February 2018

IBOR Global Benchmark Survey 2018 Transition Roadmap

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1. Introduction

The future of IBORs	• Interbank offered rates (IBORs) play a central role in financial markets and act as reference rates to hundreds of trillions of dollars in notional of derivatives and trillions of dollars in bonds, loans, securitizations and deposits • The dependence on IBORs by all sectors of financial markets is changing, however. Driven by benchmark reform initiatives that have recommended reducing the reliance on IBORs, work has been undertaken, or is underway, in multiple jurisdictions to select alternative nearly risk-free rates (alternative RFRs) and to plan for a transition to those rates
Identifying the challenges of transition	• Identifying the challenges of transition is the first step in resolving them. In his speech to the Bank of England roundtable of sterling risk-free reference rates in July 2017, Chris Salmon, executive director, markets at the Bank of England said: "We do not underestimate the complexity of reducing the financial system's LIBOR dependency. We are at the beginning of the process, and at this early stage the challenges are not all clearly in focus. That is why the engagement, help and support of the wider community of users of sterling interest rate benchmarks – issuers, investors, banks, as well as dealers – will be essential. The Working Group needs your help to identify the impediments to transition as you see them – and, equally, to identify where there are opportunities[1]"
IBOR Global Benchmark Transition Roadmap	• The International Swaps and Derivatives Association, Inc. (ISDA), the Association of Financial Markets in Europe (AFME), International Capital Market Association (ICMA), as well as the Securities Industry and Financial Markets Association (SIFMA) and its asset management group (SIFMA AMG) (the "Trade Associations"), have joined together to publish this Roadmap in response to this call to action. By combining their resources the Trade Associations can help the regulators and market participants who are leading the global transition initiatives reach parts of the market which have yet to fully engage in the process • The Roadmap aims to raise awareness of some of the challenges to be solved as part of the transition plan and provide a central resource of information for benchmark transition across market sectors
The need to transition from IBORs to alternative RFRs	• A lack of robustness, due to shrinking underlying markets, in certain key IBORs, coupled with the large volume of financial transactions that references these rates, has resulted in systemic risk concerns • The minimal number of transactions in the unsecured interbank funding market means that submissions by panel banks are largely based upon judgment (as opposed to transactions) • In the face of concerns regarding potential liabilities associated with judgment-based submissions, panel banks have become significantly less willing to submit. The EURIBOR panel of submitting banks, for example, has fallen from 43 to 20 since 2013, and some banks have stopped submitting to LIBOR panels for certain currencies • Andrew Bailey's announcement last year that the UK's Financial Conduct Authority (FCA) would no longer persuade or compel banks to make LIBOR submissions from the end of 2021 has raised concerns about the availability of LIBOR from that date [2, 3]

[1] Source: *The Bank and Benchmark Reform* - speech by Chris Salmon, July 2017.
[2] Source: Andrew Bailey's speech on *The future of LIBOR*, July 2017.
[3] Source: *FCA statement on LIBOR panels*, November 2017.

1. Introduction

Potential benefits of transitioning from IBORs to alternative RFRs	• The alternative RFRs selected for transitions in key jurisdictions are all based on robust, very liquid underlying markets, making them much more reliable. Additionally, they do not require submissions based on expert judgment • In recent years, public-private sector working groups (RFR Working Groups) have determined that alternative RFRs represent a more appropriate benchmark for products and transactions that do not need to incorporate the credit risk premium embedded in the IBORs • Currently, price alignment interest (PAI) for cleared transactions and discounting are typically based on overnight rates, while interest rate derivatives primarily reference IBORs. Alternative RFRs are expected to be used in both instances, which will reduce basis risk
The ideal end state	• A successful transition will have been achieved if the financial market significantly reduces its reliance on IBORs with minimal market disruption
To solutions and beyond	• Importantly, the process of crafting solutions to IBOR transition challenges is already underway. The RFR Working Groups, which have been convened by the official sector but which are market-led, have recently begun the process of re-launching themselves, expanding their membership to include a more diverse mix of market participants and end users and creating subgroups whose terms of reference specifically include the resolution of some of the most important of these issues. Readers of this Roadmap are encouraged to engage with that process in order to ensure they are prepared for transition and able to help shape its outcomes • The next steps in this project aim to contribute to the identification of both the challenges and the solutions sides of the equation. The Trade Associations will shortly initiate a global survey of buy- and sell-side firms and of infrastructure providers, regarding their use of IBORs, the extent of their readiness to engage with the transition process across all of their product lines, the issues they foresee and the solutions they may have in mind. The survey results will then form the basis of an in-depth report that will seek to help answer Mr. Salmon’s question as to whether all of the potential impediments have been identified, provide insight into the markets’ awareness of the transition initiatives, test market participants’ readiness to transition and seek out potential solutions to the issues identified • The Trade Associations will continue their efforts to ensure a successful transition, which will result in a safer and more efficient global financial marketplace

[redacted]

2a. Executive summary
Roadmap structure

The table of contents provides a summary of the sections and supporting information within the Roadmap. The Roadmap will serve as a point of reference for IBOR transition progress to date and will provide the foundation for the Global IBOR Survey and Report.

Publicly available information from the Financial Stability Board (FSB), International Organization of Securities Commissions (IOSCO), RFR Working Groups and other sources

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Global IBOR Survey and Report

Scope of this document

2b. Executive summary
Scope and objectives

Global IBOR Transition Roadmap (or "Roadmap")

The Roadmap collates and summarizes existing analysis made publicly available by the FSB, IOSCO, RFR Working Groups and other sources identified by the Trade Associations and provides a single point of reference for market participants seeking a high-level overview of the global initiatives undertaken to date. It does not include unpublished information on the significant work already underway by the RFR Working Groups to address many of the challenges that are described in the Roadmap, but it does provide contact details for those groups, where available.

Roadmap objectives

Centralize information. The primary objective of the Roadmap is to identify, summarize and centralize information made publicly available by major regulatory bodies and RFR Working Groups regarding transition planning progress with respect to major IBORs denominated in five currencies (see panel below). The Roadmap describes efforts realized to date to transition markets from using products that reference these IBORs to products that reference alternative RFRs, with a focus on transition-related challenges.

Facilitate market education. The Roadmap constitutes a key educational resource for a broad range of market participants who may not have significant familiarity with the initiatives underway to transition products from IBORs to alternative RFRs.

Survey baseline. The Roadmap will serve as an input to the Global IBOR Survey and Report (described further in the Introduction). Thus, it is anticipated that the information presented in this document will evolve over time.

Transition Scope

Benchmark by currency[1]

- GBP LIBOR
- USD LIBOR
- EURO LIBOR, EURIBOR
- CHF LIBOR
- JPY LIBOR, JPY TIBOR, EUROYEN TIBOR

Product	Product examples
Over-the-counter (OTC) derivatives	Interest rate swaps, forward rate agreements (FRAs), cross-currency swaps
Exchange-traded derivatives (ETDs)	Interest rate options, Interest rate futures
Loans	Syndicated loans, business loans, mortgages, credit cards, auto loans, consumer loans, student loans
Bonds and floating rate notes (FRNs)	Corporate and non-US government bonds, agency notes, leases, trade finance, FRNs, covered bonds, capital securities, perpetuals
Short-term instruments	Repos, reverse repos, time deposits, credit default swaps (CDS), commercial paper
Securitized products	Mortgage-backed securities (MBS), asset-backed securities (ABS), commercial mortgage-backed securities (CMBS), collateralized loan obligation (CLO), collateralized mortgage obligation (CMO)
Other	Late payments, discount rates, overdraft

Market participants

- Central counterparties (CCPs)
- Exchanges
- Government-sponsored enterprise (GSE)
- Investment banks
- Commercial banks
- Retail banks
- Asset managers
- Pension funds
- Hedge funds
- Regulated funds
- Insurance/ Reinsurance
- Corporations
- Non-bank lenders
- Supranationals
- Others

[1] Regulatory reform initiatives, including the selection of alternative RFRs, are underway with respect to other IBORs that are not in scope for this review. The in-scope IBORs are those in which an RFR Working Group is currently operative or being established. For further information on the progress pertaining to other IBORs, market participants should consult with relevant trade association representatives.

2c. Executive summary
IBOR background

Section 3 provides background on the global use and impact of the IBOR reference rates. These rates are used by a broad range of market participants and are referenced by a high volume of contracts.

IBOR definition

IBORs are average rates at which certain banks could borrow in the interbank market and range in tenors from overnight to 12 months. The rates include a spread reflecting the credit risk involved in lending money to banks.

