FSB FINANCIAL STABILITY BOARD

Reforming Major Interest Rate Benchmarks

Progress report on implementation of July 2014 FSB recommendations

21 July 2016

Contents **Page**

Originally published 19 July 2016. Revised version published 21 July 2016 containing revised text of last paragraph in section 3.3 (p. 23).

Executive Summary

In July 2015, the Financial Stability Board (FSB) published its report *Progress in Reforming Major Interest Rate Benchmarks*,[1] as an interim report on implementation of the recommendations laid out in the 2014 FSB report *Reforming Major Interest Rate Benchmarks* (the 2014 Report).[2] The 2014 Report proposed recommendations for enhancing existing benchmarks for key interbank offered rates (IBORs) in the unsecured lending markets, and to promote the development and adoption of nearly risk-free benchmark rates (RFRs) where appropriate. These recommendations were developed by the Official Sector Steering Group (OSSG),[3] building on input by market participants, as well as the international framework for financial market benchmarks established by IOSCO and endorsed by the FSB and G20.

Since the previous interim report in July 2015, the IBOR administrators have continued to take important steps towards implementing the recommendations proposed by the FSB to strengthen the existing benchmarks through adapting their methodology to underpin the rates with transaction data to the extent possible. The administrators for the three major interest reference rates – EURIBOR, LIBOR and TIBOR – have all released papers laying out plans to evolve their rates, consulting and engaging with their stakeholders to improve the methodology and increase the scope of transactions involved in setting the rates, with some of those administrators commencing feasibility studies on receiving the raw data and centralising the calculation. Reflecting the systemic importance of the IBORs, authorities in all three jurisdictions have now taken action to regulate their IBOR administrators. Similar to steps already taken in Japan and the United Kingdom to regulate the TIBOR and LIBOR administrators, the Belgian government is in the process of establishing a national regime for the supervision of the administrator of EURIBOR. Also in June, the EU Benchmarks Regulation was published, introducing a regulatory framework for benchmarks across the EU.[4] OSSG member authorities, benchmark administrators and market participants from other jurisdictions, including Australia, Canada, Hong Kong, Mexico, Singapore and South Africa, have continued to take steps to improve the existing interbank rates in their own jurisdiction.

OSSG members have also made good progress in identifying potential RFRs.[5] It is important that RFRs are identified because the volume of transactions in the IBORs underlying markets are low and at risk of declining further. There has been productive engagement between authorities and relevant stakeholders: private sector groups have been working closely with authorities in the United States, United Kingdom, Switzerland, Japan and the euro area. In each

[1] www.fsb.org/wp-content/uploads/OSSG-interest-rate-benchmarks-progress-report-July-2015.pdf

[2] www.fsb.org/wp-content/uploads/r_140722.pdf

[3] The G20 asked the FSB to undertake a fundamental review of major interest rate benchmarks and plans for reform to ensure that those plans are consistent and coordinated, and that interest rate benchmarks are robust and appropriately used by market participants. To take the work forward, the FSB established a high-level Official Sector Steering Group (OSSG) of regulators and central banks. The OSSG was assigned responsibility for coordinating and maintaining the consistency of reviews of existing interest rate benchmarks and for guiding the work of a Market Participants Group, which was in turn tasked to examine the feasibility and viability of adopting additional reference rates and potential transition issues. The members of the OSSG are listed in Appendix B.

[4] 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.

[5] The 2014 Report found that "Members [of the Market Participants Group] believe that there are certain financial transactions, including many derivatives transactions, that are better suited to reference rates that are closer to risk-free. Developing such alternative reference rates meets the principle of encouraging market choice." See footnote 2, at p. 2.

of these cases, overnight secured and unsecured rates have been identified that could serve as alternatives to the IBORs, and consultations with market participants have been conducted regarding these rates. The groups in the United Kingdom and euro area have spurred work to produce new privately administered secured rates. OSSG members have themselves taken steps to produce some of these rates in some instances. In the United States, the Federal Reserve has begun publishing the Overnight Bank Funding Rate and has stated that it is considering publishing a secured repo rate, while the Bank of England has taken over administration of SONIA and expects to commence publication of the reformed SONIA benchmark in Q2 2017.

However, while substantial progress has been made, the reforms of the IBORs have not been completed. Administrators should now focus on transition and decide how to anchor rates in transactions and objective market data as far as practicable. The reforms proposed by the administrator of LIBOR will be implemented progressively during 2016; further, the administrator is conducting a feasibility study to centralise the determination of LIBOR. These reforms, if proposed and implemented, could have far-reaching implications for the rate and would not take place until 2017. Likewise, reforms to EURIBOR and TIBOR are still ongoing. Due to the synergies with other infrastructure projects and the need to verify the reliability of the data, as well as to enhance transparency in the reform process, the implementation timeline for EURIBOR now foresees a reformed EURIBOR in H1 2017. The TIBOR administrator has been accelerating its internal discussions and preparations to finalise its reforms, taking into account the comments collected through its second consultation process as well as other issues that are relevant to recent financial market conditions.

Similarly, more progress remains to be achieved in identifying RFRs and promoting their use where appropriate. Where groups have been set up to identify a single alternative and to promote its use, the final choice has yet to be made and transition planning is still in preliminary stages.

The FSB considers that both streams of work – the reform of existing IBORs and the identification and promotion of RFRs where appropriate – are at crucial stages in their progress, and that further work is warranted and should be supported. In some currency areas, there are no plans to promote a transition to RFRs, as authorities have concluded that the identification of robust RFRs should be sufficient.[6] However, for those currencies that intend to more actively promote the use of RFRs as an alternative to LIBOR for some purposes, the 2014 Report noted, "*shifting a material proportion of derivative transactions to a risk-free rate would reduce the incentive to manipulate rates that include bank credit risk and would reduce the risks to bank safety and soundness and to overall financial stability*." Due to the importance of this work and how market participants would benefit from improved benchmarks and more choice within markets, it is paramount that momentum is maintained to achieve the FSB's recommendations regarding RFRs.

The OSSG will continue to monitor progress in reforms to interest rate benchmarks, and will prepare a final report for publication in 2017.

[6] As noted in the FSB's 2014 report, while there was widespread support for an approach that promoted reform of the IBORs and the availability of robust RFRs, there will necessarily be heterogeneity across currencies in terms of how and when this approach is implemented. The report noted that there were several reasons for this heterogeneity including differing availabilities of underlying transactions data necessary to produce a credible IBOR+ rate, different available risk-free rates, and different levels of willingness and authority to use supervisory or other means to encourage markets participants to shift to the multiple-rate approach.

1. Introduction

1.1 Background

The 2014 Report was prepared both in response to cases of attempted manipulation in relation to key interbank interest rate benchmarks (IBORs), and given the decline in liquidity in key interbank unsecured funding markets.

Informing the OSSG's work has been the set of principles published by IOSCO in July 2013 to be adopted by benchmark administrators to improve the robustness and integrity of financial market benchmarks in general, and which were endorsed by the FSB as the global standard for financial market benchmarks.[7]

The 2014 Report included several recommendations to enhance major interbank interest rate benchmarks (IBOR+) and for the development of RFRs, as follows:

IBOR+

There should be a strengthening of existing IBORs and other reference rates based on unsecured bank funding costs by underpinning them to the greatest extent possible with transactions data. These enhanced rates are termed "IBOR+".

Specific milestones included:

- By end Q1 2015, each of the current IBOR administrators were to work with contributing banks and each central bank was to work with active participants in wholesale funding markets to analyse available transaction data. This would inform the feasibility of each IBOR+ methodology.
- By end Q2 2015, in conjunction with relevant central banks and their regulators, administrators should have considered the recommended IBOR+ methodologies and the feasibility of each rate and tenor.
- By end 2015, administrators should have publically consulted on any recommended changes.
- Meanwhile and in addition, each currency subgroup should have considered:
  - Work to develop transition strategies and address any legal obstacles and risks.
  - International cooperation and consistency in any changes.

Risk-free rates

Steps were recommended to be taken to develop alternative RFRs, given that there are certain financial transactions, including many derivatives transactions, which are better suited to reference rates that are closer to risk-free.

In particular, where suitable, central banks and supervisory authorities were tasked to:

- Collect or encourage administrators and other market participants to collect data in the underlying RFR markets by end Q4 2014.

7 www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf

- Encourage the industry or facilitate the identification of potential RFR designs and administrators by end Q2 2015.
- Encourage the industry or work with the administrators to identify any infrastructure or other requirements for the RFRs' functioning and IOSCO compliance and assess overall feasibility and viability of RFRs by end Q3 2015.
- Ensure that by end Q1 2016, at the latest, a public consultation on any recommended changes has taken place.
- Encourage the industry or work with the administrators to implement at least one IOSCO-compliant RFR by Q2 2016.
- Where suitable, encourage derivative market participants to transition new contracts to an appropriate RFR, while authorities in other jurisdictions should work cooperatively in support of each currency subgroup's plan.

