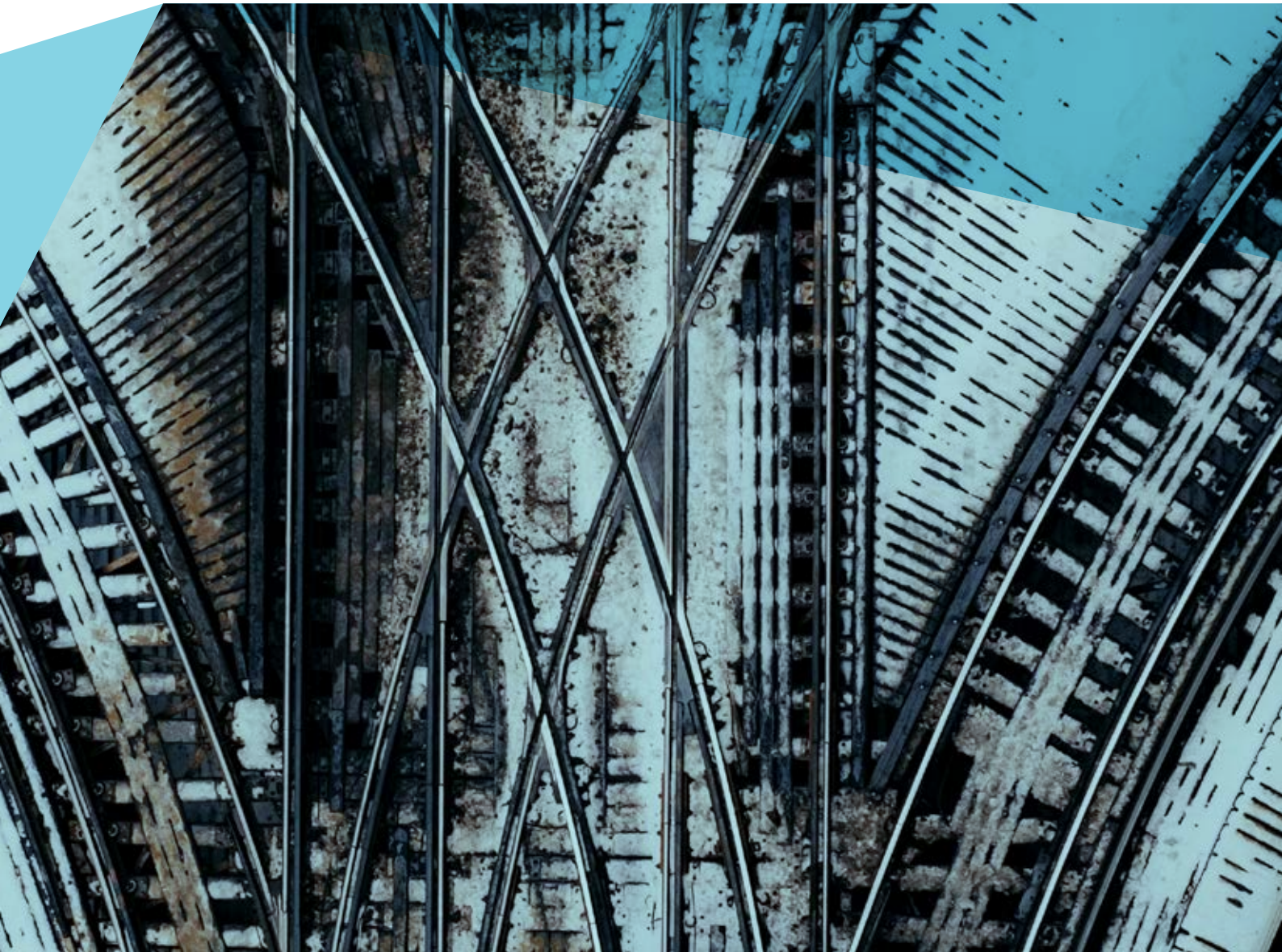


A TALE OF TWO BENCHMARKS

THE FUTURE OF EURO INTEREST RATES



EXECUTIVE SUMMARY

The Euro Interbank Offered Rate (Euribor) and the Euro Overnight Index Average (Eonia) are critically important interest rate benchmarks for the eurozone. Yet they are about to be either replaced or transformed, because neither complies with the recently introduced EU Benchmarks Regulation (BMR).

