FINANCIAL STABILITY BOARD

Reforming major interest rate benchmarks

Progress report

14 November 2018

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Abbreviations and Acronyms[1]

2014 Report	See footnote 2
2017 Progress Report	See footnote 3
ABS	Association of Banks in Singapore
ARRC	Alternative Reference Rates Committee (US)
ASIC	Australian Securities and Investments Commission
BA	Banker’s Acceptance (Canada)
BBSW	Bank Bill Swap Rate (Australia)
BCB	Brazilian Central Bank
BCBS	Basel Committee on Banking Supervision
BdM	Banco de México
BMA	Benchmark administrator
BMR	EU Benchmarks Regulation
BoE	Bank of England
BoJ	Bank of Japan
Cash Rate	Interbank overnight cash rate (Australia)
CARR	Canadian Alternative Reference Rate Working Group
CDOR	Canadian Dollar Offered Rate
CFR	Council of Financial Regulators (Australia)
CORRA	Canadian Overnight Repo Rate Average
DI rate	Overnight interbank offered rate (Brazil)
ECB	European Central Bank
EFFR	Effective Fed Funds Rate
ESMA	European Securities and Markets Authority
ESTER	Euro Short-Term Rate
EMMI	European Money Markets Institute
EONIA	Euro Overnight Index Average
EURIBOR	Euro Interbank Offered Rate
FCA	Financial Conduct Authority (UK)
FRB	Federal Reserve Board of Governors (US)
FRN	Floating rate note

[1] ISO currency codes (based on ISO 4217) are not separately listed here.

FSCA	Financial Sector Conduct Authority (South Africa)
FSB	Financial Stability Board
FSMA	Belgium Financial Services and Markets Authority
GC	General collateral (in relation to repos)
HIBOR	Hong Kong Interbank Offered Rate
HKMA	Hong Kong Monetary Authority
HONIA	Hong Kong Dollar Overnight Index Average
IBA	ICE Benchmarks Administration Ltd
IBOR	Interbank Offered Rate – in particular, EURIBOR, LIBOR and TIBOR
IOSCO	International Organization of Securities Commissions
IOSCO Principles	IOSCO *Principles for Financial Benchmarks*
JBA	Japanese Bankers Association
JBATA	JBA TIBOR Administration
JFSA	Japan Financial Services Agency
Jibar	Johannesburg Interbank Average Rate
LIBOR	London Interbank Offered Rate
MAS	Monetary Authority of Singapore
MPG	Market Practitioners Group (globally and for South Africa)
NWG	National Working Group on Swiss Franc Reference Rates (Switzerland)
OBFR	Overnight Bank Funding Rate (US)
OIS	Overnight Indexed Swap
OSSG	FSB Official Sector Steering Group
PAI	Price Alignment Interest
RBA	Reserve Bank of Australia
RFR	nearly risk-free reference rate
RFRWG	Working Group on Sterling Risk-Free Reference Rates (UK)
repo	repurchase
Sabor	South African Benchmark Overnight Rate
SASFR	South African Secured Financing Rate
SARB	South African Reserve Bank
SARON	Swiss Average Rate Overnight
Selic	Average interest rate on overnight repurchase agreements (Brazil)

SFEMC	Singapore Foreign Exchange Market Committee
SIBOR	Singapore Interbank Offered Rate
SRR	Swiss Reference Rates
SOFR	Secured Overnight Financing Rate
SOIS curve	OIS curve based on the SARON
SONIA	Sterling Overnight Index Average
SOR	Singapore Dollar Swap Offer Rate
Strate	South Africa's central securities depository
Sub-NWG D&C	Derivative and Capital subgroup of the NWG (Switzerland)
Sub-NWG L&D	Loan and Deposit Market subgroup of the NWG (Switzerland)
TB	Treasury Bills (South Africa)
TIBOR	Tokyo Interbank Offered Rate
TIIE	Equilibrium Interbank Interest Rate (Mexico)
TMA	Treasury Markets Association (Hong Kong)
TOIS	Tomorrow/next Indexed Swaps (Switzerland)
TONA	Tokyo Overnight Average rate
TSRRs	Term SONIA Reference Rates
VWAP	Volume Weighted Average Price
ZARibor	South African Rand Interbank Overnight Rate

Executive Summary

This document reports on progress made in implementing the recommendations of the Financial Stability Board (FSB) report *Reforming Major Interest Rate Benchmarks* (the 2014 Report),[2] as well as in an additional stream of work launched by the FSB in 2016 to improve contractual robustness to the risk of major interest rate benchmarks' discontinuation. In the 2014 Report, the FSB set out a series of recommendations for strengthening existing benchmarks for key interbank offered rates (IBORs) in the unsecured lending markets, and for promoting the development and adoption of alternative nearly risk-free reference rates (RFRs) where appropriate. Progress is reported since the last progress report in October 2017 (the 2017 Progress Report).[3] The FSB and member authorities through the FSB Official Sector Steering Group (OSSG) are working to implement and monitor these recommendations.[4]

Strengthening of IBORs: Although LIBOR has been strengthened since the OSSG was formed, authorities have warned that publication of LIBOR may cease once official sector support for the benchmark is withdrawn at end-2021. Work has continued among the other major IBORs (EURIBOR and TIBOR) to strengthen existing methodologies to make them more grounded in actual transactions and in other ways, as well as to strengthen regulatory frameworks and supervision. Among other markets, in Australia, Hong Kong, Singapore and South Africa, actions have taken place or are underway on the part of the official sector, benchmark administrators and market participants to strengthen methodologies and/or to develop and further implement regulatory reforms, while OSSG member authorities from Brazil and Mexico have continued to examine possible steps to strengthen existing interbank rates in their jurisdictions.

Identification of and transition to alternative reference rates: Notwithstanding important steps to strengthen IBORs, FSB member authorities are of the view that in the markets which face the disappearance of IBORs, notably markets currently reliant on LIBOR, there needs to be an orderly transition to new reference rates. In this regard, since the 2017 progress report, a great deal of progress has been made to identify RFRs and other alternative reference rates in currency areas currently reliant on LIBOR benchmarks, as well as to plan for and in some markets begin to execute transition to those RFRs. In April 2018, the Federal Reserve Board (FRB) and Bank of England, respectively, began publication of the Secured Overnight Financing Rate (SOFR) as the RFR for the USD and the Sterling Overnight Index Average (SONIA) as the RFR for the GBP. The Alternative Reference Rates Committee (ARRC) has also proposed plans to construct forward-looking term reference rates for USD, and the Working Group on Sterling Risk-Free Reference Rates (RFRWG) has consulted on such plans for GBP.

Another important development has been the selection of a euro short-term rate (ESTER) as the new euro RFR to serve both as a replacement for EONIA and as a basis for the calculation

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2 Available at www.fsb.org/wp-content/uploads/r_140722.pdf. Acronyms are explained on pages iv - vi.

3 FSB (2017), *Reforming Major Interest Rate Benchmarks: Progress report on implementation of July 2014 FSB recommendations*, available at http://www.fsb.org/wp-content/uploads/P101017.pdf. See also the 2015 and 2016 Progress Reports, available at http://www.fsb.org/wp-content/uploads/OSSG-interest-rate-benchmarks-progress-report-July-2015.pdf and http://www.fsb.org/wp-content/uploads/Progress-in-Reforming-Major-Interest-Rate-Benchmarks.pdf, respectively.

4 See Appendix B for a list of members of the OSSG.

of fallback rates for contracts linked to Euribor.

In other currency areas covered by this report (AUD, BRL, CAD, MXN, SGD and ZAR), progress has continued to identify appropriate RFRs and to consider transition planning; however in these currency areas typically a multiple rate approach has been adopted, whereby strengthened IBORs or similar rates are expected to coexist with identified RFRs. Some jurisdictions, notably Brazil, Hong Kong, Mexico, Singapore and South Africa, are yet to finally identify RFRs, or are reconsidering existing RFRs.

Enhancing contractual robustness: Significant work continues on the part of FSB member authorities as well as the International Swaps and Derivatives Association (ISDA) and other trade associations on the important task of strengthening contractual robustness to the risk of discontinuation of major interest rate benchmarks. This issue goes beyond derivatives markets and applies to many types of cash products including syndicated loans, bonds and mortgages. Since the 2017 progress report, notably:

- In July, ISDA published a consultation paper on fallbacks for certain currencies of LIBOR and certain other interest rate benchmarks.[5] The consultation closed on 22 October. ISDA is now considering the feedback received.
- On the same day that ISDA published its consultation, the FSB published a statement on reforms to IBORs and the development of RFRs and term rates.[6]
- In September, ISDA published a Benchmarks Supplement, primarily designed to enable parties to derivatives contracts to include new provisions to address requirements under the EU Benchmark Regulation (BMR) for EU supervised entities to produce and maintain robust written plans setting out the actions they would take if a benchmark materially changes or ceases to be provided.[7]

The OSSG continues to engage with ISDA, other trade associations and other industry stakeholder representatives (including buy-side representatives) to discuss these issues and provide official sector guidance where appropriate, including through a sub-group established for this purpose.

Timetable and next steps: This report covers a large number of benchmarks across the major markets and currency areas. Planning for transition is underway in some but not all markets. Appendix A gives an overview of major interest rate benchmarks and the relevant RFRs or other alternative reference rates identified, as well as milestones (where applicable). Key next steps are set out in section 1.4 below.

The OSSG has recently intensified its monitoring and coordination efforts and continues to meet regularly including with stakeholders outside the official sector to coordinate across member jurisdictions, as well as to monitor progress and prepare progress reports and ad-hoc papers as appropriate. A further progress report is expected to be published in late 2019.

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5 Available at https://www.isda.org/2018/07/12/interbank-offered-rate-ibor-fallbacks-for-2006-isda-definitions.

6 FSB (2018), *Interest rate benchmark reform – overnight risk-free rates and term rates*, available at http://www.fsb.org/wp-content/uploads/P120718.pdf.

7 ISDA (2018), "ISDA publishes Benchmarks Supplement", Press Release, 19 September, available at https://www.isda.org/2018/09/19/isda-publishes-benchmarks-supplement/.

1. International coordination and key cross-jurisdictional themes

1.1 Overview

In 2014, in response both to cases of attempted manipulation in relation to key IBORs, and to the decline in liquidity in key interbank unsecured funding markets, the FSB made several recommendations relating to:

- strengthening the IBORs, in particular by anchoring them to a greater number of transactions, where possible, and improving the processes and controls around submissions;
- identifying alternative near-risk free rates (RFRs) and, where suitable, encouraging derivative market participants to transition new contracts to an appropriate RFR.[8]

Since 2014, the work has been coordinated at the international level by the FSB's Official Sector Steering Group (OSSG).

In July 2016 the OSSG formally launched a third major initiative, to improve contract robustness to address risks of discontinuation of widely-used interest rate benchmarks. The OSSG invited ISDA to lead this third initiative as it pertained to derivative contracts, which are the largest source of exposure to the IBORs. ISDA welcomed that invitation and has undertaken a programme of work in response, launching its first major consultation this year on fallbacks for derivatives referencing certain interest rate benchmarks including GBP, CHF and JPY LIBOR, TIBOR and BBSW.[9]

In July the FSB published a statement on overnight risk-free rates, term rates and fallbacks in the context of the interest rate benchmark reform agenda.[10] IOSCO had also published a statement in January, setting out matters for users of financial benchmarks to consider in selecting an appropriate benchmark and in contingency planning, particularly for scenarios in which a benchmark is no longer available.[11]

Although all of the major IBORs have been strengthened since the OSSG was formed, FSB member authorities in certain jurisdictions have moved away from their original viewpoint that a "multiple-rate" approach, in which each IBOR could be made to be sustainable and potentially coexist with the RFR, was possible. In particular, authorities have warned that there is an appreciable risk that LIBOR will end once official sector support for the benchmark is withdrawn at end-2021. There is also the risk that LIBOR could be found not to be

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[8] FSB (2014), *Reforming Major Interest Rate Benchmarks,* 22 July, available at www.fsb.org/wp-content/uploads/r_140722.pdf.

