Methodology
Global Fixed Income Indices
January 2024

Contents

INTRODUCTION

The majority of indices in the Bloomberg Global Fixed Income family (each an "Index" and, collectively, the "Indices" or the "GFI Indices") have been retired subsequent to the migration of the Bloomberg Barclays family of fixed income indices acquired in 2016. A list of the ongoing Indices can be found in Table 2 of the appendix. Bloomberg Index Services Limited ("BISL" and, with its affiliates, "Bloomberg") is the administrator of these remaining GFI Indices.

INDEX CONSTRUCTION OVERVIEW

Daily Index Calculation

Returns and statistics for the GFI Indices are calculated every weekday, regardless of local holidays. Adhering to the principle of incorporating the most accurate and recent data available, when a local holiday precludes employing same-day pricing, then the Indices will use the previous day's pricing but maintain same-day settlement.

Returns and Statistics

Levels and related portfolio characteristics for the GFI Indices are drawn from two different versions of the index family the "Returns Universe" and the "Statistics Universe."

Returns Universe

The Returns Universe is designed to mimic a strict buy-and-hold portfolio with a monthly rebalancing. The Returns Universe membership is defined by applying the security eligibility rules at each monthly rebalancing date and holding the resulting list of securities constant over the month. Starting weights for the constituents are based on closing prices on the rebalancing date. All published return measures are calculated against the Returns Universe and include corporate actions that occur during the month such as principal paydowns and coupon payments.

Statistics Universe

The Statistics Universe represents the changing risk profile of the market the Indices are designed to represent. The Statistics Universe membership is defined by applying the security eligibility rules daily and setting constituent weights based on daily closing prices. The Statistics Universe captures new issuance, removes securities that are no longer eligible and incorporates bond revaluations that impact relative weights. The Statistics Universe is used as a projection of the next rebalancing as the Statistics Universe membership becomes the Returns Universe membership for the following month.

Weighting

All index returns and most statistics for the GFI Indices are market capitalization-weighted unless otherwise noted. Performance measurements are proportionally weighted by the beginning market capitalization of each bond.

Statistics are drawn from the Statistics Universe and, therefore, reflect most recent market capitalization. Exceptions to the market-capitalization weighting are the measures of average price and average coupon, which are par-weighted averages. Market capitalization is calculated by multiplying the bond's dirty price (price plus accrued interest) by the current total amount outstanding.

Treatment of Cash

Cash generated from constituent bonds' coupons, paydowns or calls is assumed to be reinvested in the index portfolio upon receipt.

Settlement

All bonds are assumed to have settled for cash regardless of individual settlement conventions. That is, the settlement date is the same as trade date (same day settlement) for purposes of calculating accrued interest and market capitalization.

Currency

For GFI Indices in which all instruments are denominated in a single currency, the base currency of that Index is the local currency. For Indices that include securities denominated in multiple currencies, the base currency of the Index is the U.S. dollar. Securities denominated in other currencies are converted to U.S. dollars using BFIX currency rates.

GFI Indices use the BFIX fixings for translation of currencies. BFIX provides daily currency fixing rates, which are generated throughout the trading day at fixed, half-hourly intervals. For translation of end-of-day index levels, the London 4:00 pm snapshot is used for most currencies; where appropriate, another snapshot time may be used.

ELIGIBILITY OF CONSTITUENTS

Index membership is defined by multiple criteria. The primary criteria for the GFI Indices include, but are not limited to: market sector, rating, currency, maturity, amount outstanding and market of issue.

Amount Outstanding

The principal amount outstanding of a bond is a primary criterion for determining Index membership. It offers the most efficient way to ensure that Index bonds have a sufficient degree of liquidity- which is a main pillar of investability.

Maturity

In general, only bonds with at least 12 months remaining time to maturity are eligible. Time to maturity is based on the stated final maturity of a security, regardless of call or put option clauses.

Ratings

Multiple rating agencies provide credit opinions on individual bonds and bond issuers. GFI Indices employ a composite of four ratings agencies - DBRS, Fitch, Moody's and Standard & Poor's. See the Ratings section for more details.

Currency

Both single-currency Indices and multi-currency Indices are included in the GFI Index family. Currency refers to a security's denomination and is independent of the country of the issuer.

Sector Classification

GFI Indices use the Bloomberg Industry Classification System for Fixed Income (BICS FI <GO>). This is a hierarchical system that classifies fixed income security issuers. See the Sector Classification section for more details.

For corporate bond Indices, issuers belonging to all Levell sectors except Government are eligible. For government bond Indices, Level 2 of BICS FI defines eligibility.

Country of Risk

The Indices subscribe to Bloomberg's internal definition of a bond's market status. That is, if an issue's country of risk or country of incorporation is considered to be an emerging market, then the issue will be labeled emerging. The full list of countries denoted by Bloomberg as emerging market countries can be found at the function EMWH <GO>.