LIBOR (London interbank offered rate): The IBOR for the London interbank market; published in British pound sterling (GBP), US dollar (USD), euro (EUR), Swiss franc (CHF) and Japanese yen (JPY)

Administrator: ICE Benchmark Administration (IBA)

TIBOR (Tokyo interbank offered rate): The rate offered in the Japan interbank market

Administrator: JBA TIBOR Administration (JBATA)

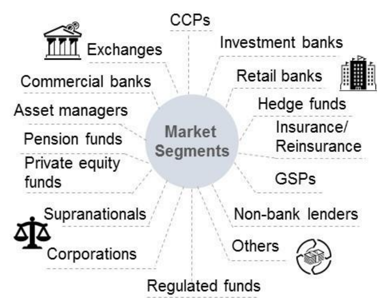
EURIBOR (euro interbank offered rate): The rate offered in the euro interbank market

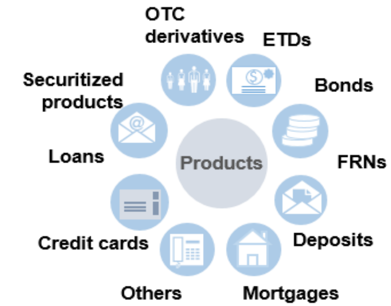
Administrator: European Money Markets Institute (EMMI)

LIBOR and EURIBOR are designated as critical benchmarks under the European Benchmarks Regulation (BMR)[1]. TIBOR's administrator is subject to the Financial Instruments and Exchange Act, which includes rules pertaining to calculation, publication and administration of the benchmark rate.

IBOR uses

IBORs are used by a broad range of market participants in a wide range of product types. Illustrative uses of IBORs include firms hedging exposures with OTC derivatives, banks acting as an intermediary between end users and exchanges for ETDs and corporations issuing debt whose payments are calculated by reference to an IBOR.





Broad market footprint[2]

The Market Participants Group (MPG) *Final Report on Reforming Interest Rate Benchmarks* in 2014 (MPG Report) demonstrated that IBOR benchmarks have a broad market footprint across jurisdictions, tenors, and products.

USD LIBOR and EURIBOR	**USD LIBOR and EURIBOR** each represent more than \$150TN on a gross notional volume outstanding basis. Together they represent approximately **80% of the total IBOR market exposure (>\$370TN)**
Derivatives (OTC derivatives and ETDs)	**OTC derivatives and ETDs** represent more than \$300TN (80%) of products referencing IBORs
Syndicated loans	97% of **syndicated loans** in the US market, with outstanding volume of approximately \$3.4TN, reference USD LIBOR**.** 90% of **syndicated loans** in the euro market, with outstanding volume of approximately \$535BN, reference EURIBOR
FRNs	84% of **FRNs** in the US market, with outstanding volume of approximately \$1.5TN, reference USD LIBOR. 70% of **FRNs** in the euro market, with outstanding volume of approximately \$2.6TN, reference EURIBOR
Business loans	30%-50% of **business loans** in the US market, with outstanding volume of approximately \$2.9TN, reference USD LIBOR. 60% of b**usiness loans** in the euro market, with outstanding volume of approximately \$5.8TN, reference EURIBOR
Tenor	**The 3-month tenor** by volume is the most widely referenced rate in all currencies (followed by the 6-month tenor)

[1] Reference section 7a. Other key benchmark reform initiatives – European Benchmarks Regulation (BMR) for further information.
[2] Source: MPG Final Report on Reforming Interest Rate Benchmarks, July 2014. Amounts represent outstanding notional gross volume.

2d. Executive summary

IBOR reform

Section 4 depicts the key global initiatives driving the review and reform of major IBORs to meet the recommendations set forth by the FSB.

2009

- The global regulatory community began leading IBOR reform to reinstate confidence in the reliability and robustness of benchmark rates. The effort to reform IBORs is driven by the following factors:
  - **Systemic risk:** uncertainty surrounding the durability of IBORs represents a source of vulnerability
  - **Liquidity:** the price discovery process in short-term interbank unsecured funding markets has been undermined by minimal activity in the market
  - **LIBOR and EURIBOR panel bank reluctance:** reluctance to submit quotes in the absence of active underlying transactions due to perceived litigation risk
  - **Charges of misconduct:** charges of attempted manipulation and false reporting for profit by multiple financial institutions prompted The Wheatley Review of LIBOR, which recommended, among other things, governance and methodology reforms

2013

- The number of IBOR currencies and tenors was significantly reduced following the 2012 Wheatley Review. LIBOR is now published for 5 currencies in 7 maturities (instead of 10 currencies in 15 maturities). Similar choices have been made for EURIBOR and TIBOR and, as a result, EURIBOR is now published for 8 (instead of 15) maturities, and TIBOR is now published for 6 maturities (will also discontinue 2-month)
- In February 2013, the G20 asked the FSB to review and reform major interest rate benchmarks
- In July 2013, IOSCO published its *Final Report on Principles for Financial Benchmarks*, which sets out 19 Principles for sound benchmarks and was endorsed by the G20 and the FSB as good practice for robust reference rates
- The OSSG was established by the FSB to monitor and oversee the efforts to implement the benchmark reforms
- The MPG was established by the FSB OSSG to propose alternatives to existing IBOR benchmarks and analyze potential transition issues

2014

- In July 2014, the FSB OSSG published a report recommending a "multiple-rate" approach with reformed and more robust reference rates that contain a bank credit risk component (IBOR+) and alternative RFRs for products that do not require a rate which includes bank credit risk

2017

End-2021

- In July 2017, Andrew Bailey said that all the current panel banks had been spoken to about agreeing voluntarily to sustain LIBOR until end-2021 but that after that point "the survival of LIBOR on the current basis…could not and would not be guaranteed"

Based on the key official sector milestones and guidance, the industry has divided work into four components:

Enhancing major interbank interest rate benchmarks (IBOR+):	Developing alternative RFRs:	Developing transition strategies to adopt alternative RFRs:	Increasing contractual robustness:
Underpinning existing reference rates with transaction data and improving the processes and controls around submissions	Identifying new or existing alternative RFRs that could be used in place of IBORs in a range of contracts	Transition planning for the migration of cash and derivative products from their respective IBORs to IOSCO-compliant alternative RFRs	Mitigating the risk associated with the permanent discontinuation of a widely used IBOR

2e. Executive summary

Benchmark transition and challenges

Section 5 discusses the reasons why the transition is seen as appropriate and beneficial and also outlines a sample of challenges documented to date. It focuses on the transition of the IBORs that are in scope for this Roadmap to alternative RFRs. The list is not comprehensive, and the RFR Working Groups are engaged in significant outreach efforts in order to help identify more. Once identified, the RFR Working Groups and others are setting about addressing the challenges and significant work is already underway in this respect.

Categories	Description
Market adoption of alternative RFR	The adoption of an alternative RFR requires education and devotion of resources across multiple market sectors. This is particularly the case for alternative RFRs that do not yet exist. Liquidity in derivatives markets referencing alternative RFRs is a key to adoption. Additionally, exchanges and CCPs must facilitate adoption by listing and clearing products referencing the alternative RFRs, offering PAI and discounting based on the alternative RFRs (if they do not already).
Liquidity	Liquidity in the derivatives market referencing the alternative RFRs is crucial. Such liquidity will also be necessary for development of term structures based on the alternative RFRs.
Legal	Contract amendments will lead to increased transition costs and operational risk. A significant administrative effort associated with transitioning contracts to the alternative RFRs will be required.
Valuation and risk management	Transition of legacy contracts could potentially result in less effective hedges and/or market valuation issues and may require adjustments to address inherent differences between the IBORs and alternative RFRs.
Infrastructure	Significant challenges may arise when the required institutional infrastructures (e.g., trading and clearing data, systems, and operational procedures) are established to support the transition to the alternative RFRs.
Tax	The transition may result in changes in the amount of taxes due or acceleration of payments on financial contracts or tax structures.
Accounting	The transition may result in complications related to fair value designation, hedge accounting and inter-affiliate accounting structures.
Governance and controls	Institutions must have robust governance and controls to manage the transition of contracts to alternative RFRs.
Regulatory	Requirements under existing regulatory regimes may make the transition to alternative RFRs more difficult if not modified. For example, current margining requirements may be triggered for existing derivatives transactions if they transition to alternative RFRs.

3a. IBOR background
IBOR definition and governance

The IBORs, as defined below, inherently reflect a degree of the credit risk.

LIBOR

- LIBOR is a benchmark rate produced for five currencies with seven maturities, which include overnight/spot next, 1-week, 1-month, 2-month, 3-month, 6-month and 12-month, producing 35 rates each business day
- LIBOR provides an indication of the average rate at which a LIBOR contributor bank can obtain unsecured funding in the London interbank market for a given period, in a given currency. Individual ICE LIBOR rates are the end product of a calculation based upon submissions from LIBOR contributor banks
- The IBA[1] maintains a reference panel between 11 and 16 contributor banks for each currency calculated. IBA currently publishes in the following five currencies: GBP, USD, EUR, CHF and JPY. The number of currencies and tenors was significantly reduced following the Wheatley Review[2]
- ICE has been the administrator of LIBOR since February 2014 and is regulated by the FCA[3] as of April 2013
- LIBOR is designated as a critical benchmark under the BMR and now incorporates a methodology designed to enhance its robustness. However, in July 2017, Andrew Bailey of the FCA noted that the "absence of active underlying markets raises a serious question about the sustainability of the LIBOR benchmarks"

TIBOR

- TIBOR benchmark rates are based on the interest rates at which banks offer to lend unsecured funds to other banks in the Japan interbank market
- There are two TIBOR rates: Japanese yen TIBOR rates reflect prevailing rates on the unsecured call market, and the EUROYEN TIBOR rates are based on the Japan offshore market
- TIBOR is calculated by the JBATA[4] as a prevailing market rate based on quotes for six different maturities (1-week, 1-month, 2-month, 3-month, 6-month and 12-month) provided by reference banks
- The JBATA has been responsible for the calculation and publication of the JBA TIBOR since 1 April 2014, after assuming the role as administrator from the Japanese Bankers Association (JBA)
- The TIBOR administrator was designated under the Financial Instruments and Exchange Act[5] in May 2015

EURIBOR

- EURIBOR is the rate at which euro interbank term deposits are offered by one prime bank to another prime bank within the Economic and Monetary Union
- The EMMI[6] has been responsible for the calculation and publication of EURIBOR since 1 April 2014
- EMMI maintains a reference panel of 20 contributor banks and fixings in the following maturities: 1-week, 2-week, 3-month, 6-month, 9-month and 12-month
- EURIBOR is designed as a critical benchmark under the BMR. Efforts to anchor the benchmark in transactions rather than quotes were unsuccessful due to minimal transactions in the underlying market. Work has commenced on a possible hybrid methodology instead

[1] For more information on IBA, please view IBA official website.
[2] Wheatley Review of LIBOR, September 2012.
[3] For more information on FCA, please view FCA official website.
[4] For more information on JBATA, please view JBATA official website.
[5] For more information on the Financial Instruments and Exchange Act, please view FSA official website.
[6] For more information on EMMI, please view EU official website.

