

FTSE Advanced Climate Risk-Adjusted Government Bond Index Series

v1.9



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Section 1

Introduction

1. Introduction

1.1 Overview

1.1.1 The FTSE Advanced Climate Risk-Adjusted Government Bond Index Series incorporates the same quantitative climate risk assessment framework as the FTSE Climate Risk-Adjusted Government Bond Index Series but aims to achieve greater climate benefit. This is measured as a drop in greenhouse gas (GHG) emissions and an improvement in 2-degree alignment, which implies a drop in current and future exposure to physical climate risks, as well as better overall resilience.

1.1.2 The FTSE Advanced Climate Risk-Adjusted Government Bond Index Series takes account of ESG factors in its design.¹

1.2 FTSE Advanced Climate Risk-Adjusted Government Bond Index Series

1.2.1 The FTSE Advanced Climate Risk-Adjusted Government Bond Index Series measures the performance of fixed-rate, local currency, investment-grade sovereign bonds by incorporating a tilting methodology that adjusts index weights according to each country's relative climate risk assessment. The series comprises:

| FTSE Advanced Climate Risk-Adjusted Government Bond Index | Standard FTSE Government Bond Index |
|--|---|
| Advanced Climate World Government Bond Index ("Advanced Climate WGBI") | World Government Bond Index ("WGBI") |
| Advanced Climate World Government Bond Index ex-Japan ("Advanced Climate WGBI ex-Japan") | World Government Bond Index ex-Japan ("WGBI ex-Japan") |
| Advanced Climate World Government Bond Index – Developed Markets ("Advanced Climate WGBI-DM") | World Government Bond Index – Developed Markets ("WGBI-DM") |
| Advanced Climate European Monetary Union (EMU) Government Bond Index ("Advanced Climate EGBI") | EMU Government Bond Index ("EGBI") |

1.2.2 The series follows the monthly rebalancing mechanics of the standard FTSE global government bond indices with respect to universe membership, however, the market value weight for each security is tilted by its respective country's climate score. Climate scores are calculated on an annual basis using input data through September 1, and are effective for each September month-end rebalance. The country climate scores are derived by assessing each country's relative climate risk across three core climate risk pillars (each with multiple sub-indicators): The country climate risk methodology can be consulted here: [FTSE Climate Risk Assessment Methodology \(lseq.com\)](https://www.ftserussell.com/Climate-Risk-Assessment-Methodology).

- **Transition risk** represents the level of historical and forward-looking climate related risk exposure of the country's economy as measured by GHG intensity compared to its peers and its Nationally Determined Contributions (NDCs) Implied Temperature Rise (ITR).

¹ If a tilting approach is used for an ESG data input, the objective is for the index methodology to overweight and/or underweight constituents according to specific ESG criteria. This approach will not remove any constituents on its own.

- **Physical risk** represents the level of historical and forward-looking climate related risk exposure to the country and its economy from the physical effects of seven hazards induced by climate change from an economic sector perspective.
- **Resilience** represents a country's preparedness and actions to cope with its level of climate related risk exposure.

1.2.3 Countries are scored across each pillar and a single combined score is derived for each country. The country scores are used to reweight its index exposure to provide higher exposures to countries less exposed to climate change risks and lower exposures to countries that are more exposed to climate change risks.

1.3 FTSE Russell

1.3.1 FTSE Russell is a trading name of FTSE International Limited, Frank Russell Company, FTSE Global Debt Capital Markets Limited (and its subsidiaries FTSE Global Debt Capital Markets Inc. and FTSE Fixed Income Europe Limited), FTSE Fixed Income LLC, FTSE (Beijing) Consulting Limited, Refinitiv Benchmark Services (UK) Limited, Refinitiv Limited and Beyond Ratings.

1.3.2 FTSE Russell hereby notifies users of the index series that it is possible that circumstances, including external events beyond the control of FTSE Russell, may necessitate changes to, or the cessation of, the index series and therefore, any financial contracts or other financial instruments that reference the index series or investment funds which use the index series to measure their performance should be able to withstand, or otherwise address the possibility of changes to, or cessation of, the index.