Exclusions
The following bond types are excluded:
- Private placements (except for emerging markets and high-yield indices, privates were included in USD high yield starting in June 2073)
- Convertible bonds
- Perpetual bonds
- Bonds with non-fixed coupon
- Inflation-linked bonds
- Bonds with survivor puts

PRICING OF INDEX CONSTITUENTS

Prices of index bonds in the GFI Indices are gathered from BVAL, Bloomberg's securities valuation services. BVAL provides credible, transparent and defensible valuations across a broad spectrum of financial instruments, including fixed income, derivatives and structured notes.

These prices are completely independent, drawing on market data contributed from more than 4,000 market participants. This broad global dataset of market observations is combined with market-leading analytics and Bloomberg's terms and conditions databases to produce objective third-party pricing with deep transparency into how the prices are derived.

All Indices are marked with NY 3:00 pm BVAL prices and all prices are assigned on the bid side regardless of whether the bond is new to or is leaving an Index.

For bonds that are traded on dirty price by convention, the Index follows this convention and displays the dirty price. When dirty-priced bonds pay a coupon, an adjustment to the price must be made to accommodate the receipt of a cash coupon. This adjustment is made in accordance with the settlement convention of the bond.

An important feature of BVAL as it relates to indexing is the BVAL Score, which measures the amount and consistency of data used to produce the final BVAL prices. These scores are used by regulators, auditors and repo desks and can potentially be used as Index criteria for customized solutions. For example, using BVAL Scores as a screen in constituent selection rules could potentially improve tradability for enhanced or dynamic Indices.

METHOD	DESCRIPTION	MAXIMUM SCORE
Direct Observations	Direct market observations sourced from the Bloomberg Trading System, TRACE, MSRB, and other permissioned contributors.	10
Historical Tracking	For securities with no direct market observations, observed market data for comparable securities is used.	7
Observed Comps	If neither of the above approaches is possible, generally accepted algorithms such as reference curves are used.	5

Historical prices in the Index series for times that predate BVAL use two Bloomberg pricing sources developed earlier, BGN and BFV. Bloomberg Generic Price (BGN) is a market-consensus price for corporate and government bonds calculated by using prices provided to Bloomberg and any other information that Bloomberg considers relevant.
Bloomberg Fair Value (BFV) establishes a bond's theoretical value based on where similar bonds, as defined by credit quality and market sector, have traded. This value is not based on market price, but it does incorporate OAS methodology in deriving the theoretical value. BGN is given higher priority than BFV in historical index pricing.

RATINGS

GFI Indices employ a composite of four ratings agencies; DBRS, Fitch, Moody's and Standard & Poor's. Issue, or bond- level, ratings are used except for sovereigns. For sovereigns, the Index uses the issuer's long-term local or long-term foreign currency rating.

Algorithm

The algorithm used to derive Index ratings ("Index Ratings") gives all four agencies equal weight. Each rating gradation is assigned a numeric value as seen below. The algorithm generates an integer from which a corresponding index rating is assigned.

	INDEX RATING	MOODY'S	S&P	FITCH	DBRS
1	AAA	Aaa	AAA	AAA	AA
2	AA+	Aa1	AA+	AA+	AA high
3	AA	Aa2	AA	AA	AA
4	AA-	Aa3	AA-	AA-	AAlow
5	A+	A1	A+	A+	Ahigh
6	A	A2	A	A	A
7	A-	A3	A-	A-	Alow
8	BBB+	Baa1	BBB+	BBB+	BBB high
9	BBB	Baa2	BBB	BBB	BBB
10	BBB-	Baa3	BBB-	BBB-	BBB low
11	BB+	Ba1	BB+	BB+	BB high
12	BB	Ba2	BB	BB	BB
13	BB-	Ba3	BB-	BB-	BB low
14	B+	B1	B+	B+	B high
15	B	B2	B	B	B
16	B-	B3	B-	B-	B low
17	CCC+	Caa1	CCC+	CCC+	CCC high
18	CCC	Caa2	CCC	CCC	CCC
19	CCC-	Caa3	CCC-	CCC-	CCC low
20	CC	Ca	CC	CC	CC
21	C	C	C	C	C
22	D		D	D	D

Consideration is given to circumstance of having l, 2, 3 or 4 ratings available in the following fashion, after a ranking of highest to lowest:

Number of Ratings Available/Index Rating Assignment:
1 - Assign that rating
2 - Assign the lower rating
3 - Assign the middle rating
4 - Assign the lower rating of the middle two

Timing of Rating Assignment

The Index Rating is updated immediately with a ratings change from any of the four agencies and is reflected in subsequent index-level reporting. For the purpose of index assignment, the rating on the "lockout" date (two business days prior to rebalancing) is utilized. A change in the Index Rating does not affect its index membership until the next rebalancing.

Index-Level Rating Calculation

The algorithm for individual bonds results in an integer and is reported as the corresponding Index Rating; the average rating of an Index will not always result in an integer. In these circumstances, the reported rating will be rounded to the nearest integer. For example, an Index average weighting of 7.6 will result in reporting a quality of BBB+.