[9] ISDA (2018), *Consultation on Certain Aspects of Fallbacks for Derivatives Referencing GBP LIBOR, CHF LIBOR, JPY LIBOR, TIBOR, Euroyen TIBOR and BBSW*, available (together with other data including illustrate charts) at https://www.isda.org/2018/07/12/interbank-offered-rate-ibor-fallbacks-for-2006-isda-definitions. See further section 4.

[10] FSB (2018), *Interest rate benchmark reform – overnight risk-free rates and term rates*, available at http://www.fsb.org/wp-content/uploads/P120718.pdf.

[11] IOSCO (2018), *Statement on Matters to Consider in the Use of Financial Benchmarks,* available at http://www.iosco.org/library/pubdocs/pdf/IOSCOPD589.pdf.

representative of its underlying market, due to a lack of underlying transactions, which would have consequences for those users covered by the EU Benchmarks Regulation (BMR).[12]

For these reasons, FSB member authorities consider that transition away from LIBOR is necessary, across the five LIBOR currencies (USD, EUR, JPY, GBP and CHF); it should be presumed that LIBOR will not be sustainable.[13] As the UK authorities have stated they will neither persuade nor compel panel banks to participate in LIBOR panels after end-2021, transition well before that end date would minimise risks to financial stability.

For certain other major IBORs, authorities are encouraging efforts to develop robust RFRs and to make derivatives and other contracts more robust to discontinuation, but it is recognised that transition to RFR may take longer and therefore maintaining IBORs is still necessary. For example, authorities in the euro area seek to promote a robust RFR while also supporting the current Euribor reform, whose administrator is in the process of launching a hybrid methodology for the calculation of that benchmark. Finally, in other currency areas, authorities do not at this time think that transition solely to RFRs is necessary and continue to support a multiple-rate approach. Examples of such jurisdictions include Australia, Canada and (with regard to TIBOR) Japan. See further Appendix A.

1.2 Issues related to divergence between IBORs

In terms of transition timing, the announcement that there is a possible deadline of end-2021 for LIBOR, and authorities' assessment that it should be presumed that LIBOR will not be sustainable, have quickened the pace of necessary change.[14]

In the EU, end-2019 is the date by which all benchmark administrators must either be authorised or registered or qualify as exempt from authorisation under the BMR for EU supervised entities to be able to continue to use their benchmarks. The administrator of EONIA has indicated[15] that EONIA will not comply with the EU BMR by January 2020, giving added impetus to the work by the Euro area working group to identify an alternative RFR. In this regard, the members of the private sector working group on euro risk-free rates have expressed their concerns to the European public authorities that this timeline is very tight and that a two year extension of the provisional period might be a safer option for a smooth transition.[16]

This divergence in the assessed sustainability of key IBORs points to the need for continued international coordination in order to help manage basis risks that are likely to emerge between currencies in which an RFR is now expected to become the dominant interest rate benchmark and others where the IBOR may remain dominant. To the extent possible, authorities will seek to coordinate their efforts.

The potential end to LIBOR also reinforces the need for robust contractual fallbacks, both in derivatives (via the ISDA process) and cash products. The OSSG's efforts on fallbacks were

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[12] See the speeches and official statements referenced in section 2.1.1(a).

[13] See FSB (2018), *op. cit.*

[14] Financial Conduct Authority (2017), "The future of LIBOR", speech by CEO Andrew Bailey, available at www.fca.org.uk/news/speeches/the-future-of-libor.

[15] EMMI (undated), State of Play of the Eonia Review, available at https://www.emmi-benchmarks.eu/assets/files/D0030D-2018-Eonia%20review%20state%20of%20play.pdf.

[16] See:https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/WG_euro_risk-free_rates/shared/pdf/20180913/Item_3_High_level_implementation_plan.pdf

firstly directed to the derivatives markets, through its engagement with ISDA. In 2018 the OSSG has broadened out its engagement to include major global cash products trade associations as well, including those covering the loan and mortgage markets.

Finally, in some LIBOR currencies, including recently for the euro area, currency area working groups are actively considering the potential to create term rates based on RFR-derivative markets. While the creation of a term rate could benefit end users whose systems have been built around the use of LIBOR rates, the FSB has stated that the greater robustness of overnight RFRs (including compounded overnight) compared with term rates makes overnight RFRs a better reference rate choice than term rates in markets where participants do not need forward-looking term rates.[17]

1.3 Approach to transition

Transition planning and implementation challenges that will require engagement between FSB member authorities and market participants (including benchmark administrators and financial market infrastructures (FMIs) such as central counterparties (CCPs)) include:

- the development of the necessary standards or protocols so that the various markets can operate based on RFRs;
- development of products referencing RFRs, especially where global consistency can promote liquidity (e.g. similarly structured futures contracts);
- issues related to transitioning the cross-currency basis market to the new RFR benchmarks especially given the differing timelines between jurisdictions;
- development of RFR-derived term rates, where it is considered feasible and consistent with financial stability, and maintenance of IBORs that are supported by active underlying markets and considered reliable by regulators and market participants;
- conversion of the stock of legacy contracts to de-risk the financial system and reduce reliance on vulnerable benchmarks.[18]

More outreach and awareness-raising with various market segments and a large number of firms and market participants is needed, and information dissemination will continue to catalyse authorities and working group efforts.

For some jurisdictions, especially for **emerging markets**, where there are thin or non-existent established overnight indexed swaps (OIS) or futures markets from which to create a term rate, it may be difficult to implement the same approaches as those in more developed economies.

1.4 Future actions

In response to these challenges, the OSSG and its member authorities have significantly ramped-up their activities, and will continue to work intensively on these issues with market

[17] FSB (2018), *op. cit.*

[18] Whilst contractual robustness and the insertion of robust fallback clauses is a key step in mitigating the financial stability risk linked to interest rates benchmark reforms, the most effective way to reduce reliance on vulnerable benchmarks is to exit these contracts where possible, or to convert them to alternative rates. To that extent, the development of legacy conversion mechanisms will be essential.

actors over the foreseeable future. The OSSG will also continue working with other authorities to investigate how the regulatory framework could best support transition.

Further milestones/actions in the reform agenda include:

- Ongoing engagement between the OSSG and the OSSG's subgroup on contractual robustness and ISDA and other trade associations on derivatives and cash markets fallbacks;
- authorities' engagement with CCPs and confirmation/trading platforms to encourage legacy conversion mechanisms;
- authorities' engagement with benchmark administrators;
- publication of a response to the ISDA consultation on fallbacks for GBP, CHF and JPY LIBOR, TIBOR and BBSW, expected by end-2018;
- publication by ISDA of a supplemental consultation paper on derivative contract fallbacks for USD LIBOR, expected in 2019;
- publication by ISDA of a supplemental consultation paper for EUR LIBOR and Euribor, with timing to be determined;
- launch of ESTER by the ECB (expected by October 2019 at the latest);
- from start-2020, the coming into force of the BMR requirement for authorisation or registration of benchmarks administrators in order for EU supervised entities to enter new transactions referencing the relevant benchmark; and
- from end-2021, the Financial Conduct Authority (FCA) no longer persuading or compelling banks to submit to LIBOR.

Appendix A gives further details of expected key milestones in respect of individual benchmarks.

The OSSG expects to continue to monitor and coordinate progress and to publish a further progress report in late 2019.

2. Developments in interbank offered rates (IBORs)

2.1 Developments in major IBORs

2.1.1 LIBOR

(a) The future of LIBOR

In November 2017 the Chief Executive Officer of the FCA, Andrew Bailey, confirmed agreement with the 20 panel banks to sustain LIBOR until the end of 2021.[19] After that date the FCA would not persuade or compel banks to submit to LIBOR.[20] In July 2018 he reiterated the absence of ways to remedy the current underlying weakness in LIBOR. He said that the discontinuation of LIBOR should not be considered a remote probability "black swan" event, but something that will happen and for which the market must be prepared. Given the systemic risk posed by an excessive reliance on LIBOR, he announced that authorities in UK will take steps to make sure that supervised firms produce adequate plans to mitigate these risks and to reduce dependencies on LIBOR.[21] Aligned messages were delivered in May by Bill Dudley, CEO of the Federal Reserve Bank of New York[22] and by Mark Carney, Governor of the Bank of England, [23] and, on the same day as Mr Bailey's speech in July, by Chris Giancarlo, Chairman of the Commodity Futures Trading Commission.[24]

(b) Regulatory environment

On 28 December 2017, the European Commission added LIBOR to the list[25] of critical benchmarks under the EU Benchmark Regulation[26] (BMR). From this date, relevant provisions of the BMR relating to critical benchmarks have applied to LIBOR, including (time-limited) powers of compulsion over the submitting banks and IBA.

As required for all critical benchmarks under the BMR, the FCA has established a consultative college[27] to discuss key decisions on LIBOR. This is chaired by the FCA and is comprised of the European Securities Markets Authority (ESMA), the national competent authorities of the submitting banks, and other EU Member States that would suffer significant adverse impact in the event of LIBOR's cessation. The college, which was set up at the beginning of 2018 and had it first meeting in February, supported the authorisation of IBA by the FCA, granted in April.

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19 See https://www.fca.org.uk/news/statements/fca-statement-libor-panels

20 See https://www.fca.org.uk/news/speeches/the-future-of-libor

21 See https://www.fca.org.uk/news/speeches/interest-rate-benchmark-reform-transition-world-without-libor

22 See https://www.newyorkfed.org/newsevents/speeches/2018/dud180524

23 See https://www.bankofengland.co.uk/-/media/boe/files/speech/2018/staying-connected-speech-by-mark-carney.pdf?la=en&hash=746A04FE49984D60C4DE3BF4CC75887B5045B510

24 See https://www.cftc.gov/PressRoom/SpeechesTestimony/giancarlostatement071218.

25 See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32017R2446&from=EN.

26 See https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R1011&from=EN.

27 See https://www.fca.org.uk/publication/mou/libor-supervisory-college-written-arrangements.pdf.

As required under the BMR, IBA, as the benchmark administrator, published a benchmark statement[28] in May which provides key information for users (including what the benchmark is intended to measure, the rationale behind its methodology, and the rules relating to any exercise of judgement and discretion by the administrator or the contributors). It published its new code of conduct[29] for contributors in June.

(c) Implementation of the LIBOR waterfall methodology

Since the 2017 Progress Report, ICE Benchmarks Administration Ltd (IBA) has continued to work with the LIBOR panel banks to develop the infrastructure and systems necessary to move to a so-called "waterfall methodology". Prior to the transition to the waterfall methodology, panel banks identify the rates they submit through their own internal procedures and in compliance with the LIBOR code of conduct. The waterfall methodology standardises the submission process requiring that submitting banks utilise eligible transaction data where available, otherwise transaction-derived data if it is available, and if neither type of data is available, panel banks use expert judgement based on market and other transaction data, appropriately framed using the individual bank's internally developed procedure as approved by IBA. Between September and December 2017 the panel banks provided IBA with test LIBOR contributions using the waterfall methodology, alongside their usual submissions. The results of the test submissions were made public on 17 March 2018, allowing market participants to have a better understanding of the rates under the new methodology. [30]

On 25 April, IBA announced[31] that it intended to move panel banks to the waterfall methodology on a gradual basis, in order to minimise operational and technology risks. The transition is expected to be completed no later than Q1 2019. In the same report IBA stated that it intended to engage with market participants to identify the most important currency/tenor pairs that IBA might seek to publish after 2021, when the FCA's voluntary agreement with the panel banks expires. IBA stated that there is no guarantee that any LIBOR rates will be published after that time.

2.1.2 Euribor

(a) Move to a hybrid methodology

Since the 2017 Progress Report, the European Money Markets Institute (EMMI) has made further progress in its efforts to reform the Euribor benchmark, in order to ground its calculation, to the extent possible, in euro money market transactions that reflect its underlying interest. In March, EMMI published a consultation paper describing its plans for a hybrid methodology for Euribor, consisting of a three-level waterfall which prioritises the use of real transactions whenever available and appropriate, and relies on other related market pricing sources when necessary.[32]

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[28] See https://www.theice.com/publicdocs/LIBOR_Benchmark_statement.pdf.

