Progress in Reforming Major Interest Rate Benchmarks

Interim report on implementation of July 2014 FSB recommendations

9 July 2015

Contents **Page**

Executive Summary

In July 2014 the Financial Stability Board published the report *Reforming Major Interest Rate Benchmarks*, which proposed recommendations for enhancing existing benchmarks for key interbank unsecured lending markets ("IBORs"), 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), 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.

In relation to IBORs, the FSB's July 2014 report recommended that these rates should be underpinned to the greatest extent possible with transactions data. The recommendations called for the development of specific proposals for enhancements to these benchmarks, to be put to consultation by end-2015.

Since July 2014, the administrators of the most widely used IBORs – EURIBOR, LIBOR and TIBOR – have all taken major steps in this regard. These steps have 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; this work has also typically being undertaken in liaison with relevant international authorities. In recent years authorities in all three jurisdictions where the IBOR administrators are located have taken action to more formally regulate these benchmarks.

Furthermore, while the FSB recommendations were directed at the three major IBORs, OSSG member authorities, benchmark administrators and market participants from other jurisdictions, including Australia, Canada, Hong Kong, Mexico, Singapore and South Africa, have 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.

OSSG members have also made concrete progress in identifying potential RFRs. In particular, detailed data collection exercises have been undertaken in key markets, and work is now underway to identify potential RFRs, where these do not currently exist. As with IBORs, market participants and authorities are working together closely, either through existing industry bodies or through the establishment of working groups. In addition to authorities in the euro area, Japan, UK and US, several other OSSG members are also working with industry in local markets to develop RFRs in their respective currencies.

As work on developing RFRs proceeds, an issue that several authorities are considering is how to facilitate the availability of RFRs at terms longer than overnight. Once a wider range of RFRs have been identified, some consideration may also be needed for coordination amongst authorities in later phases of developing RFRs and related term markets, particularly if these rates are referenced in cross-currency transactions.

The OSSG will continue to monitor progress in implementing the FSB's recommendations in the year ahead, and will prepare an updated progress report for publication by the FSB in July 2016.

1. Introduction

1.1 Background

In response to cases of attempted manipulation in relation to key interbank interest rate benchmarks, together with the post-crisis decline in liquidity in interbank unsecured funding markets, in 2013 the FSB established the OSSG, bringing together central banks and regulatory authorities to coordinate international work to review and reform interest rate benchmarks.

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 (MPG), which was in turn tasked with examining the feasibility and viability of adopting additional reference rates and potential transition issues. The OSSG focussed in the first instance on interbank benchmarks that were most widely used in the global financial system – namely EURIBOR, LIBOR and TIBOR – with the expectation that reform in these major markets would provide an impetus for similar enhancements in other key markets.

In July 2013 IOSCO published a set of principles[1] to be adopted by benchmark administrators to improve the robustness and integrity of financial market benchmarks in general, which were endorsed by the FSB as the global standard for benchmarks. At the request of the OSSG, the IOSCO Task Force for Financial Market Benchmarks then undertook a review of the degree of implementation of IOSCO's Principles for Financial Benchmarks by the administrators of EURIBOR, LIBOR and TIBOR (collectively the "IBORs").

In July 2014, the FSB published the report prepared by the OSSG, "Reforming Major Interest Rate Benchmarks",[2] together with the report of the MPG,[3] and the findings of IOSCO's review.[4] In the FSB's report, as well as encouraging benchmark administrators to address the IOSCO taskforce's findings in its review, the following specific recommendations for benchmark reforms were made:

IBOR+

There should be a strengthening in 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 are to work with contributing banks and each central bank is to work with active participants

---

[1] IOSCO (2013), *Principles for Financial Benchmarks*, 17 July; available at: https://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf.

[2] FSB (2014), *Reforming Major Interest Rate Benchmarks*, 22 July; available at: http://www.financialstabilityboard.org/wp-content/uploads/r_140722.pdf.

[3] FSB (2014), *Final Report of the Market Participants Group on Reforming Interest Rate Benchmarks*, 22 July; available at: http://www.financialstabilityboard.org/wp-content/uploads/r_140722b.pdf.

[4] IOSCO (2014), *Review of the Implementation of IOSCO's Principles for Financial Benchmarks by Administrators of Euribor, Libor and Tibor*, 22 July; available at: https://www.iosco.org/library/pubdocs/pdf/IOSCOPD444.pdf.

in wholesale funding markets to analyse available transaction data. This will 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 should be taken to develop alternative RFRs, given that there are certain financial transactions, including many derivatives transactions, that are better suited to reference rates that are closer to risk-free.

In particular, where suitable, central banks and supervisory authorities should:

- Collect or encourage administrators and other market participants to collect data in the underlying RFR markets by end Q4 2014.
- 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 FSB agreed that the OSSG would be tasked with monitoring progress against these recommendations, with an interim report to be produced 12 months after the initial recommendations, and a final report 24 months after.

1.2 This report and future work

This interim monitoring report 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.

In implementing benchmark reforms related to IBOR+ and RFR, authorities have been keen to facilitate appropriate stakeholder engagement. In many instances, authorities together with the private sector have been involved in the establishment of industry working groups or similar arrangements, bringing together benchmark administrators, rate contributors and other sell-side participants, buy-side participants and authorities. For larger markets, these arrangements have been important in ensuring specific proposals are being explored and adopted in a collaborative manner and to ensure the needs and concerns of a wide range of market participants are addressed. For markets where specific steps are not yet underway, these arrangements have been useful in helping disseminate information, and to begin discussions that may ultimately lead to specific enhancements being undertaken.

Looking forward, in the second half of 2015 IOSCO will commence a follow-up review of steps taken by EURIBOR, LIBOR and TIBOR administrators to further assess the degree of implementation of its Principles since July 2014. This second review will seek to identify whether administrators have made progress in addressing the recommended remediation work set out in IOSCO's first review report, which was published in July 2014.

The FSB will publish a final progress report on implementation of the OSSG recommendations in July 2016.

2. Developments in IBOR+ Benchmarks

2.1 Overview

The three major interest reference 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. As a result, the administrators of these IBORs are cooperating with the relevant authorities to reform the rates. All three administrators have complied with the FSB recommendation to publically consult on any recommended changes by end 2015. The speed and depth of administrators' implementation of their proposed changes will be informed by on-going market feedback.

The European Money Markets Institute (EMMI),[5] ICE Benchmarks Administration Ltd. (IBA) and the JBA TIBOR Administration (JBATA) have each proposed steps to enhance their rates, consulting with submitting banks, users and other stakeholders. Each administrator is examining their respective benchmark methodology and definition, and consulting on proposed changes to better reflect the market realities they seek to measure. To inform this work on the feasibility of anchoring the IBORs in transactions, administrators have conducted data collection exercises, either independently or together with public authorities.

The authorities in all three IBOR jurisdictions have taken action to regulate these benchmarks, given their systemic importance. The LIBOR administrator and 20 submitting banks have been regulated in the UK since 1 April 2013, the TIBOR administrator was designated under the new legislative framework in Japan in May 2015, and EURIBOR will be regulated by the new EU Regulation (which will also capture LIBOR and replace the existing UK regime).

While the FSB recommendations were directed at the three major IBORs, other OSSG members including Australia, Canada, Hong Kong, Mexico, Singapore and South Africa, have taken steps towards reforming the existing interbank rates in their own jurisdiction, given the importance of these rates to their domestic markets and their role as international financial centres.

2.2 EURIBOR

The EURIBOR+ Project, launched by the administrator of EURIBOR, EMMI, has the objective of developing a transaction based unsecured market benchmark, as a possible alternative/evolution of EURIBOR. The EURIBOR+ project advanced in the course of 2014 where, following a data analysis provided by the European Central Bank (ECB) and a number of consultations with market participants and end-users, the EMMI designed a plan for a gradual reform of the existing EURIBOR benchmark, designed to anchor it into transactions instead of quotes. The execution of this plan is expected to go through 2015 and early 2016, resulting in a reformed EURIBOR in Q3 2016.

