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CONSULTATION PAPER
ON A
HYBRID METHODOLOGY
FOR
EURIBOR

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*The **European Money Markets Institute** (**EMMI**, formerly known as Euribor-EBF) is an international non-profit making association under Belgian law founded in 1999 with the launch of the euro and based in Brussels (56, Avenue des Arts, 1000 Brussels.*

As per EMMI's statutes, its purpose is twofold:

I. *The development and support of activities related to the money and interbank markets. To that end, the association shall have the task of making an evaluation of fluctuations in the interest rates in the money and interbank markets of the euro area and of providing the results of its research to the monetary authorities and interested parties who are active in these markets.*

II. *In ancillary, the association shall also serve to support other practical initiatives fostering the integration of the European financial market such as but not limited to the improvement of the liquidity, safety and transparency of the European short term debt market by means of a harmonized framework for short-term European paper 'STEP'.*

EMMI currently provides the following two indexes: Euribor®, the money market reference rate for the euro and Eonia®, the effective overnight reference rate for the euro.

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1 Introduction

Reference rates based on unsecured interbank short-term lending and borrowing were introduced in the late 1960s and are now dominant in financial systems. They serve as benchmarks, used to measure the relative performance of investment returns or funding costs, or as reference rates upon which financial instruments are contracted to establish the terms of agreement. Classes of financial contracts linked to reference rates include retail loans, syndicated and bilateral corporate loans, OTC financial derivatives—such as FRAs and long-term swaps—and exchange-traded financial derivatives—such as future contracts and options on these.

With the start of the euro in January 1999, the Euribor index was created and replaced domestic reference rates across the Eurozone. Euribor is nowadays a major euro interest reference rate, administered by the European Money Markets Institute (EMMI). In light of its wide use in the global financial system as a reference rate for a large volume and broad range of financial products and contracts, in 2016 Euribor was established as a critical benchmark of systemic importance for financial stability by the European Commission.[1]

During the financial crisis, cases of market manipulation raised concerns about the appropriateness of the processes and methodologies used in formulating reference interest rates. As a result, initiatives in a number of fora were established to analyze how the increasing loss of confidence could be improved, including the UK Treasury Wheatley Review of Libor (September 2012), the EBA/ESMA Principles for Benchmark-Setting Processes in the EU (January 2013), and the IOSCO Principles for Financial Benchmarks (January 2013).

Over the past years EMMI has worked to implement wide-ranging reforms related to its benchmark administration activities. These reforms were aimed at ensuring EMMI had established and operated a best-in-class governance, oversight, and control framework in alignment with the ESMA-EBA Principles and the IOSCO Principles, as well as with *Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks*, which entered into force on 30 June 2016. Despite all the progress made by EMMI in enhancing the transparency and governance of the Euribor benchmark, the current methodology remains based on collecting quotes from contributing banks and the use of expert judgment.

All the initiatives above coincide and settle on the principle that a benchmark should be "*anchored in an active market having observable, bona-fide, arm's-length transactions*." In July 2014, the Financial Stability Board (FSB) published its report Reforming Major Interest Rate Benchmarks. In line with the IOSCO Principles, the FSB report recommended to strengthen "*IBORs and other potential reference rates based on unsecured funding costs by underpinning them to the greatest extent possible with transaction data*."

Since the end of 2013, and after performing two large data collection exercises, EMMI worked in the development of a new determination methodology for Euribor fully anchored in real transactions. In 2016, a few months prior its planned implementation, EMMI decided to conduct a six-month long verification exercise[2] (the PLVP), in order to guarantee the viability of a calculation methodology developed in substantially different

[1] Having regard to 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 investments funds and amending Directives 2008/48/EC and 2014/17/EU and Regulation (EU) No 596/2014.

[2] More information on EMMI's pre-live verification program can be found in the Guidelines published by EMMI.

market conditions. The conclusion[3] of the exercise was that in the current environment, a transition from the current quote-based to a fully transaction-based methodology via a seamless transition was not feasible.

Since then, and on the basis of the PLVP findings, EMMI has been working on the development of a *hybrid* determination methodology for Euribor, where the calculation is supported by transactions from Panel Banks whenever available, and relies on other related market pricing sources when necessary. Where the aforementioned data is absent, the hybrid methodology relies on a Panel Bank's appreciation of their cost of funds. The hybrid methodology was developed by EMMI with the support of a dedicated Task Force, in which the Belgian Financial Services and Markets Authority (FSMA) participated as an observer. The Task Force served EMMI to gather market participants' initial feedback and guidance on the new methodology.