3b. IBOR background

Illustrative IBOR uses

Sell-side institutions

- Banks trade derivatives linked to IBORs to hedge exposure generated by various positions
- Banks act as market makers for OTC derivatives referencing IBORs
- Banks act as intermediaries between the end users and exchanges for ETDs that reference IBORs
- Banks that are clearing members act as intermediaries between clients (e.g., institutional investors) and CCPs for cleared derivatives that reference IBORs
- Banks offer deposits, credit cards, mortgages and other loans for individuals and businesses that reference IBORs
- Although now a relatively inactive market, IBOR represents where panel banks consider (on average) they could borrow in the unsecured interbank market for funding and liquidity
- Banks issue floating rate notes that reference IBORs, which are purchased by institutional investors, including those served by asset managers, and may be rated by rating agencies
- Banks securitize assets and offer securitized products such as residential mortgage-backed securities (RMBS), commercial mortgage-backed securities (CMBS), etc., that are pegged to IBOR, purchased by institutional investors, including those served by asset managers, and may be rated by rating agencies

Corporations and other users

Supranationals, healthcare institutions, oil and gas companies, manufacturing firms and other firms/users:

- Trade OTC derivatives and ETDs with banks to hedge interest rate or cross-currency risk arising from business exposures, borrowing under loans and note issuances
- Issue floating rate notes and callable debt, which reference IBORs and which may be rated by the rating agencies
- Obtain loans, some of which reference IBORs from lenders (including Banks)

Buy-side institutions

Investors (pension funds, regulated funds, insurance firms, hedge funds, other clients of asset managers):

- Enter into OTC derivatives and ETDs with banks and dealers to hedge interest rate or cross-currency risk arising from investments
- Invest in bonds and securitization products that reference IBORs
- Express a market view through OTC derivatives, ETDs, debt instruments and securitized products that reference IBORs

CCPs

Clearing products

- CCPs clear and settle trades such as cleared interest rate swaps, acting as the buyer to every seller and the seller to every buyer

3c. IBOR background

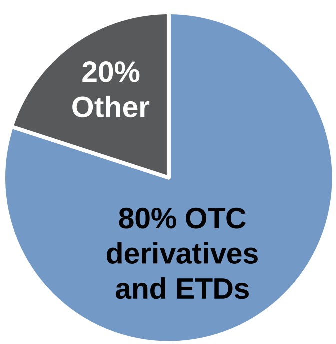
Market footprint overview[1]

LIBOR is the predominant interest rate benchmark for USD, GBP, CHF and JPY derivatives contracts. EURIBOR is the most widely used interest rate benchmark for EUR contracts. The MPG Report[1] showed in 2014 that OTC derivatives and ETDs represent approximately 80% of LIBOR-linked contracts by outstanding notional value, and thus derivatives formed much of the early focus for global transition and reform initiatives. Going forward, this focus will broaden to include other products, such as securities, loans, ETDs and mortgages.

GBP LIBOR	USD LIBOR	EURIBOR	Euro-LIBOR	CHF LIBOR	JPY LIBOR	TIBOR
>$30TN	>$150TN	>$150TN	>$2TN	>$6.5TN	>$30TN	>$5TN

The main categories of contracts indexed to IBORs include OTC derivatives and ETDs, syndicated loans, securitized products, business loans, retail loans, floating rate bonds and deposits.

% IBOR linked contracts
by total notional outstanding



Product	Product examples
• OTC derivatives	• Interest rate swaps, FRAs, cross-currency swaps
• ETDs	• Interest rate options, Interest rate futures
• Loans	• Syndicated loans, business loans, mortgages, credit cards, auto loans, consumer loans, student loans
• Bonds and FRNs	• Corporate and non-US government bonds, agency notes, leases, trade finance, FRNs, covered bonds, capital securities, perpetuals
• Short-term instruments	• Repos, reverse repos, time deposits, CDS, commercial paper
• Securitized products	• MBS, ABS, CMBS, CLO, CMO
• Other	• Late payments, discount rates, overdraft

[1] Source: *MPG Final Report on Reforming Interest Rate Benchmarks*, July 2014.

[redacted]

4a. IBOR reform

The need for benchmark reform

Decline in the interbank unsecured funding markets has undermined the reliability and robustness of some existing interbank benchmark interest rates. Many products currently referencing IBORs do not require the credit spread inherent in the benchmarks, and it may be more appropriate for them to reference alternative RFRs.

Liquidity. Without liquidity in interbank unsecured funding markets, the price discovery process in those markets will remain vulnerable as panel banks are obliged to submit quotes with limited activity backing the submissions on the basis of judgment.

- Volume in unsecured funding vs. total outstanding LIBOR contracts is fractional, especially for longer-term funding
- According to US Federal Reserve Bank data on daily USD unsecured funding volumes (post-money market reform), the median daily volume of 3-month funding (the most heavily referenced LIBOR tenor) is less than $1BN compared to more than $100TN in outstanding volumes of US dollar LIBOR contracts
- According to the FCA, in an extreme example for one currency-tenor combination, the panel banks executed just fifteen transactions of potentially qualifying size in that currency and tenor for the entirety of 2016
- Liquidity has worsened post-crisis for a variety of reasons, such as short-term wholesale funding capital rules, which have made it more expensive to issue short-term unsecured debt. Additionally, money market reform has increased liquidity requirements and interest rate risk requirements for money market funds (MMFs). These new requirements have made MMFs less popular and thus reduced the supply of funding funneling through MMFs, which had been a source of unsecured interbank funding. Finally, under Basel liquidity rules, banks need to be long-funded, further reducing activity in the short-term interbank market

LIBOR and EURIBOR panel bank reluctance. Panel banks have become increasingly reluctant to continue submitting quotes in support of LIBOR in the absence of underlying transactions, due to concerns involving potential litigation risks when they submit based on expert judgment.

- In 2016 one bank stopped submitting to the USD panel; in November 2017 another bank stopped submitting to the USD panel and one bank stopped submitting to the JPY panel; since 2013 the EURIBOR panel decreased from 43 to 20 banks
- In November, the FCA issued a statement saying *"All 20 panel banks have provided their support until the end of 2021"*
- Under the BMR, regulators can compel submission for a period of only two years

Systemic risk. Uncertainty surrounding the durability of interest rate benchmarks due to liquidity concerns and panel robustness represents a potentially serious source of vulnerability and systemic risk.

The measures proposed by the official sector are designed to restore the governance and oversight, reliability and robustness of major interest rate benchmarks.

4b. IBOR reform
Graphical roadmap

The graphical roadmap depicts the key reports issued by the global regulatory community to review and reform the major IBORs and the progress of global initiatives to meet the recommendations set forth by the FSB.

Sep 2012
Wheatley review of LIBOR

Feb 2013
G20 commissioned the FSB to review and reform major interest rate benchmarks

Jun 2013
OSSG was established

Jul 2013
IOSCO Principles for Financial Benchmarks were published

2013
The National Working Group on CHF Reference Rates was established to understand and enhance the two short-term fixed reference rates in Switzerland: Tomorrow/Next Indexed Swaps (TOIS) fixing and Swiss Average Rate Overnight (SARON)

Jul 2014
MPG published *Final Report on Reforming Interest Rate Benchmarks*

Jul 2014
FSB OSSG published report *Reforming Major Interest Rate Benchmarks*

Nov 2014
ARRC convened in the US to identify the preferred USD alternative RFR

Mar 2015
The Working Group on Sterling RFRs was established in the UK to identify the preferred GBP alternative RFR

Apr 2015
The Study Group was established in Japan to identify the preferred JPY alternative RFR

May 2016
The ARRC published an interim final report containing the first iteration of its paced transition plan

Jun 2016
The BMR was published in the Official Journal

Dec 2016
Tokyo Overnight Average Rate (TONA) was selected as the preferred alternative RFR for JPY

Apr 2017
Reformed Sterling Overnight Index Average (SONIA)[1] was selected as the preferred alternative RFR for GBP

Jun 2017
Secured Overnight Financing Rate (SOFR) was selected as the preferred alternative RFR for USD

Jul 2017
Andrew Bailey said that he and his colleagues had spoken to all the current panel banks about agreeing voluntarily to sustain LIBOR until end-2021 but did not think markets could rely on LIBOR continuing to be available indefinitely

Sep 2017
Working Group was established in Europe[2] to identify the preferred EUR alternative RFR

Oct 2017
SARON was selected as the preferred alternative RFR for CHF

Nov 2017
The FCA issued a statement saying "All 20 panel banks have provided their support until the end of 2021"

Summary publications on subsequent slides

[1] Unless otherwise specified, references in this document to SONIA refer to SONIA or reformed SONIA as the context requires.
[2] References in this document to Europe as a jurisdiction refer to the scope of the Eurozone, which excludes the UK.