The July 2014 report also included a review undertaken by the IOSCO Task Force for Financial Market Benchmarks on the degree of implementation of IOSCO's Principles for Financial Benchmarks by the administrators of EURIBOR, LIBOR and TIBOR.[8] The FSB encouraged benchmark administrators to address the IOSCO Task Force's findings in its review, in addition to the specific recommendations for benchmark reforms set out above.

In July 2015 the FSB published an interim report by the OSSG on progress in implementing the FSB's recommendations. Key findings of that report were:

- Since July 2014, the administrators of the most widely used IBORs – EURIBOR, LIBOR and TIBOR – had made progress in implementing recommendations. Steps taken included reviews of respective benchmark methodologies and definitions, data collection exercises and feasibility studies, consideration of transitional and legal issues, and broad consultations with submitting banks, users and other stakeholders.
- Benchmark administrators and market participants from other jurisdictions, including Australia, Canada, Hong Kong, Mexico, Singapore and South Africa, had also taken steps towards reforming the existing rates in their own jurisdiction, given the importance of these rates to their domestic markets and their role as international financial centres.
- Concrete progress had also been made in identifying potential risk-free rates, where these did not currently exist. In particular, detailed data collection exercises had been undertaken in key markets.

More recently, in February 2016 IOSCO published a second review of the implementation of IOSCO's Principles for Financial Benchmarks by the administrators of EURIBOR, LIBOR and TIBOR.[9] This report found ongoing improvements by these administrators in adhering to IOSCO's recommendations.

---

8 www.fsb.org/2014/07/r_140722a/ and www.iosco.org/library/pubdocs/pdf/IOSCOPD444.pdf

9 www.iosco.org/library/pubdocs/pdf/IOSCOPD526.pdf

1.2 This report and future work

This report is a second interim report by the OSSG on reforms to major interest rate benchmarks. It has been prepared based on information provided by each currency sub-group, each of which reported on progress against the specific recommendations listed above. Developments in both IBOR+ and RFR across the key markets are set out in more detail in sections 2 and 3 of this progress report.

At the time of the FSB's July 2015 interim progress report, it was envisaged that in July 2016 a final report would be published. However, given that some further implementation steps are expected to be seen in the largest markets beyond July 2016, and given ongoing reforms in other markets, a final report will instead be published in 2017.

1.3 Contract robustness

The OSSG has also encouraged work by market participants to increase derivative contract robustness against the risk that a key interest rate benchmark could be discontinued permanently. From a public policy perspective, the FSB believes that market participants should understand the fall-back arrangements that would apply if a permanent discontinuation of a key interest rate benchmark occurred, and that these arrangements should be robust enough to prevent potentially serious market disruption in such an event.[10]

[10] The Market Participants Group established by the OSSG stated in its final report, published in July 2014, "in most cases, fall-back provisions are not sufficiently robust for a permanent discontinuation of a key IBOR." The MPG noted that in the case of such an event, "Without carefully considered alternatives and mitigants, claims of contract frustration could arise. In the worst case, there could be widespread valuation and accounting problems, and workout costs could be severe." FSB (2014), Final Report of the Market Participants Group on Reforming Interest Rate Benchmarks, July; available at: www.fsb.org/wp-content/uploads/r_140722b.pdf.

2. Developments in IBOR+ Benchmarks

2.1 Overview

Since the previous interim report in July 2015, the IBOR administrators have continued to take important steps towards implementing the recommendations proposed by the FSB to strengthen the existing benchmarks through adapting their methodology to underpin the rates with transaction data to the extent possible.

The administrators for the three major interest reference rates – EURIBOR, LIBOR and TIBOR – have taken further steps to evolve their rates to IBOR+ through consulting and engaging with their stakeholders to improve the methodology and increase the scope of transactions involved in setting the rates.

EURIBOR, LIBOR and TIBOR are widely used in the global financial system as benchmarks for a large volume and broad range of financial products and contracts. The IBOR administrators have been cooperating closely with the relevant authorities whilst reforming the rates.

Due to their systematic importance, the authorities in all three jurisdictions have taken action to regulate the IBOR administrators. Currently ICE Benchmarks Administration Ltd (IBA) is regulated by the UK Financial Conduct Authority as the administrator of LIBOR. The Japanese Bankers Association TIBOR Administration (JBATA) became regulated by the Japan Financial Services Agency (JFSA) as a Specified Financial Benchmark Calculator for TIBOR in May 2015. In December 2015, the Belgian legislator designated the Belgian Financial Services and Markets Authority (FSMA) as supervisor of the European Money Markets Institute (EMMI), the administrator of EURIBOR.[11] EURIBOR

In June 2016, the EU Benchmarks Regulation was officially published. This Regulation captures all benchmarks (including EURIBOR and LIBOR) that are referenced in financial instruments admitted to trading on EU trading venues, in consumer credit and mortgage contracts, and that are used to measure the performance of investment funds. Administrators producing benchmarks that are used by supervised entities in the EU will be required to seek authorisation or registration from national competent authorities, although there will be certain exemptions. The Regulation is expected to fully apply in the EU from 1 January 2018 and will supersede existing domestic legislation.

2.2 EURIBOR

For the past three years, EMMI, as administrator of EURIBOR, has developed a plan to gradually reform the existing EURIBOR benchmark, which will anchor it on the basis of transactions instead of quotes. The design of the new methodology was supported by a EURIBOR+ Task Force, which comprised representatives of EMMI, banking and benchmark user professionals. The European Central Bank (ECB) provided technical expertise to the Task Force.

---

[11] In addition to designating the FSMA as EMMI's supervisor under an interim national benchmarks regime to be set up by the Belgian government, the law constitutes an advance designation of the FSMA as National Competent Authority under the European Benchmarks Regulation, which will supplant the interim national regime when it enters into application.

In October 2015, EMMI published its Consultative Position Paper on the Evolution of EURIBOR, where the transaction-based determination methodology for EURIBOR was presented to market participants together with a rationale for the proposed enhancements in the definition. The market feedback to the consultation was supportive of EMMI's efforts and significant progress has been made with regards to the development of the new methodology and reporting infrastructure. Due to the synergies with other infrastructure projects (the ECB's Money Market Statistical Reporting – MMSR) and the need to verify the reliability of the data, as well as to enhance transparency in the reform process, the implementation timeline for EURIBOR+ now foresees a reformed EURIBOR in H1 2017.

Data

The original data collected to inform the design of EURIBOR+ was gathered during 2012/13 in two large scale exercises among almost 60 participating institutions. Structural and liquidity conditions in the euro money markets have continued to evolve since the data collection period. For this reason, EMMI will conduct a further data evaluation test as part of the EURIBOR+ Pre-Live Verification Program, which will be launched in Q3 2016. This verification exercise, sourced from real transactions conducted by panel banks, will allow for the testing of the envisaged transaction-based methodology under current market conditions, including the fine-tuning of key design elements in the methodology and an assessment of the impact of the transaction-based methodology on rate and volatility levels. The submission infrastructure will also be tested as part of the programme.

Change to methodologies

Following the IOSCO Principles for Financial Benchmarks, two aspects of the benchmark specification were distinguished by EMMI: firstly, the underlying interest, which defines the economic variable that a benchmark seeks to measure; and secondly, the determination methodology, which is applied to make a practical measurement of the underlying interest. While EMMI clearly stated that it did not intend to change the underlying interest of the current EURIBOR, hence favouring a seamless transition between the current and the reformed EURIBOR, it decided to further refine its specification in order to describe it as "the rate at which banks of sound financial standing could borrow funds in the EU and European Free Trade Association (EFTA) countries in the wholesale, unsecured money markets in euro." Once clarified, a consolidated proposal of the EURIBOR+ methodology was also presented to market participants in the Consultative Position Paper in October 2015. EMMI's proposed transaction-based methodology for EURIBOR aims, among other things, at answering the issue of data sufficiency through a widening of the scope of eligible transactions, as well as at addressing the concerns related to increased volatility inherent to a transaction-based index by means of smoothing techniques.

The EURIBOR+ Task Force, following the consultation, has proposed some refinements of the methodology for further consideration by stakeholders and EMMI during Q2 2016, prior to the launch of the Pre-Live Verification Program. These refinements focus in large part on providing a greater level of detail to the envisaged contingency arrangements for conditions where there is a lack of sufficient transaction data to undertake a robust benchmark determination.

Market transition to IBOR+

The design finalisation and implementation action items of the EURIBOR+ project continues to be organised into four workstreams.