This consultation paper sets out in more detail and seeks respondents' views on EMMI's proposed hybrid methodology for Euribor. By providing further insight on the methodology's development work, EMMI expects to get a reliable indication of the market's opinion and view on the proposed methodology. The consultation tackles, moreover, other aspects of the publication process that concern the market, and for which EMMI will value feedback.

The questions on which EMMI would welcome feedback from market participants, interested parties and stakeholders are placed throughout the text in the relevant sections. Feedback may be submitted by e-mail to hybrid2018@emmi-benchmarks.eu specifying "Euribor Consultation" on the subject line. More instructions can be found on page 14. **EMMI welcomes and encourages respondents to share any additional views or considerations that are not covered in the questions suggested by EMMI, in particular aspects of the Hybrid Methodology—Section 8 onwards.**

EMMI would be thankful if all responses reached the EMMI Secretariat by **Tuesday, 15th May 2018**. A summary of stakeholder feedback will be made public during the month of June 2018.

[3] A report on the outcome of the pre-live verification program analyses can be found on EMMI's website.

Euribor Specification

In the following two sections, we elaborate on the need to provide a clearer expression of Euribor's *underlying interest*. In the 2015 Consultation Paper, EMMI already tackled this issue, and we still believe in the need to clarify this aspect of the benchmark. In conversations with Euribor users, contributors, and other market participants, it became apparent that the wording proposed by EMMI in October 2015 still allowed for some misinterpretation. Section 3 contextualizes the need for a clarification in what is understood as the definition of a reference index: a *benchmark's specification*. In Section 4, we recall the shortcomings of the current definition, and propose a new wording which clarifies Euribor's underlying interest.

2 Components of a benchmark specification

International regulatory best practice places a duty on benchmark administrators to have in place procedures for the potential need for evolution of a benchmark. In particular, IOSCO Principle 10 recommends to regularly review conditions in the benchmark's underlying market in order to determine whether changes to the design of the benchmark methodology might be necessary. The EU Regulation 2016/1011 on indices used as benchmarks also addresses this issue throughout the text: Article 11 (input data) and Article 28 (changes to and cessation of a benchmark) require benchmark administrators to maintain a procedure for actions to be taken in the event a material change to the benchmark occurs.

To this extent, and bearing in mind the potential need to evolve the index in the future without disruption to contracts referencing to it, EMMI considers it is helpful, and enhances Euribor's transparency, to distinguish between the following two aspects:[4]

(i) Its **underlying interest**, which defines the market or economic reality that the index seeks to measure; and

(ii) A **statement of its determination methodology**, which describes how the underlying interest is to be measured, describing the relevant data inputs and the method of calculation.

In combination, these are considered to be the *benchmark specification*.

The underlying interest represents the more fundamental element of the specification, as it defines the objective for establishing the benchmark. In turn, the determination methodology is a means to measure this objective.

A benchmark administrator should choose a determination methodology that faithfully portrays the underlying interest, taking into account the structure and dynamics of the market for the underlying interest. In line with IOSCO Principle 10, if the market for the underlying interest undergoes structural alteration, it may be necessary to adapt the determination methodology to reflect such a change so that the benchmark continues to serve as a sound measure of the underlying interest.

3 Underlying interest for Euribor

The current Euribor specification, as defined in the Euribor Code of Conduct, states that Euribor is:

"the rate at which euro interbank term deposits are being offered within the EU and EFTA countries by one prime bank to another at 11.00 a.m. Brussels time."

[4] This distinction has been made and used by EMMI and other benchmark administrators in the context of other reforms and reviews; see, for example, EMMI's Position Paper on the Evolution of Euribor (2015), the Bank of England's definition of SONIA in their public consultation on the reform of SONIA in October 2016; EMMI's definition of EONIA in the EONIA Governance Framework; and EMMI's definition of the New Repo Index in the Consultation Paper from June 2017.

In the Consultative Position Paper from October 2015, EMMI identified three shortcomings in the formulation of the specification, namely:

- It does not clearly state the underlying interest for the benchmark. Euribor and its forerunner legacy IBORs arose, at least partly, from a desire to measure bank unsecured funding costs, in turn to serve as a basis for pricing commercial loans by banks. The concept of **cost of funding**, however, is not evident in the current Euribor specification;
- The specification does not make the distinction between underlying interest and determination methodology referred to previously. This leads to uncertainty as to what is fundamental to the specification versus what is a design choice for measuring the benchmark;
- The term "prime bank" is not fully defined, leading to variations in interpretation.

