The Flaws of Bond Indexes... Benchmark, Bogey or Bogus?

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The first bond indexes were born June 1973 created by Art Lipson (my boss) at Kuhn, Loeb. As my mentor, I owe Art much for his educational leadership. When Lehman purchased Kuhn, Loeb at the end of 1977 such indexes became the Lehman bond indexes. Since there was no bond exchange (still true today) you needed a Wall Street broker/dealer to create bond indexes because they knew how to price all the securities that comprised a bond index as well as calculate some of the difficult yield and duration calculations. In 1979 Lehman became the accepted bond index benchmark(s) for most U.S. institutions although Salomon (now Citigroup) and Merrill Lynch (now Bank of America) provided numerous bond indexes. These old traditional indexes have dictated the risk/reward of most bond managers for over 40 years. Investment bankers embraced these bond indexes as a way to win clients suggesting that any issuance of bonds would result in inclusion in their indexes. Through time these traditional bond indexes became garbage cans of investment banking as the index portfolios swelled to many thousands of bonds. Such bond indexes have structural flaws that should prevent them from being accepted as benchmarks for most institutions especially those with a liability objective:

Flaw: Weights
Traditional bond indexes use market weighting as their preferred valuation. In order to market weight a bond index you need two data requirements: **end of day pricing** of all bonds in the index and the **current amount outstanding**. Since there is no bond exchange end of day pricing is difficult. Different market vendors will all have different prices for the same bonds. This leads to different risk/reward behaviors. But the more difficult data, believe it or not, is the amount outstanding. As simple as it sounds, we do not know the amount outstanding for many issues at month-end rebalancing and calculation. Treasuries and Agencies are stripped thereby reducing the float on these bonds. Such information is provided delinquently (Treasuries) or not at all (Agencies). As a result, traditional bond

indexes leave the original amount issued as the amount outstanding. A $10 billion Treasury issue may have only $4 billion left in float. Since bond indexes do not include STRIPS they will overweight Treasuries and Agencies coupon issues by not changing the original amount outstanding. This will skew the returns of the index accordingly. Corporate bonds have tenders, sinking funds and puts which could affect the amount outstanding. Usually such information is only reported annually in the 10-k. As a result, corporate bonds are never correctly updated if they face any of the principal reduction features. Mortgage-backed securities have monthly payments of principal (as regular amortizations and prepayments). Such information is reported after the end of the month several weeks delinquent. As a result, bond indexes have to use previous month's data. Since prepayments affect total returns not only is the amount outstanding incorrect but the prepayment used for the current month is not accurate. Both inaccuracies lead to erroneous return calculations however small or large they may be. In truth, it is **Mission Impossible** to update accurately the amount outstanding of most bonds which in turn affects the accuracy of the risk/reward calculations.

Solution: Equal Weighted. When I left Lehman, I began to create **equal-weighted bond indexes** as the solution to the market weighting problems. Not only does equal-weighting have no weighting skewness or bias but it also best represents how most investors do their work (every bond is analyzed without weights as individual securities with an equal opportunity to be purchased). Moreover, why should one bond be superior to another bond in its portfolio weight in an unbiased index? Treasuries with their huge and growing issuances could and do dominate a bond index portfolio such that other bonds hardly affect the risk/returns of the index. Can you imagine how a Treasury 2-year auction of $44 billion skews the weights when compared to a $400 million corporate bond. That's a ratio of 110 to 1. Is that really what investors want? All Treasuries, Agencies, Corporate and Mortgage-backed securities should be equal weighted in an index construction. **The only question should be …do you weight these *sectors* differently?**

Tracking Error

Given the enormous size of most traditional bond indexes (in number of issues) it is most difficult, if not impossible, to purchase such a portfolio. Most bonds in an index are not liquid. So, what do Index Funds and especially ETFs do to duplicate

these illiquid bond indexes? Wall Street provides replication strategies that supposedly get you close to the risk/reward behavior of such indexes. In most replication models they only buy the most liquid securities and try to match the average duration of the index benchmark. Investors will then be faced with some degree of tracking error since you cannot purchase the index portfolio. Tracking error tends to measure the monthly average return differences. However, a five basis point monthly tracking error could be a 30 basis points annual return difference. The question remains why not build the index the way replication models work with only the most liquid issues?

Solution: Investible Indexes. All Ryan ALM Indexes are *investible indexes* as a rule of our index methodology. We only take the largest and most liquid issues as the composition in any of our indexes to insure liquidity which also insures better pricing. Equity indexes have certainly worked this way for several decades as the Dow Jones Industrial Average (30 stocks) and the S&P 500 are a testament.

Transparency
Flaw: Portfolio Averages
Summary statistics are critical data for bond asset managers. Most investors will build their bond portfolios around the average yields and durations displayed by the index benchmarks. Index funds try to match these averages while active bond managers will try to tilt their portfolio longer or shorter than this average duration. Unfortunately, portfolio averages are misleading, if not erroneous, data. To prove this accusation please input any bond index's posted average price, coupon and maturity into a bond calculator and see if you get the average YTM. NO …so what happened? A classic was the Lehman Aggregate reported averages as of July 1990:

> **Average Coupon = 9.13%**
> **Average Price = 100.00**
> **Average YTM = 8.57%**

How could a bond at par have a YTM that is 0.56% less than the coupon? Because portfolio averages are not indicative of the true risk/reward of the index portfolio…
Caveat Emptor!

About Ryan ALM, Inc.

Ryan ALM was founded by Ronald J. Ryan, CFA on July 12, 2004 as an Asset/Liability Management firm. The firm builds 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. It is back-tested since 2009 showing a consistent cost savings of 8% to 15%. Our LBP best represents the core portfolio of a pension plan.

Our team has been recognized for our expertise and results including Ron Ryan having won the William F. Sharpe Index Lifetime Achievement Award.