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FTSE Term €STR Methodology

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Section 1 Introduction

1. Introduction

1.1 Overview

- 1.1.1 This document specifies the Methodology of the FTSE Term €STR benchmark ("Benchmark"). It is published on the LSEG website¹ and is available on request.
- 1.1.2 The purpose of the Benchmark is to provide a EURIBOR^{®2} fallback in certain cash instruments. The Benchmark is representative of nearly risk-free term rates for the euro.

1.2 Description of the Benchmark

- 1.2.1 FTSE Term €STR comprises five tenors: spot-week, 1 month, 3 months, 6 months and 12 months. It is calculated using a waterfall methodology comprised of two levels: "Level 1" and "Integrated Fallback".
- 1.2.2 Input data for the calculation of Level 1 comprises
 - committed (i.e. executable) quotes for spot starting €STR Overnight Index Swap ("OIS") contracts taken from a dealer-to-client trading platform (Tradeweb), and
 - rates for transacted spot starting €STR OIS contracts taken from a central clearing counterparty ("CCP", LCH SwapClear).

Input data for the Integrated Fallback level is compounded overnight €STR and historical Benchmark values.

- 1.2.3 The Benchmark is published on TARGET2 business days at approximately 11:00 CET.
- 1.2.4 The Benchmark is calculated for Level 1 as the trimmed mean of
 - mid-rates for each 10-minute period over the collection window of 09:00-18:00CET³ on the previous
 TARGET2 business day derived from the dealer-to-client trading platform quotes, and
 - transacted rates taken from the CCP for €STR OIS contracts transacted during the collection window of 09:00-18:00CET on the previous TARGET2 business day.

1.3 ESG factors

1.3.1 The FTSE Term €STR Benchmark does not take account of ESG factors in its benchmark design.

¹ www.lseg.com/termestr

² EURIBOR[®] is the registered trademark of and used under licence of EMMI a.i.s.b.l.. The source of EURIBOR[®] data is the <u>EMMI.</u>

³ Throughout this Methodology, CET implies CEST (UTC + 2 hours) when summer daylight-saving time applies.

Section 2 Management responsibilities

2. Management responsibilities

2.1 FTSE International Limited

- 2.1.1 FTSE International Limited (FTSE) is the benchmark Administrator⁴ of FTSE Term €STR⁵.
- 2.1.2 As Administrator, FTSE is responsible for collecting input data, determining and publishing the Benchmark, and for all aspects of governance, oversight, compliance and integrity of the Benchmark.

2.2 Oversight Committee

2.2.1 The independent Oversight Committee is responsible for oversight of all aspects of the provision of the benchmark including the reviews of the Benchmark definition and Methodology at least annually, overseeing any changes to the Benchmark Methodology or cessation of the Benchmark, and overseeing the Administrator's control framework, management and operation of the Benchmark.

2.3 Benchmark Manager

2.3.1 A benchmark manager is appointed from time to time by the Administrator who will be a subject matter expert responsible for interpreting the Methodology.

2.4 User Feedback

2.4.1 FTSE shall communicate periodically with stakeholders in order to assess conditions in the market for riskfree interest rates for the euro over the relevant Benchmark tenors as implied by OIS contracts that reference €STR and to assess the ongoing fitness and suitability of the Methodology. Such feedback may be used as part of the periodic review of the Methodology.

2.5 Identification of potential limitations of the Benchmark

2.5.1 The ability of the dealer-to-client trading platform and central clearing counterparty to provide accurate input data relies on there being a liquid market in €STR OIS contracts. If any ongoing constraint or fragmentation to liquidity in this market is identified or foreseen, the Administrator will consult with stakeholders as well as the independent Oversight Committee.

2.6 Review of the methodology and input data providers

2.6.1 The Administrator will carry out a review of the Methodology on at least an annual basis. Additional reviews may be conducted at the Administrator's discretion. Reviews will include an analysis of the underlying market the Benchmark seeks to represent, the availability and sufficiency of quotes from the dealer-to-client

⁴ The term Administrator is used in this document in the same sense as it is defined in <u>Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016</u> 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).

⁵ Prior to December 2024, Refinitiv Benchmark Services (UK) Limited was the benchmark Administrator of FTSE Term ESTR. This document has been updated to reflect the change in Administrator but the last review date and effective date of this Methodology are as shown on the cover.

trading platform (Tradeweb) and transactions from the central clearing counterparty (LCH SwapClear), and a review of other potential platforms.