The race is on to reform Euribor so that it complies before the BMR authorisation deadline of 1 January 2020. No attempt will be made to reform Eonia, however, and transition to a new overnight reference rate will be required. European authorities have established an industry working group tasked with recommending alternative euro risk free rates and a plan for adopting them. The European Central Bank (ECB) is simultaneously developing Euro Short-Term Rate (ESTER), a new euro unsecured overnight interest rate, a possible alternative to Eonia and, potentially, to Euribor.

While regulators are supportive of the Euribor reform process, its success is not guaranteed. There are scenarios where the volume of transactions in the market which Euribor is meant to reflect prove insufficient even for a hybrid methodology. This could leave the industry needing to adopt (as yet, undefined) new reference rates for new business from as early as January 2020. The disruption could be yet greater if banks need to transition the >\$175 trillion stock of outstanding contracts referencing Euribor and Eonia to alternative rates.

Preparations are already underway for a transition away from the London Interbank Offered Rate (LIBOR), an equivalent to Euribor for US Dollars and four other major currencies (including EUR-LIBOR), triggered by the FCA's announcement that it will stop supporting LIBOR after 2021. As of today, the industry has less than four years to make the transition, which is claimed by many to be too little time given the ubiquity of LIBOR and the potential systemic risks created by the transition. There has so far been much less attention on Euribor and Eonia but, in the worst case, the transition time may be less than two years. With a similar order of magnitude of business referencing Euribor and Eonia as LIBOR, this represents a major risk.

In the best case, Euribor can be reformed to allow a seamless transition, as with the recent reform of the Sterling Overnight Interbank Average (SONIA) rate in the UK. But whether this best case will eventuate will not be known until very close to the deadline, and this still leaves the issue of Eonia. Given the volume of business involved, it would be a brave institution that relied on this happening without developing a Plan B.

Transition from the rates presents a unique set of challenges for market participants due to their ubiquitous nature; the range of clients impacted, with varying levels of sophistication; the economic impact due to potential material differences between Euribor/Eonia and an alternative rate but also potentially between Euribor today and a successfully reformed Euribor; and the very present conduct and litigation risk which is building with every contract that is currently being entered into with a maturity beyond the transition dates.

Euro rate transition has more expedited timelines than even LIBOR transition. Firms with exposure to Eonia must now shift gear to prepare for transition to an alternative rate. Firms need to also take action now to develop a credible Plan B for Euribor transition in the event that reform is unsuccessful or if the reformed rate is materially different. Delaying action

will only increase the final transition costs and will amplify the financial, operational, and reputational risks. Indeed for some firms transition costs in excess of \$100 million have been estimated. European banks that mobilise now for Euro rate transition will reap the benefits in LIBOR transition.

EU BENCHMARKS REGULATION PROVIDES AN IMPETUS TO REFORM OR REPLACE EURIBOR AND EONIA

Euribor and Eonia are critically important for the eurozone. Together, they are used as reference rates for >\$175 trillion of wholesale and retail financial products, including long-term residential mortgages in Finland, Spain, and Italy. And they have several other applications across both financial and non-financial sectors (see Appendix A).