4c. IBOR reform

Key players

The FSB is playing the leading role in many of the global reform efforts surrounding major interest rate benchmarks. Jurisdictional RFR Working Groups are also playing an important role in guiding the industry toward the FSB's recommendations.

International reviews

Following alleged manipulation of IBORs and other financial benchmarks in the aftermath of the financial crisis, a series of reviews was instituted by the global regulatory community.

Establishment of the OSSG

In 2013, the FSB established the OSSG, bringing together central banks and regulatory authorities to undertake a fundamental review of major interest rate benchmarks.

Establishment of the MPG

The OSSG established and guided the work of the MPG, which was tasked with identifying feasible and viable alternative RFRs and recommending potential transition paths.

FSB recommendations on enhancing existing benchmarks

In 2014, the FSB recommended enhancing existing IBORs and, in recognition of the fact that it may be appropriate for many products to reference a rate that does not include bank credit risk, to promote the development and adoption of alternative RFRs.

Jurisdictional Working Groups

Several jurisdictions have established RFR Working Groups[1] to bring together public and private-sector market participants to review their respective markets and determine the most appropriate alternative RFR.

[1] Working Groups are listed on page 32.

4d. IBOR reform

FSB OSSG: governance and structure

The FSB was tasked by the G20 to conduct a fundamental review of major interest rate benchmarks and plans for reform to ensure robustness and appropriate use of benchmarks, as well as consistency and coordination in reform planning.

Governance structure

- In order to execute this mandate, the FSB established the high-level **OSSG** of regulators and central banks
- The OSSG was originally co-chaired by Martin Wheatley (CEO, UK FCA) and Jeremy C. Stein (Member, US Federal Reserve Board of Governors), and comprised of senior representatives of central banks and regulatory agencies. It is currently chaired by Andrew Bailey (Chief Executive, UK FCA) and Jerome Powell (Member, Federal Reserve Board of Governors)
- The OSSG guided the work of the **MPG,** which was established to examine the feasibility and viability of adopting additional reference rates and potential transition issues

Scope of work summary

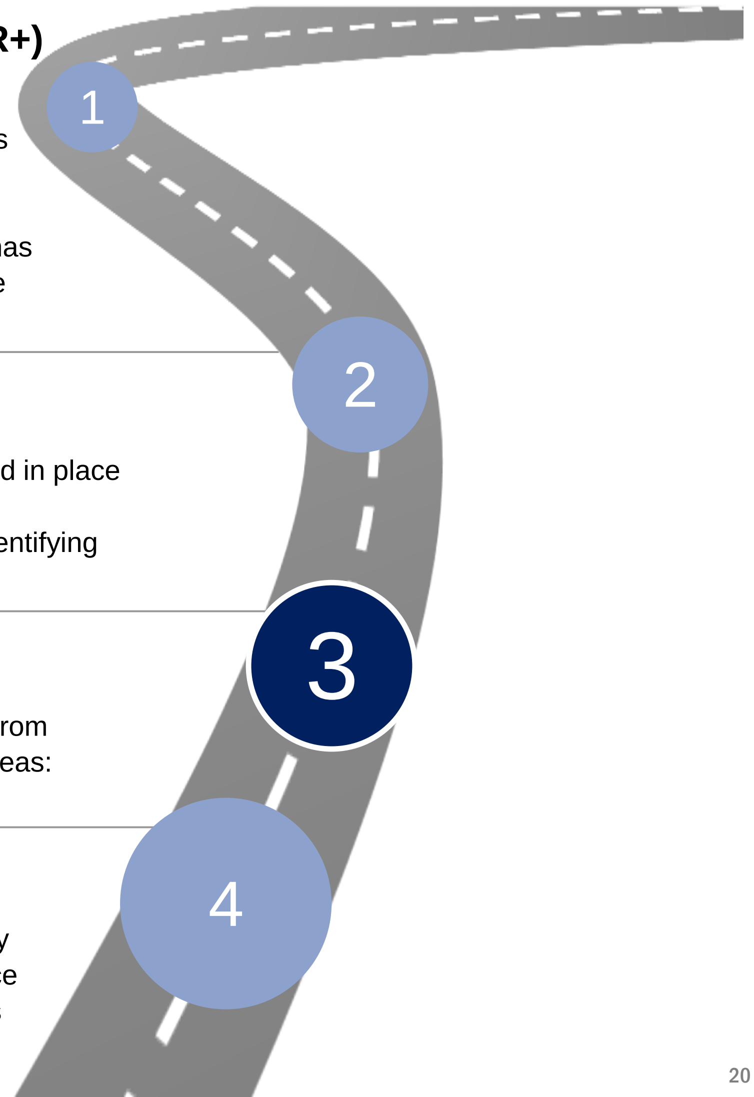
- The OSSG focused its initial work on the most fundamental interest rate benchmarks: **LIBOR, EURIBOR and TIBOR**
- The OSSG identified a single set of standards for sound benchmarks, the **IOSCO Principles for Financial Benchmarks**[1], which the FSB endorsed
- Based on OSSG recommendations, the FSB asked IOSCO to conduct a review of EURIBOR, LIBOR and TIBOR against the Principles. As a result, **IOSCO provided reform recommendations** related to benchmark design, data sufficiency and transparency of the benchmark[2]
- **The OSSG established the MPG** to encourage the private sector to identify additional benchmark rates and analyze potential transition issues. The MPG provided its *Final Report on Reforming Interest Rate Benchmarks* to the OSSG in July 2014[3]
- Based in part on the MPG *Final Report*, the **FSB OSSG published its *Reforming Major Interest Rate Benchmarks*** white paper in July 2014[4]
- The FSB mandated the OSSG to monitor and oversee the implementation of the benchmark reforms, which were recommended in the FSB OSSG's report

[1] IOSCO's *Principles for Financial Benchmarks*, July 2013.
[2] IOSCO's *Review of the Implementation of IOSCO's Principles for Financial Benchmarks by Administrators of Euribor, Libor and Tibor*, July 2014.
[3] *MPG Final Report on Reforming Interest Rate Benchmarks*, July 2014.
[4] FSB's *Reforming Major Interest Rate Benchmarks*, July 2014.

4e. IBOR reform

The main recommendations of the FSB OSSG Report

In 2014, the FSB published *Reforming Major Interest Rate Benchmarks,* in which the FSB made a number of recommendations aimed at reducing risks it had identified with respect to key IBORs.



Enhance major interbank interest rate benchmarks (IBOR+)

Initiatives related to the strengthening of existing IBORs and other reference rates based on unsecured bank funding costs by underpinning them with transaction data as much as possible and improving the processes and controls around submissions to the greatest extent possible. These enhanced rates are termed “IBOR+.” However, these initiatives have not succeeded in resolving all the underlying issues for the IBORs. In particular, it has been noted that there are not enough transactions in the market for unsecured wholesale term lending to banks to be able to underpin certain IBORs with transaction data.

Identify alternative RFRs

Initiatives have focused on identifying new or existing alternative RFRs that could be used in place of IBORs in a range of contracts, particularly derivatives, with a goal of encouraging the implementation of at least one IOSCO-compliant alternative RFR and, in some cases, identifying strategies to create liquidity in these newly introduced alternative RFRs.

Promote transition to alternative RFRs

Initiatives relate to transition planning for the migration of cash and derivatives products from their respective IBORs to IOSCO-compliant alternative RFRs in the following currency areas: GBP, USD, EUR, CHF and JPY, where appropriate.

Increase contractual robustness

Initiatives focus on increasing derivative contract robustness against the risk that a widely used interest rate benchmark could be discontinued permanently. This work would reduce the risks to financial stability of reliance on the IBORs by ensuring that financial contracts referencing them include fallback provisions in case the IBORs are no longer available.