1.3.3 Index users who choose to follow this index series or to buy products that claim to follow this index series should assess the merits of the index's rules-based methodology and take independent investment advice before investing their own or client funds. No liability whether as a result of negligence or otherwise is accepted by FTSE Russell for any losses, damages, claims and expenses suffered by any person as a result of:

- any reliance on these Ground Rules, and/or
- any inaccuracies in these Ground Rules, and/or
- any non-application or misapplication of the policies or procedures described in these Ground Rules, and/or
- any inaccuracies in the compilation of the index or any constituent data.

Section 2

Management responsibilities

2. Management responsibilities

2.1 FTSE International Limited

2.1.1 FTSE is the benchmark administrator of the index series.²

2.1.2 FTSE is responsible for the daily calculation, production and operation of the index series and will:

- maintain records of the index weightings of all constituents;
- make changes to the constituents and their weightings in accordance with the Ground Rules;
- carry out the periodic index reviews of the index series and apply the changes resulting from the reviews as required by the Ground Rules;
- disseminate the indices.

2.2 Amendments to these Ground Rules

2.2.1 These Ground Rules shall be subject to regular review by FTSE Russell to ensure that they continue to best reflect the aims of the index series. Any proposals for significant amendments to these Ground Rules will be subject to consultation with FTSE Russell advisory committees and other stakeholders if appropriate. The feedback from these consultations will be considered by the FTSE Russell Index Governance Board before approval is granted.

2.2.2 As provided for in the Statement of Principles for FTSE Russell Indices, where FTSE Russell determines that the Ground Rules are silent or do not specifically and unambiguously apply to the subject matter of any decision, any decision shall be based as far as practical on the Statement of Principles. After making any such determination, FTSE Russell shall advise the market of its decision at the earliest opportunity. Any such treatment will not be considered as an exception or change to the Ground Rules, or to set a precedent for future action, but FTSE Russell will consider whether the Rules should subsequently be updated to provide greater clarity.

² The term administrator is used in this document in the same sense as it is defined in Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds (the European Benchmark Regulation) and The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019 (the UK Benchmark Regulation)..

Section 3

FTSE Russell index policies

3. FTSE Russell index policies

These Ground Rules should be read in conjunction with the following policy documents which can be accessed using the links below or by contacting fi.index@lseg.com. These policies are reviewed annually and any changes are approved by the FTSE Russell Product Governance Board.

3.1 Statement of Principles for FTSE Fixed Income Indices (the Statement of Principles)

Indices need to keep abreast of changing markets and the Ground Rules cannot anticipate every eventuality. Where the Ground Rules do not fully cover a specific event or development, FTSE Russell will determine the appropriate treatment by reference to the Statement of Principles for FTSE Fixed Income Indices which summarises the ethos underlying FTSE Russell's approach to index construction. The Statement of Principles is reviewed annually and any changes proposed by FTSE Russell are presented to the FTSE Russell Index Advisory Board for discussion before approval by the FTSE Russell Product Governance Board.

The Statement of Principles for Fixed Income Indices can be accessed using the following link:

[Statement of Principles Fixed Income Indices.pdf](#)

3.2 Queries and Complaints

FTSE Russell's complaints procedure can be accessed using the following link:

[Benchmark Determination Complaints Handling Policy.pdf](#)

3.3 Recalculation Policy and Guidelines

The Recalculation Policy and Guidelines for Fixed Income Indices document is available from the FTSE Russell website using the link below or by contacting fi.index@lseg.com.

