Bloomberg US Investment Grade Corporate Bond Tradable Tracker Index Methodology

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OVERVIEW OF THE US IG TRADABLE TRACKER

The Bloomberg US IG Corporate Bond Tradable Tracker Index (TTIGCU) is designed to be a rules-based index that aims to track the Bloomberg US Corporate Bond Index ("Parent Index"), based on liquidity criteria. This document provides the rules for index constituent eligibility, construction, and rebalancing, as well as information on pricing and input data.

Section 1: Index Construction Methodology

Index Eligibility Criteria

Securities must meet the following criteria to be considered for inclusion in the index:

- **Parent Universe** – Each bond must be a constituent member of the Bloomberg US Corporate Bond Index
- **Coupon Type** – The following coupon types are included
  - Fixed (including fixed-to-float bonds during their fixed rate term only)
  - Zero coupon bonds
- **Rank** – Bonds must be senior unsecured or higher in capital structure
- **Maturity** – Callable (including make-whole call) and puttable are eligible

Index Construction

The Bloomberg US Investment Grade ("IG") Corporate Bond Tradable Tracker Index follows the same pricing conventions, calendar, publishing time, and settlement and cash re-investment assumptions as the Parent Index it tracks. For details, please see the Bloomberg US Corporate Bond Index factsheet.

The US IG Tradable Tracker index is comprised of 100 issuers across all industry sectors and 2 liquid bonds per issuer. The selection of the issuers, bond liquidity criteria and construction of the index is described below:

- The US IG Corporate bond sub-set of the Bloomberg US Aggregate Index is partitioned into industry sectors based on level 3 of the Bloomberg classification for fixed income securities ("BCLASS3").

- The number of issuers per industry sector is based on the Market Value ("MV") % of each industry sector. For example:

	#	Market Value (%)
	Total	Total
Total	6780	100.00
Corporate	**6780**	**100.00**
Industrial	**4026**	**61.71**
Basic Industry	243	2.82
Capital Goods	484	5.85
Consumer Cyclical	482	6.79
Consumer Non-Cyclica	1034	16.07
Energy	552	8.06
Technology	491	9.63
Transportation	230	2.44
Communications	447	9.60
Other Industrial	63	0.45
Utility	**941**	**8.12**
Electric	850	7.31
Natural Gas	71	0.63
Other Utility	20	0.18
Financial Institutions	**1813**	**30.18**
Banking	888	20.65
Brokerage Assetmanag	108	1.20
Finance Companies	84	1.08
Insurance	383	4.45
REITS	341	2.72
Other Financial	9	0.08

	# of Issuers
	Total
Total	100.00
Corporate	**100.00**
Industrial	**62.00**
Basic Industry	3
Capital Goods	6
Consumer Cyclical	7
Consumer Non-Cyclica	16
Energy	8
Technology	10
Transportation	2
Communications	10
Other Industrial	0.00
Utility	**8.00**
Electric	7
Natural Gas	1
Other Utility	0.00
Financial Institutions	**30.00**
Banking	21
Brokerage Assetmanag	1
Finance Companies	1
Insurance	4
REITS	3
Other Financial	0.00

- Once the number of issuers per industry sector is determined, the top issuers are selected based on their MV% within that industry:

Example: energy is assigned 8 issuers

Company name	**Ticker**	**MV% in the industry**
Energy Transfer	ET	7.58%
Shell	RDSALN	6.96%
Exxon	XOM	6.83%
British Petroleum	BPLN	6.34%
Enterprise Products	EPD	5.71%
Kinder Morgan	KMI	5.34%
Chevron	CVX	5.22%
Williams Cos	WMB	4.22%
MPLX	MPLX	3.98%
Conoco Phillips	COP	3.60%
ONEOK Inc.	OKE	2.98%
TransCanada Pipelines	TRPCN	2.98%

- For each selected issuer, the MV weighted Option-Adjusted Spread Duration ("OASD") is calculated.

$$TickerOASD = \frac{\sum_{Ticker's\ bonds\ in\ LUAC}(MV_{eachBond} * OASD_{bond})}{\sum_{Ticker's\ bonds\ in\ LUAC}(MV_{eachBond})}$$

- Bonds from the selected issuers are partitioned into two buckets:
  1) Shorter Duration Bucket: Bonds with duration less than issuer MV weighted OASD
  2) Longer Duration Bucket: Bonds with duration greater than issuer MV weighted OASD

