

FTSE Eurozone Macro-Weighted Government Bond Index Series

v3.2



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Section 1

Introduction

1. Introduction

1.1 FTSE Eurozone Index Structure

- 1.1.1 FTSE Eurozone Indices¹ are a set of benchmarks for the European sovereign bond market. The indices are calculated and distributed by FTSE Russell, using pricing data from the Refinitiv Evaluated Pricing Service (REPS)².
- 1.1.2 The FTSE Eurozone Macro-Weighted Government Bond Index Series does not take account of ESG factors in its index design.

1.2 IOSCO

- 1.2.1 FTSE International Limited (FTSE) considers that the FTSE Eurozone Macro-Weighted Government Bond Index Series (the Index Series) meets the IOSCO Principles for Financial Benchmarks as published in July 2013.

Full details can be accessed at www.iosco.org.

Details of FTSE Russell's Statement of Compliance with respect to the IOSCO Principles can be accessed through the following link:

[IOSCO Statement of Compliance](#)

- 1.3 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 series.
- 1.4 Index users who choose to follow this index series or to buy products that claim to follow this index 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 nor its group companies (or any person concerned with the preparation or publication of these Ground Rules) 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.

¹ With effect from 1 April 2022 rebranded from FTSE MTS Indices.

² With effect from 10 October 2022, REPS replaced prices from MTS platform.

1.5 These Ground Rules

1.5.1 This document sets out the Ground Rules for the construction and management of the FTSE Eurozone Macro-Weighted Government Bond Index Series.

1.6 FTSE Russell

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.

1.7 Index series objectives

1.7.1 The FTSE Eurozone Macro-Weighted Government Bond Indices are designed to reflect the performance of the Eurozone Sovereign Bond market, with the market value weights of countries adjusted by their economic fundamental scores. The indices are transparent and designed to be replicable.

1.8 Publication of index and underlying data

FTSE Eurozone Indices are published on end of day basis following market close at 17:15 CET.

1.9 The base currency of the benchmark is EUR.

1.10 FTSE Eurozone Macro-Weighted Government Bond Index Series

1.10.1 The FTSE Eurozone Government Bond Index Series comprises the following indices:

- FTSE Eurozone Highest Rated Macro-Weighted Government Bond Index;
- FTSE Eurozone Macro-Weighted Government Bond IG Index.

1.10.2 The FTSE Eurozone Highest Rated Macro-Weighted Government Bond Indices consist of Eurozone sovereign indices based on issuers with the highest credit ratings grouped by maturity. The Eurozone indices (together with the maturity sub-indices) were launched in October 2011 and each index has a history of index values back to 31 December 1998.

1.10.3 The FTSE Eurozone Macro-Weighted Government Bond IG Index is comprised of bonds from Eurozone issuers with at least two investment grade ratings from the three main credit ratings agencies. It was launched in March 2012 and has a simulated history of index values back to 31 December 1998.

1.11 Price and total return indices

1.11.1 Price and total return indices are calculated.

1.11.2 Total return index: coupons paid by any bond index constituent are reinvested overnight in the index. No deduction is made before a coupon is reinvested in the index i.e. no withholding tax is applied.

1.12 Index analytics

1.12.1 In addition to capital and total return index values, the following index analytics are also calculated:

- Average coupon
- Average yield to maturity
- Average time to maturity
- Average Macaulay duration
- Average modified duration
- Average convexity

1.13 Index calculation

The indices are calculated on every day that is not a TARGET2 payment system holiday. The calculation of the index and associated index analytics will use a T+2 settlement convention.

Section 2

Management responsibilities

2. Management responsibilities

2.1 FTSE International Limited (FTSE)

2.1.1 FTSE is the benchmark administrator of the index series³.

2.1.2 FTSE Russell is responsible for the daily calculation, production and operation of the FTSE Eurozone Macro-Weighted Government Bond Index Series and will:

- maintain records of all the constituents;
- be responsible for the addition and deletion of bonds and changes of nominal amounts, in accordance with the Ground Rules.

