

“DISAGGREGATING” THE U.S. AGGREGATE BOND INDEX: A COMPONENT -BASED INVESTMENT APPROACH

SUMMARY

Investors often accept the market-weighted sector composition of the Bloomberg Barclays U.S. Aggregate Bond Index (Agg index) in their portfolios, but they do not need to. Investors can establish sector weights that better reflect their risk and exposure objectives. This can be done relatively simply by disaggregating the Agg index into its main components and then reassembling them to more closely align with a desired portfolio allocation.

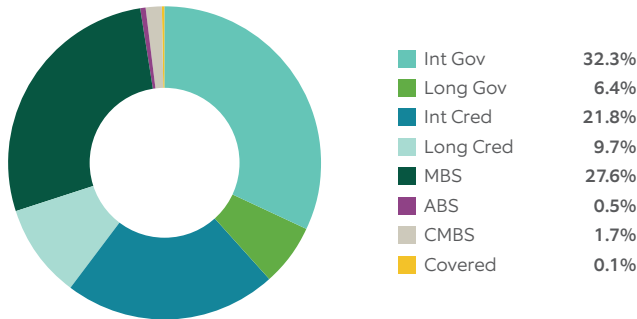
WHAT IS THE U.S. AGGREGATE BOND INDEX?

The Agg index has long been used as a benchmark by a wide range of fixed income investors and plan sponsors seeking to achieve broad, diversified exposure to U.S. bonds. Many index managers strive to track the returns of the Agg index, while many active managers use its returns as a performance benchmark. It is also common for retirement plan sponsors to offer an Agg index option to plan participants for low-cost exposure to the fixed income market.

The Agg index and its sub-indices cover the investment-grade, U.S. dollar-denominated, fixed-rate taxable bond market, including U.S. Treasuries, government-related and corporate, mortgage-backed, asset-backed, and commercial mortgage-backed securities. Major sub-indices include U.S. Government, U.S. Credit, and U.S. Securitized as shown in Exhibit 1.

Investors do not have to accept the market weighted Agg index allocations -- strategically choosing Agg components can help avoid unintended or undesirable concentrations or exposures.

EXHIBIT 1: U.S. AGGREGATE BOND INDEX COMPONENTS



Source: Bloomberg, Barclays, September 30, 2016

The Agg index is a market capitalization-weighted benchmark in which issuer and sector weights are driven by the outstanding amount of debt issued.

THE AGG INDEX IS DYNAMIC

The Agg index is a market capitalization-weighted benchmark in which issuer and sector weights are driven by the outstanding amount of debt issued. This market value weighting approach means that the issuers with the largest amount of outstanding debt will carry the largest weights in the index. Because of ongoing changes in index constituents and changing bond prices, the Agg index composition, concentrations, and risk measures will naturally change over time, including duration and yield within component sectors. An example of how large these changes can be is in the table below that shows the historic sector weights for the Agg index. This is a prime example of how shifting sector exposures can materially alter investor portfolios simply as a function of bond issuance patterns. We believe the constantly changing nature of the Agg index is something investors should actively decide to either accept or reject.

EXHIBIT 2: BLOOMBERG BARCLAYS U.S. AGGREGATE BOND INDEX: HISTORICAL SECTOR WEIGHTS

	Agg	Inter. Govt.	Long Govt.	Inter. Credit	Long Credit	Mortgage Backed	Asset Backed	Comml Mtge Backed
9/30/2006	100.0%	29.6%	6.4%	17.5%	5.6%	34.9%	1.2%	4.7%
9/30/2016	100.0%	32.3%	6.4%	21.8%	9.7%	27.6%	0.5%	1.7%

Source: Bloomberg, Barclays

**HOW WE DO IT AT NORTHERN TRUST ASSET MANAGEMENT:
DISAGGREGATE THE BENCHMARK AND REASSEMBLE
THE COMPONENTS**

For investors who are not content to allow issuance patterns and market value shifts determine their allocations and exposures, isolating the components of the Agg index and altering sector weights is a better way to more closely align with exposure objectives. Through this process investors can combine sector components in an allocation framework that is more reflective of their duration, yield, and risk objectives and preferences.

At Northern Trust Asset Management, we have long and extensive experience in building portfolios from the component pieces, using bottom-up construction in combination with top-down verification of overall exposure. We manage each of the component pieces separately, as standalone segments, with risk and return requirements that are consistent with those of each individual sector.

Northern Trust can manage component pieces of the Agg, which gives us the flexibility to combine its components in non-standard ways that may be more consistent with an investor's desired allocation. We manage the combination of components in a variety of delivery vehicles, including collective funds for retirement plan sponsors and custom sector allocations in separately managed accounts.

As an example of how altering your portfolio exposures relative to the Agg index can affect risk and returns, the following tables illustrate the effects of various allocation decisions. However, note that these are not recommended asset allocations, but are examples designed to illustrate the effects of different allocations.

The alternatives can be summarized as follows:

- **Actual** – historical returns of the market-weighted Agg index
- **Average Weight** – hypothetical returns using fixed average sector component weights since October 2006
- **Alternative 1** – reduce intermediate governments (relative to average), increase MBS
- **Alternative 2** – reduce intermediate governments and MBS, increase intermediate and long credit
- **Alternative 3** – reduce intermediate governments, increase intermediate credit
- **Alternative 4** – equal weight governments and credit (with larger relative allocations to the long end), increase MBS
- **Alternative 5** – simple equal weights across major component groups within governments, credit, and MBS

Northern Trust can manage component pieces of the Agg, which gives us the flexibility to combine its components in non-standard ways that may be more consistent with an investor's desired allocation.