Data

In 2013, the EURIBOR+ Project was launched by EMMI with the objective of developing and evaluating a transactions-based methodology for an unsecured Euro money market

---

5 EMMI was formerly known as Euribor-EBF.

benchmark, such as EURIBOR. The Project has been conducted with the assistance of market stakeholders and closely supported by the ECB. The Project initially focused on the formulation of a robust and reliable methodology using transaction information gathered through two extensive data collection exercises from more than 60 credit institutions. The initial development and design work involved analyses of these data in a specially created taskforce (EURIBOR+ Taskforce), consultations with market experts and a series of stakeholder outreach exercises. During 2014, the core benchmark methodology design was completed.

In 2015, the Project will focus on the finalisation of the benchmark design, the consideration of operational and infrastructure requirements, implementation planning, and the start of the actual incremental implementation, beginning with the clarification of the EURIBOR specification and the build-out of infrastructure for transactions reporting.

Change to methodologies

Based on the data analysis as well as the outreach to the stakeholders and representatives of the end-users, the EURIBOR+ Taskforce concluded that a transactions-based EURIBOR could be achieved. The EURIBOR+ Taskforce analysed the issue of data sufficiency, which could be addressed through a widening of the scope of eligible transactions by moving from the interbank to the wholesale market, an increase in the number of participating banks and modifications in the determination methodology such as adequate fall-back provisions. In addition, the EURIBOR+ Taskforce concluded that smoothing techniques in the methodological design can be used to address the concerns related to increased volatility in a transaction based index. It was recommended that the EURIBOR+ project should aim at achieving a seamless transition (as defined in the FSB's July 2014 report) for EURIBOR, from the current methodology to one based on transactions. This seamless transition mitigates many of the legal, operational, and reputational risks associated with a transition between current EURIBOR and a new distinct transactions-based benchmark.

Market transition to EURIBOR+

The design finalisation and implementation action items of the EURIBOR+ Project are organised into four work streams:

- *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. The key items under consideration by the EURIBOR Steering Committee are: (i) clarification of the concept of "prime" banks to include panel banks of "sound financial standing"; (ii) clarification of the EURIBOR as a borrowing rate by the relevant bank; (iii) expansion of transactions that should be considered in the determination of the rate from interbank to broader sources of wholesale market borrowing; and (iv) clarification of the panel bank eligibility criteria with respect to domicile. This work stream is to be completed during Q3 2015 and, after consultation with relevant stakeholders, the enhanced specification of EURIBOR will be reflected in an updated EURIBOR Code of Conduct.

- *Workstream 2: Benchmark Design – EURIBOR+ Methodology.* The objective of this workstream is to finalise the determination methodology for a transaction based index, as well as formally adopting contingency measures for the circumstances where there is no sufficient data available. This workstream is expected to be completed during Q3 2015 and to deliver an index blue print. Following a consultation of relevant stakeholders, the Code of Conduct will be updated to incorporate the EURIBOR+ methodology accordingly. The second revision of the Code of Conduct is expected to be implemented by early Q3 2016. This will represent the project end-point: i.e. EURIBOR becoming a benchmark anchored in transactions, as envisaged in the EURIBOR+ methodology.
- *Workstream 3: Infrastructure and Operations*. The objective of the third workstream is to develop the specification of the infrastructure and the exact specification of the operations. The deliverables of this workstream are clear criteria for the panel size and composition, specification of the data collection methodology and also revised governance policy and procedural documents. In this context, further analysis of the upcoming ECB Money Market Statistical Reporting (MMSR) framework[6] will be undertaken to align the data collection methodology as closely as possible to the reporting requirements posed by the new regulation in order to allow for banks to leverage technical developments and capacities where feasible.
- *Workstream 4: Transition Execution*. The objective of this workstream is to implement the revised methodologies and the new infrastructure with a view towards migrating to the new transaction based methodology for determining EURIBOR by Q3 2016. This workstream will proceed along a number of parallel tracks, including panel solicitation, development of the panel bank infrastructure, panel bank compliance with a revised Code of Conduct, transaction-based capacities development on the side of the Calculation Agent and possibly building the additional infrastructure for the fall-back mechanism.

Stakeholder engagement and consultation

The administrator of EURIBOR, EMMI, has developed the EURIBOR+ Project in close cooperation with market participants, some of which contributed to the work of the specially created EURIBOR+ Task Force, and also with the involvement of the ECB in analysing the available transaction data. On a number of occasions EMMI has consulted large groups of market participants (mainly credit institutions, but also corporates) and has reached out to end-users presenting the outcome of the EURIBOR+ Task Force work.

International cooperation

There have been a number of presentations organised by the ECB for representatives of other central banks, among which the Federal Reserve Board and the Federal Reserve Bank of New York, Bank of England, the Swiss National Bank (SNB), Bank of Japan (BOJ) and the Hong

[6] On 26 November 2014 the ECB published a regulation (ECB/2014/48) concerning statistics on the money markets aiming at collecting granular money market data from Monetary Financial Institutions (MFIs) on their secured, unsecured and certain derivatives money market transactions. While the purpose of the regulation is to deliver detailed information on the euro money markets for monetary policy purposes, the fact that MFIs' systems must allow for granular reporting of transactions could potentially facilitate reporting by MFIs to benchmark administrators for the purpose of a transaction based index. After a development and testing phase over the course of 2015 and the first half of 2016, a first production phase of the MMSR is expected to commence in July 2016. Further detail on the MMSR is available at: https://www.ecb.europa.eu/ecb/legal/pdf/oj_jol_2014_359_r_0006_en_txt.pdf.

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

On 18 September 2013 the European Commission published a draft proposal for a regulation on indices used as benchmarks in financial instruments and financial contracts. The proposed regulation aims at making benchmarks more reliable and robust so that they are less easily manipulated by market participants and to make the benchmarks setting process more transparent. This proposed law, which is under negotiation in the EU institutions, is expected to cover all benchmarks that are referenced in financial instruments admitted to trading on EU trading venues, in consumer credit and mortgage contracts and that are used to value the performance of investment funds. The proposal includes broad governance and transparency requirements for benchmark administrators. The concept of a critical benchmark is introduced for benchmarks deemed to be fundamental to the European economy and financial stability.

2.3 LIBOR

The LIBOR administrator, IBA, began consulting on the implementation of the recommendations of the FSB in the five currencies for which rates are calculated (US dollar, euro, pound sterling, Japanese yen and Swiss franc), following the publication of the July 2014 report. IBA has issued a first consultative position paper and a feedback statement to the respondents. Simultaneously, IBA consulted with key LIBOR users through a questionnaire and roundtable meetings in London, Paris, New York, Tokyo and Zürich. They are planning to issue a second position paper in Q3 2015, seeking further responses to more detailed aspects of their proposals to better understand the potential impact of the changes. IBA continues to collect and classify transaction data from submitters for all currencies and tenors. While IBA is complying with the FSB's recommendations to consult on proposed reforms, specific plans to implement the proposals are not yet clear as they will not be developed until later in 2015 after further consultation.

Data

Since taking over LIBOR administration in February 2014, and as per the UK's regulatory regime for Benchmarks, IBA has been working to collect transaction data from each of the LIBOR submitters. All submitting banks are collaborating. IBA has no access however to activity data outside the current panel banks.

Change to methodologies

Following active engagement between relevant authorities and IBA, it was proposed that LIBOR would need to change to account for the changing reality in the underlying markets, in particular recognising that: transactions may involve firms outside London; transactions may not occur at 11am UK time; and that banks use wholesale funding sources in addition to interbank borrowing.

IBA published a position paper[7] on 20 October 2014, detailing the potential evolution of the existing LIBOR rate towards a rate, determined using a unified transaction based methodology for submissions, with a waterfall approach (transactions, interpolation, then expert judgement). The position paper acknowledged that there is no single definition of LIBOR – rather, participants refer to it based on a variety of factors, including its name (London Interbank Offered Rate); the question asked of submitters[8]; and market practice for bank unsecured funding activity. IBA notes that LIBOR elements should be more explicitly documented so that the methodology, processes, fall-backs and other practices are more transparent to stakeholders.

The principal objective is to create a single, clear, comprehensive and robust LIBOR framework while seeking to implement a methodology that can further anchor its rate in transactions.