[29] See https://www.theice.com/publicdocs/ICE_LIBOR_Code_of_Conduct.pdf.

[30] See https://www.theice.com/iba/libor/testfiledata/031718.

[31] See https://www.theice.com/publicdocs/ICE_LIBOR_Evolution_Report_25_April_2018.pdf.

[32] EMMI (2018), Consultation Paper on a Hybrid Methodology for Euribor, available at https://www.emmi-benchmarks.eu/assets/files/D0083-2018%20Consultation%20Hybrid%20Euribor_full.pdf.

To foster the accuracy and reliability of Euribor, EMMI seeks to ground the determination of Euribor in transactions that reflect the benchmark's underlying interest. The data analysis exercise conducted by EMMI in 2016 and 2017 concluded that the current level of liquidity in the unsecured money market is not consistently sufficient to base the Euribor calculation solely on transactions. EMMI, supported by a market participants task force, subsequently proposed a hybrid methodology, which follows a hierarchical approach consisting of three levels: in Level 1, submissions are based solely on transactions in the underlying interest, whose eligibility criteria are defined by EMMI; in Level 2, submissions are based on transactions in the underlying interest across the money market maturity spectrum and from recent TARGET days, adjusted by a series of formulaic calculation techniques defined by EMMI; and in Level 3, submissions are based on additional transactions in the underlying interest, excluded from Level 1 and Level 2, as well as other data from markets related to the unsecured euro money market.

Following the introduction of the new methodology, EMMI intends to be responsible for the determination of panel banks' submissions under the Level 1 and Level 2 methodologies, using as input the panel banks' individual transactions and historical submissions.

The feedback summary to the March consultation was published at the end of June.[33] EMMI also confirmed a cessation of some Euribor tenors,[34] as well as the discontinuation of publication of individual panel banks' submissions, both to take place as of 3 December 2018.

A second public consultation was published in October,[35] and provides the final blueprint for the hybrid methodology. The publication of the feedback summary will take place at end-2018.

(b) Data

To support the parameters for the hybrid methodology, EMMI conducted a new data collection exercise between May and July. During this period, participating panel banks submitted, on a daily basis, their contributions based on the proposed hybrid methodology for Euribor, which included their daily unsecured money market trades.

EMMI performed in mid-2018 an in-depth analysis of the submission data received from participating panel banks. In order to guarantee the index's representability and robustness, the analysis considered different scenarios that informed the final parametrisation of the methodology. The phasing-in of the hybrid methodology should take place in 2019.

(c) Regulatory environment for benchmarks

The EU Benchmarks Regulation has been fully applicable from 1 January 2018. Euribor has been declared a critical benchmark for the purposes of the BMR, along with the Euro Overnight Index Average (EONIA).[36] In accordance with its Article 51, index administrators already providing an index on 30 June 2016 have until 1 January 2020 to apply for authorisation to their

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33 See https://www.emmi-benchmarks.eu/assets/files/D0244A-2018%20Feedback%20Summary%20Consultation%20Hybrid%20Euribor-final%20version.pdf.

34 See https://www.emmi-benchmarks.eu/assets/files/D0237B-2018-CESSATION%20OF%20EURIBOR%20TENORS.pdf.

35 See https://www.emmi-benchmarks.eu/assets/files/D0373-2018%20Second%20Consultation%20Hybrid%20Euribor_full.pdf.

36 See https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R1147.

national competent authority. If an index administrator does not submit an application for authorisation by this date, EU supervised entities will not be in a position to use the benchmarks of such administrators in new contracts and financial instruments after that date (continued use for legacy contracts may be permitted by the competent authority).[37] EMMI is planning to apply for authorisation to the Belgian FSMA, Euribor's competent authority, by Q2 2019. As regards EONIA, its administrator EMMI, has already indicated that it will not meet the requirements of the Regulation under its current form (see Section 3.2).

2.1.3 TIBOR

(a) Implementation status of the reform

Since the Japanese Bankers Association TIBOR Administration (JBATA) implemented TIBOR reform in 2017,[38] introducing a waterfall methodology that includes a calculation method which determines the submission rate without discretion based on various data including actual transaction data of the underlying market, the use of expert judgement is now limited to emergency situations (e.g. affected by large-scale disaster and sudden financial market turmoil).

Since the implementation of this reform, there has been no case where the expert judgement was used to calculate and determine reference rates for both Japanese Yen TIBOR and Euroyen TIBOR. Particularly for Japanese Yen TIBOR, reference banks determine their submission rates in the first level of the waterfall, in which data of the underlying market (i.e. Japan unsecured call market) are used, for all tenors in almost all cases.

(b) Efforts for further improvement

JBATA continues its efforts on improving the robustness of JBA TIBOR and conducted a self-assessment of its compliance with the IOSCO *Principles for Financial Benchmarks* (19 principles).[39] The result of the self-assessment was published on 5 March.[40] JBATA concluded that substantial compliance with the IOSCO Principles has been achieved as a result of the implementation of the JBA TIBOR reform, while being aware of some remaining issues relating to Principle 7 (Data Sufficiency) and Principle 13 (Transition).

With respect to Principle 7, the amount of transaction balance for the underlying market of Euroyen TIBOR (i.e. Japan offshore market) is relatively limited and continues to shrink. To address this issue, JBATA published a consultation report on the integration of Japanese Yen TIBOR and Euroyen TIBOR on 2 October 2018.[41] In this public consultation, JBATA is seeking comments on (1) proceeding with the initiative to integrate Japanese Yen TIBOR and Euroyen TIBOR by retaining Japanese Yen TIBOR and discontinuing Euroyen TIBOR ("integration into Japanese Yen TIBOR"), (2) potential issues that may arise from the integration into Japanese Yen TIBOR and (3) preparation period for the integration into

[37] According to the Article 51(4) of the EU Benchmark Regulation, in case a benchmark does not satisfy the requirements of the Benchmarks Regulation, but ceasing it would result in a force majeure event, the use of the benchmark shall be permitted by the competent authority of the Member State where the index provider is located. No financial instruments, financial contracts, or measurements of the performance of an investment fund shall add a reference to such an existing benchmark after 1 January 2020.

[38] See http://www.jbatibor.or.jp/english/news/Revision_of_CoC.html.

[39] See https://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf.

[40] See http://www.jbatibor.or.jp/english/pdf/Compliance_with_IOSCO_19Principles_E_2017.pdf.

[41] See http://www.jbatibor.or.jp/english/news/20181002_tibor_1st_consultation.html.

Japanese Yen TIBOR. JBATA will develop proposed reforms during the first half of 2019 and conduct a second consultation.

With respect to Principle 13, JBATA encourages users of JBA TIBOR to agree on fallback provisions to prepare for the situation where JBA TIBOR has not been published. It is also paying attention to developments in ongoing discussions for financial benchmark reform by ISDA and other organisations, and would take actions for identifying an alternative benchmark appropriate to the needs of users of JBA TIBOR and transitioning to that alternative benchmark.

In addition, the publication of the two-month tenor of JBA TIBOR and simultaneous publication of individual submissions will be terminated as from 1 April 2019; the latter will be published three months after the publication of JBA TIBOR from that date.

2.2 Developments in other markets

2.2.1 Australia

The key IBOR benchmark for the Australian dollar is BBSW. The Reserve Bank of Australia (RBA) and the Australian Securities and Investments Commission (ASIC) have been working closely with the Australian Securities Exchange (ASX, the administrator of BBSW) and industry to strengthen BBSW through the implementation of a new methodology.

The critical difference between BBSW and LIBOR is that there are enough transactions in the Australian bank bill market each day to calculate a robust benchmark. Australia has an active bank bill market, where the major banks issue bills as a regular source of funding, and a wide range of wholesale investors purchase bills as a liquid cash management product.

(a) New BBSW methodology

BBSW was previously calculated from the best executable bids and offers (using National Best Bid and Offer (NBBO)) for the bills issued by the major banks. Until recently, there was concern about the low trading volumes in the interbank market at the time of day that BBSW was being measured (around 10.00 am). While there were enough transactions over the course of the day, there were not enough transactions occurring in the narrow rate set window.

Over the past year, the BBSW methodology has been strengthened to enable the benchmark to be calculated directly from the wider set of market transactions that occur each day. The new methodology was implemented in May, and involves calculating BBSW as the volume-weighted average price (VWAP) of bank bill transactions during the rate set window of 8.30–10.00 am. The VWAP method is at the top of a robust calculation waterfall for BBSW, so the benchmark can continue to be published as conditions change in the bank bill market. If there are not enough transactions on a day, BBSW is instead calculated using NBBO, and if quotes are unavailable, there are algorithms that can be used to calculate the benchmark for a time.

To rebuild confidence in trading during the rate set window ahead of the implementation of the VWAP methodology, the ASX worked closely with market participants to develop a new set of trading guidelines for BBSW, which were implemented in October 2017. ASIC and the RBA made it clear that they expect all bank bill market participants to adhere to the guidelines and support the new BBSW methodology.

The new methodology has broadened the BBSW rate set to include transactions outside the interbank market during a longer trading window. This reflects the decline in bank holdings of bills over recent years while holdings by investment funds have increased. Previously, these investors had purchased bills outside the rate set, agreeing to the transaction at the yet-to-be-determined BBSW rate. From December 2017, banks and investors started trading bank bills at outright yields during the rate set window. This change in market practice was successfully implemented, enabling these transactions to be used to calculate BBSW.

Since the VWAP methodology has been implemented, there have been around AUD 1.8 billion in transactions during the rate set each day, with a wide range of institutions participating. On most days, it is possible to calculate the key three month and six month rates using the VWAP method. In addition, the difference between the rate calculated using VWAP and the NBBO method is very close to zero. As a result, there has been a seamless transition to the new BBSW methodology.[42]

(b) Regulatory environment for benchmarks

In April, the Australian Government implemented a new regulatory framework for financial benchmarks. The legislation empowers ASIC to set the rules for, and license administrators of, significant benchmarks such as BBSW. ASIC published the rules for benchmark administrators in June.[43] ASIC also has the power to compel submissions to a significant benchmark in the rare circumstances where the benchmark would otherwise cease to be published. Finally, the legislation has made it an offence to manipulate financial benchmarks. This new regulatory framework has helped to address the uncertainty that institutions were facing when participating in the BBSW rate setting process.

2.2.2 Brazil

The overnight unsecured interbank offered rate (DI rate) is the major reference rate applied for fixed income instruments issued by banks and corporations, as well as for derivative instruments in Brazilian markets. The DI rate is the average interest rate of overnight interbank unsecured transactions, calculated by the Brazilian securities exchange (B3). Despite being based on actual market transactions, the low level of trading activity in its underlying market has been challenging its use for referencing significant amounts of locally issued instruments.

Regarding LIBOR, there is a very low trading volume of LIBOR-linked products and contracts in the Brazilian local financial industry. There are no LIBOR-linked loans (business, syndicated, retail or mortgages), notes, deposits or securitised instruments and among OTC derivatives, there are only interest rate swaps. These LIBOR swaps represent 12% of the total notional swap in Brazilian markets and only 1% of the total derivatives market. Regarding these contracts, 75% will mature by 2021. In principle, these contracts refer to hedge exposures in foreign currency debt. Currently, according to B3, which is the custodian of these swaps, all claims are well-drafted contracts, having fallback provisions that specify an alternative rate in case LIBOR is unavailable.

In terms of external funding, Brazilian banks are still borrowing at LIBOR rates and the LIBOR maturity depends on the length of the contract. For some banks, the cost of financing is a LIBOR maturity plus the country risk premium.

[42] See https://www.rba.gov.au/publications/bulletin/2018/sep/interest-rate-benchmarks-for-the-australian-dollar.html.

[43] See https://asic.gov.au/regulatory-resources/markets/financial-benchmarks/.

