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# The Ryan ALM Pension Letter™

June 30, 2019

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Index	Returns YTD 2019	Weights
<b>Pension Liabilities:</b>		
<b>Market (Tsy STRIPS)</b>	<b>10.07%</b>	<b>100 %</b>
<b>ASC 715 (FAS 158)</b>	<b>14.29</b>	
<b>PPA (MAP 21 = 3 Segments)</b>	<b>3.01</b>	
<b>PPA (Spot Rates)</b>	<b>11.89</b>	
<b>GASB /ASOP (7.50% ROA)</b>	<b>3.75</b>	
<b>Pension Assets:</b>		
<b>Ryan Cash</b>	<b>1.49 %</b>	<b>5 %</b>
<b>Bloomberg Barclay Aggregate</b>	<b>6.11</b>	<b>30</b>
<b>S&amp;P 500</b>	<b>18.54</b>	<b>60</b>
<b>MSCI EAFE Int'l</b>	<b>14.53</b>	<b>5</b>
<b>Asset Allocation Model</b>	<b>13.79 %</b>	<b>100 %</b>
<b>Pension Assets – Liabilities:</b>		
<b>Market</b>	<b>3.72</b>	
<b>ASC 715 (FAS 158)</b>	<b>-0.50</b>	
<b>PPA (MAP 21 = 3 Segments)</b>	<b>10.78</b>	
<b>PPA (Spot Rates)</b>	<b>1.90</b>	
<b>GASB/ASOP (7.50% ROA)</b>	<b>10.05</b>	

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 return above, the difference in pension asset growth vs. liabilities in 2019 was: **3.72%** (market valuation STRIPS), **-0.50%** (ASC 715), **10.78%** (PPA 3-segment rates), **1.90%** (PPA-Spot Rates) and **10.05%** (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 -169.81%** on a compounded index basis starting at 100 on 12/31/99!

Total Returns										
	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
<b>Difference:</b>										
<b>Annual</b>	<b>-28.46</b>	<b>-8.48</b>	<b>-30.89</b>	<b>18.08</b>	<b>-0.43</b>	<b>-4.44</b>	<b>11.44</b>	<b>-4.94</b>	<b>-58.40</b>	<b>28.95</b>
<b>Cumulative</b>		<b>-37.60</b>	<b>-73.40</b>	<b>-60.08</b>	<b>-66.13</b>	<b>-76.75</b>	<b>-64.60</b>	<b>-77.50</b>	<b>-181.53</b>	<b>-106.9</b>
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Assets	11.89	3.27	11.79	19.04	9.74	1.22	8.12	15.15	-2.96	13.79
Liabilities	10.13	33.77	4.46	-12.59	24.35	-0.49	1.92	7.94	-1.26	10.07
<b>Difference:</b>										
<b>Annual</b>	<b>1.76</b>	<b>-30.50</b>	<b>7.33</b>	<b>31.63</b>	<b>-14.61</b>	<b>1.71</b>	<b>6.20</b>	<b>7.21</b>	<b>-1.70</b>	<b>3.72</b>
<b>Cumulative</b>	<b>-115.67</b>	<b>-195.73</b>	<b>-194.30</b>	<b>-120.74</b>	<b>-177.14</b>	<b>-172.78</b>	<b>-163.36</b>	<b>-160.34</b>	<b>-162.68</b>	<b>-169.81</b>

### Anybody Watching Liability Growth in 2019

Although asset growth was spectacular for the 1<sup>st</sup> half of 2019 (S&P 500 = 18.54%, MSCI EAFE = 14.53%, Bloomberg Aggregate = 6.11%) liability growth was just as strong. As interest rates trended downward, liability growth was up 10.07% (Treasury STRIPS) and 14.29% (ASC 715) based on these discount rates. As a result, most corporations showed an actuarial loss so far this year. GASB pricing of liabilities at a 7.50% ROA would have shown only a 3.75% growth in liabilities. Which discount rate is correct? It should always be the market rate you can buy to settle the liabilities (you can only buy market rates not the ROA).

### Awards for Ryan ALM

Ronald J. Ryan, CFA was born and raised in New Orleans for 29 years. The city awarded him a Certificate of Recognition by Mayor LaToya Cantrell *“in recognition of his work in the investment industry and the worldwide impact you have made. We honor your expertise, your success and your roots in the city of New Orleans.”*

Ryan ALM outsources areas of importance to known experts in that field. Our technology advisor Joseph de Poortere, Partner at Thomas Murphy & Associates, has notified us that they were part of the team that won “Project of the Year” at the 2019 USGBC Gala Awards for the newly opened Hudson County School of Technology. The technology team at Thomas Murphy & Associates designed the 70 leading-edge classrooms, broadcasting studio and black box theatre. The team was also recognized for *“creating something truly revolutionary”* and cited for creating *“the gold standard for technical schools across the country.”*

