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ONE DECADE:
The Transformation of the Bloomberg Barclays Intermediate Government Credit Index

The Investment Grade fixed income universe has undergone a transformation over the last decade. We focus the following analysis of this transformation in the context of the Bloomberg Barclays Intermediate Government Credit Index. The index itself is a representation of investment grade fixed income issuance in the market place. This index is a widely accepted representative fixed income benchmark for Core Investment Grade investors.

On the surface, the allocation mix of the index of roughly 60% Government securities and 40% Credit orientated securities looks mostly unchanged over the years. When we dig deeper, however, the compositional changes within the individual Government and Credit Sectors are actually quite profound. As such, the index of ten years ago is not the index of today.

Since the index is a representation of issuance in the market place, we must examine how issuance has changed. The table below demonstrates these changes in ten years time, broken down by broad investment grade sectors. It shows where the issuance has increased and decreased both in market value and in number of issues.

As the table indicates, the number of issues in the index grew from 3,230 to 4,766, an increase of 1,536 or 48%. Most importantly, the growth was not proportional. In fact, the Government proportion of issues actually shrank by 412, or 47%. This was mostly due to Government Agency Issuance decreasing subsequent to the U.S. Government taking certain Agency issuers into conservancy.

Alternatively, the number of issues in the Credit Sector grew from 2,358 to 4,306, an increase of 1,948 or 83%.

	2007			2017		
	% of Market $	# of Issues	% of Issues	% of Market $	# of Issues	% of Issues
Government	**61.0%**	**872**	**27.0%**	**60.3%**	**460**	**9.7%**
Treasury	40.8%	107	3.3%	57.5%	210	4.4%
Agency	20.2%	765	23.7%	2.8%	250	5.2%
Credit	**39.0%**	**2358**	**73.0%**	**39.7%**	**4306**	**90.3%**
Corporate	33.0%	2128	65.9%	32.7%	3835	80.5%
Non-Corporate	6.0%	230	7.1%	7.1%	471	9.9%
Total		**3230**			**4766**	
Credit	**39.0%**	2358	73.0%	**39.7%**	4306	90.3%
AAA	5.0%	175	5.4%	4.5%	237	5.0%
AA	9.2%	385	11.9%	4.1%	391	8.2%
A	13.6%	887	27.5%	14.5%	1521	31.9%
BBB	11.2%	911	28.2%	16.6%	2157	45.3%

Source: Bloomberg Barclays

What we found so profound was when we examined the proportional changes in the number of issues in each Government and Credit component. The number of Government issues used to be roughly 27% (872/3,230) of the index. Now it is 9.7% (460/4,766). The Credit sector by number of issues used to be 73% (2,358/3,230). Now it is 90.3% (4,306/4,766). In all of the data so far, the Corporate proportion of issues is most notable, 80.5% of the issues now make up only 32.7% of the index market value!

We then go further into the quality composition of Credit sector issuance. We identified that the growth of this sector is not proportional by credit rating. As a proportion of both market value and number of issues, AAA and AA rated securities decreased. Single A rated securities as a percentage of market value and number of issues grew somewhat. The greatest change was with BBB rated securities. They appear to be the largest contributor to market value growth and new issuance in the index. The portion of total index market value grew from 11.2% to 16.6% and the number of issues grew from 911 to 2,157. BBB rated securities now compose 45.3% of the issues in the index and only make up 16.6% of the market value. In other words, of the 1,536 increase in net index issues, 1,246 (81%) were in BBB rated securities.

We have identified the contributors to the index changes by market value and issue. Now we continue the analysis by examining individual issuer concentrations in the Corporate sector.

Source: Bloomberg Barclays, CMS Bondedge

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The Barclays Intermediate Government Credit Index presently has 4,766 issues, of which 3,835 are corporate issues. There are multiple issues from specific issuers in the index. In total, there are 706 issuers of corporate securities in the index. Here we examine issuer contribution to the index as a percentage of the Corporate Sector.