2.2.3 Canada

There have been no changes to the definition or functioning of the Canadian Dollar Offered Rate (CDOR). The number of CDOR panel member banks declined from seven to six, but the current set of submitter banks represent the six largest issuers of Canadian Bankers' Acceptances (BA), the underlying market for CDOR, accounting for approximately 92-93% of the BA issuance in Canada. In contrast with the decline in the underlying transactions for some other IBORs, the amount of BAs outstanding hit a record of over $85 billion in April. The BA market is the second largest segment of the Canadian money market accounting for over 25% of the market.[44]

The Investment Industry Regulatory Organization of Canada plans to start publishing in early 2019, one and three month Bankers' Acceptance (BA) rates based on secondary market BA offered-side trades entered into their Market Trade Reporting System. These delayed rates will be published for informational purposes to support transparency in the underlying BA market.

2.2.4 Hong Kong

The Hong Kong Monetary Authority (HKMA) continues to work closely with the Treasury Markets Association (TMA), the administrator of Hong Kong Interbank Offered Rate (HIBOR), to strengthen HIBOR in line with the international recommendations, having regard to local market conditions. A number of changes were made to the governance processes to enhance the robustness of HIBOR, for example, strengthening independent oversight through the establishment of a Surveillance and Governance Committee and issuing new policies on conflicts of interest, complaints, whistle-blowing and error correction.

The HKMA and TMA continue to monitor interest rate benchmark reforms in other major jurisdictions. They have also been exploring the feasibility of including actual transactions in a wider range of interest rate instruments in HIBOR determination, such as wholesale non-bank deposits and short-term debt securities, but the practicability and implications of such a change to HIBOR would need careful evaluation. Subject to the results of the feasibility study, the TMA plans to conduct market consultation by early 2019.

2.2.5 Mexico

As mentioned in previous reports, Mexico's IBOR is the Interbank Equilibrium Interest Rate (TIIE) and is the main benchmark rate in the Mexican markets. The TIIE rate faces problems very similar to those faced by the main IBORs around the world. On the one hand, the calculation of the TIIE is not based on observed transactions in the market: in fact, it is calculated through voluntary contributions by local banks to the administrator of the TIIE, the Banco de México (BdM), which reserves the right to execute credits or deposits with the contributors, when their contributions are not aligned with market conditions. On the other hand, the underlying market of the TIIE is non-existent given that 99% of the transactions in the wholesale funding market are overnight transactions. In fact, during the last 12 months, the average amount of wholesale funding transactions at a tenor of 28 days, which is the main tenor of the TIIE, is less than one transaction per day.

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[44] See *A Primer on the Canadian Bankers' Acceptance Market* (available at https://www.bankofcanada.ca/2018/06/staff-discussion-paper-2018-6/) for more background information on the Canadian BA market.

Even though the TIIE faces similar problems to those of the main IBORs, BdM considers that it is more robust than those IBORs. As mentioned above, the TIIE is calculated by the central bank and not by a private institution, and the bids received are subject to ending up as an actual transaction.

BdM is nevertheless seriously analysing the possibility of promoting the use of an RFR as the main benchmark rate. If in the future, IBORs cease to exist, it is possible that those institutions that currently contribute to the calculation of the IBORs will decide to stop contributing to the calculation of the TIIE.[45]

In order to cope with these potential problems with the TIIE, BdM has already met with the most important commercial banks in Mexico to open the discussion about the future of the TIIE and the possibility of using an RFR as the main benchmark rate. As of late 2018, BdM is considering creating a Working Group of Benchmark Rates.

2.2.6 Singapore

The ABS Benchmarks Administration Co Pte Ltd and the Singapore Foreign Exchange Market Committee (ABS-SFEMC) issued a public consultation in December 2017 to seek feedback on proposals to enhance the Singapore Interbank Offered Rate (SIBOR).[46] Following this public consultation, ABS-SFEMC finalised its proposals to improve SIBOR in July. The key recommendations aim to increase reliance on market transactions by calculating SIBOR using the following waterfall methodology: (a) transactions in the underlying wholesale funding markets, (b) transactions in related markets, and (c) expert judgement. The inclusion of other wholesale funding transactions reflected the structural shifts in banks' key sources of funding. The waterfall methodology will be implemented after a period of transitional testing, which is expected to commence in H2 2019 when administrator and panel banks will have completed preparations for the shift.

Concurrently, MAS introduced a financial benchmarks regulatory regime, which commenced on 8 October 2018. The regulatory framework[47] subjects the manipulation of any financial benchmark in Singapore to criminal and civil sanctions, and administrators of and submitters to key financial benchmarks (as designated by MAS[48]) to regulation.

2.2.7 South Africa

The South African Reserve Bank (SARB) published a consultation paper on selected interest rate benchmarks in South Africa (Consultation Paper) in August.[49] The paper contains proposals on the reform of key interest rate benchmarks used in South Africa as well as proposals on a suite of new benchmarks that could potentially be used as reference interest rates. The proposals are based on the analysis of transaction data collected from commercial

[45] In Mexico, most of the local banks are subsidiaries of foreign banks that currently participate in the calculation of the main IBORs.

[46] SIBOR is administered by the ABS Benchmark Administration Co Pte Ltd, with Thomson Reuters as the calculation agent. SIBOR is currently calculated from a survey of a panel of 20 banks and is available in four tenors – 1-month, 3-months, 6-months and 12-months.

[47] See https://sso.agc.gov.sg/Act/SFA2001; https://sso.agc.gov.sg/SL/SFA2001-S642-2018?DocDate=20181002.

[48] See https://sso.agc.gov.sg/SL/SFA2001-S644-2018?DocDate=20181002.

[49] See http://www.resbank.co.za/Lists/News%20and%20Publications/Attachments/8722/Consultation%20Paper%2028-08-2018.pdf.

banks during 2017. The domestic reform efforts are consistent with the SARB's endorsement of the coordinated work by global regulators and central banks to ensure that interest rate benchmarks are credible, accurate and trusted by consumers and financial market participants.

The Consultation Paper recommended that:

- the current calculation of the Johannesburg Interbank Average Rate (Jibar) be phased out and replaced with a transaction-based rate, comprising negotiable certificates of deposit (NCDs) and non-bank financial corporate deposits;
- risk-inclusive reference rates be used for the pricing of unsecured on-balance sheet (Jibar-linked) items and risk-free reference rates be used for collateralised transactions and derivative contracts;
- a term-deposit benchmark be introduced and considered as a possible alternative to the Jibar;[50]
- the current South African Benchmark Overnight Rate (Sabor) be reformed and renamed as Sabor Money Market, comprising all overnight unsecured wholesale funding obtained by all banks; and
- a South African Rand Interbank Overnight Rate (ZARibor), based solely on overnight interbank transactions obtained from all banks, be calculated and considered as a near risk-free rate.

2.2.8 Switzerland

All relevant Swiss developments are covered by the LIBOR update (see section 2.1.1 above) to the extent it relates to the Swiss franc.

[50] While the current Jibar for one-, three-, six- nine- and twelve month maturities are derived from NCD rates as quoted by the five major domestic banks, the term-deposit benchmark will be calculated based on actual deposit transactions of all domestic banks for all deposit categories and for maturities from overnight to one year.

3. Transition to risk-free rates (RFRs), where appropriate

3.1 US dollar (USD)

3.1.1 Production or Identification of RFRs

The Federal Reserve Bank of New York (FRBNY) began daily publication of the Secured Overnight Financing Rate (SOFR) on 3 April.[51] SOFR is calculated as a volume-weighted median of transaction-level data that includes (a) all overnight, tri-party general collateral repurchase agreement (repo) transactions collected from the Bank of New York Mellon, (b) GCF Repo data obtained from DTCC Solutions (excluding transactions to which the Federal Reserve is a counterparty), and (c) bilateral Treasury repurchase agreement (repo) transactions cleared through the Delivery-versus-Payment service offered by the Fixed Income Clearing Corporation.

SOFR routinely has over $750 billion in daily transactions underlying it, representing the largest single rates market at a given maturity in the US. As a fully transactions-based, publicly-produced reference rate, SOFR represents a transparent and robust alternative to USD LIBOR. An independent audit group within FRBNY has reviewed the internal control structure used to administer SOFR and determined that it is in compliance with the *Principles for Financial Benchmarks* published by the IOSCO.[52]

Federal Reserve officials have publicly noted that they are considering publishing a compound average of SOFR as a way to encourage use of SOFR in cash products. The ARRC has also included the production of a forward-looking term rate based on SOFR futures and/or OIS transactions as the final step of its Paced Transition Plan. The ARRC's Second Report noted that production of this type of rate would not intended for primary use in derivatives but would be intended to ease transition among some users in certain cash markets, such as corporate loans, whose systems are built around use of forward-looking term rates.

3.1.2 Transition

The ARRC finalised its Paced Transition Plan and published a detailed timeline for each step in its Second Report, which was released in March.[53] The Plan envisioned the start of SOFR futures and cleared OIS trading (to take place over 2018 and the first part of 2019), the introduction of price alignment interest and discounting based on SOFR (first introduced on a voluntary basis in 2020 and then eventually required for all new trades in 2021), culminating in the planned production of a forward-looking term rate by the end of 2021.

Market adoption of SOFR is already ahead of the goals set in the ARRC's Plan. Within a month of SOFR's publication, CME began offering SOFR futures. LCH began offering cleared SOFR OIS and basis swap trading in July and CME began offering clearing of SOFR products using SOFR PAI and discounting in October. Trading in SOFR futures has started at a faster pace than either Eurodollar Futures or Fed Funds Futures, with average daily volume of about 8,000

[51] SOFR data is published on FRBNY's website at https://apps.newyorkfed.org/markets/autorates/sofr. SOFR was selected in 2017 by the Alternative Reference Rates Committee (ARRC) as its recommended alternative to USD LIBOR, and is a broad measure of the cost of borrowing cash overnight collateralised by Treasury securities.

[52] See https://www.newyorkfed.org/medialibrary/media/markets/IOSCO-statement-of-compliance-jun2018.

[53] See https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-Second-report.

contracts ($24 billion notional). Over 590,000 contracts have traded, with open interest surpassing 51,500 contracts ($177 billion). Importantly, the first SOFR cash instruments, $18 billion in floating rate notes (FRNs), have met with heavy demand.

The ARRC's Second Report also included updated estimates of scale of use of USD LIBOR, estimating gross notional exposures of nearly $200 trillion as of the end of 2016, and estimates of the volume of transactions underlying LIBOR, finding that on most days there was $500 million or less in transactions underlying 3-month USD LIBOR. These findings emphasize the financial stability risks involved in placing so many transactions on a rate underpinned by such thin volume.

While the ARRC's Second Report estimated that roughly 95 percent of exposures to USD LIBOR are in derivatives, an estimated $10 trillion are in cash products, including business loans ($3.4 trillion), floating rate notes ($1.8 trillion), securitisations ($1.8 trillion), and retail mortgages ($1.2 trillion).[54] Participants in these cash markets became much more actively interested in mitigating their risks to LIBOR following Andrew Bailey's remarks in July 2017. For this reason, the Federal Reserve reconstituted the ARRC in March in order to ensure the successful implementation of the Paced Transition Plan and serve as a forum to coordinate and track planning across cash and derivatives products as market participants consider transitioning to alternative reference rates and addressing risks in legacy contracts.[55]

3.2 Euro (EUR)

3.2.1 Production or Identification of RFRs

The working group on euro risk-free rates had its first meeting in February. The working group is comprised of euro area credit institutions as voting members, and a few non-voting members, such as users and trade associations, as well as the European Money Markets Institute (EMMI) as EONIA and Euribor administrator. The working group is chaired by a private sector representative and the four founding public institutions are observers. The ECB provides the secretariat.[56]

The first deliverable of the working group was to identify and recommend the euro RFR which will replace EONIA, as EONIA is currently not meeting the requirements of the EU Benchmarks Regulation, and hence its usage in new contracts or financial instruments could be prohibited after 1 January 2020 (see below). In addition, the euro RFR would also serve as a basis for the calculation of fallback rates for contracts linked to the Euribor.

[54] See Table 1 of the ARRC Second Report.

[55] Many of the end users that were on the ARRC's Advisory Group became formal ARRC members, and a number of new firms and associations were added. Twenty seven institutions are represented on the ARRC, including banks, CCPs, insurance companies, asset managers, nonfinancial corporations, government-sponsored and international agencies, municipal issuers, and a wide set of trade associations. Over 100 institutions are represented on the ARRC's working groups. See https://www.newyorkfed.org/medialibrary/microsites/arrc/files/2018/ARRC-Minutes-April-17-2018.pdf.

