



EUROPEAN CENTRAL BANK

EUROSYSTEM

# Report by the working group on euro risk-free rates

on the transition from EONIA to  
ESTER

December 2018



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# 1 Executive summary

In September 2017, the European Central Bank (ECB), the Financial Services and Markets Authority (FSMA), the European Securities and Markets Authority (ESMA) and the European Commission established the working group on euro risk-free rates<sup>1</sup> (hereinafter “working group”) with the task of identifying and recommending alternative euro risk-free rates. Such rates could serve as a basis for an alternative to current benchmarks used in a variety of financial instruments and contracts in the euro area. The terms of reference of the working group<sup>2</sup> also include developing an adoption plan, and if necessary creating a transition plan for legacy contracts referencing existing contracts.

As the first public consultation of the working group recommended the euro short-term rate (ESTER) as the euro overnight risk-free rate<sup>3</sup>, this report focuses on the transition from the current euro overnight index average (EONIA) to ESTER. The working group on euro risk-free rates encourages all stakeholders in EONIA to read this report and provide feedback on the technical analysis conducted by the working group and the recommendation for the EONIA-ESTER transition path.

EONIA is widely used as the reference rate in financial instruments. Due to its systemic importance, the European Commission added EONIA to the list of critical benchmarks on 28 June 2017. Under its current methodology, EONIA’s compliance with the EU Benchmarks Regulation<sup>4</sup> cannot be warranted and consequently, it cannot be used as of 1 January 2020, at least for new contracts. This would have a material impact on a wide range of instruments and contracts.

The objectives of the working group are therefore to ensure an orderly transition, to avoid market fragmentation, to help create a liquid risk-free rate derivatives market in euro and to ensure proper stakeholder coordination and communication. A successful transition path would also have to comply with the deadlines imposed by the EU Benchmarks Regulation, effectively transfer current EONIA derivatives liquidity to ESTER and protect users, especially the least sophisticated, by mitigating potential value transfers in the system. Furthermore, it must minimise legal risks, be operationally feasible and take into account financial accounting and risk management requirements.

The working group has identified the following four main transition types:

- parallel run approaches
- contractual alternative approaches

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<sup>1</sup> See “[Composition of the working group on euro risk-free rates](#)”.

<sup>2</sup> [Terms of reference for the working group on euro risk-free rates](#).

<sup>3</sup> “[First public consultation by the working group on euro risk-free rates on the assessment of candidate euro risk-free rates](#)”, June 2018

<sup>4</sup> Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds.

- pure succession rate approaches
- recalibration approaches.

Under both the parallel run and contractual alternative approaches, market participants should voluntarily negotiate their EONIA legacy contracts to transition to ESTER or let them expire. Both of these transition approaches require a long period of time in which EONIA continues to exist. However, these extensive timelines may not be compatible with the uncertainty regarding the sustainability of EONIA. Given that EONIA under its current form will be prohibited for new contracts under the EU Benchmarks Regulation, and in the light of the reliance on the EONIA panel banks and the plan of its administrator not to continue EONIA's publication indefinitely, these transition paths are highly risky.

The pure succession rate approach relies on a succession date on which EONIA ceases to be published and ESTER is deemed to be its official successor. Under this “big bang” approach, EONIA legacy contracts and its significant derivatives liquidity would instantaneously be transferred to ESTER. Due to the historical spread between EONIA and ESTER, this particular transition path would require detailed compensation mechanisms to avoid value transfers across market participants. More importantly, the pure succession rate approach would be very difficult to implement without strong legislative support and regulatory coordination to enforce such a transition among all existing EONIA users.

Under the recalibration approach, EONIA methodology would no longer rely on a panel of banks, as in the current methodology, but be calculated as a fixed spread over the new ESTER. Although no transition is risk-free, the working group believes that a fixed EONIA ESTER relationship would provide for a temporary stable platform to facilitate a gradual, smooth transition to ESTER. The evolved EONIA with a recalibrated methodology would continue to represent the euro overnight unsecured market but draw on a more representative and stable set of input data based on a higher volume of transactions. To avoid value transfer, a transition spread should be used under this approach. To ensure that there is an incentive for market participants to transition from EONIA to ESTER, the availability of the evolved EONIA would be limited in time. The working group also believes that during that closed period, the evolved EONIA should be authorised and therefore allowed to be used under the EU Benchmarks Regulation.

The working group has therefore formulated the following recommendations for which it is seeking feedback:

1. The working group recommends that the European Money Markets Institute (EMMI), as the administrator of EONIA, takes the following steps before 1 January 2020:
  - (a) Modify the current EONIA methodology to become ESTER plus a spread for a limited period, in accordance with Financial Stability Board (FSB) recommendations and IOSCO Principles for Financial Benchmarks to further anchor EONIA's methodology in transactions;

- (b) Engage with the relevant authorities to ensure the compliance of EONIA, under its evolved methodology, with the EU Benchmarks Regulation;
  - (c) Consider and consult market participants on discontinuing the publication of EONIA under its evolved methodology, after a transition period that ensures firms can achieve transition to ESTER in a smooth manner and that pays due regard of the existing EONIA legacy book. This transition period should last until the end of 2021, which is consistent with benchmarks transitions in other jurisdictions.
2. The working group also invites EMMI to take the following considerations into account:
- (a) Consider an EONIA-ESTER spread methodology based on a simple average with an observation period of at least 12 months, combined with a 15% trimming mechanism;
  - (b) That the recalibration methodology and the effective determination of the spread are announced at the same time before ESTER's first day of publication;
  - (c) That the recalibration date is on the first day of ESTER's publication for simplicity reasons.
3. The working group recommends that market participants gradually replace EONIA with ESTER as a reference rate for all products and contracts and make all adjustments necessary for using ESTER as their standard benchmark after the transition period (including making the appropriate changes to their systems to enable a T+1 publication).
4. The working group encourages market participants to make all reasonable efforts to replace EONIA with ESTER as a basis for collateral interest for both legacy and new trades with each of its counterparties (clean discounting).

The ECB provides the secretariat for the working group on euro risk-free rates and is publishing the report solely in this capacity. The ECB does not however accept any responsibility or liability for the contents of the document and the fact that the ECB provides the secretariat for the working group should not be taken as implying in any way that it shares the views expressed in the document.

## 2 Introduction

**This is a report by the working group on euro risk-free rates.** It seeks feedback from market participants on the technical analysis conducted by the working group on the available paths for the transition from EONIA to ESTER, as well as on the recommendation on the preferred identified transition option. Responses to the questions included in Chapter seven of the report (“Conclusions”), as well as any additional comments on this document, should be sent to [EuroRFR@ecb.europa.eu](mailto:EuroRFR@ecb.europa.eu) by 17:00 CET on 1 February 2019. The ECB provides the secretariat for the working group and is publishing the report in this capacity. The ECB does not however accept any responsibility or liability for the contents of the document and the fact that the ECB provides the secretariat for the working group should not be taken as implying in any way that it shares the views expressed in the document. The ECB will evaluate all the responses and prepare an anonymised summary of the feedback. This summary will be published on the ECB’s website and discussed by the working group in February 2019.

### 2.1 Background

Since its introduction in 1999, the euro overnight index average (EONIA) has been one of the most widely used interest rate benchmarks in the euro area. EONIA is used as a reference rate in financial instruments – spot contracts and overnight index swaps (OIS) – and also as a discounting curve for collateralised euro cash flows, including those referenced to EURIBOR. Added together, the total notional amount of contracts referenced or valued using EONIA exceeds €100 trillion. This also illustrates that the liquidity of the EONIA-based OIS market is relatively high compared with other jurisdictions.

Due to its systemic importance, the European Commission added EONIA to the list of critical benchmarks on 28 June 2017 pursuant to Article 20 of the EU Benchmarks Regulation<sup>5</sup>. Under its current methodology, EONIA is not compliant with the EU Benchmarks Regulation<sup>6</sup> and consequently, in its current form, EONIA cannot be used after 1 January 2020<sup>7</sup>.

This would have an impact on a wide range of instruments and contracts, making a swift and smooth transition to a more robust risk-free rate necessary to avoid market dislocation and protect users, especially less sophisticated users. Taking this into account, it is clear to the working group that taking no action would be the worst option.

<sup>5</sup> Commission Implementing Regulation (EU) 2017/1147 of 28 June 2017 amending Implementing Regulation (EU) 2016/1368 establishing a list of critical benchmarks used in financial markets pursuant to Regulation (EU) 2016/1011 of the European Parliament and of the Council.

<sup>6</sup> Regulation (EU) 2016/1011 of the European Parliament and of the Council of 8 June 2016 on indices used as benchmarks in financial instruments and financial contracts or to measure the performance of investment funds.

<sup>7</sup> EONIA use can, however, be permitted by the national competent authority (the Belgian Financial Services and Markets Authority – FSMA) in legacy contracts pursuant to Article 51(4), of the EU Benchmarks Regulation.

## 2.2 The working group on euro risk-free rates

In September 2017, the European Central Bank (ECB), the Financial Services and Markets Authority (FSMA), the European Securities and Markets Authority (ESMA) and the European Commission announced the launch of a working group on euro risk-free rates. The working group was tasked with identifying and adopting a “risk-free overnight rate” which can serve as a basis for an alternative to the current benchmarks used in a variety of financial instruments and contracts in the euro area.

Following a consultation, on 13 September 2018 the working group recommended the euro short-term rate (ESTER) as the alternative euro risk-free rate and replacement for EONIA.<sup>8</sup>

## 2.3 The subgroup on EONIA transition

To ensure a smooth transition from EONIA to the recommended risk-free rate ESTER, the working group set up a subgroup on EONIA transition (hereinafter “subgroup”) in July 2018. The subgroup has the following deliverables<sup>9</sup>:

- a technical analysis of available paths for the transition from EONIA to ESTER, including the analysis of possible market-led transition paths and successor rate transition paths;
- a recommendation to the working group on the best transition path option(s).

The subgroup members have a wide range of expertise and market experience as both providers and users of EONIA financial instruments and contracts. Representatives from the ECB, the ESMA, the European Commission and the FSMA participate in the subgroup as observers, while the ECB provides the secretariat.

As the deadline of 1 January 2020 approaches, there are still many uncertainties. The subgroup has taken a balanced approach between the need to provide a clear message and the uncertainty of potential future measures implemented by the public sector. Where possible, the subgroup has taken a conservative approach to these potential measures, but at the same time highlights the benefits of continued collaboration with public authorities, which can substantially improve stakeholder coordination and the effectiveness of the different transition paths identified by the group.

## 2.4 Structure of the report

In order to take advantage of the wide range of expertise in the group, the drafting of this report was divided among all subgroup members. Conference calls were held on a bi-weekly basis and drafts were open for comments from the subgroup and working

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<sup>8</sup> See [“Private sector working group on euro risk-free rates recommends ESTER as euro risk-free rate”](#).

<sup>9</sup> See [“Terms of reference for subgroup 4 on EONIA transition”](#).



group members. The report was endorsed by the working group in its plenary meeting on 19 December 2018.

The report is structured into six main parts:

Chapter 1 "Executive summary" summarises the main constraints, options and recommendations put forward by the working group for market feedback.

Chapter 3 "Background and objectives" provides an overview of EONIA vulnerabilities, the reasons why EONIA's current methodology cannot become compliant with the EU Benchmarks Regulation and the main risks to market integrity in the event of a disorderly cessation or prohibition of EONIA under the EU Benchmarks Regulation. It describes the main objectives of the working group, which include avoiding the use of fallback clauses and the ability to transfer EONIA-based derivatives market (OIS) activity and strong liquidity to the new ESTER.

Chapter 4 "EONIA footprint" provides an overview of current EONIA usage. It shows that EONIA is used in a wide range of instruments and contracts, making its recognition as critical benchmark justified. Although there is currently a lack of sufficient data, EONIA use seems to be mainly concentrated in the derivatives market, with the majority of legacy contracts maturing within 12 months.

Chapter 5 "Transition approaches" identifies and describes all transition paths from EONIA to ESTER even if some are unfeasible under current conditions. For each path, the main features, general transition philosophy and steps to be taken are described.

Chapter 6 "Comparative analysis" provides an analysis of each identified transition path using predefined criteria and then assigns ratings. The criteria include (i) effectively transferring current EONIA liquidity to ESTER, (ii) mitigating value transfers between counterparts and (iii) reducing complexity and potential litigation risks. Although no transition path has been identified as risk-free, some of the transition paths clearly appear to ensure smoother transitions than others.

Finally, Chapter 7 outlines the main conclusions and the four working group recommendations. Under the current regulatory framework and market conditions, the working group is in favour of developing the current EONIA methodology to become ESTER-dependent. This interim path can provide a temporary stable platform in which the current liquidity of EONIA-based derivatives can be transferred to ESTER. The use of a fixed spread adds some complexity but mitigates the potential value transfers between EONIA users. In this section the working group encourages market participants to express their views on the recommended transition path option.

## 3 Background and objectives

### 3.1 EONIA definition and short history

EONIA is a major reference rate for the European money markets which “*represents the rates at which banks of sound financial standing in the European Union and European Free Trade Area (EFTA) lend funds in the overnight, interbank money markets in euro.*”<sup>10</sup> The European Money Markets Institute (EMMI) is the administrator of the EONIA index. The ECB acts as its calculation agent.

EONIA was long considered a viable nearly risk-free rate<sup>11</sup>, supported by a panel-based methodology. Its use is broad: it stands as the main (nearly) credit-risk-free reference rate in the euro-denominated interest rate derivatives markets. As it is determined on the basis of executed transactions, it was seen to already broadly conform to international best practices.

In 2016, with the aim of enhancing the index’s governance and aligning it with the requirements of the EU Benchmarks Regulation, EMMI launched the EONIA Review. As part of this programme, EMMI also intended to enhance the EONIA methodology, in view of some shortcomings that had been historically observed.

#### Underlying market activity and submission indicators

The EONIA Review showed that the activity underpinning the benchmark had decreased since the financial crisis. In the early 2000s traded volumes did not fall below €32 billion, increasing to an average of almost €48 billion during 2007 and 2008. Since 2009, however, average yearly volumes have gradually declined, falling to around €7 billion in 2017. During the first half of 2018, the average EONIA volume was €4.7 billion. On 31 October 2018, EONIA was published on the basis of an underlying activity of €488 million.

The limited market activity has inevitably been mirrored by an increase in the underpinning volumes concentrated in a limited number of EONIA contributors. While between 1999 and 2009 approximately 51% of total daily EONIA volume was reported by the five most active banks in the panel, between 2010 and 2015 this average increased to 72%. In 2017, about 88% of the volume was reported by the top five non-zero contributors.

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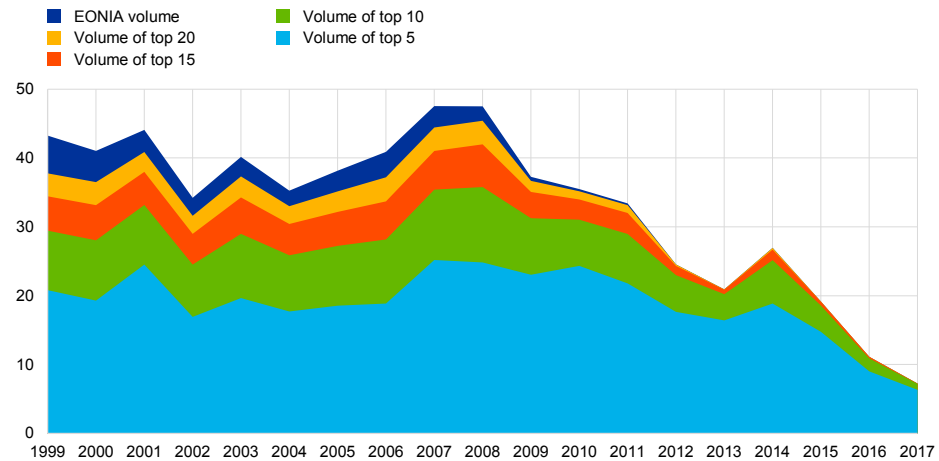
<sup>10</sup> As defined in EONIA’s “[Benchmark Determination Methodology](#)”.

<sup>11</sup> Financial Stability Board, “[Reforming Major Interest Rate Benchmarks. Progress report on implementation of July 2014 FSB recommendations](#)”, 21 July 2016.

## Chart 1

### EONIA volume and panel bank concentration

(1999–2017; EUR billions, yearly average)



Source: European Money Markets Institute (EMMI).

The number of EONIA contributors which submit non-zero volumes has decreased significantly in the past few years. Between 2004 and 2009, approximately 69% of EONIA contributors made non-zero submissions toward the index's determination. In 2017, only 38% reported overnight unsecured interbank lending activity on a daily basis.

