



EUROPEAN CENTRAL BANK

EUROSYSTEM

Second public consultation on the publication by the ECB of an unsecured overnight rate

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1 Introduction

On 21 September 2017, the ECB announced that its Governing Council had decided to develop a euro unsecured overnight interest rate on the basis of data already available to the Eurosystem. That interest rate, which would be produced by 2020, would complement existing benchmark rates produced by the private sector and would serve as a backstop reference rate. That interest rate would be based entirely on transactions in euro that were reported by banks in accordance with the ECB's money market statistical reporting (MMSR).¹

This note elaborates on the detailed parameters for the new overnight rate, building on the work that was carried out prior to the first public consultation in order to define the rate's underlying interest and scope. The first public consultation document established the following broad parameters defining the rate's underlying interest and scope:

1. As regards the rate's underlying interest:
 - The ECB's new overnight rate should be representative of the euro area (implying geographical diversity in terms of its scope).
 - The rate should capture the unsecured money market.
 - The rate should reflect banks' borrowing costs.
 - Those borrowing transactions should have a very short horizon (i.e. overnight).
 - The rate should be published on a daily basis.
 - The rate should be based on arm's length transactions, thereby reflecting market rates in an unbiased way.
2. As regards the scope of the rate:
 - Official production of the rate should start in 2019, most likely in the second half of the year. It should be based on the 52 MMSR reporting agents' transactions with their financial counterparties – i.e. it should not be limited to interbank transactions, which provide too narrow a base for calculation purposes.
 - The instruments used should be deposits (which are fairly standardised and are the most frequent means of conducting arm's length transactions on the basis of a competitive quote procedure), rather than call accounts or securities issuance, thereby limiting idiosyncratic factors that could make the rate subject to undue volatility.

¹ See Regulation (EU) No 1333/2014 of the European Central Bank of 26 November 2014 concerning statistics on the money markets (ECB/2014/48) (hereinafter "the MMSR Regulation").

- At a later stage, the rate may reflect the activities of more reporting agents.
- The precise timing of the rate's daily publication along with the starting date for its daily official production will be decided by summer 2018.

In line with these broad parameters, and taking into consideration the responses received during the first public consultation, the Eurosystem proposes that the rate's underlying interest be defined as follows:

The [new ECB unsecured overnight rate] is a rate which reflects the wholesale euro overnight borrowing costs of euro area banks. The rate is published daily on the basis of transactions deemed to be executed in market conditions and at arm's length.²

This second public consultation document explores the defined methodology of the new rate, as well as key operational and technical parameters, on the basis of the above definition of the rate's underlying interest.

Moreover, this public consultation document also defines contingency calculation rules in case certain representativeness thresholds are not met.

The ECB aims to ensure that the design and implementation of the new unsecured overnight rate are consistent with international best practice. This second public consultation document includes information on compliance with the IOSCO Principles for Financial Benchmarks, which concern the quality of the rate and its methodology (in particular benchmark design (Principle 6), data sufficiency (Principle 7) and the content of the methodology (Principle 11)). Other principles are however also relevant for the methodology, namely the hierarchy of data inputs (Principle 8), the transparency of the determination (Principle 9) and periodic review (Principle 10). Aspects of these principles will be further developed in subsequent consultations on the legal acts for the implementation of the benchmark.

Section 2 looks at whether sufficient data are available to implement a simple and transparent methodology based solely on transactions, avoiding recourse to expert judgement or complex methodologies to complement data.

Section 3 compares four main ways of calculating a rate on the basis of transactions (a volume-weighted median, a volume-weighted mean, and volume-weighted means with two different trimming values to reduce the weight of outliers) and back-tests those methods using TARGET2 data for the last nine years.

That evaluation is based on the following criteria:

1. the sufficiency and concentration of data;
2. the robustness of the rate, particularly in respect of outliers;

² In its [Principles for Financial Benchmarks](#), which were published in July 2013, the International Organization of Securities Commissions (IOSCO) defines an arm's length transaction as follows: "A transaction between two parties that is concluded on terms that are not influenced by a conflict of interest (e.g., conflicts of interest that arise from a relationship such as a transaction between affiliates)."

3. behaviour in terms of spreads and volatility as compared with EONIA;
4. behaviour over time; and
5. simplicity.

Section 4 discusses operational parameters for the new rate, including its publication and data sufficiency policies. A transparent data sufficiency policy is necessary to define the conditions under which a contingency procedure for the rate's publication should be triggered.

Using banking industry feedback collected by the Eurosystem, Section 5 sets out the main indications regarding markets' acceptance and use of the new rate.

Main takeaways and recommendations

On data sufficiency

- Various metrics (transaction volumes, number of participating banks, etc.) show that data are sufficient to produce a reliable daily rate based purely on deposit transactions conducted with financial counterparties.
- Daily volumes average €30 billion and range from €6.8 billion to €41 billion. On average, around 30 banks report data each day.
- Even on days with reduced activity on account of major holidays (including the year-end period), volumes and concentration remain sufficient to calculate an unbiased rate.
- Transactions with a value of less than €1 million should not be taken into account in the calculation of the rate. This would entail only a limited loss of information (with such transactions only accounting for around 0.2% of total volumes) and limit operational burdens in terms of daily processes.

On the calculation methodology

- Four different methodologies are looked at here: a volume-weighted mean; a volume-weighted median; and volume-weighted means with trimming applied at the 10% and 25% levels.
- The volume-weighted mean with trimming applied at the 25% level significantly reduces daily volatility, as it filters out transactions conducted at outlying rates. In the case of the volume-weighted median, there are extended periods where the rate looks too stable, implying a loss of relevant pricing information. Meanwhile, the simple volume-weighted mean is twice as volatile as other indicators owing to outliers.

- Consequently, the Eurosystem proposes using a volume-weighted mean with trimming applied at the 25% level on the grounds that this methodology reduces the impact of outliers while still complying with data sufficiency and transparency requirements.
- The new rate averages around 4 basis points less than the deposit facility rate, irrespective of the methodology used.

On operational parameters

- The rate will be published on a daily basis, at the latest by 09:00 CET on the following business day. The exact timing of the publication is still being investigated, taking into account the functioning of the market, end users' feedback as expressed in the first public consultation and MMSR data collection constraints. The precise timing along with the official start date for the daily publication of the rate will be communicated in the context of the Governing Council's decision on the final methodological aspects of the rate, which is due by summer 2018.
- A data sufficiency policy requiring a minimum absolute number of banks contributing data will help to ensure that the published rate is not subject to reporting biases, as will the establishment of a concentration limit.
- If those thresholds are not met, a rate should be calculated on the basis of a contingency formula.
- In order to enhance public transparency, details of the distribution of rates and volumes should be published.

On use of the rate

- Feedback indicates that the market welcomes the ECB's new overnight rate and expects it to rapidly gain wide acceptance.
- Given that information on the rate's behaviour would be useful to market participants before its effective production starts, the ECB intends to begin publishing regular rate runs for its new rate in the second half of 2018 once the final methodology has been decided.

2 Assessing data sufficiency

Data sufficiency is essential for a transaction-based calculation methodology. If the absence of sufficient data prevents a rate from being produced entirely on the basis of transactions, there are various ways of overcoming that lack of data in certain instances. The ECB's unsecured overnight rate will not have this problem, and it will usually be possible to produce a rate solely on the basis of reported transactions.

2.1 Importance of data sufficiency

It is essential to assess data sufficiency³ before thinking about the calculation methodology for the reference rate. Having enough trading activity ensures that any aggregate rate (i) reflects market moves, rather than idiosyncratic factors, (ii) is less vulnerable to individual trades, and (iii) can be published on a daily basis.

Without sufficient underlying data, it is impossible to guarantee the calculation of a robust benchmark. Sufficient numbers of transactions need to be executed by a satisfactory number of reporting agents on most business days. Otherwise, the robustness of the index may be called into question, and a more complex calculation methodology may be required involving the enrichment of data (e.g. by looking at old transactions) or some means of tackling extreme volatility resulting from limited data.

Conversely, if large numbers of daily trades are originated by significant numbers of reporting agents on most business days, less complex techniques will be required and the final rate will be easier to understand and use.