To achieve this, IBA's position paper considers a number of enhancements to the LIBOR definition and submission process, the method of calculation and the composition of the LIBOR panels for all currencies and tenors:

- *Adopting a waterfall approach to submissions based on transactions.* LIBOR would evolve to a rate generated from observable market transactions to the greatest extent possible, and calculated from submissions derived from transactions executed by banks in the wholesale unsecured market. This would follow a waterfall methodology when there are insufficient transactions.
- *Eligible transactions.* Submitters' unsecured wholesale funding deposits, Commercial Paper (CP) and primary issuance Certificates of Deposit (CD) would be directly included as an input to the LIBOR submission with other transactions such as overnight indexed swaps (OIS), repurchase agreements, or floating rate notes included only when necessary to support expert judgement. Historical transactions and inter/extrapolation would be used when (i) a benchmark submitter has no available transactions for a particular tenor but it does have transaction-derived anchor points for other tenors of that currency, and (ii) if the submitter's aggregate volume of eligible transactions is less than a minimum level specified by IBA.
- *Location of funding centres*. Eligible transactions booked in submitters' primary funding centres would be used by benchmark submitters, as agreed bilaterally with the benchmark administrator.
- *Expand counterparties for unsecured funding*. All wholesale entities would be regarded as eligible counterparty types, to reflect changes in bank funding in recent years.
- *Timing of transactions.* Benchmark submitters would include all of their eligible transactions within a pre-determined window – potentially with weightings – anchoring the benchmark as far as possible in transactions.

---

7 IBA (2014), *Position Paper on the Evolution of ICE LIBOR*, 20 October; available at: https://www.theice.com/publicdocs/ICE_LIBOR_Position_Paper.pdf.

8 LIBOR question: "*At what rate could you borrow funds, were you to do so by asking for and then accepting interbank offers in a reasonable market size just prior to 11 am London time?*" See the IBA website for further details: https://www.theice.com/iba/libor#/calculating.

- *LIBOR calculation.* IBA is evaluating alternatives to the 'topping and tailing' methods of the calculation process, as well as the potential for a complete change from the trimmed arithmetic mean calculation method currently used.
- *Panel composition.* IBA sees expansion of the existing currency panels as important for collating more transactions and envisages an approach under which some banks would provide only transaction data.

Market transition to LIBOR+

In working toward changes to LIBOR, IBA is considering a variety of different risks and potential mitigants, such as those highlighted in the FSB MPG report. IBA has proposed to evolve the current waterfall approach to submissions, with the intention of further addressing the risk of low transaction volumes.

IBA intends for the feedback it gathers from the submitting banks, LIBOR users and other stakeholders to inform the evolution to LIBOR+, helping to minimise potential litigation risks. IBA published a feedback statement[9] on the position paper on 1 May 2015, inviting further comments on their proposals. In addition to the position paper, IBA issued a questionnaire[10] seeking to establish the frequency of use of each tenor and currency and the importance placed on each rate by a majority of market participants. Responses indicated that all LIBOR currencies and tenors are currently utilised extensively for a variety of purposes – valuations, loan pricing, derivatives and swaps pricing, re-settling floating rate instruments and accounting. On this basis, IBA does not plan to discontinue any LIBOR currency or tenor.

IBA expects to publish a further consultation paper in Q3 2015, seeking feedback on more detailed aspects of their proposals, thereby meeting the FSB recommendation that the administrator publically consult on any changes to the benchmark before end 2015.

The scale of the reforms to be implemented is not yet known as IBA has not yet formulated an implementation plan. Depending on the results of the next stage of consultation, IBA may choose to take forward some of the proposals discussed in the October 2014 position paper.

Stakeholder engagement and consultation

IBA has engaged directly with stakeholders through a series of roundtable events in each of the key jurisdictions for the LIBOR currencies to further inform the next consultation phase. These meetings, hosted by the relevant central banks, were aimed at gathering feedback from the key LIBOR user groups[11] and focused on the major topics addressed by the October 2014 position paper.

International cooperation

As LIBOR is widely used and published in five currencies, there is a need for international cooperation. The UK Financial Conduct Authority (FCA) has received strong support from all

---

[9] IBA (2015), *Evolution of ICE LIBOR Feedback Statement*, 1 May; available at: https://www.theice.com/publicdocs/futures/IBA_LIBOR_Feedback_Evolution_Statement.pdf.

[10] IBA (2014), Usage of ICE LIBOR Questionnaire; available at: https://www.theice.com/publicdocs/Usage_of_ICE_LIBOR_Questionnaire.pdf.

[11] These user groups included pension funds, investment managers, money market managers, corporates, etc.

the authorities in the currency groups. Following the publication of the FSB report, European, Japanese, Swiss, UK and US authorities met to determine the common first steps in the evolution of LIBOR to LIBOR+. Subsequently, the authorities met with IBA to encourage implementation of the FSB's recommendations. Cooperation between IBA, the FCA, as LIBOR supervisor, and other relevant international authorities is on-going. In particular, representatives of the Bank of England, Swiss National Bank and US Federal Reserve Board sit as observers on the IBA Oversight Committee.

Regulatory environment for benchmarks

LIBOR has been a regulated benchmark in the UK since April 2013. Following the recommendations of the Wheatley Review to reform LIBOR, the UK government brought LIBOR administration and submission activities within the scope of statutory regulation by inserting provisions into the UK Financial Services Market Act 2012 (FSMA) to allow the regulation of activities in relation to benchmarks and subject manipulation of benchmarks to criminal sanctions. The Treasury amended the Regulated Activities Order to make the administering of, and providing information to, "specified benchmarks" regulated activities under FSMA.

The administrator of LIBOR and the 20 submitting banks are now subject to direct oversight by the FCA, in accordance with the FCA Handbook rules. At a submitter and administrator level, these rules include: administrator governance and oversight procedures; accountable persons for submitting and administering LIBOR; systems and controls to compile and monitor LIBOR submissions; and a submitter Code of Conduct. Other recommendations have also been implemented – most importantly, the change in administrator from the British Bankers Association (BBA) to IBA as of February 2014 and the discontinuation of LIBOR currencies and tenors in 2013.

While these rules currently govern benchmark setting activities in the UK, they will soon be replaced by a pan-European Regulation for indices used as benchmarks in financial instruments and financial contracts. As discussed in the context of EURIBOR (see section 2.2), a draft proposal for a Benchmarks Regulation is under negotiation in the European institutions and, once finalised, will apply directly to all EU member states.

2.4 TIBOR

The TIBOR administrator, JBATA, is working to reform TIBOR following the timeline set out in the FSB report:

- JBATA is cooperating closely with the members of the MPG as well as the Japan Financial Services Agency (JFSA) and BOJ for the reform of TIBOR.
- Following the discussions with reference banks, JBATA released a first consultation paper for TIBOR reform in December 2014. JBATA will conduct data analysis, complete the feasibility study, and release a second consultation in coming months.

Data

JBATA, in cooperation with the BOJ and JFSA, has continued to collect and analyse transaction data in the underlying market of TIBOR and of related markets. Data collection is being conducted on an ongoing basis, with the collection including unsecured wholesale transactions by 17 TIBOR reference banks, such as unsecured call market transactions, Euroyen market transactions, CP, CD (both financial and non-financial corporates) and wholesale deposits (both financial and non-financial corporates).

JBATA will conduct further analysis of additional data on actual transactions and will further consider to what extent the calculation could be based on actual transactions.

Change to methodologies

The collection and analysis of data on actual transactions suggest that while transactions in the unsecured call market are quite limited for tenors over six months, sizable transactions exist for the euro yen, CD, and wholesale deposits for tenors up to twelve months, although to varying degrees.

Actual transactions data available would be relatively small for certain tenors (e.g. 12-month) even if the scope of markets is expanded, or the distinction between Japanese yen and Euroyen TIBOR rates is eliminated as a result of the expansion of the scopes of the underlying markets.

Following the discussions with stakeholders, the first consultation paper asks TIBOR users and others for comments on the approaches for the reform, which include (i) increased reliance on actual transactions and (ii) review of calculation methods, as well as (iii) expected challenges in the transition.

