

EURONIA Benchmark Methodology

EURO Overnight Index Average ("EURONIA")

WMBA Limited has developed this EURONIA Benchmark Methodology to provide transparency to users in order to understand how the benchmark is provided against the objectives of the index and the underlying market it intends to measure as per the 'EURONIA Benchmark Statement'.

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EURONIA Methodology

On each Publication Day, EURONIA is measured as the volume weighted average price (“VWAP”), rounded to four decimal places, of interest rates paid on eligible transactions.

Eligible transactions are: -

- euro denominated;
- unsecured;
- one business day maturity;
- arranged by Eligible intermediaries;
- executed between 00:00 hours and 16:15 hours UK time;

Eligible intermediaries

Eligible intermediaries are defined as the services and platforms operated by member firms of the European Venues and Intermediaries Association (“EVIA”)¹ which constitute authorised multilateral trading venues.

Publication Day

EURONIA is published on UK business days where the ECB Target Services and Real-time Gross Settlement System (“RTGS”) is open.

Calculation Method

The EURONIA benchmark is calculated using the following formula:

$$VWAP = \frac{\sum(V \times P)}{\sum V}$$

where:

- “V” is the volume of each eligible transaction
- “P” is the price of each eligible transaction

Contingent Methodology in the event there are no Eligible transactions

Where no eligible transactions exist during a Publication Day, a straight average will be taken of the previous three business day EURONIA publications.

Where this contingent methodology is applied, a notation will be made to that effect.

¹ Formerly Wholesale Markets Brokers’ Association (“WMBA”) prior to 2018

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Key Features of the Benchmark

Publication Time

WMBA Limited will endeavour to publish the benchmark by 17:00 hrs UK time but does not guarantee this in cases where events are beyond the administrator's direct control.

Source of Input Data

See ARTICLE 2 (Specific Disclosure for regulated-data benchmarks) of the 'EURONIA Benchmark Statement'.

Prioritisation of Input Data

EURONIA is a benchmark determined by the application of the formula as stated within the EURONIA Methodology, and based entirely on transaction input data. There is no prioritisation of different types of input data required for the determination of the benchmark.

Sufficiency of Input Data; Minimum Input Data Needed to Determine a Benchmark

There is no minimum number of eligible transactions either by quantity or volume required for the determination of the benchmark. Where only one eligible transaction exists on any Publication Day, the volume and rate of that eligible transaction will form the output for publication of the benchmark.

Because EURONIA is used as a compounded figure, any single day value will only form part (i.e. 1/90th to 1/365th) of a determination and therefore sufficiency needs to be viewed in the context of contiguity.

The procedures which govern the determination of the benchmark in periods of stress or periods where transaction data sources may be insufficient, inaccurate or unreliable are set out in the contingent methodologies and subsequently under the fall-backs.

Validation of Input Data & Benchmark Determination

WMBA Limited have documented controls and procedures over the collection and monitoring of input data used for the determination of the benchmark. All input data is subject to a number of pre-defined tolerance checks to identify any potential erroneous input data prior to the calculation and dissemination of the benchmark.

Due to the simplicity of the EURONIA methodology, it would only be on a rare occasion that the pre-publication checking of the benchmark will highlight any adverse results that have not already been identified during the validation of the input data. However, prior to publication, the benchmark is verified using several simple statistical checks (i.e. comparison against previous published price +/- variance).

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Use of Expert Judgement or Discretion

No persons involved in the provision of the benchmark shall exercise use of discretion or expert judgement in the determination of the benchmark which is calculated by including all eligible transactions as defined by the EURONIA Methodology.

Notification of Changes

WMBA Limited reserve the right to revise or amend the benchmark at any time in line with the 'EURONIA Recalculation Policy'.

Any amendments to publications will be notified to all subscribers via recalculation emails and new publication files made available. All recalculation notifications will be placed on the relevant website and notice of the amendments to benchmarks will be posted to authorised redistributors of the benchmarks.

