

MSCI DEVELOPED MARKETS CLIMATE TILTED GOVERNMENT BOND INDEX METHODOLOGY

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1 Introduction

The MSCI Developed Markets Climate Tilted Government Bond Index¹ (the 'Index') is designed to reflect the performance of an investment strategy that adjusts the market value weights of the MSCI Government Bond Index - Developed Markets (the 'Parent Index'). This adjustment is based on the emission intensity characteristics of all Developed Markets Sovereign bond issuers. The Index is designed to enhance exposure to issuers within the Parent Index that exhibit both a superior emission intensity profile and a consistent improving trend.

¹ The Index is governed by a set of methodology and policy documents ("Methodology Set"), including the present index methodology document. Please refer to Appendix II for more details.

2 Constructing the MSCI Developed Markets Climate Tilted Government Bond Index

The Index uses company ratings and research provided by MSCI ESG Research² for the Index construction.

Constructing the Index involves the following steps:

- Defining the Applicable Universe
- Defining the Parent Index
- Eligibility Criteria
- Determination of Combined Score
- Weighting Scheme

2.1 Applicable Universe

The Applicable Universe includes sovereign bond issuers of all countries which are classified as Developed Markets³ according to the Economic Development Assessment for the countries defined in the MSCI Fixed Income Market Classification Framework⁴.

2.2 Parent Index

The Parent Index consists of securities in the MSCI Government Bond Index - Developed Markets⁵, which is a subset of the Applicable Universe.

2.3 Eligibility Criteria

All existing constituents of the Parent Index are eligible for inclusion in the Index. However, the Combined Score calculation (defined in Section 2.4) is based on all issuers from the Applicable Universe.

2.4 Determination of Combined Score

Each issuer in the Applicable Universe is assigned a Combined Score which is calculated using an Adjusted Emission Intensity Score and Trend Score defined in Section 2.4.1 to Section 2.4.4.

² See section 4 for further information regarding ESG and climate data used in the Indexes that MSCI Limited and MSCI Deutschland GmbH source from MSCI ESG Research LLC, a separate subsidiary of MSCI Inc. MSCI ESG Research is solely responsible for the creation, determination and management of such data as a provider to MSCI Limited and MSCI Deutschland GmbH. MSCI Limited and MSCI Deutschland GmbH are the benchmark administrators for the MSCI indexes.

³ Please refer to Appendix I for the list of Developed Markets countries and their Parent Index membership.

⁴ Please refer to the MSCI Fixed Income Market Classification Framework document for further details. Available at <https://www.msci.com/our-solutions/indexes/market-classification>.

⁵ Please refer to the MSCI Government Bond Indexes methodology available at: <https://www.msci.com/index-methodology>.

2.4.1 Emission Intensity Score

Each issuer⁶ in the Applicable Universe is ranked in descending order based on Government Carbon Emissions - Scope 1 excluding LULUCF Intensity⁷ and divided into buckets as illustrated in the table below. Issuers outside the Parent Index are included in the Emission Intensity Score calculation to ensure stability of Bucket Ranks independent of their membership in the Parent Index.

Emission Intensity	Bucket Rank	Emission Intensity Score
Highest	1	1/3
Neutral	2	2/3
Lowest	3	3/3

2.4.2 Adjusted Emission Intensity Score

To reduce impact of large issuers changing their bucket ranks, if the bucket rank of an issuer changes at a rebalance, then the score corresponding to the average of the two buckets (at latest and previous rebalance) will be used.

For example, if the bucket rank for an issuer at the last rebalance was 2 and it changed to 1 at the latest rebalance, then the Adjusted Emission Intensity Score would be $(2/3 + 1/3)/2 = 0.5$. Likewise, a change from bucket rank 3 to 2 will result in an Adjusted Emission Intensity Score of $(3/3 + 2/3)/2 = 0.8333$.

2.4.3 Trend Score

The Trend Score is calculated by grouping the issuers to Upgrade, Neutral and Downgrade buckets based on amount of decarbonization achieved over the last 3 years as defined in the following table. The decarbonization for each issuer is calculated using the geometric mean of last 3 years emission intensity reduction.

Trend	Decarbonization over last 3 years	Trend Score ⁸
Upgrade	$\geq 7\%$	1.1
Neutral	$\geq 3.5\%$ and $< 7\%$	1

⁶ Macao is currently not included in the calculation of Adjusted Emission Intensity Score. It will be included in the calculation as soon as sovereign bonds issued by Macao are available in the database for index construction.