- 2.6.2 The aim of the review will be to ensure that the Benchmark is still representative of the underlying market, that the input data from the dealer-to-client trading platform and the central clearing counterparty sufficiently represent the underlying market, and that the dealer-to-client trading platform and the central clearing counterparty have been providing input data in an accurate and timely manner.
- 2.6.3 Additional reviews may be conducted at the Administrator's discretion. Such additional reviews may be triggered by (i) events affecting the Benchmark that are not optimally treated by the Methodology, (ii) events in the underlying market, (iii) developments in the source of input data used in the Benchmark determination and (iv) issues raised by Stakeholders in the Benchmark.
- 2.6.4 The independent Benchmark Oversight Committee will provide input into reviews and reviews are approved by the appropriate FTSE International Limited board committee.
- 2.6.5 Any proposals for significant amendments to this Methodology are subject to the FTSE Russell Policy for Benchmark Methodology Changes and 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.
- 2.6.6 Back-testing shall take place at least at each annual review of the Methodology and following any material change of the Methodology. The Methodology shall include an assessment of the back-testing results, including processes to ensure that systemic anomalies highlighted by back-testing are identified and properly addressed. No issues were found under the back-test for the 12 month period to the date of the last annual review shown on the cover of this Methodology.

Section 3 FTSE Russell policies

3. FTSE Russell policies

This Methodology should be read in conjunction with the following policies and policy documents.

3.1 Policy for Benchmark Methodology Changes

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

Policy for Benchmark Methodology Changes.pdf

3.2 FTSE Russell Governance Framework

3.2.1 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 Benchmarks⁶, the European benchmark regulation⁷ and the UK benchmark regulation⁸. The FTSE Russell Governance Framework can be accessed using the following link:

FTSE_Russell_Governance_Framework.pdf

3.3 FTSE Russell organisational policies

3.3.1 FTSE Term €STR is subject to the following FTSE Russell organisational policies:

Index Series Decommissioning Statement,

Benchmark Administration Governance and Conflicts of Interest Management and

Policy for Benchmark Methodology Changes.

3.4 Refix policy

- 3.4.1 Following publication, if a material error is identified in the input data or the determination of the Benchmark before 12:00 CET, FTSE shall endeavour to refix the affected tenor or tenors of the Benchmark as soon as possible.
- 3.4.2 No refix will be issued after 16:00CET on the day of publication.
- 3.4.3 A material error is one that results in a change of + or 0.1 basis points to the published value of a Benchmark setting.

⁶ IOSCO Principles for Financial Benchmarks Final Report, FR07/13 July 2013.

⁷ 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.

⁸ The Benchmarks (Amendment and Transitional Provision) (EU Exit) Regulations 2019.

3.5 Complaints, Operational Enquiries and Price Challenges

- 3.5.1 FTSE Russell's complaints procedure can be accessed using the following link: <u>FTSE Russell Benchmark</u> <u>Determination Complaints Handling Policy</u>
- 3.5.2 A Price Challenge is a request from a user or a stakeholder to verify and confirm the accuracy of one or more of the published Benchmark rates, inputs to those rates (if publicly available), or whether a specific benchmark determination is representative of market value.
- 3.5.3 Operational enquiries do not meet the definition of a compliant and include Benchmark Price Challenges. However, FTSE Russell may decide to treat an operational enquiry or a series of operational enquiries as a formal complaint.
- 3.5.4 Operational enquires must be submitted to FTSE Russell by e-mail and should contain as much information as possible, including your name, your title, the institution you represent, your e-mail address and telephone number, to enable the operational enquiry to be investigated in a timely manner.
- 3.5.5 The e-mail address to raise any benchmark related price challenge and operational enquiries is: <u>benchmarkoperations@lseg.com</u>

Section 4 Input data

4. Input data

4.1 Level 1 Input data

- 4.1.1 Input data for Level 1 of the Methodology is taken from a dealer-to-client trading platform (Tradeweb) and a CCP (LCH SwapClear).
- 4.1.2 Input data from the dealer-to-client trading platform comprises quotes from each dealer captured every 10 minutes over a collection window from 09:00 to 18:00CET on the previous TARGET2 business day. The precise time of capture within each 10 minute period varies. Quotes are captured 54 times over the collection window for each dealer and are for centrally-cleared €STR OIS contracts. Input data from the CCP comprises transacted rates for €STR OIS contracts transacted during the collection window of 09:00-18:00CET on the previous TARGET2 business day.
- 4.1.3 All input data are in respect of spot starting €STR OIS for the relevant tenors for the Benchmark.
- 4.1.4 The dealer-to-client trading platform and CCP have been selected as sources of input data as they involve a representative number of dealers active in the market for €STR OIS contracts. The Level 1 input data is therefore sufficient to represent accurately and reliably the market for €STR OIS contracts.