[56] The composition and terms of reference of the care published on the ECB website: see https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/WG_euro_risk-free_rates/html/index.en.html.

In September the working group selected the Euro Short-Term Rate (ESTER) as the new euro risk-free rate.[57] ESTER is the new wholesale unsecured overnight bank borrowing rate, which the ECB will produce by October 2019 at the latest.[58]

ESTER, together with the other candidate rates, was assessed against pre-defined selection criteria.[59] Index providers were also invited to propose other rates and the providers of the shortlisted euro RFRs presented their euro benchmarks to the working group. On this basis, the working group established a "short list" of the potential candidates, which included both secured and unsecured rates,[60] and gathered market feedback through a public consultation. The outcome of this public consultation was published in August 2018[61] and showed that 88% of responses viewed ESTER as the most appropriate future euro RFR, predominantly on the grounds of its unsecured nature, compilation methodology and low volatility, as well as the fact that the ECB – an EU institution – is the administrator.

These considerations were taken into account by the working group members before deciding on their recommendation of ESTER as of the new euro RFR.

Consistent with the terms of reference of the working group, the group also started to explore possible approaches for ensuring a smooth transition to this rate.

3.2.2 Transition

The working group is exploring the transition to new benchmarks with the support of its substructures.[62]

A subgroup on EONIA transition was established. Indeed, EONIA, as it currently stands, will not be compliant with the requirements of the BMR, and consequently its usage will be prohibited for new contracts at the end of the BMR's transitional period, i.e. from 1 January 2020. The EONIA transition subgroup has now started to work on identifying the possible paths for transition. A possible recommendation on a specific path is planned around end-2018.

In addition, a subgroup was created to investigate how to build term rates on the basis of the new euro RFR. The subgroup has mainly worked on the identification of the possible methodologies and the pros and cons of each of them. It has also worked on the requirements for establishing term rates based on ESTER, notably outlining the need to develop a derivative markets based on the new RFR as soon as possible.

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57 See press release: https://www.ecb.europa.eu/press/pr/date/2018/html/ecb.pr180913.en.html.

58 See https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/euro_short-term_rate/html/index.en.html.

59 See https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/WG_euro_risk-free_rates/shared/pdf/20180420/2018_04_20_WG_on_euro_RFR_Item_4_3_criteria_list_for_RFR_selection.pdf.

60 The short list of potential euro RFR candidates included three rates, both secured and unsecured: (i) ESTER; (ii) GC Pooling Deferred, a one-day secured, centrally cleared, general collateral repo rate, which is produced by STOXX, a wholly owned subsidiary of Deutsche Börse Group; (iii) RepoFunds Rate, a one-day secured, centrally cleared, combined general and specific collateral repo rate, which is produced by NEX Data Services Limited, a wholly owned subsidiary of NEX Group plc. EMMI's pan-European repo benchmark initiative, launched in 2014, could not be envisaged as a euro RFR potential candidate, as EMMI announced that its production will not be pursued. EMMI explained this decision to stop the project of the "New Repo Index" by its willingness to dedicate its resources to the ongoing Euribor reform and the transition from EONIA to the alternative reference rate. In addition, EMMI considered that, in the current situation "alternatives to existing reference rate indices, and in particular to EONIA, can be found".

61 See https://www.ecb.europa.eu/paym/cons/html/wg_assess_cand_euro_risk-free_rates.en.html.

62 The terms of reference and composition of the substructures established by the working group on euro risk-free rates are published on the ECB website.

Finally, a contract robustness subgroup under the coordination of ESMA will also advise the working group on how to enhance the legacy and new contracts across the euro area jurisdictions. The group focuses particularly on how to include fallbacks in existing contracts referencing Euribor, and especially consumer mortgages, given the great exposure in many European countries.

3.2.3 Challenges ahead in the euro area

There are a number of challenges ahead of the benchmark users in the euro area. More specifically, the non-compliance of EONIA in its current methodology with the EU Benchmarks Regulation is making the transition towards ESTER very urgent, as the usage of EONIA in new contracts would be prohibited as of 1 January 2020. On the other hand, the Euribor reform is progressing, with the administrator (EMMI) introducing a "hybrid methodology" combining transactions, market data and expert judgement ahead of its application for authorisation under the EU Benchmarks Regulation to its National Competent Authority.

The working group on euro risk-free rates has already recommended ESTER as the relevant euro RFR, which should both replace EONIA and serve as a basis for Euribor fallbacks. Over the next months, the working group should also position itself on the transition paths from the EONIA, the various methodologies to create term rates based on ESTER, and the development of fallback templates for various asset classes, in case of the discontinuation of a benchmark.

3.3 Japanese yen (JPY)

3.3.1 Establishment of a new deliberating body

In March, in response to its achievement of the primary objectives which include identification of the Tokyo Overnight Average rate (TONA) as the JPY RFR[63] and deliberation on measures to expand use of the RFR,[64] members of the Study Group on Risk-Free Reference Rates (the Study Group) discussed the next step for financial benchmark reform in Japan and shared the following views:[65]

- The establishment of a new body consisting of market participants, including a broad set of users of financial benchmarks, is important for further discussion in light of the fact that financial benchmarks are used by a wide range of parties.
- Prior to its establishment, outreach to users of financial benchmarks, including those on the buy-side and non-financial corporates, is necessary.

[63] In December 2016, the Study Group identified the uncollateralised overnight call rate as the JPY RFR. This rate is known as TONA (Tokyo Overnight Average rate) and is published by the Bank of Japan.

[64] The Working Group on Use of the Risk-Free Rate, since its establishment in January 2017, addressed the issues intensively on (i) implementation of the reforms to OIS market conventions suggested in the public consultation paper released in March 2016 and (ii) the means other than the suggested reforms to activate the OIS market referencing the uncollateralized overnight call rate, including end-user outreach. As a result, the Japan Securities Clearing Cooperation (JSCC) included interest payments with different frequencies, in addition to those made annually, for the OIS transactions regarded as "Eligible Interest Rate Swap (IRS) Transactions" for JSCC clearing, which became effective from March 2018. Also, the Working Group made "Japanese yen OIS (Overnight Index Swap) -- Overview and Case Studies --," a guide containing basic information and case studies of OIS for financial institutions that had not used OIS transactions, which was approved by the Study Group and published on the Bank of Japan's website in April 2018.

[65] See http://www.boj.or.jp/en/paym/market/sg/rfr1803b.pdf.

- It would be appropriate that the Bank of Japan (the BoJ) assumes the role as Secretariat for the new body.

After the meeting in March, the outreach to a wide range of users of financial benchmarks including regional banks, cooperative banks, insurance companies, investment trust funds, and non-financial corporates was conducted with an initiative by the BoJ. As envisaged, the outreach became a very important step not only to establish the new body with engagement of a wide range of stakeholders but also to raise awareness of the on-going reform among the users who had not taken part of its discussion before. The communication with market participants and users also helped to better picture the recent situation respecting the usage of financial benchmarks as well as the possible impact of a case if the existing financial benchmarks such as LIBOR discontinues permanently.

Following the outreach, "Cross-Industry Committee on Japanese Yen Interest Rate Benchmarks (the Committee)", the new deliberating body in Japan, was established on 1 August.[66]

3.3.2 Details of the Committee

In line with the 2014 FSB recommendations, the Committee was established to work further on implementing a "multiple-rate approach" in Japan. With identification of RFR in December 2016 and implementation of the JBA TIBOR reform in July 2017, the Committee set the following objectives: (i) developing recommendations for the stocktaking of ideas on the appropriate choice and usage of JPY interest rate benchmarks; (ii) identifying specific challenges arising from (i) and proposing solutions; and (iii) developing transition plans based on (i) and (ii) for a new framework enabling the use of JPY interest rate benchmarks.[67]

The members of the Committee are drawn from a diverse set of market participants and users including financial institutions, institutional investors, and non-financial corporates.[68] The Committee also includes observers such as a benchmark administrator (JBATA), trade associations, infrastructure entities and Financial Services Agency (FSA), and the BoJ. A wide set of industry groups attends the meetings, which may enable smoother implementation of the outcome of the Committee's discussion. The BoJ plays a secretariat role for the Committee.

For the structure, the Committee is the primary coordinating body to achieve objectives, and the sub-groups established underneath the Committee provide inputs on technical issues discussed by product and theme. The on-going sub-groups are the ones related to certain products including loans and bonds as well as a specific theme such as development of term-rates.[69]

3.3.3 Key milestones and key implementation issues

Under the objectives of the Committee to successfully implement a "multiple-rate approach" in Japan, it is expected that the Committee undertake intensive discussion to leave enough time for orderly preparation of IT system and administrative works required in individual stakeholders and mitigate the risk of possible discontinuation of LIBOR after end-2021.

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[66] See http://www.boj.or.jp/en/announcements/release_2018/rel180823a.pdf.

[67] For further information see http://www.boj.or.jp/en/paym/market/jpy_cmte/cmtyoryo01.pdf.

[68] For further information on the membership see http://www.boj.or.jp/en/paym/market/jpy_cmte/cmt180801a.pdf.

[69] See the Committee's new page on the BoJ's website: http://www.boj.or.jp/en/paym/market/jpy_cmte/index.htm/.

It is also important that the progress of discussion is widely acknowledged by the stakeholders and developed further with inputs from those including financial institutions and small and medium-sized non-financial corporates who are not involved in the Committee's discussion. In this context, it is envisaged that the Committee holds public consultation and forum at point in time to collect views from a wide range of stakeholders. The Committee would publish the deliverables after public consultation by late next year.

In the meantime, there will be some implementation issues to be resolved. Key challenges identified so far are development of term rates and international coordination. The approaches to term rates will be carefully discussed and delivered by balancing the feasibility of operations of each product and transaction and robustness of the term rates. Also, coordinating with similar working groups in other currencies will be important especially with specific transactions such as cross-currency swaps or other cross-border transactions in which difference in approaches or timing of transition may cause difficulties in continuity.

3.4 British pound (GBP)

3.4.1 Production or Identification of RFRs

On 23 April the Bank of England (BoE) implemented its reforms to the SONIA interest rate benchmark.[70] Volumes underlying the rate under the new methodology have averaged GBP 45 billion daily, over three times larger than those underlying SONIA previously.[71] The publication time of SONIA has also been moved: the SONIA rate for a given London business day is now published at 09:00 am on the following London business day. In July, the BoE released a Statement of Compliance with the IOSCO *Principles for Financial Benchmarks* for SONIA.[72]

3.4.2 Transition

Following the selection of SONIA as the alternative RFR for Sterling markets, the BoE and the FCA announced the next phase of work with market participants on LIBOR transition. The RFRWG was given an extended mandate in order to continue catalysing a broad-based transition to SONIA across sterling bond, loan and derivative markets, such that SONIA is established as the primary sterling interest rate benchmark by end-2021.

Membership of the RFRWG now includes investment managers, non-financial corporates and other sterling issuers, infrastructure firms and trade associations, alongside banks and dealers. In total over 100 institutions are now directly involved in the RFRWG and its forums and sub-groups,[73] helping to push forward work across many aspects of transition.

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70 BoE (2018), "SONIA reform implemented", News Release, 23 April, available at https://www.bankofengland.co.uk/-/media/boe/files/news/2018/april/sonia-reform-implemented.pdf. The reforms were foreshadowed in the 2017 Progress Report, section 3.5 at pages 24-25.

71 SONIA was selected by the RFRWG as its preferred near risk-free reference rate for Sterling markets in April 2017. It is a measure of the rate at which interest is paid on sterling short-term wholesale funds in circumstances where credit, liquidity and other risks are minimal.

72 See www.bankofengland.co.uk/markets/sonia-benchmark/sonia-statement-of-compliance-with-the-iosco-principles-for-financial-benchmarks.

