

Pension ROA: TRICK OR TREAT?

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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 under GASB accounting rules. The ROA can be both a bad thing (Trick) or a good thing (Treat).

ROA: Trick

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 just 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)**

	<u>Growth Rate = 7% ROA</u>				<u>Funded</u>	
	<u>Assets</u>	<u>\$ Growth</u>	<u>Liabilities</u>	<u>\$ Growth</u>	<u>Ratio</u>	<u>Status</u>
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

If assets earn the ROA... Funded Ratio stable at 60% but deficit increases **40.3%**

Calculated ROA: Treat

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. Yes, GASB says that contributions are to be included as future asset cash flows. This fact is ignored in every funded ratio calculation. Ryan ALM modifies

the AET to calculate the ROA needed to fully fund liability cash flows. As a result, it has been our experience that our *calculated ROA* tends to be much lower than the ROA based on an asset allocation model. If the calculated ROA is much lower, then the allocation to bonds as the liquidity assets to fully fund the liability cash flows can be higher. This should be **the first step in asset allocation... calculating the ROA needed to fully fund net liabilities AFTER contributions.**

Asset Allocation

The ROA is usually calculated using 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 based on the exposure in that plan 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 other Alternatives to a low of 4% to 5% for cash and fixed income. This range is dependent on current interest rates and recent market returns.

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 (@ 6.75% 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.

But what if a calculated ROA accurately shows that a 5.32% ROA can fully fund liability cash flows then a more conservative asset allocation is appropriate. 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. 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 (maturity is constrained by the length of the mandate – 1- to 10-years). 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 a Guinness Global study reviewing historic S&P data, the S&P 500 has 47% 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 them 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 lower yielding portfolio of bonds. 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 (CFM) product we call the Liability Beta Portfolio™ (LBP). The LBP is a cost optimization model that cash flow matches (and duration 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 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. The allocation to CFM 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. Importantly, 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 principal 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** the Alternative Investments. The LBP should increase the yield advantage margin versus cash since the LBP is using coupon income from all maturities of the LBP and is skewed to higher yielding 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
