laurence Msall, president of the Civic Federation, a third of Illinois underfunded pension liability of \$110 billion is due to their COLA of 3%.

PBGC: A Broke Insurance Company

In an article written by Alex Pollock, he sites that the PBGC has assets of \$88 billion and liabilities of \$164 billion for a funded ratio of 53.7%. Moreover, the PBGC has a net worth of -\$76 billion and a capital-to-obligations ratio of -46%. Would any State Insurance Commissioner allow such an insurance company financials to remain in business... of course not. But this is a Government sponsored entity. The PBGC has two separate financial parts: the Single-Employer program and the Multiemployer Program. The Single-Employer program has assets of \$86 billion and liabilities of \$110 billion with a net worth of **-\$24 billion**. The Multiemployer program has assets of \$2 billion and liabilities of \$54 billion with a net worth of **-\$52 billion** or 26x its assets. How can the PBGC survive? On July 6, 2012 President Bush signed the Moving Ahead for Progress in the 21st Century Act (MAP 21). This increased PBGC premiums by 40% in two years then indexed to inflation thereafter. Multiemployer premiums were increased by 33% in one year and then indexed to inflation thereafter. This has led many corporations to transfer their pensions to insurance companies under a Buyout Annuity where there is no PBGC premiums or protection for employees. According to the ERISA law of 1974 where the PBGC was born, ERISA requires that PBGC programs be self-financing. ERISA also tells us that the U.S. Government is not liable for any obligation or liability incurred by PBGC... wonderful. So will there be a bailout of PBGC in the future. I predicted this awhile ago and suggested it would take the form of the S&L bailout where agency debt is issued to fund the bailout.

Puerto Rico Bondholders WIN!

On June 9, the U.S. Supreme Court ruled against a Puerto Rico law that would have let its public utilities restructure their debts over the objection of its creditors. Siding with bondholders who challenged the law, the court ruled that the measure was barred under federal bankruptcy law. The Recovery Act, as the law was known, would have affected more than \$20 billion in utility debt and given the commonwealth leverage in handling the other \$70 billion it owes. On a separate issue, the U.S. House passed a Puerto Rico aid bill 297-127 on June 9. The bill establishes a 7-member Board tasked with the goal of regaining PR access to capital markets. The Board is assigned to get the fiscal books in order while working with the PR government to develop fiscal plans and balanced budgets.

Duration Matching = Hedging Strategies... NOT De-risking Strategies

Duration matching is designed to match the growth rate of liabilities. Since the duration of most liabilities are not provided by the actuary, most duration matching strategies use *generic* bond indexes as a proxy for liabilities. This is not an accurate or effective way to match liabilities. Liabilities are like snowflakes... you will never find two alike. Only through a Custom Liability Index (CLI) could you ever know the duration profile of liabilities which is quite interest rate sensitive. Since coupon bonds durations peak out at around 16 years, any liabilities longer than 16 years must be duration matched with high cost Treasury STRIPS. Moreover, buying a 5-year duration bond to match a 5-year duration liability, a 10-year duration bond to match a 10-year duration liability, etc. is much more costly than **cash flow matching**. Cash flow matching uses longer bonds (interest income) to fund the shorter liabilities. Bond math is clear that the longer

the maturity the lower the cost (purchase price) given the same yield. Moreover, the yield curve is usually positive sloping such that the longer bonds have higher yields which results in more cost savings. Please read my research paper "[*How To De-Risk A Pension*](#)" located in the research section of our web site www.RyanALM.com. **Futures, derivatives and interest rate swaps are certainly not de-risking strategies** since there are no funds to match and pay the liability benefit payment schedule. The objective of a pension should not be return oriented (especially the ROA). The 1990s should be a constant reminder of what happens when your focus is on a target return instead of the funded ratio and funded status. Had pension's cash flow matched liabilities in the 1990s when they had surpluses, there would be no pension crisis today!