### Pension Objective: Secure Benefits and Reduce Funding Costs

There are basically only two ways to secure benefits: **insurance annuities and defeasement (through cash flow matching benefit payments)**. Insurance buyout annuities (IBA) are extremely expensive. Corporations are purchasing IBAs in record amounts to get rid of the high and rising PBGC premiums caused by the MAP 21 (Moving Ahead for Progress in the 21<sup>st</sup> century) legislation of July 6, 2012 and for the impact of pension liabilities and contribution costs on the income statement and balance sheet. Since public pensions do not have the PBGC and multiemployer plans have very limited PBGC benefits, the IBA is certainly not appropriate and/or affordable for these pension plan sponsors. However, Corporations would be wise to do a cost analysis of the IBA versus defeasement. The typical IBA prices Retired Lives (liabilities) at a discount rate of Treasury STRIPS plus a 4% premium. According to our calculations, a **defeasance strategy (cash flow matching) using investment grade corporate bonds would provide a cost savings of about 25% versus IBA, which is a very significant cost savings and should be reviewed.**

*Cash flow matching* (using the Ryan ALM Liability Beta Portfolio™) will secure **monthly** benefits and reduce funding costs by roughly 25% relative to IBA and at 8% vs. ASC 715 discount rates (AA corporates). Our **Liability Beta Portfolio™ (LBP)** is a *cost optimization model* where we go through numerous iterations to find the optimal cost savings that will fund each and every monthly benefit payment. Since liabilities are priced like bonds (FASB discount rates) they behave like bonds. As a result, bonds become the proper proxy or assets to match liabilities. Bond math tells us that the longer the maturity the lower the cost for the same par value and the higher the yield the lower the cost for the same par value. Our LBP model skews the portfolio weights to longer maturities such that a 30-year coupon bond will partially fund 29 years of benefits through interest income. The same is true for a 29-year, 28-year, 27-year bond, etc. plus principal cash flow at maturities adds even more cash flow.

This is not how duration matching works, which has definite liability cash flow mismatches and cost inefficiencies. Since the longest duration bonds are around 16-years today, duration matching is forced to use Treasury zero-coupon bonds (STRIPS) to fund any liability past 16-years. Since Treasuries are the lowest yielding bonds, they are the highest cost bonds to fund and match liabilities. Moreover, duration is a present value (PV) calculation that is very interest rate sensitive. Duration matching is focused on matching liability growth rates and not on matching and funding benefit payments (future values). Since it is a PV focus, duration matching can be an extremely interest rate sensitive strategy.

**Only cash flow matching (defeasement) can secure benefits and reduce funding costs.** By matching liabilities (benefit payments) LBP reduces risk accordingly. Our LBP has numerous benefits that best achieve the true pension objective:

**Benefit: Enhances Funded Ratio /Status**

LBP outyields Liabilities by roughly 50 - 100 bps, which creates Alpha

**Benefit: Reduces Costs**

LBP reduces Contribution, Funding and Asset Management Costs

**Contribution Costs:**

LBP outyields liabilities thereby creating Alpha, which enhances Funded Ratio

**Funding Costs:**

LBP Cost < Liability Cost (based on AA Corporate discount rates)

Liability *Beta* Portfolio Yield > Liability Yield (AA Corporates)

**Funding Cost Savings = 8% to 10% vs. AA Corporates Discount Rates  
26% vs. Treasury STRIPS  
30% vs. IBA**

**Asset Management Costs:**

**LBP Fee = 12 bps** (25% to 50% less than most active bond managers)

**Benefit: Reduces Volatility**

Liability *Beta* Portfolio *Matches* and *Funds* Liabilities

Reduces *Volatility* of Funded Ratio/Funded Status

Reduces *Volatility* of Contribution Costs

**Benefit: Reduces Risk**

Risk equals Uncertainty of Funding Benefit Payments

Liability *Beta* Portfolio *Matches* and *Funds* Benefit Payments

Projected Benefit Payments equal Future Value

Future Values have No Interest Rate Sensitive

**Benefit: Enhances ROA**

Liability *Beta* Portfolio composition is:

Investment Grade corporates (skewed to longer A/BBB bonds)

LBP should *outyield* most active management bond portfolios

Enhances ROA (Return on Asset assumption)

**Benefit: Buys Time**

Liability *Beta* Portfolio *Matches* & *Funds* Liabilities *Chronologically*

Moves deficit out longer extending the investment horizon

Buys Time for Non-bond Assets (Alpha assets) to outgrow Liabilities

Non-bond Assets Outperform Bonds (Liabilities) over Long Horizons

**Benefit: Portable Alpha**

As Alpha Assets Outgrow Liabilities

Transfer (port) Excess Returns to Beta Portfolio

Secures Funded Status Victory and Reduces Volatility of Funded Ratio

### **Cash Flow Matching vs. Duration Matching**

Cash flow matching is the only accurate way to defease a liability. If it is done with U.S. Treasury STRIPS, it is accepted by accounting rules as a defeased liability that can be removed from the books (i.e. pre-funding municipal bonds). Since U.S. Treasury STRIPS tend to be low yielding securities, they are also high cost. Cash flow matching with investment grade bonds can achieve a high degree of liability funding certainty at a much lower cost (@ 10% to 15%). In the 1960s through the 1980s cash flow matching with investment grade bonds was in vogue and called "Dedication".