The concentration of volume in a limited number of panel banks is a trend that may reflect the contraction of the unsecured money markets, as captured and portrayed more recently in the [“First ECB public consultation on developing a euro unsecured overnight interest rate”](#) and [“EMMI's presentation on issues related to the EONIA transition during the roundtable on euro risk-free rates”](#).

EMMI therefore concluded that, under current market conditions and dynamics, *“EONIA's compliance with the EU Benchmarks Regulation by 1 January 2020 cannot be warranted, as long as its definition and calculation methodology remain in its current format.”*<sup>12</sup>

## 3.2 Impact of EONIA not complying with the EU Benchmarks Regulation as of 1 January 2020

Pursuant to the EU Benchmarks Regulation, only registered or authorised benchmarks can be used in new contracts conducted as of 1 January 2020. Based on EMMI's conclusion that – in its current form – EONIA's compliance with the EU Benchmarks Regulation cannot be warranted, EONIA in its current form can therefore not be used for new contracts entered into after 1 January 2020.

<sup>12</sup> European Money Market Institute, [“State of play of the EONIA Review”](#), February 2018.

Following a consultation, on 13 September 2018 the working group recommended ESTER as the alternative euro risk-free rate and replacement for EONIA.<sup>13</sup>

As a wide range of EONIA-linked products and valuation processes will be affected as of 1 January 2020, and ESTER will only be published by the ECB (as the administrator) from October 2019 (at the latest) onwards, market participants need to plan this transition carefully but in a timely manner to minimise disruption to the markets and consumers and to safeguard the continuity of contracts to the greatest extent possible. An orderly transition from EONIA to the new risk-free rate is recommended to avoid any unpalatable scenarios (potential examples highlighted below):

1. The use of EONIA as the reference rate for calculating interest on collateral for legacy transactions may still be allowed under a number of Credit Support Annexes (CSAs) (assuming EONIA is still published). Hedging the outright and discounting risks resulting from these transactions using EONIA-linked derivative instruments (OIS) would no longer be permitted.
2. Even if the International Swaps and Derivatives Association (ISDA) prepares a protocol to voluntarily mass-convert legacy trades and CSAs to ESTER, many banks trade under different national derivatives frameworks (e.g. the German Master Agreement for Financial Derivatives Transactions (DRV), the French Banking Federation Master Agreement (FBF)) for which standard conversion and fallback solutions still have to be found. Basis risks between ISDA and non-ISDA trades/CSAs could arise. Market participants could also challenge the validity of any conversions if these are perceived to be economically detrimental to them.
3. Different market participants will only be able to adapt to new ESTER markets at different speeds, which could result in an uneven playing field with respect to market access.
4. Given that only European firms are subject to EU Benchmarks Regulation provisions, a new offshore EONIA market could develop where non-EU firms could: (i) still enter into EONIA-linked products among themselves, (ii) create a curve which could be used for discounting purposes, and/or (iii) even trade new EONIA-EURIBOR basis swaps to hedge their books. Such a scenario could create an uneven playing field for European market participants who would be unable to value and risk-manage their exposures in the same way as their non-EU peers.

All these scenarios entail potentially significant value transfers between market participants, which are not in the interests of the market as a whole.

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<sup>13</sup> [Private sector working group on euro risk-free rates recommends ESTER as euro risk-free rate](#)

### 3.3 Objectives of the working group

#### To ensure an orderly transition and to avoid market fragmentation

Paying due regard to the different uses of EONIA, the working group's key objective is to propose a coordinated and smooth plan for transitioning to ESTER. Without a clear approach to treating legacy EONIA exposures, different market participants could approach the issue in different ways and at different points in time, causing excessive market dislocations and transaction costs, potentially affecting market integrity and consumer protection. As described in the previous chapter, a fragmented transition would negatively impact hedging relationships and transaction valuations, and cause inconsistencies in collateral remuneration and discounting. Although fallback provisions are a vital emergency tool, the working group is in favour of avoiding their use where possible.

#### To help create a liquid risk-free rate market

An orderly transition will largely depend on the existence (or at least the market's confidence in the future existence) of a liquid ESTER derivatives market. The objective of the working group is to take advantage of the large amount of liquidity currently in the EONIA derivatives market, in particular in the EONIA OIS market, and propose a transition path which will promote as much depth and liquidity as possible in ESTER derivatives (and other) markets across all maturities.

Therefore, it is the objective of this working group to recommend a robust path for the transition from EONIA to ESTER in order to ensure sufficient liquidity in the ESTER market in a swift and timely manner.

#### Stakeholder coordination and communication

To achieve its objectives, it is necessary that all stakeholders communicate with one another. This could involve the management of central and bilateral collateral agreements, the timely publication of ESTER and EONIA by their administrators and possible contractual changes (ISDA, national/European framework contracts, etc.), as well as support from the public sector, including the national competent authorities.

## 4 EONIA footprint

EONIA is used by a wide array of stakeholders for various purposes. Both EONIA and its OIS derivatives curve can be used in processes that strongly influence the daily activities of market participants, such as use as a floating reference rate, and for collateral remuneration and cash flow discounting.

### 4.1 EONIA use in products

EONIA is commonly used as a reference rate in variable rate products with contractual maturity dates that may go beyond 30 years. This section provides an overview of the products in which EONIA is used most often. For further details see the quantitative mapping exercise on the usage of EONIA that was presented to the working group on 20 April 2018<sup>14</sup> and updated on 17 May 2018<sup>15</sup>.

**Overnight index swaps (OIS):** EONIA swaps are used as a way to hedge interest rate risk or take a position on interest rate expectations. Although their usage has declined following the financial crisis, changes in OIS rates have been correlated with changes in sovereign and corporate bond yields, indicating a clear transmission of moves in the unsecured overnight rate to market-based funding costs.

**Repurchase agreements (repo) and securities lending:** Repo desks can quote repos as a fixed rate, or as a variable rate versus EONIA<sup>16</sup>. Bank treasurers or buy-side players may consider entering into EONIA repos, as the operation is then directly comparable with the unsecured market conditions, which may mitigate interest rate risk.

**Debt capital markets:** In the current euro-denominated primary debt market, the presence of EONIA-linked issuances is very limited. However, in jurisdictions where the recommended risk-free rate is already being published (UK SONIA and US SOFR), investors have shown an increased appetite to buy floating rate notes based on risk-free rate benchmarks.

**Commercial paper (CP) and certificates of deposit (CD):** For short-term variable rate CP and CDs, EONIA is widely used, although practices vary across countries.

**Collateral remuneration for cleared and non-cleared derivatives:** Collateral remuneration through initial and variation margin calls for cleared derivatives and through CSAs are mostly provided in cash, which is mainly remunerated using EONIA (see chapter 4.2).

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<sup>14</sup> See “[Update on quantitative mapping exercise](#)”, 20 April 2018.

<sup>15</sup> See “[Update on quantitative mapping exercise](#)”, 17 May 2018.

<sup>16</sup> For French government bonds, the market convention is to quote repo rates as a spread versus EONIA.

**Current accounts, overdraft facilities and savings accounts:** EONIA is also used to remunerate clients' accounts, ranging from households to professional market players.

**Funds:** There are no official quantitative data on EONIA usage as an investment objective for funds across the asset management sector. Nonetheless, a number of investment firms are in the process of conducting inventories of benchmark usage in anticipation of implementing the EU Benchmarks Regulation and assessing compliance. The European Fund and Asset Management Association (EFAMA) surveyed their members on EONIA usage.<sup>17</sup> It received seven firm responses, the main points of which are summarised below:

- money market and fixed income funds are the main users of EONIA for benchmarking purposes;
- no strategy change is expected as EONIA does not have investible constituents, but this would need to be assessed on a case-by-case basis;
- the most commonly used instruments referencing EONIA are floating rate notes, repurchase agreements, interest rate derivatives and loan agreements;
- should EONIA be changed to reference ESTER, members expect to amend fund prospectuses, communicate with clients and adapt systems to cope with EONIA publication on a T+1 basis;
- respondents expect to need more than 12 months to be ready for transactions in ESTER-based instruments after official publication by the ECB.

Changing the systems to T+1 publication (see chapter 6.8) could strongly impact the way of calculating the net asset value (NAV) of funds. This in turn could lead to important changes regarding existing cut-offs for fund subscription/redemption, in particular for funds offering same-day settlement. For a smoother transition, it would be best to avoid migrating EONIA publication to T+1 before ESTER is fully operational and becomes effective.

**Swingline loans:** Swingline loans are loans typically granted to support a borrower's CP programme. They can usually be requested on a same-day basis for very short drawing periods (typically one to seven days). Swinglines denominated in euro mostly refer to EONIA plus a spread.

**Default interest or penalty rate:** In some euro area countries, by law or common market practice, default interest or penalty rates accrue on overdue amounts on a day-to-day basis. The actual reference rate used may be EONIA.

**Non-standard interest period:** EONIA is also used to interpolate an interest rate such as EURIBOR due over a non-standard interest period.

**Guarantees:** Interest rates charged by banks in case a guarantee is called by the beneficiary may refer to EONIA.

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<sup>17</sup> See Annex 8.1 for further details.

**Guaranteed investment contracts (GICs):** In GICs, often used in asset securitisation structures, the interest rates at which special purpose vehicles (SPVs) would deposit/lend their excess cash may also refer to EONIA.

**Intercompany transactions:** For longer-term intercompany agreements, EURIBOR is more prevalent. However, for daily intragroup cash sweeps and short term intercompany agreements, EONIA may be used.

## 4.2 EONIA use in balance sheet and valuation processes

EONIA and its OIS curve are used as a key reference rate for essential processes such as risk management, cash flow valuation and internal pricing between business areas within banks. It is therefore used in back or middle offices as a reference for a wide range of internal processes or by balance sheet management functions for regular valuation exercises. This section provides an overview of the processes in which EONIA is most widely used.

**Cash flow discounting or valuation:** For collateralised derivatives such as EURIBOR swaps, there will (most commonly) be daily collateral calls based on the current valuation of the swap. The party which owes money will post eligible collateral to the other party of an equivalent amount. For cash collateral, the CSA defines the interest rate paid on this collateral type, usually the relevant overnight rate (for euro, this is EONIA in the vast majority of cases). As a result, future cash flows of collateralised derivative trades including EURIBOR products should be discounted using the OIS curve because EONIA is the rate at which they are funded. Dealers have accelerated their transition from EURIBOR to OIS discounting for collateralised trades since the financial crisis in 2008, following a widening of the OIS-EURIBOR basis.

Similarly, from around 2010 onwards, clearing houses have also transitioned to OIS discounting; EUR derivatives are now discounted at EONIA.

**Risk management – margin:** Actual and historic price information for EONIA swaps is used as an important input into risk management models. These models are universally used by market participants to evaluate the riskiness of a trading portfolio. Such metrics are essential for quantifying initial margins for clearing purposes under EMIR, which prescribes criteria such as the margin period of risk, lookback horizon and level of confidence. They are also vital for bilateral counterparty risk management, for example in the context of the uncleared margin rules.

**Risk management – concentration:** From a liquidity perspective the observed cost of un-winding an EONIA portfolio may be used to assess the portfolio exit costs over and above a straightforward market move P&L. These liquidity costs may lead to additional margin requirements, particularly when positions are highly concentrated.

**Stress testing:** From a stress testing perspective the largest observed historic moves in EONIA swap prices are commonly used either to calibrate the size of stress



scenarios or directly as a real observed event, where such real observations may relate to events not captured within the lookback horizon for margin purposes.

**Balance sheet management** (see further “Accounting perspective” in chapter 6.7):

- Fund transfer pricing for intercompany loans are usually referenced at EONIA. Business areas or internal desks can be partially funded on a daily basis at a rate simply calculated as EONIA +/- spread.
- Balance sheet management books (especially high-quality liquid asset (HQLA) buffers) are frequently managed using EONIA asset swapped bonds, especially for short-term papers.
- Balance sheet management books are also frequent users of EONIA-based derivatives products, especially EONIA interest rate swaps (IRS).

## 5 Transition approaches

### 5.1 Criteria used to recommend the best possible transition approach

In order to recommend the best possible transition approach the working group has considered the following criteria:

1. **Benchmark Regulation:** a key factor for the success of a potential benchmark transition path is that it pays regard to the current legislative and regulatory framework particularly the deadline of 1 January 2020 by which, under its current methodology, EONIA's compliance with the EU Benchmarks Regulation cannot be warranted and consequently, its use will be prohibited.
2. **Legal risks:** the potential litigation risks stemming from any benchmark transition path and any mitigating factors should be properly analysed.
3. **Smooth and effective transfer of liquidity:** a successful benchmark transition path should avoid fragmentation and ensure a smooth and effective transfer of liquidity (i.e. derivatives and non-derivatives) from EONIA to ESTER.
4. **Economic risks:** a potential value transfer as a result of the benchmark transition from EONIA to ESTER should be mitigated to the maximum extent possible.
5. **Collateral management:** the consequences of a benchmark transition must be manageable from a collateral management perspective. A successful transition path should not increase the complexity surrounding the valuation and remuneration of collateralized derivatives.
6. **Risk Management:** from a risk management perspective, a successful benchmark transition would allow i) proper measurement of the risks stemming from products and instruments based on the relevant benchmarks especially the EONIA legacy book and ii) provision of the ability to hedge the underlying risks stemming from these benchmarks.
7. **Operational readiness:** the benchmark transition path should be operationally possible within the given timeline constraints. Systems and market infrastructures readiness for all market participants (buy-side, sell-side, trading platforms, clearing houses, etc) is essential for this purpose.
8. **Financial accounting:** the impact of a benchmark transition on financial accounting should be mitigated both from a "day 1-P&L impact" and a hedge accounting perspective.

In chapter 6, the working group details these factors and concludes with a comparison between the preconditions and constraints versus the various identified transition approaches.

## 5.2 Description of available transition approaches

The working group distinguishes between the following families of transition approaches:

1. Parallel run
2. Contractual alternative
3. Recalibration
4. Pure succession

These families were defined based on the following key questions:

- Does the path involve developing the current EONIA methodology (not compliant with the EU Benchmarks Regulation) to become ESTER-dependent?
- Does the path involve continuing the publication of EONIA?
- Does the path involve the application of a non-zero spread between EONIA and ESTER?
- Does the path involve the simultaneous operation of EONIA and ESTER discounting regimes?
- A fifth important question, which is of great practical significance, is whether time limits apply as a defining feature of a transition option. These time limits could apply to the benchmark publication, to the contractual use and/or to the discounting environments. Where time limits are a defining feature of an approach, their nature is outlined in its definition.

### Parallel run approaches

#### Defining features

**EONIA methodology:** the current methodology does not evolve and remains independent of ESTER during the critical phases of these approaches.

**Parallel publication:** there must be parallel publication of EONIA and ESTER. This is contingent on:

1. continued support by panel banks to maintaining the current EONIA and
2. on EONIA fulfilling all regulatory requirements.

**Transition spreads:** since EONIA and ESTER remain independent, the spreads between the rates, on both a spot and a forward basis, are a function of market developments and are not prescribed as part of the approach.

**Single or dual discounting:** there must be simultaneous independent operation of an EONIA discounting regime and an ESTER discounting regime with a given counterparty, and specifically at a given central counterparty (CCP).

**Time limits:** under the parallel run approach there is a choice between an open-ended approach and a time-limited approach.

## General transition philosophy

The parallel run approaches are pure market-led transitions. Their objective is to give users of the EONIA benchmark time to familiarise themselves with ESTER-based instruments, to develop an ESTER liquidity pool alongside an EONIA liquidity pool, and to shift their exposures from EONIA to ESTER. This would be done on an entirely voluntary basis.

These approaches rely on the greater utility of ESTER, which leads market participants to choose it as a better alternative to EONIA in all contexts in which EONIA is currently used.

Enforced value transfer resulting from a parallel run transition can be zero due to the transition's gradual, voluntary and negotiated nature. Sufficient lead time is required to develop the parallel ESTER market and to perform the switch while EONIA contracts remain available for trading and EONIA remains available for use as a price alignment interest (PAI) rate.

In principle, the transition should be permitted to continue until the longest liability linked to EONIA vanishes from the market (or is at least sufficiently hedged). If a time limitation were applied to the parallel run approach, a time limit would be set for the use of EONIA in contracts and the operation of simultaneous discounting regimes. Rightly calibrated, the imposition of a time limit may act as a strong incentive to move away from existing practices. Under the time-limited approach, a discounting cessation date would be set on a discounting cessation announcement date prescribing the date at which the EONIA discounting regime will cease to exist. Residual exposures that would otherwise remain outstanding past the discounting cessation date would need to be transitioned to ESTER discounting via a conversion mechanism.