Individual Issuers as a % of Corporates ($)	# of Corporate Issuers	% of # of Corporate Issuers	Total % Weight ($)	Weighted Avg. YTM	Weighted Avg. Duration	Moody's Weighted Avg. Quality	S&P Weighted Avg. Quality
Greater than 2%	4	0.6%	9.04%	2.87	4.42	A3	BBB+
Between 1½% and 2%	3	0.4%	5.40%	2.80	4.72	A2	A
Between 1% and 1½%	4	0.6%	5.05%	2.84	4.49	A2	A
Between ½% and 1%	26	3.7%	17.30%	2.71	3.93	A3	A-
Between ¼% and ½%	66	9.3%	23.90%	2.84	4.28	A3	A-
Between ⅛% and ¼%	100	14.2%	17.24%	2.85	4.19	Baa1	BBB+
Between 1⁄16% and ⅛%	122	17.3%	10.72%	3.04	4.76	Baa2	BBB+
Less than 1⁄16%	381	54.0%	11.35%	3.14	4.75	Baa2	BBB
	706	100.0%	100.0%	2.87	4.36	Baa2	BBB

Source: CMS BondEdge

Within the corporate sector it is very important to note that a small amount of issuers comprise a large proportion of the market weight of the Corporate sector. The 10 largest issuers (JPM, BAC, MS, GS, C, WFC, AAPL, T, ABIBB, HSBC) comprise 18.4% of the market weight of Corporates in this index. The smallest 469 issuers make up the same concentration. That is two thirds of the issuers only make up 18.4% of the market weight of the Corporate sector. Taken another way, the largest 100 issuers make up 60% of the Corporate market weight.

From a sampling perspective, we would assume that picking an adequate amount of the largest and most liquid and tradable securities could do a reasonable job of representing the Corporate sector. That would be mostly true if the distribution of quality were even. Unfortunately, it is not. The largest corporate issuer contributors are higher in quality on average, as can be seen in the table above.

To further demonstrate the disproportionate tilt in issuer contribution versus quality, we have taken the data from the above example and removed single A rated and higher issuers from the table. Only BBB rated securities and split rated (A/BBB) securities are included in the table below.

Individual Issuers as a % of Corporates ($)	# of **BBB Corp** Issuers	% of # of BBB Corp Issuers	BBB Rated Total % Weight ($)	BBB Rated Weighted Avg. YTM	BBB Rated Weighted Avg. Duration	Moody's Weighted Avg. Quality	S&P Weighted Avg. Quality
Greater than 2%	2	0.4%	8.08%	2.91	4.24	A3	BBB+
Between 1½% and 2%	1	0.2%	3.76%	2.96	4.65	Baa1	BBB+
Between 1% and 1½%	1	0.2%	2.75%	3.15	4.78	Baa1	BBB+
Between ½% and 1%	7	1.4%	9.52%	3.04	4.10	Baa2	BBB
Between ¼% and ½%	33	6.7%	23.15%	3.12	4.41	Baa2	BBB
Between ⅛% and ¼%	60	12.2%	20.03%	2.99	4.30	Baa2	BBB
Between 1⁄16% and ⅛%	89	18.1%	15.20%	3.19	4.84	Baa2	BBB
Less than 1⁄16%	299	60.8%	17.51%	3.24	4.79	Baa3	BBB
	492	100.0%	100.0%	3.10	4.50	Baa2	BBB

Source: CMS BondEdge

Of the original 706 issuers, 492 remain. In other words, 70% of the total Corporate issuers fall in the BBB rated spectrum. Only 11 of them each make up more than ½% of the Corporate portion of the index. That fractional contribution is less when taking the index as a whole. Those remaining 481 issuers of BBB rated securities are so numerous yet they are such small fractional components of the index. What is more interesting is that these small issuers are the large majority of the lowest quality contributors to the index. Capturing an index representative sample of those 481 issuers, let alone locating an adequate amount of supply and liquidity, is a challenge in itself. Select the wrong sample, the result could lead to disparate relative portfolio returns to the benchmark.

Attempts at replication of the low quality portion of the index may likely have notable tracking error relative to the actual index. In fact, the small fractional constituents, market supply, liquidity and trading conditions for this index component make the large potential for increased tracking error difficult to avoid.

Once upon a time the number of issues, issuers, and market weight of the BBB rated component were small enough to be less concerned over compositional precision of the replication. That is no longer the case.

Moreover, whether it was ten years ago or today, the BBB rated component is by far the most volatile component of this index. At 11.2% of market value in 2007 or 16.6% in 2017, it's ability to affect overall returns is actually quite substantial. To examine this, we look at the BBB rated component contribution to return by comparing the annual Intermediate Government Credit Index returns over the last ten years relative to the returns of the Intermediate A+ Government Credit Index (the same index minus the 2,157 BBB rated security allocation). See the table below.