73 This includes law firms, infrastructure firms, banks, corporates, asset managers and trade associations

Progress has so far been made in several key areas:

- Three providers[74] now offer SONIA-linked futures contracts. There has been a notable pick-up in the monthly volume of these futures since June. SONIA OIS clearing has been extended to 50 years' maturity and the proportion of the cleared sterling interest rate swaps market accounted for by SONIA-referencing OIS had increased over the past year. As of July, SONIA-referencing OIS had an 18% share of overall cleared sterling interest rate swaps, up from 11% a year ago.
- Documentation to reference SONIA in FRNs and loans is under development, and a consultation on market conventions for SONIA referencing cash market products is in the pipeline.
- Finally, several SONIA-linked FRNs[75] were issued in Q3 2018.

As in other jurisdictions, participants in some markets have become more actively interested in mitigating risks around LIBOR following communications by the UK authorities in mid-2018.

In June, the BoE's Financial Policy Committee (FPC) noted that the stock of LIBOR-linked sterling derivatives maturing beyond end-2021 continued to grow. The FPC judged this to increase medium-term financial stability risks, which could only be reduced by transition away from LIBOR.

In September, the PRA and the FCA wrote to CEOs of major banks and insurers supervised in the UK asking for details of their preparations to manage risks inherent in the transition from LIBOR to alternative interest rate benchmarks. The purpose of the letter was to seek assurance that firms' senior managers and boards understood the risks associated with this transition and were taking appropriate action so that firms could transition to alternative rates ahead of end-2021.

The market-led efforts around transition also led to various public communications. In July, the RFRWG issued a consultation on term reference rates derived from SONIA.[76] This will enable the RFRWG to make recommendations relating to the potential development of Term SONIA Reference Rates (TSRRs), which can play an important role in facilitating transition to SONIA, particularly in loan and debt capital markets. The consultation suggests that the short-dated SONIA OIS market provides the best potential source of pricing inputs for the development of TSRRs in the near term. The RFRWG anticipates that a TSRR could be available in the second half of 2019.

In the context of the RFRWG work on bond markets, the RFRWG published a paper outlining some of the risks associated with new issuances referencing LIBOR, as well as possible steps to mitigate these risks.[77] The paper is intended to help inform bond market participants who are continuing to issue, offer and purchase new Sterling bonds referencing LIBOR, in particular

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[74] CurveGlobal, ICE and CME

[75] Ten FRNs had been issued by the date of this report.

[76] See www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/consultation-on-term-sonia-reference-rates.pdf.

[77] See www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/risk-free-reference-rates-new-issuance-of-sterling-bonds-referencing-libor.pdf.

where those bonds mature beyond end-2021. The key risks it highlights are that the floating rate bonds may become fixed if LIBOR is discontinued, litigation risk may increase, bank capital instruments may not operate adequately and hedging arrangements may be impacted.

Finally, the RFRWG identified the development of key infrastructure to facilitate the transition would be a critical milestone. As such, it published a list of desired implementation steps and will seek to prioritise these and reach out to technology and infrastructure firms through a newly established infrastructure work stream.[78]

3.5 Swiss franc (CHF)

3.5.1 Production or Identification of RFRs

The key forum for reform proposals in Switzerland is the National Working Group (NWG) on Swiss Franc Reference Rates.[79] The NWG was founded in 2013 and has since been guiding the reform process on CHF reference interest rates. The NWG is co-chaired by a representative of the private sector and a representative of the Swiss National Bank (SNB). The SNB abstains from voting and acts primarily as a moderator. In October 2017, the NWG recommended the Swiss Average Rate Overnight (SARON) as the alternative to the Swiss franc LIBOR. In October 2018, the NWG recommended the use of a compounded SARON as a term reference rate for new products wherever possible. According to the NWG's assessment, it is unlikely that a robust derivatives-based term fixing in CHF is feasible.

SARON is the overnight tenor of the Swiss Reference Rates (SRR).[80] The SSR are administered by SIX Swiss Exchange and are based on transactions and executable quotes from the CHF repo market. An Index Commission (ICS) reviews, at least once a year, all aspects of the SRR and may suggest changes to the administrator. The ICS consists of representatives of the administrator, the calculation agent (SIX Repo AG), the SNB and major participants in the repo market.[81]

Since the 2017 Progress Report, the Tomorrow/next Indexed Swaps (TOIS) fixing has been discontinued. Despite a large number of reforms by the NWG and ACI Suisse, the TOIS fixing administrator, the number of panel banks had remained critically low since 2013. Discontinuation was recommended by the NWG and announced by the administrator in 2016. The TOIS fixing was used as the benchmark rate for interest rate derivatives and for discounting purposes. As proposed by the NWG, a transition from TOIS fixing to SARON took place over the course of 2017. One goal of the transition was to establish an OIS curve based on the SARON (SOIS curve) which would replace the former TOIS curve based on the TOIS fixing. This curve developed during 2017. Until now, OIS contracts have primarily been concluded to hedge interest rate payments arising from IRS contracts (interest rate swap curve based on LIBOR). The IRS curve – and thus, in turn, LIBOR – is used as the basis for the pricing of Swiss franc loans. The IRS curve is therefore also the ideal basis for hedging instruments. In a transition from LIBOR to SARON, the SOIS curve could take over the function of the IRS

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[78] See the list included in Annex 1 of the August 2018 minutes of the RFRWG, available at https://www.bankofengland.co.uk/minutes/2018/rfr-august-2018.

[79] See https://www.snb.ch/en/ifor/finmkt/fnmkt_benchm/id/finmkt_reformrates.

[80] See https://www.six-swiss-exchange.com/indices/data_centre/swiss_reference_rates/reference_rates_en.html.

[81] See https://www.six-swiss-exchange.com/indices/data_centre/index_regulation_en.html

curve and become much more significant. The establishment of the SOIS market is an important prerequisite for a LIBOR transition.

3.5.2 Transition

The NWG is open to financial market participants and other relevant stakeholders. The working group expanded in 2018 due to the shift in focus from the TOIS to the LIBOR transition. Besides participants from the financial industry, it also includes representatives outside the financial sector. At the end of 2017, the NWG set up two sub-groups to explore the issue of how to transition from LIBOR- to SARON-based financial products. The first group is responsible for products in the derivatives and capital market (Sub-NWG D&C); the second for those in the loan and deposit market (Sub-NWG L&D). The objective of both groups is to identify the relevant products and their users and to assess the suitability of SARON or SARON-based products as a reference rate. In addition, the groups discuss possible fallback provisions for the respective product groups. Furthermore, legal and technical requirements are to be reviewed, a comprehensive communication plan drawn up, and international comparability considered.[82]

Given the established SOIS market, the work of the Sub-NWG D&C group focused on developing standards for further derivatives and capital market products. The sub-group identified futures referencing SARON as the next key product. Based on the work done by the sub-group, the NWG published a term sheet with the specifications for three month SARON Futures contracts in June 2018. In October 2018, a financial market infrastructure operator (Eurex Exchange) launched SARON Futures and the first transactions were concluded after that. The Sub-NWG L&D group identified syndicated loans, corporate loans and, in particular, retail mortgages as key products. Work to date has focused on assessing the end users' need for and the feasibility of a forward-looking term rate in the above-mentioned loan products. Moreover, a checklist for market participants has been developed and published supporting them and their institutions to become operationally ready for the LIBOR transition. Finally, progress has been made with regards to the development of a fallback template for new loans, which continue to refer to CHF LIBOR.

The NWG focused on three topics at its latest meeting at the end of October. The first topic was a recommendation for a SARON-based term rate. The recommendation was derived from the feasibility and end users' needs assessment conducted in the sub-groups. The NWG recommended use of a compounded SARON wherever possible. It was stated that a robust derivatives-based term fixing is unlikely to be feasible. If the relevant derivatives markets were to evolve considerably, the creation of a forward-looking term rate, particularly with the aim of using it as a fallback rate, might be reassessed. On contractual robustness, a fallback template for new loans which continue to use CHF LIBOR as a reference rate was presented and discussed. The meeting also considered activities aimed at raising awareness and operational readiness of all stakeholders for the transition from LIBOR to SARON. A key target for the next NWG meeting in February 2019 is to present options for how cash flow uncertainty inherent in a compounded term rate approach can be solved or mitigated. A further focus is on specifications for other products based on SARON, such as floating rate notes or cross-currency swaps, and on accounting issues.

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[82] See Terms of References of the two sub-groups, both available at: https://www.snb.ch/en/ifor/finmkt/fnmkt_benchm/id/finmkt_reformrates.

3.6 Australian dollar (AUD)

3.6.1 Production of RFRs

The RFR for the AUD is the interbank overnight cash rate (Cash Rate), which is administered by the RBA. The RBA has reviewed the methodology for the Cash Rate to ensure alignment with the IOSCO *Principles for Financial Benchmarks* and with the new Australian benchmark regulatory framework. The Cash Rate is calculated directly from market transactions data. There are around AUD 5 billion in transactions each day in the cash market.[83]

3.6.2 Transition

Australia's credit-based benchmark, BBSW, can continue to exist even if credit-based benchmarks, such as LIBOR, are discontinued in other jurisdictions. For many financial products, it will still make sense to reference a credit-based benchmark that measures banks' short-term wholesale funding costs. This is particularly the case for products issued by banks, such as FRNs and corporate loans. The counterparties to these products would still need derivatives that reference BBSW so that they can hedge their interest rate exposures. As market participants transition from referencing LIBOR to RFRs, there may be some corresponding migration away from BBSW towards the Cash Rate. This will depend on how international markets for products such as derivatives and syndicated loans end up transitioning away from LIBOR.

The infrastructure is already in place for BBSW and the Cash Rate to coexist as the key interest rate benchmarks for the Australian dollar. The OIS market is linked to the Cash Rate and has been operating for almost 20 years. It already has good liquidity for tenors shorter than one year, and the infrastructure is there for longer term OIS. A functioning derivatives market for trading the basis between the benchmarks is important for BBSW and the Cash Rate to smoothly coexist. Such a basis swap market is also in place, allowing market participants to exchange the cash flows under these benchmarks.

3.7 Brazilian real (BRL)

3.7.1 Production or identification of RFRs

The RFR benchmark for the Brazilian Real is the Selic rate – a transaction-based reference rate calculated by the Central Bank of Brazil since 1986. The Selic rate is the volume-weighted average interest rate of overnight repo transactions collateralised by Government debt securities. Currently, the Selic rate calculation includes around BRL 550 billion daily of overnight repo market transactions. The Selic rate is the major reference rate for floating-rate Treasury bonds[84] and some market instruments issued by the Central Bank, such as the overnight repos and reverse repos, floating-rate reverse repos and FX swaps (for the domestic interest rate leg).

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83 See Serena Alim and Ellis Connolly (2018), "Interest Rate Benchmarks for the Australian Dollar," RBA bulletin, available at https://www.rba.gov.au/publications/bulletin/2018/sep/interest-rate-benchmarks-for-the-australian-dollar.html.

84 Letras Financeiras do Tesouro Nacional or LFT

3.7.2 Transition

Although the Selic rate is considered the RFR, it remains challenging to encourage market participants to use it as the main reference rate for fixed income instruments issued by banks and corporations, as well as for derivative instruments. The DI rate remains the main reference rate for these instruments, despite the low level of transactions traded on its underlying market.

The adoption of the RFR as the benchmark interest rate by the market participants suggests some difficulties, since there is no liquidity for the futures contract on the Selic rate (derivative instruments). Some incentives to encourage migration to the Selic rate benchmark have also been analysed by the BCB.

B3, which is responsible for compiling the DI rate, is continuing to work with representatives of the Brazilian Federation of Banks (Febraban) for suggesting the best approach for reference rates. In addition, the improvement of reference rates is one of the items in the Central Bank of Brazil institutional agenda (‘*Agenda BC+*’).

3.8 Canadian dollar (CAD)

3.8.1 Production or identification of RFRs

The Bank of Canada announced in March the creation of the Canadian Alternative Reference Rate Working Group (CARR), sponsored by the Canadian Fixed-Income Forum.[85] Membership consists of experienced individuals from across the Canadian financial industry who have an excellent understanding of the various issues related to these types of financial benchmarks.[86]

CARR’s main objective is to identify and seek to develop a Canadian dollar term RFR benchmark that is robust, reliable and resilient to any market stress, as well as consistent with international regulatory standards. Such a term risk-free rate would operate alongside the existing CDOR.