Data sufficiency is also contingent on the underlying dataset (including the definitions of the relevant transactions), as well as the definition of the rate's underlying interest and scope. For the purposes of the discussion below, and in line with the first public consultation document,⁴ the future ECB rate will be considered to be an overnight rate calculated on the basis of unsecured borrowing transactions carried out by MMSR reporting agents. Eligible transactions consist of money market deposits with other banks or financial institutions (including deposit-taking corporations, money market funds, insurance corporations, pension funds, non-MMF investment funds, other financial intermediaries and central banks) as counterparties, in line with the MMSR reporting instructions.^{5 6}

³ IOSCO's Principles for Financial Benchmarks provide a definition of data sufficiency, with Principle 7 stating: "The data used to construct a Benchmark determination should be sufficient to accurately and reliably represent the Interest measured by the Benchmark and should: a) Be based on prices, rates, indices or values that have been formed by the competitive forces of supply and demand in order to provide confidence that the price discovery system is reliable; and b) Be anchored by observable transactions entered into at arm's length between buyers and sellers in the market for the Interest the Benchmark measures in order for it to function as a credible indicator of prices, rates, indices or values."

⁴ The [First ECB public consultation on developing a euro unsecured overnight interest rate](#) was published in November 2017.

⁵ [Reporting instructions and other information relating to MMSR data.](#)

2.2 Available metrics

Data sufficiency can be quantified by analysing several available metrics:

1. transaction volumes,
2. the number of eligible transactions each day,
3. the number of reporting agents executing transactions each day,
4. the number of countries that are represented in the daily pool of transactions, and
5. the number of days on which no transactions are executed.

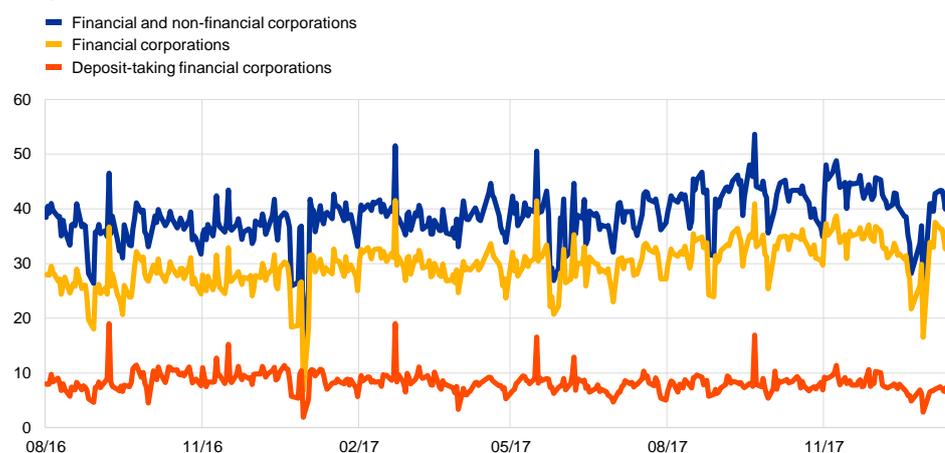
Transaction volumes are insufficient if the rate is calculated solely on the basis of interbank transactions (see Chart 1). The following assessment of data sufficiency compares transactions between MMSR reporting agents (i.e. banks) and three different groups of counterparties:

1. other banks only (referred to in **Chart 1** as “deposit-taking financial corporations”);
2. other banks and financial corporations, including central banks (referred to in **Chart 1** as “financial corporations”); and
3. financial and non-financial corporations. The assessment below will focus primarily on the second group, which reflects the counterparties indicated in the ECB’s first public consultation.

Chart 1

Overnight borrowing volumes by counterparty sector

(1 Aug. 2016 – 15 Jan. 2018; EUR billions)



Sources: MMSR data and ECB calculations.

⁶ Respondents to the ECB’s first public consultation broadly backed these parameters. See [Summary of responses to the ECB’s first public consultation on developing a euro unsecured overnight interest rate](#).

A comparative assessment of key data sufficiency metrics (including average and lowest daily volumes, the number of eligible transactions, the number of reporting agents executing transactions, and the number of countries represented in the daily pool of transactions) supports a focus on transactions with other banks and financial institutions – i.e. financial corporations (see Table 1). Whereas widening the scope from credit institutions to financial corporations significantly improves relevant metrics, widening it even further to include non-financial corporations as well leads to only marginal improvements and does not justify the added complexity that results from the inclusion of that type of counterparty.⁷

Table 1
Data sufficiency parameters for three groups of counterparties

Measure	(1) Deposit-taking financial corporations	(2) Financial corporations	(3) Financial and non-financial corporations
Average number of banks	23	31	33
Lowest number of banks	15	24	26
Largest number of banks	29	36	38
Average number of countries	9	10	10
Lowest number of countries	6	7	7
Largest number of countries	10	10	10
Average number of transactions	266	592	688
Lowest number of transactions	70	202	277
Largest number of transactions	770	1114	1198
Average daily volume (EUR billions)	8.3	29.8	39.0
Lowest daily volume (EUR billions)	1.9	6.8	15.1
Largest daily volume (EUR billions)	19.0	41.5	53.6

Note: This table is based on daily MMSR data and covers the period from 1 August 2016 to 15 January 2018, capturing unsecured overnight transactions in the form of fixed-rate deposits.

If we look at transactions with all financial corporations, data can be obtained from a significant number of reporting agents. An average of 31 banks report transactions each day – eight more than if we look solely at the interbank segment and two fewer than if non-financial corporations are included as well. Importantly, the lowest number of banks reporting eligible transactions on a single day in the review period stands at 24 when all financial corporations are considered – nine more than if we look exclusively at the interbank market and two fewer than if we include non-financial corporations.

The average number of countries represented does not change substantially when looking at different groups of counterparties, with all MMSR countries typically being

⁷ See Section 5.2 of the first public consultation document.

represented. The lowest number of countries represented is six when all financial corporations are considered, and that does not change when non-financial corporations are included as well.

An average of 592 transactions with financial corporations are reported each day (more than twice the number of transactions in the interbank market), with daily volumes averaging some €30 billion (and peaking above €41 billion).

The number of reporting banks and total transaction volumes both appear to remain robust in the central scenario when activity levels fall (see Table 2). The day with the lowest reported transaction volumes was 30 December 2016, when 25 MMSR banks reported transactions with financial corporations. Transactions on that day had a total volume of €6.8 billion, but eight countries were still represented. Year-end 2017 was more active in comparison, with both volumes and the unsecured overnight rate quickly returning to the levels prevailing before year-end 2017.

Table 2
Days with the lowest activity levels in the central scenario

	Number of active banks	Volume (EUR billions)	Rate level (percent)	Share of largest 5 banks	Number of countries
15/08/2016	24	24.6	-0.42	68%	7
30/12/2016	25	6.8	-0.47	60%	8
02/01/2017	29	18	-0.42	52%	8
05/06/2017	25	27.1	-0.42	57%	7
29/12/2017	28	14.8	-0.51	59%	8

Sources: MMSR data and ECB calculations.

Focusing on transactions with financial corporations also ensures representativeness at both country and bank level, with no concerns in respect of concentration (see Table 3). At bank level, the five and six largest banks account for averages of 59% and 64% of daily volumes respectively, with their shares peaking at 74% and 78% respectively. At country level, the largest contributions come from reporting banks in France, Germany, the Netherlands and Belgium, but at least modest volumes are reported for each of the ten countries in the sample on all days.

Table 3**Representativeness and concentration at bank and country level**

	Measure	Average	Highest	Lowest
Bank level	Five largest banks' share of total daily volumes	59%	74%	50%
	Six largest banks' share of total daily volumes	64%	78%	56%
Country level	Belgium's share of total daily volumes	15%	22%	5%
	Germany's share of total daily volumes	22%	33%	14%
	Spain's share of total daily volumes	5%	9%	1%
	France's share of total daily volumes	36%	55%	25%
	Italy's share of total daily volumes	1%	5%	0%
	Netherlands' share of total daily volumes	17%	32%	8%
	Others' share of total daily volumes	4%	8%	1%

Sources: MMSR data and ECB calculations.

Note: This table is based on daily MMSR data and covers the period from 1 August 2016 to 15 January 2018, capturing unsecured overnight transactions in the form of fixed-rate deposits.

