

FTSE Advanced Climate Risk-Adjusted Government Bond Index Series

v1.8



**FTSE
RUSSELL**
An LSEG Business

Contents

Section 1 Introduction	3
Section 2 Management responsibilities	5
Section 3 FTSE Russell index policies	6
Section 4 Base Universes for the FTSE Advanced Climate Risk-Adjusted Government Bond Index Series	7
Section 5 ESG data inputs.....	8
Section 6 Index methodology	9
Appendix Further information	13

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.

1.2 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 performance. The series comprises:
- FTSE Advanced Climate Risk-Adjusted World Government Bond Index ("Advanced Climate WGBI")
 - FTSE Advanced Climate Risk-Adjusted World Government Bond ex Japan Index ("Advanced Climate WGBI ex Japan")
 - FTSE Advanced Climate Risk-Adjusted European Monetary Union (EMU) Government Bond Index ("Advanced Climate EGBI")

The FTSE Advanced Climate Risk-Adjusted Government Bond Index Series weights each country based on the market capitalisation of its index eligible debt, as well as its relative climate risk performance, measured across three distinct and quantitative, climate-related pillars. The growing risks of climate change and the scale of the transition to a 2-degree pathway is strengthening the thesis that the materiality of climate risk is growing for government bond issuers. The unique Climate-Risk Model that underpins the FTSE Advanced Climate Risk-Adjusted Government Bond Index Series is designed to mitigate against climate change related risks for the sovereign bond asset class.

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: [Sustainable Sovereign Risk Methodology \(Iseg.com\)](https://www.ftserussell.com/sustainable-sovereign-risk-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).

- **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.

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.

1.2.2 These Ground Rules are detailed in two core sections to best reflect the way in which the index series is constructed:

1. The Base Index: detailing the methodology of the underlying market value weighted index, and
2. The Climate Index: detailing the methodology to incorporate climate scores or tilts to the Base Index.

1.3 Index Objective and Intended Use

1.3.1 The indices and index statistics are intended to reflect the eligible fixed income government markets and to facilitate the detailed analysis of such markets.

1.4 FTSE Russell

1.4.1 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.

1.4.2 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.

1.4.3 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 (FTSE)

2.1.1 FTSE is the benchmark administrator of the index series.¹

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.

¹ 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:

3.1 Queries and complaints

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

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

3.2 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 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 Policy Advisory Board for discussion before approval by the FTSE Russell Index Governance Board.

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

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

3.3 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 info@ftserussell.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](#)

Section 4

Base Universes for the FTSE Advanced Climate Risk-Adjusted Government Bond Index Series

4. Base Universes for the FTSE Advanced Climate Risk-Adjusted Government Bond Index Series

- 4.1 The base universe for the FTSE Advanced Climate Risk-Adjusted World Government Bond Index (“Advanced Climate WGBI”) is the standard, market value weighted FTSE World Government Bond Index (WGBI). The FTSE WGBI measures the performance of fixed-rate, local currency, investment-grade sovereign bonds and comprises sovereign debt from over 20 countries.
- 4.2 The base universe for the FTSE Advanced Climate Risk-Adjusted World Government Bond ex Japan Index (“Advanced Climate WGBI ex Japan”) is the standard, market value weighted FTSE World Government Bond ex Japan Index (WGBI ex Japan).
- 4.3 The base universe for the FTSE Advanced Climate Risk-Adjusted European Monetary Union (EMU) Government Bond Index (“Advanced Climate EGBI”) is the standard FTSE EMU Government Bond Index (EGBI). The FTSE EGBI measures the performance of fixed-rate, local currency, investment-grade sovereign bonds. It consists of the EMU-participating countries that meet the WGBI inclusion criteria.
- 4.4 For full details on the design criteria and calculation assumptions for the base indices, please refer to the FTSE Fixed Income Index Guide which can be accessed using the following link: [FTSE Fixed Income Index Guide](#)

Section 5

ESG data inputs

5. ESG data inputs

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

ESG data inputs	Details	Used for selection, weighting or exclusion ²
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 – Sustainable Sovereign Risk Methodology	LSEG Sovereign Sustainability – Sustainable Sovereign Risk Methodology consists in various indicators aiming to offer a broad assessment of sovereign ESG including climate risks and resilience indicators. The methodology can be consulted here: FTSE Sustainable Sovereign Risk Assessment Methodology	Weighting

5.1.2 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.

² 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.

Section 6

Index methodology

6. Index methodology

6.1 Advanced Climate Risk-Adjusted Government Bond Index Series overview

- 6.1.1 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.
- 6.1.2 The Advanced Climate Risk-Adjusted Government Bond Index Series applies the country climate scores (derived from the three climate risk pillars) to the market value weights of each country. The index weights are a function of the market value weights and country climate scores.
- 6.1.3 The Advanced Climate Risk-Adjusted Index Series follows the monthly rebalancing mechanics of the standard FTSE 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 for each country 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):
- 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).
 - 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 a sectoral lens.
 - Resilience represents a country's preparedness and actions to cope with its level of climate related risk exposure.
- 6.1.4 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.

6.2 Advanced Climate Risk-Adjusted WGBI design criteria and calculation methodology

- 6.2.1 The base universe for the FTSE Advanced Climate WGBI is the FTSE WGBI. 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.

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

6.2.3 The tilting of index weights is designed reweight countries based on their relative Climate score in the cohort outlined below:

Weighting	Alternatively weighted
Country Climate Scores	Updated annually and applied each September month-end rebalance ³ . 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 <ul style="list-style-type: none"> – Transition risk: 1 – Physical risk: 1 – Resilience: 1
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 FTSE Russell website.
Base date	December 31, 2001

6.2.4 FTSE Advanced Climate WGBI ex Japan shares the same design criteria and calculation methodology as FTSE Advanced Climate WGBI.