EXHIBIT 3: ALTERNATIVE SECTOR COMPONENT ALLOCATIONS

	Actual	Avg weight	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Intermediate Government	Non-static Market Weighted	32.7%	17.0%	17.0%	26.0%	20.0%	18.0%
Long Government		5.3%	3.0%	3.0%	4.0%	10.0%	18.0%
Intermediate Credit		18.7%	20.0%	38.0%	25.0%	20.0%	18.0%
Long Credit		7.0%	6.0%	13.0%	8.0%	10.0%	18.0%
Mortgage Backed		32.9%	50.0%	25.0%	33.0%	40.0%	18.0%
Asset Backed		0.5%	1.0%	1.0%	1.0%	0.0%	5.0%
Commercial Mortgage Backed		2.9%	3.0%	3.0%	3.0%	0.0%	5.0%
		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: Bloomberg, Barclays

EXHIBIT 4: FIVE YEAR RETURNS AND VOLATILITY AS OF SEPTEMBER 30, 2016 (ANNUALIZED)

	Sector Component Allocation:						
	Actual	Avg weight	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total Return	3.08%	3.09%	3.16%	3.70%	3.24%	3.47%	4.14%
Return Volatility	2.64%	2.58%	2.39%	2.90%	2.59%	3.09%	4.10%
Return/Risk Ratio	1.17	1.20	1.32	1.27	1.25	1.12	1.01
Rank	5	4	1	2	3	6	7

Source: Bloomberg, Barclays. Results are reflective of static sector-weighted monthly returns, held constant over the measurement period and assumed to rebalance to static sector component weights in each period, rather than adjusting for shifts in relative sector durations.

EXHIBIT 5: TEN YEAR RETURNS AND VOLATILITY AS OF SEPTEMBER 30, 2016 (ANNUALIZED)

	Sector Component Allocation:						
	Actual	Avg weight	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Total Return	4.79%	4.90%	4.93%	5.22%	4.97%	5.26%	5.81%
Return Volatility	3.19%	3.25%	3.04%	3.83%	3.31%	3.76%	4.93%
Return/Risk Ratio	1.50	1.51	1.62	1.37	1.50	1.40	1.18
Rank	4	2	1	6	3	5	7

Source: Bloomberg, Barclays. Results are reflective of static sector-weighted monthly returns, held constant over the measurement period and assumed to rebalance to static sector component weights in each period, rather than adjusting for shifts in relative sector durations.

Some key observations from the examples found in Exhibits 3, 4 and 5 include:

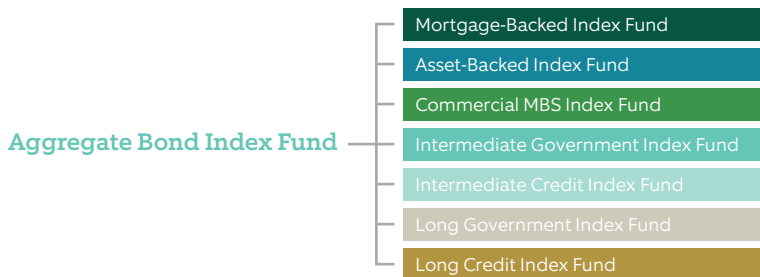
- Over both five year and ten year periods, the allocation which simultaneously reduced government exposure and increased MBS exposure (Alternative 1) generated the best return/risk ratios of all the alternative allocations.
- Conversely, the simple equally weighted allocation (Alternative 5) produced the lowest return/risk ratios. Despite higher absolute returns, it also displayed the largest variability of monthly returns.
- The actual historical Agg index allocation fell in the middle of the pack with respect to risk and returns.

It’s important to note that aside from the actual historical index allocation, these alternative allocations are static over the entire measurement period. In reality, however, we can help investors periodically adjust their allocations over time based on their risk preferences and outlook. The point is not to demonstrate that a certain allocation is superior to another, but rather to illustrate that different allocation choices can result in different return and risk profiles.

These examples show why an investor may choose to exert control over the component allocation decision, and because we manage each of these components individually, we can easily use them as building blocks to create a structure that is more closely aligned with an investor’s preference. Further, an investor need not choose each and every component to achieve a desired exposure. We manage the components individually, as well as in any combination. We can also draw on our top-down relative value investment approach and our macro view of the broader environment to help investors establish desired allocations among the components. Finally, the allocation approach is flexible and can be revisited and rebalanced periodically.

The point is not to demonstrate that a certain allocation is superior to another, but rather to illustrate that different allocation choices can result in different return and risk profiles.

EXHIBIT 6: COMPONENT APPROACH TO INDEX FIXED INCOME



CONCLUSION

Market weighted Agg index allocations may result in unintended or undesirable concentrations or exposures. However, investors do not have to accept market-weighted Agg index allocations and can more strategically choose their desired exposures. The Agg can be disaggregated into components and the components can then be reassembled to more closely align with their risk and exposure objectives.

Market weighted Agg index allocations may result in unintended or undesirable concentrations or exposures. Components can be reweighted to more closely align with investor preferences.

LEARN MORE

With years of experience and expertise in managing the individual Agg index components, Northern Trust Asset Management is positioned to help you achieve your goals. Visit us at northerntrust.com for more information.

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