However, EMMI, the administrator for both Euribor and Eonia, has determined that neither currently complies with the BMR that came into effect on 1 January 2018. In particular, changes must be made to comply with the regulatory requirement that benchmarks should be “anchored in transactions, to the extent possible”¹. To be used within the EU, EU benchmark administrators must be authorised by regulators, with a deadline of 1 January 2020 to apply for authorisation. Euribor will need to be reformed to meet BMR requirements by this date if it is to be used afterwards. EMMI has already announced that it will not seek to reform Eonia to meet BMR requirements, and new contracts will not, therefore, be able to reference it from 1 January 2020. Under BMR, benchmark users are required to have written plans setting out the actions they would take in the event a benchmark materially changes or ceases to be provided.²

BMR also restricts the period during which authorities can compel submission or the administration of “critical” benchmarks (including Euribor and Eonia) to two years. If Euribor panel banks were to request withdrawal, the number of submitters could fall to a level which makes calculation of Euribor impossible after the two-year compulsion period. Indeed, the number of panel banks submitting data to calculate Euribor has already decreased from 43 in 2008 to 20 today. By way of comparison, before the principal provisions of BMR came into force, the UK’s FCA gained voluntary support from LIBOR submitters for four and a half years to support the transition. (See Appendix B.)

EURIBOR represents the unsecured interbank offered rates in the eurozone, derived from quote submissions from a panel of 20 banks. While the precise definition and methodology differ, the mechanics and purpose of Euribor are very similar to those of EUR-LIBOR (and LIBOR in general).

EONIA is the effective overnight reference rate for the euro, computed as a weighted average of all overnight unsecured lending transactions in the interbank market from a panel of 28 banks.

¹ Euribor reform, Frequently Asked Questions, EMMI

² BMR, Article 28(2)

A TRANSITION FROM EONIA IS INEVITABLE

EMMI, Eonia’s administrator, has announced that concerns about concentration and insufficient submission data cannot be resolved under current market conditions. It will not, therefore, attempt to modify Eonia to comply with BMR. A likely alternative, ESTER, is being developed by the ECB with the aim to be finalised before 2020. However, there are significant differences between it and Eonia, as further detailed in Appendix B. We see two scenarios for the future of Eonia (Exhibit 1) and both entail a significant transition effort for market participants.

Besides its direct use in overnight index swaps (OIS), Eonia is fundamental to the broader euro derivatives market, as it is used to value derivatives and calculate related margin and collateral. Where Eonia is used as the discount rate for Euribor-based swaps (the largest part of the market), Eonia/Euribor basis swaps are often used to hedge the basis risk. After January 2020, Eonia may not be available to be used as the discount rate and, even if it is, market participants would not be able to enter new Eonia-based transactions to manage the basis risk.

This further emphasises the need for a consistent reform process with wide confidence in the reference rate(s) that will replace Eonia.

Exhibit 1: Possible scenarios for Eonia replacement

Scenario: Eonia alternative is established	New transactions ^{*1}	Existing transactions ^{*2}
<p>1 Banks continue to submit to Eonia and original rate continues to be published</p>	<p>Transition new products to Eonia alternative before 1 January 2020</p>	<p>No transition required – continue to reference (original) Eonia in legacy contracts, with regulatory permission^{*3, *4}</p>
<p>2 Submitting banks or the benchmark administrator withdraw support for (original) Eonia and the rate is no longer published</p>		<p>Transition existing contracts to Eonia alternative with at most two years notice^{*5} (could be as soon as now)</p>

■ Transition activities required ■ No transition activities required

*1 New contracts, entered into after 1 January 2020 or benchmark authorisation is granted/refused

*2 Legacy contracts, entered into before 1 January 2020 or benchmark authorisation is granted/refused

*3 Market participants may still decide to transition existing transactions to alternative risk free reference rates to ensure consistency of approach with new transactions

*4 Article 51(4) of BMR allows this if withdrawing the benchmark would result “in a force majeure event, frustrate or otherwise breach the terms of any financial contract or financial instrument or the rules of any investment fund, which references that benchmark”

*5 BMR provisions for mandatory administration (Article 21) and mandatory contribution (Article 23) to critical benchmarks