Although there are significant differences, the Paced Transition Plan of the Alternative Reference Rate Committee (ARRC) in the USA may be taken as an example of this approach. This plan aims to drive benchmark transition in the US market by establishing a SOFR market in parallel to the existing Fed Funds market, with independent fixings being published concurrently for both benchmarks. No pre-defined cessation of the Fed Funds benchmark has been prescribed or is envisaged.

## Transition framework and steps to be taken

- ESTER and EONIA coexist as two independent benchmark fixings in the market and both benchmarks fulfil all regulatory requirements.
- As EONIA in its current form will not meet the requirements set out under the EU Benchmarks Regulation (full compliance mandatory by 1 January 2020), a successful parallel run approach requires this provision to be extended until the maturity date of the longest outstanding legacy EONIA-linked contract (in case of an open-ended approach) or until the discounting cessation date (in case of a time-limited approach). As EONIA does not become dependent on ESTER, market participants need the freedom to hedge, to risk manage risks, and to auction legacy EONIA positions.
- In parallel to the existing EONIA market, a sufficient liquid market for an independent ESTER as the underlying benchmark rate needs to be created in parallel for most, if not all, products and processes described in Chapter 3 “EONIA footprint”.
- For hedging ESTER exposures and transitioning legacy EONIA contracts, new liquid derivatives have to be created, which should cover ESTER OIS, ESTER-EONIA basis swaps and, ESTER-EURIBOR basis swaps (all the way to the long end of the curve, which commonly extends out to 50 years).
- Steps include establishing an ISDA definition for ESTER use in derivatives, an internal set-up for market makers, prime/clearing brokers and clients, trading venues/broker screens for ESTER products, CCP service extensions and trade reporting extensions.
- Regulatory and commercial incentives to support the adoption of ESTER need to be established. Likewise, disincentives to ESTER adoption (e.g. for instance, possible impact from the Fundamental Review of the Trading Book) need to be avoided. Disincentives to EONIA use may be implemented at a later date.

## Contractual alternative approaches

### Defining features of contractual alternative approaches

**EONIA methodology:** similar to parallel run approaches, in contractual alternative approaches EONIA methodology does not evolve and remains independent of ESTER during the critical phases.

**Parallel publication:** there will be a parallel publication of EONIA and ESTER. This is contingent on: (i) the continued support by panel banks to maintaining the current EONIA and (ii) on EONIA fulfilling all regulatory requirements.

**Transition spreads:** since EONIA and ESTER remain independent, the spreads between the rates, on both a spot and a forward basis, are a function of market developments and are not prescribed as part of the approach.

**Single or dual discounting:** contrary to the parallel run approaches, there is no point in time at which simultaneous independent discounting regimes will coexist.

**Time limits:** Under the contractual alternative approach there is the choice for open-ended approach or a time-limited approach.

### General transition philosophy

As with the parallel run, the contractual alternative approach aims to give users of the EONIA benchmark time to familiarise themselves with ESTER-based instruments and recognise their greater utility.

Under an open-ended contractual alternative approach, EONIA contracts will remain available indefinitely but the EONIA discounting regime ceases after a discounting switch date. Under a time-limited contractual alternative approach, a hard time-limit is set also on the use of EONIA in contracts (on a contractual cessation date). In addition, under the time-limited approach, the EONIA discounting regime ceases after a discounting switch date.

On the discounting switch date, outstanding and new contracts subject to EONIA discounting will be switched to the ESTER discounting regime.

The discounting switch date should allow for a period long enough to minimise cliff effects, but be short enough to serve as a transition incentive.

### Transition framework and steps to be taken

- The open-ended contractual alternative approach involves a switch of discounting regimes as of a discounting switch date. This discounting switch date would need to be set out in an announcement, and this date could be disruptive to market participants.
- The time-limited contractual alternative approach requires additionally setting out a cessation of the contractual use, alongside the switch of discounting regime as of a contractual cessation date. The announcement of the contractual cessation date could create a cliff effect and be disruptive to market participants. Extensive consultation over and signalling of the discounting switch date, discounting switch announcement date, the contractual cessation date and the contractual announcement cessation date is required to manage and minimise the potential cliff effects. Compensation mechanisms may need to be designed and implemented in order to help to mitigate these effects.
- As EONIA in its current form will not meet the requirements set out under the EU Benchmarks Regulation (full compliance mandatory by 1 January 2020), a

successful open-ended contractual alternative approach needs market participants to be able to manage their risks and auction legacy EONIA positions.

- A standard methodology for closing out or transitioning any legacy EONIA exposure on the discounting switch date may be very helpful (and potentially publicly consulted on). For example, standard compensation mechanisms may help to minimise the likely value transfer resulting from this process and to minimise any disputes or litigation risks.

## Recalibration approaches

### Defining features of recalibration/spread/dual and single discounting approaches

**EONIA methodology:** EONIA's current methodology (currently not compliant with the EU Benchmarks Regulation) will be developed to become a dependent<sup>18</sup> on ESTER as of a recalibration date. This directly links the two benchmarks and allows them to be exchanged. With a fixed spread, both OIS curves are expected to become parallel with identical shapes.

**Parallel publication:** EONIA and ESTER must both remain in publication beyond this recalibration date (however EONIA will now be published as a tracker benchmark to ESTER).

**Transition spreads:** EONIA becomes linearly dependent on ESTER, with a fixed, constant and spread. Although in theory this spread could be zero, it would lead to a value transfer across market participants and would therefore not be ideal.

**Single or dual discounting:** for the recalibration approach, both a: (i) clean discounting regime (single discounting curve is used with a given counterparty and specifically at a given CCP) and (ii) dual discounting regime (two discounting regimes are in simultaneous operation with a given counterparty, and specifically at a given CCP), could be used in the period during which the recalibration approach would be applied. The preference would be, however, to use a single discounting curve to ensure a consistent valuation approach for multiple purposes (i.e. accounting, risk management, collateral management, etc.).

**Time limits:** although in theory the recalibration approach could be applied without a time limitation, this is not considered ideal as it would lead to a fragmented market place with two overnight benchmarks being used simultaneously in both cash and derivative products where liquidity will be distributed over both benchmarks.

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<sup>18</sup> e.g. through a formula  $EONIA = ESTER + Spread$

## General transition philosophy

The open recalibration approaches aim to provide continuity in the legacy books by keeping the EONIA rate available for a certain period, and a recalibration of the EONIA methodology to provide a stable framework for its transition.

It aims to maximise the number of areas in which EONIA can continue to be used as a reference or discounting rate, and thereby to minimise cliff effects, including technological, operational and repapering work.

The approach aims to mitigate EONIA vulnerabilities whilst taking advantage of positive ESTER properties.

The approach also recognises the similarities and differences between ESTER and EONIA. Although they do not typically have the same numerical value, the correlation and the difference between both benchmarks have been stable.

The approach recognises that there is likely to be immediate demand to operate an ESTER (flat) discounting environment, not least for new ESTER trades, on the basis that ESTER (flat) is expected to be the sole discounting environment in the long term.

Cash markets, derivatives trading and clearing could continue in an almost seamless manner<sup>19</sup> pending the development of conventions and an approach to harmonise the (now dependent) EONIA and ESTER discounting regimes, which would co-exist for some period.

There is scope to vary other features of contracts and of the risk management framework that are subject to mandatory conversion.

For the above explained reasons the preferred option among the recalibration approaches would be the time-limited recalibration approach with spread and single discounting.

## Transition framework and steps to be taken

- The current non-compliant EONIA methodology is developed to become ESTER-dependent and is implemented on a recalibration date.
- The recalibration approach with spread and dual discounting regime relies on the publication of the recalibrated EONIA index by its administrator for an ex-ante defined period of time.
- Additionally, the spread between EONIA and ESTER needs to be determined, and a methodology for this needs to be developed and implemented (see chapter 5.3 “Spread methodology”).

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<sup>19</sup> Some features may change, such as its publication date (T+1 vs T).



## Pure succession

### Defining features of pure succession

**EONIA methodology:** ESTER is simply deemed to be the successor and therefore will supersede EONIA. EONIA publication ceases as of a succession date and as of this same date ESTER is used instead of EONIA.

**Parallel publication:** as the succession date aligns with the first ESTER publication date, there will be no parallel publication.

**Transition spreads:** no transition spread

**Single or dual discounting:** as a result of the adoption of a spread of zero, there is no period during which two discounting regimes are in simultaneous operation (in an economic sense).

**Time limits:** there is no time limit on the use of ESTER as EONIA's direct successor.

### General transition philosophy

The pure succession approach aims to provide legal continuity to the marketplace by keeping an EONIA successor rate available (ESTER).

It aims to maximise the number of areas in which EONIA's use can continue undisturbed, thereby minimising disruption, but may require immediate technological, operational and repapering changes depending on the succession method.

The use of a single discounting regime for euro-denominated derivatives can be maintained. Adopting an approach that sets EONIA equal to ESTER makes an economic switch necessary.

The approach recognised that ESTER has been announced as a separate benchmark, and aims to take advantage of its positive properties.

The approach does not account for the fact that ESTER and EONIA do not generally have the same numerical values.

Outstanding trades which reference EONIA could retain this contractual linkage if a permanent fallback to ESTER is included.

The enforcement of an economic switch from an EONIA (flat) discounting environment to an ESTER flat environment could be potentially disruptive.

## Transition framework and steps to be taken

- Current EONIA is superseded by ESTER as of a succession date. Methods to achieve this<sup>20</sup> need to be identified and evaluated.
- No compensation mechanisms for the transition to a dependent EONIA in legacy trades have been proposed, although this might be challenged.
- The pure succession approach involves an economic switch of discounting regime. In this approach, the discounting switch date is the succession date. This switch could be disruptive to market participants, for example in respect of contract valuations, and would need to be accompanied by a succession announcement date.

Extensive consultation over and signalling of the succession date and succession announcement date are required to manage and minimise market disruption.

- A standard methodology for closing out or transitioning any legacy EONIA exposure on the succession date may be very helpful (and potentially publicly consulted on). For example, standard compensation mechanisms may help to minimise the likely value transfer resulting from this process and to minimise any disputes or litigation risks.
- Reasonable switch timelines should be between two and five years starting from when ESTER is published as a benchmark (this yields enough lead time to build a derivatives market).

## 5.3 Spread methodology

Several transition approaches (recalibration of EONIA methodology including a spread, successor rate) require that current EONIA methodology be changed by applying a spread to ESTER to provide a stable platform to facilitate a smooth transition from EONIA to ESTER. If the path of a successor rate or of an EONIA recalibration is recommended by the working group, the spread methodology would need to be put forward by EONIA's administrator, EMMI, in consultation with market participants. The aim of this chapter is to present and evaluate possible methodologies for calculating this EONIA-ESTER spread in line with the market situation and put forward several points to take into account in determining this spread methodology, supporting EMMI in its possible future thinking.

### Context

Evidence based on historical data shows that both rates have been highly correlated, and the spread observed between EONIA and ESTER has been rather stable since the start of the pre-ESTER publication in March 2017 (see Chart 2 below). The larger

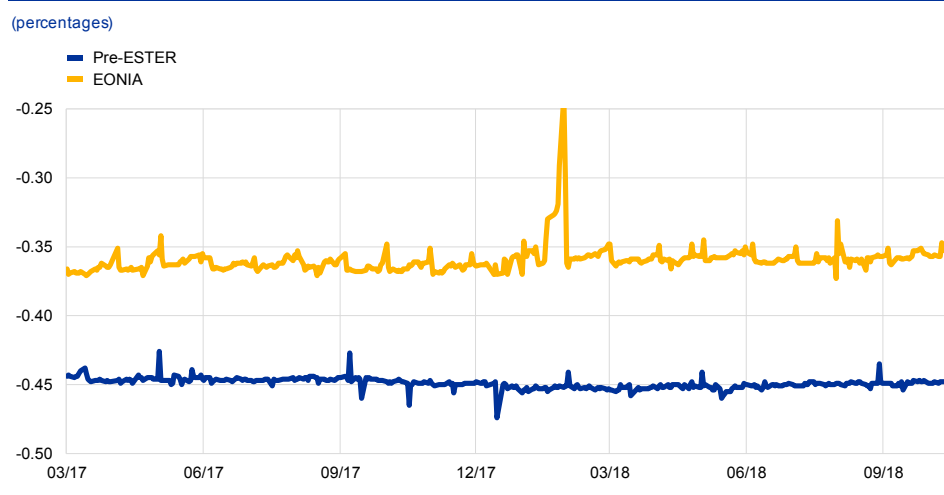
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<sup>20</sup> Ranging from fallback methodologies to legislative action.

EONIA-ESTER spread movements are generally driven by some atypical values of EONIA, which occurred as a result of the data sufficiency issues highlighted in Chapter 3, as observed for instance in November 2017.

## Chart 2

Spread between EONIA and pre-ESTER (since pre-ESTER data have been available, March 2017)



Source: EONIA data (EMMI) and pre-ESTER data available on the ECB website.

## Features of the EONIA ESTER spread

In the case of a successor rate scenario or recalibrated approach, a spread may be required to smooth the transition between EONIA and ESTER. This spread would measure the economic difference between the underlying interests of the two benchmarks: on the one hand, the EONIA, calculated as an interbank lending rate<sup>21</sup>, and on the other hand, ESTER, calculated as a borrowing rate based on a wider range of money market transactions<sup>22</sup>. This spread would measure the differences observed in the two benchmarks for the single purpose of the transition from EONIA to ESTER.

For this reason, the EONIA-ESTER spread should be fixed, and measured using evidence coming from the historical data from both pre-ESTER and EONIA. Indeed, the possibility of a “forward-looking spread” (i.e. a spread based on the derivative markets of both EONIA and ESTER, hence including a view of the future level of the rates), cannot be envisaged because a derivative market based on ESTER does not exist yet and would not exist at the time of the expected change in the EONIA methodology (see below). For the same reasons, a “dynamic EONIA-ESTER spread” cannot be contemplated.

<sup>21</sup> The underlying interest of EONIA is described thus by EMMI: “EONIA represents the rates at which banks of sound financial standing in the European Union and European Free Trade Area (EFTA) lend funds in the overnight, interbank money markets in euro.” ESTER’s underlying interest is described as followed by the ECB: “ESTER is a rate which reflects the wholesale euro unsecured overnight borrowing costs of euro area banks.”

<sup>22</sup> Adjusted by the difference between publication on T+1 (ESTER) and T (EONIA)

The objective of the EONIA-ESTER spread would be to provide a stable framework to facilitate a smooth transition to the more robust ESTER and to avoid market disruption for legacy EONIA contracts. In particular, in the scenario of a recalibration approach, this spread would be used in the new EONIA methodology (defined as ESTER + spread), for the limited amount of time during which EONIA would be maintained by its administrator. Consequently, in the long term this fixed spread might lose its importance as legacy EONIA contracts mature over time. The representativeness of the spread in the long term is rather conceptual, as the transition to a more sustainable ESTER is expected to be completed within a few years.

Several parameters and milestones are key for the determination of the EONIA-ESTER spread:

- the date of the announcement of the application of the spread methodology, i.e., the date at which the spread methodology would be announced by its administrator, EMMI;
- the “observation period” of the spread, i.e., the data period taken into account to determine the ESTER-EONIA spread;
- the calculation (or determination) date, i.e., the date at which the value of the spread is determined, based on the methodology and the historical data;
- the recalibration date, i.e. the implementation date of the new EONIA methodology (in the recalibration scenario);
- the first publication date of ESTER (by October 2019).

Finally, from a technical point of view, the rounding convention of the spread should be aligned with both EONIA and ESTER. Including a rounding to the third decimal (below 0.0005% is rounded down, above and equal to 0.0005% is rounded up).

## Criteria for selecting a statistical methodology

The statistical methodology used for the calculation of the EONIA-ESTER spread should reach the following objectives:

- Accurate representation of the spread
- Transparency and simplicity of understanding
- Data robustness

### Accurate representation of the spread

The EONIA-ESTER spread must be close to its last observed value to mitigate the potential value transfer resulting from the change in methodology. The chosen methodology must therefore be able to capture possible changes in the value of the

spread. This argument points to an observation period close to the day of the change of methodology and short enough to observe the impact of recent data on the value.

On the other hand, the methodology chosen must ideally be able to exclude anomalies which might not be representative of the economic value of the spread (see context above). This objective could be reached by using a long data series (which dilutes the weight of outlier data) and some statistical tools applied to the spread (trimming mechanisms)<sup>23</sup>.

### **Transparency and simplicity of understanding**

To reduce information asymmetries between participants, a transparent and simple methodology based on public data from the European Central Bank should be favoured.

For this reason, the EONIA-ESTER spread should rely on a simple historical average, median or mean with possibly a trimming mechanism if deemed useful.