2.3 Relevance of transaction sizes

While the MMSR Regulation does not establish any thresholds as regards the size of reported transactions, the size of individual transactions may be of relevance. Smaller transactions (e.g. those with a value of less than €1 million) may not be priced at a market consensus level or may be too numerous to handle from an operational perspective in terms of quality checks, with limited benefits as regards price information. On the other hand, setting that threshold too high could result in relevant market transactions being missed.

Ignoring transactions with a value of less than €1 million has only a minimal impact on data sufficiency (see Table 4). The average and lowest numbers of banks contributing to the daily rate do not change when a €1 million threshold is applied, and they decline only marginally when a €10 million threshold is applied. Moreover, in both threshold scenarios, the daily average volume remains at a level of €30 billion and the lowest daily volume remains close to €6.8 billion.

Applying a threshold significantly reduces the number of small transactions. Applying a €1 million threshold reduces the average number of transactions per day by 154 (down from 592), while a €10 million threshold more than halves the number of eligible transactions.

Whereas transactions with a value of less than €1 million account for around 25% of total transactions in terms of number, they only make up 0.2% in terms of volume. Thus, applying a threshold of this kind entails only a limited loss of information, while reducing operational burdens (e.g. as regards system capacity and data quality checks).

Table 4

Impact that transaction size thresholds have on data sufficiency parameters

Measure	No threshold	€1 million threshold	€10 million threshold
Average number of banks	31	31	29
Lowest number of banks	24	24	22
Average number of countries	10	9	8
Lowest number of countries	7	7	6
Average number of transactions	592	438	269
Lowest number of transactions	202	158	90
Average daily volume (EUR billions)	29.8	29.8	29.2
Lowest daily volume (EUR billions)	6.8	6.7	6.5

Sources: MMSR data and ECB calculations.

Note: This table is based on daily MMSR data and covers the period from 1 August 2016 to 15 January 2018, capturing unsecured overnight transactions in the form of fixed-rate deposits.

A transaction size threshold has only a marginal impact on the published rate.

The weighted average rate without a threshold is -0.427%, it is the same when a €1 million threshold is applied and it moves to -0.430% when a €10 million threshold is applied. As anticipated, excluded transactions were executed at rates somewhat higher than the average – i.e. at a premium when compared with the consensus rate.

The above results support the exclusion of transactions with a value of less than €1 million when calculating the rate.

2.4 Panel versus trade logic

MMSR data allow the new ECB rate to be calculated on the basis of a pool of transactions reported by MMSR reporting agents. In contrast, many existing benchmarks (such as the EONIA and most -IBOR rates) rely on each reporting bank on the panel contributing one rate per maturity. The calculation matters when using a statistical method to eliminate outliers in order to calculate the final rate (see subsequent sections for a description of the calculation methodology). For example, a benchmark that is based on a pool of transactions originated by all reporting agents (trade logic) will tend to reflect market moves, whereby any outlier elimination techniques will deal with trades which are not in line with the consensus (and may even be erroneous). In contrast, a benchmark that is based on the individual funding costs of individual banks (panel logic) will tend to reflect the credit level of each reporting bank, so any aggregation method which involves trimming runs the risk of eliminating an entire bank, or several banks. This would imply the elimination of certain levels of credit and pricing. With a data collection exercise such as the MMSR, where the selection of reporting agents takes no account of the credit levels of those entities, aggregation based on transactions may be preferable to a single rate per entity. This will ensure that there is no ex ante exclusion of reporting agents/credit levels, as well as ensuring that the new rate is not a “prime rate” and simply reflects the average borrowing costs of euro area banks.

2.5 Concluding remarks on data sufficiency

The assessment above points to data sufficiency being assured for the preferred scope of the ECB rate – i.e. if that rate takes account of transactions with all financial corporations, not just other banks. More generally, the fact that adequate levels of activity were observed on every business day in the review period suggests that it may not be necessary for the calculation methodology to provide for enrichment with past data (e.g. by taking account of historical evidence), or to rely on other market segments or even expert judgement. In view of sufficient transactions data being observed in the MMSR, the methodology for the ECB rate has been developed as a fully transaction-based methodology and for that reason the concept of hierarchy of data input as described in the IOSCO Principle 8 is not deemed relevant.

Question 1

Do you agree that a €1 million threshold is preferable to any higher threshold, as it adequately reduces operational burdens while limiting any loss of information?

3 Calculation methodology

This section details the various elements of the calculation of the rate for the four tested methodologies: a volume-weighted mean, a volume-weighted median, a volume-weighted mean with trimming applied at the 25% level, and a volume-weighted mean with trimming applied at the 10% level. The results are analysed on the basis of certain metrics, as the rate should not, now that data sufficiency has been ascertained, be subject to volatility that would reflect the weights of individual reporting agents. Also, given that MMSR time series are fairly short and do not extend back beyond the current excess liquidity environment, the proposed methodology has been back-tested using TARGET2 data that go right back to 2008. Although TARGET2 and MMSR data differ in terms of scope, a back-testing exercise makes sense, as it provides an indication of the stability of the algorithm over an extended period.

3.1 Data distribution characteristics and the calculation methodology

The choice of calculation method depends on the distribution characteristics of the underlying data and goes beyond data sufficiency. Pronounced volatility that is unrelated to genuine market moves justifies the application of outlier elimination techniques (e.g. a trimmed mean or median), whereas a homogeneous and time-invariant distribution, which does not change over time, may call for a calculation methodology incorporating all available data (e.g. a weighted average rate).

To ensure transparency and ease of understanding, the discussion below focuses on four calculation methods: a volume-weighted mean, a volume-weighted median, and volume-weighted means with trimming applied at the 10% and 25% levels.

3.2 The concept of trimming

A volume-weighted trimmed mean is calculated by:

1. putting transactions in order, from the lowest rate to the highest rate;
2. aggregating the transactions occurring at each rate level;
3. removing the top and bottom x% (e.g. 10% or 25%) in volume terms; and
4. calculating the mean of the remaining x% (e.g. 80% or 50%) of the volume-weighted distribution of rates.

Applying a pro rata calculation to volumes that span the thresholds for trimming ensures that exactly x% of the total eligible volume is used in the calculation of the volume-weighted mean⁸ (see [Table 5](#) for an example).

Table 5
Sample pro rata calculation for a mean trimmed at the 25% level

Step 1 Aggregation of transaction volumes by rate level			Step 2 Calculation of percentiles on the basis of volumes			Step 3 Prorating of volumes spanning trimming thresholds			
Transaction rate	Transaction volume	Total volume by rate level	Rate level	Total volume by rate level	Percentiles based on volumes	Rate level	Total volume by rate level	Percentiles based on volumes	Volume (% of total volume)
0.10	325	650	0.10	650	100%	0.10	650	100%	3,250 (25%)
0.10	325								
0.15	625	975	0.15	975	95%	0.15	975	95%	
0.15	300								
0.15	50			0.25	1,300	88%	0.25	1,300	88%
0.25	1,300	1,300							
0.30	1,900	2,600	0.30	2,600	78%	0.30	325	78%	6,500 (50%)
0.30	150					0.30	2,275	75%	
0.30	150					0.35	3,250	58%	
0.30	400			0.35	3,250	58%	0.35	3,250	
0.35	2,500	3,250	0.40	2,600	33%	0.40	975	33%	
0.35	750					0.40	1,625	25%	
0.40	2,050	2,600	0.45	975	13%	0.45	975	13%	3,250 (25%)
0.40	550								
0.45	650	975	0.50	650	5%	0.50	650	5%	
0.45	275								
0.45	50								
0.50	650	650	Total volume:		13,000	Total volume:		13,000	

Volume eligible for calculation of trimmed mean

Source: ECB.

3.3 Comparison of methodologies

This assessment of the four calculation methods builds on the stability of the rate⁹ and the rate's comparability with EONIA (see [Chart 2](#)). Although it is a lending rate, EONIA is the current overnight reference rate for the euro area. All four possible methodologies can be considered fairly easy to understand and therefore transparent.

In terms of their level, the rates calculated on the basis of the four methodologies are – unsurprisingly, since they reflect borrowing rates – below EONIA, ranging from around 7 basis points lower for the volume-weighted mean to around 9 basis points lower for the volume-weighted median (see [Chart 2](#)). Those differences in level do not, however, mean that one methodology is

⁸ This approach is similar to that applied by the Bank of England when calculating the reformed SONIA.