After reanalyzing some of the feedback received in response to the consultative paper, and also taking into consideration the recommendations of the Euribor Task Force, EMMI believes it necessary to formulate Euribor's underlying interest in a more transparent manner. Hence, EMMI would like to clarify the underlying interest for Euribor as:

> ***"the rate at which wholesale funds in euro could be obtained by credit institutions in the EU and EFTA countries in the unsecured money market."***

For the purpose of Euribor's underlying interest, 'credit institution' has the meaning as specified in Article 4(1)(1) of Regulation (EU) No. 575/2013, i.e. an undertaking whose business is to receive deposits or other repayable funds from the public and to grant credits for its own account.

In the consultative paper from 2015, EMMI made a reference to the steady decline of interbank activity and the significant shift in banks' funding sources to explain the need to more explicitly refer to *wholesale* funding. The statistics on the euro money market based on the data collected under the umbrella of the ECB's money market statistical reporting (MMSR) regulation, confirm this statement.[5]

> **QUESTION 1**
> Do you consider that EMMI's clarification of Euribor's underlying interest provides enough transparency and allows stakeholders to understand its definition and decide on its use?

Euribor Overview

4 Panel Bank Contributions

The determination methodology for Euribor relies on a survey approach across a panel of credit institutions ("Panel Banks") that are active participants in the euro money market. Criteria for the selection of the members of the panel are specified in the Euribor Code of Conduct. In general terms, the number of banks should be sufficient to constitute a representative sample for the purposes of determining the average rate and to reflect the geographic diversity of the euro money market.

Publication of individual contributions

Following the implementation of the intraday refixing policy[6] in July 2016, publication of individual panel bank contributions was delayed until 3PM CET, in order to prevent undue misreporting during the refixing window with the intention of influencing the rate.

As described later, under the new hybrid methodology, Panel Banks will be asked to rely on their own transactions in Euribor's underlying interest to determine their daily contribution toward the benchmark. To this end, Panel Banks'

[5] The last issue of the ECB's euro money market statistics can be found here.

[6] The full text of the policy can be found on EMMI's website.

individual submissions may reveal market-sensitive information, which could affect a bank's ability to raise funds if misinterpreted, and ultimately deter financial institutions from participating in the daily determination of the index. This could, in turn, undermine Euribor's stability. EMMI is planning to discontinue the publication of individual Panel Bank submissions as of **1 October 2018**.

> QUESTION 2
>
> Do you think that six months is enough lead time for the market to prepare for the discontinuation of the publication of individual Panel Bank submissions? Please, provide a rationale for your answer.

The IOSCO Principles and the EU BMR make explicit reference to the need for a benchmark administrator to develop and operate the benchmark and its methodology transparently. In that respect, EMMI considers that the implementation of the measure above would not, in any event, undermine the index's transparency.

Moreover, in order to provide the market with enough information so that users have a better understanding of the benchmark and the reality it intends to represent, EMMI intends to publish, on a regular basis, aggregated anonymized indicators that will shed light on some aspects of the index. Publication of these indicators will start by Q4 2019—further details on the first day of publication of these indicators will be given by EMMI on due course.

> QUESTION 3
>
> **Which anonymized indicators** would you consider useful to publish along with the Euribor rate, and **with what frequency**? Please, explain the use you will give to this indicators. (Examples of these indicators could be: reliance on different levels of the new methodology, aggregated volume underpinning the benchmark's determination, percentage of counterparty types in Level 1 submissions, etc.)

5 Euribor Tenors

Euribor is currently published for 8 maturities. In 2013, the number of maturities for which the benchmark was calculated and published was halved, following the recommendations of EBA/ESMA. The analyses carried out by EMMI during the PLVP, which ran from September 2016 until the end of February 2017, confirmed the low levels of activity underpinning the market which the 2 week, 2 months, and 9 months Euribor tenors intend to represent. In addition to this observation, reliance on these tenors in contracts and products is, to EMMI's knowledge, marginal. To this end, EMMI would like to propose the **discontinuation of the calculation and publication of the 2 week, 2 months, and 9 months tenors** as of **1 October 2018**.

Starting on **1 October 2018**, Euribor will only be calculated for the following five tenors (the "Defined Tenors"):

1 week	1 month
3 months	6 months
12 months	

The reduction in the number of tenors will, moreover, have the benefit of simplifying the submission process.

> QUESTION 4
>
> Do you think that six months is enough lead time for the market to prepare for the discontinuation of the publication of the 2 week, 2 months, and 9 months Euribor tenors, on the basis of their lack of underlying activity and limited use? Please, provide a rationale for your answer.