EURONIA Recalculation Policy

WMBA Limited will make every effort to ensure the accuracy and timeliness of the benchmark. However, where WMBA Limited becomes aware that post publication events affect the integrity or independence of the benchmark, the administrator reserves the right to revise or amend the benchmark by means of publishing a recalculation in line with the below:

- Recalculations will only occur where an error has been identified two hours prior to the subsequent publication on the following UK business day.
- Recalculations will only be published if the volume weighted average price (VWAP) has changed from the original publication by one basis point or more. I.e. meaning the VWAP has increased or decreased by a minimum 0.01% (e.g. from 0.455% to 0.465%).
- No recalculations will be published for changes to the Volume; unless the recalculated VWAP has also changed by one basis point or more during the same recalculation.
- Recalculations will be published as soon as possible but no later than one hour prior to the subsequent publication on the following UK business day.

Any amendments to published data will be notified to subscribers via recalculation emails and new (S)FTP files made available on WMBA Limited data servers. All recalculation notifications will be placed on the WMBA Limited website and notice of the amendments will be posted on Reuters and Bloomberg.

Chosen Methodology

WMBA Limited has chosen EURONIA to be calculated as a volume weighted average price ("VWAP") due to it being simple to calculate and understand. The VWAP identifies the true average interest rate paid on eligible transactions by factoring the volume of those transactions at a specific rate and not simply based on the price of each eligible transaction itself.

The confluence of an all-day traded VWAP, trade aggregation across all Eligible intermediaries, and a usage based on compounded averages combine to create the single most resilient benchmark methodology as recognised by the FSB in its published hierarchy. In this way, the

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output resembles a market wide consolidated tape and would require a similarly scaled attempt to manipulate spread across both space and time. With all outputs clearly transparent to all market participants on a daily basis, such a vulnerability is less likely than with other methodologies. Consequently, EURONIA is a clean and pure measure.

In measuring all Eligible transactions and selecting the all-day VWAP, the measure takes due account of the size and skew of the transaction distribution tails, yet is robust enough not to require the removal of these quartiles as in many other statistical benchmarks. In setting Eligible transactions as those struck in authorised multilateral trading venues, both transparent market scrutiny, as well as sufficient standardisation informs the trade population and removes any requirement for transaction selection or further criteria.

Where EURONIA is a regulated-data benchmark and is determined based on real verifiable transaction data, with a simple and transparent methodology, EURONIA can be taken as a robust and reliable benchmark measuring that objectivity which it is intended to measure.

Limitations of the Benchmark Methodology

The administrator notes the following limitations of the benchmark methodology:

- i. The current definition of Eligible transactions is restricted to 'transactions arranged by Eligible intermediaries'. Should transactions be arranged by other intermediaries, they would not be eligible for inclusion in the benchmark.
- ii. Eligible transactions may be excluded where the administrator could not have been reasonably aware that the transactions occurred. For example, a transaction not booked by an intermediary in a timely manner.
- iii. Dependency upon Eligible transactions occurring in sufficient volumes, which in turn depends upon the sufficient availability of eligible collateral.
- iv. Preference for multiple and competing trading venues.
- v. Dependency upon rulebooks and adherence to compliance of the sources of input data such that all Eligible transactions are reported to the administrator, and that all reported trades did actually occur.

WMBA Limited notes that in addition to the regulatory perimeter governing the sources of input data, the administrator also enforces its "Data Quality Code" ("DQC"), transactions are open to public scrutiny and all sources of input data adhere to the BOE Money Market Code of Conduct².

Periodic Reviews and Changes to the Benchmark methodology

To ensure the integrity of the benchmark calculations and that the benchmark continues to reflect the market or economic reality that it is intended to measure, WMBA Limited through its Board and oversight function shall undertake, on at least an annual basis, an internal review of the methodology and supporting policies and procedures used in the benchmark determination.