2.2 FTSE EMEA Fixed Income Advisory Committee

2.2.1 The FTSE EMEA Fixed Income Advisory Committee has been established by FTSE Russell. The Committee may recommend changes to the Ground Rules for approval by the FTSE Russell Index Governance Board.

2.2.2 The Terms of Reference of the FTSE EMEA Fixed Income Advisory Committee are set out on the FTSE Russell website and can be accessed through the following link:

[FTSE EMEA Fixed Income Advisory Committee.pdf](#)

2.3 Amendments to these Ground Rules

2.3.1 These Ground Rules shall be subject to regular review (at least once a year) 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 the FTSE EMEA Fixed Income Advisory Committee and other stakeholders if appropriate. The feedback from these consultations will be considered by the FTSE Russell Index Governance Board before approval is granted.

2.3.2 As provided for in the Statement of Principles for FTSE Fixed Income 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.

³ 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).

2.4 Market disruption

- 2.4.1 If the value of one or more constituents is not published due to a suspension or a market disruption event, the index will be calculated taking the previous end of day value.

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 through the links below:

3.1 Queries and Complaints

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

[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 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 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 through 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 through 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 through 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

3.5.1 Details of FTSE Russell's policy for making benchmark methodology changes can be accessed through 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 Benchmarks⁴, the European benchmark regulation⁵ and the UK benchmark regulation⁶. The FTSE Russell Governance Framework can be accessed through 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](#)

⁴ IOSCO Principles for Financial Benchmarks Final Report, FR07/13 July 2013.

⁵ 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.

⁶ The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019.

Section 4

Eligibility criteria

4. Eligibility criteria

4.1 Eligible Bonds

	FTSE Eurozone Highest Rated Macro-Weighted Government Bond Index	FTSE Eurozone Macro-Weighted Government Bond IG Index
General	Quoted on the Refinitiv Evaluated Pricing Service (REPS) Nominal, fixed coupon bullet-maturity bonds with no embedded options or convertibility	
Currency	EUR	
Minimum credit rating	No less than two AAA ratings from the three main ratings agencies: Fitch, Moody's and S&P	No less than two investment grade ratings from the three main ratings agencies: Fitch, Moody's and S&P Investment grade is the rating BBB- or higher by Fitch and S&P and Baa3 or higher by Moody's
Issuer	Sovereign government bonds issued by the following Eurozone countries: Austria, Belgium, Finland, France, Germany, Ireland, Italy, Netherlands, Portugal, and Spain	
Minimum outstanding amount	€2 billion	
Minimum remaining time to maturity	Greater than 1 year, defined as the difference between the maturity of the bond and the rebalance effective date	
First settle day	Bonds must have a first settle date on or before the selection day, as defined in Section 5 – Index Rebalancing	

The FTSE Eurozone Highest Rated Macro-Weighted Government Bond Index comprises a **minimum of five issuers**. Where a credit rating downgrade of an existing eligible issuer would result in the number of eligible issuers falling below this minimum, the issuer in question will remain an eligible issuer until a new issuer becomes eligible to replace it.

Section 5

Price sources

5. Price sources

5.1 FTSE Eurozone Indices are priced using on the Refinitiv Evaluated Pricing Service (REPS)

Index values are calculated using best bid prices. New bonds entering an index for the first time use the best offer price, to reflect the bid-offer spread experienced by market participants attempting to track the index.

Select indices are also calculated using mid-prices to value existing index constituents. However, in order to reflect bid-offer spreads, new constituents will be added to the index at the offer price and ineligible bonds will leave the index at the bid price. All mid-prices are calculated as the arithmetic average of the respective bid and offer price pair.

5.2 Prior to being used in the index calculation, the prices are subject to a multi-step verification process which aims to remove stale or off-market prices. The verification procedure includes:

- Comparing the bid and offer spreads against country thresholds;
- Comparing price movements in individual bonds against pre-defined thresholds.

Any price that successfully completes the verification process is referred to as the Last Good Price (LGP) and is subsequently used in the index calculation. In the event that the verification process disqualifies all prices for a particular bond the LGP is used, until a new price is available.