Overnight Euribor tenor

EMMI's analysis of transaction-level market data over the period between September 2016 and the end of February 2017 revealed that substantial transactional volume would, however, be captured by a tenor at the very short-term end of the Euribor curve. This observation is in line with the conclusions reflected by the ECB in their First public consultation on developing a euro unsecured overnight interest rate.

QUESTION 5

Would you consider the publication of an overnight tenor for Euribor as useful? Please, provide a rationale for your answer.

EMMI considers an overnight tenor for Euribor could, in principle, be used as fallback rate to other overnight benchmarks.

6 Calculation basis and publication

Euribor will continue to be published daily on every TARGET[7] day, at or shortly after 11AM CET.

Market conventions

The published Euribor rates under the hybrid methodology will continue to follow euro money market conventions, that is, the TARGET2 calendar, an Actual/360 rate count convention, and modified following business day with month-end adjustment convention.

QUESTION 6

In addition to the Actual/360 calculation mentioned above, EMMI currently calculates and distributes Euribor, to authorized vendors, on both an Actual/365 and a 30/360 basis. EMMI is considering the discontinuation of the calculation and distribution of Euribor on a 30/360 basis, across all tenors as of **1 October 2018**.

Do you agree with EMMI's decision to discontinue the publication of the 30/360 basis calculation? If not, please provide a rationale. In particular, provide an explanation of the use you give to Euribor published under the 30/360 convention.

Rounding conventions

Panel Banks' rate submissions will be made rounded to two decimal places, using the rounding-away-from-zero convention. EMMI will publish Euribor fixing rates rounded to three decimal places, also using the rounding-away-from-zero convention

7 Calculation hierarchy

As required by the EU BMR, EMMI seeks to ground the calculation of Euribor, to the extent possible, in euro money market transactions that reflect its underlying interest. Nonetheless, EMMI recognizes that the level of liquidity in the unsecured money market is currently not consistently sufficient to base the Euribor calculation solely on transactions. As a consequence, the hybrid Euribor determination methodology follows a hierarchical approach consisting of three levels. Each day, each individual Panel Bank's submission, for each Defined Tenor, will be determined on the basis of one of these three levels:

Level 1	Submission based solely on transactions in the underlying interest at the Defined Tenor from the prior TARGET day, using a formulaic approach provided by EMMI.
Level 2	Submission based on transactions in the underlying interest across the money market maturity spectrum and from recent TARGET days, using a defined range of formulaic calculation techniques provided by EMMI.
Level 3	Submission based on additional transactions in the underlying interest, excluded from Level 1 and Level 2 submissions, and/or other data from a range of markets closely related to the unsecured euro money market, using a combination of modelling techniques and/or the Panel Bank's judgment.

The above approach will be applied progressively. Thus, a Panel Bank's submission will be determined

[7] TARGET is the Trans-European Automated Real-time Gross settlement Express Transfer System. The Eurosystem maintains TARGET2, which is the second generation of TARGET and is a real-time gross settlement system. Throughout this document, references to "TARGET" should be read with respect to the euro system's TARGET2 system.

using the Level 1 methodology when the conditions for such an approach, as specified later in the document, are met. If such conditions are not met, it should be assessed whether the conditions for a Level 2 submission are satisfied, and, if so, the Panel Bank's submission will be based on Level 2. Finally, if neither a Level 1 nor a Level 2 submission can be made, the Panel Bank makes a Level 3 submission. In each case, the Panel Bank's submission shall consist of a submission rate and the corresponding submission Level.

Following the introduction of the new methodology, EMMI will be responsible for the determination of Panel Banks' submissions under the Level 1 and Level 2 methodologies, using as input the Panel Banks' individual transactions. In turn, given the heterogeneity observed in the composition of the Euribor Panel (aimed at capturing the geographic diversity of the euro money market), each individual Panel Bank will be responsible of determining their individual Level 3 submission.

Hybrid methodology

In the following Sections, EMMI describes in more detail each of the levels of the hybrid methodology. Sections 8 and 9 delve further into detail and provide a description of the formulaic determination of the submissions under the first two levels of the hybrid methodology. In Section 10, EMMI provides clear guidance regarding the determination of a Panel Bank's contribution under the third level of the methodology, which provides an appreciation of the funding cost of the contributing bank using as proxies data in related markets and/or environmental market conditions.

EMMI's proposal will be analysed and tested under live conditions between the months of May and August 2018. As such, some of the details of the methodology may be subject to change. EMMI welcomes comments on the proposed approach. A second consultation with more concrete details regarding some of the parameters of the methodology is scheduled at the end of Q3 2018.