### **Data robustness**

Several solutions are possible to avoid any potential vulnerability to single and large transactions or inappropriate external influence on the EONIA-ESTER spread, which are not mutually exclusive:

- A methodology which relies on historical data;
- A methodology based on the largest possible number of observations (this approach favours a long period of observation);
- A methodology relying on data published prior to any decision on the spread methodology, which are by construction more robust. NB: if ESTER is published earlier, in summer 2019, and the EONIA-ESTER spread methodology is announced around the beginning of Q2 2019, the period sensitive to inappropriate external influence will be minimised.

Based on these criteria, the working group considers that there are broadly two main approaches to determining the EONIA-ESTER fixed spread to be used for the transition:

1. a methodology based on as long a period of observation as possible;
2. a methodology based on a “shorter” observation period.

The shorter period is more sensitive to current economic conditions but this potential benefit may be outweighed by unwelcome volatility and vulnerability to outliers. Alternatively, a longer observation period may be less sensitive to current conditions

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<sup>23</sup> ESTER is using a 25% trimming mechanism on its input data, while in EONIA no trimming mechanism is applied to the contributions. The proposed methodology should ideally absorb the difference in approach.

but would benefit from statistical rigor due to the large sample size. For this reason, one year seems like a reasonable minimum period of observation.

A trimming mechanism could also be used to smooth out the possible outliers, especially if a shorter period of observation is preferred. The choice of the level of trimming (e.g. 25% or 10%) might be guided by practical considerations (e.g. low number of outlier observations). Based on these factors, and after reviewing the various options, a trimmed mean 15% seems to be an appropriate approach.

The working group listed the pros and cons of each option, depending of the length of the observation period.

Market participants should also note that EONIA-ESTER spread simulations based on publically available data to date show that the differences in value for each of the tested methodologies (longer and shorter period, trimmed or not trimmed) are overall limited and inferior to 0,012% (see study in Annex 8.2).

**Table 1**  
Criteria to determine the EONIA-ESTER fixed spread

Criteria	Option (i) period of observation as long as possible	Option (ii) shorter period of observation
<b>Accurate representation of the spread</b>	Lower A longer period of observation might lead to a higher risk of diverging with the last observation of the spot spread.	Higher Shorter observation period enables better capturing of possible change in the EONIA-ESTER spread dynamic and hence reduces valuation transfer risk.
<b>Transparency and simplicity of understanding</b>	Higher Difficulty of finding a meaningful starting date. For instance, March 2017 corresponds to the date as of which the MMSR data quality would be sufficient to calculate pre-ESTER.	Lower Difficulty of finding a meaningful starting date. One year prior to the determination date could be a compromise.
<b>Data robustness</b>	Higher Legitimacy of the historical behaviour. Lower risk of incentives for inappropriate external influence. Lower risk in case the EONIA-ESTER spread becomes less stable.	Lower However, slightly higher risks of incentives for inappropriate external influence could be mitigated: (i) by choosing an observation period that ends before the choice of the spread methodology is made (for instance, before February 19). However, the benefits of the better spread representation would then be lost; (ii) by bringing the publication date of ESTER forward (to summer 2019), as this would minimise the period sensitive to inappropriate external influence (i.e. between the announcement of the spread methodology around Q2 2019 and the fixing of the spread around the recalibration date in the summer).

### Additional considerations on the EONIA recalibrated approach

If such a transition path is implemented, the synchronisation between the announcement date, the determination date and the recalibration dates will be key.

To avoid any possibility of arbitrage, it might be necessary to limit unknown observations contributing to the EONIA-ESTER spread by avoiding an observation period where EONIA and ESTER are published in parallel (under the current methodology). Therefore, it might be preferable for the determination date for the EONIA-ESTER spread to be either before or the same as the ESTER publication date

(October 2019 at the latest). This would also allow for the spread to benefit from the current “stable regime” observed since pre-ESTER data have been published.

This leads to the conclusion that the announcement of the recalibration methodology and the effective determination of the spread should coincide in time before ESTER’s first day of publication.

In addition, to avoid ESTER and EONIA running in parallel and to avoid liquidity fragmentation, as well as for simplicity reasons, the working group would also be in favour of the recalibration date would be ESTER first day of publication.

## Summary

If the working group recommends the successor rate approach (ESTER to succeed EONIA) or an EONIA recalibrated approach including a spread (EONIA methodology to be reformed and indexed to ESTER), the calculation of an additional spread between the two benchmarks will be necessary to make the transition as smooth as possible.

Based on the considerations above, the working group:

- Recommends that the future EONIA-ESTER spread methodology should accommodate the above mentioned criteria (representativeness, transparency and robustness) if the successor rate approach or EONIA recalibration path is selected.
- *Recommends an EONIA-ESTER spread methodology based on a simple average with an observation period of at least 12 months, associated with a trimming mechanism at 15%.*
- Points out that, if an EONIA recalibration approach including a spread is chosen, synchronisation between the methodology announcement date, the spread determination date and the recalibration date will be key. In this regard, the working group would favour a spread determination date before ESTER publication date, to avoid the observation period including a spread where ESTER and the (non-reformed) EONIA are running in parallel. The working group would also favour that the recalibration date would be the first day of publication of ESTER.

## 6 Comparative analysis

### 6.1 Legal perspective

The purpose of this section is to provide high-level legal comments on EONIA transition paths to ESTER and the related challenges as seen from a legal perspective<sup>24</sup>. These high-level legal comments are provided for information purposes only and should not be relied upon as legal advice<sup>25</sup>. As pointed out in Chapter 4 (“EONIA footprint”), EONIA is mostly used in the OIS market for a range of processes, including valuation and margining of derivatives. Therefore, this analysis focuses primarily on issues relating to derivative contracts. The transition paths discussed in Chapter 5 will in the following be broken down into three distinct approaches:

1. parallel run and contractual alternative;
2. successor rate;
3. EONIA recalibration.

Each of the approaches mentioned above may also be combined with other approaches. In view of the many possible combinations, the current high-level legal comments are preliminary in nature and further legal analysis will be required once a transition path is chosen.

#### Parallel run approaches and contractual alternative approaches

Under these approaches the provision of EONIA would continue in its current form, without a change in methodology. This section will consider two variations of the parallel run approach:

1. the open-ended parallel run, which assumes an indefinite parallel run of EONIA alongside ESTER; and
2. the time-limited parallel run, which assumes a cut-over from EONIA to ESTER on a pre-determined and preannounced cessation date.

Both parallel run approaches, which are further developed below, are predicated on the coexistence of both EONIA and ESTER. The implementation of both scenarios would benefit from some actions and amendments under the EU Benchmarks Regulation, such as an extension of the EU Benchmarks Regulation transition period and/or mandatory contribution by panel banks, if needed. In particular, continued support by panel banks could become an issue in light of the coexistence of both rates. The EU Benchmarks Regulation grants the competent authority the power to

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<sup>24</sup> Legal comments and related challenges should be understood in a broad sense as referring to the inability to calculate payments that are due, potential voiding of contracts, financial losses, and disputes.

<sup>25</sup> Please refer to the disclaimer in Annex 8.8.



impose mandatory contribution for a limited period of time, namely 24 months (see “Regulatory/Benchmarks Regulation Considerations” below). Contractual alternative approaches are similar to parallel run approaches from a legal standpoint, as EONIA does not evolve and remains independent of ESTER.

### **Open-ended parallel run**

This transition path relies on the simultaneous publication of EONIA and ESTER for a presumed indefinite period. This means that outstanding transactions would continue to be linked to EONIA and calculated in the same way as they are currently.

This approach would have a number of practical advantages, including:

1. allowing existing contracts to mature, thereby reducing the legacy book exposure to EONIA without requiring amendments or changes during the terms of outstanding contracts (provided that the parties begin to reference ESTER in their new contracts);
2. allowing parties that wish to do so to agree on amendments to their documents in order to transition from EONIA to ESTER on terms bilaterally agreed at arm’s length (including with respect to any adjustment (such as a spread) to reflect economic differences between EONIA and ESTER);
3. allowing sufficient time for a deep and liquid ESTER market to develop, albeit this may be hampered as EONIA-discounting and ESTER-discounting markets will be running in parallel.

There may, however, be a disruption to contracts referencing EONIA if the EU Benchmarks Regulation transition period is not extended, in which case the use of EONIA will be prohibited for new contracts as of 1 January 2020, or if EONIA has ceased to operate (panel degradation or panel banks no longer making contributions – see “Regulatory/Benchmarks Regulation Considerations” below). It is therefore unrealistic to plan on the basis of an independent EONIA being available indefinitely. This risk can be mitigated by parties ensuring that (i) any new contracts which reference EONIA and (ii) any existing contracts which reference EONIA have in place robust fallbacks which will be effective in transitioning products from EONIA to ESTER (with appropriate adjustments where necessary) upon any cessation of publication of EONIA or any prohibition of the use of EONIA that applies to either counterparty.

It should be noted that fallbacks are generally viewed as a “safety net” to be deployed in times of difficulty. Depending on their terms and implementation, they may not result in a smooth or uniform transition from one rate to the other on terms which the parties would agree to if the transition were being effected by negotiated amendment at the time that an event triggers the fallback provisions. Any such fallbacks would need to incorporate appropriate adjustments (such as a spread) to reflect differences between EONIA and ESTER.

## Time-limited parallel run

Under this transition approach, ESTER is published in parallel with EONIA before a final transition. At the end of that period, EONIA would cease to be published (the “cessation date”). In this scenario, the adoption of ESTER is encouraged by notice that EONIA will be discontinued at a future date.

As with the open-ended parallel run approach, the time-limited parallel run approach has a number of benefits, including:

1. allowing for a deep and liquid ESTER market to develop;
2. reducing the stock of existing contracts referencing EONIA by allowing those contracts due to mature prior to the cessation date to expire, thereby reducing the legacy book exposure to EONIA without requiring any amendments or changes during the terms of outstanding contracts (provided that the parties begin to reference ESTER in their new contracts);
3. allowing parties that wish to do so to agree on amendments to their documents in order to transition from EONIA to ESTER prior to the cessation date on terms bilaterally agreed at arm’s length (including with respect to any adjustment (such as a spread) to reflect economic differences between EONIA and ESTER).

The main advantages of the time-limited parallel run approach compared with the open-ended parallel run approach are that it recognises the practical reality that EONIA will not be available indefinitely and that it encourages the stock of EONIA transactions to be reduced more quickly. During this multi-year phase-in period market participants, aware of the impending discontinuation date, would be encouraged to replace their existing contracts with new contracts referencing ESTER. Indeed, there may be a risk of disruption to contracts which reference EONIA if there is a planned cessation in the publication of EONIA (i.e. upon the cessation date) prior to those contracts maturing or being amended or if EONIA is prohibited from use in those contracts (as discussed in the analysis of the open-ended parallel run approach above).

There are several ways to mitigate the aforementioned risks<sup>26</sup>:

1. ensuring that the transition period is widely publicised and long enough to accommodate the re-writing of existing contracts that would not have matured as of the cessation date as well as to allow for a deep and liquid market for ESTER to develop;
2. pre-empting the transition contractually, where feasible, via bilateral agreements. Although there is no substitute rate concept in the 2006 ISDA Definitions, in cases where EONIA is substituted, there may be scope under some contracts for the reference rate to follow the new rate under the so-called “substitute rate” provisions, but this would probably not be the usual position. Instead, the

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<sup>26</sup> Actions referred to as risk mitigation have different degrees of effectiveness and may not eliminate the risks under consideration.

absence of a quotation of a reference rate on the specified rate source may result in the triggering of contractually provided rate fallbacks;

3. ensuring that (i) any new contracts which reference EONIA and (ii) any existing contracts which reference EONIA have in place robust fallbacks which will be effective in transitioning products from EONIA to ESTER (with appropriate adjustments where necessary) upon any cessation in the publication of or prohibition of the use of EONIA that applies to either counterparty. It is important to note that while the inclusion of fallback language in new contracts seems legally and operationally feasible, the amendment of existing contracts represents a significant challenge, notably for non-standardised contractual frameworks;
4. applying an industry-wide solution negotiated and implemented to nominate a successor rate as of the cessation date under the auspices of trade organisations such as ISDA. A protocol which had the effect of replacing references to EONIA in derivatives with references to ESTER as of the cessation date would, as a minimum, require identification of the alternative rate and a standardised adjustment mechanism to account for any differences between the original rate and the new rate. Consideration would need to be given to the approach for CSAs. However, it is worth noting that adherence to protocols is voluntary and protocols may not be an effective mechanism for multilateral amendments to contracts in situations where an arm's length negotiation of commercial terms is required.

The adoption of EU legislation designating or recommending ESTER as EONIA's successor, or granting a European authority the power to designate EONIA's successor, could only be applicable to contracts governed by the laws of an EU Member State and would require careful review under constitutional law and pursuant to other legal remedies pertaining to the protection of private property. It is important to note that such a legislative proposal is currently not under consideration<sup>27</sup>. In the absence of such a specific law, support from European authorities (e.g. the European Commission, the ECB, the ESMA, the FSMA) in the form of speeches, statements, regulatory guidance and reports would help to raise awareness among market participants and could mitigate legal concerns about the transition to ESTER, albeit it would not resolve all legal issues.

## Successor rate approach

This scenario foresees that either EMMI, as the administrator of EONIA, or any competent European authority in its regulatory capacity may declare ESTER as the

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<sup>27</sup> See minutes of the meeting of the working group on euro risk-free rates on [18 October 2018](#).

successor rate of EONIA. A “succession date” is announced upon which EONIA publication ceases and ESTER is designated as a successor.<sup>28</sup>

The mechanism by which ESTER is designated a successor to EONIA is yet to be defined. It is worth noting that EMMI has no authority to make such a designation under the EU Benchmarks Regulation, and that no legislative proposal granting a European authority the power to designate a successor rate to EONIA is currently under consideration by the EU co-legislators.

There is a risk of dispute and contractual disruption in case the successor rate does not measure the same economic reality as the benchmark which had been initially chosen by the counterparties. While there may be steps that can be taken to attempt to reduce this risk, they may be ineffective in preventing disputes.

Similarly, there may also be a potential risk of disputes and contractual disruption whenever value transfer is caused by the transition from one benchmark to another without appropriate compensation. If the methodology of EONIA evolves to include any such adjustment prior to the succession date, that may not preclude or render unnecessary the inclusion of such an adjustment when transitioning contracts from EONIA to ESTER. This is very uncertain, however, and additional analyses would be required including assessments of whether there are circumstances in which a change in methodology could lead to possible claims for contractual frustration and the impact on derivative valuation.

Finally, legacy books linked to EONIA may not have materially decreased by the succession date if ESTER were not available for use for a sufficient time prior to this point.

There are several ways to mitigate the aforementioned risks<sup>29</sup>:

1. ensuring that the period leading to the succession date is of sufficient duration to accommodate amendments to existing contracts;
2. ensuring that the succession date is widely publicised so that parties who enter into new contracts referencing EONIA after the succession date has been announced can arguably be understood to have contemplated the evolution of the methodology for EONIA (i.e. because it was common knowledge that such an evolution would occur during the life of the contract);
3. ensuring that the declaration of a successor rate should include the reference to a spread that minimises value transfer between parties;

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<sup>28</sup> Subject to the below reference to ISDA's Benchmarks Supplement, there are no standardised provisions in ISDA documentation that would result in a transaction falling back to an alternative benchmark nominated by the administrator of the original benchmark or a regulatory authority. A pure succession, in which EONIA publication is ceased at the same time as the relevant body declares ESTER as a successor, would result in the same outcome under the 2006 ISDA Definitions as an index cessation. ISDA's Benchmarks Supplement does contain such provisions, although they would be unlikely to be effective in this case if EMMI were to make the declaration because ESTER and EONIA are not “substantially the same”. Declaration by a European Authority may be more effective provided that higher fallbacks in the waterfall do not produce an alternative result.

<sup>29</sup> Actions referred to as risk mitigation have different degrees of effectiveness and may not eliminate the risks under consideration.

4. ensuring that (i) any new contracts which reference EONIA and (ii) any existing contracts which reference EONIA have in place robust fallbacks which will be effective in transitioning products from EONIA to ESTER (with appropriate adjustments where necessary) upon any cessation in the publication of or prohibition of the use of EONIA that applies to either counterparty.

In this case, too, the adoption of EU legislation designating or recommending ESTER as EONIA's successor, or granting a European authority the power to designate the successor of EONIA, could only be applicable to contracts governed by the laws of an EU Member State and would require careful review under constitutional law and pursuant to other legal remedies pertaining to the protection of private property. It is important to note that such a legislative proposal is currently not under consideration. Again, in the absence of such a specific law, support from European authorities (e.g. the European Commission, the ECB, the ESMA, the FSMA) in the form of speeches, statements, regulatory guidance and reports would help to raise awareness among market participants and could mitigate legal concerns about the transition to ESTER, albeit it would not resolve all legal issues.