4.2 Integrated Fallback input data

4.2.1 Input data for the Integrated Fallback level comprises overnight €STR published by the European Central Bank (ECB) and historical values of the Benchmark.

Section 5 Determination of the Benchmark

5. Determination of the Benchmark

5.1 Waterfall methodology

- 5.1.1 The Benchmark is calculated using Level 1 of the Methodology subject to a threshold. If the threshold is not reached, the Benchmark is calculated using the Integrated Fallback level.
- 5.1.2 The waterfall is applied individually to each tenor of the Benchmark. Consequently, it is possible that different tenors are determined using different levels of the waterfall on the same day.

5.2 Level 1 determination

- 5.2.1 Once every 10 minutes between 09:00 and 18:00CET on the previous TARGET2 business day, the quotes from the dealer-to-client trading platform (Tradeweb) are captured. In order to be valid, each bid rate to offer rate must be less than or equal to a maximum spread that is specified for each tenor, and the volume on the bid and offer rate must be greater than or equal to a minimum notional amount. Quotes that are from the same dealer and for the same tenor but are for €STR OIS contracts that would be cleared by different CCPs if transacted are treated as separate quotes.
- 5.2.2 A unique mid-rate is calculated for each 10 minute capture by taking the median of all valid dealer quotes for that 10 minute capture. To be valid for use in the Benchmark determination, each unique mid-rate must be derived from a minimum number of separate dealers. Consequently, there is a maximum of 54 unique rates for the collection window.
- 5.2.3 Additionally, rates for transacted €STR OIS contracts from the CCP (LCH SwapClear) are collected. Each rate must be for an €STR OIS contract that is transacted during the collection window (see 4.1.2) and has a minimum notional size in order to be valid for use in the Benchmark determination. The number of similar transactions involving the same pair of counterparties for a given tenor is capped.
- 5.2.4 Both the unique 10 minute mid-rates and the transacted rates are then collected for each tenor and used to determine the Benchmark if one of the following criteria is satisfied:
 - 1. If there are at least a minimum number of valid unique 10 minute mid-rates and a minimum number of valid transacted rates, or
 - 2. If the number of valid unique 10 minute mid-rates is lower than the relevant minimum in criteria 1 above but the number of valid transacted rates is higher than a new minimum that is greater than the relevant minimum in criteria 1 above, or
 - 3. If the number of valid transacted rates is lower than the relevant minimum in criteria 1 above but the number of valid unique 10 minute mid-rates is higher than a new minimum that is greater than the relevant minimum in criteria 1 above.

- 5.2.5 For each tenor, the collected rates are sorted and a percentage is trimmed from the highest rates and lowest rates. The Benchmark tenor is then calculated as the mean of the remaining rates.
- 5.2.6 If none of the three criteria above are satisfied for a given tenor of the Benchmark, the threshold for use of Level 1 for that tenor is not reached and the tenor is determined using the Integrated Fallback.

5.3 Integrated Fallback level determination

- 5.3.1 If the threshold for use of Level 1 of the waterfall is not reached for a tenor, that Benchmark tenor is determined in accordance with the Integrated Fallback level.
- 5.3.2 Under the Integrated Fallback level for a given tenor, the spread between the Benchmark on the previous TARGET2 business day and overnight €STR compounded to the previous TARGET2 business day is applied to €STR compounded to the day of the Benchmark determination.

On each day t, the spread for Benchmark tenor f, denoted S(t,f) is calculated as

$$S(t,f) = RTE(t-1,f) - \frac{360}{d(t_0,t-1)} \cdot \left[\prod_{\tau=t_0}^{t-2} \left(1 + \frac{d(\tau,\tau+1) \cdot R(\tau)}{360} \right) - 1 \right]$$

where RTE(t-1,f) is the Benchmark published on the preceding TARGET2 business day (t-1) for tenor f, $R(\tau)$ is the \in STR rate published by the ECB on day $\tau+1$ based on transactions conducted and settled on day τ , $d(\tau,\tau+1)$ is the number of calendar days from τ to $\tau+1$ and $d(t_0, t-1)$ is the number of calendar days from t_0 to t-1. The product is over all TARGET2 business days from t_0 to t-2 where t_0 is 10 TARGET2 business days before t-2. If t_0 does not fall on a TARGET2 business day, it is moved back to the first preceding TARGET2 business day.