A TRANSITION FROM EURIBOR TO ALTERNATIVES IS A REAL PROSPECT

EMMI has launched efforts to reform Euribor based on a “hybrid” methodology which combines transaction data and expert judgement (but prioritizes the former)³. Prior attempts to move to a methodology based entirely on transaction data concluded that this is impossible under current market conditions because “determination of the index would be based, for most tenors, on a limited number of transactions executed by a very limited number of contributors”⁴. Regulators are supportive of the Euribor reform process⁵ and are hopeful that a reformed Euribor can continue to be used. However, given the similarities of the markets that Euribor and LIBOR represent, and given that plans to reform LIBOR based on a similar “hybrid” methodology were insufficient to prevent the FCA from recommending a transition away from LIBOR, a reformed Euribor may well eventually be deemed insufficiently robust.

We see three possible scenarios for the future of Euribor, each with different implications for market participants (see Exhibit 2). A best-case scenario will have no material impact on firms. Under the other two scenarios, however, a transition to an alternative rate for either new transactions or both new and existing transactions will be required.

Exhibit 2: Possible scenarios for Euribor reform or replacement

Scenario	Outcome of Euribor reform	Availability of current Euribor after end 2019	New transactions ^{*2}	Existing transactions ^{*3}
1	Successful reform and new rate is materially SAME ^{*1} as today	N/A - Reformed Euribor consistent with current Euribor	Seamless transition – no material business impact	
2	Successful reform, but new rate is materially DIFFERENT ^{*1} to today	✗ Current Euribor ceases when/shortly after reformed Euribor published	Transition new products to either reformed Euribor or alternative reference rate(s) before 1 January 2020	Transition existing contracts to either reformed Euribor or alternative risk free reference rate(s) (max 2 year notice period ^{*5})
3a	Euribor reform unsuccessful	✓ Current Euribor continues to be published for legacy contracts – requires continued support of submitting banks	Transition new products to alternative risk free reference rate(s) before 1 January 2020	No back-book transition required – continue to reference “current Euribor” in legacy contracts, with regulatory permission ^{*4}
3b		✗ Euribor ceases completely		Transition existing contracts to alternative risk free reference rate(s) (max 2 year notice period ^{*5})

Transition activities required
 No transition activities required

*1 Definition, level and volatility

*2 New contracts, entered into after 1 Jan 2020 or benchmark authorisation is granted/refused

*3 Legacy contracts, entered into before 1 January 2020 or benchmark authorisation is granted/refused

*4 Article 51(4) of BMR allows this if withdrawing the benchmark would result “in a force majeure event, frustrate or otherwise breach the terms of any financial contract or financial instrument or the rules of any investment fund, which references that benchmark”

*5 BMR provisions for mandatory administration (Article 21) and mandatory contribution (Article 23) to critical benchmarks

3 Public consultation for the proposed methodology was complete between 26 March and 15 May 2018, with outcome to be published in June 2018. The methodology will be tested between May and August 2018

4 EMMI, Working group on euro risk free rates, 26 February 2018

5 ESMA, Speech by Steven Maijor, 31 May 2018; ECB, Risk.net interview with Cornelia Holthausen, 16 May 2018

TRANSITION TO THE NEW BENCHMARKS WILL BE CHALLENGING

Market participants are already grappling with the realities of LIBOR transition, with US banks, in general, further ahead in their preparations than European peers. However, the inevitable transition from Eonia and possible transition from Euribor provides an impetus for European banks to accelerate their programmes. Transition from Euribor and Eonia will also present further challenges:

- The new rates will differ from Euribor and Eonia, changing the expected cash flows and risk from contracts (products) based on them. This will necessitate changes to valuation tools, product design, hedging strategies, and funding
- A large number of counterparties and end users will be affected by the transition to the new reference rates. Euribor, especially, is referenced in many contracts with retail customers across Europe. Banks will need to communicate carefully with these clients and manage them through the transition, encountering considerable conduct risk in the process
- Given the uncertainty regarding alternative rates and transition arrangements, sell-side institutions in wholesale markets are increasing their conduct risk with every new contract referencing Euribor or Eonia that extends beyond 1 January 2020. At a minimum, increased communication and disclosure to clients are required
- If and when Euribor and Eonia become unavailable, relying on fall-back provisions in current contracts may change product economics and create financial and operational risk, because such provisions are typically designed to deal with the temporary unavailability of reference rates rather than their permanent cessation. Updating fall-back provisions for existing contracts will require significant effort – preliminary estimates by the working group on euro risk-free rates suggest timelines ranging from six months to three years, and in some cases such changes may not even be possible

Firms will be faced with a large and complex transition. The overall effort involved, particularly if Euribor reform is not successful, is likely to resemble that of other major regulatory programmes. Indeed, for some firms transition costs in excess of \$100 million have been estimated.

FIRMS CAN ACT NOW TO PREPARE FOR TRANSITION

While the reform process for Euribor is ongoing, and alternatives to Euribor and Eonia are still being investigated, market participants can take five important actions:

1. Support industry-wide initiatives to reform Euribor and to develop alternative reference rates for both Euribor and Eonia
2. Ensure robust, written contingency plans are in place in case a benchmark materially changes or ceases to be provided (including nomination of alternative, fall-back rates), as required by BMR
3. Take “no-regrets” moves to mitigate potential future challenges and risks, such as changes to, or introducing, fall-back language in contracts, evaluating conduct and legal risks, improving communications, and making disclosures to clients related to new transactions referencing Euribor or Eonia
4. Perform an “enterprise scan” to assemble an inventory of Euribor and Eonia usage across products and front-to-back processes, and to assess transition challenges and impacts
5. Develop a phased transition playbook so that a programme can be launched and executed quickly if and when needed

Firms with ongoing LIBOR transition efforts should be able to create synergies by drawing all reference interest rate work into a coordinated response. However, the timelines for Eonia and Euribor transition are arguably tighter and more rigid than the LIBOR timelines, while the alternatives are still less clear. There is no time to spare.

APPENDIX A: THE ROLE OF EURO REFERENCE RATES

LIBOR is ubiquitous in the financial landscape. It is used as a reference rate in a wide range of wholesale and retail financial products, the total notional outstanding value of which exceeds \$240 trillion across all currencies. However, as discussed in [our recent report *Changing the World's Most Important Number*](#), its future is uncertain.

For the eurozone, the role of EUR-LIBOR is relatively limited, with about \$2 trillion notional of financial contracts using it as a reference rate. Instead, Euribor and Eonia are the most important interest rate benchmarks. Together they are used as reference rates for >\$175 trillion of wholesale and retail financial products (see Exhibit 3), as well as for other applications across both financial and non-financial sectors.

Eonia is referenced in the OIS market and is used for a range of other applications, including valuation and margining of derivatives. Euribor is used across a much wider range of asset classes and user segments, including an estimated five million retail customers who hold \$750–800 billion⁶ of mortgages underpinned by Euribor. Euribor-indexed mortgages are more prevalent in some European markets than others. While only a small fraction of German and French mortgages are indexed to Euribor, for example, more than 90% of mortgage lending in Finland references Euribor. And in Spain, Portugal, and Austria about 60% of mortgages are indexed to Euribor.

Recent analysis by the working group on euro risk-free rates⁷ concluded that approximately \$6 trillion of the currently existing stock of Eonia-linked financial instruments will remain outstanding beyond the BMR transition period, on 1 January 2020.

