Ground Rules

May 2023

FTSE Eurozone Government Bill Index Series

v3.1

FTSE RUSSELL
An LSEG Business

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Contents

Section 1

Introduction

1. Introduction

1.1 The FTSE Eurozone Index Structure

1.1.1 FTSE Eurozone Indices[1] is 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].

1.2 The FTSE Eurozone Government Bill Index Series does not take account of ESG factors in its index design.

1.3 IOSCO

1.3.1 FTSE International Limited (FTSE) considers that the FTSE Eurozone Government Bill 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

1.4 FTSE Russell hereby notifies users of the index 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 and therefore, any financial contracts or other financial instruments that reference the index or investment funds which use the index to measure their performance should be able to withstand, or otherwise address the possibility of changes to, or cessation of, the index.

1.5 Index users who choose to follow this index or to buy products that claim to follow this index should assess the merits of the index's rule-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.

1.6 These Ground Rules

1.6.1 This document sets out the Ground Rules for the construction and management of the FTSE Eurozone Government Bill Index Series.

[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.

1.7 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, The Yield Book Inc. and Beyond Ratings.

1.8 Index Series objectives

1.8.1 The FTSE Eurozone Government Bill Index Series is designed to be a measure of the Eurozone Government Bill market. They are transparent indices and are designed to be replicable with individual security holdings and prices disclosed electronically each day.

1.9 Publication of index and underlying data

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

1.10 The base currency of the benchmark is EUR.

1.11 FTSE Eurozone Government Bill Index Series

The FTSE Eurozone Government Bill Index Series is a family of indices that measure the total return of a portfolio of sovereign bills issued by countries belonging to the Eurozone and listed on the Refinitiv Evaluated Pricing Service (REPS).

The series comprises indices grouped by the following maturity bands: 0-3 months, 0-6 months and 0-12 months. In the 0-6 months maturity bucket, two indices are produced, one of which is capped, meaning that each issuer is capped within the index to a maximum of 34.5%. The 0-3 month, 0-12 month and remaining 0-6 month indices are weighted by market capitalisation without issuer capping.

The Bill indices are published every 30 seconds and with snapshots at 11:00, 16:00 and 17:15 CET.

1.12 Price and total return indices

1.12.1 Price and total return indices are calculated.

1.12.2 Total return index: coupons paid out on any bond in an index portfolio are reinvested overnight in the index itself. No deduction is made to a coupon before it is reinvested in the index i.e. no withholding tax is applied.

1.13 Index Analytics

1.13.1 In addition to the Capital Index and total return index, 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

The formulae to calculate the total return indices and the index analytics are available in Appendix B.

1.14 Index calculation

The indices are calculated on every day that is a TARGET Business. The index calculation will use the T+2 settlement convention for the valuation of index constituents and the calculation of index analytics.

Section 2

Management responsibilities

2. Management responsibilities

2.1 FTSE International Limited (FTSE)

2.1.1 FTSE is the benchmark administrator of the index[3].

2.1.2 FTSE Russell is responsible for the daily calculation, production and operation of the FTSE Eurozone Government Bill Indices 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. 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.

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.

[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).

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_Indexes.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 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 Benchmarks[4], the European benchmark regulation[5] and the UK benchmark regulation[6]. The FTSE Russell Governance Framework can be accessed through the following link:

FTSE_Russell_Governance_Framework.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 bills

To be eligible for the Index, bonds must meet the following criteria:

- Any sovereign bill issued by France, Germany, Spain, Italy, Belgium, the Netherlands, or Portugal – subject to the above issuers having at least two short-term investment grade credit ratings from the three main ratings agencies;
- Subject to prices on the Refinitiv Evaluated Pricing Service (REPS);
- Maturity date falls within the Maturity Range for any given selection period, as defined below.

4.2 Selection criteria

Bills satisfying the eligibility criteria become “Selected Bills”. Bills that satisfy all criteria except for the quotation requirement (but are listed on the Refinitiv Evaluated Pricing Service (REPS)) are “Eligible Bills”.

Section 5

Price sources

5. Price sources

5.1 FTSE Eurozone Indices are priced using prices from the Refinitiv Evaluated Pricing Service (REPS).

Index updates are calculated using best bid prices. New bonds entering the index for the first time use the offer price, replicating the bid-offer spread experienced by a fund tracking the index. This applies to both the all-maturity and the individual maturity sub-indices.

Selected indices of each series are also available in mid-priced versions, where existing constituents are valued using mid prices. In order to replicate the bid-offer spread incurred when tracking the mid-index, new constituents enter the mid-priced index using their respective offer prices, and leave the index using their respective bid prices. The mid-price is calculated as the arithmetic average of the respective bid and offer price pair.

5.2 The prices used to update the indices are taken from the Refinitiv Evaluated Pricing Service (REPS). 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.

5.3 For each instrument the most recent price that successfully completes the verification process is referred to as its Last Good Price (LGP) and is subsequently used in the index calculation. In the event that the verification process disqualifies the price for an instrument, or if no prices have been received, the LGP is used until a new price is available.

5.4 Verification and price challenges

5.4.1 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.

5.4.2 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 Weekly rebalancing

6.1.1 New selections for the index portfolios and their nominal amounts are on the last business day of the calendar week (which is defined as both a TARGET business day) – such a Business Day being the "Selection Day".

6.1.2 The prices used for the selection process are as of the penultimate business day of the calendar week.

6.1.3 The indices are rebalanced immediately after the close of the first business day of the week (the "Rebalance Day").

