Ground Rules

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# FTSE Volatility Target Index Series II

v1.4

FTSE RUSSELL
An LSEG Business

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# Contents

Section 1

# Introduction

## 1. Introduction

1.1 This document sets out the Ground Rules for the construction and management of the FTSE Volatility Target Index Series II. Copies of the Ground Rules are available from FTSE Russell.

1.2 The FTSE Volatility Target Index Series II represents the performance of an investment strategy that seeks to manage expected volatility close to a specific targeted level.

1.3 The FTSE Volatility Target Index Series II deleverages (leverages) i.e. decreases (increases) the allocation to the underlying equity index and increases (decreases) exposure to a risk-free cash return component, as the volatility of the underlying index increases (decreases), in order to target a pre-specified level of volatility. The total return and the excess return indices include a cash return component.

1.4 The base currency of the indices is the same as their underlying index. Index values may also be published in other currencies.

1.5 For more information on the underlying indices, please refer to the relevant FTSE Russell Ground Rules at www.ftserussell.com. Details of the indices included in the FTSE Volatility Target Index Series II are shown in the Appendices.

1.6 The indices in the FTSE Volatility Target Index Series II may contain a fixed cost deducted from the index to represent expected transaction costs. The cost can be applied either as a number of fixed points to the index value or as a fixed percentage to the underlying index returns. Description of the calculation and details for this component can be found in Rule 5.3 and Appendix C.

1.7 The FTSE Volatility Target Index Series does not take account of ESG factors in its index design.

**1.8 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.

1.9 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.

1.10 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 series' 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 series or any constituent data.

1.11 This index series is published at the end of each working day. The total return indices are based on ex dividend adjustments.

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 will maintain records and disseminate the index.

2.1.3 MerQube is the calculation agent of the index as defined by the IOSCO Principles and is responsible for its daily calculation.

### 2.2 Status of these Ground Rules

2.2.1 These Ground Rules set out the methodology and provide information about the publication of the FTSE Volatility Target Index Series II.

### 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 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.

2.3.2 As provided for in the statement of principles for FTSE Russell Equity 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 Ground 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 through the links below:

### 3.1 Statement of Principles for FTSE Russell Equity 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 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 can be accessed through the following link:

Statement_of_Principles.pdf

### 3.2 Queries and Appeals

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

Benchmark_Determination_Complaints_Handling_Policy.pdf

### 3.3 Index Policy for Trading Halts and Market Closures

3.3.1 Guidance for the treatment of index changes in the event of trading halts or market closures can be found through the following link:

Index_Policy_for_Trading_Halts_and_Market_Closures.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 Recalculation Policy and Guidelines

3.5.1 Where an inaccuracy is identified, FTSE Russell will follow the steps set out in the FTSE Russell Index recalculation guidelines when determining whether an index or index series should be recalculated and/or associated data products reissued. Users of the FTSE Volatility Target Index Series II will be notified through appropriate media.

For further information, please refer to the FTSE Russell recalculation policy and guidelines document which is available from the FTSE Russell website through the link below or by contacting info@ftserussell.com.

Recalculation_Policy_and_Guidelines_Equity_Indices.pdf

### 3.6 Policy for Benchmark Methodology Changes

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

Policy_for_Benchmark_Methodology_Changes.pdf

### 3.7 FTSE Russell Governance Framework

3.7.1 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[2], the European benchmark regulation[3] and the UK benchmark regulation[4]. The FTSE Russell Governance framework can be accessed through the following link:

FTSE_Russell_Governance_Framework.pdf

### 3.8 Real Time Status Definitions

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

Real_Time_Status_Definitions.pdf

[2] IOSCO Principles for Financial Benchmarks Final Report, FR07/13 July 2013.

[3] 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.

[4] The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019.

Section 4

# Target risk exposure and return on cash

## 4. Target risk exposure and return on cash

### 4.1 Target risk exposure

4.1.1 FTSE Volatility Target Index Series II controls the risk exposure to the underlying index from the volatility of that index.