5.3 Verification and price challenges

5.3.1 Statistical techniques are used to identify pricing anomalies based on bid-ask spreads, day-over-day changes and comparisons across peer groups by maturity, asset type, etc.

5.3.2 Any price challenges from index users and possible outliers from the verification process are reviewed with our pricing provider.

In the event that an issue is not able to be resolved in a timely manner, FTSE Russell may exercise expert judgement and roll prices from the previous day. Any exercise of expert judgement is recorded.

Section 6

Index rebalancing

6. Index rebalancing

6.1 Monthly rebalancing

- 6.1.1 The FTSE Eurozone Macro-Weighted Government Bond Index Series is rebalanced monthly. Eligible Bonds are determined using market data at 17:15 CET on the first day following the 15th day of the month that is a TARGET business day (the Selection Day).
- 6.1.2 The monthly rebalance is applied post close on the last business day of the month with prices from 17:15 CET, i.e. with effect from open on the first business day of the following month.
- 6.1.3 In the event that no Eligible Bonds are available at the monthly rebalance, the current index constituents will be maintained until a new bond(s) becomes eligible at a subsequent monthly rebalance.

6.2 Country weights

- 6.2.1 Country weightings are initially based on each eligible countries' share of aggregate eligible Gross Domestic Product (GDP). Initial country weightings are then further adjusted using the four macroeconomic metrics shown in the table below:

Data	Metric	Source
Gross Domestic Product (GDP)	--	Eurostat
Government Debt (as a percentage of GDP)	Negative	Eurostat
Current Account Balance (as a percentage of GDP)	Positive	OECD
Quarter-on-quarter GDP Growth	Positive	Calculated from the GDP data
Long-term Interest Rates ⁷	Negative	OECD

- 6.2.2 Each metric is calculated as the average quarterly value over the most recent eight quarters. If any data is unavailable, the data from the previous quarter is used⁸. Any data that was missing in the previous quarter, if now available will be taken into account. This will not impact previous quarter's weightings. Revisions to the indicators are not taken into account.
- 6.2.3 For each country a share of GDP in the total GDP for the whole group is calculated. This gives an initial weight for each country's GDP
- $$\text{Initial Weight} = \frac{\text{Country GDP}}{\text{Total GDP}}$$

⁷ Generally 10 years as defined by the OECD.

⁸ For example, if the average is being calculated at the end of Q4 2015 and the Q4 value is not available then Q3 2015 is used for Q4. Thus, the 8 quarters will be Q1 2014, Q2 2014, Q3 2014, Q4 2014, Q1 2015, Q2 2015, Q3 2015 and Q3 2015.

6.2.4 Each individual country's initial weight is then adjusted using a set of macroeconomic indicators (i.e. Government Debt, Current Account Balance, Q-on-q GDP growth and Long-term Interest Rates). For each macroeconomic indicator, the average of the last 8 quarters is taken, which is subsequently standardized using the Z-score formula:

$$Z = \frac{x - \mu}{\sigma}$$

where:

- x is a raw score to be standardized per country;
- μ is the mean of the population, i.e. all selected issuing countries as per the selection criteria;
- σ is the standard deviation of the population, as described above for μ .

6.2.5 The standardized scores are multiplied by +1 or -1 depending on whether the metric is considered positive or negative (as indicated in the table above). The sum of data for one indicator for all countries per quarter should be equal to 0.

Example:

Calculating the Z-score.

In Q1 2015, the Government Debt (as a % of GDP) data for countries A, B and C were as follows:

A	B	C
97.5	74.4	109.7

The mean and standard deviation of the population are:

$$\mu = \frac{97.5 + 74.4 + 109.7}{3} = 93.9$$

$$\sigma = \frac{\sqrt{(97.5-93.9)^2 + (74.4-93.9)^2 + (109.7-93.9)^2}}{3} = 17.9$$

Government Debt is a negative metric, therefore Z-score for the Government Debt indicator of the 3 countries needs to be negative as well:

$$Z_{DebtA} = \frac{97.5 - 93.9}{17.9} \times (-1) = -0.202659$$

$$Z_{DebtB} = \frac{74.4 - 93.9}{17.9} \times (-1) = 1.08581$$

$$Z_{DebtC} = \frac{109.7 - 93.9}{17.9} \times (-1) = -0.883148$$

Note that $Z_{DebtA} + Z_{DebtB} + Z_{DebtC} = 0$.