8 Level 1 Submissions

Level 1 submissions are based solely on Eligible Transactions, as defined below, in the unsecured euro money market on the TARGET day, T, preceding the submission date, T+1.

8.1 Eligible transactions

A Panel Bank's *Eligible Transactions* are determined by applying the filters in the following criteria:

i. Currency denomination: Only transactions directly denominated in euro are eligible.[8]
ii. Transaction timing: Only transactions executed on TARGET day T are eligible for a Level 1 submission on TARGET day T+1.
iii. Transaction types and counterparties: Only transactions conducted in the wholesale unsecured money markets and based on the following types of unsecured borrowing by the Panel Bank are eligible:
   - Unsecured, fixed rate, cash deposits attracted from the following counterparties,[9] irrespective of their geographic location:
     - Deposit-taking Corporations, except those of the Central Bank subsector;
     - Other Financial Institutions;
     - Official Sector Institutions;[10]

[8] In particular, borrowing transaction in euro through the foreign exchange market are not eligible.

[9] In particular, a priori, borrowing transactions from Non-Financial Corporate counterparties are not eligible at Level 1, although a final decision in this regard is subject to the results of the testing phase scheduled between May and August 2018.

[10] The Central Bank subsector is included as an eligible counterparty under Official Sector Institutions. Transactions related to tender operations and standing facilities or, in more general terms, any transaction conducted with Central Banks for the implementation of monetary policy, are not eligible.

- › Insurance Corporations; and
- › Pension Funds.

› Fixed rate, short-term securities (i.e. CPs, ECPs, CDs, ECDs, and others) irrespective of the type and location of the counterparty.

Borrowings or securities with embedded options are not eligible. The possibility of including floating rate transactions as Eligible is currently being assessed by EMMI.

iv. Settlement dates: For all eligible transactions, the standard value date window for each TARGET day is T, T+1, and T+2.

v. Maturity date windows: For each of the Defined Tenors, EMMI will define 'maturity windows', in order to guarantee data sufficiency in Level 1 submissions.

vi. Minimum size: EMMI will study the possibility of introducing a minimum notional volume threshold.

8.2 Level 1 Submission Criterion

EMMI is currently studying the introduction of a threshold on the number of Eligible Transactions a Panel Bank must have for a Level 1 submission to be possible.

9 Level 2 Submissions

Where a Panel Bank has insufficient Eligible Transactions for a Level 1 submission to be calculated for a given tenor, but nonetheless has had transactions in nearby maturities or recently, the Panel Bank's submission can be calculated using a **further range of calculation techniques** in order to make a Level 2 submission for that tenor.

Under EMMI's proposed hybrid methodology for Euribor, three different submission techniques will be allowed. These will be employed progressively and in the following order:

Level 2.1	Adjusted linear interpolation from adjacent Defined Tenors
Level 2.2	Transactions at non-Defined Tenors
Level 2.3	Eligible transactions from prior dates

Thus, where a Panel Bank's submission can be calculated using the Level 2.1 method, that submission constitutes the bank's submission for the day. Similarly, a Level 2.2 submission takes precedence over a Level 2.3 submission.

The following subsections provide a high-level description of each of the Level 2 methodologies designed by EMMI.

9.1 Adjusted Linear Interpolation from Adjacent Defined Tenors (Level 2.1)

This technique will apply to **submissions for the 1 Month, 3 Months and 6 Months tenors only**. A Panel Bank's submission will be determined using this technique only when the Panel Bank's submissions at both adjacent tenors are calculated using the Level 1 methodology.

The Panel Bank's submission rate will be calculated as the sum of two components:

a) the linearly interpolated rate at the submission tenor, using the Level 1 submission rates at the adjacent tenors; and

b) a Spread Adjustment Factor (SAF), which seeks to correct for the curvature of the money market yield curve.

The linear interpolation between the adjacent tenors will be based on the respective number of days over the spot settlement date applying to each tenor.

The SAF will be determined based on the Euribor fixing rates published in recent days at each of the tenors. The precise number of days in the lookback period for the determination of the SAF will be assessed during the testing phase.

9.2 Transactions at Non-Defined Tenors (Level 2.2)

A *Qualifying Non-Standard Maturity Transaction* is a transaction that satisfies all of the conditions for being an Eligible Transaction, except that its maturity date falls between 1 Week and 12 Months but lies outside of the maturity date windows specified for Eligible Transactions.