4.1.2 The volatility of the underlying index is calculated based on daily underlying index returns using either an exponential weighted moving average or a simple volatility formula.

### 4.2 Simple volatility calculation

4.2.1 On any business day *t*, the target level of risk exposure of the underlying index is calculated as:

$$E(t) = \begin{cases} \min\left(L_M, \frac{\alpha_T}{V_{t-lag}}\right) \; if \; \frac{\min\left(L_M, \frac{\alpha_T}{V_{t-lag}}\right)}{E(t-1)} - 1 > buffer \\ E(t-1) \; if \; \frac{\min\left(L_M, \frac{\alpha_T}{V_{t-lag}}\right)}{E(t-1)} - 1 < buffer \end{cases}$$

where:

- $L_M$ is maximum leverage;
- $\alpha_T$ is the volatility target;
- $V_t$ is the realized volatility of the underlying index at day *t* across the last *n* days.
-

$$V_t = \left(\frac{\sum_{i=t+1-n}^{t}(R_i - R_{average})^2}{n-1}\right)^{1/2} x \; (252)^{1/2}$$

- *lag* represents the number of days prior to t that the volatility formula is applied

where,

- $R_i$ is the daily return of the underlying index at day *i*., that can be calculated either as a percentage return or logarithmic return:

$$Percentage \; R_i = \frac{(Underlying \; Index \; Value_t - \; Underlying \; Index \; Value_{t-1})}{Underlying \; Index \; Value_{t-1}}$$

$$Logarithmic\ R_i = \log\left(\frac{Underlying\ Index\ Value_t}{Underlying\ Index\ Value_{t-1}}\right)$$

– $n$ is the number of days that the volatility of the underlying index is calculated across

## 4.3 Exponential volatility calculation

4.3.1 On any business day $t$, the target level of risk exposure of the underlying index is calculated as:

$$E(t)=\begin{cases} \min\left(L_M, \frac{\alpha_T}{V_{t-lag}}\right) \ if \ \frac{\min\left(L_M, \frac{\alpha_T}{V_{t-lag}}\right)}{E(t-1)} - 1 > buffer \\ E(t-1) \ if \ \frac{\min\left(L_M, \frac{\alpha_T}{V_{t-lag}}\right)}{E(t-1)} - 1 < buffer \end{cases}$$

Where,

– $L_M$ is maximum leverage;

– $\alpha_T$ is the volatility target.

The volatility of the underlying index is calculated using an exponential weighted moving average based on daily underlying index returns.

Two volatility estimates; a short period and a long period estimate, $\sigma_S$ and $\sigma_L$ respectively, are calculated over the volatility calculation period of $n$ days at time t:

$$\sigma_S(t) = \sqrt{252 \sum_{i=t-n+1}^{t} \frac{\alpha_S(t-i+1)}{\sum_{i=1}^{n} \alpha_S(i)} \times \left(ln\frac{S(i)}{S(i-1)}\right)^2}$$

$$\sigma_L(t) = \sqrt{252 \sum_{i=t-n+1}^{t} \frac{\alpha_L(t-i+1)}{\sum_{i=1}^{n} \alpha_L(i)} \times \left(ln\frac{S(i)}{S(i-1)}\right)^2}$$

Where,

– $S(i)$ is the underlying index value at time $i$;

– $n$ is the number of days over which volatility is calculated;

– $\alpha_L(i) = (1-\lambda_L) \times \lambda_L^{i-1}$ is the long period exponential weighting factor at time $i$ where $\lambda_L \leq 1$ is the long period decay factor;

– $\alpha_S(i) = (1-\lambda_S) \times \lambda_S^{i-1}$ is the short period exponential weighting factor at time $i$ where $\lambda_S \leq 1$, $\lambda_S < \lambda_L$ is the short period decay factor.

$\sigma_S(t)$ and $\sigma_L(t)$ are calculated on each day. The average, $\sigma_{AV}(t)$, or maximum, $\sigma_{MAX}(t)$, of the short and long horizon volatility estimates is used to determine the target level of risk exposure.