Specifically, it presents two approaches or a combination of the two:

1. Expand the scope of the underlying markets to include not only interbank but also wholesale markets, and to determine the rates based on transaction data of expanded underlying markets.
2. Maintain the concept of treating the interbank markets as the underlying market, and consider wholesale markets as “relevant markets.” The rates will be calculated taking a waterfall approach: they are generated primarily from actual transactions in the underlying market, secondly from actual transactions in the related markets, thirdly from committed quotes, and then from indicative quotes.

JBATA and reference banks will choose an approach from the above in the second consultation paper, taking into consideration the most appropriate and feasible TIBOR+ methodologies for increasing reliance on actual transactions.

In addition, the first consultation paper asked about discontinuation of certain tenors for TIBOR and for all of Euroyen TIBOR, whose actual transactions data are relatively sparse, and JBATA will decide the plan considering the comments from TIBOR users and others.

Market transition to TIBOR+

If significant changes occur to the current TIBOR as a result of the benchmark reform, the parties to the existing financial transactions referencing the current TIBOR would possibly need to agree to some reasonable contractual modifications and/or to conclude a revised contract or memorandum of understanding.

In addition, in order to minimise such contract frustration, the JBATA is considering the option of a seamless transition (as defined in the FSB’s July 2014 report) through the evolution of TIBOR.

International cooperation & stakeholder engagement

JBATA has informally exchanged views with other IBOR administrators and intends to align any TIBOR reform with international benchmark reform initiatives. To facilitate this international cooperation, JFSA and BOJ have also exchanged views with other authorities. JBATA engages in meetings with stakeholders including reference banks and authorities on a regular basis. In particular, JBATA and reference banks together have discussed the framework of reform in detail and make plans for the preliminary data collection and analysis, cooperating with both BOJ and JFSA. JBATA also engaged in bilateral meetings with non-financial corporates and non-bank financial institutions for the outreach.

Regulatory environment for benchmarks

The Financial Instruments and Exchange Act was amended in May 2014, which provides for a legal framework for the regulation and supervision of important benchmarks (specified financial benchmarks), and for their administrators to become designated benchmark administrators. These amendments came into effect in May 2015, immediately after which the JBATA was designated. Designated financial benchmark administrators are required to formulate and comply with operational rules, containing items in line with the IOSCO Principles, and to establish and conclude the "Submitter Code of Conduct" with submitters to impose a discipline on submitters. The act and relevant rules also establish an inspection/supervision framework for designated administrators and related entities.

2.5 Developments in other markets

In addition to the five currency subgroups formed by the OSSG to consider and make recommendations regarding the feasibility and viability of the reformed and alternative benchmark rates within each home currency area, a global currency subgroup was also formed and asked to consider steps other jurisdictions could take to promote an orderly transition to alternative benchmarks proposed by the currency subgroups.

Since the publication of the FSB report in July 2014, some members of the global subgroup have taken steps towards reforming the existing rates in their own markets.

2.5.1 Australia

The primary credit reference rate in Australia, the bank bill swap rate (BBSW), has been calculated since September 2013, using executable quotes in the bank bill/CD market directly from trading platforms rather than via a survey of market participants. This rate is administered by the Australian Financial Markets Association (AFMA), an industry body.

Whether BBSW (and other benchmarks) needs to be regulated is currently under review in Australia.

In July 2015, the Australian Securities and Investments Commission (ASIC) released a report on financial benchmarks[12], highlighting the importance of financial benchmarks in the Australian economy and the consequences if benchmarks are not robust and reliable. The report sets out in detail a number of regulatory reforms and other responses that have occurred

[12] ASIC (2015), *Financial Benchmarks*, Report 440, 8 July; available at: http://download.asic.gov.au/media/3285136/rep440-published-8-july-2015.pdf

both internationally and in Australia in response to concerns about the reliability and robustness of benchmarks. The report also makes a number of forward-looking recommendations that market participants should adopt to avoid conduct issues in relation to benchmarks.

2.5.2 Canada

Thomson Reuters was appointed the administrator for the two key Canadian interest rate benchmarks at the end of December 2014, including for the Canadian IBOR equivalent, Canadian Dollar Offered Rate (CDOR). Thomson Reuters has been working since then with industry and in consultation with the Canadian authorities to establish an IOSCO-compliant administrator for these benchmarks. CDOR is a survey-based measure reflecting the bid-side rates of the primary Banker's Acceptance (BA) market. The submitted bids represent the committed rate at which the submitting bank would be willing to lend (offer) funds for specific terms-to-maturity against primary BA market issuance to clients with existing credit facilities that reference CDOR. The seven CDOR panel members issue BAs daily and account for close to 99% of the outstanding BAs.

Six Canadian provincial and territorial governments and the Canadian federal government are establishing a Cooperative Capital Markets Regulatory System that would create a common regulator. Consultation drafts of a uniform capital markets act and federal capital markets legislation were published for comment in September 2014. The federal capital markets legislation will empower the common regulator to collect data and manage systemic risk related to capital markets on a national basis. The regulator will have the power to designate a financial benchmark as systemically important and issue regulations that may prescribe requirements, prohibitions and restrictions respecting the benchmark, including regulations applying to the administrator of the benchmark.

2.5.3 Hong Kong

The Hong Kong Interbank Offered Rate (HIBOR) is the interest rate benchmark of Hong Kong. It seeks to measure the "estimated borrowing cost of prime banks in the Hong Kong interbank market" for Hong Kong dollar (HKD) and offshore renminbi (CNH) in eight tenors (i.e. overnight; 1- and 2-week; 1-, 2-, 3-, 6- and 12-month). HIBOR is currently calculated based on expert-judgement based contributions collected from the contributing banks.[13] The Hong Kong Treasury Markets Association (TMA) is the administrator of HIBOR.

The HKMA has been working with the administrator of HIBOR to review the extent of reforming Hong Kong's interest rate benchmarks along the OSSG recommendations through stakeholder engagement, data collection and market consultations.

The HKMA has conducted a special survey to collect transaction-level data on relevant interest rate transactions from all Hong Kong's Authorized Institutions (i.e. licensed banks, restricted licence banks and deposit-taking companies) to analyse whether and how it would be possible to reform HIBOR into a rate based on actual transactions and the appropriate

[13] HKD HIBOR and CNH HIBOR are calculated from contributions from 20 and 16 banks, respectively. Active players in the respective markets, as identified based on objective and quantitative criteria endorsed by the HKMA, are appointed annually to serve as HIBOR contributing banks. The criteria take into account banks' relevant assets, activities in the interest rate market, and other relevant factors.

calculation methodologies. The HKMA has proceeded to data analysis. The findings and any possible changes will then be summarised for market consultation. In collecting relevant interest rate transactions, HKMA is mindful that it may be necessary to widen the definition of HIBOR to one that measures the "wholesale funding cost of a panel of banks" and to expand the panel.

The current regulatory environment for benchmarks is a result of the HIBOR Review conducted by the TMA in 2012 which recommended a five-pronged approach to improve the transparency and robustness of the HIBOR fixing mechanism. These recommendations, endorsed by HKMA, were fully implemented by the first half of 2014. They include: (i) the transfer to a new administrator (TMA); (ii) the review of the composition of panel banks every 12 months; (iii) the phasing out of fixings with little market demand (i.e. 4-, 5-, 7-, 8-, 9-, 10- and 11-month); (iv) the development of a Code of Conduct through a statutory guideline; and (v) an effective surveillance and governance structure for the administrator function. Consideration may also be given in future to the adoption of a "waterfall" approach and to phasing out additional tenors. The HKMA and the TMA will consult the market on such issues as appropriate.

2.5.4 Mexico

Mexico's main reference rate is the 28-day Equilibrium Interbank Interest Rate (TIIE). 28-day TIIE is a rate calculated by Banco de México and aims at reflecting prevailing funding conditions in the local money market. To calculate TIIE, Banco de México randomly picks every day at least six financial institutions from the pool of participating banks. Chosen banks are required to submit a bid consisting of an interest rate and a sum of money, which must be an integer multiple of a previously determined base amount. Banco de México uses the bids to construct supply and demand curves representing the combinations of rates and amounts of money at which banks are willing to grant loans or receive deposits, respectively. When demand and supply curves intersect, the TIIE is the midpoint of rates quoted at the intersection. Otherwise it is calculated as the average of active and passive rates at the point where distance is shortest between demand and supply schedules.