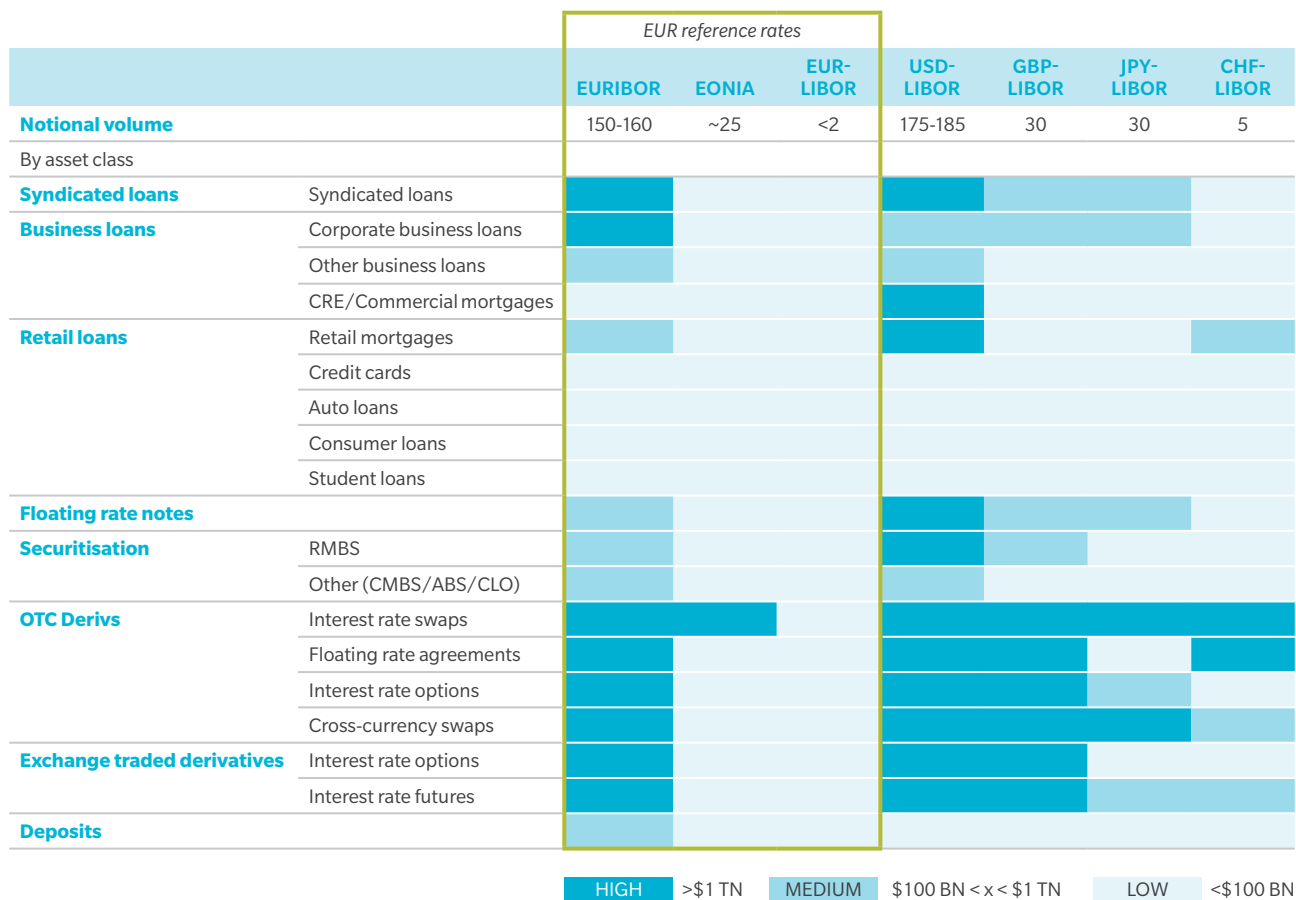
⁶ Oliver Wyman analysis based on ECB and European Mortgage Federation Hypostat data

⁷ 3rd meeting of the working group on euro risk-free rates (17 May 2018)

