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1. INTRODUCTION

1.1 Overview

This document specifies the methodology of the Refinitiv Term €STR Prototype (“Prototype”). It is published on the Refinitiv website¹ and is available on request.

The purpose of the Prototype is to support industry testing of a EURIBOR® fallback in select cash instruments. The Prototype is not a benchmark and should not be used as a reference rate in financial instruments, financial contract or for valuation and pricing activities.

1.2 Description of the Prototype

The Prototype 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”.

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, and
- rates for transacted spot starting €STR OIS contracts taken from a Central Clearing Counterparty (CCP).

Input data for the integrated fallback level is compounded overnight €STR and historical Prototype values.

The Prototype is published on TARGET2 business days at approximately 11:30 CET.

The Prototype is calculated for Level 1 as the trimmed mean of

- mid-rates for each 10-minute period over the collection window of 09:00-18:00CET² 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 Intended Readership

This document is intended for Stakeholders of the Prototype.

1.4 Document Publication and Further Information

This document and further information is available on the Refinitiv website¹ and on request.

¹ www.refinitiv.com/termestr
² CEST (UTC + 2 hours) is used when summer daylight-saving time applies
Refinitiv welcomes feedback. Any comments or questions regarding this Methodology or the Term €STR prototype should be sent to index_queries@refinitiv.com and include ‘Term €STR’ in the email subject line.
2. INPUT DATA

2.1 Level 1 Input Data

Input data for Level 1 of the methodology is taken from a dealer-to-client trading platform and a CCP.

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. Variable notional swaps are excluded.

All input data are in respect of spot starting €STR OIS for the relevant tenors for the Prototype.

2.2 Integrated Fallback Input Data

Input data for the integrated fallback level comprises overnight €STR published by the European Central Bank (ECB) and historical values of the Prototype.
3. DETERMINATION OF THE PROTOTYPE

3.1 Waterfall Methodology

The Prototype is calculated using Level 1 of the methodology subject to a threshold. If the threshold is not reached, the Prototype is calculated using the integrated fallback level.

The waterfall is applied individually to each tenor of the Prototype. Consequently, it is possible that different tenors are determined using different levels of the waterfall on the same day.

3.2 Level 1 Determination

Once every 10 minutes between 09:00 and 18:00CET on the previous TARGET2 business day, the quotes from a dealer-to-client trading platform 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.

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 Prototype 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.

Additionally, rates for transacted €STR OIS contracts from the CCP are collected. Each rate must be for an €STR OIS contract that is transacted during the collection window (see 2.1) and has a minimum notional size in order to be valid for use in the Prototype determination. The number of trades between the same counterparty pair, for the same tenor at the same rate is capped.

The rates are then collected for each tenor of the Prototype using the following criteria:

1. If there are at least a minimum number of valid unique 10 minute mid-rates and a minimum number of valid transacted rates, both the unique 10 minute mid-rates and the transacted rates are collected.

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, the transacted rates are collected and the unique 10 minute mid-rates are excluded.

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, the unique 10 minute mid-rates are collected and the transacted rates are excluded.
For each tenor, the collected rates (i.e., both valid transacted trade and valid unique 10 minute mid-rates, subject to the inclusion criteria above) are sorted and the highest 20% of rates are trimmed and the lowest 20% of rates are trimmed. The Prototype tenor is then calculated as mean of the remaining rates.

If no rates are collected in accordance with the collection criteria above for a Prototype tenor, the threshold for use of Level 1 for that tenor is not reached and the tenor is determined using the integrated fallback.

### 3.3 Integrated Fallback Level Determination

If the thresholds for use of Level 1 of the waterfall is not reached, the Prototype is determined in accordance with the integrated fallback level.

Under the integrated fallback level, the spread between the Prototype 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 Prototype determination.

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

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

where \( RTE(t - 1, f) \) is the Prototype published on the preceding TARGET2 business day $(t - 1)$ for tenor $f$, $R(\tau)$ is the €STR rate published by the ECB on day $\tau + 1$ based on transactions conducted and settled on day $\tau$, $d(\tau, \tau + 1)$ is the number of calendar days from $\tau$ 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.

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

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

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.

### 3.4 Exercise of Expert Judgment

Refinitiv will not exercise expert judgment in the determination of the Prototype.
4. PUBLICATION AND REFIX POLICY

4.1 Publication

The Prototype is published at approximately 11:30 CET on each TARGET2 business day and is determined using input data from the preceding TARGET2 business day. The Prototype is published to 3 decimal places. Any use of the integrated fallback level is indicated when the resulting Prototype value is published.

The Prototype will be made available on the following Refinitiv EIKON RICs:

- Spot-week: <EURTRRSW=RFTB>
- 1 month: <EURTRR1M=RFTB>
- 3 months: <EURTRR3M=RFTB>
- 6 months: <EURTRR6M=RFTB>
- 12 months: <EURTRR1Y=RFTB>

The Prototype is available via Refinitiv products including Elektron, DataScope and Workspace.

4.2 Delayed Publication

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

4.3 Refix Policy

Following publication, if a material error is identified in the input data or the determination of the Prototype, Refinitiv will refix the Prototype. Following any publication using the integrated fallback, if it subsequently becomes possible to determine the Prototype using Level 1 of the waterfall, Refinitiv will refix the Prototype.

A material error is one that results in a change of + or – 0.1 basis points to the published value of a Prototype setting.

A refix may occur at any time after the initial publication of the Prototype.
5. DISCLAIMER

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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 Refinitiv as an input into the Term €STR Prototype, 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 Refinitiv, is in no way responsible for the calculation, maintenance, or publication of the Term €STR Prototype and shall in no event have any liability for any use of, or reliance on, the Term €STR Prototype 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. Refinitiv’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 Refinitiv.

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