⁷ The most recently reported or estimated Scope 1 emissions intensity of greenhouse gases excluding land use, land-use change and forestry (LULUCF) for the country territory in tons of CO2 equivalent per year per PPP-adjusted GDP (tCO2e/ USD million GDP-PPP).

⁸ An issuer will be assigned a Trend Score corresponding to 'Neutral' if the Trend Score cannot be calculated due to missing data.

Downgrade	<3.5%	0.9
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2.4.4 Combined Score

The Combined Score is calculated for each issuer as follows:

$$\text{Combined Score} = \text{Adjusted Emission Intensity Score} \times \text{Trend Score}$$

Each security within an issuer in the Parent Index is assigned the same Combined Score.

2.5 Weighting Scheme

At each rebalancing, all the securities from the Parent Index are weighted by the product of their market value weight in the Parent Index and the Combined Score.

$$\text{Security Weight} = \text{Combined Score} \times \text{Market Value Weight in the Parent Index}$$

The above weights are subsequently re-normalized to add up to 100%.

3 Maintaining the MSCI Developed Markets Climate Tilted Government Bond Index

3.1 Monthly Index Review

- The Index undergoes a monthly review, with the rebalancing impact taking effect on the first business day of each month (termed as Rebalancing Date). To elaborate, bonds are incorporated into the index at the close of the last business day of every month, but the impact on returns is observed on the first business day of the subsequent month.
- The rebalanced Index composition is determined by the most recent data available three days prior to the Rebalancing Date, termed as the Cut-Off Date. If a security in the universe satisfies any inclusion or exclusion criteria after the Cut-Off Date, it will typically become effective at the next monthly rebalancing, provided conditions remain constant. In extraordinary circumstances, such as cases of input data correction, MSCI has the discretion to shorten the Cut-Off Date for Index rebalancing from T-3 to T-2, T-1, or T. In such scenarios, MSCI will inform Index clients of these changes through an announcement.
- MSCI will disclose proforma index rebalancing results starting the second business day of each month. MSCI will freeze the proforma index rebalancing results as of the Cut-Off Date.
- Bonds are either added to or removed from the index solely on monthly rebalancing dates. For existing index components, any changes to index eligibility will only be reflected in the subsequent monthly rebalancing.
- Any cash that accumulates within the index each month is re-invested across the index constituents on a pro-rata basis, on the Rebalancing Date. Essentially, cash in the index is cleared out on rebalancing, and the opening index portfolio on the Rebalancing Date commences with zero accrued cash balance.
- Specific variants of the total return calculation of the index on the Rebalancing Date may be adjusted for transaction costs⁹ as securities are added to the index at the offer price.

For additional information on index total return calculation and corporate events handling, please refer to the MSCI Fixed Income Index Calculation Methodology¹⁰. For the holiday calendar used in the indexes, please refer to the MSCI Fixed Income Data Methodology¹¹.

⁹ Refer to the MSCI Fixed Income Index Calculation Methodology for detail. Available at <https://www.msci.com/index-methodology>

¹⁰ Refer to the MSCI Fixed Income Index Calculation Methodology for detail. Available at <https://www.msci.com/index-methodology>

¹¹ The methodologies are available at: <https://www.msci.com/index-methodology>.

4 MSCI ESG Research

The Indexes are products of MSCI Inc. that utilize information such as company ratings and research produced and provided by MSCI ESG Research LLC (MSCI ESG Research), a subsidiary of MSCI Inc. In particular, the Indexes use the following MSCI ESG Research products: MSCI Climate Change Metrics. MSCI Indexes are administered by MSCI Limited and MSCI Deutschland GmbH.

4.1 MSCI ESG Ratings

MSCI ESG Ratings aim to measure entities' management of environmental, social and governance risks and opportunities. MSCI ESG Ratings use a weighted average key issue calculation that is normalized by industry to arrive at an industry-adjusted ESG score (0-10), which is then translated to a seven-point scale from 'AAA' to 'CCC', indicating how an entity manages relevant key issues relative to industry peers.

The MSCI ESG Ratings methodology can be found at:

<https://www.msci.com/esg-and-climate-methodologies>.