- *Workstream 1: Benchmark Design – EURIBOR Definition.* The objective of this workstream is to align the EURIBOR and EURIBOR+ definitions by ensuring that the current EURIBOR specification appropriately reflects the underlying interest and properly distinguishes between the underlying interest and methodological considerations in order to allow for changes to the benchmark methodology in accordance with IOSCO Principle 10 and to thus facilitate a seamless transition. Since the July 2015 progress report, the issue of the clarification of the prime bank concept and the expansion of transactions that should be considered in the determination of the benchmark rate were largely encapsulated by the EURIBOR specification presented in EMMI's October 2015 position paper. The issue of the eligibility criteria of credit institutions for the EURIBOR panel will be fully addressed in the course of 2016.
- *Workstream 2: Benchmark Design – EURIBOR+ Methodology.* During Q3 2015, EMMI moved forward with the finalisation of the EURIBOR+ methodology, analysing the impact on data sufficiency, rate levels, and volatility of different methodological aspects and equipping the core methodology with a tiered contingency approach. The Pre-Live Verification Program will allow for an initial setting of methodological parameters and the analysis of design choices for potential future modifications to the methodology. In addition, in Q2 2016 EMMI started developing an update of the EURIBOR Code of Conduct to be implemented with the start of the new calculation methodology in H1 2017.
- *Workstream 3: Infrastructure and Operations* –The objective of the third workstream is to develop the exact specifications of the infrastructure and the operations for the determination of EURIBOR under the transaction-based methodology. A high level overview of these was provided in the October 2015 Position Paper. In their responses to the consultation for the Position Paper, a number of banks in the panel suggested that EMMI should consider the option of a direct transaction contribution method in which participating banks would transmit daily transactional "raw data" directly to EMMI. This direct transaction contribution option would leverage the ECB's MMSR, with banks submitting their MMSR formatted files to EMMI, and EMMI undertaking the detailed rate and volume calculations to arrive at the benchmark contributions. EMMI along with market participants validated this approach in Q2 2016: on 21 June 2016, EMMI published a revised roadmap for the evolution of EURIBOR, stating that its governing bodies had approved a submission model based on raw transaction data. Pursuing this option does not affect the calculation methodology as such.
- *Workstream 4: Transition Execution* – EMMI's objective is to achieve a seamless transition to the reformed EURIBOR. Following the decisions on the determination methodology and contribution method mentioned in Workstream 3, a more detailed plan will be developed, allowing the implementation of the new infrastructure by Q4 2016. The Pre-Live Verification Program will provide EMMI with a more current understanding of the impact of the new determination methodology and will inform a decision on whether a seamless transition will indeed be feasible in present circumstances. In addition, EMMI will continue with the efforts to establish a broader

panel before the implementation of the new EURIBOR methodology. In order to assess the extent of possible legal risks arising from this transition, EMMI has sought advice from legal advisors and has created a Legal Working Group, whose members are representatives of the legal advisory departments of panel banks, national banking associations, and the end-user community.

International cooperation

Since mid-2015, a number of presentations have been organised by the ECB for representatives of other central banks, among which the Bank of Japan (BOJ) and the Hong Kong Monetary Authority (HKMA). The purpose of these presentations was to update the other central banks on the progress of the EURIBOR+ project and the methodology design considerations.

Regulatory environment for benchmarks

Following the forthcoming entry into application of the EU Regulation, and the designation of the EURIBOR as a critical benchmark, a college of supervisors, under the chairmanship of the FSMA, will be responsible for supervising EURIBOR. Until that time, the FSMA will assume supervision of EURIBOR as soon as the interim Belgian regime for benchmarks enters into force.

2.3 LIBOR

Subsequent to the FSB's July 2015 interim report, on 31 July 2015 ICE Benchmarks Administration (IBA) issued a second position paper to make more concrete proposals for the evolution of LIBOR and to further consult on a number of proposed changes to evolve its methodology. There were around 1,000 recipients of the second position paper and around 200 stakeholders were represented at roundtables, bilateral meetings and other forums. A feedback statement to the 31 July 2015 consultation was published on 14 December 2015.

On 18 March 2016, IBA released a Roadmap that outlined the concrete reforms to be implemented progressively during 2016. The main changes broaden the set of transactions eligible to support a LIBOR submission and define a uniform submission methodology for panel banks based on parameters detailed by IBA and the LIBOR Oversight Committee. After the proposed changes have been implemented, LIBOR will be anchored in transactions using a broader set of counterparty types, product types, funding locations and a wider transaction window including transactions from the last submission.

Alongside the Roadmap, in Q1 2016 IBA commenced a feasibility study to centralise the determination of LIBOR from transactions provided by submitting banks.

Data

To further understand the activity and evolution of its underlying market, IBA continues to build a data series by collecting granular data from the current panel banks on a daily basis. IBA is collecting and classifying transaction data underpinned by a wide set of LIBOR eligible counterparties, product types, funding locations and transaction times. This exercise will facilitate the analysis of further changes in LIBOR such as the centralisation of the LIBOR determination by the administrator who will collect real-time transaction data.

As of March 2016, IBA has started publishing aggregate activity charts for the underlying transactions of each currency and tenor. The publication of the activity charts is required by current UK regulation and will help LIBOR users to understand the evolution of the activity underpinning the currencies and tenors they select to use. IBA state in their Roadmap that they will be consulting on the depth and usage of LIBOR currencies and tenors to assess the availability of fall-backs and whether it may be appropriate to discontinue further LIBOR rates.

Change to methodologies

IBA's second position paper, published on 31 July 2015, proposed to implement a transaction waterfall, expand the range of eligible transactions, standardise the parameters for transactions and the techniques for interpolation and extrapolation, and frame expert judgement appropriately when it remains necessary.[12]

The Roadmap took into account the feedback received in response to the two position papers and in the many roundtables hosted by several Central Banks. The Roadmap contains the measures designed to transition to a more robust LIBOR rate. To achieve its objectives, IBA state that they will:

- implement a uniform submission methodology for LIBOR panel banks based on parameters defined by IBA and the LIBOR Oversight Committee;
- publish a single, clear, comprehensive and robust LIBOR definition; and
- base the rate on non-subjective and fully transaction-based inputs wherever feasible.

The waterfall methodology that was stated in the 9 July 2015 Interim Report has been further developed as follows:

- *Level 1:* Transactions which feature time-weighted and volume-weighted average price (VWAP) of the bank's eligible transactions.
- *Level 2:* Transaction-derived data which features VWAP of adjusted historical transactions, interpolation, parallel shift.
- *Level 3:* Expert judgement using a documented methodology for basing submissions on transactions in related markets, committed quotes, indicative quotes and other market observations.

IBA intends to mitigate the risks posed by low transaction volumes by further expanding the trades to be included in the calculation to include trades with corporations, broadening the list of funding centres which can be considered and widening the transaction window. The widening of eligible counterparties types, which IBA estimate could increase the volume of transaction data available by up to 15%, reflects an evolution in bank funding which is no longer based exclusively in interbank transactions. Eligible counterparty types will include:

- Banks;
- Central banks;
- Corporations as counterparties to a bank's funding transactions but only for maturities greater than 35 calendar days;

[12] www.theice.com/publicdocs/ICE_LIBOR_Second_Position_Paper.pdf

- Government entities (including local /quasi-governmental organisations);
- Multilateral development banks;
- Non-Bank Financial Institutions, including Money Market Managers and Insurers;
- Sovereign wealth funds; and
- Supranational corporations.

No premium or discount will be applied to transacted prices. Expansion of the funding centres is introduced to take into account the different organisational and geographical profile of each panel bank. The LIBOR Oversight Committee will own an approved list of funding locations (initially Canada, USA, EFTA, Hong Kong, Singapore, Japan and Australia.). The Oversight Committee and IBA are able to approve changes to the list to adapt to changes in market conditions. The criteria to be considered for changing the list are:

- a material level of transactions that will inform transaction-based calculations;
- a satisfactory regulatory oversight regime for wholesale funding transactions;
- an absence of capital controls, sanctions or other regulatory steps that would influence rates; and
- the location is used by one or more bank(s) or a bank has requested to use the location.

Banks are to agree bilaterally with IBA the centres which will be considered when producing the daily submissions.

Finally IBA formalised the widening of the transaction window which will be the period from the previous day submission. By extending the time window, IBA aims to maximise the number of transactions captured by banks. To compensate for the fact that transactions are crossing two business days IBA introduced a lower weight for trades booked in the previous day.

Subject to a successful feasibility study, IBA plans to build systems and algorithms to collect the trade data and minimise the use of banks' expert judgement in the determination of LIBOR. IBA is studying the design and implementation of an algorithm that can allow IBA to produce LIBOR in diverse market circumstances using the transaction data provided by the panel banks.

Should there be a positive outcome to the feasibility study, IBA will propose to centralise the calculation and to produce the rate using real-time trade data and provide expert judgement only in cases where there are insufficient transactions from panel banks.