The volume of observable transactions in the 28-day interbank market is small: 1.2% of the total interbank market. Market participants have been approached to work in the development of the 28-day TIIE market. However a move to an IBOR+ through the use of observable transactions for calculation will not take place until the market has developed.

Banco de México carried out a study to determine the alignment of the TIIE to the IOSCO Principles and will work in the short and medium term to fulfil most of the Principles.

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 – 1-month, 3-months, 6-months and 12-months.

In 2014, the Singapore Foreign Exchange Market Committee (SFEMC) completed a study that identified preliminary options for a SIBOR+. The SFEMC is now conducting a deeper review to assess the feasibility of moving towards a transaction-based SIBOR+, by undertaking a data-collection exercise for key SGD instruments which serve as sources of funds for banks.

Concurrently, the Monetary Authority of Singapore (MAS) has consulted on draft legislation for the regulation of financial benchmarks in Singapore, in line with the IOSCO Principles, and is in the process of finalising the necessary legislation. 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.[14]

2.5.6 South Africa

The Johannesburg Interbank Average Rate (JIBAR) represents the domestic equivalent of IBOR+. A JIBAR Code of Conduct was implemented in 2012 and revised in 2013. The key change was to move the JIBAR from a 'point in time' submission-based process to a market where the Code of Conduct governs pre-trade price transparency for the entire trading day and JIBAR is then calculated using data harvested from the JIBAR-contributing bank's Reuters and/or Bloomberg screens during a 30 minute window period. There is also a requirement to appropriately reflect on screen all trades executed in volumes governed by the Code of Conduct, which is then validated the following day.

The effectiveness and relevance of JIBAR as the key reference rate, as well as the JIBAR Code of Conduct, are evaluated on a continuous basis. A revision to the Code that addresses gaps with the IOSCO-principles will be implemented in 2015. The South African Reserve Bank has started a process to collect data from the JIBAR-contributing banks on funding through instruments that are outside the current JIBAR universe. The objective of this research is to evaluate the relevance of JIBAR in its current format, to gauge the impact of regulatory changes on bank funding behaviour, and to consider changes to enhance the credibility of JIBAR. These data will also include the size of contracts that reset against JIBAR. The lack of readily available data to perform this analysis reflects the need to enhance transparency in the money markets, including the overnight deposit market. Finding a solution to this challenge will enable a revision of the calculation and verification process for the South African Benchmark Overnight Rate (SABAR). The key challenge in reforming domestic reference rates is finding a technological solution to enhancing overall market transparency, something that is unlikely to be resolved in the short term.

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

3. Developments in Risk-free Rate Benchmarks

3.1 Overview

FSB members have made concrete progress in identifying potential RFRs, following up on the work begun in the FSB report and the report of the OSSG's MPG. Although euro-area authorities already consider EONIA to be a viable RFR, they are also working with market participants to develop a new RFR based on general collateral (GC) repo markets. Japanese and Swiss authorities have conducted a survey of money market activity in their jurisdictions; in Japan a range of options for an RFR are being explored, including the uncollateralised overnight call rate, GC repo rate, and the OIS rate. UK and US authorities have both convened working groups comprised of the largest broker dealers in their currencies to identify potential alternative RFRs and to develop implementation plans to promote their use. As with developments in IBOR+ rates, several other OSSG members have also been working with the industry to develop RFRs in their respective currencies. As work on developing RFRs proceeds, an issue that several authorities are considering is how to facilitate the availability of RFRs at terms longer than overnight; Box A at the end of this chapter discusses this in more detail. Looking forward, some consideration might also be given to the merits of coordinating the development of RFRs (and term markets based on them) across the major currencies to facilitate cross-currency transactions such as FX swaps.

3.2 US dollar

With the support of a number of agencies including the US Treasury, Commodities Futures Trading Commission, and the Office of Financial Research, the Federal Reserve Board and Federal Reserve Bank of New York convened a committee of market participants, known as the Alternative Reference Rates Committee (ARRC).[15] The ARRC consists of representatives from 15 large global interest rate derivatives dealers; the Federal Reserve and the US Treasury are participating as *ex officio* members. The ARRC was set up in November 2014 at a meeting attended by central banks and regulators from the euro area, Japan, Switzerland and the UK. The group was charged with developing a plan to identify one or more alternative risk-free or nearly risk-free US dollar reference rates that both fits the needs of the market and meet IOSCO standards. More specifically, the ARRC has four objectives:

- *Identify best practices for alternative reference rates and identify rates that meet those practices*. The ARRC will consider the range of existing and potential reference interest rates and identify a risk-free rate or rates that in the consensus view of the Working Group would represent best practice for use in certain new derivatives and other contracts;
- *Identify best practices for contract robustness*. The ARRC will consider the best practices related to robust contract design that ensure that contracts are resilient to the possible cessation or material alteration of an existing or new benchmark
- *Develop an adoption plan*. The ARRC will identify the factors that would either facilitate or impede the adoption of the alternative rates identified as consistent with

[15] More information on the ARRC is available at: http://www.newyorkfed.org/arrc/.

best practices or the adoption of best practices related to robust contract design. In both cases, the Working Group will identify the necessary steps that the official sector and market participants could take to make the adoption more successful.

- *Create an implementation plan with metrics of success and a timeline*. The Working Group will identify observable metrics that reflect the successful adoption of the best practices and the alternative reference rates that are consistent with those best practices, and how participating firms will work to achieve these best practices over time. The Working Group's recommendations will also include an expected timeline and clear measures of success for the implementation.

The ARRC has been meeting regularly to work toward these objectives, with a timeline consistent with the time frames set out in the FSB Report.

After initial discussions, the ARRC has preliminarily centred its focus on two potential types of alternative rates: (i) one type based on overnight bank unsecured borrowing, which would still contain a credit component although this would be limited by the short maturity of borrowing; and (ii) the other type based on secured borrowing such as GC repo rates. In addition to its work with the ARRC, the Federal Reserve has been meeting with a wide range of market participants, including end-users, corporations, clearing houses, and exchanges to ensure that the development of the risk-free alternative meets their needs. With regards to the use of any new benchmark, the Federal Reserve has contacted FASB and had initial conversations about the possible inclusion of other reference rates for inclusion in FASB's hedge accounting rules.

The Federal Reserve has used data obtained as part of the FR 2420 data collection[16] to examine whether a robust US dollar rate could be created using rates on unsecured bank borrowing transactions collected directly from a wide set of depository institutions. Federal Reserve staff members have conducted preliminary analysis of these data, and were encouraged by the number of transactions in overnight tenors. The analysis also indicated some areas for improvement in the collection, and revisions were proposed in the Federal Register in April 2015. The Federal Reserve Bank of New York has announced that it intends to publish an Overnight Bank Funding Rate (OBFR), after the revisions are complete, which will be calculated based on federal funds and Eurodollar transactions-level data sourced from this data collection.[17]

3.3 Euro

As discussed in the July 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. Furthermore, this rate is being strengthened by the European authorities and its administrator EMMI. EONIA has been published by EMMI since 1999 and is directly anchored in the cash (unsecured deposit) market being based on transactions from a

---

[16] Federal Register notice on the FR 2420 data collection exercise, 7 April 2015; available at: https://www.federalregister.gov/articles/2015/04/07/2015-07920/proposed-agency-information-collection-activities-comment-request.

[17] FRBNY notice "Statement Regarding Planned Changes to the Calculation of the Federal Funds Effective Rate and the Publication of an Overnight Bank Funding Rate", 2 February 2015; available at: http://www.newyorkfed.org/markets/opolicy/operating_policy_150202.html.

panel representing a wide range of banks across the euro area. Derivatives markets based on EONIA already exist and are widely used.