											10 Year Return	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**	**Annualized**
Bloomberg Barclays Intermediate Gov/Credit Index	**5.08**	**5.24**	5.89	5.80	**3.89**	-0.86	3.13	1.07	2.08	2.14	38.68	3.32
Bloomberg Barclays Intermediate A+ Gov/Credit Index	**6.82**	**2.85**	5.48	5.67	**3.14**	-1.00	2.84	1.31	1.44	1.60	34.26	2.99
Intermediate AAA	**7.86**	**1.87**	4.85	4.56	**3.19**	-0.54	2.45	0.96	1.17	1.54	31.36	2.77
Intermediate AA	**1.58**	**8.63**	6.25	4.33	**5.21**	-0.70	3.69	1.71	2.19	2.46	41.11	3.50
Intermediate A	**-4.85**	**15.34**	7.98	4.83	**9.12**	-0.10	4.08	1.82	2.95	3.45	52.84	4.33
Intermediate BBB	**-8.42**	**27.01**	9.39	6.91	**9.64**	0.05	4.92	-0.21	5.42	4.79	72.59	5.61

Source: Bloomberg Barclays

In periods when the performance of lower credit quality and higher credit quality are highly divergent, performance of the two indices without question differ considerably.

Considering the results above, we now highlight our premise that BBB rated security sampling ineffectively replicates the performance of this portion of the index given the complexity of the component. We analyze this by comparing the Intermediate Government Credit Index returns versus the returns of the iShares Intermediate Government Credit Bond index ETF (GVI). GVI is an index based ETF that has an investment objective to track the performance of the Bloomberg Barclays Intermediate Government Credit Index. It's objective is to replicate the attributes of the index. It is one of the largest true Core investment grade publically traded investment vehicles mandated to track the performance of the index. With over $2 billion under management and 2,500 securities in the portfolio it should have the scale to capture fractional components better than most.

											10 Year Return	
	2008	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**Total**	**Annualized**
Bloomberg Barclays Intermediate Gov/Credit Index	**5.08**	**5.24**	5.89	5.80	**3.89**	-0.86	3.13	1.07	2.08	2.14	38.68	3.32
GVI	**7.95**	**1.89**	5.43	5.87	**3.15**	-0.93	2.86	0.80	1.99	1.83	35.07	3.05

Source: Bloomberg Barclays, Blackrock iShares

Note that in years with large variances between credit quality returns (e.g. 2008, 2009, 2012), even one of the largest most diversified index tracking portfolios fails to constantly capture the index results. In periods where BBB rated securities underperform, GVI outperforms the index. In periods where BBB rated securities outperform, GVI lags the index. This leads us to conclude that despite strict index specific portfolio objectives and guidelines, and even 2,500 issues in the portfolio, the manager fails to capture the performance of all the fractional components of the increasingly complex lower rated BBB security allocation.

To recap, the index compositionally has transformed. The transformation came from a significant increase in issuance and issuers of lower quality corporate credit. In general, the market value weight of each lower quality constituent is only a small fraction of the index. Taken as a whole, these fractional constituents are an increasing allocation and influence within the index. These fractional constituents are also the most volatile contributors to the index performance. We have

demonstrated their effects on index performance, historically when they were less in market weight and number. Given the already large increase and the growth trend in composition, we expect performance disparities between the index and a stratified sampling methodology to have greater variance in the future. The stratified sampling method even in a highly diversified portfolio fails to capture the entire index. A notable variance will occur again when the market experiences another period of meaningfully lower credit quality and higher credit quality performance divergence, all else equal.

Our findings and experience expound even the largest of true Core investment grade portfolio managers can not track the index effectively in periods of high Corporate quality component variation. Furthermore, for any true Core manager, as the size of the portfolio decreases and the ability to diversify efficiently diminishes, the tracking error to the index will undoubtedly increase, all else equal. Replication of an index is always a challenge, but the real quandary is how best to capture and communicate the influence an increasingly complex index allocation of BBB rated securities has on a representative stratified sample portfolio.

SUMMARY POINTS OF THE ANALYSIS

- The Corporate composition within the index has transformed notably
- The number of corporate issues and issuers has increased disproportionately
- Most corporate issuers are now small fractional components of the index
- A very large majority of the smallest contributors are lower in quality
- Overall, the smallest components are the lowest in quality
- Replication of the small fractional components is problematic
- Lower quality securities are the most volatile
- Greater tracking error is inevitable in a representative stratified sample portfolio
- Tracking error will be greatest in periods of meaningfully lower credit quality and higher credit quality performance divergence

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