### EONIA recalibration approach

Under this scenario, EONIA's current (non-compliant) methodology evolves so that it replicates ESTER with effect from a designated recalibration date, whereby both the recalibrated EONIA and ESTER remain in publication beyond the recalibration date for a period of time.

The EU Benchmarks Regulation requires administrators of benchmarks to publish, or make available to the public, the procedures for consulting on any proposed material change in the administrator's methodology, which will ensure transparency in the marketplace.

As with the parallel run approaches, the EONIA recalibration approach would have a number of practical advantages, including:

- (a) allowing existing contracts to mature, thereby reducing the legacy book exposure to EONIA without requiring amendments or changes during the terms of outstanding contracts;
- (b) allowing parties that wish to do so to agree on amendments to their documents in order to transition from EONIA to ESTER on terms bilaterally agreed at arm's length (including with respect to any adjustment (such as a spread) to reflect economic differences between EONIA and ESTER);
- (c) allowing sufficient time for a deep and liquid ESTER market to develop.

The evolution of the methodology and the potential resulting difference in benchmark levels could be challenged by some counterparties if they thought EONIA had a different benchmark or the EONIA methodology represented a material change from that which prevailed and/or was anticipated at the time the contract was executed.

To reduce litigation risk (disputes and contractual disruption) associated with the recalibration, the EONIA name should be maintained and the benchmark should continue to be published on the same screen, in order to preserve current references to EONIA in existing contracts. Litigation risks could be further reduced by minimising the value transfer resulting from the recalibration.

There are several ways to mitigate the aforementioned risks<sup>30</sup>:

1. ensuring that the declaration of an EONIA recalibration includes the reference to a spread that minimises or avoids to the extent practicable the transfer of value between parties;
2. ensuring that the recalibration date is widely publicised so that parties who enter into new contracts referencing EONIA after the recalibration date has been announced can arguably be understood to have contemplated any changes in the methodology for EONIA (i.e. because it was common knowledge that such changes would occur during the life of the contract);
3. ensuring that (i) any new contracts which reference EONIA and (ii) any existing contracts which reference EONIA have in place acknowledgements that the parties will continue with the contract despite any change in methodology, as well as robust fallbacks which will be effective in transitioning products from EONIA to ESTER (with appropriate adjustments where necessary) upon any cessation in the publication of or prohibition of the use of EONIA that applies to either counterparty;
4. clarification by EONIA's administrator and any European authority that the evolution of the methodology is not intended to alter the underlying interest, but aims to address its current shortcomings;
5. support from European authorities in communicating to market participants that the evolution of the methodology is in line with best practices and international recommendations, such as the ones issued by the Financial Stability Board (FSB) and the International Organization of Securities Commission (IOSCO), with a view to supporting a smooth transition from EONIA to ESTER;
6. seeking authorisation for the recalibrated EONIA under the EU Benchmarks Regulation. This would provide a more robust framework for the transition and would allow parties to use EONIA after the transition period currently provided by the EU Benchmarks Regulation. This would mean that contracts subject to life-cycle events would not face restrictions in this regard.

## Regulatory/Benchmarks Regulation considerations

In September 2018, the working group published a call to the co-legislators, requesting an extension of the EU Benchmarks Regulation transition period of at least

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<sup>30</sup> Actions referred to as risk mitigation have different degrees of effectiveness and may not eliminate the risks under consideration.

two years for critical benchmarks, such as EONIA. Although an amendment of the EU Benchmarks Regulation extending the transitional period for critical benchmarks is currently under consideration by the European co-legislators, the outlook for the legislative amendment requested is still uncertain. This question, whether there will be a longer EU Benchmarks Regulation transitional period, represents a major regulatory uncertainty in the context of the transition from EONIA to ESTER, particularly with respect to the parallel run approaches.

Should this amendment be adopted, EONIA's use would not be limited to legacy contracts, but EONIA (under its current methodology) could be used in new financial instruments/contracts until the end of the extended transitional period, even without EONIA being authorised under the EU Benchmarks Regulation. The ultimate goal is still to incentivise market participants to reference ESTER in new trades, to transition their contracts to ESTER, where feasible and possible, and allow the use of EONIA for legacy trades where practicable. The continuation of current EONIA would require consent and support across the board from panel banks and EMMI, as its administrator, and the FSMA, as the national competent authority, would need to sustain EONIA. Ultimately, continued contributions by panel banks will prove crucial in determining how long the current set-up for EONIA can continue to be referenced, at least in legacy contracts.

In this connection, the EU Benchmarks Regulation grants the competent authority the power to impose mandatory contribution if certain conditions are met, as a last resort option which can only be used for a maximum of 24 months. In light of this restrictive time limit the national regulators for contributing banks can, instead of compulsion, use powers of persuasion, and this option could be considered in the first instance. Indeed, a way of ensuring a longer sustained (although limited in time) availability of EONIA could be via voluntary contributions, which is the path followed by LIBOR submitters. The UK's Financial Conduct Authority gained voluntary support from LIBOR submitters for four and a half years to support the transition. A similar approach could be considered with regard to EONIA so as to ensure a representative and substantive contribution pool to maintain EONIA. But the success of such an approach will depend on current panel banks' willingness to commit to voluntary contribution to EONIA beyond what is required of them under the EU Benchmarks Regulation. It will also be contingent on the FSMA to support such an endeavour.

Conversely, if there is no extension of the transitional period of the EU Benchmarks Regulation, the FSMA could consider applying Article 51(4) of the EU Benchmarks Regulation to EONIA. The Regulation allows for continued reference of EONIA in legacy transactions 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". The application of this provision would allow the use of EONIA after 1 January 2020 only for those instruments and contracts which already referenced EONIA before 1 January 2020, leaving new trades and contracts (i.e. entered into after 1 January 2020) to reference ESTER. At the same time, the FSMA could also apply the powers to mandate continued administration of EONIA with mandatory contributions by panel banks under Articles 21 and 23 of the EU Benchmarks Regulation.

Additionally, in terms of the recalibration path, having an authorisation of recalibrated EONIA by the FSMA under the EU Benchmarks Regulation would entail a more robust framework for the evolution of the methodology and might help to reduce legal risks. The authorisation process could be an opportunity for European authorities to contribute to the transition by stating that the evolution of the methodology is not intended to alter the underlying interest represented by the benchmark and is in line with best practices and international recommendations. In addition, further legal analysis would be required, including assessments of whether there are circumstances under which an evolved methodology could lead to possible claims for contractual frustration and the impact on derivative valuation.

Finally, it should be noted that the regulatory reach is limited and that counterparties and financial instruments that are not subject to the EU Benchmarks Regulation could continue to reference EONIA for new and legacy contracts, as long as the rate were made available. This could, for instance, create the risk of mismatches and operational challenges in, for example, hedging arrangements, as some counterparties may use EONIA and others may not.

## Summary

All the EONIA transition paths under analysis pose different legal challenges – understood in a broad sense as the inability to calculate payments that are due, the risk of contracts being declared void/frustrated, financial losses, and legal disputes. However these risks could be mitigated in several ways. The likelihood of these risks materialising is contingent on the implementation of mitigating measures<sup>31</sup>.

Parallel run approaches would benefit from some actions and amendments under the EU Benchmarks Regulation, such as an extension of the transition period or mandatory contribution by panel banks. In particular, continued support by the existing panel banks in a concentrated underlying market could become a major regulatory issue in light of the coexistence of both rates. Contractual alternative approaches are similar to parallel approaches from a legal standpoint, as EONIA does not evolve and remains independent of ESTER.

On a first analysis, the successor rate approach may seem to represent a straightforward path. However, it would require the adoption of a European regulation granting a European authority the power to designate a successor rate to EONIA. No such legislative proposal is currently under consideration, however, and, even if such a regulation would be possible and were to be enacted, it would, on its own, be ineffective in the case of contracts governed by the laws of a non-EU Member State.

The risk of disputes and contractual disruption that stems from the EONIA recalibration path, whenever value transfer is caused by the transition from one benchmark to another or if counterparties consider the new EONIA as a different benchmark, could be mitigated through a spread that minimises or avoids value

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<sup>31</sup> Actions referred to as risk mitigation have different degrees of effectiveness and may not eliminate the risks under consideration.



transfer between parties. European authorities could also provide support by stating that the evolution of the methodology is in line with best practices and international recommendations, such as FSB recommendations and IOSCO principles, and continues to reflect the underlying interest, among other measures.

Once a transition path from EONIA to ESTER has been selected, the chosen approach should be further analysed from a legal perspective. For instance, further legal analysis may be needed to establish whether there are general litigation risks arising from any change in discounting regime, especially where there is a resulting transfer of value. Such analysis should consider if any such risks could be mitigated by extending the period in which dual discounting – be it (i) between legacy and existing contracts or (ii) between ESTER and EONIA for new contracts – is available before any discounting cut-over takes place.

## 6.2 Derivatives valuation impact<sup>32</sup>

**Table 2**

Derivatives valuation impact rating<sup>33</sup>

Impact on...	5.2.1 Parallel run approaches	5.2.2 Contractual alternative approaches	5.2.3 Recalibration / spread / dual discounting	5.2.3 Recalibration / spread / clean discounting	5.2.3 Recalibration/ no Spread	5.2.4 Pure succession
Impact on instrument universe and data feeds to avoid proxies	High	High	Medium	Low	Low	Low
Present value impact on legacy contracts (discounting)	Low	Low	Medium	Medium	High	High
Present value impact on legacy contracts (cash flow change)	Low	Low	Low	Low	Low (non-OIS) High (OIS)	Low (non-OIS) High (OIS)
Funding cost impact due to change in Present Value	Low	Low	Medium	Medium	High (big bang switch Jan 2020)	High (big bang switch Jan 2020)
Overall	Low / Medium	Low / Medium	Medium	Medium	High	High

The main valuation or price impact of the identified transition paths is determined by the characteristics of each transition path or family of transition paths relating to discounting regime changes, benchmark index level changes, and changes to the derivatives universe in general.

The analysis at hand will concentrate on general considerations and areas which are most likely to be important for the vast majority of market participants and which are

<sup>32</sup> Please see Annex 8.4 for additional information

<sup>33</sup> For the sake of clarity, the rating scheme ranges from “Low” (= small impact) to “High” (= major impact).

largely independent of individual portfolio constellations. For each transition path we will ask ourselves the following questions:

1. Does the universe of instruments to be priced change and, if so, are the required input data feeding the pricing models available or is there a risk to rely on proxies, which could cause significant pricing disruptions?
2. Does a particular transition path impact the price of a (legacy) derivative and associated funding costs?

Compensation schemes could be devised to counter adverse price effects on derivatives as a direct result of the transition. Holistic compensation schemes would need to be universal (counterparty independent), unambiguous (well defined across the market and part of the defining properties of each transition path to avoid dead-lock situations), and be applicable ex-ante to all affected exposures, covering, as a minimum, changes to projected cash flows, and changes due to discounting effects.

It appears reasonable to conclude that a change of P&L and projected cash flows could be measurable for all transition paths, but this would still require an agreement on the current value of the projected change (e.g. which discount curve would be used across counterparties). However, transition paths which include a (non-zero) spread between EONIA and ESTER do approximately this: they aim to keep projected cash flow curve levels largely unchanged or at least to minimise the impact. A universal and market-wide mitigation of further value impacts seems to be beyond reach, as it would rely significantly on counterparty specific factors and would need to be subject to bilateral negotiations. Again, transition paths which include a (non-zero) spread between EONIA and ESTER aim to mitigate this effect at least temporarily.

As the target of all transition paths is for transactions to reside under the umbrella of one single discounting and PAI regime based on ESTER, a forward-looking exposure management leading up to the transition point appears to be an effective tool to actively manage upcoming impacts. Hence, transition paths which provide sufficient lead time should be the least disruptive, while transition paths without time buffers are potentially the most disruptive.

## 6.3 Collateral impact<sup>34</sup>

**Table 3**  
Collateral impact rating

Impact on...	5.2.1 Parallel run approaches	5.2.2 Contractual alternative approaches	5.2.3 Recalibration / spread / dual discounting	5.2.3 Recalibration / spread / clean discounting	5.2.3 Recalibration/ no Spread	5.2.4 Pure succession
Collateral	High	Low	High	Low	Low	Low

<sup>34</sup> Please see Annex 8.5 for additional information

**Parallel run:** High – the need to provide the capability on a given date to compensate the same type of collateral (euro cash) at two different rates (independent EONIA and ESTER) according to a trade-level participant selection is highly problematic and creates additional complication.

**Contractual alternative:** Low – there is no point at which the same collateral (euro cash) needs to be compensated at two different rates (independent EONIA and ESTER), which reduces the challenge of this approach to that associated with switching from compensation at one rate to compensation at another.

**Recalibration/Spread/Dual:** High – in common with the parallel run approach, the need to provide the capability on a given date to compensate the same type of collateral (euro cash) at two different rates (dependent EONIA and ESTER) according to a trade-level participant selection is highly problematic and creates additional complication. However, this complication will be marginal if euro cash collateral is compensated based on ESTER with a spread as a replacement of EONIA.

**Recalibration/Spread/Clean:** Low – under this approach, there is no date on which the same collateral (euro cash) needs to be compensated at two different rates (dependent EONIA and ESTER), which reduces the challenges to those associated with switching from compensation at one rate to compensation at another. There is a marginal complication in that euro cash collateral may be compensated at ESTER plus spread for a period before transitioning to ESTER flat.

**Recalibration/No Spread:** Low – there is no point at which the same collateral (euro cash) needs to be compensated other than at a single rate, which reduces the challenge of this approach to that associated with switching from compensation at one rate to compensation at another.

**Pure Succession:** Low – euro cash collateral is always compensated at a single rate, meaning that the impact on collateral is very low under this approach.

## 6.4 Risk management impact

**Table 4**  
Risk management impact rating

Impact on...	5.2.1 Parallel run approaches	5.2.2 Contractual alternative approaches	5.2.3 Recalibration / spread / dual discounting	5.2.3 Recalibration / spread / clean discounting	5.2.3 Recalibration/ no Spread	5.2.4 Pure succession
<b>Trading Systems</b>						
<b>Description</b>	Not all systems might be able to distinguish between different discounting rates depending on CSA	Not all systems might be able to distinguish between different discounting rates depending on CSA	Not all systems might be able to distinguish between different discounting rates depending on CSA	Spread has to be taken into account for discounting	-	-
<b>Valuation</b>	High	High	High	Medium	Low	Low
<b>Market Data History (curves, volume)</b>						
<b>Description</b>	Market data history on ESTER not very long, possible use of pre-ESTER, EONIA history available, liquidity in EONIA curve will grow scarce in time	Market data history on ESTER not very long, possible use of pre-ESTER, EONIA history available, liquidity in EONIA curve will grow scarce in time	All risk on ESTER, market data history not very long, possible use of pre ESTER	All risk on ESTER, market data history not very long, possible use of pre ESTER	All risk on ESTER, market data history not very long, possible use of pre ESTER	All risk on ESTER, market data history not very long, possible use of pre ESTER
<b>Valuation</b>	Medium	Medium	Medium	Low	Low	Low
<b>Portfolio-Management-Liquidity of the products</b>						
<b>Description</b>	Illiquid ESTER at beginning, illiquid EONIA at the end	Illiquid ESTER at beginning, illiquid EONIA at the end				
<b>Valuation</b>	Medium	Medium	Medium	Low	Low	Low
<b>Portfolio-Management-Asynchronous transition from EONIA -&gt; ESTER</b>						
<b>Description</b>	Parts of a portfolio could incrementally change from EONIA to ESTER discounting (due to CSA change), two separate portfolios could arise, open risk position (VaR), Liquidity in EONIA-Swaps might grow scare	Parts of a portfolio could incrementally change from EONIA to ESTER discounting (due to CSA change), two separate portfolios could arise, open risk position (VaR), Liquidity in EONIA-Swaps might grow scare	Parts of a portfolio could incrementally change from EONIA to ESTER discounting (due to CSA change), two separate portfolios could arise, open risk position (VaR), Liquidity in EONIA-Swaps might grow scare	All discounting is done on one curve at a time	All discounting is done on one curve at a time, time to prepare is limited	All discounting is done on one curve at a time, time to prepare is limited
<b>Valuation</b>	High	High	High	Low	Medium	Medium

Risk management consists of two parts: on the one hand, the ability to properly measure exposure to a risk factor, and on the other hand, the ability to act in order to eliminate or reduce that risk.

For transition paths with dual discounting regimes, where derivatives and collateral are based on two different benchmarks (EONIA and ESTER), systems might be able to make this distinction; the alternatives might be either erroneous risk measurement or costly IT projects. For transition paths with one single discounting regime a spread applied to ESTER might have to be taken into account for the discount curve.

