Ryan ALM
Asset/Liability Management

Pension Myth #1: Earn the ROA… and All is Well

Most pension asset allocations are focused on earning the return on assets (ROA) assumption. This ROA is almost always based on the asset allocation model weighted forecast for each asset class ROA to determine the average or target ROA. The pension return on assets (ROA) assumption is a critical calculation since it affects both assets (asset allocation) and liabilities (discount rate). Most plan sponsors and their consultants focus on the ROA as the assets hurdle rate for asset allocation. Public and multiemployer pension plans also use the ROA as the liability discount rate.

Funded Ratio

Since the ROA is based on the asset allocation model, it ignores the funded ratio and funded status of the plan sponsor. This is a serious error of omission and logic. Logically, a 60% funded plan should have a radically different asset allocation than a 90% funded plan. Accordingly, the ROA should be calculated based on the target return needed to fully fund liabilities. Simple math can make this clear. A 60% funded ratio with a 7.00% ROA could never reach full funding if the assets earned the ROA. As shown below, if liabilities are priced at a discount rate = ROA, they have the same growth rate as assets. In order for $60 of assets to fully fund liabilities of $100 with a 7.00% growth rate, assets need a ROA of **11.67%** not 7.00%. If assets earn the ROA and grow at 7.00% then so does the deficit grow at 7.00%. In five years, the deficit has grown by **40.3%** requiring higher and higher contributions. This is not in harmony with the pension objective to… ***fund liabilities in a cost-efficient manner with prudent risk***.

Example: Funded Ratio = 60% Funded Status = ($40)

		Growth Rate = 7% ROA			Funded	
	Assets	$ Growth	Liabilities	$ Growth	Ratio	Status
Start	$60.00	$ 4.20	$100.00	$ 7.00	60%	$ 40.00
Year 1	64.20	4.49	107.00	7.49	60	42.80
Year 2	68.69	4.81	114.49	8.01	60	45.80
Year 3	73.50	5.15	122.50	8.61	60	49.00
Year 4	78.65	5.50	131.11	9.15	60	52.46
Year 5	84.15	5.89	140.26	9.85	60	56.11

At same growth rate (ROA) Funded Ratio stable at 60%… but deficit increases 40.3%

The solution to this funding issue is the **Asset Exhaustion Test (AET)**. The AET is a GASB 67/68 requirement to validate that the asset cash flows (*including contributions*) fully fund the

liability cash flows based on the ROA chosen. Ryan ALM modifies the AET to calculate the ROA needed to fully fund liability cash flows. It has been our experience that our *calculated ROA* is much different and lower than the ROA based on an asset allocation model. This should be **the first step in asset allocation… calculating the ROA needed to fully fund liabilities.**

Asset Allocation

The ROA is usually calculated by first looking at the average historical returns of the index benchmarks for each allowable asset class except bonds and cash where the current yield is used. Each asset class is then weighted to come up with the ROA calculation for the total pension fund. The ROA has to be verified by auditors and/or actuaries that such return assumptions used for each asset class are realistic. The range of return assumptions usually stretch from a high of 10% to 12% for Private Equity and Alternatives to a low of 4% to 5% for cash and fixed income. This range is dependent on current interest rates.

As a result, each asset class is asked to earn the ROA assigned to them by using their index benchmark yield as the target return proxy. They are **NOT** required to earn the total pension fund ROA assumption (@ 6% to 7% today). This is an important fact to remember in asset allocation. We at Ryan ALM often hear the criticism and question… how can we invest in 4% bonds to earn our ROA (of 7%)? The answer is bonds do **NOT** need to earn the pension ROA… just their assigned ROA in the asset allocation model. If cash flow matching of liabilities is chosen as the fixed income strategy, then the ROA is no longer a goal since liabilities are fully funded with certainty.

The ROA is usually an annual calculation. Most asset allocation models traditionally use the Bloomberg Barclay (BB) Aggregate as the fixed income index benchmark (initially the Lehman Aggregate I designed as the head of Fixed Income Research). This index is **heavily skewed to low yielding Government securities (YTM = 4.53% as of December 31, 2023 and 4.42% as of August 31, 2024)**. If you buy a fixed income portfolio that outyields the BB Aggregate with a similar duration, you are in a good position to earn the ROA assigned to fixed income. Remember… the asset allocation model uses yields not returns for the fixed income ROA.