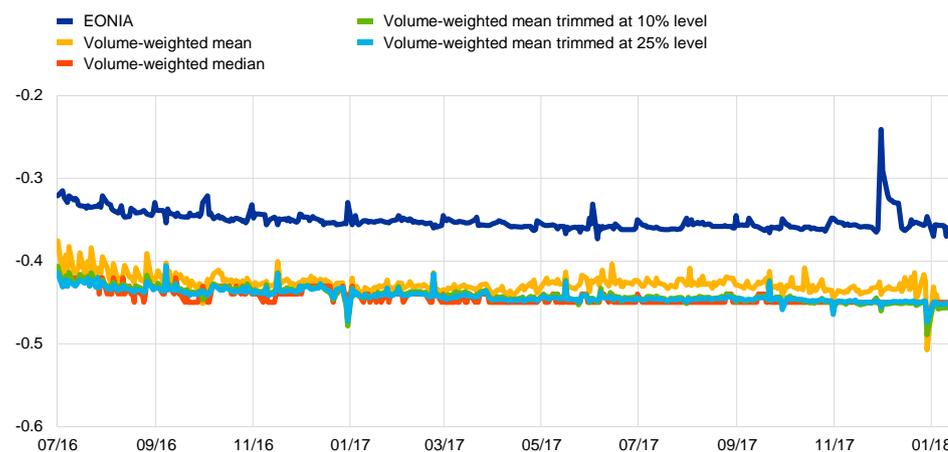
⁹ By way of reminder, the rate is to be calculated solely on the basis of overnight unsecured borrowing transactions with financial corporations that have a value of €1 million or more.

necessarily preferable to another. They may well reflect the level of excess liquidity, which drives down the rate at which euro area banks receive funds via deposits from non-banks or non-euro area banks, which do not have access to the ECB's deposit facility, unlike EONIA – which is based on interbank lending and stays, by construction, above the deposit facility rate.

Chart 2

EONIA and overnight rates based on the four methodologies

(1 July 2016 – 15 Jan. 2018; percentages)



Sources: EMMI, MMSR data and ECB calculations.

Note: The four volume-weighted rates are all calculated on the basis of transactions between reporting agents and financial corporations with a value of €1 million or more, as reported in MMSR data.

A comparative assessment of the stability dimension of the rate under the four methodologies suggests that a volume-weighted mean trimmed at the 25% level will be fairly stable (see Table 6). Because it spans a wider range of transactions, that rate has the potential to be more volatile than EONIA as a consequence of outliers. The aim is to produce a rate that will exhibit what, in the current environment of low rates and significant excess liquidity, seems to be an acceptable level of volatility. As such, the methodology should capture genuine changes in prices, rather than reflecting the impact of idiosyncratic factors or outliers. At the same time, it is equally important that the rate is not artificially stable.

A comparative assessment of the four methodologies taking account of the level of annualised volatility, the maximum daily change and the number of spikes¹⁰ finds that the volume-weighted mean trimmed at the 25% level results in the most stable rate. This methodology also reduces the impact of outliers, reporting errors and manipulations.

¹⁰ Defined as daily moves above (below) the mean plus (minus) two standard deviations of the series of daily moves within the sample period.

Table 6

Comparative assessment of methodologies

Methodology	Measure	Stability			Comparability	
		Annualised volatility (percentage points)	Day-to-day changes (basis points)	Number of spikes (share of total number of days)	Absolute distance to deposit facility rate (basis points)	Absolute distance to EONIA (basis points)
EONIA	Average	0.121	0.4	3.0%	4.9	-
	Highest	-	6.1	-	15.9	-
	Lowest	-	0.0	-	2.7	-
Volume-weighted mean	Average	0.178	0.7	4.6%	2.8	7.6
	Highest	-	8.3	-	10.7	19.9
	Lowest	-	0.0	-	0.0	4.5
Volume-weighted median	Average	0.109	0.4	5.3%	4.3	9.2
	Highest	-	3.0	-	7.0	20.9
	Lowest	-	0.0	-	1.0	6.4
Volume-weighted mean trimmed at 10% level	Average	0.105	0.4	4.3%	4.1	9.0
	Highest	-	4.5	-	8.9	21.9
	Lowest	-	0.0	-	0.6	5.3
Volume-weighted mean trimmed at 25% level	Average	0.093	0.3	4.8%	4.2	9.1
	Highest	-	3.8	-	7.4	21.5
	Lowest	-	0.0	-	0.6	5.2

Sources: EMMI, MMSR data and ECB calculations.

Note: This table is based on daily MMSR data and covers the period from 1 August 2016 to 15 January 2018, capturing unsecured overnight transactions in the form of fixed-rate deposits.

Overall, the key findings can be summarised as follows:

- The volume-weighted median produces a rate that can be regarded as excessively stable, with distributions of rates and volumes hardly changing at all in the current environment. Such behaviour is likely to reduce the information value and credibility of the rate.
- Using a simple volume-weighted mean exposes the rate to a relatively high degree of fluctuation as a result of idiosyncratic factors linked to the rate's fairly broad scope.
- Trimming allows volatility to be reduced, while still producing a rate that exhibits daily changes apparently linked to market conditions, rather than variation in individual rates reported in the context of the MMSR.

Testing of a range of trimming options supports a trimming level of 25% as a reasonable trade-off between representativeness (with the rate being calculated on the basis of 50% of transactions) and volatility. Beyond 30%, there are no added benefits in terms of reduced volatility (see [Table 7](#) and [Chart 3](#)). Moreover, as the trimming level increases, the rate moves towards the median value, which is regarded as too insensitive to changes in market conditions. Overall, trimming levels of between 25% and 40% offer similar benefits in terms of reduced volatility, producing average day-to-day changes of between 0.29 and 0.32 basis

points, which are close to the levels exhibited by EONIA and fairly realistic in view of the current levels of excess liquidity.

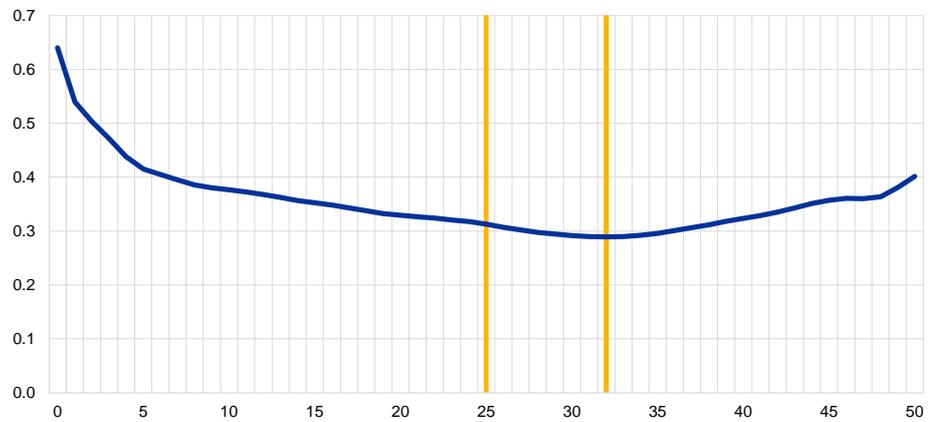
Table 7
Comparative assessment of various levels of trimming

	Spread vis-à-vis EONIA (average; basis points)	Day-to-day changes (average absolute difference; basis points)
Weighted mean	-7.46	0.64
Weighted median	-9.11	0.40
Trimmed at 10% level	-8.76	0.38
Trimmed at 15% level	-8.77	0.35
Trimmed at 20% level	-8.84	0.33
Trimmed at 25% level	-8.91	0.31
Trimmed at 30% level	-8.96	0.29
Trimmed at 35% level	-9.00	0.30
Trimmed at 40% level	-9.05	0.32
Trimmed at 45% level	-9.08	0.36
EONIA	0.00	0.31

Sources: EMMI, MMSR data and ECB calculations.

Chart 3
The trimming smile

(trimming level in percentages (x-axis); average absolute day-to-day changes in basis points (y-axis))



Sources: MMSR data and ECB calculations.

Notes: The yellow bars indicate the suggested trimming level (25% level) and the trimming level associated with the minimum average absolute day-to-day rate changes (32% level).