Liquid markets with sufficient (historic) market data are very important to ensure an accurate representation of market realities. Under some transition paths a slow phase-in and phase-out of ESTER and EONIA products respectively would lead to curves based on low liquidity and would hamper the ability to manage a portfolio under risk. This is most prevalent when both discounting regimes are in place at the same time, forcing the risk/portfolio management to use both kinds of derivatives. Therefore, it appears that a swift transition from EONIA to ESTER would be preferable in order to reduce complexity and ensure the availability of necessary products.

As mentioned above, risk management includes the ability to eliminate or reduce the exposure to a risk factor. This is typically done by entering into derivative contracts to influence sensitivities to the risk factor in question. Under a transition path that allows bilaterally switching from one discounting regime to the other, hedged positions could become unhedged due to different timing. This initially causes a rise in risk measures (like VaR) and increases the need to enter new hedges. Rehedging needs to be done in time and entails transaction costs. Given the number of contractual counterparties, this could happen rather often over a long period of time.

## 6.5 Non-derivatives impact

**Table 5**  
Non-derivatives impact rating

Impact on...	5.2.1 Parallel run approaches	5.2.2 Contractual alternative approaches	5.2.3 Recalibration / spread / dual discounting	5.2.3 Recalibration / spread / clean discounting	5.2.3 Recalibration/ no Spread	5.2.4 Pure succession
Non-derivatives	Medium	Medium	Medium	Low	Low	Low

There is some difficulty in gauging the usage of EONIA beyond the derivatives market, particularly in scenarios where there will be continuing exposure to EONIA-indexed instruments. The orders of magnitude of these exposures are widely known to be smaller than in the derivatives market, and given the relatively short maturity of most of them, they should produce fewer obstacles to transition.

EONIA-linked banking products such as deposits, loans and facilities are small in volume and of a short-term nature, which means that a number of them will mature before EONIA is discontinued in the future. Longer-term products will likely be flexible enough to be re-papered to ESTER.

EONIA-linked investment products and structures where EONIA is embedded as a reference rate may be more complicated to amend, as this is likely to require a contractual change. These products will also likely have EONIA-linked derivative hedges. Notification or guidance from the relevant regulator, competent authority, or legislative body will enable this crucial switch.

## 6.6 Readiness of systems and market infrastructures<sup>35</sup>

**Table 6**

Readiness of system and market infrastructures impact rating

Impact on...	5.2.1 Parallel run approaches	5.2.2 Contractual alternative approaches	5.2.3 Recalibration / spread / dual discounting	5.2.3 Recalibration / spread / clean discounting	5.2.3 Recalibration/ no Spread	5.2.4 Pure succession
Systems and infrastructures	High	High	Medium	Low	Low	Low

The readiness of systems and market infrastructure does not significantly vary across the different transition paths. All systems will be mainly affected by the T+1 publication of ESTER (see 6.8). There are, however, significant additional complications associated with parallel run approaches. The main difficulties with the parallel run approach are due to this transition approach imposing a new requirement on the market, specifically parallel discounting under a given counterparty relationship, for which most systems are fundamentally ill-equipped, and due to lead times for modifying systems and infrastructures being needed.

## 6.7 Accounting perspective

The accounting issues identified in this chapter can largely apply to all the transition paths, but the analysis may change due to specific facts and circumstances. The International Accounting Standards Board (IASB) has started a research project, but it is unclear whether and when they will issue any guidance.

### Modification versus extinguishment

For financial instruments referencing to a risk-free rate, which are not subsequently measured at fair value, the question arises of how to account for a change in the underlying benchmark rate, such as replacing EONIA with ESTER. There are three possible accounting approaches, each impacting profit and losses (P&L) in a different way:

1. The transition from EONIA to ESTER could be interpreted as a movement in market rates of interest on a floating rate instrument, thus applying the guidance in International Financial Reporting Standards (IFRS) 9 B5.4.5 (previously IAS -International Accounting Standards- 39.AG7) (deemed floater accounting). Under this approach, the carrying amount remains unchanged and the effective interest rate (EIR) is updated prospectively. Following the transition, interest income is recognised using the new ESTER-based EIR.
2. The transition might be seen as a renegotiation of contractual cash flows, which does not result in derecognition and is accounted for in accordance with the

<sup>35</sup> Please see Annex 3 for additional information

guidance in IFRS 9.5.4.3 (modification accounting). Under this approach, the carrying amount of the financial instrument is recalculated as the present value of the renegotiated, ESTER-based cash flows discounted at the original EONIA-based EIR. The recalculation of the carrying amount impacts P&L on transition. Following the transition, interest income is still recognised using the original, EONIA-based EIR. Applying the guidance in IFRS 9 B5.4.6 (IAS 39.AG8) would result in the same accounting. There are also practical challenges involved when EONIA is no longer produced.

3. The transition from EONIA to ESTER could be considered as giving rise to a substantially different issue, i.e. a new financial instrument, resulting in derecognition of the original instrument, applying the guidance in IFRS 9 3.3.1 and 3.3.2 (extinguishment/derecognition). Under this approach, the difference between the current carrying amount of the original instrument and the fair value of the new instrument immediately impacts P&L on transition. Following the transition, interest income on the new instrument is recognised using the ESTER-based EIR. This approach also applies in cases where the contractual arrangements of financial instruments affected by the change in the benchmark rate are legally cancelled and replaced with a new contract.

## Hedge accounting – documentation of hedges referring to EONIA

The impact on hedge accounting largely depends on what are designated and documented as hedged items and hedging instruments as well as the entity's documented risk management objective.

If the hedging cash flow or the hedged risk is specified as being EONIA, the risk-free rate transition constitutes a change in the hedged risk or the hedged item, which typically triggers the discontinuance of a hedge relationship. Where a *specific loan* is designated as a hedged item, the impact on hedge accounting depends on whether the specific loan is considered to be modified or extinguished. If the specific loan is considered to be modified, the hedging relationship will typically be continued, whereas the original hedge relationship will typically need to be discontinued if the hedged item no longer exists due to extinguishment.

Regarding a *specific derivative* designated as a hedging instrument, similar considerations apply with regard to modification or extinguishment. While the hedging relationship is typically continued if the hedging instrument is not extinguished, an extinguished hedging instrument needs to be replaced, which is possible without discontinuing the hedging relationship only if a so-called rollover strategy is part of the entity's documented risk management objective.

## Cash flow hedge accounting – highly probable forecast cash flows

Both IAS 39 and IFRS 9 require forecasted hedged cash flows in a cash flow hedge to be "highly probable". Where these cash flows depend on benchmark rates such as

EONIA, the question arises as to what point in time the respective cash flows cannot be considered “highly probable” anymore and therefore the hedging relationship must be discontinued.

There are some arguments that, for 2018, the hedged cash flows can still be considered highly probable unless there are any clauses that would cause the hedged item to terminate when EONIA ceases, it will still contractually have floating rate cash flows once EONIA has been replaced. As ESTER is not in place at the current time, the best predictor of ESTER in the future is still EONIA, for which there is a deep and liquid market as evidenced by derivative and non-derivative transactions referencing to or priced off EONIA.

## Valuation of instruments at fair value

Benchmark rates such as EONIA are used as inputs (risk-free rate) in almost every fair value methodology for financial instruments. As IFRS 13 defines fair value as being the exit price of a financial asset or a financial liability, fair value methodologies will have to reflect the change from EONIA to ESTER.

IFRS 13 ranks fair values in a hierarchy for disclosure purposes. If a fair value is calculated by applying a methodology, it is typically not categorised as level 1<sup>36</sup> but rather as level 2<sup>37</sup> or 3<sup>38</sup>. Categorisation as level 2 or level 3 may depend on whether EONIA is still, or ESTER is already, liquid and thus considered observable in terms of IFRS 13.

Besides the accounting for financial instruments within the scope of IFRS 9, other areas of accounting may be impacted, as the respective accounting principles provide for the use of a risk-free rate. Examples are Employee Benefits (IAS 19), Impairment (IAS 36), Provisions (IAS 37), Investment Property (IAS 40), Leasing (IFRS 16) or upcoming Insurance Contracts (IFRS 17).

The IASB agreed to conduct a research project on the impacts of risk-free rate transition, but it is not certain whether it will issue any mitigating guidance, such as the amendment to IAS 39 issued in response to EMIR requiring the clearing of derivatives with a central counterparty (CCP). IASB staff have proposed moving the IBOR replacement from the research to the main agenda. In this context, they also questioned whether continuation of hedge accounting may lead to more relevant financial information.

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<sup>36</sup> Level 1 inputs are quoted prices in active markets for identical assets or liabilities that the entity can access at the measurement date (IFRS 13.76)

<sup>37</sup> Level 2 inputs are inputs other than quoted market prices included within Level 1 that are observable for the asset or liability, either directly or indirectly (IFRS 13.81).

<sup>38</sup> Level 3 inputs are unobservable inputs for the asset or liability (IFRS 13.86).



## 6.8 T+1 publication

EONIA is a benchmark, computed and published on the same day as the trade date of the underlying transactions, i.e. on day “T”. Unlike EONIA, ESTER will be published only on the next business day following the trade day, i.e. on day “T+1”. Therefore it should be acknowledged that all paths for transition to ESTER will involve changes to systems to adapt them to a publication date on “T+1”.

Relying on an index that is only published on the next business day already has precedents in other jurisdictions. The reformed SONIA seeks to represent the largest possible number of transactions and is therefore published on “T+1” to allow for a robust benchmark computation. Despite existing precedents, the impact of this change in IT and valuation systems must not be underestimated – this change could affect all products and processes currently referenced to EONIA.

The working group therefore encourages all participants to make the appropriate changes to their systems to enable a “T+1” publication.

For example, changing the systems to a “T+1” publication could strongly impact the way a funds’ net asset value (NAV) is calculated. This in turn could lead to important changes regarding existing cut-offs for fund subscription/redemption, in particular for funds offering same day settlement. To ensure a smoother transition, it would be best to avoid migrating EONIA publication to “T+1” before ESTER is fully operational and becomes effective.

**Table 7**  
Summary analysis of transition paths

Transition path	Parallel run approaches	Contractual alternative approaches	Recalibration approaches	Pure Succession rate approach
<b>Benchmarks Regulations</b>	As EONIA compliance with EU BMR cannot be warranted under its current methodology, a successful parallel run approach requires a delay of the current transition deadline until the maturity date of the longest outstanding legacy EONIA-linked contract or to the time limit of the parallel approach, if imposed. As EONIA does not become dependent of ESTER, market participants need to delay the prohibition to use EONIA for new contracts to be able to risk manage their legacy books.	As EONIA compliance with EU BMR cannot be warranted under its current methodology, a successful contractual alternative approach requires a delay of the current transition deadline until the maturity date of the longest outstanding legacy EONIA-linked contract or to the time limit of the parallel approach, if imposed. As EONIA does not become dependent of ESTER, market participants need to delay the prohibition to use EONIA for new contracts to be able to risk manage their legacy books.	As EONIA will become a simple function of ESTER and expected to be authorised under the EU BMR, the BMR timelines might not necessarily have to be extended for this transition path. Important prerequisite for this would however be that market participants are fully operationally ready before recalibration date..	As EONIA will be superseded by ESTER, the BMR timelines do not necessarily have to be extended for this transition path. Important prerequisite for this would be however that market participants are fully operationally ready before succession date..
<b>Legal risks</b>	The parallel run approaches entail lower risks from a legal perspective due to its gradual, voluntary and negotiated nature. However, the current EONIA vulnerabilities could become a major regulatory issue to ensure the coexistence of both rates for a sufficient period of time	The contractual alternative approaches entail lower risks from a legal perspective due to its gradual, voluntary and negotiated nature. However, the current EONIA vulnerabilities could become a major regulatory issue to ensure the coexistence of both rates for a sufficient period of time.	The potential legal risks of a change in methodology could be mitigated if the evolved EONIA methodology is authorized under the EU BMR.	The pure succession rate approach would require legislative action such as a change in law at national or European level to mitigate potential legal risks.
<b>Effective transfer of liquidity</b>	A parallel run approach will not effectively transfer liquidity from EONIA to ESTER as market participants could still transact both benchmarks (assuming a provision to the BMR will be set) with the risk that market participants will continue transacting on EONIA instead of on ESTER.	The contractual alternative approach will effectively transfer liquidity from EONIA to ESTER at the date the contractual alternative approach will be effectuated.	A fixed EONIA/ESTER relationship will help current liquidity to be shared and gradually transferred from EONIA to ESTER	As EONIA will be superseded by ESTER, liquidity will be immediately and effectively transferred to ESTER.
<b>Economic risks</b>	Value transfer resulting from a transition under the parallel approach can be minimal due to its gradual, voluntary and negotiated nature.	The contractual alternative approach may lead to a potential value transfer. Compensation mechanisms may be required to minimise any potential disputes or litigation risks.	Potential value transfer resulting from a transition under the recalibration approach can be mitigated by the usage of a spread.	The pure succession rate approach may lead to a value transfer. Compensation mechanisms may be required to minimise any disputes or litigation risks.
<b>Collateral Management</b>	The need to provide the capability on a given date to compensate the same type of collateral (euro cash) at two different rates (independent EONIA and ESTER) according to a trade-level participant selection is problematic and creates additional complication.	There is no point at which the same collateral (euro cash) needs to be compensated at two different rates (independent EONIA and ESTER), which reduces the challenge of this approach to that associated with switching from compensation at one rate to compensation at another.	In common with the parallel run approach, the need to provide the capability on a given date to compensate the same type of collateral (euro cash) at two different rates (dependent EONIA and ESTER) according to a trade-level participant selection creates additional complexity. However, this may be a lesser complication if the relationship between ESTER and EONIA is fixed.	Euro cash collateral is always compensated at a single rate, meaning the impact on collateral is very low in this approach

Transition path	Parallel run approaches	Contractual alternative approaches	Recalibration approaches	Pure Succession rate approach
<b>Operational readiness</b>	The readiness of systems and market infrastructure does not significantly vary across the different transition paths. The main difficulties arise by the fact ESTER will be published on T+1			
<b>Financial Accounting</b>	The impact on Financial Accounting under a parallel approach will be minimal as long as existing positions are not altered.	The contractual alternative approach will bring Financial Accounting challenges both from a day-1 P&L and Hedge Accounting perspective.	The recalibration approach will bring Financial Accounting challenges both from a day-1 P&L and Hedge Accounting perspective. Challenges could be partially mitigated if the accounting bodies and standards recognize the recalibrated EONIA as fundamentally unchanged.	The pure succession rate approach will bring Financial Accounting challenges both from a day-1 P&L and Hedge Accounting perspective.
<b>Risk Management</b>	Parallel run approach would require system development to distinguish between different discounting rates depending on CSA. Market data history on ESTER is limited. Liquidity in hedging instruments would be split between EONIA and ESTER. Risk of having dispersed portfolios and growing basis risk while liquidity in EONIA swaps could decrease.	Contractual alternative approach would bring only one discounting rate and regime. Market data history on ESTER is limited. Liquidity in hedging instruments would be concentrated in ESTER. No risk of dispersed portfolios as all positions will be moved to ESTER.	Recalibration approach could require system development to distinguish between different discounting rates depending on CSA (in case of dual discounting). Market data history on ESTER is limited. Liquidity in hedging instruments would be shared between ESTER and EONIA.	Pure succession rate approach would bring only one discounting rate and regime. Market data history on ESTER is limited. Liquidity in hedging instruments would be transferred to ESTER. No risk of dispersed portfolios as all EONIA positions will be superseded by ESTER.

## 7 Conclusions

For each transition path type, the main findings and conclusions are summarised below. These conclusions are open for comments by the public.

### 7.1 Parallel run and contractual approaches

The main attractiveness of parallel run and contractual approaches is that they give freedom of choice to market participants as to whether they want to voluntarily negotiate their legacy contracts to transition to ESTER or let them expire. However, the need for a long period combined with uncertainty regarding the sustainability of EONIA, which includes the deadline to comply with the EU Benchmarks Regulation, the reliance on the EONIA panel banks and the plan of its administrator not to continue EONIA's publication indefinitely, makes these transition paths highly risky.

Although they can help as a contingency plan, potential postponements of the EU Benchmarks Regulation transition deadline may not give a definitive solution to the issues outlined above. It can be argued that allowing the coexistence of the current and widely used EONIA with the new ESTER for a longer period could make the transfer of EONIA liquidity to ESTER even more difficult to achieve as EONIA users may lack sufficient incentives to voluntarily coordinate a transition to a new (and therefore initially less used) benchmark.

### 7.2 Successor rate approaches

The main attractiveness of a pure successor transition is its simplicity as it reduces uncertainty and liquidity fragmentation by ending the EONIA publication and deeming ESTER as its natural successor. Under this “big bang” approach, EONIA liquidity would instantaneously be transferred to ESTER<sup>39</sup>.