[Fixed Income Recalculation Policy and Guidelines.pdf](#)

3.4 Index Policy in the Event Clients are Unable to Trade a Market or a Security

3.4.1 Details of FTSE Russell's treatment can be accessed using the following link:

[Index Policy in the Event Clients are Unable to Trade a Market or a Security.pdf](#)

3.5 Policy for Benchmark Methodology Changes

Details of FTSE Russell's policy for making benchmark methodology changes can be accessed using the following link:

[Policy for Benchmark Methodology Changes.pdf](#)

3.6 FTSE Russell Governance Framework

3.6.1 To oversee its indices, FTSE Russell employs a governance framework that encompasses product, service and technology governance. The framework incorporates the London Stock Exchange Group's three lines of defence risk management framework and is designed to meet the requirements of the IOSCO Principles for

Financial Benchmarks³, the European benchmark regulation⁴ and the UK benchmark regulation⁵. The FTSE Russell Governance Framework can be accessed using the following link:

[FTSE_Russell_Governance_Framework.pdf](#)

3.7 Real Time Status Definitions

3.7.1 Please refer to the following guide for details of real time status definitions for indices that are calculated in real time.

[Real Time Status Definitions.pdf](#)

³ IOSCO Principles for Financial Benchmarks Final Report, FR07/13 July 2013.

⁴ Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds.

⁵ The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019.

Section 4

Composition and design criteria

4. Composition and design criteria

4.1 Advanced Climate Risk-Adjusted World Government Bond Index Series (“Advanced Climate WGBI”)

4.1.1 The base universe for the FTSE Advanced Climate Risk-Adjusted World Government Bond Index (“Advanced Climate WGBI”) is the standard FTSE WGBI. The same logic applies to FTSE WGBI ex-Japan and FTSE WGBI – Developed Markets. Please see the standard [FTSE Climate Risk-Adjusted Government Bond Index Ground Rules](#) for the list of eligible markets.

4.1.2 To be eligible for the FTSE WGBI, markets must satisfy minimum market size, credit rating and market accessibility level criterion. These criteria are assessed on an annual basis each September, however, markets that no longer meet the minimum credit quality are removed from the index at the next month’s profile. Securities must also meet minimum amount outstanding requirements, have a fixed-rate, and at least one year to maturity.

For full details on the design criteria and calculation assumptions for the FTSE WGBI please refer to the [FTSE Fixed Income Index Guide](#).

4.1.3 The FTSE Advanced Climate Risk-Adjusted Government Bond Index Series is built upon the same quantitative climate risk assessment framework (climate risk pillars and underlying indicators) applied in the existing FTSE Climate Risk-Adjusted Government Bond Index Series but aims to achieve greater climate benefit (measured by improvement in 2-degree alignment), while maintaining sufficient diversification and without compromising replication. This is achieved through the calibration of the tilts applied to the climate risk pillars, with the Advanced Series applying an equal tilt to each climate risk pillar. Specifically, the Advanced Series differs from the existing standard climate variants by applying a stronger tilt to the transition pillar.

Figure 1. FTSE Advanced Climate Risk-Adjusted World Government Bond Index design criteria & methodology

| | |
|--|--|
| Weighting | Alternatively weighted |
| Country Climate Scores | Updated annually and applied each September month-end rebalance ⁶ . The cut-off for input data is September 1 of each year. |
| Country Climate Score Assessment Cohort | Local currency sovereign bond markets eligible for the WGBI. |
| Climate Pillars and tilt calibration | Geometric tilt – Transition risk: 1 – Physical risk: 1 – Resilience: 1 |
| Rebalancing | Once a month at the end of the month |
| Calculation frequency | Daily |

⁶ Prior to 2024, Climate scores were updated each May month-end”.

| | |
|--------------------|---|
| Fixing date | Each month, the upcoming month's index constituents are "fixed" on the profile fixing date. Each year's scheduled fixing dates are published on the FTSE Russell website. |
| Base date | December 31, 2001 |

4.2 Advanced Climate Risk-Adjusted EMU Government Bond Index ("Advanced Climate EGBI")

4.2.1 The base universe for the FTSE Advanced Climate Risk-Adjusted EMU Government Bond Index ("Advanced Climate EGBI") is the standard FTSE EGBI, which consists of the Eurozone-participating countries that meet the WGBI criteria. Please see the standard FTSE Climate Risk-Adjusted Government Bond Index Ground Rules for the list of eligible markets.