The work will also explore possible enhancements to the existing and well-established Canadian overnight RFR, the Canadian Overnight Repo Rate Average (CORRA), specifically considering options to broaden the volume of trades that are used to calculate the rate, either by expanding the universe of counterparties and/or the underlying collateral.[87] A consultation paper is expected to be published on an enhanced CORRA at the beginning of 2019.

3.8.2 Transition

Canada is following a multiple-rate approach, similar to the one recommended by the OSSG in 2014, resulting potentially in three robust benchmarks being available for market participants to use depending on the risks/interest rates that they are trying to hedge:

- Term IBOR – CDOR;

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85 See https://www.bankofcanada.ca/markets/canadian-fixed-income-forum/.

86 See https://www.bankofcanada.ca/markets/canadian-alternative-reference-rate-working-group/.

87 CORRA is currently calculated from overnight general collateral repo trades on Government of Canada securities that take place through designated inter-dealer brokers. CORRA is set at the Bank of Canada’s target for the overnight rate when the transacted volume is below a predetermined threshold.

- Overnight RFR – enhanced CORRA; and
- Term RFR – based on Overnight Index Swaps or CORRA futures.

However, given the interconnected nature of the global derivatives markets, it is possible that much of the Canadian derivatives market could eventually transition to the overnight RFR, similarly to other major jurisdictions.

3.9 Hong Kong dollar (HKD)

3.9.1 Production or Identification of RFRs

Hong Kong is weighing the pros and cons of different options for RFRs (e.g. HONIA) in Hong Kong dollar (HKD).

The HKMA and the TMA are in discussion with market participants on the feasibility of different RFRs and the challenges faced by these potential alternative rates. Taking into account the industry feedback and local market conditions, Hong Kong will determine the most appropriate alternative RFR for HKD, drawing reference from the reform progress of other major markets.

3.9.2 Transition

The TMA's Market Practices Committee, which comprises the HKMA and major banks and money brokers in Hong Kong, is an industry working group monitoring international developments related to IBOR reform and transition. The HKMA and market participants in general see HIBOR as a reliable benchmark after the recent reforms and at the current stage do not preclude the possibility of adopting a "multiple-rate approach" which will allow HIBOR and RFRs to co-exist in the HKD markets.

In the meantime, the HKMA encourages banks in Hong Kong to continue to contribute to HIBOR, as any discontinuation of the benchmark without suitable replacement and transition plan would have a significant impact on the financial sector. On the other hand, the HKMA will continue to assist the TMA in raising market awareness of the possibility that the transition to RFRs may take place when HIBOR is no longer supported by an active interbank funding market.

3.10 Mexican Peso (MXN)

3.10.1 Production or identification of RFRs

BdM has published three overnight wholesale funding rates since the late 1990s. Those rates are preliminary candidates to be the preferred RFR in Mexico or to be the building blocks to develop an RFR using the underlying transactions included in their computation. Two of these overnight rates are based on actual repo transactions using government securities as collateral.[88] The third rate is based on actual overnight transactions in some cases collateralised with commercial paper issued by banking institutions, and in some cases uncollateralised. In all cases, the rates are calculated as a weighted average of all the corresponding transactions.

[88] One is collateralised with Federal Government securities and the other one is collateralised with the same securities together with securities issued by the Mexican Insurance Deposit Corporation, IPAB.

A rate based on these transactions would produce an RFR similar to SOFR. Once the RFR is chosen, Banco de México is planning to engage in methodological discussions with commercial bank specialists and traders, regarding the pros and cons of different implementations. Specifically, the discussions will focus on the methodological issues raised by the OSSG and ISDA. Additionally, the legal department of BdM is analysing the potential impacts of a major reform to the methodology of the TIIEs from a legal standpoint.

3.10.2 Transition

As stated previously, BdM has started a communication effort among the main commercial banks. So far, BdM has been clear in saying that there are no current intentions to discontinue the TIIE rate. However, BdM expressed to market participants that the possibility a benchmark rate reform should be discussed. Particularly, some methodological issues regarding the integration of a possible RFR with the rest of the TIIE tenors. From this communication effort, BdM expects to get feedback about the implications of the possible changes, especially for the legacy contracts.

Before deciding whether to change the methodology to determine the term TIIEs, the first step that could be taken in order to start the transition would be to develop the OIS market in Mexico, currently non-existent.

3.11 Singapore dollar (SGD)

The USD/SGD FX swap market is the deepest and most liquid SGD money market in Singapore, reflecting the structure of the local banking industry where there are many global foreign banks whose key source of SGD funding is the FX swap market. Accordingly, and unlike other jurisdictions where IBOR rates are used in derivatives, SGD derivatives reference the SGD Swap Offer Rate (SOR) instead of SIBOR. SOR is an FX swap implied interest rate, computed from actual transactions in the USD/SGD FX swap market, and utilising USD LIBOR in its computation.

In September 2017, the Singapore Foreign Exchange Market Committee (SFEMC) reviewed options for the future of SGD interest rate derivative markets. Preliminary conclusions were that given the structure of the market, SGD derivatives would continue to be based on an FX swap implied rate. However, the SOR, which uses USD LIBOR as an input, would have to be reviewed, taking into consideration developments in USD funding markets, specifically the on-going transition of USD derivatives from USD LIBOR to SOFR. The SFEMC would also continue to explore risk-free rate alternatives for the SGD interest rate derivative market.

3.12 South African rand (ZAR)

The SARB's Consultation Paper[89] also includes, in addition to transaction-based unsecured interest rate benchmarks, proposals for RFRs in order to enable market participants to have choices of different reference rates that are fit for purpose. With respect to risk-free rates the Consultation Paper recommends that:

- a government bond (GB) repurchase (repo) rate and a South African Secured Financing Rate (SASFR), comprising overnight funding in the GB repo market and supplementary

[89] Refer to footnote 49 above.

repos conducted with the SARB in its end-of-day square-off operations, be introduced and considered for use as key overnight RFRs, including the pricing of overnight index swaps;

- steps be taken to improve the liquidity of the secondary market for Treasury bills (TBs) so that TB yields may be considered for the calculation of a term risk-free curve; and
- a broader GC repo market with a broader pool of collateral than the current GB repo market be developed.

The SARB has commenced with the establishment of a joint public and private Market Practitioners Group (MPG), which will comprise members of the SARB, the Financial Sector Conduct Authority (FSCA), and senior professionals active in the domestic money market. The primary purpose of the MPG will be to facilitate final decisions on the choice of interest rate benchmarks to be used as reference interest rates for financial and derivative contracts, to provide input to the SARB and the FSCA on the operationalisation of the interest rate benchmark proposals as contained in the consultation paper, and to draft a transition plan.

4. Development of fallback rates to enhance contractual robustness

4.1 Introduction

The FSB encourages work by market participants, including ISDA, other trade associations and their members, to increase contract robustness for various financial products against the risk that a widely-used interest rate benchmark could be discontinued permanently.

Because derivatives make up such a large proportion of overall exposure to the IBORs, fallback provisions in these contracts are a particular concern. If an IBOR is not available (including if it is permanently discontinued), current fallbacks under the 2006 ISDA Definitions require the calculation agent to obtain quotes from major dealers in the relevant interdealer market. If an IBOR has been permanently discontinued, it is likely that major dealers would be unwilling and/or unable to give such quotes. Even if quotes were available in the near-term after a permanent discontinuation, it is unlikely they would be available for each future reset date over the remaining tenor of all long-dated contracts. It is also likely that quotes could vary materially across the market.

However, while derivatives comprise the largest share of gross notional exposure to IBORs, cash product exposures are also quite large and the need for robust contractual fallbacks is equally important. In many instances, cash instruments have language that is similar in nature to that in ISDA documentation, but may also have further language that would convert references to an IBOR to the last published value of the IBOR or would convert to a successor floating rate without adjusting for any potential spread.

In the opinion of the OSSG, these findings call for work to ensure that contract fallbacks are more robust to this form of risk. This is in line with the IOSCO *Principles for Benchmarks*. Principle 13 provides that benchmark administrators should encourage users to have robust fallback provisions in contracts or financial instruments that reference a benchmark in the event of cessation of the referenced benchmark. The EU Benchmark Regulation[90] also requires that supervised entities that use a benchmark must produce and maintain robust written plans setting out their actions in the event that a benchmark ceases to be provided.

4.2 Contractual robustness work at the international level

In response to the concerns outlined above, the OSSG asked ISDA to participate in work to enhance the robustness of derivatives contracts referencing widely-used interest rate benchmarks in July 2016.

As part of its initial consultative process, ISDA determined that the fallbacks would be to the RFRs identified by the relevant currency area public/private sector working groups as an alternative to the IBORs. This choice is consistent with the FSB's public statement that, in markets such as LIBOR which face the disappearance of an IBOR, use of overnight RFRs in

[90] See Article 28 of the Regulation; text available at: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv:OJ.L_.2016.171.01.0001.01.ENG&toc=OJ:L:2016:171:TOC.

derivatives markets is more appropriate than use of the forward-looking term rates that are being considered for development in some currencies.[91]

Through its initial consultative process, ISDA also determined two triggers[92] and a set of potential options for term and spread adjustments designed to account for the differences between term IBORs and the overnight RFRs. ISDA then sought public comment on these options before making its final decisions by releasing a consultation paper covering GBP LIBOR, CHF LIBOR, JPY LIBOR, TIBOR, Euroyen TIBOR and BBSW in July 2018.[93]

Consultations for other IBORs, included USD LIBOR, EUR LIBOR, and Euribor, will be published at a later stage, although ISDA also requested preliminary feedback on these currencies.

The July consultation ran for three months and was open to all market participants. ISDA is working with an independent third-party vendor selected via an open process to build a system that will provide public dissemination of the adjustments. ISDA will publish the final approach for review and comment before any changes are made to its standard documentation.[94]

4.3 Currency-specific work on contractual fallbacks

4.3.1 USD

The ARRC's Second Report provided details on contractual fallbacks in the many cash products referencing USD LIBOR. Many of the details researched in the ARRC report were also subsequently highlighted in the IBOR Global Benchmark Transition Report.[95] The ARRC found that most cash products did not have provisions that would be workable if LIBOR permanently stopped: most FRNs and private (non-agency) securitisations would convert to fixed-rate instruments at the last published value of LIBOR, while most corporate loans would convert to using the Prime rate as the cost of borrowing, which currently is several hundred basis points above LIBOR. While new issuance of USD syndicated loans and some FRNs have recently incorporated more flexible contract language, contract language in other cash products has not changed. For this reason, the ARRC is seeking to finalise recommendations for safer contract language in FRNs, business loans, and securitisations. The ARRC published Guiding Principles for contract language in June, presenting its preliminary work at a public roundtable

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91 FSB (2018), *Interest rate benchmark reform: overnight risk-free rates and term rates*, 12 July, available at http://www.fsb.org/wp-content/uploads/P120718.pdf.

92 The triggers consulted on were (a) a statement by the administrator that it has ceased or will cease to provide the relevant IBOR permanently or indefinitely, or (b) a statement by the relevant administrator's regulator, currency central bank or other competent authority that the administrator of the relevant IBOR has ceased or will cease to provide the relevant IBOR permanently or indefinitely.

93 See https://www.isda.org/2018/07/12/interbank-offered-rate-ibor-fallbacks-for-2006-isda-definitions.

94 ISDA has also worked at an international level to provide a separate protocol for market participants covered by the EU Benchmark Regulation. ISDA's "EU Benchmark Supplement," like its work on IBORs, is meant to offer market participants the means to incorporate more robust contract language. However, while the Benchmark Supplement would cover benchmarks generally, contract fallbacks for the IBORs would be superseded by ISDA's supplement and protocol aimed specifically at these key interest rate benchmarks.

95 See https://www.isda.org/a/OqrEE/IBOR-Transition-Report.pdf.

in July, and released two public consultations on contract language in September with further consultations expected by the end of the year. [96, 97]

4.3.2 EUR

The working group on euro RFRs, through its contract robustness subgroup, has analysed the applicable legal frameworks for financial products across euro area countries and is working on possible solutions concerning new and legacy contracts. Towards the end of 2018 the contract robustness subgroup expects to publish a document suggesting fallback clauses for new cash market products (not legacy ones).