3.4 Back-testing on the basis of TARGET2 money market data¹¹

Back-testing using TARGET2 money market data¹² also helps to assess the proposed calculation methodologies for the new rate. The TARGET2 money market dataset is derived from TARGET2 payments data and consists of overnight interbank money market trades. Unlike MMSR data, that dataset goes back as far as June 2008, allowing the behaviour of the various methodologies to be observed over a period of almost ten years – a period that includes both the global financial crisis and the sovereign debt crisis.

A comparison between the MMSR and TARGET2 datasets shows that the aggregated TARGET2 interest rate¹³ is 2 basis points lower than the corresponding MMSR rate. Moreover, the two aggregated interest rates follow the same pattern over time, and the distributions of rates per bank and per day are almost perfectly in line. Differences between the two datasets relate to the fact that the MMSR rate is based on deposits with all financial corporations, while TARGET2 data only capture transactions that are settled in central bank money in TARGET2 and do not include deposits that are rolled over.

Back-testing indicates that all four methodologies produce rates that follow EONIA (see Chart 4). Moreover, all four of those rates are also more stable than EONIA, exhibiting lower levels of annualised volatility and fewer spikes. Those rates' spreads vis-à-vis the EONIA range from 6.8 to 7.7 basis points, providing confirmation over a longer time period of the significant divergence from EONIA that was highlighted above. Those spreads are not constant over time, ranging from 0 to 52 basis points, with the largest spreads being observed during the sovereign crisis.

¹¹ The results based on TARGET2 data that are included in this document were prepared by a member of one of the user groups with access to TARGET2 data in accordance with Article 1(2) of Decision ECB/2010/9 of 29 July 2010 on access to and use of certain TARGET2 data. The ECB and the Market Infrastructure and Payments Committee have checked the results against the rules for guaranteeing the confidentiality of transaction-level data imposed by the former Payment and Settlement Systems Committee (subsequently replaced by the Market Infrastructure and Payments Committee) pursuant to Article 1(4) of the above-mentioned Decision.

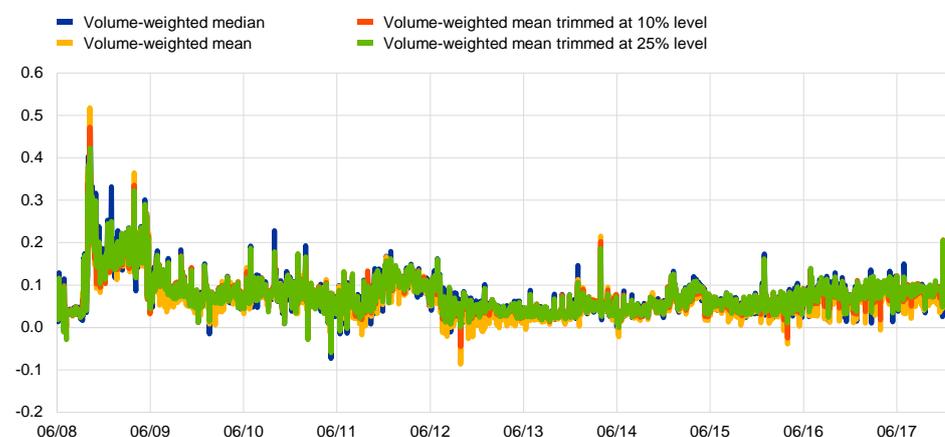
¹² The methodology for deriving the TARGET2 money market data follows Frutos, J. C., Garcia-de-Andoain, C., Heider, F. and Papsdorf, P., "Stressed interbank markets: evidence from the European financial and sovereign debt crisis", *Working Paper Series*, No 1925, ECB, 2016.

¹³ The TARGET2 interest rate is calculated as the volume-weighted mean of the borrowing interest rates of the MMSR reporting agents as identified in TARGET2.

Chart 4

Spreads between EONIA and overnight rates resulting from the four methodologies on the basis of TARGET2 data

(2 June 2008 – 15 Jan. 2018; percentage points)



Sources: TARGET2 data, EMMI and ECB calculations.

Unlike the primary analysis, this back-testing does not point to a clear favourite in terms of methodology. Indeed, different methodologies do better on different criteria: the volume-weighted mean exhibits the lowest annualised volatility and the volume-weighted mean trimmed at the 10% level exhibits the lowest average day-to-day changes and the smallest number of spikes. Note that all of these values are lower than the values observed for EONIA. In terms of representativeness, the ten-year review period only features one day where three banks account for more than 80% of volumes: 30 December 2016. This day was characterised by low levels of trading prior to the end of the year, coupled with the standard small volumes in the interbank money market in the context of elevated levels of excess liquidity.

The fact that the MMSR and TARGET2 datasets do not perfectly match might explain why, in contrast with the primary analysis, this back-testing does not point to a clear favourite in terms of methodology. **However, this back-testing does, in any case, provide reassurance that all four methodologies behave in a stable manner in the long run.**

Table 8

Results of back-testing using TARGET2 money market data

Methodology	Measure	Stability			Comparability	
		Annualised Volatility (percentage points)	Daily change (basis points)	Number of spikes (share of total number of days)	Absolute distance to deposit facility (DF) rate (basis points)	Absolute distance to EONIA (basis points)
EONIA	Mean	1.34	3.00	4.70%	18.86	-
	Max	-	95.40	-	176.00	-
	Min	-	0.00	-	2.70	-
Volume-weighted mean	Mean	1.22	3.16	4.34%	13.06	6.79
	Max	-	94.00	-	124.22	51.78
	Min	-	0.00	-	0.01	0.03
Volume-weighted median	Mean	1.27	3.01	4.26%	12.59	7.76
	Max	-	97.00	-	145.00	49.60
	Min	-	0.00	-	0.00	0.10
Volume-weighted mean trimmed at 10% level	Mean	1.23	2.92	4.22%	12.9	7.55
	Max	-	96.19	-	128.75	47.24
	Min	-	0.00	-	0.00	0.17
Volume-weighted mean trimmed at 25% level	Mean	1.24	2.93	4.26%	12.65	7.69
	Max	-	96.91	-	137.05	42.29
	Min	-	0.00	-	0.00	0.02

Sources: TARGET2 data, EMMI and ECB calculations.

Note: Data cover the period from 2 June 2008 to 15 January 2018.

Question 2

Do you agree with the proposal to apply trimming at the level of 25% in order to reduce the volatility of the daily rate? Please provide details of the reasoning underpinning your assessment.

4 Operational design features

Three other design elements concerning (i) input data, (ii) the process and framework for the determination of the reference rate in contingency situations and (iii) related transparency standards, also need to be decided in order to further improve the quality, integrity, continuity and robustness of the reference rate – i.e. in order to increase its credibility. First, additional daily quality checks on input data are critical in order to ensure that the rate is calculated on the basis of accurate information. Second, a data sufficiency policy is required in order to cater for contingency situations triggered by a lack of data or rate representativeness issues. Rules in a contingency situation have to be as simple and comprehensible as possible in order to safeguard continuity. And third, the publication of well-defined and clear data will ensure that relevant information is conveyed to the public in a transparent manner and support public accountability.

4.1 Data quality checks

Business checks will decide which data contributions can be accepted and integrated into the calculation of the rate, and which data contributions should be set aside for verification with the reporting agent. This process will remain internal.

4.2 Data sufficiency policy

A data sufficiency policy should ensure that the data used to construct a benchmark are sufficient to accurately and reliably represent the interest measured by that benchmark. In particular, those data should:

- be based on values that have been formed by competitive forces of supply and demand in order to provide confidence that the price discovery system is reliable;
- be anchored by observable arm's length transactions between buyers and sellers in the market for the interest measured by the benchmark, in order for that benchmark to function as a credible indicator of the value it represents.

In addition, it should also define situations where the rate cannot be published using the usual defined methodology owing to a lack of data.