4.2.2 To be eligible for the FTSE EGBI, markets must satisfy minimum market size, credit rating and market accessibility level criterion. These criteria are assessed on an annual basis each September, however, markets that no longer meet the minimum credit quality are removed from the index at the next month's profile. Securities must also meet minimum amount outstanding requirements, have a fixed-rate, and at least one year to maturity.

For full details on the design criteria and calculation assumptions for the FTSE EGBI please refer to the [FTSE Fixed Income Index Guide](#).

4.2.3 To enhance diversification and manage concentration risk due to the relatively small EGBI universe, a relative capping mechanism is introduced. This mechanism limits country weights to within +/- 5 percentage points compared to the base index (i.e., EGBI). This approach ensures that no single country has an outsized influence on the index, promoting a balanced representation of the base index while maintaining alignment with the index purpose, i.e., limiting climate risk-related exposure.

4.2.4 If the deviation is greater than 5 percentage points upwards or downwards, the excess market value weight is redistributed to other countries on a pro rata basis.

Figure 2. FTSE Advanced Climate Risk-Adjusted EMU Government Bond Index design criteria & methodology

| | |
|--|--|
| Weighting | Alternatively weighted |
| Country Climate Scores | Updated annually and applied each September month-end rebalance. The cut-off for input data is September 1 of each year. |
| Country Climate Score Assessment Cohort | Local currency sovereign bond markets eligible for the EGBI |
| Climate Pillars and tilt calibration | Geometric tilt – Transition risk: 1 – Physical risk: 1 – Resilience: 1 |
| Country capping | +/- 5 percentage points compared to the base index and applied each month-end. |
| Rebalancing | Once a month at the end of the month. |
| Calculation frequency | Daily |
| Fixing date | Each month, the upcoming month's index constituents are "fixed" on the profile fixing date. Each year's scheduled fixing dates are published on the website. |
| Base date | December 31, 2001 |

4.3 Climate Risk Assessment methodology

4.3.1 The climate risk assessment methodology is a unique quantitative, relative, and systematic approach, based on 15 indicators coming from public, private and proprietary sources, for 50 countries. The output are divided into three pillars of climate risk assessment (i.e., transition risk, physical risk and resilience).

4.3.2 For each indicator, a score is calculated on a yearly basis, starting from 2001. Each of the 15 indicators is the outcome of numerous adjustments – systematic to a large extent – to ensure countries are scored between 0 and 1. All indicators are aggregated to obtain a pillar score, which is derived from advanced statistical techniques. Please see [FTSE Climate Risk Assessment Methodology](#) for further details on the climate risk assessment methodology.

4.4 Climate Risk Score assessment cohort

4.4.1 To compute s-scores⁷, each of the three climate risk pillar scores is standardised relative to an index assessment cohort (current and historical) to get s-scores between 0.1 and 1.

4.4.2 The countries assessed for the Climate WGBI and Climate WGBI ex-Japan are in line with the universe of local currency sovereign bond markets tracked by the standard version of these indices. For the Climate EGBI, the subset of EGBI eligible countries is used to compute climate risk pillar s-scores.

4.5 Tilting methodology

4.5.1 A single climate score is calculated for each sovereign and applied to the market value weight of each security in the underlying index to derive the adjusted weights⁸.

4.5.2 First, the three climate risk pillar s-scores are combined to derive a climate score for each country i :

$$CS_i = TR_i^\alpha \times PR_i^\beta \times R_i^\gamma$$

where,

TR , is the country's Transition Risk pillar s-score

PR , is the country's Physical Risk pillar s-score

R , is the country's Resilience pillar s-score

α , is the TR tilt power

β , is the PR tilt power

γ , is the R tilt power

CS , is the final country climate risk score

4.5.3 For each Climate Risk-Adjusted Government Bond Index in the series, tilt powers have been calibrated to:

- Achieve meaningful climate benefit for sensible deviations from the underlying index characteristics and minimal tracking error
- Ensure other index characteristics (e.g. index yield, duration, turnover and market value weights) do not deviate significantly from the standard index characteristics.