Indeed, as from January 2018 mortgages in the EU (together with the other financial instruments and contracts subject to the EU Benchmarks Regulation) should already include fallback clauses as required by Article 28(2) of the EU Benchmarks Regulation. The document to be published by the subgroup is expected to help market participants on this matter, suggesting a potential wording for the fallback clauses to be included in new contracts. The potential fallback is currently under development by the subgroup, which is taking into account the recent initiatives of the ISDA) and the Loan Markets Associations (LMA) on amending their contract languages (ISDA's so-called "benchmark supplement, as well as the change in LMA's screen rate clause aims at providing more flexibility for future changes).

In 2019, after the application of EMMI for authorisation under the BMR for Euribor, the working group on euro RFRs intends to consult market participants and publish a recommendation on a legal action plan for fallback provisions for Euribor and EONIA in existing and new contracts.[98]

4.3.3 JPY

The sub-groups under the Committee in Japan are discussing issues related to the transition to alternative reference rates and fallbacks for cash markets such as loans and bonds. The fallback arrangements for such products are considered very important particularly for legacy contracts for mitigating risk of possible discontinuation of existing financial benchmarks such as LIBOR.

4.3.4 GBP

In the UK, the RFRWG has initiated work on documentation for the cash market, and there has been some progress on amending contractual documentation to reduce the risks of disruption or contract frustration where contracts reference LIBOR. This work includes looking not only at contractual fallbacks, but also amending consent thresholds, for example. The cash market associations, in particular the LMA, International Capital Markets Association (ICMA) and Association for Financial Markets in Europe (AFME), have been engaged fully in this process.

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96 See https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-principles-July2018.

97 See https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-Sept-24-2018-announcement.pdf.

98 See high-level implementation plan of the euro working group on RFRs, available at https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/WG_euro_risk-free_rates/shared/pdf/20180913/Item_3_High_level_implementation_plan.pdf.

Template documentation for replacement screen rates for use in syndicated loan contracts has now been published.[99] The RFRWG will continue working to improve contractual language, but also on how these markets can function effectively using RFRs. It is also considering options for the conversion of legacy derivatives and LIBOR-referencing instruments that contain traditional fallback and consent threshold provisions.

4.3.5 CHF

Contractual robustness beyond derivatives markets was a key discussion point during the NWG meeting at the end of October 2018 (see also section 3.5.2).

4.3.6 AUD

Australian market participants have been engaged in ISDA's APAC Benchmark Working Group. This has culminated in BBSW being included in ISDA's Consultation on Benchmark Fallbacks, with the Cash Rate identified by the RBA and market participants as the fallback rate. The RBA asked the relevant market associations to encourage their members to participate in the consultation, and expects market participants to adopt more robust fallbacks for BBSW following this process.

4.3.7 BRL

In relation to fallbacks, there has been some progress, including the improvement of the fallback rules for the DI rate calculation and the introduction of fallback clauses in derivative and fixed-income instruments. Currently, the fallback rule for the DI rate establishes its value equal to the Selic rate when the number of transactions is lower than 100 or the daily financial volume is below BRL 30 billion.

4.3.8 CAD

CARR recently formed a Fallback Language Subgroup to develop robust fallback language for non-derivative products or contracts, including FRNs, hybrid capital notes and bank loans. CARR is following developments in this area in other jurisdictions, including through discussions with ISDA.

4.3.9 HKD

The HKMA and TMA continue to engage with market participants in Hong Kong to discuss various financial benchmark issues, including the development of a fallback rate. Taking into account the local market conditions, Hong Kong is taking steps to put in place the necessary fallback arrangements. To facilitate industry discussion, the TMA invited ISDA to brief local market participants in July 2018 on its proposals on the standardised fallback arrangements for derivatives contracts referencing certain IBORs, including the credit spread calculation methodologies.

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[99] See https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/risk-free-reference-rates-replacement-of-screen-rate-clause.pdf?la=en&hash=69D8106F9D8FC4BE97F67A214B456D4DEC5A893E.

For the cash markets, such as FRNs and loans, we noted that the development of transition plans has not taken shape globally. The HKMA and TMA will continue to monitor the international development with regard to these markets.

4.3.10 MXN

As mentioned above, the conclusion of the analysis by the legal department of BdM will be very important to determine if the methodology to calculate the TIIE rates can be changed without creating uncertainties in all the contracts referring to those rates. In the past, there have been several modifications to the methodology with no major implications in the market operation and in contract execution. However, the changes have never completely modified the methodology.

On the other hand, just in case it is necessary, commercial banks that have been contacted have started to analyse if their existing derivatives contracts include a fallback provision in case that the TIIE cease to exist.

4.3.11 SGD

In March, the SFEMC endorsed a set of recommendations on the contractual fallback approach for SIBOR and SOR.

For SIBOR, this is not used in SGD derivatives, and most SGD loan documentation already incorporates a final contractual fallback to lender's costs of funds.

For SOR, there are existing fallbacks in the 2006 ISDA definitions, including a first fallback to a substitute rate announced by the administrator (or its successor), on or before 21:00 Singapore time, which would be based on methodological fallback arrangements. If no substitute rate was announced by the administrator (or its successor), a second fallback to a calculation agent's poll of banks in the relevant markets would apply. To supplement these, the SFEMC endorsed a recommendation for the benchmark administrator to update the calculation methodology for the SOR, to incorporate the globally agreed fallback rate for USD LIBOR (including applicable term credit spreads) when this is available. This fallback arrangement would help minimise basis risks across markets and instruments that currently reference the USD LIBOR, in the event of its discontinuation.

4.3.12 ZAR

In the SARB's Consultation Paper, fallback rates are recommended for each interest rate benchmark that is used as reference interest rate. [100] The MPG has to provide input on fallback arrangements for the reference interest rates.

[100] Refer to footnote 49 above.

Appendix A – Mapping of major interest rate benchmarks to alternative reference rates

Currency	Interest rate benchmark	Alternative reference rate (candidates)	Type of alternative reference rate	Remarks	Key milestones
AUD	BBSW	RBA Cash Rate	Unsecured	Multiple-rate approach has been adopted	
BRL	DI rate	Selic	Secured	Multiple-rate approach has been adopted	
CAD	CDOR	Enhanced CORRA	Secured	Multiple-rate approach has been adopted Term RFR to be developed in 2019	White paper on enhanced CORRA is to be published in Q1 2019.
CHF	LIBOR	SARON	Secured	Transition is necessary. Compounded SARON is recommended. A forward-looking term rate seems not feasible.[101]	The FCA has said it will not use its powers to maintain LIBOR beyond end-2021.
EUR	LIBOR	ESTER or Euribor	Unsecured	EUR LIBOR is not in scope of the working group on euro RFR owing to its limited market usage as compared to Euribor. Possible alternatives could be ESTER or the reformed Euribor.	The FCA has said it will not use its powers to maintain LIBOR beyond end-2021.
EUR	Euribor	ESTER	Unsecured	Term RFR under consideration, meanwhile Euribor is being reformed to meet BMR requirements.	A phase-in to a new hybrid methodology for Euribor is expected in the course of 2019.
EUR	EONIA	ESTER	Unsecured	A possible recommendation on a specific path for transition is planned around end-2018.	Usage of EONIA is to be prohibited for new contracts at the end of the BMR's transitional period, i.e. from 1 January 2020.

[101] See minutes of the 20th NWG meeting, available at https://www.snb.ch/en/ifor/finmkt/fnmkt_benchm/id/finmkt_NWG_documents.

Currency	Interest rate benchmark	Alternative reference rate (candidates)	Type of alternative reference rate	Remarks	Key milestones
GBP	LIBOR	SONIA	Unsecured	Transition is necessary Public consultation on term SONIA reference rates released.	See RFRWG provisional timeline[102] The FCA has said it will not use its powers to maintain LIBOR beyond end-2021.
HKD	HIBOR	To be determined[103]		Multiple-rate approach not precluded	TMA market consultation by early 2019
JPY	LIBOR	TONA or TIBOR	Unsecured	Transition is necessary Term RFR planned to be discussed	The Committee will hold public consultation and a forum before publishing deliverables by late 2019. The FCA has said it will not use its powers to maintain LIBOR beyond end-2021.
JPY	TIBOR	TONA	Unsecured	Multiple-rate approach has been adopted	The Committee will hold public consultation and a forum before publishing deliverables by late 2019. JBATA will develop reforms during the first half of 2019 and conduct the second consultation on integration of Japanese Yen TIBOR and Euroyen TIBOR.
JPY	Euroyen TIBOR	TONA	Unsecured	Multiple-rate approach has been adopted	

[102] See https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/rfr-timeline-with-milestones.pdf?la=en&hash=93421F3ADFF423707AA0D430980751E3BEA23A05.

[103] Possible candidates such as HONIA are being considered

Currency	Interest rate benchmark	Alternative reference rate (candidates)	Type of alternative reference rate	Remarks	Key milestones
SGD	SIBOR	N/A	N/A	Rate not used in SGD derivatives	Enhanced methodology to be implemented after transitional testing in H2 2019.
SGD	SOR	To be determined	To be determined	SOR is a transaction-based rate	To review the appropriate USD funding rate for SOR computation, taking into consideration the transition of USD LIBOR to SOFR.
USD	LIBOR	SOFR	Secured	Transition is necessary Aiming to create a forward-looking term reference rate, potentially based on futures, OIS, or actionable market quotes.	ARRC's Paced Transition Plan contains milestones out to 2021.[104] The FCA has said it will not use its powers to maintain LIBOR beyond end-2021. Guiding principles for fallback contract language for cash products released (in July 2018).
ZAR	Jibar	To be determined (Reformed Jibar for existing derivative contracts. Choice of ZARibor and SASFR for new derivative contracts.)	Reformed Jibar : unsecured ZARibor: unsecured- SASFR: secured	Multiple-rate approach recommended Treasury bill curve and GC repo market potential platforms for term RFRs	Recently formed MPG will map project plans once benchmark rates have been finalised in Q2 2019.

[104] See https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-Second-report.

Appendix B – Members of the FSB OSSG Benchmark Group

as at date of publication

Co-Chairs	**Andrew Bailey** Chief Executive Officer UK Financial Conduct Authority
	Jerome Powell Chair US Federal Reserve Board of Governors
Australia	**Chris Kent** Assistant Governor, Financial Markets Reserve Bank of Australia
Brazil	**Claudio Henrique da Silveira Barbedo** Deputy Advisor, Open Market Operations Department Central Bank of Brazil
Canada	**Paul Chilcott** Advisor to the Governor Bank of Canada
Hong Kong	**Clement Lau** Executive Director, Monetary Management Department Hong Kong Monetary Authority
Japan	**Hiroki Ootake** Director, Head of Market Infrastructure Group, Market Infrastructure Division, Financial Markets Department Bank of Japan
	Kenji Oki Director for International Banking Regulations Financial Services Agency
Mexico	**Rodrigo Cano** Director of Operations Support Bank of Mexico
Saudi Arabia	**Moath A. Alyousef** Head of Monetary Policy Section Saudi Arabian Monetary Authority

Singapore	**Cindy Mok** Executive Director, Monetary and Domestic Markets Management Monetary Authority of Singapore
South Africa	**Leon Myburgh** Head, Financial Markets Department South African Reserve Bank
Switzerland	**Marcel Zimmermann** Head, Money Market and Foreign Exchange Swiss National Bank
UK	**Andrew Hauser** Executive Director, Markets Bank of England
US	**Chris Giancarlo** Chairman Commodity Futures Trading Commission
ECB	**Cornelia Holthausen** Deputy Director General Directorate General Market Operations
European Commission	**Tilman Lueder** Head of Unit, Securities Markets
EBA	**Adam Farkas** Executive Director
ESMA	**Fabrizio Planta** Head, Markets Division
IOSCO	**Jean-Paul Servais** Vice Chairman of the Board (Belgium Financial Services and Markets Authority)
FSB Secretariat	**Laurence White** Member of Secretariat