4.2.1 Criteria for activating a contingency procedure

For transparency reasons, conditions determining whether a lack of data should trigger a contingency procedure should be simple and easy to understand, consisting of a combination of indicators and accounting for the specificity of the euro area. The

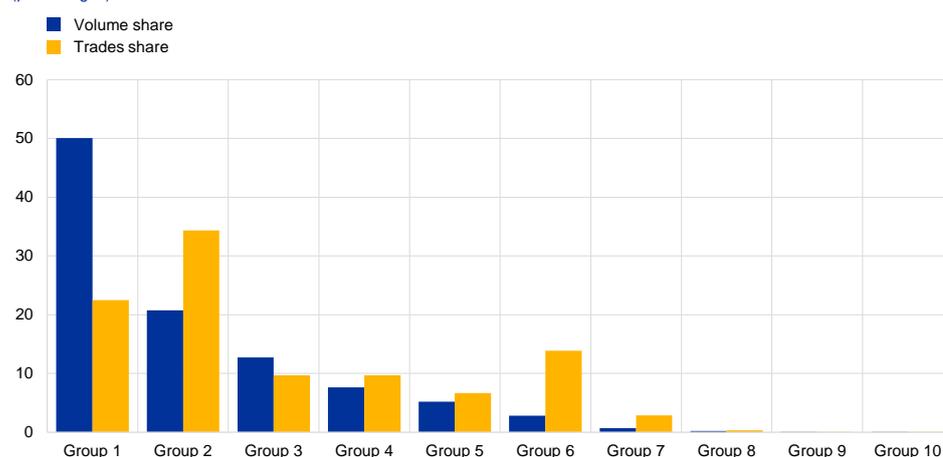
primary goal in this regard is to avoid a situation in which the final rate is determined by the transactions of very few reporting agents.

First of all, data show that the key criterion when defining a data sufficiency policy is not the number of trades, as this is not necessarily correlated with transaction volumes and could result in analysis focusing on the wrong area. For example, the largest five banks in the euro area account for 50% of total volumes (with those banks' individual shares ranging from 6% to 12%) and slightly more than 20% of the total number of trades. Meanwhile, the next group of five banks accounts for 20% of total volumes, but 35% of the total number of trades (see [Chart 5](#)). At the same time, however, volume may not be the best criterion either. Indeed, day-to-day fluctuations in volume could be seen as simply part of how the market functions. Moreover, such changes could relate to calendar effects or local holidays. MMSR data show that even on days with reduced volumes, those volumes are generated by fairly large numbers of reporting agents and there is no concentration, so aggregated rates based on those volumes still reflect a competitive market. The MMSR data point to 5 June 2017 – a German bank holiday (Whit Monday) – as being one of the days with the lowest levels of activity in the review period. However, data for that day show that while local bank holidays can have a significant impact on reported volumes, they may not necessarily affect the overall concentration of those volumes or the resulting rate. Indeed, on such occasions, it is common practice for German banks to trade liquidity over two days, so transactions eligible for inclusion in the overnight rate decline proportionally. This suggests that, given the above-mentioned specificities of the euro area, volume is not necessarily the best indicator of a loss of information or an exceptional situation that requires recourse to contingency procedures (see [Chart 5](#) and [Table 9](#)).

Chart 5

Banks' shares of transactions by volume and by number of trades

(percentages)



Sources: MMSR data and ECB calculations.

Notes: Banks have been grouped together on the basis of their shares of transaction volumes. The five banks with the largest shares are in Group 1, the banks with the next five largest shares are in Group 2, and so on. Each group comprises five banks, with the exception of Group 10, which consists of seven.

Second, at an aggregate level, the 20 most active banks account for 91% of total transaction volumes and represent six different countries, while the five most active

reporting agents account for 50% of volumes and represent four different countries (see [Table 9](#)).

Table 9
Shares of transaction volumes and numbers of countries represented

Clusters	Cumulative volume share	Number of countries
Largest five banks	50%	4
Largest ten banks	71%	5
Largest fifteen banks	84%	6
Largest twenty banks	91%	6
Full number of banks	100%	10

Sources: MMSR data and ECB calculations.

On days with very low levels of activity, the share of the five most active banks increases to between 52% and 68%, while the number of active banks ranges between 24 and 29, with seven or eight countries represented (see [Table 2](#) above). However, rates typically remain close to those recorded in normal conditions (with the exception of year-end, on account of balance sheet restrictions). This would suggest that volumes remain fairly well distributed even on days with very low levels of activity.

Third, the country dimension also needs to be taken into account in the euro area context in order to prevent the ECB's rate from being affected by a loss of agents (owing to technical issues or local holidays). As overall volumes are quite well distributed among the four most active countries, a fairly high data sufficiency threshold requiring a minimum number of participating banks every day will ensure that, in the current MMSR composition, even on local holidays the final interest rate will be calculated on the basis of transactions originating in several different euro area countries.

Fourth, there appear to be only a limited number of occasions where the number of reporting agents falls below certain thresholds. While local bank holidays and long holiday periods (such as year-end and the months of July and August) can, at times, help to lower activity levels, the overnight rate does not seem to be overly affected. With the exception of TARGET2 holidays (for which no rates will be calculated anyway), the lowest number of banks reporting transactions with financial corporations is 24, with those banks representing seven different countries (see [Table 10](#)).

Table 10

Average and lowest numbers of reporting banks and countries represented for different groups of counterparties

	(1) Deposit-taking financial corporations	(2) Financial corporations	(3) Financial and non-financial corporations
Average number of banks	23	31	33
Lowest number of banks	15	24	26
Average number of countries	9	10	10
Lowest number of countries	6	7	7

Sources: MMSR data and ECB calculations.

Note: The data in this table cover the period from 1 August 2016 to 15 January 2018.

In light of the above considerations, a contingency procedure could be triggered where (i) the number of reporting banks is less than 20 or (ii) five banks account for 75% or more of total transaction volumes.

These two criteria would be assessed both (i) in the event of a genuine lack of data and (ii) in the event of systems breaking down and preventing a sufficient data feed, thereby impairing the calculation of a representative transaction-based rate. These rules are summarised in **Table 11** below.

Table 11

Contingency rules

Number of reporting banks	20 or more	20 or more	Fewer than 20	Fewer than 20
Concentration	Six banks or more account for 75% of volumes	Five banks or fewer account for 75% of volumes	Six banks or more account for 75% of volumes	Five banks or fewer account for 75% of volumes
Contingency procedure?	No	Yes	Yes	Yes

Source: ECB.

Question 3

Do you agree with the proposed data sufficiency policy?

Do you agree with the proposed criteria for moving to a contingency procedure?

Would you suggest other criteria for implementing a contingency procedure, taking account of the specificity of the euro area?

4.2.2 Methodology for calculating a contingency rate

Where the criteria triggering the contingency procedure are met, the calculation methodology could combine the previous day's rate with the rate that would result from applying the standard methodology to the available trades on the day in

question, as well as any change in policy rates if the contingency procedure is activated on a day when a policy rate change occurs.

We propose to produce a weighted average of the previous day's rate and the result from applying the standard methodology to the available (but insufficient) data for the day in question. If the contingency procedure is triggered on a day when policy rates change, we propose shifting the level of the previous day's rate by a term reflecting the change in policy rates (see Annex).

The contingency formula applies the following logic:

- In a first step, a rate is calculated using the standard methodology based on the (insufficient) daily operations for the day in question and a volume-weighted average is calculated using the resulting rate and that of the day before. The volume weighting implies that in case of a total absence of reported transactions on the publication day, the rate of the prior day is used;
- If there is a policy rate change effective from the date for which the ECB rate is being calculated (typically, at the beginning of the new reserve maintenance period), the rate of the transactions from the day before is shifted to reflect this change according to the following rules: (i) if the ECB rate is outside the policy rates corridor, i.e. below the deposit facility (DF) rate or above the marginal lending facility (MLF) rate, then the shift in the previous day's rate will be equal to the change in the DF rate or the MLF rate, accordingly; (ii) if the rate from the previous day is within the corridor and the change in policy rate does not result in a change in the corridor width, i.e. all policy rates are adjusted by the same magnitude, then the shift of the previous day's rate will be equal to the change in the policy rates; (iii) if the ECB rate is within the policy rates corridor and the change in policy rates does result in a change in the width of the corridor, then the previous day's rate is adjusted in such a way that the position of the previous day's rate within the new corridor remains unchanged.

Question 4

Do you agree with the proposed calculation methodology for the contingency rate?