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 and changes daily. 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 not cost effective. 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](http://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 (i.e. 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!

### **Rehabilitation for Multiemployer Pensions Act (H.R. 397)**

In the Letter to the Editor section of the March 18 Pensions & Investments (P&I), the authors (David Blitzstein, Jeffrey Cohen, Gene Kalwarski and Judy Xanthopoulos) explain the benefits of this proposed legislation. The essence of such legislation is a low interest rate federal loan program that would be administered by the Pension Rehabilitation Administration (PRA), a new government agency within the Treasury, to multiemployer plans classified as Critical and Declining (plans with funded ratios < 65% + estimated to be insolvent within the next 14 years). Loan proceeds must solely be used to pay benefits to retired workers (Retired Lives). Pension plans here must use these proceeds in a defeasement type strategy with low risk investment grade bonds (cash flow matching or duration matching) or annuities. This will restore financial solvency with much less need of help from the PBGC, which is already in a solvency dilemma of its own. The legislation also tightens withdrawal provisions making it more expensive for employers to withdraw thereby reducing the risk of loan defaults. On March 7, 24 members of the United Steelworkers (USW) union attended a U.S. House subcommittee hearing on this crisis and urged Congress to pass H.R. 397. The USW represents 850,000 workers.

## **Public Pension Watch List**

**Illinois** - IL five public pension funds are roughly 40% funded that adds up to an estimated \$136 billion deficit as of June 30, 2018. This deficit is expected to increase to \$139 billion by the end of the fiscal year 2020. Public pensions represent almost 25% of the state budget up from 2.9% in 1996 as contribution costs have risen sharply to \$8.5 billion. Democratic Gov. J.B. Pritzker says his top priority is to obtain a different constitutional amendment that would allow for graduated state income tax rates so lawmakers can charge more to the wealthy. Pritzker believes this would add \$3 billion in extra revenue for the state. I wonder if wealthy people would react by leaving the state to tax free states (i.e. Alaska, Florida, Nevada, New Hampshire, South Dakota, Texas, Washington, Wyoming) as we have seen as a growing trend throughout America. Well, more than 70,000 people collecting pensions from six IL state pension plans have moved out of IL taking more than \$2.4 billion annually with them. That's the equivalent of 18% of all state pensioners in those plans. Florida leads with 14,023 IL pensioners.

### **California**

CA claims a state budget surplus of \$20.6 billion but can't afford pension costs. CA has \$102 billion in unfunded pension benefits and another \$107 billion in unfunded retiree health care. CA does not recognize losses when net pension liability increases. CA needs \$270 billion to pay its bills. CalPERS, the state's largest pension, has assets of \$365 billion but has an unfunded deficit of \$139 billion. With the state extending MediCal benefits to illegal immigrants, the already over-taxed state is expected to eventually raise taxes even further to cover its debt.

### **Michigan**

A conservative business group pitched Michigan Republican leaders on a debt swap idea for \$1 billion annually. Under this idea, the state would issue a 30-year pension obligation bond to borrow \$10 billion and place those funds into the Michigan Public Schools Employee Retirement System (MI PSERS). The bond would pay down unfunded pension liabilities and free up state budget funds earmarked for school pension funding. The concept is an old one that hinges on an arbitrage that you can invest these funds at a higher return than the cost of the bonds. At today's interest rates, this bet is more logical than it was in the past.

### **100-year Austrian Bond New Issue**

The Republic of Austria issued a 100-year bond at a yield of 1.2%. Apparently, the success of their last 100-year bond issued two years ago at a 2.1% yield to maturity led to this new issuance. Their 2017 issued bond is now trading at a premium of 60% to yield 1.2%.

## Ryan ALM Pension Scoreboard

The graphs below show asset vs. liability rolling 12 month and cumulative growth since 1999. Ryan ALM Benchmark Liability Index = **351.976%** growth while pension assets = **182.170%** growth for a difference of **-169.805%** suggesting any pension **Funded Ratio below 160.81% in 1999 has a deficit today on a market weighted basis.**

**The Ryan ALM Pension Funded Ratio = 62.43% (starting at 100.00 on 12/31/99)**



## 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 **1<sup>st</sup> 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 **1<sup>st</sup> 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 **1<sup>st</sup> 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](http://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](http://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](http://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.***

## Custom Liability Index and Liability Beta Portfolio™

*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™ (LBP)** – The value added in bonds is small as every performance ranking study proves (1<sup>st</sup> quartile vs. median difference). **The best value in bonds is its cash flow 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 Liability Beta Portfolio™ (LBP) 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 Liability Beta Portfolio™ is the lowest cost portfolio since we will always out yield liabilities by more than our very low fee thereby guarantying each client **No Net Fee**. Moreover, the Liability Beta portfolio is a cash flow matching liability portfolio that fully funds liabilities thereby reducing the cost and volatility of contributions.

### Disclaimer

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