If the review necessitates a material change* to the '*EURONIA Methodology*', WMBA Limited through guidance from the oversight function and after any required notification to the relevant

² <http://www.bankofengland.co.uk/markets/Documents/money/code/ukmoneymarketscode.pdf>

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regulator, may in its sole discretion choose to consult with key stakeholders. Should WMBA Limited opt for a public consultation, the following process will be followed:

- (a) Consult with sources of input data, subscribers and market participants to outline the proposed changes to the data scope/methodology. The consultation will provide the relevant details on the following:
 - The circumstances giving rise to the changes
 - The rationale for changes
 - The proposed changes (including clear timeframes)
 - Possible effects of changes on the benchmark or underlying market
- (b) Once the consultation process is complete, the responses will be presented by WMBA Limited with a recommendation to the oversight function for discussion. Where confidentiality has not been requested, responses to the consultation will also be published.
- (c) Approval shall be determined by WMBA Limited or a nominated approvals committee and notified to the Board;
- (d) WMBA Limited will publish an outcome of the consultation and notify subscribers (users and technical staff) of the changes and depending on the severity of the changes involved and the anticipated technical impact on subscribers, will give reasonable notice to implement changes; and
- (e) WMBA Limited will publish details of implemented changes and, if appropriate, update the benchmark methodology and statements

** 'material change' is defined as one which would require a change to the published benchmark methodology and which would impact the VWAP of the benchmark by an average of 2 basis points³ over a 90-day period.*

Benchmark Cessation

WMBA Limited has in place a 'Benchmark Cessation Plan'. This plan has been put in place to enable it to, where deemed appropriate, cease the activity of administering the benchmark.

Prior to opting for cessation of the benchmark, the WMBA Limited will first consider whether changes to the methodology and/or governance arrangements of the benchmark would be appropriate to allow for its continuation. Depending on the trigger for considering its cessation this may not always be possible and therefore WMBA Limited may have no choice but to recommend the cessation of the benchmark. If WMBA Limited believe cessation is necessary and on notification to the FCA, the WMBA Limited would follow the procedures as identified in the 'Benchmark Cessation Plan'.

In unforeseen or unexpected circumstances, it may not be possible for WMBA Limited to exercise the Normal Benchmark Cessation Process. In this scenario, and on notification to the FCA, the WMBA Limited would activate the Emergency Benchmark Cessation Process identified within the plan.

³ The quantum of 2 basis points was chosen to align with Bank of England SONIA.

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Impact of Changes or Cessation of the Benchmark

WMBA Limited remind users of its benchmarks that there may be factors, including external factors beyond its control, that may necessitate changes to, or the cessation of the benchmark. Such changes to the benchmark, or the cessation of the benchmark may impact upon the financial contracts and financial instruments that reference the benchmark or the measurement of the performance of investment funds.

WMBA Limited encourage users of its benchmarks to have fall-back provisions in place, including access to alternative benchmarks, to prepare for any scenario where a benchmark is no longer available.

Successor Source

WMBA Limited “Successor Source” statement for EURONIA benchmark under the 2006 ISDA Definition

Section 7.2(b)(i) of the 2006 ISDA Definition states that “Successor Source” means, in relation to any display page, other published source, information vendor or provider specified in subsection (a) above: (i) the successor display page, other published source, information vendor or provider that has been officially designated by the sponsor of the original page or source.

In reference to the definition of “EUR-EURONIA-OIS-COMPOUND” under the 2006 ISDA Definitions (detailed here), the definition of “EURONIA” references Thomson Reuters page “EURONIA1” as the display page for such rate.

WMBA Limited, as administrator of the EURONIA rate, designates each of the following other published sources as “Successor Sources” in accordance with section 7.2(b)(i) of the 2006 ISDA Definitions, in the event that the EURONIA rate fails to be published on Thomson Reuters page “EURONIA1”:

- i. The WMBA Limited website; www.wmbaltd.com
- ii. Bloomberg; page “WMBA”.

Ends.