SECTOR CLASSIFICATION

BICS FI classifies companies by tracking their primary business as measured first by source of revenue and second by operating income, assets and market perception. Members of groupings should exhibit similar behavior in market cycles and companies in a grouping should be correlated. Issuing subsidiaries are classified by their principal business. Special purpose vehicles (SPVs) are classified by their parent company's industry.

"Sector" is the broadest classification and represents general business activities. Each Sector is further broken down into "Industry Groups," which are classified by more narrowly defined business activities. BICS 1 contains 11 Sectors

(Level) and 65 Industry Groups (Level 2). Issuers are assigned to a particular Industry Group based on their principal business activity. An Industry Group can only be a member of one Sector.

Consistent history and deep coverage across Bloomberg's bond universe enable BICS FI to provide a rich framework for analyzing the sector risk exposures of indices. The framework also provides a tool set to build customized indices that constrain the weight of single issuers (for example, per UCITS in Europe or IRS limits in the U.S.) or sectors in enhanced or dynamic indices.

The full list of Sectors and Industry Groups is in Appendix Table l.

REBALANCING SCHEDULE

All GFI Indices rebalance monthly unless otherwise noted. The actual day for the rebalancing is universal for all Indices regardless of geographic region and is governed by the U.S. holiday schedule. The rebalancing day is the last calendar day of the month unless a weekend or U.S. holiday. The returns and statistics reported for any given month reflect those values from, and on, actual rebalancing dates as opposed to calendar dates.

For example: The last calendar day of August 2003 was a Sunday, making Friday the 29th the last non-holiday business day and, therefore, the rebalancing day. Statistics reported for August 2003 would be as of August 29, 2003, not August 31, 2003. Similarly, returns would reflect performance from July 31, 2003 to August 29, 2003.

STRESS EVENTS

In the event of an unforeseen market event whereby the market is unexpectedly closed, bonds in the GFI Indices will be priced by using prior day's values.

LIMITATIONS OF THE INDEX

Though the Indices are designed to be representative of the markets they measure or otherwise align with their stated objective, they may not be representative in every case or achieve their stated objective in all instances. They are 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 fixed income market interests which the Indices intend to measure or upon which the Indices are dependent in order to achieve their stated objective. For example, illiquidity can have an impact on the quality or amount of data available to BISL for calculation and may cause the Indices 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, as with all fixed income investing, the GFI 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.
In addition, 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.

DATA PROVIDERS AND DATA EXTRAPOLATION

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

BENCHMARK OVERSIGHT AND GOVERNANCE

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

INDEX AND DATA REVIEWS

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

STAKEHOLDER ENGAGEMENT

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

EXPERT JUDGMENT

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

RESTATEMENT POLICY

Please refer to the BISL Benchmark Procedures Handbook available [here](#).

Table 1. Sectors and Industry Group

SECTOR (LEVEL 1)	INDUSTRY GROUP (LEVEL 2)
Communications	Cable & Satellite
	Entertainment
	Media Non-Cable
	Wireless Telecom Services
	Wireline Telecom Services
Consumer Discretionary	Airlines
	Apparel & Textile Products
	Automotive
	Casinos & Gaming
	Consumer Services
	Distributors
	Educational Services
	Entertainment Resources
	Home & Office Products
	Home Builders
	Home Improvements
	Leisure Products
	Restaurants
	Travel & Lodging
Consumer Staples	Consumer Products
	Food & Beverage
	Retail Staples Supermarkets
	Tobacco
Energy	Exploration & Production
	Integrated Oils
	Oil & Gas Services
	Pipeline
	Refining & Marketing
	Renewable Energy
Financials	Banking
	Commercial Finance
	Consumer Finance
	Financial Services
	Life Insurance
	Property & Casualty
	Real Estate

SECTOR (LEVEL 1)	INDUSTRY GROUP (LEVEL 2)
Health Care	Health Care Facilities & Services
	Managed Care
	Medical Equipment & Devices
	Pharmaceuticals
Industrials	Aerospace & Defense
	Electrical Equipment
	Industrial Other
	Machinery
	Manufactured Goods
	Railroad
	Transportation & Logistics
	Waste & Environment Services Equipment & Facilities
Materials	Chemicals
	Construction Materials
	Construction & Packaging
	Forest & Paper Products
	Metals & Mining
Technology	Communications Equipment
	Hardware
	Software & Services
Utilities	Utilities
Government	Sovereign
	Government Agency
	Government Regional/Local
	Supranational
	Development Bank
	Winding Up Agency

Table 2. ESG Disclosure

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.	Fixed Income Benchmark
Item 3. Name of the benchmark or family of benchmarks.	Bloomberg Global Fixed Income Indices ("GFI")
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:	Not applicable
(b) List of social factors considered:	Not applicable
(c) List of governance factors considered:	Not applicable
Hyperlink to the information on ESG factors for each benchmark:	Not applicable
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.*	Not applicable
Date on which information has been last updated and reason for the update:	January 9, 2022, Update

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