Insurance Buyout Annuities (IBA)... Most Costly Way to De-risk

IBA have won over \$500 billion of business in recent years. The big attraction here is the transfer of the pension to the insurance company and the removal of this liability from the balance sheet and the pension expense from the income statement. Such IBA come at great cost with most using a 3% discount rate, or less, as the cost of assets to be transferred. This is in sharp contrast to the ASC 715 discount rates of 3.80% and our LBP average YTM of 5.50% (as of 12/31/15). This translates into our LBP product is 26% less costly than IBA!

Watch List: Audit the Fed

A new bill (H.R. 24: Federal Reserve Transparency Act) is being considered in the House Oversight and Government Reform Committee. The Fed is currently audited internally and overseen by the Federal Reserve Board of Governors. This legislation is calling for a full performance audit of the Fed including monetary policy and transactions of the Federal Open Market Committee (FOMC).

Watch List: Atlantic City

AC has until Jan. 1, 2017 to come up with a fiscal plan that balances the budget. The city has a \$44 million deficit to close in the 2017 budget. S&P affirmed its junk bond rating saying that the long-term prospects of a full recovery is elusive absent a credible plan to restore full solvency. AC is selling its waterfront airport + 100 other properties in an auction on June 17.

Watch List: Illinois

Moody's lowered its rating on the State of Illinois to Baa2 just two notches above junk status on its \$28.2 billion in bonds. Gov. Rauner (Republican) and a Democrat led legislature have been locked in a disagreement as to how to close the budget deficit when temporary tax increases expire. This will be the second year that the state has no budget. Illinois has the lowest pension funded ratio of any state and owes about \$111 billion in future pension costs.

Watch List: Social Security

The Board of Trustees for Social Security projected the fund will run out of money by 2034, as only 79% of benefits could be funded.

Watch List: China

China's elderly population is growing significantly while its working age population is shrinking. According to the US Census, China had 136.9 million people age 65 and older vs. Japan's total population of 126.9 million. By 2050, China's old population will be equal to the total population of Australia, Egypt, Japan and Germany combined.

Ryan ALM Pension Scoreboard

The graphs below show asset vs. liability rolling 12 month and cumulative growth since 1999. Ryan ALM Benchmark Liability Index = **333.21%** growth while pension assets = **113.01%** growth for a difference of **-220.19%** suggesting any pension **Funded Ratio below 203.37% in 1999 has a deficit today on a market weighted basis. The Ryan ALM Pension Funded Ratio = 49.17%.**



(12/31/1999 - 6/30/2016)



(12/31/1999 - 6/30/2016)

The World of Ryan Indexes

Custom Liability Indexes ... (Patent Pending)

The best way to price (discount rate) and understand the interest rate sensitivity of liabilities is the **Ryan Treasury STRIPS yield curve indexes** as a **LIABILITY INDEX BENCHMARK**. In March 1985, when STRIPS were born, the Ryan Financial Strategy Group (RFSG) created the **1st STRIPS Index**. Based upon these Ryan STRIPS indexes we created the **1st Liability Index** as the proper Liability Benchmark for liability driven objectives. The Ryan team has developed hundreds of Custom Liability Indexes (CLI). Similar to snowflakes, no two pension funds are alike with unique benefit payment schedules due to different labor forces, mortality and plan amendments. Until a CLI is installed as the benchmark, the asset side is in jeopardy of managing vs. the wrong objective (market indexes). **If you outperform generic market indexes, but lose to the CLI ... the plan loses!**

Ryan Treasury Yield Curve Indexes (Constant Maturity / Duration series)

In March 1983, the Ryan Financial Strategy Group (RFSG) created the **1st Daily bond Indexes (the Ryan Index)** as a *Treasury Yield Curve constant maturity* index series for each **auCTION** maturity series (from Bills to Bonds). In March 1985, the day after Treasury STRIPS were born RFSG created the **1st Treasury STRIPS indexes** as a *Treasury Yield Curve constant duration* series of 1-30 year maturities (30 distinct constant duration indexes + composite). The best way to measure interest rate risk is to use the Ryan Treasury Yield Curve Index series.