Exhibit 3: Notional outstanding balances by reference rate

Order of magnitude

US\$ Trillion



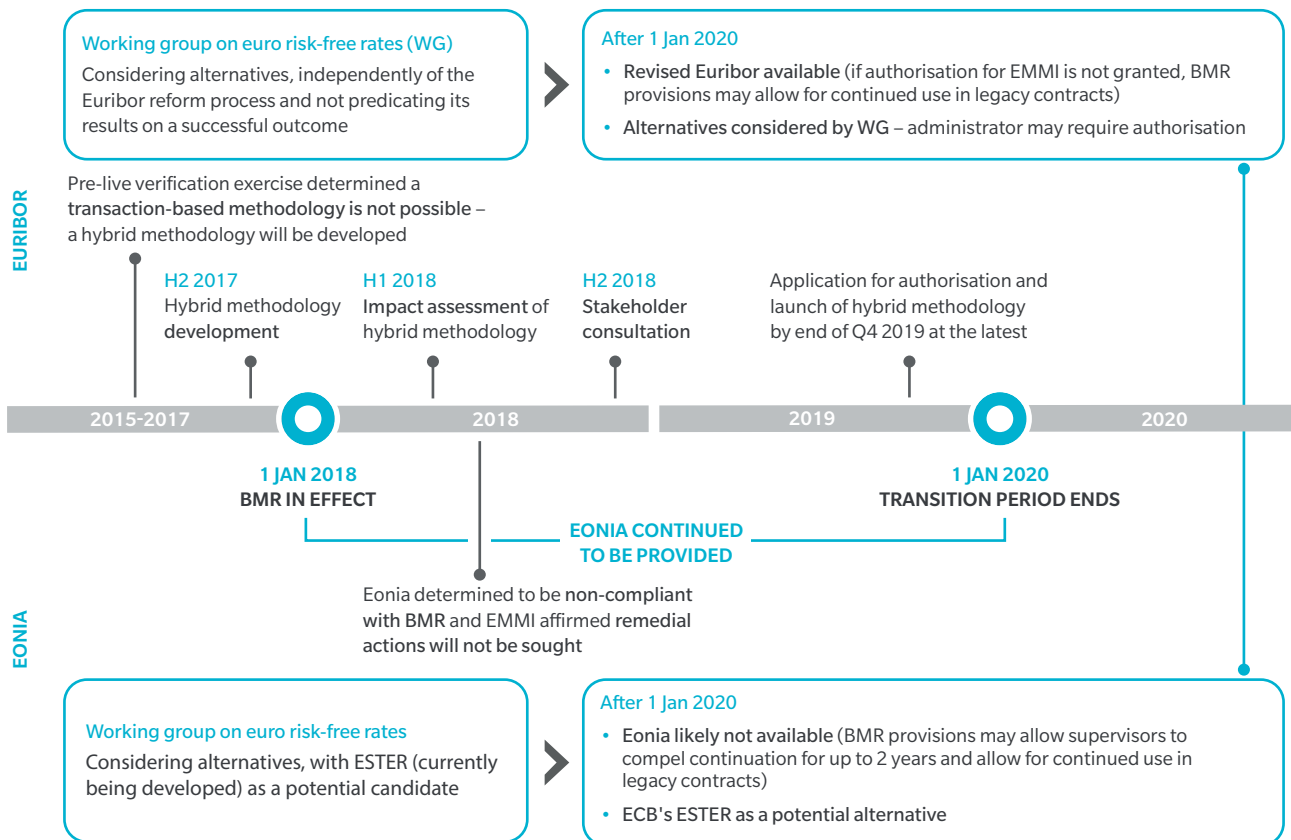
Source: Oliver Wyman analysis, data as available as of December 2017 and updated to reflect estimates from the 2nd and 3rd meetings of the working group on euro risk-free rates

APPENDIX B: EU BENCHMARKS REGULATION AND THE FUTURE OF EURIBOR AND EONIA

As a response to the rate-fixing scandals during the financial crisis, the European Commission introduced the BMR, the main provisions of which came into effect on 1 January 2018. The regulation aims to improve the integrity of benchmarks used in the eurozone (including reference interest rates) by reducing the use of discretion, improving governance controls and addressing conflicts of interest.