## 4.4 Cash return

4.4.1 FTSE Volatility Target Index Series II uses the relevant overnight interbank rate as the return on cash.

$$r_C(t) = r(t-1) \times \frac{d(t,t-1)}{DayCount}$$

Where,

- $r(t-1)$ is the overnight interbank rate. The rate applicable to each index is detailed in Appendix C.
- $d(t,t-1)$ is the number of calendar days between *t-1* and *t*;
- *DayCount* is the number of days in a year used in the convention of the corresponding interest rate.

Section 5

# Calculation of index

## 5. Calculation of index

### 5.1 Price return indices

5.1.1 The FTSE Volatility Target price return indices are calculated as follows:

$$PI(t) = PI(t-1) \times \left(1 + E(t) \times r_U(t)\right)$$

where,

– $PI(t)$ is the price return index;

– $E(t)$ is the target level of risk exposure on day t

– $r_U(t)$ is the underlying index return on day t

$$r_U(t) = \frac{(Underlying\ Index\ Value_t - \ Underlying\ Index\ Value_{t-1})}{Underlying\ Index\ Value_{t-1}}$$

### 5.2 Total return indices

5.2.1 The FTSE Volatility Target total return indices are calculated as follows:

$$TRI(t) = TRI(t-1) \times \left[E(t) \times r_U(t) + \left(1 - E(t)\right) \times r_C(t) + 1\right]$$

where,

– TRI(t) is the Total Return Index

– E(t) is the target level of risk exposure on day t

– $r_U(t)$ is the underlying index return on day t

$$r_U(t) = \frac{(Underlying\ Index\ Value_t - \ Underlying\ Index\ Value_{t-1})}{Underlying\ Index\ Value_{t-1}}$$

– $r_C(t)$ is the return on cash on day t

### 5.3 Total Return Indices with Fixed Cost Deduction / Decrement

5.3.1 The FTSE Volatility Target Total Return Decrement Indices are calculated as follows:

$$TRI(t)=TRI(t-1)\times\left[E(t)\times r_U(t)+(1-E(t))\times r_C(t)+1-\frac{(t-1,t)\text{ x }FD}{days}\right]-\frac{(t-1,t)\text{ x }FP}{days}$$

where:

- *TRI(t)* is the Total Return Index
- *E(t)* is the target level of risk exposure on day t
- $r_U(t)$ is the underlying index return on day t

$$\mathrm{r_U(t)} = \frac{(Underlying\ Index\ Value_t - \ Underlying\ Index\ Value_{t-1})}{Underlying\ Index\ Value_{t-1}}$$

- $r_C(t)$ is the return on cash on day *t*
- $FP$ is the Fixed Point (if non-applicable, FP=0)
- $FD$ is the Fixed Percentage (if non-applicable, FD=0)
- $(t\text{-}1,t)$ is the total days between t and t-1
- $days$ is the day count convention (usually 360 or 365)

## 5.4 Excess return indices

5.4.1 The FTSE Volatility Target excess return indices are calculated as follows:

$$EI(t) = EI(t-1) \times \left[1 + E(t) \times \left(r_U(t) - r_C(t)\right)\right]$$

Where,

- *EI(t)* is the excess return index;
- *E(t)* is the target level of risk exposure on day t
- $r_U(t)$ is the underlying index return on day t

$$\mathrm{r_U(t)} = \frac{(Underlying\ Index\ Value_t - \ Underlying\ Index\ Value_{t-1})}{Underlying\ Index\ Value_{t-1}}$$

- $r_C(t)$ is the return on cash on day t

## 5.5 Calculation frequency

5.5.1 The FTSE Volatility Target Index Series II is calculated end-of-day (EOD) after the close of the underlying index.

Section 6

# Periodic rebalancing

## 6. Periodic rebalancing

### 6.1 Periodic rebalancing

6.1.1 The target level risk exposure is re-estimated at a fixed frequency detailed in Appendix A for each index comprising the FTSE Volatility Target Index Series II.