5.3.3 The integrated fallback for the Benchmark with tenor f on day t, denoted IF(t, f) is then calculated as

$$IF(t,f) = S(t,f) + \frac{360}{d(t_1,t)} \cdot \left[\prod_{\tau=t_1}^{t-1} \left(1 + \frac{d(\tau,\tau+1) \cdot R(\tau)}{360} \right) - 1 \right]$$

The product is over all TARGET2 business days from t_1 to t-1 where t_1 is 10 TARGET2 business days before t-1. If t_1 does not fall on a TARGET2 business day, it is moved back to the first preceding TARGET2 business day.

5.4 Exercise of expert judgment

5.4.1 FTSE will not exercise expert judgment in the determination of the Benchmark.

Section 6 Publication

6. Publication

6.1 Benchmark publication

- 6.1.1 The Benchmark is published at approximately 11:00 CET on each TARGET2 business day and is determined using input data from the preceding TARGET2 business day. The Benchmark is published to 3 decimal places. Any use of the Integrated Fallback level is indicated when the resulting Benchmark value is published.
- 6.1.2 The Benchmark will be made available on the page <EURTRR=RFTB> and the following RICs:
 - Spot-week: <EURTRRSW=RFTB>
 - 1 month: <EURTRR1M=RFTB>
 - 3 months: <EURTRR3M=RFTB>
 - 6 months: <EURTRR6M=RFTB>
 - 12 months: <EURTRR1Y=RFTB>
- 6.1.3 The Benchmark is available via LSEG products including Elektron, DataScope and Workspace. The Benchmark is also published via third party data vendors and is published with a 24 hour delay at <u>www.lseg.com/term-estr</u>.

6.2 Delayed publication

6.2.1 FTSE may at its discretion delay publication of the Benchmark in the event that technical difficulties are preventing receipt of input data or if FTSE has reason to believe that either the input data or the determination of the Benchmark includes a potential error. In such cases, all reasonable efforts will be made to publish the Benchmark at the earliest opportunity.

Section 7 Further information

7. Further information

7.1 Third Party Disclaimer

7.1.1 The Euro Short-Term Rate ("€STR") calculated, maintained and published by the European Central Bank ("ECB") on its website and via the Market Information Dissemination ("MID") platform and the ECB's Statistical Data Warehouse, is available free of charge and used by FTSE International Limited as an input into the Term €STR benchmark, subject to the ECB's Terms of Use available at ecb.europa.eu. The ECB is the administrator of the €STR benchmark and the intellectual property owner of the "€STR" mark. The ECB has overall responsibility for providing €STR which reflects the wholesale euro unsecured overnight borrowing costs of euro area banks. The ECB has no affiliation with FTSE International Limited, is in no way responsible for the calculation, maintenance, or publication of the Term €STR benchmark and shall in no event have any liability for any use of, or reliance on, the Term €STR benchmark or any data included therein. The ECB in no way guarantees the timeliness, accurateness, completeness of, or fitness for a particular purpose and accepts no liability or responsibility for any loss, damage, expense or claim (including, but not limited to any direct, indirect or consequential loss, whether or not such loss is foreseeable and whether or not the ECB has been apprised of the use to which the rate or the information will be put), however arising, from reliance on, use of or inability to use any data or information in connection with €STR. FTSE International Limited's use of €STR data and the "€STR" mark does not imply or express any approval, endorsement or recommendation by the ECB of any products or services offered by FTSE International Limited.

7.2 Further information

7.2.1 Further information regarding FTSE Term €STR is available on the FTSE Term €STR website.

Section 8 Definition of key terms

Capitalised terms used in this document but not otherwise defined are defined in the following table.

Key term	Definition
Administrator	Administrator is used in this document in the same sense as it is defined in the Benchmark Regulation
Benchmarks Regulation	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 <u>The Benchmarks (Amendment and Transitional Provision) (EU Exit)</u> <u>Regulations 2019</u> (the UK Benchmark Regulation)
Business Day	Any day on which the TARGET2 real-time gross settlement system is open
Methodology	The written rules and procedures according to which information is collected and the Benchmark is determined
€STR	The overnight euro benchmark administered and published daily by the European Central Bank

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