4f. IBOR reform
Summary of progress against the main FSB OSSG Report recommendations

***Note:** Sourced from the FSB's progress report on implementation of July 2014 FSB recommendations, October 2017*[1]

1 Developments in IBOR+ benchmarks

All three major interest rate benchmarks administrators for EURIBOR, LIBOR and TIBOR progressed with their plans to strengthen the existing benchmarks. Adapting their methodologies to underpin each rate with transaction data[2] has proved difficult:

EMMI (EURIBOR)	• In May 2017, at the end of a pre-live verification exercise, EMMI concluded that "the current market conditions do not allow for a fully transaction-based methodology for EURIBOR via a seamless transition[3]" • EMMI has convened a task force to identify a possible hybrid methodology, which would combine transactions, market data and expert judgment
IBA[4] (LIBOR)	• IBA has concluded two consultations: (i) the LIBOR Code of Conduct[5] and (ii) the ICE LIBOR Evolution published in January 2017. The methodology and publication time of the benchmark were consequently modified. In July 2017, the FCA stated that 'the absence of active underlying markets raises a serious question about the sustainability of the LIBOR benchmarks"
JBATA (TIBOR)	• JBATA has conducted three consultations with a view to maintain and enhance the reliability and transparency of TIBOR. JBATA finalized the reform and announced its implementation date as 24 July 2017. The Japan Financial Services Agency (JFSA) approved revisions to the relevant Code of Conduct on February 2017

2 Developments in alternative RFR benchmarks

FSB members continue to make progress, with designated public and private-sector groups in many member jurisdictions/currency areas selecting recommended alternative RFRs.

UK | Working Group on Sterling RFRs	Recommended reformed SONIA as its preferred alternative to GBP LIBOR
US | ARRC	Selected SOFR as its recommended alternative to USD LIBOR
Europe | Working Group on Euro RFR	The European public authorities announced the launch of a Working Group on RFR for the euro area tasked with the identification and adoption of an alternative RFR
Switzerland | NWG on CHF Reference Rates	Selected SARON as its recommended alternative RFR to CHF LIBOR
Japan | Study Group	Identified TONA as its recommended alternative RFR; published a report on the identification of the alternative RFR

3 Developments in transition planning

Following selection of the alternative RFRs in four out of five RFR Working Groups, emphasis now shifts to implementing transition plans. This has assumed greater importance after the announcement that the FCA will not sustain LIBOR after end-2021.

The Sterling RFR Working Group and ARRC recently announced that they were reconstituting in order to ensure a broad-based approach to transition.[6]

4 Developments on contractual robustness

The Trade Associations have been undertaking initiatives to enhance contractual robustness. At the request of the OSSG, ISDA is spearheading an effort to improve derivative contract robustness to address risks of discontinuance of widely used interest rate benchmarks.

The contractual robustness subgroup of the OSSG has been established to liaise with ISDA.

ISDA has established four open member Working Groups (USD; GBP/EUR/CHF; JPY; and APAC) and a technical subgroup to define and implement a universal fallback methodology to be used in case one of the major IBORs permanently ceases to exist.

The fallbacks are intended to be used only when an IBOR has permanently ceased to exist and, until such time, the contract would continue to reference the IBOR.

The IBOR fallback Working Groups intend to produce amended definitions that include the fallbacks for use in new transactions and a protocol that can be used to incorporate the amended definitions with fallbacks into existing transactions.

[1] FSB's *Progress report on implementation of July 2014 FSB recommendations*, October 2017.
[2] Although the FSB recommendations were directed at LIBOR, TIBOR and EURIBOR, other markets have also taken steps to reform their existing rates in line with the advice given by the FSB and the IOSCO Principles.
[3] See EURIBOR pre-live verification program outcome notification, May 2017.
[4] IBA published the Roadmap for the evolution of ICE LIBOR (LIBOR) setting out measures designed to deliver a seamless transition to an even more robust rate, which will make LIBOR more sustainable for the long term.
[5] The LIBOR Code of Conduct provides the framework within which panel banks operate in the LIBOR context and assists users in deciding whether LIBOR is an appropriate benchmark to use in contracts.
[6] Source: Bank and FCA launch next phase of sterling Libor transition work, November 2017.

[redacted]

5a. Benchmark transition and challenges

Necessity and benefits

The transition from IBORs to alternative RFRs is critical given liquidity and other issues that may underlie the IBORs, but it is also expected to deliver additional benefits.

The need to transition from certain key IBORs to alternative RFRs

A lack of robustness and durability in certain key IBORs, coupled with the large volume of financial transactions that reference these rates, has resulted in systemic risk concerns.

- The minimal number of transactions in the unsecured interbank funding market means that submissions by panel banks are largely based upon judgment (as opposed to transactions)
- In the face of concerns regarding potential liabilities associated with judgment-based submissions, panel banks have become significantly less willing to submit. The EURIBOR panel of submitting banks, for example, has fallen from 43 to 20 since 2013, and some banks have stopped submitting to LIBOR panels for certain currencies
- Andrew Bailey's announcement last year that the UK's FCA would no longer persuade or compel banks to make LIBOR submissions from the end of 2021 has raised concerns about the availability of LIBOR from that date

Potential benefits of transitioning from IBORs to alternative RFRs

- The alternative RFRs selected for transitions in key jurisdictions are all based on robust, very liquid underlying markets, making them much more durable
- In recent years, public-private sector working groups have determined that alternative RFRs represent a more appropriate benchmark for products and transactions that do not need to incorporate the credit risk premium embedded in the IBORs
- Currently PAI for cleared transactions and discounting is typically based on overnight rates, while interest rate derivatives primarily reference IBORs. Alternative RFRs are expected to be used in both instances, which will reduce basis risk

5b. Benchmark transition and challenges

FCA statement on the future of LIBOR

The need to transition to alternative RFRs was given additional impetus on 27 July 2017, when the Chief Executive of the FCA, Andrew Bailey, delivered a speech in which he examined important issues related to the sustainability of LIBOR benchmarks.

Andrew Bailey's speech highlights

"My remarks today will not go over the details of LIBOR's past scandals, but instead examine important questions about the sustainability of the LIBOR benchmarks, the way that LIBOR is used now and in the future, and give an insight into the work that we, and our domestic and international partners, have been doing to reform the interest rate benchmark landscape."

"… the underlying market that LIBOR seeks to measure – the market for unsecured wholesale term lending to banks – is no longer sufficiently active."

"The absence of active underlying markets raises a serious question about the sustainability of the LIBOR benchmarks that are based upon these markets. If an active market does not exist, how can even the best run benchmark measure it? Moreover, panel banks feel understandable discomfort about providing submissions based on judgements with so little actual borrowing activity against which to validate those judgements."

"… we do not think it right to ask, or to require, that panel banks continue to submit expert judgements indefinitely. Indeed, the powers available to us under European Benchmark Regulation, do not allow us to compel indefinitely."

"I and my colleagues have therefore spoken to all the current panel banks about agreeing voluntarily to sustain LIBOR for a four to five year period, i.e. until end-2021. This date is far enough away significantly to reduce the risks and costs of a more sudden change. "

"Market participants must take responsibility for their individual transition plans, but we and other authorities will be ready to assist and support efforts to co-ordinate that work."

"We do not think we will complete the journey to transaction-based benchmarks if markets continue to rely on LIBOR in its current form. And while we have given our full support to encouraging panel banks to continue to contribute and maintaining LIBOR over recent years, we do not think markets can rely on LIBOR continuing to be available indefinitely."

Subsequently, on 24 November 2017, the FCA stated that *"All of the 20 panel banks have provided their support, and the FCA does not expect to see any further changes to the LIBOR panels."*

5c. Benchmark transition and challenges

Summary of transition challenges

In public forums, the industry has noted a variety of transition challenges[1,2] which can be grouped into the following nine key themes.

Market adoption of alternative RFR

The adoption of an alternative RFR requires education and devotion of resources across multiple market sectors. This is particularly the case for alternative RFRs that do not yet exist. Liquidity in derivatives markets referencing alternative RFRs is a key to adoption. Additionally, exchanges and CCPs must facilitate adoption by listing and clearing products referencing the alternative RFRs, offering PAI and discounting based on the alternative RFRs (if they do not already).

Infrastructure

Significant challenges may arise when the required institutional infrastructures (e.g., trading and clearing data, systems, and operational procedures) are established to support the transition to the alternative RFRs.

Valuation and risk management

The transition of legacy contracts could potentially result in less effective hedges and/or market valuation issues, and may require adjustments to address inherent differences between IBORs and alternative RFRs.

Tax

The transition may result in changes in the amount of taxes due or acceleration of payments on financial contracts or tax structures.

Legal

Contract amendments may lead to increased transition costs and operational risk. A significant administrative effort associated with transitioning contracts to the alternative RFRs may be required.

Liquidity

Liquidity in the derivatives market referencing the alternative RFRs is crucial. Such liquidity will also be necessary for development of term structures based on the alternative RFRs.

Accounting

The transition may result in complications related to fair value designation, hedge accounting and inter-affiliate accounting structures.

Regulatory

Requirements under existing regulatory regimes may make the transition to alternative RFRs more difficult if not modified. For example, current margining requirements may be triggered for existing derivatives transactions if they transition to alternative RFRs.

Governance and controls

Institutions must have robust governance and controls to manage the transition of contracts to alternative RFRs.

[1] There is a wide range of IBOR uses, both within financial markets and nonfinancial industries. The challenges captured in this section are primarily associated with the financial markets, though it is acknowledged by the currency Working Groups that nonfinancial impacts will need to be assessed.
[2] Currently, there may not be a harmonized view of the challenges and potential solutions associated with those challenges, as the levels of planning and progress across jurisdictions vary.