European authorities and market participants are also considering the development of other potential reference rates. In 2013, 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) in line with regulatory recommendations. At the end of 2014, the Joint Task Force concluded that a transaction-based repo benchmark was achievable and agreed to embark on a development program to bring a New Repo Index, possibly in the context of a broader EMMI secured benchmark family, to the market by the end of 2015 or early 2016. The Joint Task Force is currently 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.

On 25 November, 2014, the Joint Task Force held a meeting with potential project partners consisting of automated trading systems (ATS), clearing houses, and existing index providers covering the European repo market. The meeting concluded with a high-level agreement to the New Repo Index project from these potential partners. As underlying market data, the Joint Task Force is currently envisaging the use of euro repo transactions executed on-screen on European ATSs and cleared through qualified central counterparties (QCCP), made against ECB-eligible collateral, either in the form of GC baskets or individual securities. EMMI is soliciting the involved ATS platforms to provide their data in order to conduct an analysis of the broad data pool. The Joint Task Force will appoint academic experts to conduct the data analysis.

The project for the development of the New Repo Index is still in an early phase and the final benchmark design has not yet been agreed in order to actively promote transition to it. As regards infrastructure and implementation, EMMI intends to conduct a tendering process for the role of the Calculation Agent for the New Repo Index, which will require the allocation of a sufficient period of time. However, development of some aspects of the benchmark infrastructure and logistics may commence before the Calculation Agent has been nominated.

3.4 Japanese yen

In mid-2014 the BOJ conducted the Tokyo Money Market Survey, collecting data across Japanese money markets. The survey included 296 participants and covered most of the entities active in Japanese money markets, including major and regional banks, securities companies, insurance companies, asset management companies, and money market brokers. The results of the Survey were published in October 2014, including the analysis of recent developments in potential RFR markets (i.e. uncollateralised and collateralised call, GC repo, OIS and treasury discount bill markets).

The result of the survey shows that the outstanding amount of uncollateralised call transactions increased from 10 trillion yen in July 2011 to 15 trillion yen in July 2014. The BOJ collects data on transactions in the uncollateralised call market for monetary policy purposes and publishes Uncollateralised Overnight Call Rate on a daily basis. The rate is purely based on actual transactions.

The repo market has grown to be the largest segment in the Japanese money market in terms of transactions volume. Nevertheless, further clarifications for the benchmark design are needed, and there are on-going structural changes in the Yen money market that must be taken into consideration. The structure of the GC repo market is expected to change with shortening of the JGB settlement cycle from T+2 to T+1 that is planned to take place in 2018 in Japan. With this transition, settlement in GC repo markets would shift from T+1 to T+0, necessitating a new market infrastructure to enable swift and efficient transactions.

Developments are generally in line with the schedule presented in the FSB's July 2014 report. The BOJ and JFSA organised the Study Group on Risk-Free Reference Rates, in order to facilitate the identification of potential RFR designs and administrators. The Study Group consists of representatives from 12 financial institutions and ISDA, Japan Bankers Association (JBA) and Japan Securities Dealers Association (JSDA) as members, and representatives from the BOJ and JFSA as observers. The first meeting of the group was held in April 2015. The Study Group has been meeting on a monthly basis in order to meet the time frames set out in the FSB Report.

In the initial discussions of the Study Group, an analysis of data on actual transactions supported some narrowing in the range of candidates for RFRs, with the focus of discussions centring on the uncollateralised overnight call rate, the GC repo rate, and the OIS rate. However, members also noted that, in identifying RFRs, it is important to discuss how these rates would actually be used.

3.5 Sterling

The July 2014 OSSG Report identified two candidate RFRs for sterling markets: the Bank Rate, the Bank of England's main policy rate; and SONIA, a reference rate compiled by the Wholesale Market Brokers' Association (WMBA) based on brokered sterling unsecured overnight transactions. The Bank of England has constituted a Working Group on Sterling Risk-Free Reference Rates to take forward the selection and implementation of a RFR for sterling markets.

The Working Group, which met for the first time in March 2015, is comprised of senior subject matter experts from major sterling swap dealers, along with ISDA and representatives from the Bank of England and FCA participating as *ex officio* members. The group is expected to:

- Identify best practices for alternative sterling RFRs. The Working Group will consider the relative merits of the two sterling rates recommended by the FSB OSSG and MPG (and other potential alternatives, including a benchmark based on secured overnight transactions) and identify an RFR which would represent best practice for use in certain new derivative and other contracts.
- Identify best practices for contract robustness. The Working Group will consider best practices related to robust contract design that ensure that contracts are resilient to the possible cessation or material alteration of an existing or new benchmark.
- Propose reforms for existing sterling RFRs. The Working Group will propose any reforms which may be required in order that the chosen RFR conforms to best practice.

- Develop an adoption plan. The Working Group will consider the factors that could facilitate adoption of the chosen RFR or the adoption of best practices for contract robustness amongst a broad group of market participants, including end-users.
- Create an implementation plan with metrics of success and a timeline. The Working Group will identify observable metrics that reflect the successful adoption of a best practice RFR and best practice contract design. It is anticipated that firms participating in the Working Group will sign letters of agreement to support adoption of the chosen RFR, referencing these metrics.

According to the indicative timetable for the Working Group (and consistent with the FSB timeline) it will reach a consensus and make a recommendation on the best sterling near risk-free reference rate by the end of Q3 2015. Following an initial round of analysis, the Working Group is now focusing on the relative merits of improved benchmarks based upon unsecured or secured overnight transactions; Bank Rate will continue to be considered, although primarily as a potential fall-back rate. The date by which an IOSCO compliant benchmark will be in place will depend on the necessary RFR development work identified by the Working Group. At the least, we anticipate that development of the chosen RFR benchmark will be underway before Q2 2016, with a clear plan for completion in 2016.

In a separate initiative, the Bank of England has launched an exercise to begin collecting data on overnight deposit transactions directly from banks and building societies active in sterling money markets. That in part reflects concerns about falling transactions volumes in the existing SONIA benchmark, and the resulting need for a more secure and broad-based source of transactions data to support a robust overnight benchmark interest rate in sterling markets. We believe that the data we plan to collect should, in time, play an important part in providing firmer foundations for the SONIA benchmark. This initiative provides important context for the Working Group's thinking.

More broadly, there is a clear need for substantial improvements in the systems and governance around both SONIA and its secured sister rate, RONIA. That has recently been formalised as SONIA and RONIA have come under regulation by the FCA (from 1 April 2015). Following a recommendation from the UK's Fair and Effective Markets Review, the UK government has broadened the regulatory perimeter to seven "specified benchmarks" (in addition to LIBOR) in the foreign exchange, fixed income and commodity markets.[18] In light of this expansion of UK regulation to SONIA, RONIA and five other benchmarks, the FCA has changed some of the rules applicable to specified benchmarks – most notably to account for those that are not determined based on submissions but rather on publicly available data. The main purpose of the changes is to ensure that the additional benchmarks are subject to governance and conflicts of interest requirements similar to those applicable to LIBOR, which was the only specified benchmark prior to April 2015.

[18] The benchmarks brought into scope are: SONIA; RONIA; ICE Swap Rate (formerly known as ISDAFIX); WM/Reuters London 4pm Closing Spot Rate; LBMA Gold Price; LBMA Silver Price; and ICE Brent Index. For further information see: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/389479/FEMR_recommendations_on_financial_benchmarks_response_final.pdf.

3.6 Swiss franc

In furtherance of its reform efforts, the SNB conducted a data survey in mid-2014. The survey aimed to assess the feasibility of implementing the MPG's proposals and to identify reasonable reform initiatives relating to CHF reference interest rates. This survey furthered the impression that the Swiss Reference Rates (SRR), which are based on the CHF repo market, and the TOIS fixing, a tomorrow/next unsecured rate, are the principal RFRs in the Swiss franc currency area.

The National Working Group (NWG) is the key forum for reform proposals of such rates in Switzerland. The NWG was founded in 2013 and has since been guiding the reform process relating to CHF reference interest rates. Members include representatives of domestic and foreign banks, and specialists from other sectors of the finance industry and the Swiss Financial Market Supervisory Authority (FINMA) are also invited to attend. The SNB facilitates meetings in conjunction with a market representative, and participants use the forum to inform each other and discuss the latest international and national developments.