Market transition to IBOR+

Since July 2015, IBA have continued to develop its strategy for the LIBOR evolution through public consultations and an outreach programme. The administrator engaged with its stakeholders through the second consultation where they held round tables in six different locations around the world. IBA also published a feedback statement to the consultation on their website. In addition IBA released their Roadmap in March 2016 which informs their stakeholders of their plans to transition to LIBOR+ during 2016.

This broad consultation has allowed IBA to discuss with a wide set of stakeholders the key points of its evolution, to consider their comments and to identify the main potential obstacles and risks.

One of the main concerns for IBA was the risk of legal issues stemming from the implementation of the Roadmap as the perception of change in its methodology which may raise issues of legal continuity. IBA has taken legal advice which indicated that the implementation of the Roadmap is unlikely to give rise to such issues.

IBA's current feasibility study aims to explore further risks with phase two of the development of LIBOR.

International cooperation

Since the last FSB report the Financial Conduct Authority (FCA) as supervisory authority for LIBOR administrator and submitters, has engaged with all the authorities in the currency groups. Authorities from Europe, Japan, Switzerland and US have coordinated and agreed on the first common transition steps to encourage key changes which are in line with FSB recommendations. Central banks from the five LIBOR currencies hosted IBA round tables during the consultation periods which helped to raise awareness of the proposed changes in the benchmark. International cooperation is ongoing. Additionally, Bank of England, Federal Reserve Board and Swiss National Bank participate as observers in the IBA Oversight Committee.

Regulatory environment for benchmarks

Leaving aside the EU Benchmarks Regulation which has yet to enter into full application, there has not been any significant change in the domestic regulatory framework for financial market benchmark in UK since July 2015. LIBOR, alongside other seven specified benchmarks, is regulated under the UK Financial Services Market Act 2012. The administrator of LIBOR and the 20 submitting banks are subjected to direct oversight by the FCA, in accordance with the FCA Handbook rules.

2.4 TIBOR

TIBOR is in the process of being reformed in line with the IOSCO principles. The administrator of TIBOR, Japanese Bankers Association TIBOR Administration (JBATA) is preparing to implement TIBOR+. JBATA issued its second consultation document in August 2015 to further progress its TIBOR reforms.

Data

JBATA, in cooperation with the BOJ and JFSA, has continued to collect and analyse transaction data in the underlying market of TIBOR and related markets. According to the waterfall methodology that was proposed in the second consultation document, JBATA will clarify the data to be collected and how they will use it to derive the Japanese yen TIBOR. The new waterfall methodology will cover not only actual unsecured call transactions, but also actual transactions in the wholesale funding market (negotiable certificates of deposit and large term deposits with corporates, etc.).

Change to methodologies

As described in the second consultation document for TIBOR reforms, JBATA plans to standardise and clarify the calculation and determination processes for rates submitted by the panel banks. This will enhance the transparency and credibility of the existing TIBOR. The

JBATA defines the waterfall methodology used in the rate calculation process and will require reference banks to submit rates based on it thorough compliance with the updated Code of Conduct, which is in line with the IOSCO principles. (See Table A.)

The second consultation document also proposes that JBATA will discontinue the publication of the two month and the twelve month TIBOR due to the limited use by market participants.

Table A

Overview of the Waterfall Methodology proposed in the second consultation

1st Level	**Use data in the Underlying Market**
1-1	Actual Unsecured Call transactions
1-2	Committed Quotes of Unsecured Call transactions
1-3	Indicative Quotes of Unsecured Call transactions
1-4	Linear Interpolation and/or Retroactive Use, etc. of actual transactions data
2nd Level	**Use data that are considered quasi-equivalent to data in the Underlying Market**
	Data of Japan Offshore Market and Interbank NCD market
3rd Level	**Use data in relevant markets, such as the wholesale funding market**
	NCD transactions (other than Interbank) and Large Term Deposits
	Indicative Quotes displayed on brokers' screens for short-term government bonds market, GC repos market, OIS markets, and other relevant markets
4th Level	**Expert Judgment**
	Not assumed to be applied in normal circumstances

Market transition to IBOR+

The parties involved in contracts referring to the current TIBOR will need to consider and negotiate whether they should continue to use the benchmark that has been referenced under the existing contract in the event that substantial changes are made to the definition of TIBOR. This the second consultation document proposes not to change the definition of TIBOR in order to avoid legal disputes and to accomplish a seamless transition (as defined in the FSB's July 2014 report) from the current TIBOR to TIBOR+.

International cooperation

Recognising the necessity and importance of internationally coordinated IBOR reforms, JBATA interacts with other benchmark administrators as well as other relevant authorities including BOJ and JFSA to facilitate a mutual exchange of views.

Stakeholder engagement and consultation

As described above, JBATA has consulted with its stakeholders on a global basis through publishing two consultation papers (December 2014 and August 2015) in both English and Japanese.

Regulatory environment for benchmarks

Japanese Yen TIBOR, as well as Euro yen TIBOR, has been designated as Specified Financial Benchmarks based on the Japanese Financial Instruments and Exchange Act as from 29 May 2015, and JBATA has become a Specified Financial Benchmark Calculator from the same date. Following on from these regulatory designations, the JFSA approved JBATA's internal policies and procedures for its operations on 26 November 2015, which includes the JBATA's Code of Conduct and internal rules and controls for mitigating the risk of conflicts of interest.

Outstanding issues

JBATA has been accelerating its internal discussions and preparations to finalise its reforms, taking into account the comments collected through the second consultation process as well as other issues that are relevant to recent financial market conditions.

2.5 Developments in other markets

Although the FSB recommendations were directed at LIBOR, TIBOR and EURIBOR, other members have also taken steps to reform their existing rates in line with the advice given by the FSB and the IOSCO Principles. Australia, Canada, Hong Kong, Mexico, Singapore and South Africa have all progressed their plans further since the July 2015 report to reform their rates based upon the FSB recommendations.

2.5.1 Australia

Since July 2015, the methodology for the primary credit reference rate in Australia, the bank bill swap rate (BBSW) has been under review in response to concerns arising from the low trading activity during the BBSW rate set. The Council of Financial Regulators (CFR), which includes the Reserve Bank of Australia (RBA), the Australian Securities and Investments Commission (ASIC), the Australian Prudential Regulation Authority (APRA) and the Australian Treasury conducted a consultation process and proposed to the benchmark administrator methodological changes to measure BBSW directly as the VWAP of a broader range of market transactions. The administrator has endorsed the CFR's proposal.

Data

Since September 2013, the BBSW has been calculated by the Australian Financial Markets Association (AFMA) using live and executable prices from trading venues for eligible bank paper (i.e. that issued by 'Prime Banks') with tenors between one and six months. Since July 2015, low trading activity during the BBSW rate set has called into question its credibility as a benchmark. In response, the CFR conducted a consultation process with market participants on the evolution of the BBSW methodology between October 2015 and February 2016, with the aim of better anchoring BBSW to transactions in an active underlying market. The CFR published a discussion paper in February 2016, which summarised the feedback received and set out a proposal for discussion with AFMA and market participants.[13]

[13] http://www.cfr.gov.au/publications/consultations/evolution-of-the-bbsw-methodology/discussion-paper.pdf

Change to methodologies

The proposal published in the CFR's discussion paper recommended that the definition of the market underlying the BBSW is widened beyond the interbank market to include all transactions that are above a minimum size. It was also proposed that the BBSW be calculated as the VWAP of transactions during a longer rate set window. This would require the Prime Banks to conduct the bulk of their issuance in terms of outright yields (rather than the current market practice of issuing at the BBSW rates), and for secondary market trading to also be negotiated in terms of outright yields.

Market transition to IBOR+

The CFR presented the proposal to the relevant AFMA committees in February 2016, and identified the key issues as: whether to move to a VWAP; how to ensure a sufficient volume of transactions are negotiated at an outright yield; and what method should be used to execute transactions. Market participants acknowledged that changes to the BBSW methodology were necessary, and there was support for conducting transactions on electronic platforms.

Following further consultation with industry participants, AFMA endorsed the CFR's proposal in July 2016. AFMA has announced that a new administrator will be appointed to implement the methodological changes.

International cooperation

As part of the consultation process, the CFR reviewed the IBOR+ methodologies being developed in other jurisdictions, and raised some options based on the proposals at the time for LIBOR and EURIBOR. During the consultation process, the CFR considered submissions from a wide range of market participants, including foreign financial institutions such as investment banks and fund managers.

Regulatory environment for benchmarks

In March 2016, the CFR commenced a consultation process seeking views on options to reform the regulation of financial benchmarks. The reforms proposed by the CFR have three aspects:

- *Benchmark administration:* making administration of a significant benchmark a financially regulated activity and imposing obligations on the administrator of a significant benchmark that are consistent with the IOSCO Principles, including audit, governance and conflicts management requirements;
- *Benchmark submission:* imposing binding requirements, consistent with the IOSCO Principles, on submitters to a significant benchmark calculated based on submissions, and creating a legal power to compel submission to a significant benchmark; and
- *Benchmark misconduct:* introducing a new specific offence of benchmark manipulation applicable to all financial benchmarks. Separately, expressly expanding the scope of financial products to the bank paper underlying BBSW.