4.3 Data publication policy

4.3.1 Standard publication

Market participants have indicated that the timing of the rate's publication on the ECB's website will play a critical role in determining its acceptance and use. Market participants understand that the use of MMSR data means that the ECB rate will not be available until the following day and that, purely as a result of the data

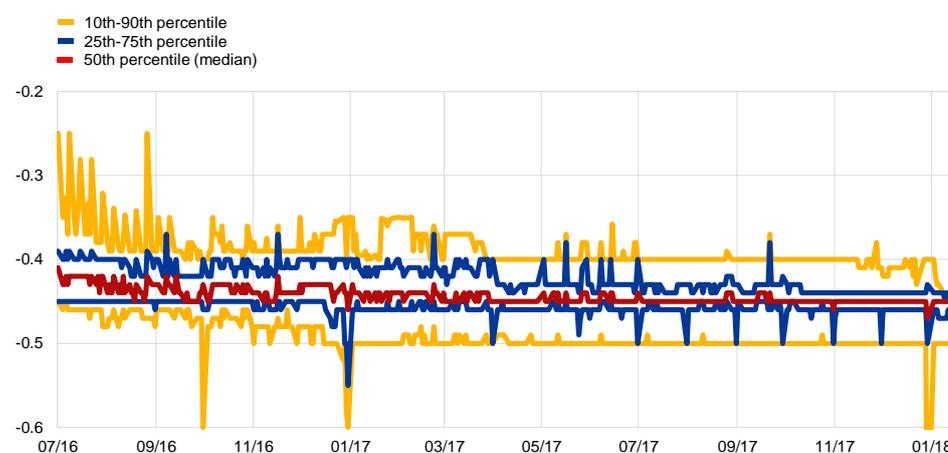
collection process, there are technical limitations as to how early the rate can be published. This new timing of the rate publication will entail a lot of technical changes, as well as changes to practices in relation to the valuation of products and market positions.

Further consideration will be given to the precise timing of the rate’s publication, taking account of data collection constraints, as well as feedback from market participants in the context of the first public consultation and bilateral discussions. A comprehensive assessment is ongoing, taking account of the functioning of the market, as well as processes linked to the collection of data, and a decision will be made in summer 2018.

In line with IOSCO Principle 9 Transparency of Benchmark Determinations, in addition to reporting the rate as calculated on the basis of the methodology described, the ECB will also publish information on the distribution of volume-weighted rates, publishing the rates and volumes observed at the 25th and 75th percentiles of daily volumes. **Chart 6** below indicates, for information, the rates at the 10th, 25th, 50th (red line), 75th and 90th percentiles for the period from 1 July 2016 to 15 January 2018.

Chart 6
Distribution of volume-weighted rates

(1 July 2016 – 15 Jan. 2018; percentages)



Sources: MMSR data and ECB calculations.

The ECB envisages publishing the following information on every TARGET2 day (with the precise timing still to be decided):

- rate for the day in question, to three decimal places;
- total volume of transactions before trimming;
- number of banks reporting transactions before trimming;
- number of transactions before trimming;
- percentage of volumes reported by the largest five banks;

- calculation method: normal or contingency;
- rates and volumes at 25th and 75th percentiles of volumes.

As this information is considered to be a public good, it will be available free of charge on the ECB's website, as well as being available to wire services.

4.3.2 Delayed publication

In the event that, in the absence of a contingency situation, significant data are missing owing to technical transmission issues or other reasons and final data are expected within a reasonable time frame, the ECB envisages delaying publication of the rate by up to 30 minutes. After 30 minutes, the rate will be published on the basis of the information available, even if that information is incomplete. If necessary, the contingency procedure will be activated as described above.

While the rate is not intended to be republished within hours at this stage, even if it is found to be erroneous after publication, the option to republish nevertheless remains open.

Question 5

Do you agree that a rate with three decimal places provides sufficiently precise information?

Do you agree with the daily publication of the variables listed in the bullet points above?

Do you think that correcting an already published rate would be necessary? If so, please elaborate in which timeframe on the same day a republication may be useful.

4.3.3 Transparency policy

The ECB's overnight rate will be based on MMSR data. Thus, MMSR overnight transaction data used to calculate the ECB rate may be revised. At the same time, however, the publication policy for the ECB rate states that the rate has to be published by the relevant deadline on the basis of the information available. While the ECB has not decided yet upon a republication of the rate, it may consider reporting periodically on the impact that any revision of MMSR data may have had on that rate.

5 Ensuring broad-based adoption of the new ECB rate

The new ECB rate should have features that make it acceptable to market participants (i.e. the design of the rate should ensure that it represents a robust reflection of the relevant market reality, users should understand how the rate is calculated, and the rate should be produced both accurately and on time). In addition, in order for the new rate to be used in new instruments and contracts, and in order for derivatives markets to evolve, market participants need sufficient information on the behaviour of that rate over time. Having such information available before the first rate is published would facilitate early use of the new rate in instruments and contracts. Against that background, this section recalls the broader circumstances surrounding the establishment of this rate in terms of the reform of existing euro benchmarks. It also touches on possible scenarios for a transition to the new ECB rate, taking account of feedback from market participants, as well as providing information about the ECB's proposed communication strategy for the new rate.

5.1 Reforming the benchmark landscape

The establishment of this new ECB rate is taking place in the context of the reform efforts that the G20 asked the Financial Stability Board (FSB) to undertake in 2013.¹⁴ In response to that request, the FSB carried out an initial review, which resulted in the publication of a number of recommendations in July 2014.¹⁵ Those recommendations advocated a “multiple-rate approach” with two broad objectives:

- strengthening existing interest rate benchmarks and any other reference rates based on unsecured bank funding costs by underpinning them with transaction data as far as possible;
- developing alternative nearly risk-free reference rates (RFRs).

In Europe, the most widely used benchmarks, EONIA and EURIBOR, have both been undergoing reforms initiated by their administrator, the European Money Markets Institute (EMMI).¹⁶ Those reforms have largely been guided by IOSCO's Principles for Financial Benchmarks, which were published in 2013, and the Benchmarks Regulation, which was adopted in 2016. Those reforms will have an impact on market practices, and contracts may need to be amended in line with that new environment in the years to come. Importantly, those reforms seek to make

¹⁴ The FSB published its latest [update on benchmark reforms](#) on 10 October 2017.

¹⁵ See FSB, [Reforming Major Interest Rate Benchmarks](#), July 2014.

¹⁶ In early February 2018 the EONIA administrator – the European Money Markets Institute (EMMI) – announced that it would no longer pursue a thorough review of the EONIA. See [EMMI announcement](#), February 2018.

critical benchmarks such as EONIA and EURIBOR compliant with the Benchmarks Regulation by 1 January 2020,¹⁷ as otherwise it will not be possible to use them for new instruments or contracts after that date. EONIA, for example, is used for a variety of contracts and instruments, including OIS swaps, long-term repos and securities issued at variable rates indexed to EONIA, and various types of loan issued to banks' clients.

Thus, the new ECB rate is designed to provide a backstop to the existing overnight benchmarks and can be regarded as complementing the existing euro overnight benchmarks, giving users a wider range of options to choose from. However, that new rate can also be regarded as a backstop for the existing overnight benchmarks, especially if they are not reformed by 1 January 2020. In this context, the question of a possible transition from existing benchmarks to alternative rates (such as the ECB rate) may become relevant in particular in the context of the Working Group on Euro Risk-Free Rates.¹⁸

The Eurosystem has reached out to some of its counterparties in an effort to understand the key issues determining acceptance of the new ECB rate,¹⁹ and their feedback points to a very high degree of support for and confidence in that rate. That confidence is explained by the fact that the Eurosystem will be basing that rate on the broad MMSR dataset, which will ensure that the rate is backed by sufficient volumes of transactions and is representative. The credibility of the Eurosystem as the provider of the rate is also seen as one of the main factors in its acceptance. Above all, however, market participants believe that the new rate will swiftly be adopted in view of the uncertainty surrounding reforms to the key existing benchmarks.

The feedback collected and the resulting proposals as to how to accommodate the needs of market participants as future users of the rate will be discussed in the next section.

5.2 Spreads and volatility

Use of the new rate will also be crucially dependent on how it behaves in comparison with existing interest rate benchmarks (such as EONIA). The level of the new rate and its volatility compared with existing rates will be key in this regard.

Initial rate runs for the new ECB rate, calculating it on the basis of transactions with financial corporations (i.e. using the proposed methodology), produce a

¹⁷ After this date, new financial instruments and contracts will generally be unable to refer to benchmarks whose administrator does not comply with the Benchmarks Regulation.