Market participants have expressed a clear preference to maintain CHF Libor, and Swiss authorities cannot prohibit the use of benchmarks. However, alternative reference interest rates and associated transitions are being debated in the NWG meetings. A sub-working group is being established, and is tasked to: (i) evaluate whether the TOIS fixing is viable, and the preferred choice in the long run; (ii) identify or develop alternative reference rates which would represent best practice for use in certain derivative contracts; and (iii) identify necessary reforms in order to strengthen SRR. If CHF Libor cannot be reformed successfully, a transition task force consisting of NWG members, other benchmark users, industry bodies and authorities will be established.

In H2 2014, a new governance framework for the TOIS fixing was implemented, defining more precisely the tasks and roles of the Administrator, the Panel Banks and the Calculation Agent. Furthermore, the (submission and) calculation methodology was modified. A Review Committee was also founded and a first meeting took place in February 2015. No adjustments are currently being contemplated for the SRR, which are based on repo transactions concluded in the interbank market as well as on indicative quotes posted on a trading platform. These reference rates are based on CHF, where SARON represents the overnight segment.

3.7 Australian dollar

The Reserve Bank of Australia (RBA) is working with AFMA and ASIC, to develop a risk-free benchmark. Using OIS would allow a term RFR but raises issues around construction of a robust benchmark. An alternative realised rate-based synthetic term reference rate, based on *ex post* compounding of the overnight cash rate (which already exists as a robust overnight RFR), does not raise these issues but it is unclear if it would be as useful to market participants. Progress on this is occurring with the aim to have such a benchmark operational by Q2 2016. Once a risk-free benchmark is operational, the RBA will work with market participants, AFMA and ASIC to coordinate a transition towards referencing such a rate, rather than a credit rate, where appropriate. The market has demonstrated a general willingness to participate in this process.

3.8 Canadian dollar

The Canadian RFR benchmark is the Canadian Overnight Repo Rate Average (CORRA), and it has been published since 1997. CORRA is a purely transaction based measure calculated from overnight GC repo trades through designated inter-dealer brokers, and is reported on a following day basis. An OIS market based on CORRA has existed in Canada since the late 1990s, and CORRA has also been used as the floating leg reference rate on a recently issued Floating Rate Note.

Thomson Reuters was appointed the administrator for CORRA (and CDOR) at the end of December 2014 and took over the calculation and publication of the CORRA rate from the Bank of Canada at the end of March 2015.

3.9 Hong Kong dollar

The HKMA has completed a special survey in collecting transaction-level details of the following interest rate transactions from all Hong Kong's Authorized Institutions (i.e. licensed banks, restricted licence banks and deposit-taking companies):

- GC repos;
- public debt papers; and
- OIS.

The HKMA is now analysing the collected data to study the potential for a RFR. The analysis will draw reference from the reform work outlined in FSB reports in this area. Consideration will be given to adopting the same administration arrangements as used for HIBOR (or the future HIBOR+), as they are considered to be effective and broadly comply with the relevant international requirements.

Market engagement has identified market acceptance as the largest risk to transition. The HKMA and the TMA will encourage the market players to transit to RFR-based contracts as appropriate and will also coordinate relevant contract negotiations if situation so required. For some uses, banks may prefer not to move to RFR-based, as doing so may result in higher basis risks for their relevant activities.

3.10 Mexican peso

Banco de México efforts are concentrated in IBOR+ and they do not have plans to work on RFR rates in the short term. However they are considering changing the rule governing the operations of banks so they can use the central bank's target rate as a reference in their liabilities operations.

There are a couple of RFRs that are currently used as reference rates by the public. However, the number of transactions and assets linked to them do not compare with those linked to the 28-day TIIE. The first rate is the 28-day Treasury bill rate, which is the rate paid on large deposits and was the main reference for the market and the public before the introduction of the 28-day TIIE. The other RFR is the central bank's target rate which is currently used as a reference for some government securities.

3.11 Singapore dollar

The data collection exercise of the SFEMC (see section 2.5.5) to examine the liquidity of underlying Singapore dollar (SGD) money markets and related market transactions will help the committee to assess the feasibility of moving towards a RFR. Although initial data collected indicates that liquidity in the overnight tenor could support a (near) risk-free benchmark, further analysis and consultation on design, methodology and transition will be necessary, before any change is implemented.

3.12 South African rand

Research into the creation of a RFR for the South African rand is on-going. The lack of a liquid secondary market in South African Treasury bills currently limits the available options. It may be possible to use the government bond repo market, though the liquidity in this market is concentrated in very short tenors.

Box A: Overnight and Term Risk-free Reference Rates

Introduction

A fundamental issue in the successful development of alternative (near) RFRs is that, while most borrowing in the relevant markets is very short-term (largely overnight in many jurisdictions), market participants have historically also used interest rate reference rates with longer tenors. Market participants therefore may also prefer longer tenors in RFRs, for reasons such as: (i) ease of interest payment calculations; (ii) to lock in future interest payments for cash flow management purposes; and (iii) to manage interest rate duration. This box outlines potential ways to build off transactions in the overnight cash market to create a "term risk-free reference rate" that might be useful for the broader adoption of robust RFRs.

Creating a term rate

As described in Section 3 of this report, there is a range of potential (near) RFRs, including both secured and unsecured options. Data from many jurisdictions suggest there are sufficient transactions in the overnight market to support the creation of a robust "overnight risk-free reference rate"; e.g. a volume-weighted average of daily transactions in the relevant cash market.[19] Financial contracts could then be tied directly to this overnight rate, as is currently the case with certain OIS, futures contracts and floating rate notes.

Derivatives markets (such as OIS or futures contracts) referencing a new near risk-free overnight reference rate might be expected to develop in order to hedge interest rate risks. Discussions with market participants and the findings of the MPG published in July 2014 suggest that the development of derivatives markets based on overnight rates is necessary to create a viable alternative to the IBORs. In this case, the overnight reference rate would be the "underlying rate" for a derivatives or futures market.

As noted above, market participants may also desire a "term risk-free reference rate" for a range of purposes; e.g. 3-month LIBOR rate is the most widely-used USD rate for a variety of floating rate loans and bonds, and there may be demand for a 3-month RFR in some markets.[20] Current market conditions, however, suggest that there are insufficient transactions in the cash market for sovereign or quasi-sovereign borrowers in most jurisdictions to produce a sustainable and robust term RFR exclusively from cash transactions.

Derivatives-based reference rate

The development of a robust derivatives market around the overnight reference rate could allow for the creation of a "derivatives-based term reference rate" that could be used as a term reference rate for other financial contracts.[21] For example, the fixed leg of a term OIS contract over n periods could serve as an n-period term reference rate for other transactions.

[19] A transaction in the cash market is one where cash is borrowed at an agreed-upon interest rate for a specific term.

[20] See, for instance, the MPG report published in conjunction with the FSB's report in July 2014.

[21] Note that the development of a term derivatives market does not necessarily require a term cash market and does not necessarily imply a need for a term reference rate.

The derivatives-based term reference rate could be calculated from daily OIS transactions, or using actionable quotations in a designated window, through a fixing methodology implemented by an administrator. Alternatively, one could impute an n-period term rate from a series of consecutive futures contracts through the period, where the value of each futures contract used to impute the term rate will itself be calculated from underlying transactions in the futures market.[22] In both examples, this type of term rate is calculated exclusively from other market prices, and is distinct from term transactions in the cash market.

Either of these options would be "forward-looking" in the sense that they are set at the beginning of the term period and incorporate expectations for overnight rates over the period. More precisely, an n-period rate is set at time t based on expectations for overnight rates for the period t to $t+n$, where the n periods are the "term" of the derivatives-based rate. Both of these options would also incorporate a term premium to compensate for interest rate uncertainty.

The robustness of this approach would depend on criteria such as the level and concentration of activity of the relevant derivatives market; the FSB's July 2014 benchmarks report concluded that the OIS market is currently not heavily traded for USD, though this may or may not be an issue for markets in other currencies. Where some standardisation of the derivatives-based rate was required by market participants (for instance, in selecting the transactions used in the calculation, and in the calculation methodology), this might require a benchmark administrator.[23] If this derivatives-based term reference rate were to be considered as a benchmark (such as if it was used as a reference rate in other contracts), then the administrator should be subject to the IOSCO Principles.