Given their importance within the eurozone, both Euribor and Eonia have been designated as “critical” interest rate benchmarks, the strictest classification within BMR. BMR allows a two-year transition period (until 1 January 2020). However, provisions for mandatory administration and contributions to critical benchmarks are already in effect. Following in-depth reviews and public engagement, EMMI, the Belgian company administering both Euribor and Eonia, has reached the conclusion that neither of the benchmarks are currently compliant with BMR. This means they cannot be used for contracts entered into after the transition period ends unless remedial actions are undertaken to reform the benchmarks.

Exhibit 4: Overview of Euribor and Eonia reform timeline (as envisioned today)



Note: Future milestones are presented as envisioned by EMMI/Working Group on euro risk-free rates

Source: EMMI, Working Group on euro risk-free rates, Oliver Wyman analysis

EMMI is currently working to reform Euribor, based on a “hybrid”⁸ methodology. Eonia, on the other hand, will not be evolved to comply with BMR.

In light of this, a working group tasked with finding alternative reference rates to Euribor and Eonia aims to publish its recommendations in October 2018. The working group on euro risk-free rates has announced it will neither involve itself in the Euribor reform process nor predicate its results on a successful outcome. As for Eonia, a possible alternative that may be considered by the working group is ESTER, the overnight interest rate being developed by the ECB. However, its development is still ongoing and there are significant structural differences between the ECB proposal and Eonia (see Exhibit 5). Any alternative rates developed by the private sector will need to be authorised under BMR before they can be used as reference rates by market participants.⁹

Exhibit 5: Overview of ESTER development



The ECB is developing ESTER (Euro Short-Term Rate), a daily euro unsecured overnight interest rate, to be based on data available from the ECB's money market statistical reporting (MMSR) dataset



The ECB intends to start publishing ESTER officially before 1 January 2020, with testing data available over 2019



Development has now completed a 2nd public consultation phase (15 March – 20 April 2018) with industry responses made available on the ECB website



The ECB is proposing that the new rate is based on:

- Banks' overnight borrowing costs
- 52 MMSR reporting agents' transactions with their financial counterparts (i.e. not limited to interbank)
- Deposit instruments only, rather than call accounts or securities issuance
- Volume-weighted mean trimmed to remove the bottom/top 25% of the data; note that market participants have expressed preference for a methodology based on 10% trimming levels during the 2nd public consultation

Comparison of Eonia and ECB proposal for ESTER

TARGET2 data back-testing (2 Jun 2008–15 Jan 2018)

		EONIA			ECB PROPOSAL ^{*1}		
		Mean	Max	Min	Mean	Max	Min
Stability	Annualised volatility (pp)	1.34	-	-	1.24	-	-
	Daily change (bps)	3.00	95.40	0.00	2.93	96.91	0.00
	Number of spikes (% of total # of days)	4.70	-	-	4.26	-	-
Comparability	Absolute distance to deposit facility rate (bps)	18.86	176.00	2.70	12.65	137.05	0.00
	Absolute distance to Eonia (bps)		-		7.69	42.29	0.02

*1 Volume-weighted mean trimmed to remove the bottom/top 25% of the data in order to remove outliers. Other variants are also considered in the ECB's 2nd public consultation, with market participants expressing a preference for a 10% trimming level

Source: ECB, Second public consultation on developing a euro unsecured overnight interest rate, March 2018

8 A three-tiered waterfall methodology prioritizing transaction-based data over expert judgement. Public consultation for the proposed methodology was completed between 26 March and 15 May 2018, with outcome to be published in June 2018. The methodology will be tested between May and August 2018

9 ESMA Q&A on BMR, 22 March 2018, Q9.2

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