¹⁸ As detailed in the [terms of reference](#) published by the ECB in November 2017, the deliverables expected of the Working Group on Euro Risk-Free Rates include the following: "Develop an adoption plan, and if necessary the creation of a transition plan for legacy contracts referencing existing benchmarks. The working group may create a transition plan and a timeline for the transition from current benchmarks, if at some point in the future this is deemed necessary."

¹⁹ This feedback adds to and complements the feedback that was received in the context of the ECB's first public consultation in November 2017 (see: [Summary of responses to the ECB's first public consultation on developing a euro unsecured overnight interest rate](#)).

rate of around -0.45%, some 9 basis points lower than recent EONIA levels on average over the observed time period (1 August 2016 to 15 January 2018).

That rate is also lower than other recent MMSR statistics²⁰, with the average overnight wholesale borrowing rate of recent maintenance periods, for example, standing close to -0.40% (i.e. 3 or 4 basis points lower than EONIA). Indeed, that average also includes non-financial corporations and governments, from which reporting agents borrow at higher rates, so it may have a natural tendency to be higher. The difference in the rate level of around 8 basis points between EONIA and the new overnight rate is a consequence of the choice of methodology, above all the decision to provide a borrowing rate.

The volatility of any new rate may also be regarded as a barrier to acceptance if it deviates significantly from the levels observed with existing benchmarks. The volatility of the ECB rate is expected to be comparable to that of EONIA, so that should not be an issue in this case.

According to market participants, differences between the ECB rate and EONIA in terms of their absolute levels will not represent a barrier to acceptance of the ECB rate, but differences in terms of their volatility will. Differences in level are seen as a technical issue, which can easily be resolved by establishing the spread between the two rates. Market participants are aware that the ECB rate will, by construction, be lower than EONIA, as the ECB rate will be a borrowing rate and will capture transactions with non-banks, which do not have access to the ECB's standing facilities. As regards the volatility of the new rate, market participants are of the view that the rate's methodology should result in a rate that tracks genuine market moves and is not influenced too much by individual transactions.

5.3 Communication policy

Market participants have pointed out that it may prove difficult to assess the suitability of the new ECB rate in the absence of sufficient information relating to key features of that rate (such as its volatility, its level, its historical performance, its effective starting date and even its name). Accordingly, they have advocated that this information be provided as early as possible. Some market participants have expressed a willingness to use the new ECB rate as of now as a fall-back rate in their instruments and contracts. For this, however, they will need, at the very least, prior knowledge of the rate's precise name and release date.

In order to facilitate the preparatory work that the industry needs to carry out in order to use the new rate, the ECB proposes to provide the markets with regular updates about the behaviour of that new rate. That communication will comprise the following:

- delayed publication of the set of daily information detailed above under "Data publication policy" at a frequency that has yet to be defined;

²⁰ [Euro money market statistics](#).

- provision of charts illustrating those various significant features, particularly as regards the volatility and level of the rate.

A first set of updated information on how the rate methodology behaves is due to be published once the details of the final methodology have been approved by the ECB's Governing Council in summer 2018. Updates will then be provided from October 2018 onwards at a frequency that will be decided upon at a later stage.

The ECB intends to start testing the production of the new rate in early 2019 with a view to fine-tuning the Eurosystem's internal procedures. The ECB will keep the markets regularly informed about these concrete preparatory steps in 2019 and intends to start publishing the daily rate on an official basis before 1 January 2020.

Question 6

Do you regard the envisaged delayed publication of daily rate and volume data during the preparatory phase as sufficient in terms of its scope and the planned start date?

Please specify any additional features that you deem necessary as regards those regular updates.

Question 7

Are there other high-level features or issues that should be taken into account and have not been sufficiently covered by the previous questions?

Annex – Formula for determining the contingency rate and illustrative examples

Terminology:

- $DF(t-1)$, $DF(t)$ = yesterday's and today's deposit facility rate
- $\Delta DF(t) = DF(t) - DF(t-1)$
- $MLF(t-1)$, $MLF(t)$ = yesterday's and today's marginal lending facility rate
- $\Delta MLF(t) = MLF(t) - MLF(t-1)$
- $MRO(t-1)$, $MRO(t)$ = yesterday's and today's main refinancing operations rate
- $\Delta MRO(t) = MRO(t) - MRO(t-1)$
- $ECBR(t-1)$ = yesterday's overnight ECB rate
- $WECBR(t)$ = today's insufficient weighted average theoretical ECB overnight rate
- $V(t-1)$, $V(t)$ = volume underlying yesterday's and today's ECB overnight rate

If none of the three policy rates was changed on (t-1), then:

$$ECBR(t) = \frac{V(t-1).ECBR(t-1) + V(t).WECBR(t)}{V(t-1) + V(t)}$$

If any of the policy rates was changed in t, then the level of $ECBR(t-1)$ is shifted by the weighted change in policy rates, $W\Delta PR(t)$, i.e.:

$$ECBR(t) = \frac{V(t-1).[ECBR(t-1) + W\Delta PR(t)] + V(t).WECBR(t)}{V(t-1) + V(t)}$$

The value of $W\Delta PR(t)$ depends on the changes in policy rates and on where $ECBR(t-1)$ stood relative to the policy rates:

- If $ECBR(t-1) \geq MLF(t-1)$ then $W\Delta PR(t) = \Delta MLF(t)$
- If $ECBR(t-1) \leq DF(t-1)$ then $W\Delta PR(t) = \Delta DF(t)$
- If $MRO(t-1) < ECBR(t-1) < MLF(t-1)$ then

$$W\Delta PR(t) = \frac{[ECBR(t-1) - MRO(t-1)]}{MLF(t-1) - MRO(t-1)} \Delta MLF + \frac{[MLF(t-1) - ECBR(t-1)]}{MLF(t-1) - MRO(t-1)} \Delta MRO$$

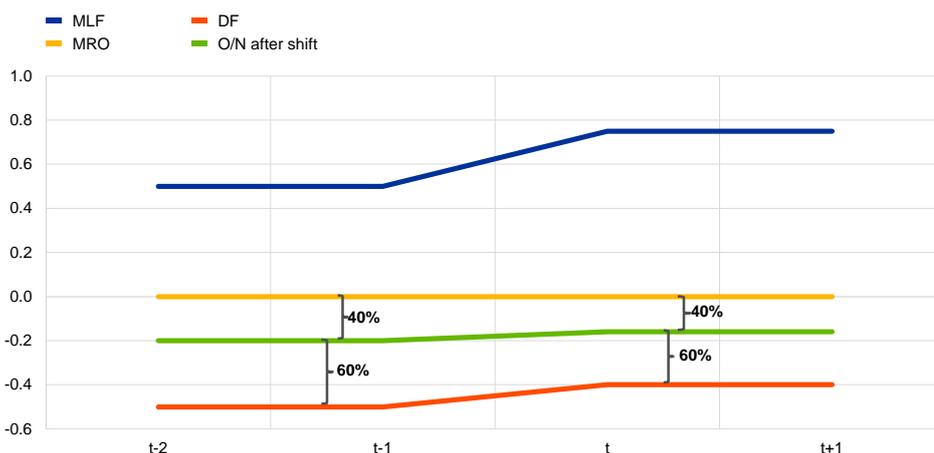
- If $DF(t-1) < ECBR(t-1) < MRO(t-1)$ then

$$W\Delta PR(t) = \frac{[MRO(t-1) - ECBR(t-1)]}{MRO(t-1) - DF(t-1)} \Delta DF + \frac{[ECBR(t-1) - DF(t-1)]}{MRO(t-1) - DF(t-1)} \Delta MRO$$

Example 1

The corridor width is reduced from 50 bps to 40 bps and the rate is shifted to stay 60% away from the deposit facility (DF) rate

Rate (in percentages)	t-2	t-1	t	t+1
MLF	0.50	0.50	0.75	0.75
MRO	0.00	0.00	0.00	0.00
DF	-0.50	-0.50	-0.40	-0.40
O/N	-0.20	-0.20	-0.16	-0.16



Source: ECB.

Example 2

Non-parallel shift of the corridor but with the overnight rate remaining outside the corridor, and being shifted by the full change in the DF rate

Rate (in percentages)	t-2	t-1	t	t+1
MLF	0.50	0.50	0.75	0.75
MRO	0.00	0.00	0.00	0.00
DF	-0.50	-0.50	-0.25	-0.25
O/N	-0.70	-0.70	-0.45	-0.45