6.3 Advanced Climate Risk-Adjusted EGBI design criteria and calculation methodology

6.3.1 The base universe for the FTSE Advanced Climate EGBI is the standard FTSE EGBI, which consists of the Eurozone-participating countries that meet the WGBI criteria. 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.

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

6.3.3 The tilting of index weights is designed reweight countries based on their relative Climate score in the cohort outlined below:

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 <ul style="list-style-type: none"> – Transition risk: 1 – Physical risk: 1 – Resilience: 1
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

³ Prior to 2024, Climate scores were updated each May month-end".

6.4 Climate Risk Assessment methodology

- 6.4.1 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).
- 6.4.2 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.

6.5 Climate Risk Score assessment cohort

- 6.5.1 To compute s-scores⁴, 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.
- 6.5.2 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.

6.6 Tilting methodology

- 6.6.1 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 weights⁵.
- 6.6.2 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_i is the country's Transition Risk pillar s-score

PR_i is the country's Physical Risk pillar s-score

R_i 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_i is the final country climate risk score

- 6.6.3 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.
- 6.6.4 Second, the climate scores are applied to each country's market value weight in the underlying index to derive the adjusted weights:

⁴ 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.

⁵ 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.

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

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

6.7 Exchange rates

6.7.1 The WMR Closing Spot Rates and The WMR Closing Forward Rates 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.

6.8 Chronological summary of events

6.8.1 In addition to the following events, the constructions of Advanced Climate WGBI, Advanced Climate WGBI ex Japan 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.
2024	October: An enhanced methodology is used to analyse climate risk. October: Change in Benchmark Administrator from FTSE Fixed Income LLC to FTSE International Limited.

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/

Disclaimer

© 2024 London Stock Exchange Group plc and its applicable group undertakings ("LSEG"). LSEG includes (1) FTSE International Limited ("FTSE"), (2) Frank Russell Company ("Russell"), (3) FTSE Global Debt Capital Markets Inc. and FTSE Global Debt Capital Markets Limited (together, "FTSE Canada"), (4) FTSE Fixed Income Europe Limited ("FTSE FI Europe"), (5) FTSE Fixed Income LLC ("FTSE FI"), (6) FTSE (Beijing) Consulting Limited ("WOFE"), (7) Refinitiv Benchmark Services (UK) Limited ("RBSL"), (8) Refinitiv Limited ("RL") and (9) Beyond Ratings S.A.S. ("BR"). All rights reserved.

The FTSE Advanced Climate Risk-Adjusted Government Bond Index Series is calculated by or on behalf of FTSE International Limited or its affiliate, agent or partner. FTSE International Limited is authorised and regulated by the Financial Conduct Authority as a benchmark administrator. Refinitiv Benchmark Services (UK) Limited is authorised and regulated by the Financial Conduct Authority as a benchmark administrator.

FTSE Russell® is a trading name of FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, WOFE, RBSL, RL and BR. "FTSE®", "Russell®", "FTSE Russell®", "FTSE4Good®", "ICB®", "WMR™", "FR™", "Beyond Ratings®" and all other trademarks and service marks used herein (whether registered or unregistered) are trade marks and/or service marks owned or licensed by the applicable member of LSEG or their respective licensors and are owned, or used under licence, by FTSE, Russell, FTSE Canada, FTSE FI, FTSE FI Europe, WOFE, RBSL, RL or BR.

All information is provided for information purposes only. All information and data contained in this publication is obtained by LSEG, from sources believed by it to be accurate and reliable. Because of the possibility of human and mechanical inaccuracy as well as other factors, however, such information and data is provided "as is" without warranty of any kind. No member of LSEG nor their respective directors, officers, employees, partners or licensors make any claim, prediction, warranty or representation whatsoever, expressly or impliedly, either as to the accuracy, timeliness, completeness, merchantability of any information or LSEG Products, or of results to be obtained from the use of LSEG products, including but not limited to indices, rates, data and analytics, or the fitness or suitability of the LSEG products for any particular purpose to which they might be put. The user of the information assumes the entire risk of any use it may make or permit to be made of the information.

No responsibility or liability can be accepted by any member of LSEG nor their respective directors, officers, employees, partners or licensors for (a) any loss or damage in whole or in part caused by, resulting from, or relating to any inaccuracy (negligent or otherwise) or other circumstance involved in procuring, collecting, compiling, interpreting, analysing, editing, transcribing, transmitting, communicating or delivering any such information or data or from use of this document or links to this document or (b) any direct, indirect, special, consequential or incidental damages whatsoever, even if any member of LSEG is advised in advance of the possibility of such damages, resulting from the use of, or inability to use, such information.

No member of LSEG nor their respective directors, officers, employees, partners or licensors provide investment advice and nothing in this document should be taken as constituting financial or investment advice. No member of LSEG nor their respective directors, officers, employees, partners, or licensors make any representation regarding the advisability of investing in any asset or whether such investment creates any legal or compliance risks for the investor. A decision to invest in any such asset should not be made in reliance on any information herein. Indices and rates cannot be invested in directly. Inclusion of an asset in an index or rate is not a recommendation to buy, sell or hold that asset nor confirmation that any particular investor may lawfully buy, sell or hold the asset or an index or rate containing the asset. The general information contained in this publication should not be acted upon without obtaining specific legal, tax, and investment advice from a licensed professional.

No part of this information may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the applicable member of LSEG. Use and distribution of LSEG data requires a licence from LSEG and/or its licensors.