The reform options advanced are guided by the IOSCO Principles and the recommendations of the FSB with regards to FX and interest rate benchmarks. They are also informed by reforms proposed or implemented in key foreign jurisdictions including the UK, other EU jurisdictions, Japan, Singapore, Hong Kong and Canada.

2.5.2 Canada

Thomson Reuters took over the administration of the Canadian Dollar Offered Rate (CDOR – the Canadian IBOR) on 31 December 2014 and of the Canadian Overnight Repo Rate Average (CORRA – the Canadian RFR) on 30 March 2015. CDOR is a survey based measure reflecting the committed rate at which each submitting bank would be willing to lend (offer) funds for specific terms-to-maturity against primary Banker's Acceptance (BA) issuance to clients with existing credit facilities that reference CDOR i.e. it represents the bid-side rates of the primary BA market. The panel member banks are responsible for close to 100% of the BA issuance in Canada.

Thomson Reuters formed an official CDOR/CORRA oversight committee[14] in late 2015. Thomson Reuters, together with the oversight committee, is currently reviewing some potential changes to the existing CDOR methodology, including whether the number of tenors published is still appropriate. Any proposed changes would be subject to consultation with all relevant stakeholders. Additional changes, including potentially introducing a purely transaction-based IBOR, to complement the committed CDOR rate, will be considered later in 2017.

2.5.3 Hong Kong

The HKMA continues to facilitate Hong Kong's benchmark administrator, the Treasury Markets Association (TMA), to review the extent of reforming Hong Kong Interbank Offered Rate (HIBOR) along the international recommendations, having regard to local market conditions.

The HKMA completed a special survey to collect transaction-level data on a variety of interest rate transactions from all Hong Kong's Authorized Institutions (i.e. licensed banks, restricted licence banks and deposit-taking companies). The HKMA has progressed to analysing the data to study the feasibility of the reforms. The focus is on:

- Whether and how to widen the definition of HIBOR, with a view to appropriately underpinning HIBOR to actual transactions;
- Whether there is a need to enlarge the number of panel banks;
- Whether a "waterfall" is needed, and if so, the appropriate framework;
- Possible changes to the calculation methodology; and
- Whether any of the HIBOR tenors have limited market usage and liquidity in the underlying market, hence scope for phasing out.

In conducting the analysis, the HKMA has been drawing reference from the reform proposals made by the administrators of the three major IBORs. After completing the analysis, the HKMA will summarise and share the findings with the TMA for their further study. The HKMA will assist the TMA in their work as needed. The TMA will consult stakeholders before making any material changes to the determination of the HIBOR.

---

[14] The oversight committee is currently composed of the seven CDOR submitting banks, the three inter-dealer brokers responsible for submitting the overnight repo trades, the International Swaps and Derivatives Association, the Investment Industry Association of Canada and the Bank of Canada as an observer.

2.5.4 Mexico

Mexico’s Interbank Equilibrium Interest Rate (TIIE), administered by Banco de México (BdM), is being revised to align it to the IOSCO principles. The first step in the reform process was to understand the necessary changes that have to be made. Last year the BdM undertook some actions that can be grouped into two categories: legal changes and market participation enhancement. In the legal category, BdM endorsed reforms to the governing documents relating to the existing calculation methodology to determine the TIIE. The changes are currently going through the legal approval process. In the market participation enhancement category, BdM contacted market participants in the interbank money markets to discuss alternatives to strengthen the TIIE methodology. BdM is in the process of establishing a study group to work closely with the banking industry to analyse the challenges ahead for the TIIE. Additionally, BdM is in frequent contact with the banking industry to consult and engage with them on the calculation method and in the bidding procedures that would enhance the local banks’ participation in the TIIE determination process. BdM expects that these reforms will improve the Mexican benchmark rate by aligning it to the principles recommended by IOSCO. Despite these improvements, the TIIE outlook in the long run poses some challenges. Specifically, the most important one will be to base the TIIE determination on actual transactions in the market.

The governance of the TIIE will be enhanced by formally introducing a supervision committee for the calculation process which will have a mandate that includes ensuring appropriate quality and integrity of the reference rate and periodic reviews of the methodology.

During the TIIE reform process, BdM has been incorporating the views of the interbank money market institutions regarding the TIIE methodology. For example, BdM consulted the market participants regarding the price adjustments applied by BdM in the quoted prices provided by the surveyed banks in the TIIE determinations. Similarly, BdM also consulted with the participant banks about the amounts that have to be quoted in the pricing of the interbank loans used for the TIIE calculation.

The working group will look to incorporate some of the feedback that they gained from market participants regarding the pricing methodology to the determination of the TIIE which could enhance the rate representativeness of the current market conditions. In addition, the study group is dealing with additional issues such as evaluating if the TIIE can feasibly be calculated for 28 days, 91 days and 182 days or if the rate should be calculated for fewer tenors.

Overall, it is expected that the reforms will substantially improve the Mexican Benchmark rate by aligning it to the IOSCO principles. Despite these improvements, the TIIE outlook in the long run poses some challenges regarding the interbank money market such as the potential loss of some major participants in the TIIE bidding due to regulatory changes in major banking centres which may damage the representativeness of the benchmark rate.

Finally, another important challenge to fully align the determination of the TIIE to the IOSCO principles will be to base it on market transactions. Unfortunately, as in many markets in the world, developed or emerging, in Mexico the interbank repo market of tenors longer than seven days is very shallow which makes it currently impossible to base the TIIE determinations process on actual transactions. BdM continues to work hard on developing the market.

2.5.5 Singapore

The Singapore Interbank Offered Rate (SIBOR) is administered by the Association of Banks in Singapore (ABS), and is calculated from a survey of a panel of 20 banks. An individual ABS SIBOR contributor bank submits the rate at which it could borrow funds, were it to do so by asking for and accepting inter-bank offers in a reasonable market size, just prior to 11:00 hours. SIBOR is currently available in four tenors – one month, three months, six months and 12 months.

In 2014, the Singapore Foreign Exchange Market Committee (SFEMC) completed a study that identified preliminary options for a SIBOR+. In 2015, the ABS and SFEMC, with support from the Monetary Authority of Singapore (MAS) undertook a data collection exercise covering key Singapore dollar wholesale funding instruments for banks. Discussions on an enhanced SIBOR+ methodology, taking into account the results of the data analysis, are ongoing. An ABS-SFEMC consultation paper will be published later in 2016, which will set out proposals on issues such as the hierarchy of inputs, tenor buckets, eligible transaction window, publication timing and the evolution of the benchmark definition.

Concurrently, MAS has consulted on draft legislation for the regulation of financial benchmarks in Singapore, in line with the IOSCO Principles. The proposed framework will subject the manipulation of any financial benchmark in Singapore to criminal and civil sanctions, and will empower MAS to regulate administrators and submitters of key financial benchmarks.[15] The legislative amendments are expected to be tabled in Parliament in the second half of 2016.

2.5.6 South Africa

The Johannesburg Interbank Average Rate (JIBAR) represents the domestic equivalent of the IBORs. The effectiveness and relevance of JIBAR, the key reference rate, as well as the JIBAR Code of Conduct (Code) are evaluated on a continuous basis.

Following implementation in 2012, a revised JIBAR Code, incorporating refinements to the JIBAR Code based on the practical experiences during the first two years, was published on 16 May 2014. In August 2015, following an IOSCO principles gap analysis, the current JIBAR Code was implemented.

During the second half of 2015 the South Africa Reserve Bank (SARB) embarked on a data collection exercise to review JIBAR, with specific focus on analysing the shift into other funding instruments by the contributing banks and the decline in the volumes of Negotiable Certificate of Deposits (NCDs) from which JIBAR is derived. The Bank is evaluating whether new instruments need to be included in the calculation of JIBAR to enhance its credibility. Part of this initiative is aimed at gauging an understanding of the impact of Basel III regulation on the funding behaviour of the banks, and the implications for reference rates.

The collection of funding data from the five JIBAR contributing banks was completed at the end of 2015. Data represents all funding instruments outside the current JIBAR universe and has been analysed by the SARB. Analysis was also conducted on the size of the financial derivative instruments and banks' balance sheet items that reset against JIBAR. The analysis, which was completed in April 2016, found that there was a substantial mismatch between the

15 MAS will designate key financial benchmarks for regulation based on their systemic importance and susceptibility to manipulation.

aggregate volume of derivative and non-derivative contracts that reset against the three-month JIBAR and the volume of NCDs that are used to calculate the JIBAR rate on which these contracts reset. In addition, wholesale and other deposits dominated short term funding while NCD issuance was concentrated in the medium- to longer-term area (six to twelve months). The findings were presented to the Reference Rate Oversight Committee (RROC), the committee overseeing domestic reference rate-setting processes, and the Financial Markets Liaison Group (FMLG). The FMLG substructures have been tasked with proposing a solution.