But bonds can do better… much better:

1. **Cash Flow Matching** – if bonds were used to cash flow match and fund net liabilities (after contributions) ***chronologically*** they would produce the liquidity needed to fully fund such net liabilities. Cash flow matching works best with longer coupon bonds where you use semi-annual interest income to partially fund shorter liabilities. A 10-year bond has 20 interest cash flows + one principal cash flow all priced at a 10-year yield. This would eliminate the need to do a *cash sweep* of other asset classes which is a common liquidity procedure. According to S&P data, the S&P 500 has 48% of its historical returns from dividends and reinvestment since 1940 on a 10-year rolling period basis. Wouldn't you want to reinvest dividends back into growth assets rather than spend it on funding benefits + expenses? By using bonds as the liquidity assets, the growth assets are left unencumbered to grow. The longer the cash flow matching period, the more time the Alpha assets have to compound their growth. This could significantly enhance their ROA.

2. **Bond Index Benchmark** – As described previously, the ROA forecast for fixed income is based on the current yield of its index benchmark. The Bloomberg Barclay Aggregate is most favored as the bond index benchmark. The Aggregate is a very large, diversified and low yielding portfolio of bonds with the following summary statistics as of December 31, 2023:

# of issues	**9,982**	Treasury	**39.76%**	AAA	**68.92%**
YTM	**4.53%**	Agency	**4.04%**	AA	**2.92%**
Duration	**6.24 yrs.**	Mtg. Backed	**29.91%**	A	**11.16%**
Avg. Maturity	**8.46 yrs.**	Corporates	**26.29%**	BBB	**15.38%**

As a result, most asset allocation models would have a ROA for bonds of about **4.50%**. If you can build a bond portfolio that outyields the Aggregate index with similar duration, it should enhance the ROA for fixed income and total assets. Ryan ALM Advisers, LLC has created a cash flow matching product we call the **Liability Beta Portfolio™ (LBP)**. The LBP is a cost optimization model that cash flow matches liability cash flows chronologically at the lowest cost from a corporate bond portfolio skewed to A/BBB rated bonds.

Based on the actuarial projections of each client, Ryan ALM will initially build a **Custom Liability Index (CLI)** to calculate *net liabilities* ((benefits + expenses) – contributions) chronologically as the proper fixed income objective and benchmark. The CLI provides all the data needed for the LBP to function efficiently. Based on the allocation to the LBP will determine how far out the LBP can fully fund net liabilities. A 15% allocation to the LBP can normally fund 1-7 or 1-10 years of net liabilities. Usually, the longer the term structure of the LBP, the higher the yield. The LBP should outyield the Aggregate index by about 50 bps (1-5 years) to 100 bps (1-10 years) based on the LBP term structure. If the LBP outyields the AGG index by 50 to 100 bps, asset allocation can afford to overweight the bond allocation and still meet the target ROA for total assets. If a *calculated ROA* based on the AET was the hurdle rate, asset allocation could skew the weights to more bonds cash flow matched to fully fund liabilities. This would reduce the volatility of the funded ratio and contributions.

3. **Higher Interest Rates** – bonds are interest rate sensitive as to their market value (present value). Rising US interest rates could cause negative returns. However, cash flow matching is focused on funding B + E (Benefits + Expenses) which are future values. Future values are not interest rate sensitive. Bonds are the only asset class with the certainty of cash flows (future values). That is why bonds have always been used as the methodology for *defeasance* (cash flow matching) of liabilities. Moreover, if interest rates trend upward any reinvestment of cash flow can buy future value at a lower cost. As a result, cash flow matching sees higher interest rates as an opportunity to reduce funding costs. The Ryan ALM cash flow matching model (LBP) will also *duration match* liabilities since we are funding each monthly B+E payment… term structure matching. We strongly recommend that our LBP be the core portfolio in asset allocation = liquidity assets needed to fully fund B+E.

4. **Cash** – many pension plans have a cash allocation of around 3% or more. Cash is usually the lowest yielding asset. Since the LBP becomes the liquidity assets to fully fund benefits + expenses chronologically, there is little need for cash to fund B+E. Cash might only be needed for capital calls on Private Equity and other Alternative Investments. The LBP should increase the yield margin versus cash since the LBP is using coupon income from all maturities of the LBP and is skewed to A/BBB corporate bonds. With the LBP fully funding B+E, the cash allocation can be reduced. Replacing most of the cash allocation to fund B+E with the LBP allocation is another ROA enhancement… it all adds up.

"Where is the knowledge we have lost in information"
T.S. Eliot