4.5.4 Second, the climate scores are applied to each country's market value weight in the underlying index to derive the adjusted weights:

$$\theta_i = \frac{\omega_i CS_i}{\sum_{i=1}^n (\omega_i CS_i)}$$

where,

ω , is the county's market value weight in the underlying index

θ , is the county's weight in the Climate Risk-Adjusted index

4.6 Exchange rates

⁷ S-scores stand for standardised scores and are computed as follows: $s - score(X_i) = (X_i - \min_x X / \max_x X - \min_x X) * 0.9 + 0.1$, where X denotes a pillar score from the underlying climate risk assessment model and i denotes a country. Those s-scores are thus relative to the index assessment cohort and may change accordingly.

⁸ A similar tilting methodology to that employed in the FTSE Global Factor Index Series is used with some modifications to cater for the differences between equity and fixed income indices.

- 4.6.1 The WMR Closing Spot Rates and The WMR Closing Forward Rates, provided by Refinitiv, are used. Several snapshots are taken at regular intervals centered on the fixing time of 4:00 p.m. London time and the median rate is selected for each currency. All rates are mid-market quotations.
- 4.6.2 The closing Refinitiv Spot Rates and The Refinitiv Forward Rates, provided by Refinitiv, are used. WM takes several snapshots at regular intervals centered on the fixing time of 4:00 p.m. London time and selects the median rate for each currency. All rates are mid-market quotations.

4.7 Chronological summary of events

In addition to the following events, the constructions of Advanced Climate WGBI, Advanced Climate WGBI ex-Japan, Advanced Climate WGBI-DM, and Advanced Climate EGBI are driven by the same events that mark the WGBI and EGBI.

For details, please also refer to the [FTSE Fixed Income Index Guide](#).

| Year | Highlights |
|------|---|
| 2019 | July: FTSE Climate Risk-Adjusted World Government Bond Index is introduced. |
| 2020 | January: FTSE Climate Risk-Adjusted EMU Government Bond Index and FTSE Climate Risk-Adjusted World Government Bond Index ex-Japan are launched. May: FTSE Advanced Climate Risk-Adjusted World Government Bond Index and FTSE Advanced Climate Risk-Adjusted EMU Government Bond Index are launched. |
| 2022 | May: FTSE Advanced Climate Risk-Adjusted World Government Bond ex-Japan Index is launched. |
| 2025 | January: An enhanced methodology is used to analyse climate risk. February: FTSE Advanced Climate Risk-Adjusted World Government Bond Index – Developed Markets is launched. |

Section 5

ESG data inputs

5. ESG data inputs

5.1 The following ESG datasets are used in the construction of the indices.

| ESG data inputs | Details | Used for selection, weighting or exclusion ⁹ |
|--|--|---|
| LSEG Sovereign Sustainability – Climate KPIs | LSEG Sovereign Sustainability Climate KPIs consist in various indicators aiming to offer a broad assessment of sovereign climate risks across carbon intensity, transition, and physical risk metrics. | Weighting |
| LSEG Sovereign Sustainability – Climate Risk Assessment Methodology | LSEG Sovereign Sustainability – Climate Risk Assessment Methodology consists in various indicators aiming to offer a broad assessment of sovereign climate risks including transition risks, physical risks and resilience indicators. The methodology can be consulted here: FTSE Climate Risk Assessment Methodology (lseg.com) | Weighting |

5.2 Further information on ESG data provided by FTSE Russell and third parties used in this index (index series) can be found in the following guide:

[Guide to FTSE and Third Party ESG Data used in FTSE Russell Indices](#)

This includes information on the data and standards used for these ESG data inputs. These data sets may include estimated data.

⁹ Definitions:
 Selection- ESG data is used to select or rank constituents or calculate minimum scores or thresholds.
 Weighting- ESG data is used to calculate the weight of a constituent in an index.
 Exclusion- ESG data is used to exclude securities from the index.

Appendix

Further information

For contact details, please visit the FTSE Russell website or contact FTSE Russell client services at info@ftserussell.com.

Website: www.lseg.com/en/ftse-russell/

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