6.1.4 For a security to be eligible for the index its maturity date should fall after the next Rebalance Day plus 3 business days.

6.1.5 Bonds are allocated to maturity sub-indices according to their maturity on the Rebalance Day. For instance, at the rebalance the maximum maturity date considered for the 0-6 month index will be the next rebalance date plus 6 months, and the minimum maturity will be the next rebalance date plus 0 months.

6.1.6 The first settlement day of any security following issuance must be on or before the Selection Day in order for that bond to be eligible at the subsequent rebalance.

6.2 Amounts

Only bills that have a price become Selected Bills for the FTSE Eurozone Government Bill Indices. The weight of each bill reflects the total size of each country's bill market as listed on the Refinitiv Evaluated Pricing Service (REPS) (whether quoted or not) and falling in the correct maturity range, i.e. all Eligible Bills.

Appendix A

The FTSE Eurozone Government Bill Index Family

Index	Maturity range	Base date (Index = 100)	Selection criteria
FTSE Eurozone Government Bill 0-3 Month Index	0-3 months	1 Sep 03	Eurozone Issuers Listed Above
FTSE Eurozone Government Bill 0-6 Month Index	0-6 months	1 Sep 03	Eurozone Issuers Listed Above
FTSE Eurozone Government Bill 0-6 Month Capped Index	0-6 months	1 Sep 03	Eurozone Issuers Listed Above subject to capping at 34.5%
FTSE Eurozone Government Bill 0-12 Month Index	0-12 months	1 Sep 03	Eurozone Issuers Listed Above

For the avoidance of doubt, the maturity ranges are inclusive of the lower bound and exclusive of the upper bound. For example, a 3-6 months index will hold the Bills with maturity greater than or equal to 3 months and less than 6 months.

Appendix B

Calculations

Index level calculations

Total return index

$$TR(t) = \frac{\sum_{i=1}^{n}\Big(\big(P_i(t) + AI_i(t)\big) \times N_i(r)\Big) \times WF_i(r) \times E_i(t)\Big)}{TRIDivisor(t)}$$

Price index

$$PR(t) = \frac{\sum_{i=1}^{n} P_i(t) \times N_i(r) \times WF_i(r) \times E_i(t)}{Divisor(t)}$$

Index yield

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

Market value

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

TRI divisor

$$TRIDivisor(t+1) = \begin{cases} \dfrac{\sum_{i=1}^{n}\big(P_i(t) + AI_i(t)\big) \times N_i(r) \times WF_i(r) \times E_i(t)}{TR(t)}, & t <> day\ before\ rebalance\ effective\ day \\ \dfrac{\sum_{i=1}^{n}(P_i(t) + AI_i(t)) \times N_i(r+1) \times WF_i(r+1) \times E_i(t)}{TR(t)}, & t = day\ before\ rebalance\ effective\ day \end{cases}$$

Divisor

$$Divisor(t+1) = \frac{\sum_{i=1}^{n} P_i(t) \times N_i(r+1) \times WF_i(r+1) \times E_i(t)}{PR(t)}$$

Macaulay duration

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

Modified duration

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

Convexity

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

Average coupon

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

Average time to maturity

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

Index notional

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

Index cash

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

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

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

Macaulay duration

$$D_i(t) = TTM_i(t)$$

Modified duration

$$MD_i(t) = \frac{TTM_i(t)}{\left(1 + Y_i(t) \times TTM_i(t)\right)}$$

Convexity

$$Cnvxt_i(t) = \frac{2 \times \left(TTM_i(t)\right)^2}{\left(1 + Y_i(t) \times TTM_i(t)\right)^2}$$

Key to terms

Key	Description
TR	Total return index
PR	Price Index
$IndexYield$	Average yield to maturity of the index
$MarketValue$	Total market value of the index
$TRIDivisor$	Total return index divisor for the total return index
$Divisor$	Price index divisor for the price index
$Duration$	Average Macaulay duration of the index
$ModDuration$	Average modified duration of the index
$Convexity$	Average convexity of the index
$Coupon$	Average coupon of the index
$TimeToMaturity$	Average time to maturity of the index
$IndexNotional$	Total amount outstanding of the index
$Cash$	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	Capping factor of the bond i
E_i	The exchange rate required to convert the security's currency into the index's base currency
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

Key	Description
t	Calculation date
$t-1$	Previous calculation date
$t+1$	Next calculation date
r	Index rebalance-effective date
$r+1$	Next index rebalance-effective date

Distribution

The indices are distributed via Bloomberg and Reuters with the following tickers.

Real time:

FTSE Eurozone Government Bill Index	Bloomberg	Reuters
0-3 months	EMTT3UR <Index>	EMTT3UR=
0-6 months	EMTT6UR <Index>	EMTT6UR=
0-6 months capped	EMTT6CR <Index>	EMTT6CR=
0-12 months	EMTTYUR <Index>	EMTTYUR=

1715 Snapshot:

FTSE Eurozone Government Bill Index	Bloomberg	Reuters
0-3 months	EMTT3UC <Index>	EMTT3UC=
0-6 months	EMTT6UC <Index>	EMTT6UC=
0-6 months capped	EMTT6CC <Index>	EMTT6CC=
0-12 months	EMTTYUC <Index>	EMTTYUC=

Appendix C

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 Government Bill Index Ground Rules please visit www.ftserussell.com or e-mail info@ftserussell.com.

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