The Level 2.2. methodology will apply to submissions at all tenors. A Panel Bank's submission will be calculated using this technique when it cannot be determined as a Level 1 or Level 2.1 submission at a particular Defined Tenor, but:

› The Panel Bank has a Qualifying Non-Standard Maturity Transaction(s) at a nearby non-standard maturity date; and

› The transaction volume allocated to the Defined Tenor from at least one Qualifying Non-Standard Maturity Transaction, as specified below, meets the minimum size criteria in point vi. in Section 8.1 above.

The idea underlying this technique is to determine the submission rate at the adjacent Defined Tenor based on a parallel shift of the yield curve from the prior day's Euribor fixing.

Volume Allocation and Threshold

› For each Qualifying Non-Standard Maturity Transaction, **relative weights** to be ascribed to each of the Defined Tenors adjacent to the non-standard maturity are calculated. These weights are determined as the relative proportions of the number of days over the spot settlement date. [For example, if the transaction is at 4 Months maturity, the relative weights would be approximately 66% and 34% for the 3 Months and 6 Months adjacent Defined Tenors respectively.]

› The **volume** of the Qualifying Non-Standard Maturity Transaction is split between the two adjacent Defined Tenors, based on these weights. If the allocated volume to either of these tenors does not meet the corresponding threshold level, the transaction cannot be used to make a Level 2.2 submission for that tenor.

Submission Rate Determination

› Using the prior day Euribor fixing rates at each of the adjacent Defined Tenors, the linearly interpolated rate at the non-standard maturity date is calculated. [This calculation uses the same weights as above.]

› The spread between the transaction rate and the linearly interpolated rate is calculated.

› The ascribed rate at each of the adjacent Defined Tenors is calculated as the sum of this spread and the prior day Euribor fixing rate at the respective tenor.

› The Panel Bank's submission rate is calculated at either of the adjacent tenors as the ascribed rate at the respective tenor. When the Panel Bank has more than one Qualifying Non-Standard Maturity Transaction contributing to a Defined Tenor, the submission is calculated as the volume-weighted average rate over each of the transactions, based on the volumes ascribed to the tenor.

9.3 Transactions from Prior Dates (Level 2.3)

This technique will apply to submissions at all tenors **except the 1 Week tenor**. A Panel Bank's submission will be calculated using this technique when the submission rate cannot be determined as a Level 1, Level 2.1 or Level 2.2 submission at a particular Defined Tenor, but recent Level 1 submissions were recorded by the Panel Bank at this tenor.

Specifically, the Panel Bank's submission on TARGET date T+1 in respect of TARGET date T will be calculated using this technique when a Level 1 submission was made on previous days. The precise number of days in this lookback period will be assessed during the testing phase.

For a given Defined Tenor, the submission made under this technique will be based on only the most recent Level 1 submission made, within the time windows EMMI will specify.

The Panel Bank's submission rate for a given Defined Tenor will be determined as the sum of:

a) the submission rate on the most recent day at that tenor when a Level 1 submission was made; and

b) a *Market Adjustment Factor* (MAF). This factor seeks to correct for the overall movement in interest rates between the date of the submission in a) and the current date.

The MAF will be calculated based on both the Defined Tenor and the market movement between the date of the most recent Level 1 submission and the current date.

Exclusion of 1 Week Tenor

EMMI has excluded the 1 Week tenor from the Level 2.3 method because no suitable mechanism is currently available to arrive at a MAF for this tenor. EMMI explored a number of alternatives but none proved technically suitable. Rates at 1 Week are subject to a number of idiosyncratic influences so that they do not correlate well with either overnight rates, on the one hand, or with rates at longer-dated tenors on the other hand. As such, determining a suitable MAF for the 1 Week tenor is not feasible at present.

Choice of Market Adjustment Factor (MAF)

As noted above, the MAF is intended to capture the overall movement in interest rates, relevant to each tenor, in order to update the submission data from prior days. In making a choice of the instruments from which the MAF is determined, EMMI considers it important that there be a generally-accepted closing or fixing price available for those instruments. EMMI believes that the Euribor futures closing prices meet this criterion.

EMMI has also considered whether OIS swaps could be used to furnish a MAF. Using OIS swaps might be preferable to futures in that the liquid maturities of these swaps align more closely to the Euribor tenors than those of the futures. However, there are currently no well-defined benchmark rates for the OIS market. Should such benchmarks emerge in the future, EMMI may re-visit the use of the OIS swaps data to provide a set of MAFs.

10 Level 3 Submissions

Where a Panel Bank's submission at a given Defined Tenor cannot be made using either a Level 1 or Level 2 methodology, the Panel Bank must make a Level 3 submission. Such submissions may be based on two sources of data:

› Additional transactions in the Underlying Interest that were excluded from Level 1 and Level 2 submissions; and/or

› Other data from a range of markets closely related to the unsecured euro money market.