6.2.6 The final Z-score for each country is obtained by taking an average of the four standardized macroeconomic indicators. It is subsequently used as an adjustment factor to the initial GDP share for each country, $GDP_{Initial}$, using the below formula:

$$CW_c = GDP_{Initial} \times \left(1 + \frac{Z}{10}\right)$$

where:

CW_c is the weight of a country c.

Example:

Applying an adjustment factor.

Country A has a 3.9% share in the total GDP of a group of countries, as well as the Government Debt Z-score as in the example above. To adjust the GDP weighting by the Z-score, the below formula is used:

$$CW_A = \text{GDP}_{Wei}^{\text{Initial}} \times \left(1 + \frac{Z_{\text{DebtA}}}{10}\right) = 3.9\% \times \left(1 + \frac{-0.202659}{10}\right) = 3.820963\%$$

Since the above macroeconomic indicator is a negative metric, the final country weighting is lower than the initial GDP weighting.

The resulting weight distribution for each country c , CW_c , is normalized to add up to exactly 100%. Final country weightings are referred to as “Macro-adjusted GDP weights” and constitute country weights in the all maturity index and all sub-indices for which all issuers are eligible.

6.3 Bond weights

The weight W_i of each selected bond i is determined using data from 11:00 CET on the first business day, following the 15th day of the month immediately preceding the effective month₁. This time is denoted t_0 . All weights are published to 3 decimal places. Bond eligibility and selections are established by applying the relevant criteria for each index at the same time t_0 .

$$W_i = W_j^* \times \frac{(Cp_i[t_0] + AI_i[t_0]) \times N_i[t_0]}{\sum_j (Cp_j[t_0] + AI_j[t_0]) \times N_j[t_0]}$$

where:

W_j^* is the weight of a country j (the issuer of bond i);

$Cp_i[t_0]$ is the quoted clean price of Eligible Bond i at t_0 ;

$AI_i[t_0]$ is the accrued interest;

$N_i[t_0]$ is the nominal amount of Eligible Bond i outstanding on day t_0 ;

where the summation in the denominator is over all Eligible Bonds issued by all Eligible countries.

Appendix A

Calculations

Index level calculations

Total return index

$$TR(t) = TR(t - 1) \times \frac{\sum_{i=1}^n ((P_i(t) + AI_i(t)) \times N_i(r)) \times WF_i(r) + Cash(t)}{\sum_{i=1}^n (P_i(t - 1) + AI_i(t - 1)) \times N_i(r) \times WF_i(r)}$$

Index yield

$$IndexYield(t) = \frac{\sum_i^n Y_i(t) \times MV_i(t) \times MD_i(t) \times WF_i(r)}{\sum_i^n MV_i(t) \times MD_i(t) \times WF_i(r)}$$

Market value

$$MarketValue(t) = \sum_{i=1}^n (P_i(t) + AI_i(t)) \times N_i(r) \times WF_i(r)$$

Macaulay duration

$$Duration(t) = \frac{\sum_i^n MV_i(t) \times D_i(t) \times WF_i(r)}{\sum_i^n MV_i(t) \times WF_i(r)}$$

Modified duration

$$ModDuration(t) = \frac{\sum_i^n MV_i(t) \times MD_i(t) \times WF_i(r)}{\sum_i^n MV_i(t) \times WF_i(r)}$$

Convexity

$$Convexity(t) = \frac{\sum_i^n MV_i(t) \times Cvxt_i(t) \times WF_i(r)}{\sum_i^n MV_i(t) \times WF_i(r)}$$

Average coupon

$$Coupon(t) = \frac{\sum_i^n N_i(t) \times C_i(t) \times WF_i(r)}{\sum_i^n N_i(r) \times WF_i(r)}$$