5d. Benchmark transition and challenges

Transition challenges (1 of 5)

In general, the transition challenges summarized in this section are likely to apply broadly across jurisdictions and have been identified from a review of publicly available information. However, not all of them have been identified publicly by each RFR Working Group, and there may be currency-specific nuances. They do not represent the complete list of challenges raised by transition, and the RFR Working Groups are working to identify as many more as possible, on the basis that identification is the first step on the road to resolving them. As set out in the sections detailing the RFR Working Groups, they are already setting about resolving a number of challenges identified below.

#	Categories	Subcategories	Challenges
1	Market adoption of alternative RFR	New traded products	The adoption of an alternative RFR requires education and devotion of resources across multiple market sectors. This is particularly an issue for alternative RFRs that do not yet exist. Liquidity in derivatives markets referencing alternative RFRs is a key factor for facilitating adoption. Additionally, CCPs and exchanges have a critical role to play.
2	Liquidity	New traded products	If a term reference rate is to be made available, there must be deep liquidity in new traded products (derivatives and cash) that reference the alternative RFR in order to build the curve. Many market participants believe that a term rate is required for certain products to transition from IBORs.
3	Valuation and risk management	Market valuation issues	With respect to legacy transactions, a mechanism needs to be established to minimize adverse economic impacts or windfall profits due to changes in market value that result from a change in the benchmark reference rate. For instruments that have embedded volatility, it may be difficult to establish a conversion mechanism that is capable of ensuring that the change in market value due to conversion is zero, because the change in market value depends not only on the interest rate level but also on the volatility input, which varies with interest rate levels.
		Curve implications	For some currencies, such as USD, a further transition will be required as the alternative RFR replaces the existing discount rate. New projection curves may need to be modeled, and the downstream impacts on valuation and risk models may need to be assessed accordingly.

5d. Benchmark transition and challenges

Transition challenges (2 of 5)

#	Categories	Subcategories	Challenges
3	Valuation and risk management	Less effective hedges	Less effective hedges could result if the transition to the alternative RFR does not occur at the same time and on the same terms for both the underlying asset/liability and the corresponding hedge. This would require re-hedging and/or other risk management. For example, when a loan and its hedge reference the same benchmark, but only one moves to the alternative RFR, the hedge may cease being effective and even result in additional risk.
		Absence of forward term fixing	IBORs are currently available with 1-, 3-, 6- and 12-month term fixings, but alternative RFRs are available only on an overnight basis. Challenges associated with the transition from a forward-looking term rate to an overnight rate need to be considered. Additionally, IBORs provide certainty because they are fixed in advance (i.e., at the beginning rather than the end of an interest period), whereas the overnight alternative RFRs can be determined at only the end of the interest period (i.e., in arrears). For example, this is an issue for floating rate notes because they are traded on the basis of known interest payments at the next interest payment date.
		Secured vs. unsecured rates	Institutions may need to consider the variances in alternative RFRs. For example, SOFR and SARON are secured rates, whereas reformed SONIA and TONA are unsecured rates.
4	Infrastructure	Impact identification	Institutions will have to perform firm wide impact assessments in order to ensure that relevant infrastructure changes are identified and actioned.
		Processes	A wide range of industry processes may need to be modified to account for transition-related impacts (e.g., changing market conventions for products that will reference the alternative RFR and alternative RFR publication timelines that differ from IBOR publication).

5d. Benchmark transition and challenges

Transition challenges (3 of 5)

#	Categories	Subcategories	Challenges
4	Infrastructure	Technology	Significant investments in technology changes may be required for a broad range of impacted systems, such as trade data repositories, data providers and middleware, core retail and commercial banking systems, and nonfinancial corporate systems.
		Data	Robust alternative RFR historical data sets must be available and set up for utilization by trading, valuation and reference data systems.
5	Legal	Contract amendments	The conversion of legacy contracts to alternative RFRs may require consequent amendments to other contractual terms, resulting in significant up-front transition costs and increased operational risk. Stakeholders with diverging incentives might limit the ability to reach an agreement on amendments, resulting in partial adoption and the creation of basis risk.
		Contractual triggers	If transitioning to the alternative RFR would result in a breach of contractual terms or the obligation to take certain actions, parties will not agree to move to the alternative RFR. For example, a change in the alternative RFR may impact the value of the assets or liabilities on securitizations or covered bonds. Changes in the value of assets and liabilities may reduce the collateralization ratio of assets to cover liabilities, resulting in the need to post additional collateral or other actions as defined in the contract.
6	Tax	Fair value changes	Any changes in the fair value of contracts may have an impact on the amount of (direct and indirect) taxes. Tax structures, especially international ones, might be subject to changes in taxation.
		Acceleration of tax payments	Contract renegotiation or closeout may require immediate tax recognition and thus lead to acceleration of tax payments on gains.

5d. Benchmark transition and challenges

Transition challenges (4 of 5)

#	Categories	Subcategories	Challenges
7	Accounting	Day one balance sheet impacts	The transition from IBORs to alternative RFRs may create a valuation change for IBOR-linked legacy contracts that may impact the financial statements. If IBOR is not effectively offset by the alternative RFR, financial instruments and their respective hedges may need to be booked separately. Having hedges booked separately and recorded at fair value may result in net income volatility and growing balance sheets. For example, institutions that use accrual accounting under the International Financial Reporting Standards (IFRS) may crystalize profit or loss on conversion.
		Fair value measurement	The transition from IBORs to alternative RFRs may give rise to questions as to what the fair value of the alternative RFR and IBOR derived instruments should be given that the initial liquidity in alternative RFR derived instruments is unclear.
		Hedge accounting	Maintaining hedge accounting is likely to require significant work.
		Accounting classification	The transition to alternative RFRs may result in modification of lease agreements that include variable payments based on IBORs, potentially requiring reassessment of their classification.
		Cash products	The change in rate would need to be evaluated by issuers to determine if the change is considered a modification or extinguishment. Investors will need to consider how to account for the change in index. Embedded derivatives that reference fallback rates due to IBORs being unavailable, upon subsequent reassessment, may require bifurcation. The change in interest rate may cause discounting or impairment concerns regarding recoverability of the investment.

5d. Benchmark transition and challenges
Transition challenges (5 of 5)

#	Categories	Subcategories	Challenges
8	Governance and controls	Institutional control framework	Lack of appropriate controls and approval processes for transitioning legacy contacts may expose institutions to risk, such as legal, operational and conduct risks.
9	Regulatory	Regulatory uses of IBOR	Existing regulations require the use of IBORs to fulfill regulatory requirements. For example, the European Insurance and Occupational Pensions Authority (EIOPA) requires insurers to value future liabilities using a rate that is in part based on LIBOR.
		Transition constraints	Existing regulations may impose requirements that create challenges for transitioning to alternative RFRs. For example, modified contracts may be classified as new agreements that may then trigger uncleared margin requirements in various jurisdictions.

[redacted]

Slides:

6a. Benchmark transition and challenges

Overview of alternative RFR identification

Working Groups in each jurisdiction have recommended robust, alternative RFRs to transition away from existing IBORs, with the exception of Europe. The alternative RFR benchmarks are overnight, whereas current use of IBORs is largely in term rates.

Jurisdiction	Working Group	Alternative RFR	Rate administration	Characteristics		
				Secured vs. unsecured	Anticipated publication date	Description
UK	Working Group on Sterling Risk-Free Reference Rates	Reformed Sterling Overnight Index Average (SONIA)	Bank of England	Unsecured	23 April 2018	• Fully transaction-based • Encompasses a robust underlying market • Overnight, nearly risk-free reference rate • Includes an expanded scope of transactions to incorporate overnight unsecured transactions negotiated bilaterally and those arranged with brokers • Includes a volume-weighted trimmed mean
US	Alternative Reference Rates Committee	Secured Overnight Financing Rate (SOFR)	Federal Reserve Bank of New York	Secured	First half of 2018	• Fully transaction-based • Encompasses a robust underlying market • Overnight, nearly risk-free reference rate that correlates closely with other money market rates • Covers multiple repo market segments, allowing for future market evolution
Europe	Working Group on Risk-Free Reference Rates for the Euro Area	Not yet selected	TBC	TBC	TBC	• The Working Group on Risk-Free Reference Rates for the Euro Area has not selected an alternative RFR. EONIA, the new repo benchmark, and a new unsecured overnight interest rate could be among the possible alternatives
Switzerland	The National Working Group on CHF Reference Rates	Swiss Average Rate Overnight (SARON)	SIX Swiss Exchange	Secured	Currently being published	• Became the reference interbank overnight repo on 25 August 2009 • Secured rate that reflects interest paid on interbank overnight repo
Japan	Study Group on Risk-Free Reference Rates	Tokyo Overnight Average Rate (TONA)	Bank of Japan	Unsecured	Currently being published	• Fully transaction-based benchmark for the robust uncollateralized overnight call rate market • The Bank of Japan calculates and publishes the rate on a daily basis, using information provided by money market brokers known as Tanshi • As an average, weighted by the volume of transactions corresponding to the rate

[redacted]

		Slides:
6b	UK Working Group on Sterling Risk-Free Rates	34 – 37

6b. UK Working Group on Sterling Risk-Free Rates

Graphical timeline

The timeline below provides an overview of the IBOR-related milestones to date.