Realised compound reference rate

A second type of term reference rate could be a compound rate that reflects the realised overnight rates through a given period. Although this is not a forward-looking rate, Duffie and Stein (2015) suggest it as an alternative and refer to this construct as an overnight index rate (OIR).[24] In this case, one could enter a contract at time t to determine payments at time $t+n$ based on the overnight rates realised during the period, so the investors would not know the outcome until time $t+n$.[25] This wait-and-see payment method is familiar to wholesale market participants, and to some retail financial consumers where floating-rate mortgage repayment amounts are reported at the end of the floating-rate period. Alternatively, the floating-rate payment could be set on the basis of the OIR from the previous period. In this case, the borrower's payments would be known in advance, but there would be a mismatch in the period covered by the OIR (i.e. the previous period $t-n$ to t) and the period covered by the

[22] Conceptually, the expected overnight rate implied by the n-period derivatives and futures contracts are similar to expected overnight rates implied by an n-period cash trade, and in this sense a derivatives-based term reference rate is economically equivalent to a cash term reference rate. There are other differences related, for example, to the optionality implied with shorter transactions.

[23] A benchmark for the fixed leg of an OIS contracts would be conceptually similar to the ICE Swap Rate (formerly known as ISDAFIX), a benchmark that represents the interest rate on the fixed leg of interest rate swaps with tenors ranging from 1 to 30 years.

[24] Duffie, Darrell and Jeremy Stein, "Reforming LIBOR and Other Financial Market Benchmarks," Journal of Economic Perspectives, 29(2), Spring 2015, 191-212.

[25] Note that this is the payoff from the floating leg of an OIS contract.

contract (i.e. the forward period t to $t+n$). The lender would likely charge a term premium to compensate for the further interest rate risk incurred in this type of arrangement.

This type of term reference rate based on the realised overnight rate is robust to manipulation due to the small impact of a single day rate and the deep market for the underlying cash overnight rate. In addition, this type of rate would not require the creation of a market to develop a term reference rate as in the derivatives example above. If the market desired this solution, it could be calculated as the compounded overnight rate directly from realised overnight rates. Those rates would not include substantial credit risk due to the overnight nature of the underlying transactions or a term premium, but would include counterparty risk.

Open issues

This box outlines some of the conceptual issues associated with creating a term reference rate that is close to risk-free when there are not sufficient transactions in the cash market to create a term rate directly. This issue is not unique to (near) RFRs and the issue applies equally to other rates if there is a robust overnight market and a smaller term market.

At a practical level, there a number of issues that market participants or industry committees should consider when making recommendations about potential alternative reference rates that are based on overnight transactions:

1. Is there a need for a term risk-free rate in addition to an overnight risk-free rate? For what purposes would the term rate be most suited?
2. Would the potential for a term risk-free rate to meet those purposes depend on whether it was forward-looking or would an OIR concept be sufficient?
3. Could use of a forward-looking term rate for some purposes co-exist with the use of term OIR for other market segments? What are the pros and the cons of a fragmented market?
4. Would the derivatives market be sufficiently robust to be acceptable as the basis for a sustainable forward-looking term reference rate?
5. Is the development of a forward-looking term reference rate essential for the overnight rate to become widely used?

4. OSSG Next Steps

The OSSG will submit a final progress report to the FSB on implementation of the FSB recommendations by July 2016.

- In relation to IBOR+, a key focus of this next report will be to review progress made by administrators in completed their consultations to enhance interbank rates towards more transactions-based rates, and whether these enhancements have been put into effect.
- For RFRs, the next report will review additional steps taken to implement RFRs, particularly with respect to the largest currency markets; a prime goal is to have at least one IOSCO-compliant RFR in effect by the time the next report is published.

This final report will also be informed by a second IOSCO review of steps taken by the EURIBOR, LIBOR and TIBOR administrators to further implement IOSCO's Principles for Financial Benchmarks, following the publication of a first review of this in July 2014. In particular, this second review will seek to identify whether administrators have made progress in addressing the recommended remediation work set out in IOSCO's first review report.

Appendix A – List of Abbreviations and Acronyms

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)
BBA	British Bankers Association
BBSW	Bank Bill Swap Rate (Australia)
BOJ	Bank of Japan
CD	Certificate(s) of Deposit
CDOR	Canadian Dollar Offered Rate
CORRA	Canadian Overnight Repo Rate Average
CP	Commercial paper
ECB	European Central Bank
EMMI	European Money Markets Institute
EONIA	Euro Overnight Index Average
EURIBOR	Euro Interbank Offered Rate
FASB	Financial Accounting Standards Board
FCA	UK Financial Conduct Authority
FINMA	Swiss Financial Market Supervisory Authority
FSB	Financial Stability Board
FSMA	UK Financial Services Market Act 2012
GC	General collateral (in relation to repos)
HIBOR	Hong Kong Interbank Offered Rate
HKMA	Hong Kong Monetary Authority
IBA	ICE Benchmarks Administration Ltd.
IBOR	Interbank Offered Rate – in particular, EURIBOR, LIBOR and TIBOR
IOSCO	International Organization of Securities Commissions
ISDA	International Swaps and Derivatives Association
JBA	Japanese Bankers Association
JBATA	JBA TIBOR Administration
JFSA	Japan Financial Services Agency
JIBAR	Johannesburg Interbank Average Rate
JSDA	Japan Securities Dealers Association
LIBOR	London Interbank Offered Rate
MAS	Monetary Authority of Singapore
MMSR	ECB Money Market Statistical Reporting framework
MPG	Market Participants Group, established by the OSSG
NWG	National Working Group (Switzerland)
OBFR	Overnight Bank Funding Rate (US)

OIR	Overnight index rate
OIS	Overnight Indexed Swap
OSSG	FSB Official Sector Steering Group
QCCP	Qualifying Central Counterparty (EU)
RBA	Reserve Bank of Australia
RFR	(near credit-) Risk-free reference rate
RONIA	Repurchase Overnight Index Average Rate (UK)
SABAR	South African Benchmark Overnight Rate
SARON	Swiss Average Rate Overnight
SFEMC	Singapore Foreign Exchange Market Committee
SIBOR	Singapore Interbank Offered Rate
SNB	Swiss National Bank
SONIA	Sterling Overnight Index Average
SRR	Swiss Reference Rates
TIBOR	Tokyo Interbank Offered Rate
TIIE	Equilibrium Interbank Interest Rate (Mexico)
TMA	Hong Kong Treasury Markets Association
TOIS	TOM/next Indexed Swaps (Switzerland)
WMBA	UK Wholesale Market Brokers' Association

Appendix B – Members of the FSB OSSG Benchmark Group

Co-Chairs	**Jerome Powell** Member Federal Reserve Board of Governors
	Martin Wheatley Chief Executive Officer UK Financial Conduct Authority
Australia	**Guy Debelle** Assistant Governor, Financial Markets Reserve Bank of Australia
Brazil	**Ricardo Moura** Senior Advisor to the Board Central Bank of Brazil
Canada	**Paul Chilcott** Chief, Financial Markets Bank of Canada
Hong Kong	**Howard Lee** Executive Director, Monetary Management Department Hong Kong Monetary Authority
Japan	**Kenji Fujita** Associate Director General, Financial Markets Department Bank of Japan
	Masamichi Kono Vice Minister for International Affairs Financial Services Agency
Mexico	**Rodrigo Cano** Director of Operations Support Banco de México
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
UK	**Chris Salmon** Executive Director, Markets Bank of England

US	**Timothy Massad** Chairman Commodity Futures Trading Commission
	Kevin Stiroh Senior Vice President Federal Reserve Bank of New York
EBA	**Adam Farkas** Executive Director
ECB	**Roberto Schiavi** Deputy Director General, Market Operations
ESMA	**Steffen Kern** Chief Economist and Head of Financial Stability
IOSCO	**Greg Medcraft** Chairman of the Board (Australian Securities and Investments Commission)
FSB Secretariat	**Mark Chambers** **Richard Thorpe**