- A liquidity score is assigned to each eligible bond. The score is used to rank bonds from the most liquid to the least liquid within each bucket, based on the liquidity score:

$$\boldsymbol{Liquidity\ Score = 0.5 * \ Previous\,Trace\ Avg + \ 0.3 * \ AmtOut - \ 0.2 * Age}$$

  Where *PreviousTraceAvg* is the average daily number of dealer to client trades (over 250K USD) from TRACE*, *AmtOut* is the bond amount outstanding at the time of the re-balance and Age is the time in years between the rebalance date and the bond's issuance date[1]

- Two bonds per issuer are selected: one from the Shorter Duration Bucket with the highest liquidity score and one from the Longer Duration Bucket with the highest liquidity score.

- Once the bonds to be used are selected, the weights of each bond in the index is determined such that their combined MV% is equal to the issuer's MV% in the Parent Index and such that their weighted duration is equal to the OASD of the issuer within the Parent Index plus 1/8 of a year.

<u>*W1*</u> + <u>*W2*</u> = TickerWt
<u>*W1*</u>*OASD1 + <u>*W2*</u>*OASD2 = TickerWt * TickerOASD+1/8

TickerWt= MV% Weight of Ticker Among chosen issuers in Industry*IndustryMV% weight

[1] Each of these three components in the equation is transformed into a z-score (winsored between -4 and 4) before being used in the calculation.

Index Rebalancing

The index will be rebalanced quarterly (Feb end, May end, Aug end and Nov end) on the last business day of the quarter and eligibility of bonds will be determined on the fourth to last business day of each quarter.

The index definition for liquidity

The index aims to select bonds with most projected liquidity over the 3-month period after the rebalance date per the liquidity criteria set forth in the methodology.

The index prioritises bonds with the highest liquidity metric (using the liquidity calculation set out above) from the selected issuers (liquidity score = 0.5* {average daily number of TRACE trades (>250m) in the past 20 days} + 0.3* {amount outstanding at time of rebalance} - 0.2*{age of issue}.

Section 2: Back Test Assumptions

The rules outlined above are applied historically and the Index was backfilled to March 2, 2020.

Section 3: Limitations

Limitations of the index

Though the Index is designed to be representative of the markets it measures or otherwise aligns with its stated objective, it may not be representative in every case or achieve its stated objective in all instances. It is designed and calculated strictly to follow the rules of this Methodology, and any Index level or other output is limited in its usefulness to such design and calculation.

Markets can be volatile, including those market interests that the Index measures or upon which the Index is dependent to achieve its stated objective. For example, illiquidity can have an impact on the quality or amount of data available to the administrator for calculation and may cause the Index to produce unpredictable or unanticipated results.
In addition, market trends and changes to market structure may render the objective of the Index unachievable or to become impractical to replicate by investors.

In particular, the indices measure global fixed income markets. As with all fixed income investing, the indices are exposed to interest rate risk. The value of bonds fluctuates with the changes in the interest rate policies established by central banks and the natural movement of rates over time. Bonds with optionality will also be impacted by interest rate volatilities. Most fixed income securities often trade at a spread to the base interest rate curve. The level of the spread reflects the additional premium an investor requires for taking the additional credit risk, liquidity risk, and other risks. The change of the spread, which reflects primarily the change in perceived risk of a security, comes from both common forces, affecting all bonds with similar characteristics, and information specific to a particular issuer. As the indices are designed to measure those markets, its indices could be materially impacted by market movements, thus significantly impacting the use or usefulness of the fixings for some or all users.

Section 4: Benchmark Oversight and Governance

Benchmark governance, audit and review structure

BISL uses three primary committees to provide overall governance and effective oversight of its benchmark administration activities:

- The Product, Risk & Operations Committee ("**PROC**") is responsible for the first line of control over the creation, design, production and dissemination of benchmark indices, strategy indices and fixings administered by the BISL.
- The oversight function is provided by Bloomberg's Benchmark Oversight Committee ("**BOC**"). The BOC is independent of the PROC and is responsible for the review and challenge of the Board and the PROC regarding relevant aspects of the provision of Benchmarks by BISL, as set out in the UK BMR.
- The Risk Committee ("**RiskCo**") advises the Board, the PROC and the BOC on the Company's overall risk appetite, tolerance and strategy and oversees the Company's risk exposure and risk strategy

On a quarterly basis, the PROC reports to the BOC on governance matters, including but not limited to client complaints, the launch of new benchmarks, operational incidents (including errors & restatements), major announcements and material changes concerning the benchmarks, the results of any reviews of the benchmarks (internal or external) and material stakeholder engagements.