3. Developments in RFR benchmarks

3.1 Overview

FSB members continue to make progress in implementing RFRs and in some cases have identified strategies to create liquidity in any newly introduced RFRs as part of their initial transition planning. Work has focused on either overnight unsecured or secured rates, as these markets have been identified as having the most significant underlying transactions.

- In the United States, the Alternative Reference Rates Committee (ARRC) has preliminarily narrowed its choice of an RFR to two rates, the Overnight Bank Funding rate (OBFR) and some form of overnight Treasury GC repo rate. The Federal Reserve Bank of New York began publishing the OBFR, an index of a wide set of overnight federal funds and Eurodollar transactions, in March 2016. The ARRC has not yet identified a specific overnight GC repo rate but the ARRC has expressed some preference for a rate produced by the public sector. The ARRC has mapped out an initial strategy for moving price alignment interest (PAI) and discounting to its chosen new rate as a way of creating initial liquidity, but further work will be required – following consultation and an inclusion of input from a wide set of end users – in planning for a full transition strategy that would move a more significant portion of the market away from LIBOR.
- While European authorities already consider EONIA[16] to be a viable and actively used RFR, they have also been working with EMMI and market participants to explore the feasibility of a transactions-based repo benchmark (New Repo Index). EMMI intends to conduct a tendering process for the role of the Calculation Agent for the New Repo Index early in Q3 2016.
- In Japan, the Study Group on Risk-Free Reference Rates published a consultation paper in March 2016. The Study Group narrowed down the candidates for the JPY risk-free rate to the uncollateralised overnight call rate (the Tokyo Overnight Average Rate, TONAR) as the primary candidate and a GC repo rate as the secondary candidate. It also assessed the scope of use of the risk-free rate in financial transactions and contracts, and how to expand its use. Based on the discussions about the comments received through the public consultation process and developments of the risk-free rates of other major currencies, the Study Group now aims to identify the Japanese yen risk-free rate by the end of 2016.
- The Bank of England has taken on the administration of the SONIA benchmark with a view to reforming SONIA to include bilateral and brokered transactions in the calculation of the benchmark, using a new data collection as its source. Subject to the outcome of a future consultation, the Bank of England expects to commence publication of the reformed SONIA benchmark in Q2 2017. The Working Group on Sterling Risk-Free Reference Rates has deferred choosing between a secured or

[16] The 2014 Report stated that EONIA is a reference overnight rate set since 1999 by the EURIBOR-EBF. It is directly anchored in the cash market (unsecured deposit market), it is based on real transactions and on a panel representing a wide range of banks across the euro area and a derivatives market based on such reference interest rate already exists (Overnight Index Swaps, also called EONIA swaps in EUR). (See footnote 2, at p. 22).

unsecured overnight rate as its preferred RFR until further information about the prospective rates is available. In the meantime it has focused on transition planning.

- In Switzerland, the National Working Group (NWG) has concluded that market activity would not be sufficient to calculate the unsecured reference interest rate (TOIS fixing) as a transactions-based rate. The NWG has deprioritised reform efforts for the TOIS fixing and turned its focus to SARON, the overnight secured rate, with a possible transition from TOIS fixing to SARON being discussed. For CHF LIBOR itself, a transition is not currently under consideration.

Working groups in each of the currency areas have kept in close consultation with their counterparts, and have stressed a desire to coordinate final choices and strategies where feasible.

3.2 US dollar

The ARRC released a white paper on its progress in identifying potential US dollar RFR benchmarks in May 2016[17]. Following extensive deliberations, the ARRC has preliminarily narrowed this list to two rates that it considers to be the strongest potential alternatives, the OBFR and some form of overnight Treasury GC repo rate.

The OBFR began being published in March 2016 and is calculated using federal funds transaction data as well as certain overnight Eurodollar transaction data reported in the FR 2420 data collection.[18] The included Eurodollar transactions are unsecured borrowings of US dollars booked at international banking facilities and at offshore branches that are managed or controlled by a US banking office.[19] Consistent with the FR 2420 reporting, overnight transactions are transactions settled on the same day as the trade date and maturing the following business day. Rates for transactions with greater than one business day to maturity or without a specified maturity date ("open transactions") are not included in the calculation. The OBFR is calculated as a volume-weighted median, which is the rate associated with transactions at the 50th percentile of transaction volume, rounded to the nearest basis point.

Although the ARRC has also identified a secured (GC repo) overnight rate as its second leading candidate for a potential alternative rate, they have not yet identified a specific rate. Several privately produced alternatives based on the triparty GC and GC-financing markets are currently produced, but the ARRC has expressed some preference for a rate produced by the public sector. The Federal Reserve stated (in the December 2015 FOMC minutes) that it is considering producing a Treasury repo rate in cooperation with the Office of Financial Research, but no details are available yet on what such a rate would entail.[20] The ARRC itself

---

[17] www.newyorkfed.org/medialibrary/microsites/arrc/files/2016/arrc-interim-report-and-consultation.pdf?la=en

[18] The Board of Governors adopted several amendments to its FR 2420 data collection in 2015, including: (a) lowering the asset-size threshold for domestic depository institutions to report on the FR 2420; (b) raising the asset-size threshold for FBOs to report on the FR 2420; (c) adding an activity-based reporting criterion to capture meaningful activity of domestic depository institutions; (d) requiring FBOs to include the Eurodollar borrowings for certain Cayman or Nassau branches; and (e) requiring all FR 2420 respondents to submit separate reports for their International Banking Facilities.

[19] For US branches and agencies of foreign banks, "managed and controlled" branches are defined by Reporting Form FFIEC 002S as those offshore branches for which the US branch or agency has majority responsibility for business decisions. For US banks, the managed and controlled branches represent offshore branches for which the US office of the bank primarily manages the funding activity.

[20] www.federalreserve.gov/monetarypolicy/fomcminutes20151216.htm

has expressed a preliminary preference for a rate that included both triparty and bilateral transactions.

Because both of the potential alternatives preliminarily identified by the ARRC are overnight rates, the need to build an initial level of demand and liquidity in derivatives markets based on either rate will necessarily involve transitioning some the current private sector uses of the effective fed funds rate (EFFR), the current overnight index used by market participants, to the new rate. Therefore, the ARRC has mapped out an initial strategy for moving PAI and discounting to a new rate. This strategy have been crafted to avoid any changes in existing contracts – the ARRC envisions a paced transition focusing on new transactions rather than a "big bang" that would seek to change existing trades – thereby minimising market disruptions while still creating a robust source of demand for and underlying liquidity in hedging markets for the new rate.

Under this paced transition strategy, as of a specified future date, collateral held on new IRS contracts clearing at participating CCPs would be remunerated at the new rate chosen by the ARRC for PAI ("new rate"). These new trades would exist within the same clearing pools and default funds as existing legacy IRS contracts, which would continue to receive the EFFR as PAI on any collateral posted. As legacy contracts paying EFFR for PAI matured over time, the clearing pool would come to be based entirely on the new rate for PAI. Under this scenario, based on market demand and individual rules and business strategies, discounting would eventually also likely move to the new rate. Although the plan refers specifically to PAI paid by the CCPs given that most new standardised IRS contracts are now cleared, it is expected that broker-dealers will also seek to adjust the interest on collateral specified in their bilateral CSAs to the new rate. As these agreements must be negotiated on a case-by-case basis, this portion of a paced transition is expected to take a longer period of time.

The ARRC's work so far has focused on an initial transition strategy. A paced transition would represent a first step in creating a liquid market for the alternative rate, but further work will be required – following consultation and an inclusion of input from a wide set of end users – in planning for a full transition strategy that would move a more significant portion of the market away from LIBOR to the new rate.

3.3 Euro

As discussed in the 2014 Report, European authorities already consider EONIA to be a viable and actively used nearly-credit-risk-free reference interest rate, supported by a robust governance framework. European authorities and market participants are also considering the development of other potential reference rates, continuing the work begun in 2013, when EMMI and the European Repo Council launched a Secured Benchmark Indices Joint Task Force to explore the feasibility of a transactions-based repo benchmark (New Repo Index).

EMMI has been working to assess the market needs, to formally define the underlying interest to be measured by the new repo index, to analyse the market for the Underlying Interest, and to specify preliminary design principles for the benchmark. To this end, during the second half of 2015, EMMI commissioned experts at the Swiss Institute of Banking and Finance at the University of St Gallen with determining whether the repo data made available from European Automated Trading Systems (ATSs) were sufficient to support the determination of a new pan-

European benchmark.[21] Key issues included the question of data sufficiency, its effect on tenor availability, the co-existence of funding- and security-driven repo transactions in the data, and further eligibility criteria that should be defined to ensure the new benchmark's robustness.