Panel Banks should determine a Level 3 submission using the above data through the application of a combination of modelling techniques and/or the Panel Bank's judgment. While EMMI will not mandate that Panel Banks employ a particular model or type of analysis in using data from these other markets, in making such determinations, each Panel Bank should reflect its own particular circumstances and business patterns, while observing the General Principles given below. Panel Banks should apply established risk management standards in using such analyses as a basis for their submissions. In particular, Panel Banks should have regard to the robustness of their analyses in providing an accurate estimate of their unsecured funding costs, and especially in times of market or institutional stress.

10.1 General Principles

EMMI expects that Panel Banks observe the following principles in determining their Level 3 submissions:

a) Responsibility

Each Panel Bank will bear full responsibility for the particular determination methodologies and data sourcing that it will employ in arriving at its Level 3 submissions. EMMI will perform periodic surveys of methodologies and will provide feedback to Panel Banks on how each individual Panel Bank's approach compares to peers. However, each Panel Bank will be ultimately responsible for the analytic and operational robustness of its approach.

b) Governance

Panel Banks should apply established risk management standards and practices to the governance, documentation, testing, implementation, review, record-keeping and change control of Level 3 determination methods.

Within Panel Banks, clear roles and responsibilities should be established for:

› the overall design, approval, implementation and review of Level 3 determination methods;
› the selection of specific input data and data sources; and
› the ongoing monitoring of performance of the Level 3 determination methods, and periodic review by independent functions and/or third parties.

c) Transparency

Panel Banks should provide information on their Level 3 determination methods, including methodology descriptions, performance and independent review reports, on request, to EMMI and the corresponding national competent regulatory authorities. Any changes in a Bank's Level 3 determination methodology will have to be brought to EMMI's attention.

d) Tenors

Panel Banks should ensure that their determination methodologies for Level 3 submissions adequately reflect the differentiation in market drivers between each tenor.

e) Input Data

Where data other than those used in Level 1 and Level 2 determinations are used as inputs for Level 3 submissions, these data should, where feasible:

› be publicly available (subject to a possible subscription arrangement);
› be sourced from regulated markets, trading venues or entities; or
› possess or otherwise be amenable to an audit trail.

EMMI will permit the use of data from prior days, including a Panel Bank's prior submissions, provided that such data are appropriately adjusted to take account of market movements or changes in the Panel Bank's relative borrowing costs from the time of the original submission to the current reference period.

10.2 Use of Data from Additional Transactions in the Underlying Interest

EMMI will require the determination of Euribor to be anchored to the greatest extent possible in transactions in the underlying interest. Accordingly, Panel Banks will be expected to consider taking account of data from additional transactions that may have not been used for Level 1 or Level 2 submissions, provided that these transactions accurately[11] reflect the individual Panel Bank's unsecured wholesale borrowing costs. Specifically, Panel Banks may incorporate into their Level 3 submissions data derived from:

› Transactions that would be classed as Level 1 Eligible Transactions, except that they fall below the Minimum Size threshold;
› Qualifying Non-Standard Maturity Transactions whose volumes allocated to Defined Tenors are below the tenor threshold; and

[11] For the purpose of Level 3 submissions, as considered here, Panel Banks will be permitted to exclude individual transactions or classes of transactions from their calculations if such transactions can reasonably be considered to be conducted at rates that do not reflect the bank's wholesale unsecured funding costs. Specifically, transactions with special pricing arrangements or with special structural terms can be so excluded.

- Transactions with Non-Financial Corporations, where such Corporations are not categorized as small business customers in the Basel III LCR regulations. These transactions should otherwise be Level 1 Eligible Transactions or be Qualifying Non-Standard Maturity Transactions for the purposes of Level 2, but without restrictions on the notional volume.

10.3 Use of Data from Other Markets

In determining Level 3 submissions Panel Banks may also use data from markets that reflect or are closely correlated with the Underlying Interest of Euribor. EMMI considers that the markets and instrument types listed below generally fulfil this criterion:

- Futures contracts referencing Euribor;
- Forward Rate Agreements (FRAs), Fixed/Floating Interest Rate Swaps, and Basis Swaps referencing Euribor;
- Overnight Index Swaps referencing EONIA or other short-term euro interest rates; and
- Overnight and term securities financing transactions in euro.

For this purpose "securities financing transaction" has the meaning as specified in Article 3(11) of Regulation (EU) No. 2015/2365.