Appendix A

# List of volatility target indices

| Index Name | Volatility Method | Lag | Volatility Target | Days for Calculation | Daily Return Calculation |
|---|---|---|---|---|---|
| FTSE 100 Equally Weighted Gross 15% Volatility Target Total Return Index | Simple | 2 | 15% | 60 | Percentage |
| FTSE 100 Equally Weighted Gross 15% Volatility Target Excess Return Index | Simple | 2 | 15% | 60 | Percentage |
| Russell 2000 10% Volatility Target Index | Exponential | NA | Underlying Vol. +10% | 120 | NA |
| FTSE 100 Gross 15% Volatility Target Total Return Index | Simple | 2 | 15% | 60 | Percentage |
| FTSE 100 Risk Control 45 Point Decrement Index | Simple | 2 | 15% | 60 | Percentage |
| FTSE 100 EW Risk Control 45 Point Decrement Index | Simple | 2 | 15% | 60 | Percentage |

Appendix B

# Underlying indices and cash rates

| Index name | Underlying | Cash rate | Day count basis |
|---|---|---|---|
| FTSE 100 Equally Weighted Gross 15% Volatility Target Total Return Index | FTSE 100 Equally Weighted Index (Total) | SONIA | 360 |
| FTSE 100 Equally Weighted Gross 15% Volatility Target Excess Return Index | FTSE 100 Equally Weighted Index (Total) | SONIA | 360 |
| Russell 2000 10% Volatility Target Index | Russell 2000 Index (Price) | NA | NA |
| FTSE 100 Gross 15% Volatility Target Total Return Index | FTSE 100 Index (Total) | SONIA | 360 |
| FTSE 100 Risk Control 45 Point Decrement Index | FTSE 100 Index (Total) | SONIA | 360 |
| FTSE 100 EW Risk Control 45 Point Decrement Index | FTSE 100 Equally Weighted Index (Total) | SONIA | 360 |

Appendix C

# Calculation

| Index Name | Calculation | Exposure Calculation Frequency | Fixed Cost Applied | Fixed Point (FP) | Fixed Percentage (FP) | Days |
|---|---|---|---|---|---|---|
| FTSE 100 Equally Weighted Gross 15% Volatility Target Total Return Index | Total | Daily | N | NA | NA | NA |
| FTSE 100 Equally Weighted Gross 15% Volatility Target Excess Return Index | Excess | Daily | N | NA | NA | NA |
| Russell 2000 10% Volatility Target Index | Price | Daily | N | NA | NA | NA |
| FTSE 100 Gross 15% Volatility Target Total Return Index | Total | Daily | N | NA | NA | NA |
| FTSE 100 Risk Control 45 Point Decrement Index | Total | Daily | Y | 45 | 0 | 360 |
| FTSE 100 EW Risk Control 45 Point Decrement Index | Total | Daily | Y | 45 | 0 | 360 |

Appendix D

# Other index parameters

| Index Name | Short Period Decay | Long Period Decay | Leverage Change Buffer | Average or Maximum | Max Leverage |
|---|---|---|---|---|---|
| | $\lambda_S$ | $\lambda_L$ | | $\sigma_{AV/MAX}(t)$ | $L_m$ |
| FTSE 100 Equally Weighted Gross 15% Volatility Target Total Return Index | NA | NA | NA | NA | 1.25 |
| FTSE 100 Equally Weighted Gross 15% Volatility Target Excess Return Index | NA | NA | NA | NA | 1.25 |
| Russell 2000 10% Volatility Target Index | 0.94 | 0.97 | NA | Average | 2.0 |
| FTSE 100 Gross 15% Volatility Target Total Return Index | NA | NA | NA | NA | 1.25 |
| FTSE 100 Risk Control 45 Point Decrement Index | NA | NA | NA | NA | 1.25 |
| FTSE 100 EW Risk Control 45 Point Decrement Index | NA | NA | NA | NA | 1.25 |

Appendix D
# Further information

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

Glossary.pdf

Further information on the FTSE Volatility Target Indices is available from FTSE Russell.

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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