- Significant progress has been made since the G20 commissioned the FSB to review systemically important benchmark rates in 2013
- The Bank of England (the Bank) convened the Working Group on Sterling Risk-Free Reference Rates (the Group) (March 2015)
- The Group recommended reformed SONIA as the preferred alternative RFR (April 2017)
- The FCA announced it would no longer persuade or compel banks to make LIBOR submissions from the end of 2021 (July 2017)
- The Bank announced that reformed SONIA, which will include an expanded scope of transactions, will commence publication on 23 April 2018 (October 2017)

2013

Feb 2013
G20 commissioned the FSB to review and reform major interest rate benchmarks

Jun 2013
Official Sector Steering Group (OSSG) was established

Jul 2013
IOSCO Principles for Financial Benchmarks were published

2014

Jul 2014
FSB OSSG published its report on interest rate benchmark reform

Jul 2014
MPG published its *Final Report on Reforming Interest Rate Benchmarks*

2015

Mar 2015
The Bank convened the Group to identify the preferred GBP alternative RFR

Jul 2015
The Bank announced its plans to reform SONIA

2016

May 2016
The Group published an interim report that outlined progress since mobilization and go-forward objectives

Dec 2016
The Bank published a letter to the Group detailing progress and responsibilities

2017

Mar 2017
The Bank presented the final design of reformed SONIA

Apr 2017
The Group recommended SONIA as its preferred alternative RFR

Jul 2017
Andrew Bailey said that he and his colleagues had spoken to all the current panel banks about agreeing voluntarily to sustain LIBOR until end-2021

Oct 2017
Reformed SONIA will take effect on 23 April 2018

Nov 2017
The FCA issued a statement saying "All of the 20 panel banks have provided their support… until the end of 2021[1]"

6b. UK Working Group on Sterling Risk-Free Rates
Objectives and Deliverables

The Group was established to identify and implement a preferred alternative RFR in the United Kingdom.

The Group was convened by the Bank of England in March 2015 with the primary focus of identifying and implementing a preferred alternative RFR. Until the start of 2018, the private sector group and its voting members comprised senior subject-matter experts (SMEs) from 16 major GBP swap dealers. Over the last two years, the Group conducted detailed analysis and engaged a wide range of stakeholders to assess alternative RFRs. Starting in January 2018, the Group mandate and membership was extended to promote a broad-based transition to SONIA over the next four years across sterling bond, loan and derivative markets.

Chair – private sector
François Jourdain (Barclays)

Working Group membership
Working Group advisory members, and representatives from ISDA, LCH Ltd., the Bank and the FCA

Subgroups	Objectives of work
Futures	• Agree upon and publish a possible specification for SONIA referencing futures contract(s) to be traded on electronic trading platform(s), which facilitates the transition away from GBP LIBOR and maximizes usage across a broad set of market participants • Consider mechanisms to ensure that the SONIA futures contract achieves critical liquidity
Term reference rate	• Identify and assess relevant potential use cases for term SONIA market reference rates and the significance of each rate • Identify and review potential data inputs and calculation methodologies for term SONIA reference rates • Make recommendations about whether, for which applications and for what tenors term SONIA reference rates may be appropriate Propose measures with the aim of avoiding systemic reliance on these indices • Agree on design criteria for potential administrators and data providers to develop term reference rates
Pensions and insurance adoption	• Focus on promoting strategies to adopt SONIA and to convert legacy products • Publish key recommendations for wider consultation to facilitate broader transparency regarding their work
Bonds	• Focus on benchmark transition issues in bond markets
Syndicated loans	• Focus on benchmark transition issues in loan markets

The Group's new mandate is to catalyze a broad based transition to SONIA over the next four years across sterling bond, loan and derivative markets, so that SONIA is established as the primary sterling interest rate benchmark by end-2021.

For this next phase of work, it is clear that active engagement will be needed from participants across all relevant sectors and markets. Membership of the working group has been broadened to include investment managers, non-financial corporates and other sterling issuers, infrastructure firms and trade associations, alongside banks and dealers.[1]

Contact address of the Group:
RFR.Secretariat@bankofengland.co.uk

[1] Source: Bank and FCA launch next phase of sterling Libor transition work, November 2017.
[2] All references in this page to 'SONIA' are to reformed SONIA.

6b. UK Working Group on Sterling Risk-Free Rates

Rate selection

SONIA was recommended as the GBP alternative RFR.

Evaluation criteria for alternative RFRs:

- Sufficient and reliable market data
- Robustness to changes in market structure
- Appropriate governance and commercial sustainability
- Sensitivity to market conditions and policy rates
- Ease of understanding
- Ease of OIS transition
- Same-day availability of the alternative RFR
- Ability to build a term extension
- Consistency with alternative RFRs across currencies

Range of rates considered based on criteria:

- Overnight unsecured (SONIA)
- Overnight secured (Repurchase Overnight Index Average Rate (RONIA), other secured rate)
- Bank rate (Bank of England Bank Rate)
- Other rates (T-bill, term OIS, composite rates on private money market activity, Bank of England reserves)

In April 2017, the Group identified SONIA as its preferred alternative to GBP LIBOR.

Rationale for SONIA selection:

- Existing market for SONIA-linked swaps, with supporting infrastructure in place
- SONIA is based on actual transactions, with reformed SONIA significantly increasing the volume of underlying transactions (>3-4x current SONIA)
- The Bank serves as the end-to-end administrator
- The current use of SONIA as the alternative RFR for GBP OIS

Characteristics

- SONIA will include an expanded scope of transactions to incorporate overnight unsecured transactions negotiated bilaterally, as well as those arranged with brokers
- The methodology for calculating SONIA has been modified to a trimmed mean, which will be derived from the central 50% of the volume-weighted distribution of rates
- Reformed SONIA is highly correlated to current SONIA, averaging slightly over 1 basis point lower[1]

Rates production

- SONIA will also be published with summary statistics to accompany the daily publication of the rate, consisting of the 10th, 25th, 75th and 90th volume-weighted percentile rates, as well as aggregate volumes

Publication

- The target publication time is 09:00 on the following London business day
- SONIA will continue to be published by Bloomberg and Thomson Reuters

Governance

- A SONIA Oversight Committee is being established to provide review and challenge to the administration of the benchmark
- The SONIA benchmark will be effective on 23 April 2018. The Bank of England will continue to serve as the administrator, including calculation and publication of the rate
- The rate will be supported by the Stakeholder Advisory Group, which will comprise SONIA stakeholders, including market infrastructure providers, reporters to the Sterling Money Market daily data collection, interdealer brokers, and other users of the SONIA benchmark. This subgroup will assist with assessing the benchmark and ensuring that the methodology appropriately measures the underlying interest

[1] Source: Bank of England official website.
[2] All references in this page to 'SONIA' are to reformed SONIA.

6b. UK Working Group on Sterling Risk-Free Rates

SONIA proposed transition plan

The UK Group's mandate was extended in January 2018 to support a broad-based transition to SONIA over the next four years.

Transition approach development is underway

- Based on the Group's conclusion that there is broad market-wide support for SONIA, the Group is now considering **the best way to promote the adoption of SONIA**
- The Group is planning a public consultation on term rates in the first half of 2018
- The Group's members think **SONIA futures could be traded within 3 to 6 months**[1], with technology and connectivity issues as the main barriers
- The Bank has previously stated that the **adoption of the alternative RFR** should be a **market-driven process**

Challenges to consider with SONIA Adoption

- **Basis risks** between SONIA and LIBOR
- **Cross-currency hedges**, including consideration of implications and variances between reference rates across jurisdictions (i.e., unsecured vs. secured rate will constitute an additional factor in cross currency basis)
- **Design and use of SONIA** futures contracts
- Identified use cases for **term rates** and potential approach for **forward-looking alternative RFR**
- Mechanism for **migrating legal contract and securities (especially bonds and loans) to SONIA**

SONIA transition timeline

2018 | 2019 | 2020 | 2021

Reconstituted Working Group on Sterling RFR (2018 Q1)

SONIA reforms **implemented** (2018 Q2)

Reconstituted RFR Working Group, in operation since January 2018, will discuss key transition metrics, timeline and milestones

FCA to **stop sustaining LIBOR submissions** (2021 Q4)

Q1 Q2 Q3 Q4 > Q1 Q2 Q3 Q4 > Q1 Q2 Q3 Q4 > Q1 Q2 Q3 Q4

[1] Please see 6 October 2017 meeting minutes for more information (Source: Bank of England official website)

[2] All references in this page to 'SONIA' are to reformed SONIA.

[redacted]

Slides:

6c US Alternative Reference Rates Committee (ARRC) 39 – 42

6c. US Alternative Reference Rates Committee (ARRC)

Graphical timeline

The timeline below provides an overview of the IBOR-related milestones to date.

The establishment of the ARRC provided the foundation for benchmark reform in the US, leading to the selection of a broad Treasuries repo financing rate (SOFR) as the preferred alternative RFR in June 2017.