The study performed by the University of St Gallen was delivered in November 2015. It highlighted that combining the volume data from all three of the major European ATSs was needed to develop a representative pan-European secured money market index. The data analysis also confirmed that euro repo activity is mainly concentrated on one-day tenors (O/N, T/N, S/N), with sufficient data to construct a robust and reliable transaction-based repo index.

In December 2015, EMMI launched a public consultation to assess the potential market need for and use of a pan-European repo benchmark. The responses confirmed the appetite for the New Repo Index to be used primarily for pricing/valuation and hedging purposes. A few respondents indicated that the index could at some point become a substitute of the unsecured EONIA index, as volumes in the unsecured interbank market have been declining over the past years.

In view of the results of the St Gallen study and the feedback from the public consultations, EMMI has started the design of the benchmark methodology during Q3 2016 and expects to deliver a complete index blueprint by the end of Q4 2016. EMMI has been in the process of contacting ATSs and CCPs in order to establish agreements with all data providers as well as understanding the structure of each of the national markets in Europe. EMMI intends to conduct a tendering process for the role of the Calculation Agent for the New Repo Index at the end of Q4 2016.

3.4 Japanese Yen

In Japan, the Study Group on Risk-Free Reference Rates (Study Group) published a consultation paper in March 2016 laying out its analysis and initial identification of the leading candidate for a risk-free rate and seeking feedback from a wide variety of market participants.[22, 23]

In identifying the Japanese yen risk-free rate, the Study Group considered the following three properties:

1. The risk-free nature of the rate;
2. The depth of the market underlying the rate; and
3. Ease of use in financial transactions (particularly derivatives transactions).

Based on its analysis, the Study Group identified the uncollateralised overnight call rate as the primary candidate for the Japanese yen risk-free rate and a GC repo rate as the secondary

---

[21] Following a high-level agreement reached in November 2014, participating European Automatic Trading Systems (ATS) provided EMMI with data spanning nine years of euro repo transactions. According to the initial specifications provided by EMMI, the selected transactions had to comply with the following criteria: (a) executed on-screen; (b) cleared through qualified central clearing counterparties (CCP); and (c) against ECB-eligible collateral, either in the form of general collateral (GC) baskets or individual securities (specifics).

[22] The Study Group's terms of reference, meeting agendas, and the minutes are available on the Bank of Japan's web site: www.boj.or.jp/en/paym/market/sg/index.htm/.

[23] The Study Group's public consultation paper is available on the Bank of Japan's web site: www.boj.or.jp/en/paym/market/sg/rfr1603c.pdf.

candidate. The Study Group felt that the uncollateralised overnight call rate satisfied all three properties in a very balanced way. Since TONAR is a transaction-based benchmark for the uncollateralised overnight call rate (calculated and published by the Bank of Japan using information provided by money market brokers), the Study Group members believe there will be no need to set up a new administrator and expects the calculation methodology to be maintained after the identification as the risk-free rate. At the same time, the Study Group has also recognised that international consistency across risk-free rates of major currencies is an important property, especially when they are used as currency swap indices, and thus the Group will also take the development of risk-free rates in other currencies into consideration.

The Study Group estimated the proportion of Japanese yen interest rate swap transactions for which the use of a risk-free rate is suitable through its internal surveys on transactions purposes. Based on the surveys by the Study Group, the share of OIS transactions referencing TONAR are estimated to be between 30 and 40 percent of total Japanese yen interest rate swap transactions, with the potential to increase as the liquidity of the OIS market improves. The Study Group also considered revision of market conventions that would improve convenience of OIS referencing TONAR.

Comments received through the public consultation process are generally supportive of the proposals in the public consultation paper with a positive reference to the fact that TONAR is a transaction-based benchmark and widespread utilisation of OIS discounting method in derivatives valuation would stimulate OIS transactions. However, some market participants indicated that it is worth reassessing the possible impact of negative interest rate policy on Japanese yen short-term money markets.[24]

After discussing the comments received through the public consultation process and developments on the risk-free rates of other major currencies, the Study Group decided to further assess the relationship of Japanese yen risk-free rates with risk-free rates in other currencies, along with developments in the Japanese money market. The Study Group now aims to identify the Japanese yen risk-free rate by the end of 2016.

3.5 Sterling

The Working Group on Sterling Risk-Free Reference Rate published an Interim Report in May 2016[25] setting out its progress on taking forward the selection and implementation of a RFR for the sterling markets and to formulate a plan to transition parts of the derivative market from LIBOR to the new rate. Since its inception in March 2015, the Working Group has accomplished the following steps:

- provisionally identified either an unsecured overnight rate (a reformed version of SONIA) or an (as yet unspecified) overnight secured rate as plausible candidate RFRs;
- set out the selection criteria it plans to use to make a determination between these options, covering both the intrinsic properties of the available benchmarks, and importantly the feasibility of transition;

[24] The Study Group's feedback statement on the public consultation paper is available on the Bank of Japan's web site: www.boj.or.jp/en/paym/market/sg/rfr1606c.pdf.

[25] www.bankofengland.co.uk/markets/Documents/sterlingoperations/rfr/2016/rfrwgintrep16.pdf

- canvassed views from end-users on the secured and unsecured options, recognising the importance of end-user acceptance; and
- determined that a successful transition from LIBOR to a RFR is most likely to succeed if the RFR was first established as the main OIS reference rate, and hence became the standard rate for discounting and valuing swap positions and remunerating collateral balances.

Following a consultation in July 2015, the Bank of England took on the administration of the SONIA benchmark in April 2016, with the UK Wholesale Market Brokers Association (WMBA) initially acting as its calculation and publication agent.[26] The Bank of England plans to reform SONIA to include bilateral as well as brokered transactions in the calculation of the benchmark. Subject to the outcome of a second consultation later this year on the details of this reform, the Bank of England expects to commence publication of the reformed SONIA benchmark in Q2 2017.

The data source the Bank of England will use to calculate reformed SONIA will be its new data collection, which it consulted on in July 2015 alongside its high level plans for SONIA reform. Using a first annual money market survey completed in January 2016, the most active institutions were identified and required to submit transactions data to the Bank of England on a daily basis.[27] The collection of transaction level data from a set of early adopters commenced in March 2016 and the full set of reporters in [July 2016.

Further to the work the Bank of England is undertaking regarding the reform of SONIA – which will proceed regardless of whether reformed SONIA or a secured rate is chosen as the RFR – the Working Group has sought to catalyse interest in developing a robust secured benchmark based on overnight gilt repo transactions. EBS BrokerTec and ICAP Information Services launched a new sterling repo index in March 2016. The Working Group has also received expressions of interest from a number of other potential benchmark administrators, and is continuing to engage with them as they decide whether to develop a benchmark.

In light of its earlier analysis, the Working Group concluded that the choice between overnight secured and unsecured benchmarks was finely balanced. On the one hand an overnight secured rate would have a stronger transactions base and might prove to be more robust over time. But, on the other hand, no suitable secured benchmark was currently available. Transitioning from LIBOR to a new secured RFR would be more challenging than transitioning to a reformed SONIA, since it would be necessary first to transition the OIS market to the secured RFR (whereas SONIA is already established as the OIS reference rate); the Working Group has identified a potential plan for such a transition, although further consultation and outreach would be required to validate the approach, if such a transition were to be required.

The Working Group expects to choose the sterling RFR in H2 2016 once: (a) the prospects for the emergence of a robust secured benchmark were are clearer; (b) there is a fuller understanding of the properties of reformed SONIA; and (c) there is a better understanding of whether and how the OIS market could be transitioned to a secured RFR.

---

26 www.bankofengland.co.uk/publications/Pages/news/2016/046.aspx

27 The key points from the annual survey were published in the H2 2015 Money Market Liaison Committee Sterling Money Markets Survey: www.bankofengland.co.uk/publications/Documents/other/markets/mmlc/smms2015h2.pdf.

3.6 Swiss franc

The national working group (NWG) on CHF reference rates is the key forum for considering proposals to reform reference interest rates in Switzerland. The NWG established a sub-group last year to analyse the possibility of establishing a platform for unsecured money market transactions. Such a platform could be used to underpin the unsecured tomorrow/next indexed swap (TOIS) fixing with actual transactions. However, the NWG concluded that market activity would not be sufficient to calculate a transactions-based reference interest rate. Reforms for TOIS fixing have accordingly been deprioritised, and the NWG has instead turned its focus to SARON, the overnight secured rate, which already exists and is based on actual transactions and binding quotes (from the SIX repo platform).[28]

The NWG has established a sub-group for alternative CHF reference rates (CHF ARR) which is tasked with: (a) considering transition issues from TOIS fixing to SARON; (b) assessing reforms for SARON; (c) assessing the level of regulation needed; and (d) reaching out to a broader group of market participants. The sub-group includes specialists for the respective objective, e.g. transitional issues are discussed with representatives of clearing houses or current users of the TOIS fixing. The NWG decided to focus on the transition from TOIS fixing to SARON. For CHF LIBOR itself, a transition is currently not under consideration.