4.2 MSCI Climate Change Metrics

MSCI Climate Change Metrics provides climate data & tools to support institutional investors seeking to integrate climate risk & opportunities into their investment strategy and processes. This includes investors seeking to achieve a range of objectives, including measuring and reporting on climate risk exposure, implementing low carbon and fossil fuel-free strategies, alignment with temperature pathways and factoring climate change research into their risk management processes, in particular through climate scenario analysis for both transition and physical risks.

The dataset spans across the four dimensions of a climate strategy: transition risks, green opportunities, physical risks and 1.5° alignment.

For more details on MSCI Climate Change Metrics, please refer to <https://www.msci.com/climate-solutions>.

Appendix I: Developed Markets Countries¹² and their Parent Index Membership¹³ as of June 03, 2024

Region Name	ISO Symbol	Country Name	Economic Development Classification	Parent Index Membership
Asia	JP	Japan	Developed Markets	Yes
Asia	SG	Singapore	Developed Markets	Yes
Europe	FR	France	Developed Markets	Yes
Europe	GB	United Kingdom	Developed Markets	Yes
Europe	IT	Italy	Developed Markets	Yes
Europe	DE	Germany	Developed Markets	Yes
Europe	ES	Spain	Developed Markets	Yes
Europe	BE	Belgium	Developed Markets	Yes
Europe	NL	Netherlands	Developed Markets	Yes
Europe	AT	Austria	Developed Markets	Yes
Europe	PT	Portugal	Developed Markets	Yes
Europe	FI	Finland	Developed Markets	Yes
Europe	IE	Ireland	Developed Markets	Yes
Europe	CH	Switzerland	Developed Markets	Yes
Europe	DK	Denmark	Developed Markets	Yes
Europe	SK	Slovakia	Developed Markets	Yes
Europe	SE	Sweden	Developed Markets	Yes
Europe	NO	Norway	Developed Markets	Yes
Middle East	IL	Israel	Developed Markets	Yes
North America	US	USA	Developed Markets	Yes
North America	CA	Canada	Developed Markets	Yes
Oceania	AU	Australia	Developed Markets	Yes
Asia	HK	Hong Kong	Developed Markets	
Asia	MO	Macao	Developed Markets	
Europe	HR	Croatia	Developed Markets	
Europe	CY	Cyprus	Developed Markets	
Europe	EE	Estonia	Developed Markets	
Europe	GR	Greece	Developed Markets	
Europe	IS	Iceland	Developed Markets	
Europe	LV	Latvia	Developed Markets	
Europe	LT	Lithuania	Developed Markets	
Europe	LU	Luxembourg	Developed Markets	

¹² Please refer to the MSCI Fixed Income Market Classification Framework document for latest classification available at: <https://www.msci.com/our-solutions/indexes/market-classification>.

¹³ Please refer to the MSCI Government Bond Indexes methodology for latest details available at: <https://www.msci.com/index-methodology>.

Appendix II: Methodology Set

The Indexes are governed by a set of methodology and policy documents (“Methodology Set”), including the present index methodology document as mentioned below.

- Description of methodology set –
<https://www.msci.com/index/methodology/latest/FIInfo>
- MSCI Fixed Income Data Methodology –
<https://www.msci.com/index/methodology/latest/FIDATA>
- MSCI Fixed Income Calculation Methodology –
<https://www.msci.com/index/methodology/latest/FIINDEXCALC>
- MSCI Fixed Income Glossary of Terms –
<https://www.msci.com/index/methodology/latest/FIGLOSS>
- MSCI Fixed Income Index Policies –
<https://www.msci.com/index/methodology/latest/FIINDEXPOLICY>
- MSCI Government Bond Indexes Methodology–
<https://www.msci.com/index/methodology/latest/FIGOV>
- ESG Factors in Methodology

The Methodology Set for the Indexes can be accessed from MSCI’s webpage <https://www.msci.com/index-methodology> in the section ‘Search Methodology by Index Name or Index Code’.

* ‘ESG Factors in Methodology’ contains the list of environmental, social, and governance factors considered, and how they are applied in the methodology (e.g., selection, weighting or exclusion). It can be accessed in the Methodology Set as described above.

Appendix III: Changes to this Document

The following sections have been modified as of December 2024:

Updated Appendix II – Links for the documents in the Methodology Set

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