Index and data reviews

The Index Administrator will review the Indices (both the rules of construction and data inputs) on a periodic basis, not less frequently than annually, to determine whether they continue to reasonably measure the intended underlying market interest, the economic reality or otherwise align with their stated objective. More frequent reviews may result from extreme market events and/or material changes to the applicable underlying market interests.

In addition to material changes, BISL may from time to time terminate one or more Indices ("Discontinued Indices"), whether due to changes in market structure, a lack of requisite data, insufficient usage, or for other regulatory or practical concerns. The process for terminating such Discontinued Indices is as follows:

The PROC will review proposed terminations, taking into account the reasons for termination, the impact on users (if any), the availability of alternative products and other such factors. If termination is approved, users will be provided as much prior notice as is reasonable under the circumstances, typically 90 days. In the event there is little or no known usage identified, the Discontinued Indices may be terminated with less (or no) notice, as applicable. In the event the Discontinued Indices are licensed for use as the basis of an ETF or other widely available financial product or is otherwise determined by BISL to be an important benchmark without reasonable substitutes, the notice period may be extended, as warranted. Any advance notice period is subject to BISL being reasonably able to continue administering and calculating such benchmark during such period (for example, BISL has access to requisite data on commercially reasonable terms, is not subject to any litigation or other claims, has adequate internal resources and capabilities, etc.). Terminations and associated user engagement decisions made by the PROC are subject to review by BISL's oversight function, the BOC.

Criteria for data inputs include reliable delivery and active underlying markets. Whether an applicable market is active depends on whether there are sufficient numbers of transactions (or other indications of price, such as indicative quotes) in the applicable constituents (or similar underlying constituent elements) that a price (or other value, as applicable) may be supplied for such constituent(s). Where the constituents of the Indices are themselves other index levels or values, as in this Methodology, whether or not the underlying market is active is determined solely by reference to whether an official level or value is published in accordance with such underlying index's methodology.

Other than as set forth in this Methodology (read in conjunction with the Bloomberg US Corporate Bond factsheet.), there are no minimum liquidity requirement for Index constituents and/or minimum requirements or standards for the quantity or quality of the input data. The review will be conducted by product managers of the Index in connection with the periodic rebalancing of the Index or as otherwise appropriate.

Any resulting change to the Methodology deemed to be material (discussed below) will be subject to the review of the PROC under the oversight of the BOC, each of which committees shall be provided all relevant information and materials it requests relating to the change. Details regarding the PROC and BOC are described above. Any relevant changes will be reflected and tracked in updated versions of this Methodology.

BISL's Index administration is also subject to Bloomberg's Compliance function which periodically reviews various aspects of its businesses in order to determine whether it is adhering to applicable policies and procedures and assess whether applicable controls are functioning properly.

Material changes related to the Indices will be made available in advance to affected stakeholders whose input will be solicited. The stakeholder engagement will set forth the rationale for any proposed changes as well as the timeframe and process for responses. The Index Administrator will endeavour to provide at least two weeks for review prior to any material change going into effect. In the event of exigent market circumstances, this period may be shorter. Subject to requests for confidentiality, stakeholder feedback and the Index Administrator's responses will be made accessible upon request.

In determining whether a change to an Index is material, the following factors shall be taken into account:

- The economic and financial impact of the change;
- Whether the change affects the original purpose of the Index; and/or
- Whether the change is consistent with the overall objective of the Index and the underlying market interest it seeks to measure

Expert judgement

The Index is rules-based, and its construction is designed to consistently produce values without the exercise of expert judgment or discretion. Nevertheless, BISL may use expert judgment or discretion with regards to the following:

- Index restatements
- Extraordinary circumstances during a market emergency
- Data interruptions, issues, and closures

When expert judgment or discretion is required, BISL undertakes to be consistent in its application, with recourse to written procedures outlined in this Methodology and internal procedures manuals. In certain circumstances exercises of expert judgment or discretion are reviewed by senior members of BISL management and Legal & Compliance teams, and are reported to the PROC, BISL's governance committee, which operates under the supervision of BISL's oversight function, the BOC. BISL also maintains and enforces a code of ethics to prevent conflicts of interest from inappropriately influencing index construction, production, and distribution, including the use of expert judgment or discretion.