However, the working group feels that this particular transition path requires a very strong involvement from the public sector either by taking over the administration of EONIA or through the implementation of legislative measures that would irrevocably nominate ESTER as EONIA's successor.

The public authorities (ESMA, FSMA, ECB and EC) highlighted to the working group that any EU legislation amending legacy contracts would require a sound legal basis for interference in contractual law, which is a field strictly enshrined in national law. An additional problem with introducing fallback or replacement clauses in legacy

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<sup>39</sup> However, the scenario of a successor rate without a spread might cause subsequent transfer value.

contracts through EU legislation pertains to the trans-jurisdictional nature of those contracts, many of which are governed by third countries' laws<sup>40</sup>.

### 7.3 Recalibration approaches

Although no transition is devoid of risks, recalibration approaches provide for a temporary stable platform in which an evolved EONIA may allow for a progressive and smooth transition to ESTER. To reduce transition barriers, EMMI would have to modify EONIA's methodology to become ESTER-dependent.

The bonding of both rates through a simple and linear formula ( $EONIA = ESTER$  or  $EONIA = ESTER + X$ ) may facilitate the renegotiation of the existing contracts to transition to ESTER. As both benchmarks will have the same risk characteristics, they are expected to be inter-exchangeable and to benefit from the same liquidity pool.

The evolved EONIA with a recalibrated methodology will continue to represent the euro overnight unsecured market but this time with a more representative and stable set of input data based on a higher volume of transactions. A useful improvement would be for EMMI to request and obtain authorisation from its national competent authority for the new EONIA to be temporarily allowed for new contracts under the EU Benchmarks Regulation (during its publication period).

A time-limited publication period by the end of 2021 may incentivise users to transition from EONIA to ESTER by allowing counterparties to let their EONIA legacy books lapse or to renegotiate their existing contracts that will benefit from a simple EONIA-ESTER equivalence formula. In addition, this particular deadline would align the transition from EONIA to ESTER with transition exercises in other jurisdictions.

### 7.4 Recalibration with no spread

In this transition path, the EONIA methodology will evolve to a simple equality:  $EONIA = ESTER$ . This is similar to the pure successor rate approach - the difference is, however, that both benchmarks will be published in parallel, avoiding a "big bang" approach.

Although the main advantages of this transition path include its simplicity and an immediate transfer of liquidity to ESTER, it would have a valuation transfer and balance sheet impact on market participants. Evidence provided by data series show that although both benchmarks are highly correlated, the historical spread between pre-ESTER and EONIA has been stable but different than zero.

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<sup>40</sup> Any EU legislation amending legacy contracts would not apply to contracts governed by third countries' laws.

## 7.5 Recalibration with spread

In this transition path EONIA methodology will evolve to a simple formula  $EONIA = ESTER + X$  where  $X$  is a predetermined and constant spread. The main advantage of the spread is that it would smooth out any perceived valuation transfer and balance sheet impact, thus lowering the barriers to transition from EONIA to ESTER.

### Clean discounting versus dual discounting

As some recalibration paths allow for a time-limited coexistence of EONIA and ESTER curves, the question is whether discounting regimes can also coexist.

Under a clean discounting path, there is only one curve that can be applied to discount cash flows for each of the counterparties. This unique curve is applied at bilateral level especially at CCP. The attractiveness of this path is its simplicity, the avoidance of fragmentation and clarity of discounting. As ESTER will be the preferred discounting curve, one of the advantages of clean discounting is that liquidity of the ESTER forward curve is expected to take off rapidly.

Under a dual discounting path, users can choose to discount different contracts using EONIA or ESTER curves. The EONIA curve will likely apply to legacy books, while cash flows coming from instruments after the transition date (prior to January 2020) will be discounted under the new ESTER curve. This path would allow for a progressive phasing out of legacy books but has some drawbacks resulting from a dual framework that may generate fragmentation, perceived basis risk and higher IT costs, not to mention arbitrage and a slower take-off of the ESTER curve.

### Minimum period to maintain EONIA under its new calibration approach

As stated several times, the timeline for the EONIA transition path is short, due to the potential prohibition of its usage as of 1 January 2020 under the EU Benchmarks Regulation. If the EONIA recalibration path is chosen, this could allow EONIA to be used after 1 January 2020.

Even if EONIA could be used after 1 January 2020, the working group recommends that such use should be time-limited. EMMI, the EONIA administrator, confirmed that EONIA's existence should be limited in time<sup>41</sup> and that it would strive to implement this recommendation. The public authorities also express a preference for a clear and orderly end-date for EONIA.

In this regard, the reasonable minimum period to maintain EONIA under its new recalibrated methodology was debated within the subgroup on EONIA transition. This minimum time should correspond to the minimum period that allows for a smooth transition to ESTER. This minimum time should allow for, among other things, the

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<sup>41</sup> See 18 October Minutes of the meeting of the working group on euro risk-free rates.

repapering of the CSA agreements and the possible renegotiation of the legacy contracts that will mature after EMMI stops the publication of EONIA, which seems to be the most time-consuming endeavour for EONIA users.

While this issue should be further investigated by the EONIA administrator EMMI, the working group would recommend keeping EONIA until the end of 2021. Two additional years seemed a fair estimation for a minimum time needed for repapering various agreements and pay regard of legacy contracts. In addition, this would align the transition from EONIA to ESTER with transition exercises in other jurisdictions.

## Recommendations

1. The working group recommends that the European Money Markets Institute (EMMI), as the administrator of EONIA, takes the following steps before 1 January 2020:
  - (a) Modify the current EONIA methodology to become ESTER plus a spread for a limited period, in accordance with Financial Stability Board (FSB) recommendations and IOSCO Principles for Financial Benchmarks to further anchor EONIA's methodology in transactions;
  - (b) Engage with the relevant authorities to ensure the compliance of EONIA, under its evolved methodology, with the EU Benchmarks Regulation;
  - (c) Consider and consult market participants on discontinuing the publication of EONIA under its evolved methodology, after a transition period that ensures firms can achieve transition to ESTER in a smooth manner and that pays due regard of the existing EONIA legacy book. This transition period should last until the end of 2021, which is consistent with benchmarks transitions in other jurisdictions.
2. The working group also invites EMMI to take the following considerations into account:
  - (a) Consider an EONIA-ESTER spread methodology based on a simple average with an observation period of at least 12 months, combined with a 15% trimming mechanism;
  - (b) That the recalibration methodology and the effective determination of the spread are announced at the same time before ESTER's first day of publication;
  - (c) That the recalibration date is on the first day of ESTER's publication for simplicity reasons.
3. The working group recommends that market participants gradually replace EONIA with ESTER as a reference rate for all products and contracts and make all adjustments necessary for using ESTER as their standard benchmark after

the transition period (including making the appropriate changes to their systems to enable a T+1 publication).

4. The working group encourages market participants to make all reasonable efforts to replace EONIA with ESTER as a basis for collateral interest for both legacy and new trades with each of its counterparties (clean discounting).

## 7.6 Questions

1. Do you agree with the working group's recommendation that the preferred transition path is the time-limited recalibration approach with spread and clean discounting?
2. If not, what would be your preferred option and why?
3. Do you agree that a publication deadline for the recalibrated EONIA of end-2021 is sufficient for a smooth transition under the recalibration approach with spread and clean discounting path?
4. Do you have any other ideas to accelerate the transition of the derivatives market to ESTER?
5. Do you see any benefit in the new recalibrated EONIA to be authorised and supervised until its publication deadline?
6. Do you agree with a spread methodology based on a 1-year pre-ESTER historical data period, calculated as an average with a 15% trimming?
7. If not, what would be your preferred option and why?
8. How much time do you think would be the minimum to make your systems ready for ESTER T+1 publication and why?



## 8 Annex

### 8.1 European Fund and Asset Management Association survey on EONIA usage

#### Box 1

European Fund and Asset Management Association survey

**1. For which type of investment funds does your firm use EONIA for benchmarking purposes? Please tick all that apply**

Money market funds

Fixed income funds

Other – please specify

**2. Would the discontinuation of EONIA in its current form result in a change in investment strategy for any funds benchmarked to EONIA?**

Yes

No

**3. What instruments or contracts referenced to EONIA does your firm employ? Please tick all that apply**

Floating rate notes

Repurchase agreements

Interest rate derivatives

Loan agreements

Other – please specify

**4. If the definition of EONIA were to be changed to reference ESTER, what actions would you need to take?**

Change to fund prospectus

Client communication

Adapt systems to cope with EONIA publication on T+1

Other – please specify

**5. How much time would you need to be ready to transact in ESTER-based instruments after its official publication by the ECB?**

0 to 6 months

6 to 12 months

More than 12 months

## 8.2 Calculation methodologies

**Table 8**

Available spread calculation methodologies indicative comparison of simulated spreads using publically available data

(in basis points).

Studied Methodologies	Simulated spread in basis points
Spot spread	7.900
Historical mean 21D (1M)	8.110
Historical mean 126D (6M)	8.716
Historical mean 250D (1Y)	9.016
Historical mean full data (416D)	8.940
Trimmed mean (10% 6M)	8.700
Trimmed mean (10% 1Y)	8.854
Trimmed mean (10% full data)	8.831
Trimmed mean (15% 6M)	8.695
Trimmed mean (15% 1Y)	8.839
Trimmed mean (15% full data)	8.822
Trimmed mean (25% 6M)	8.689
Trimmed mean (25% 1Y)	8.827
Trimmed mean (25% full data)	8.806
Historical v wap (range)	Not Applicable
Median (1Y)	8.800
Median (full data)	8.800

Disclaimer: this table shows various calculations based on publically available data (EONIA and pre-ESTER data series, published by EMMI and the ECB respectively). These are purely indicative values that users should not rely upon to form any expectations.

## 8.3 ISDA Benchmarks Supplement

For non-cleared derivatives traded under an ISDA Master Agreement that incorporate ISDA's standard interest rate definitions (including the 2006 ISDA Definitions), cessation or prohibition on use of EONIA would be likely to have different consequences, depending on the terms that apply to a transaction.

As drafted, the definition of EONIA in the ISDA 2006 Definitions does not include a fallback in the event that the benchmark ceases to be published or is prohibited from use. Other provisions in standard derivatives documentation published by ISDA, such as the ISDA Master Agreement, may become relevant if the benchmark ceases to exist or is prohibited from use, but they may be unlikely to result in a transaction which references EONIA falling back to ESTER.

In September 2018, ISDA published the ISDA Benchmarks Supplement which sets out certain triggers and fallbacks relating to benchmarks which could become applicable during the course of the transition from EONIA to ESTER. The ISDA Benchmarks Supplement was primarily developed in response to the requirements under the EU Benchmarks Regulation for certain contracts to reflect the actions

parties will take if a referenced benchmark is materially changed or ceases to be provided.

Where the ISDA Benchmarks Supplement has been incorporated into the terms of a trade, the waterfall of fallbacks is as follows:

1. Any fallbacks specified in the definition of EONIA to apply upon an index cessation event would apply as 'Priority Fallbacks'. As discussed above, ISDA's existing definition of EONIA does not contain any such fallbacks. It is important to note this fallback only applies following an "Index Cessation Event" and not following an "Administrator/Benchmark Event" (both terms as defined in the ISDA Benchmarks Supplement).
2. Agreement between the parties.
3. Use of an alternative benchmark nominated by the parties at the time of trading.
4. Use of a replacement benchmark nominated by either (i) the original index's administrator (in this case EMMI), provided the nominated benchmark is substantially the same as the original benchmark or (ii) a Relevant Nominating Body (i.e. a central bank for the currency in which the benchmark is denominated (in EONIA's case, the European Central Bank) or any other central bank or supervisor responsible for supervising the benchmark or the administrator (in EONIA's case, the Belgian Financial Services and Markets Authority or 'FSMA' is the responsible supervisor) or any working group or committee officially endorsed or convened by such a central bank/supervisor/group of such central banks/supervisors or the Financial Stability Board or part thereof). The Relevant Nominating Bodies recommendation takes precedence over any recommendation by the administrator.
5. Use of an alternative benchmark nominated by the Calculation Agent.
6. No fault termination.

The ISDA Benchmarks Supplement envisages that an 'Adjustment Payment' or 'Adjustment Spread' and other adjustments may be made to address differences between the original and any alternative benchmark arrived at under the waterfall of fallbacks. The Adjustment Spread may be agreed between the parties, nominated by the Calculation Agent or, if a Relevant Nominating Body recommends an alternative index, nominated by the Relevant Nominating Body (as defined in the ISDA Benchmarks Supplement). In this last case, the parties to the transaction would not have the right to dispute use of the alternative benchmark and spread so nominated as the fallback.

Any of the fallbacks in the waterfall may be deemed to not apply including if the parties cannot resolve a dispute relating to the Calculation Agent's determinations, if that fallback would be non-compliant with applicable regulation (e.g. the BMR) or if the calculation of the Adjustment Spread would impose an unwanted regulatory burden on the Calculation Agent. Further information on the ISDA Benchmarks Supplement is available on the ISDA website.

The ISDA Benchmarks Supplement is not yet in common use, but we note that ISDA recently published a protocol to allow market participants to incorporate the ISDA Benchmarks Supplement into new and potentially also into legacy transactions between adherents to the protocol.

## 8.4 Derivatives valuation impact – additional information

The main valuation or price impact of the identified transition paths (TPs) is determined by the characteristics of each TP or family of TPs relating to discounting regime changes, benchmark index level changes, and changes to the derivatives universe in general.

The analysis at hand shall concentrate on general considerations and areas which will most likely be important for a vast majority of market participants and which are largely independent of individual portfolio constellations. For each TP the following main questions will guide our train of thought:

1. Does the universe of instruments to be priced change and, if so, are the required input data feeding the pricing models available or is there a risk to rely on proxies, which could cause significant pricing disruptions?
2. Does a particular TP impact the price of a (legacy) derivative and associated funding costs?

The general scope and assumptions of the valuation impact analysis shall be summarised as follows.

- "Price" shall mean the present value of a future claim under no-arbitrage conditions.
- The price can either be influenced by a change of the claim itself (e.g. as the reference benchmark index of a derivative changes level) and/or other factors determining its present value (e.g. changes relating to the discounting and PAI regime).
- The majority of derivatives pricing models themselves remain unaffected across all TPs.
- Discounting and collateral remuneration are linked and should be treated consistently.
- The analysis does not target adjustments like value adjustments (XVA) or fair-value accounting specifically, even though a change of the risk-free rate might affect these areas.
- Vanilla interest rate and overnight index swaps will be the focus of the considerations.

- No compensation mechanisms above and beyond what has been set out as part of the defining properties of each TP are assumed to be in place.

## Recap of price-determining factors

The current price (present value) of a swap transaction is determined by the sum of all projected future cash flows discounted to today's date. E.g. the projected future cash flows of an EONIA or EURIBOR swap are based on implied EONIA or EURIBOR forward curves calculated from liquidly traded benchmark instruments. The discounting applied to projected cash flows is most commonly derived from the forward rates of the index which determine the interest on the cash collateral of the respective transaction. If, in the case of a EUR denominated swap, the counterparties have agreed to post EUR cash as collateral for the present value of a swap with EONIA as the cash collateral rate (also known as the PAI rate in case of cleared transactions), the party that posts the cash collateral receives EONIA interest on the posted cash amount from the party that receives the cash collateral. The exchange of PAI amounts can be interpreted as compensating the counterparties for their cash collateral-related funding costs, assuming that borrowing and lending happens at the agreed PAI rate (in this example, EONIA-flat). It is understood that the net, individual funding costs, which will in most cases not be at EONIA-flat, are not reflected in the present value at this point. Such considerations are sometimes treated as further price adjustments and might very well contribute to the net economic value of a transaction.

It should be pointed out that from an economic point of view, "valuation or price impact" is likely to have a range of interpretations depending on each market participant's own business focus, e.g. as an economic impact per client or institution, an impact on P&L by desk or institution, or an impact on the overall balance sheet. One should be careful not to make a general assumption that a change of price (in the above definition) means that an equal amount of "economic value" is transferred under all circumstances due to a lack of a universal definition.

## Impact on the derivatives universe and required data

In principle, derivatives pricing requires a complete set of liquidly traded benchmark instruments to be available from which the implied input data for pricing models can be derived. If such data are not readily available, they need to be modelled or proxied, exposing present value calculations to further model risk and uncertainty. As outlined above, the current set of tradable instruments required to price a (vanilla) swap transaction mainly comprises EONIA and EURIBOR swaps which are quoted in the EONIA discounting and PAI regime. Hence, TPs which involve a bifurcation into benchmarks instruments under multiple, parallel discounting and PAI regimes introduce the risk of pricing in an incomplete market. This is particularly pronounced in cases where EONIA and ESTER would be independent benchmarks and where the transition is under significant time pressure due to regulatory constraints like the EU Benchmarks Regulation. Where EONIA and ESTER were dependent benchmarks but would nevertheless be operated in parallel discounting regimes, the proxy risk would

be less prominent, if not completely avoided. In all other cases, the liquidity will always be focused on a single discounting regime and a set of benchmark instruments resulting in a low perceived impact.