Panel Banks may request EMMI to confirm the addition of other inputs.

Where a choice of such data exists for the particular market or set of instruments above, the following hierarchy of preferences should apply:

- Data grounded[12] in actual transactions, where appropriate;
- Data based on executable quotes;
- Indicative prices, rates or quotes, with no firm commitment for execution;
- Data reliant primarily on the expert judgment of the Panel Bank.

In considering this hierarchy of preferences, a Panel Bank should take account of the particular micro-structure of the specific market and the Panel Bank's role and level of activity in this market.

Choice of Markets and Instruments

In compiling the list of markets and instruments that may be considered in arriving at a Level 3 submission, EMMI has sought to choose markets that are strongly correlated with Euribor and that banks commonly use as references when constructing their funding curves. Futures, FRAs and swaps that reference Euribor ultimately are anchored by the benchmark at their expiry or reset dates. The rates implied by such instruments are therefore expected to offer strong pricing signals for Euribor itself. Many banks use these instruments in constructing unsecured funding curves from which Euribor rates may be inferred.

Banks also frequently consider funding analyses that relate their secured and unsecured funding rates. Curves for secured funding can be derived from actual overnight and term secured funding arrangements, on the one hand, and synthetic term borrowings that combine overnight cash transactions with OIS swaps. In turn, unsecured funding rates can be assessed by applying spreads to the secured funding curve, representing the additional credit component of the bank's overall borrowing costs. Banks use a variety of techniques to evaluate these spreads, including historical analyses and estimates based on peer bank funding rates.

Considerations for Specific Market and Instrument Types

Where a Panel Bank uses data from the above instruments to derive a Level 3 submission, EMMI will expect the Panel Bank to make due provision for the particular characteristics of the instrument. As specific examples:

[12] EMMI considers that closing reference prices on regulated markets and trading venues would be so grounded.

- If a Panel Bank makes use of repo or similar secured rates as input data, the bank should consider how to adjust for any special characteristics of the underlying collateral. Collateral from different asset classes, with differing degrees of liquidity, or trading "special", all may cause repo rates to vary. The Panel Bank will need to include appropriate adjustments in its analyses to accommodate these effects. The bank might also choose to restrict the repos to be considered as inputs for Level 3 submissions to those whose collateral is in pre-defined classes such as sovereign bond "General Collateral".
- Where a Panel Bank uses futures or swaps as inputs to construct a funding curve, the bank should consider how the margin arrangements for such contracts affect the predicted funding rates.

10.4 Combining Additional Transaction Data and Data from Other Markets

EMMI does not intend that there be a hierarchy between the two broad approaches above—additional transactions in the underlying interest (10.2), and data from other markets (10.3). Rather these two approaches may be used in a combination that is appropriate to each Panel Bank's own business profile. Panel Banks should of course document the general rationale by which they combine these two approaches. EMMI indeed will place a general emphasis on the use of transaction data in the underlying interest. However, it may be the case that a Panel Bank has a high volume of activity in the other markets that in turn provides a better gauge of its funding costs, as opposed to sparse or low-volume transactions in the underlying interest.

10.5 Consistency in Choice of Methods

Where a Panel Bank has a range of available methods for making a Level 3 submission, the Panel Bank should seek to ensure that a particular method is applied consistently over time and with a documented rationale or criteria for switching between methods.

If you have any comments or remarks on any of the aspects regarding the proposed hybrid methodology for Euribor, please include them in your response form under 'Other comments.'

A second consultation with more concrete details regarding some of the parameters of the methodology is scheduled at the end of Q3 2018.

Responding to the consultation and publication of feedback

Throughout the text, EMMI placed a number of questions for which we would welcome the market's feedback. It is crucial for EMMI to obtain the largest number of responses possible, with a preference for full responses, in which the rationale behind each answer is fully elaborated.

For the readers' convenience, all questions are listed below, as well as in a .doc file published on our website. EMMI kindly asks respondents to submit their answers by e-mail to hybrid2018@emmi-benchmarks.eu specifying "Euribor Consultation" on the subject line. **EMMI welcomes and encourages additional views or considerations** regarding any issue discussed in this consultation paper, even if explicit questions are not included in the text.

EMMI would be thankful if all responses reached the EMMI Secretariat by **Tuesday, 15th May 2018**. A summary of stakeholder feedback will be made public during the month of June 2018.

Together with their responses, EMMI kindly asks respondents to submit the following minimum information:

› Full name of respondent;
› Position;
› Organization and country;
› E-mail address;
› Contact telephone.

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