RAFI Fundamental Weighted High Yield Index Series + RAFI Investment Grade Index Series

(PowerShares ETFs = PHB + PFIG)

In January 2010, Research Affiliates announced the creation of a series of bond indexes based on the RAFI fundamental weights. These include a short, intermediate long and composite Investment grade series and a short and intermediate High Yield series. Ryan ALM was honored and chosen as the index designer and calculation agent. In August 2010 the RAFI 1-10 year High Yield Index was launched as a **PowerShares ETF (PHB)**. There is also a Canadian hedged version (**PFH_CN**). In September 2011 the RAFI 1-10 year Investment Grade index was launched as a PowerShares ETF (**PFIG**). For more info on these ETFs and index, please go to:

www.Powershares.com (click on fixed income portfolios)

Ryan/Nasdaq 1-30 year Treasury Maturity Ladder (PowerShares ETF = PLW)

On October 11, 2007 PowerShares launched a fixed income ETF (**PLW**) based upon the Ryan/Nasdaq 1-30 year Treasury Maturity Ladder index. This index is an equal-weighted diversified portfolio of 30 distinct maturities. For more info on this ETF and index, please go to:

www.Powershares.com (click on fixed income portfolios)

Ryan ASC 715 (formerly FAS 158) Discount Rates

In 2006, Ryan ALM designed the FAS 158 yield curve index that prices any private pension liabilities in conformity to FAS 158 standards. We provide four distinct yield curves of AA corporate zero-coupon bonds in conformity to ASC 715.

Given the Wrong Index ... you will get the Wrong Risk/Reward!

To view all Ryan Indexes data go to: www.RyanIndex.com

Ryan Index is a Registered Trademark of Ryan ALM, Inc.

In October 2005, Ron Ryan terminated his license agreement with Ryan Labs to distribute and calculate the Ryan Indexes and Ryan STRIPS Indexes. Ron Ryan and Ryan ALM have no affiliation with Ryan Labs. Any use of the formulas, methodologies and data of any of the Ryan Indexes without Ron Ryan's written permission is prohibited.

Pension Solutions: Custom Liability Index and Liability Beta Portfolio™

(Patent Pending)

Ryan ALM offers a turnkey system of CLI + Liability Beta portfolio as a pension solution:

Custom Liability Index (Patent pending) - The first step in prudent pension management is to measure and monitor the liability objective frequently and accurately. Until liabilities are packaged as a **Custom Liability Index (CLI)** the asset side is in jeopardy of managing to the wrong objectives (i.e. market indexes). Only a CLI best represents the unique liability schedule of pensions. Just like snowflakes, no two pension liability schedules are alike due to different labor forces, salaries, mortality and plan amendments. How could a *generic market index* ever properly represent such a diverse array of pension liabilities? Once the CLI is installed the pension will now know the true **economic Funded Ratio** which should dictate the appropriate Asset Allocation, Asset Management and Performance Measurement. Ryan ALM is a leader in CLI as Ron Ryan was the inventor of the *first Liability Index* in 1991. In 2006, Ron won the *William F. Sharpe Index Lifetime Achievement Award!*

Liability Beta Portfolio (Patent Pending) – The value added in bonds is small as every performance ranking study proves (1st quartile vs. median difference). **The best value in bonds is to match and fund liabilities** as Dedication, Immunization and Defeasance have proven for decades. Since liabilities are dynamic calculations they need a CLI to monitor their risk/reward behavior. The *core* or Beta portfolio for a pension should be in high quality bonds that match and fund liabilities. A Beta portfolio is defined as the portfolio that matches the objective. If the true objective is liability driven then, by definition, the proper beta portfolio for any liability objective must be ... a **Liability Index Fund or Liability Beta Portfolio**. This requires a Custom Liability Index in order to be executed.

The Ryan ALM Beta portfolio system will invest only in high quality securities that match the CLI. This provides our clients with the ***lowest cost and lowest risk portfolio***. It is the lowest risk portfolio since it has:

No Interest Rate Risk (matches CLI)
No Liquidity Risk
No Credit Risk
No Event Risk
No Prepay Risk

The Ryan ALM Beta portfolio is the lowest cost portfolio since we will always out yield liabilities by more than our low fee thereby guarantying each client **No Net Fee** to maturity (liability benefit payment dates). Moreover, the Beta portfolio is a matching liability portfolio that fully funds liabilities thereby reducing the cost and volatility of contributions.