One workstream of the CHF ARR is currently reviewing the methodology for SARON in cooperation with its administrator, SIX Swiss Exchange (SSX). SSX announced IOSCO compliance of its SMI Indices, including SARON, at the end of December 2014.[29] The results so far indicate that the methodology is robust. The objective of the ongoing work is to make sure that the reference rate can potentially be employed in financial contracts and is adapting to a changing market environment. For instance, the group evaluates the necessity of a fall-back solution in the absence of transactions and quotes. This conceptual work is expected to be completed at the end of 2016.

Another workstream of the CHF ARR is currently discussing transition issues by replacing TOIS fixing with SARON. OIS contracts in which TOIS fixing is used as the floating leg, as well as the valuation of, for example, IRS contracts, are likely to be affected. Transition challenges include, among other things, legal risks for existing contracts and establishing the requirements for using SARON as an alternative. The challenges are being addressed by involving relevant stakeholders in the discussions.

In the case of TOIS fixing, the administrator (ACI Suisse) has conducted an intensive search effort to increase the size of the TOIS fixing panel. So far, this search effort has remained unsuccessful. Although according to the TOIS Practice Standards, the TOIS fixing can continue with its current size of seven panel members, ACI Suisse will reassess its role as the fixing's administrator and the fixing may be discontinued in the medium to longer term.

---

[28] Between 2005 and 2010, the average daily volume (on which SARON is based) amounted to CHF 10 billion, about 44 percent of which was attributable to the volume of CHF repo transactions (the remainder was based on the volume of tradable quotes). The volume actually increased during the crisis, reaching an average of approximately CHF 14 billion in 2008. Given the substantial expansion of liquidity in the wake of the financial crisis, the average volume on which SARON is based fell to approximately CHF 1–2 billion. After the introduction of negative interest rates the average daily volume increased, to approximately CHF 4–5 billion.

[29] www.six-swiss-exchange.com/indices/overview_en.html

3.7 Australian dollar

The RBA has reviewed the methodology for the Cash Rate (the primary Australian dollar risk-free benchmark) to ensure alignment with the IOSCO benchmark principles. Beginning in May 2016, the Cash Rate has been calculated directly from market transactions data rather than from submissions of each participant's aggregate transactions. In response to interest from market participants, in May 2016 the RBA also commenced publishing a Cash Rate total return index (TRI) as a complementary backward-looking benchmark, based on the Cash Rate benchmark.[30] The RBA consulted widely with market participants regarding the methodology and implementation of the Cash Rate TRI, and it is expected that over time some participants will use the TRI as a benchmark.

3.8 Canadian dollar

The Canadian risk-free rate, Canadian Overnight Repo Rate Average (CORRA), is a transaction-based rate that has been published since 1997. It is calculated from overnight general collateral repo trades on Government of Canada securities that take place through designated inter-dealer brokers, and is reported on a following day basis. Thomson Reuters took over the administration of CORRA from the Bank of Canada in March 2015, and formed an official oversight committee covering both CORRA and CDOR in late 2015. CORRA is used as the floating rate benchmark in the overnight index swap market which has existed in Canada since the late 1990s.

3.9 Hong Kong dollar

Preliminary findings of a special survey carried out by the HKMA on transactions conducted by Hong Kong's Authorized Institutions indicated that it would be more feasible to implement the risk-free rate based on the Hong Kong dollar overnight unsecured market. Hong Kong has an existing transaction-based rate from this market, the Hong Kong Dollar Overnight Index Average (HONIA), which is calculated based on Hong Kong dollar overnight unsecured interbank transactions conducted through selected brokers. HONIA is also the reference rate for Hong Kong dollar OIS. The rate was owned and administered by the Hong Kong Inter-Dealer Brokers Association until April 2016. With support from the industry, the TMA, the Hong Kong benchmark administrator overseeing HIBOR, took up the ownership and administration of the rate. The TMA is working to refine the governance and determination arrangements of HONIA, drawing reference from the experience of major markets.

3.10 Singapore dollar

A data collection exercise was conducted by the Association of Banks in Singapore and Singapore Foreign Exchange Market Committee to examine the liquidity of underlying Singapore dollar money markets and related market transactions. Data from this exercise has indicated that liquidity in the overnight tenor could support a (near) risk-free benchmark based on transaction data contributed by a panel of banks. Further analysis and consultation with the industry on design, methodology and transition will be undertaken, before any change is implemented.

---

30 For more details, see http://www.rba.gov.au/media-releases/2016/mr-16-12.html.

3.11 South African Rand

The South African Reserve Bank is working in consultation with market participants on reforming reference rates for the domestic market and developing new rates in line with practices and principles applied in other countries. The Bank is currently in discussions on proposals for the calculation of several reference rates, which will reflect secured (risk-free) and unsecured rates. The objective is to calculate multiple rates as proposed by the OSSG and which also meet the IOSCO design principles. A Reference Rate Working Group was established for this purpose. Progress has been made with the calculation of an unsecured interbank overnight rate, which could be validated against SWIFT messages and volumes being pushed through the domestic Real Time Gross Settlement system, and consultation with relevant stakeholders should be completed in the next 12 months. The possible use of the repo market is being investigated for the creation of a short-maturity secured interbank rate.

Appendix A – List of Abbreviations and Acronyms

2014 Report	Financial Stability Board (2014), *Reforming Major Interest Rate Benchmarks*
ABS	Association of Banks in Singapore
AFMA	Australian Financial Markets Association
ARRC	Alternative Reference Rates Committee (US)
ASIC	Australian Securities and Investments Commission
ATS	Automated Trading System (EU)
BA	Banker’s Acceptance (Canada)
BBSW	Bank Bill Swap Rate (Australia)
BdM	Banco de México
BFSMA	Belgian Financial Services and Markets Authority
BOJ	Bank of Japan
CDOR	Canadian Dollar Offered Rate
CFR	Council of Financial Regulators (Australia)
CORRA	Canadian Overnight Repo Rate Average
ECB	European Central Bank
EFFR	Effective Fed Funds Rate
EFTA	European Free Trade Association (Iceland, Liechtenstein, Norway, and Switzerland)
EMMI	European Money Markets Institute
EONIA	Euro Overnight Index Average
EURIBOR	Euro Interbank Offered Rate
FCA	Financial Conduct Authority (UK)
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
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
MMSR	ECB Money Market Statistical Reporting framework
NCD	Negotiable Certificates of Deposit
NWG	National Working Group (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	(near credit-) Risk-free reference rate
RROC	Reference Rate Oversight Committee (South Africa)
SARB	South African Reserve Bank
SARON	Swiss Average Rate Overnight
SFEMC	Singapore Foreign Exchange Market Committee
SIBOR	Singapore Interbank Offered Rate
SONIA	Sterling Overnight Index Average
TIBOR	Tokyo Interbank Offered Rate
TIIE	Equilibrium Interbank Interest Rate (Mexico)
TMA	Treasury Markets Association (Hong Kong)
TOIS	TOM/next Indexed Swaps (Switzerland)
TONAR	Tokyo Overnight Average Rate
TRI	Total Return Index
VWAP	Volume Weighted Average Price
WMBA	Wholesale Market Brokers' Association (UK)

Appendix B – Members of the FSB OSSG Benchmark Group

Co-Chairs	**David Lawton** Director, Markets Policy and International Financial Conduct Authority UK
	Jerome Powell Member Federal Reserve Board of Governors
Australia	**Guy Debelle** Assistant Governor, Financial Markets Reserve Bank of Australia
Brazil	**Ricardo Moura**[31] Senior Advisor to the Board Central Bank of Brazil
Canada	**Paul Chilcott** Advisor to the Governor Bank of Canada
Hong Kong	**Henry Cheng** Executive Director, Monetary Management Department Hong Kong Monetary Authority
Japan	**Kenji Fujita** Associate Director General, Financial Markets Department Bank of Japan
	Ryozo Himino Vice Minister for International Affairs Financial Services Agency
Mexico	**Rodrigo Cano** Director of Operations Support Bank of Mexico
Singapore	**Cindy Mok** 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

[31] Until June 2015. Replacement representative TBC.

UK	**Chris Salmon** Executive Director, Markets Bank of England
US	**Timothy Massad** Chairman Commodity Futures Trading Commission
ECB	**Cornelia Holthausen** Principal Adviser, General Market Operations
EBA	**Adam Farkas** Executive Director
ESMA	**Rodrigo Buenaventura** Head, Markets Division
IOSCO	**Jean-Paul Servais** Vice-Chairman of the IOSCO Board Chairman, Belgium Financial Services and Markets Authority
FSB Secretariat	**Mark Chambers** **Richard Thorpe** **Laurence White**