## Impact due to discounting and cash flow changes

As some TPs will change the benchmark index level and/or the discounting regime, we illustrate the resulting price impact of a +1 basis point shift for a single trade in the table below. It is found that the price impact of a discounting regime change is most pronounced for out-of-the-money trades and that changes of future contractual cash flows are usually an order of magnitude larger than the price impact of a discounting regime change. E.g. the price impact on EURIBOR swaps will be driven mainly by a change of the discounting regime, while EONIA swaps could experience a price change due to a change of projected cash flows as well as a price change due to a different discounting regime. The related price changes mark the most visible and direct impact of the benchmark transition which will materialise in a profit or loss in the P&L calculation of each market participant (e.g. a cash inflow or outflow can be triggered by a P&L-driven margin call).

TPs which involve independent operation of EONIA and ESTER benchmarks, discounting and PAI regimes will likely be the least disruptive in this sense, while TPs that lead to a gap of the benchmark index across the transition date are the most disruptive. TP that involve a fixed spread provide a middle ground between these two extremes.

**Table 9**

(EUR million)

Moneyiness T=10Y	ATM -100bp (PV < 0)	ATM (PV=0)	ATM +100bp (PV > 0)	ATM +200bp (PV > 0)	ATM +300bp (PV > 0)
Swap-Forward Delta	-10.1	-10.1	-10.1	-10.1	-10.1
Swap-Discounting Delta	0.75	0.20	-0.35	-0.90	-1.45

If the present value change is driven solely by a consistent switch of the discounting/PAI regime, it is not necessarily justified to universally conclude that an equal amount of economic value has been transferred. Additional funding costs as a consequence of a P&L change can be considered as an example of a further valuation impact to ESTER-linked PAI payments in the new regime countering any adverse or beneficial effects on funding costs at the level of the risk-free rate. In the example of the net, individual funding costs above the risk-free rate, a net change of costs, while measurable, depends significantly on each institution's own funding levels. On a different note, one might argue that such a (discounting-related) price change has a negative effect on the "exit price" and the subsequent re-use of cash. However, it seems reasonable to conclude that this can again be mapped to result in additional/changed funding costs as the price gap could be closed by borrowing at current net funding levels.

TPs which involve independent operations of EONIA and ESTER discounting and PAI regimes will likely be the least disruptive when considering impacts on valuation and related funding cost. TPs that lead to a gap of the benchmark index across the transition date are likely the most disruptive. TPs that involve a fixed spread provide a middle ground between these two extremes.

## 8.5 Collateral impact – additional information

There are four ways in which features of a transition approach could potentially have a collateral impact:

- (i) the type of collateral that can be posted might be altered;
- (ii) the aggregate amount of collateral posted across the industry might be altered;
- (iii) the distribution of collateral posted or received might be altered;
- (iv) the return (compensating interest) receivable on collateral posted (or that payable on collateral received) may be affected.

In assessing whether any of these effects are present, we should also differentiate between the variation margin (net present value, NPV, or replacement cost) and the initial margin (potential future exposure, PFE, or independent amount).

In respect of (i), and specifically for cleared swaps, there is no difference between approaches regarding the type of collateral that can be posted either as a valuation margin (VM) or an interest margin (IM). For VM, and for the instruments in question, the only eligible collateral will remain EUR cash; for IM, a wider range of collateral is eligible and this will not vary by approach, although there could be some immediate impact on the choice of IM collateral posted, driven by any changes to the remuneration rate of EUR cash (e.g. if the relative “cheapness” of different assets changes as a result).

For non-cleared swaps where the collateral set is governed by an ISDA/CSA and is likely to be wider than for cleared swaps, a change in the remuneration rate could result in a change of the “cheapest-to-deliver” asset chosen to collateralise the VM amount. This phenomenon is also applicable to point (iii) above. Depending on the transition method, and specifically the spot and forward EONIA-ESTER spreads that will be driven as part of the methodology, a collateral pledger’s preferred asset to post could change.

Following on from the impact on the type of collateral physically posted on a spot basis, any change in spread and/or term structure of the new EUR cash remuneration rate could impact the option-based discounting some market participants apply (e.g. EUR cash could become more/less expensive relative to other assets on a forward basis, impacting the time value of collateral options). Further complications might arise in a negative rates environment (as in EUR currently), where some bilateral documentation does not allow for cash collateral to be remunerated with negative

rates – a major change to the spot/forward rate of return on EUR cash could have significant implications for the value of the collateral zero floors.

It follows that a market participant who hedges collateral and discounting exposure via collateral hedges may alter their behaviour, because the expectation of one of their key market variables has changed. Any transition methodology without a clear transition plan with respect to the spot and future rate could cause funding market dislocations. In other words, in a scenario where EUR cash becomes more or less desirable, the collateral asset mix preference of market participants would change, having knock-on impacts on the FX forward markets, the repo/collateral markets, and potentially others.

In respect of (ii), there are some small potential effects on aggregate collateral posted which differ by transition approach. This relates to the fact that where liquidity is fragmented (which is a feature of routes involving dual discounting) the netting efficiency within a portfolio is reduced and its IM requirement is increased correspondingly. This is a second-order effect, but one we encourage considering in the analysis.

In respect of (ii), there are differences attributable to the transition approach to the distribution of collateral posted, specifically for VM. In short, there may be gainers where the approach imposes a disruptive valuation change (see Derivatives Valuation) and a corresponding set of losers. We feel these valuation changes are more significant because of their P&L impact than due to their collateral impact. We therefore recommend that they be ignored in this section, while noting the comments above relating to section (i) which delve into this problem in more detail.

The most disruptive collateral impact that differs by transition approach is that relating to (iv) collateral compensation. Please see further points relating to this section in part (i) above. Specifically, it relates to the EUR cash collateral posted as VM. On the basis that all transition approaches involve ESTER-based PAI and discounting as an ultimate state, all transition approaches involve the disruption of a switch from the current EONIA-based PAI and discounting regimes currently in operation. Enforced switches of regime are more disruptive than those in which the transition is voluntary, but cause low levels of disruption when only one PAI and discounting regime is in operation at any one time. Routes that require the operation of two distinct PAI and discounting regimes at the same time are more problematic. Such regimes create disruption that is not limited just to collateral impact. However, retaining the focus of this section of the report, we simply observe that collateral systems would need material reconfiguration to accommodate the choice available.

## 8.6 Readiness of systems and market infrastructures – additional information

This annex identifies:



The different types of systems and infrastructures, which need to be considered for the transition from EONIA to ESTER;

The responsibilities of each infrastructure, as well as the tasks and processes, in addition to the areas which are likely to be affected;

The extent to which such tasks and processes are disrupted or modified as a result of specific steps of the different transition approaches.

## Benchmark administrator and calculation agent

### Responsibilities/tasks/processes

- define ESTER/re-define EONIA technical specification and details including full methodology, around publication times, correction and emergency processes and associated distribution timelines;
- define terms and conditions for ESTER as a benchmark fixing and the equivalent for the recalibrated EONIA where relevant;
- define and set up the rate technical distribution process for ESTER.

### Relevant steps

- changes to benchmark methodology: design, development, consultation, definition and implementation;
- changes to benchmark publication: cessation, change of publication time and changes of publication source.

## Market associations (e.g. ISDA, FIA, ICMA, LMA, national banking associations)

### Responsibilities/tasks/processes

- legal definitions: cash products and derivatives legal documentation and framework are to be defined (ISDA/DRV/FBF, etc);
- definitions include, but are not limited to: fallback waterfall, the relevant publication times, rounding conventions, correction policies, floating rate option definition (calculation methodology of cash flows linked to ESTER), primary rate source, calculation agent and administrator;
- establish protocols and best practice guidelines for legacy trades, e.g. fallbacks.

### Relevant steps

- changes to benchmark specification: administrator/methodology/publication;
- steps involving industry co-ordination, particularly where voluntary, and consulting market where required;
- publish protocols and best practice guidelines for legacy trades.

### Inter-dealer brokers (IDBs) (e.g. TPICAP, Tradition, BGC, etc.)

#### Responsibilities/tasks/processes

- technical and operational readiness for ESTER to be established by setting up broker screens to quote ESTER derivatives;
- distribution of ESTER swap quotes to 50 years have to be set up on the vendor pages of the broker;
- Commercial terms and conditions to be able to licence the broker data for ESTER need to be defined.

### Relevant steps

- The requirement for parallel discounting would force inter-dealer brokers (IDBs) to cater for hosting parallel markets in otherwise identical instruments. The choice (of a discounting regime) by executing parties would need to be propagated along the processing chain.
- Where the treatment/status of EU firms differs from that of other market participants, IDBs will need to develop and deploy screening or filtering technologies to enable an orderly market transition.

### Dealers, prime/clearing brokers and clients

#### Responsibilities/tasks/processes

- internal setup to trade, manage risk, and perform a full lifecycle of an ESTER trade has to be established and tested;
- client services for ESTER need to be established;
- new product approvals for ESTER have to be obtained;
- prices for the full ESTER curve need to be streamed to vendors;

- internal setup to trade, manage risk, and perform a full lifecycle of an EONIA trade need to be modified where existing processes and procedures are disrupted;
- renegotiation of contracts with counterparties and clients, e.g. CSAs.

### Relevant steps

- the requirement for parallel discounting would force prime/clearing brokers to cater for processing parallel populations in otherwise identical instruments;
- where the treatment/status of EU clients differs from that of other market participants, prime/clearing brokers will need to develop and deploy screening or filtering technologies to manage the situation.

### Trading venues and trade entry platforms (e.g. Tradeweb, MarkitWire, Bloomberg, etc.)

#### Responsibilities/tasks/processes

- establish ESTER for trading and trade confirmations;
- align details of messages for ESTER with the market (e.g. FpML confirmation details);
- define a process to deal with legacy trade populations which reference EONIA in MarkitWire (primarily for successor rate paths).

### Relevant steps

- The requirement for parallel discounting would force trading venues to cater for hosting parallel markets in otherwise identical instruments. The choice (of a discounting regime) by executing parties would need to be propagated along the processing chain.
- Where the treatment/status of EU firms differs from that of other market participants, these firms will need to develop and deploy screening or filtering technologies to enable an orderly market.

## Vendors (e.g. Bloomberg, Reuters, etc.)

### Responsibilities/tasks/processes

- set up and publish ESTER screens, pages, and tickers to obtain and distribute prices;
- ensure that EONIA (under “recalibration” or “succession” paths) is available;
- define terms and conditions to enable ESTER benchmark distribution for market participants (depends on administrator/calculation agent setup of the terms and conditions).

### Relevant steps in transition approaches

- changes to benchmark publication: cessation, change of publication time, changes of publication source and change of licensing partner (i.e. administrator).

## Derivatives exchanges (e.g. Eurex Exchange, ICE, CME, etc.)

### Responsibilities/tasks/processes

- launch exchange-traded derivatives referencing ESTER to aid the transition process.

## Clearing houses/CCPs (e.g. LCH, Eurex Clearing, CME, etc.)

### Responsibilities/tasks/processes

- obtain regulatory approval for ESTER clearing services (OTC swap clearing and exchange-traded derivatives) (lead times may vary depending on the transition path taken and will additionally depend on data availability and regulatory approvals - lead time ~6-12 months);
- extend market data setup, valuation, risk management, stress testing, hedging capabilities;
- legally and technically implement and roll out ESTER clearing services (including member testing phases to facilitate a seamless transition processes);
- align and set up a single or dual discounting/PAI regime (depending on the transition path);

- align details of legacy book conversion with the market and implement related processes.

### **Relevant steps**

- The requirement for parallel discounting would force clearing houses to cater for maintaining and managing parallel populations of otherwise identical instruments. The discounting regime chosen by executing parties would need to be used and maintained.
- Mandatory switching of CCP discounting regime.
- Introduction of CCP eligibility for new contract types.
- Cessation of CCP eligibility for specified contracts.

## **Trade repositories and reporting**

### **Responsibilities/tasks/processes**

- set up infrastructure to process ESTER trade reporting;
- re-report EONIA trades if ESTER replaces EONIA (successor rate paths).

### **Relevant steps**

- the requirement for parallel discounting would force trade repositories to cater for recording and reporting the choice (of a discounting regime) by executing parties parallel in otherwise identical instruments.

## **8.7 Relevant stakeholders and their main responsibilities/challenges**

### **Asset managers, banks, insurance companies, pension funds (“financial institutions/FIs”) using EONIA**

- incorporation of replacement rates/fallbacks in legal documents;
- calculation of valuation adjustments;
- evaluation of accounting effects.

## Central counterparties (CCPs)

- technical implementation of a new replacement rate;
- calculation of valuation adjustments due to change in the discount curve.

## Clearing brokers

- set up infrastructure for ESTER trades;
- stand ready to distribute ESTER swap quotes for the whole curve.

## European Central Bank (ECB)

- calculation and publication of ESTER.

## European Money Markets Institute (EMMI)

- publication of EONIA;
- coordination with panel banks;
- public consultation.

## European Parliament

- approval of timeframe extension.

## European Securities and Markets Authority (ESMA)

- development of draft regulatory technical standards;
- implementation of technical standards;
- coordination of supervision of benchmark administrators by national authorities.

## Financial Services and Markets Authority (FSMA)

- approval of EONIA recalibration.

## International Accounting Standard Board (IASB)

- recognition of EONIA and/or ESTER as a benchmark interest rate according to IFRS.

## Inter-dealer brokers (ICAP, BGC, Tradition)

- maintain brokerage of EONIA products;
- set up new ESTER products.

## ISDA/national associations

- support the industry in the transition process (e.g. consultation and standard setting);
- develop fallbacks/benchmark supplements for derivative contracts.

## National financial authorities

- supervise the transition process.

## Non-financial institutions (NFIs) using EONIA

- incorporate replacement rates/fallbacks in legal documents;
- calculate valuation adjustments;
- evaluate accounting effects.

## Panel banks

- provide input data.

## Trade repositories

- maintain infrastructure for EONIA products;
- set up new infrastructure for ESTER products.

## Trading venues

- offer EONIA products;
- offer ESTER products.

## Vendors (Reuters, Bloomberg)

- publish ESTER and EONIA.

## 8.8 Legal disclaimer

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## Abbreviations

<b>CCP</b>	central counterparty	<b>IAS</b>	international accounting standards
<b>CD</b>	certificates of deposit	<b>IASB</b>	International Accounting Standards Board
<b>CP</b>	commercial paper	<b>IDB</b>	inter-dealer broker
<b>CSA</b>	credit support annex	<b>IFRS</b>	international financial reporting standards
<b>DRV</b>	financial derivatives transactions	<b>IM</b>	interest margin
<b>EC</b>	European Commission	<b>IOSCO</b>	International Organization of Securities Commissions
<b>ECB</b>	European Central Bank	<b>ISDA</b>	International Swaps and Derivatives Association
<b>EFAMA</b>	European Fund and Asset Management Association	<b>LIBOR</b>	London interbank offered rate
<b>EFTA</b>	European Free Trade Area	<b>NAV</b>	net asset value
<b>EIR</b>	effective interest rate	<b>NPV</b>	net present value
<b>EMIR</b>	European market infrastructure regulation	<b>OIS</b>	overnight index swaps
<b>EMMI</b>	European Money Markets Institute	<b>OSSG</b>	Official Sector Steering Group
<b>EONIA</b>	euro overnight index average	<b>OTC</b>	over-the-counter
<b>ESMA</b>	European Securities and Markets Authority	<b>PAI</b>	price alignment interest
<b>ESTER</b>	euro short-term rate	<b>PFE</b>	potential future exposure
<b>EU BMR</b>	European Benchmarks Regulation	<b>P&amp;L</b>	profit and loss statement
<b>EURIBOR</b>	euro interbank offered rate	<b>RFR</b>	risk-free rate
<b>FBF</b>	French banking federation	<b>repo</b>	repurchase agreement
<b>FSB</b>	Financial Stability Board	<b>TP</b>	transition path
<b>FSMA</b>	Financial Services and Markets Authority	<b>VM</b>	valuation margin
<b>GIC</b>	guaranteed investment contract	<b>XVA</b>	Value adjustments
<b>HQLA</b>	high-quality liquid asset		

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Postal address 60640 Frankfurt am Main, Germany  
Telephone +49 69 1344 0  
Website [www.ecb.europa.eu](http://www.ecb.europa.eu)

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