Average time to maturity

$$TimeToMaturity(t) = \frac{\sum_i^n N_i(t) \times TTM_i(t)}{\sum_i^n N_i(r)}$$

Index notional

$$IndexNotional(t) = \sum_i^n N_i(r)$$

Index cash

$$Cash(t) = \sum_i^n C_i(t) \times N_i(r) \times X_i(t) \times WF_i(r)$$

Bond level calculations

Accrued interest

$$AI_i(t) = \frac{D_i(sd, pcd_i)}{D_i(cp_i)} \times \frac{C_i(t)}{f_i}$$

Gross price

$$DP_i(t) = P_i(t) + AI_i(t)$$

Market value

$$MV_i(t) = DP_i(t) \times N_i(r)$$

Yield to maturity

$$DP_i(t) = \sum_{k_i=t}^{n_i} \frac{CF_i}{\left(1 + \frac{Y_i(t)}{f_i}\right)^{k_i}}$$

Simple yield

$$SY_i(t) = \frac{\left(\frac{FV_i}{DP_i(t)} - 1\right)}{TTM_i(t)}$$

Macaulay duration

$$D_i(t) = \frac{\sum_{k_i=t}^{n_i} \frac{CF_i \times k_i}{\left(1 + \frac{Y_i(t)}{f_i}\right)^{k_i}}}{DP_i(t)}$$

Modified duration

$$MD_i(t) = \frac{D_i(t)}{\left(1 + \frac{Y_i(t)}{f_i}\right)}$$

Convexity

$$Convxt_i(t) = \frac{1}{4 \times DP_i(t)} \times \sum_{k_i=t}^{n_i} \frac{(k_i^2 + k_i) \times CF_i}{\left(1 + \frac{Y_i(t)}{f_i}\right)^{k_i+2}}$$

Key to terms

Key	Description
<i>TR</i>	Total return index
<i>IndexYield</i>	Average yield to maturity of the index
<i>MarketValue</i>	Total market value of the index
<i>Duration</i>	Average Macaulay duration of the index
<i>ModDuration</i>	Average modified duration of the index
<i>Convexity</i>	Average convexity of the index
<i>Coupon</i>	Average coupon of the index
<i>TimeToMaturity</i>	Average time to maturity of the index
<i>IndexNotional</i>	Total amount outstanding of the index
<i>Cash</i>	Total cash held in the index as a result of coupon payments
P_i	Clean price of the bond i used for index calculation
AI_i	Accrued interest if the bond i
N_i	Amount outstanding of the bond i used for index calculation
WF_i	Weight adjustment factor of the bond i
Y_i	Annualised yield to maturity of the bond i
MV_i	Total market value of the bond i
MD_i	Modified duration of the bond i
D_i	Macaulay duration of bond i
$D_i(sd, pcd_i)$	Calendar days between the index settlement date and the previous coupon date of the bond i , based on day count basis
$D_i(cp_i)$	Number of days in the coupon period of the bond i , based on day count basis
$Cvxt_i$	Convexity of bond i
C_i	Coupon rate of bond i
TTM_i	Time to maturity of bond i
X_i	Coupon payment marker of bond i , will be 1 if coupon payment date else 0
D_i	Days applicable to bond i
DP_i	Dirty price of bond i
f_i	Coupon payment frequency of bond i
CF_i	Cash flow amount of bond i
SY_i	Annualised yield to maturity of the bond i , simple interest basis. Calculated only when the bond is in its final coupon period
FV_i	Face value of bond i
n_i	Total number of remaining cash flows of bond i
k_i	Time to each cash flow of bond i
t	Calculation date
$t - 1$	Previous calculation date
r	Index rebalance effective date

Appendix B

Further information

A glossary of terms used in FTSE Russell's Ground Rule documents can be found through the following link:

[Fixed Income Glossary of Terms.pdf](#)

For further information on the FTSE Eurozone Macro-Weighted Government Bond Index Ground Rules please visit <http://www.lseg.com/en/ftse-russell/> or e-mail info@ftserussell.com.

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