Data providers and data extrapolation

The Index is rules-based, and its construction is designed to consistently produce Index levels without the exercise of discretion. The Index is produced without the interpolation or extrapolation of input data.

In addition, BISL seeks to avoid contributions of input data that may be subject to the discretion of the source of such data and instead seeks to use input data that is readily available and/or distributed for a number of non-index or benchmark creation purposes. Accordingly, the index requires no 'contributors' to produce and no codes of conduct with any such sources are required.

Conflicts of interest

The Index confers on BISL discretion in making certain determinations, calculations and corrections from time to time. In making those determinations, calculations and corrections, the Index Administrator has no obligation to take the needs of any Product Investor or any other party into consideration. BISL is committed to avoiding and, where necessary, managing actual or potential conflicts of interest in the BISL decision-making process and has established a Conflicts of Interest Policy to minimise or resolve actual or potential conflicts of interest. BISL does not create, trade or market Products.

Restatement policy

BISL strives to provide accurate calculation of its indices. However, to the extent a material error in index levels is uncovered following publication and dissemination, a public notification will be made alerting of such error and the expected date of a revised publication, if warranted.

Not all conditions need to be present to warrant a restatement, and certain factors may be more determinative than others depending on the circumstances of the given error.

- The relative importance of the data field impacted by the error;
- When the error occurred and when it was discovered;
- The number of indices and sub-indices affected;
- Whether the impacted indices are linked to tradable products;
- The magnitude of the error;
- The burden of restatement on client re-processing relative to the impact of the error;
- The impact of the restatement on analytical tools.

Glossary

BCLASS3	Bloomberg level 3 classification for fixed income securities.
Longer Duration Bucket	Bonds with duration greater than issuer Market Value weighted Option-Adjusted Spread Duration
Market Value	Market Value reflects the current price plus accrued interest times the amount outstanding of a bond.
Parent Index	Bloomberg US Corporate Bond Index
Shorter Duration Bucket	Bonds with duration less than issuer Market Value weighted Option-Adjusted Spread Duration
TRACE	The Trade Reporting and Compliance Engine is the FINRA-developed vehicle that facilitates the mandatory reporting of over-the-counter transactions in eligible fixed income securities.

Appendix 1:

EXPLANATION OF HOW ESG FACTORS ARE REFLECTED IN THE KEY ELEMENTS OF THE BENCHMARK METHODOLOGY	
Item 1. Name of the benchmark administrator.	Bloomberg Index Services Limited ("BISL")
Item 2. Type of benchmark or family of benchmarks. *Choose the relevant underlying asset from the list provided in Annex II to Commission Delegated Regulation (EU)*2020/1816.	Fixed Income
Item 3. Name of the benchmark or family of benchmarks.	Bloomberg IG Corp Bond Tradeable Tracker Index
Item 4. Does the benchmark methodology for the benchmark or family of benchmarks take into account ESG factors?	No
Item 5. Where the response to Item 4 is positive, please list below, for each family of benchmarks, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816. Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets. The ESG factors shall be disclosed at an aggregated weighted average value at the level of the family of benchmarks.	
(a) List of environmental factors considered:	Not applicable
(b) List of social factors considered:	Not applicable
(c) List of governance factors considered	Not applicable
Item 6. Where the response to Item 4 is positive, please list below, for each benchmark, those ESG factors that are taken into account in the benchmark methodology, taking into account the ESG factors listed in Annex II to Delegated Regulation (EU) 2020/1816, depending on the relevant underlying asset concerned. Please explain how those ESG factors are used for the selection, weighting or exclusion of underlying assets. The ESG factors shall not be disclosed for each constituent of the benchmark but shall be disclosed at an aggregated weighted average value of the benchmark. Alternatively, all of this information may be provided in the form of a hyperlink to a website of the benchmark administrator included in this explanation. The information on the website shall be easily available and accessible. Benchmark administrators shall ensure that information published on their website remains available for five years.	
(a) List of environmental factors considered:	As above
(b) List of social factors considered:	As above
(c) List of governance factors considered:	As above
Item 7. Data and standards used	
(a) Data input. (i) *Describe whether the data are reported, modelled, or sourced internally or externally.* (ii) *Where the data are reported, modelled, or sourced externally, please name the third-party data provider.*	Not Applicable
(b) Verification and quality of data. *Describe how data are verified and how the quality of those data is ensured.*	Not Applicable
(c) Reference standards *Describe the international standards used in the benchmark methodology.*	N/A
Date on which information has been last updated and reason for the update:	January 2023, initial publication

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