2013

Feb 2013
G20 commissioned the FSB to review and reform major interest rate benchmarks

Jun 2013
OSSG was established

Jul 2013
IOSCO Principles for Financial Benchmarks were published

2014

Jul 2014
FSB OSSG published report on interest rate benchmark reform

Jul 2014
MPG published its *Final Report on Reforming Interest Rate Benchmarks*

Nov 2014
FRB convened the ARRC

2015

Jan 2015
ARRC delivered detailed work plan

2016

May 2016
ARRC published interim report and consultation

Nov 2016
- ARRC narrowed the list of potential replacement rates[1]
- The ARRC established an advisory group of end users

2017

Jun 2017
ARRC recommended SOFR as the preferred alternative rate to USD LIBOR

Dec 2017
FRB announced final plans for the production of rates based on overnight repo transactions secured by Treasury securities

2018

Q2 2018
Federal Reserve Bank of New York (FRBNY) is expected to publish SOFR

[1] The ARRC considers the Overnight Bank Funding Rate (OBFR) and an overnight Treasury general collateral repo rate to be the two leading alternatives.

6c. US Alternative Reference Rates Committee (ARRC)

Objectives and deliverables

The ARRC was convened by the Federal Reserve to lead financial benchmark reform efforts in the United States.

The ARRC was convened to identify a set of alternative RFRs that are more firmly based on transactions from a robust underlying market and comply with standards such as the IOSCO Principles, as well as an adoption plan to facilitate the acceptance and use of these alternative RFRs. SOFR was selected as the preferred alternative RFR.

Chair – private sector
Sandra O'Connor (JP Morgan Chase)
Secretariat – Federal Reserve

ARRC institutional membership[1,2]
US regulators and policymakers, ARRC member firms, advisory group and key industry associations[3]

ARRC deliverables include

1. Identify best practices for alternative reference rates

Consider the range of existing and potential alternative RFRs and identify one or more alternative RFRs that are IOSCO compliant and would represent the best practice for use in terms of new derivatives and other contracts

2. Develop an adoption plan

Identify the factors that would either facilitate or impede the adoption of the alternative RFRs

3. Create an implementation plan with metrics of success

Identify observable metrics that reflect the successful adoption of alternative reference rates and a plan for firms to achieve such adoption

Contact address of the Working Group:
arrc@ny.frb.org

[1] ARRC firms include 15 major banks (sell-side dealers) with voting rights and 5 non-voting members. The ARRC's Advisory Group was established to solicit feedback from a broad range of market participants and consists of 15 members representing corporations, insurance firms, asset managers, pension funds and GSEs. Representatives of the Federal Reserve and other US regulatory agencies serve as ex-officio members of the Working Group.
[2] The ARRC presented an expansion to more directly address cash products. Membership to include banks, dealers, CCPs, buy-side and end-users; cash products include FRN, business loan/CLOs, securitizations (MBS, CMBS and ABS), and mortgages/consumer loans.
[3] Key industry associations are observers.

6c. US Alternative Reference Rates Committee (ARRC)
Rate selection

SOFR was recommended as the USD alternative RFR.

Evaluation criteria for alternative RFRs:

- Benchmark quality, integrity and continuity of the rate
- Methodological quality satisfies soundness and robustness requirements of the IOSCO Principles
- Accountability to ensure the process is in compliance with the IOSCO Principles
- Governance to promote the integrity of the benchmark
- Ease of implementation to facilitate the transition to the rate

Range of rates considered based on criteria:

- Overnight unsecured lending rates
- Overnight secured repo rates
- Policy rates
- Term unsecured lending rates
- Term OIS rates
- Treasury bill or bond rates

In June 2017, the ARRC identified the SOFR as its preferred alternative to USD LIBOR.

Rationale for SOFR selection:

- Depth of the underlying market and its likely robustness over time
- The rate's usefulness to market participants
- The rate's construction, governance and accountability would be consistent with the IOSCO Principles for Financial Benchmarks

Characteristics

- Fully transaction-based
- Encompasses a robust underlying market
- Overnight, nearly risk-free reference rate that is correlated with other money market rates
- Covers multiple repo market segments, allowing for future market evolution
- The FRBNY proposes to use a volume-weighted median as the central tendency measure for SOFR and to publish summary statistics to accompany the daily publication of the rate

Publication

- SOFR will begin publication in the first half of 2018
- The target publication time for SOFR and its summary statistics would be each morning at 8:30 ET the following day
- SOFR would only be revised on a same-day basis, and only if the updated data would result in a shift in the volume-weighted median by more than 1 basis point

Governance

- SOFR's administrator, the FRBNY plans to publish an IOSCO statement of compliance covering SOFR in the first half of 2018

6c. US Alternative Reference Rates Committee (ARRC)

SOFR proposed transition plan

The ARRC formulated an initial, proposed transition strategy, “The Paced Transition,” which is aimed to move from the Effective Federal Funds Rate (EFFR) to SOFR. Additional steps would be necessary to ultimately transition from USD LIBOR to SOFR.

Trading in futures and cleared OIS referencing the new rate:

1. Infrastructure for futures and/or OIS trading in SOFR is put in place by ARRC members
2. Trading begins in futures and/or bilateral, uncleared, OIS that reference SOFR
3. Trading begins in cleared OIS that reference SOFR in the current (EFFR) PAI and discounting environment

Transitioning the key uses of EFFR in the market:

1. CCPs begin allowing market participants a choice between clearing new or modified swap contracts (swaps paying floating legs benchmarked to EFFR, LIBOR and SOFR) into the current PAI/discounting environment or one that uses SOFR for PAI and discounting
2. CCPs no longer accept new swap contracts for clearing with EFFR as PAI and discounting except for the purpose of closing out or reducing outstanding risk in legacy contracts that use EFFR as PAI and discount rate. Existing contracts using EFFR as PAI as the discount rate continue to exist in the same pool, but would roll off over time as they mature or are closed out

Term fixings:

1. Creation of a term reference rate based on SOFR-derivatives markets once liquidity has developed sufficiently to produce a robust rate

Regulatory approval for CCPs to clear futures contracts and cleared OIS referencing the new rate would be required.

Subgroups	Objectives of work
Market structures	• Examine key issues for a number of derivatives products that are expected to reference SOFR, including futures, FRAs, overnight index swaps, basis swaps, cross-currency swaps and options
Regulatory issues	• Identify any potential hurdles to implementation posed by the current regulatory structure, such as concerns that signing an ISDA protocol to transition legacy USD LIBOR trades to SOFR could trigger requirements to post margin on legacy trades
Term rate	• Investigate the feasibility of eventually creating a term reference rate
Several products	• Address unique issues related to FRN business loans, securitizations, mortgages and other consumer loans
Legal	• Stand ready to answer questions generated by the other subgroups related to legacy contracts and other issues

[redacted]

6d. Europe Working Group on Risk-Free Reference Rates
Graphical timeline

The timeline below provides an overview of the IBOR-related milestones to date.

- Financial Services Market Authority (FSMA), European Securities and Markets Authority (ESMA), the European Central Bank (ECB) and the European Commission announced the launch of a new Working Group tasked with identification and adoption of an alternative RFR to be potentially referenced by a variety of financial instruments and contracts in the euro area
- EONIA, a new repo benchmark and a new unsecured overnight rate could be among the possible alternatives

2013

Feb 2013
G20 commissioned the FSB to review and reform major interest rate benchmarks

Jun 2013
OSSG was established

Jul 2013
IOSCO principles for financial benchmarks published

2014

Jul 2014
MPG published final report on reforming interest rate benchmarks

Jul 2014
FSB OSSG published a report on interest rate benchmark reform

2015

2016

Jun 2016
BMR published in the *Official Journal*, and the EU critical benchmark regime takes effect

Aug 2016
EURIBOR defined as a critical benchmark

2017

Jun 2017
EONIA defined as a critical benchmark

Sep 2017
Launch of a new Working Group tasked with identification and adoption of an alternative RFR

6d. Europe Working Group on Risk-Free Reference Rates

Objectives and deliverables

FSMA, ESMA, ECB and the European Commission announced the launch of the Working Group on Risk-Free Reference Rates for the Euro Area (WG on Euro RFR) in September 2017.

The WG on Euro RFR, chaired by a private sector representative and the Secretariat to be provided by the ECB will be tasked with the identification and adoption of an alternative RFR, will regularly consult market participants and end users, as well as gather feedback from other public authorities. Once the WG on Euro RFR has made a recommendation on its preferred alternative RFR, the group will also work on the alternative RFR's adoption.

Secretariat provided by the ECB

WG on Euro RFR institutional membership
Private sector members, European authorities (Commission, ESMA, FSMA and ECB) and observers

Objectives of work

- Identification and adoption of a risk-free overnight rate, which will serve as a basis for an alternative to current benchmarks
- Minimize disruption to markets and consumers
- Safeguard the continuity of contracts
- Facilitate a gradual reduction of the current reliance on the IBORs

Working Group deliverables include

1. Evaluation of three major reference rate options	2. New reference rate selection	3. Transition approach	4. Timeline and transition plan
The WG on Euro RFR is considering EONIA, a new euro unsecured overnight interest rate and a repo benchmark as options for a potential alternative RFR for the Eurozone	*Deliver recommendation for preferred alternative risk-free rates*	*Deliver recommendation for possible transition approaches to ensure a smooth transition to the selected rates*	*Define timeline and transition plan that aims to minimize disruption to markets and consumers and safeguard the continuity of contracts to the greatest extent possible*

[redacted]

6e. Switzerland NWG on CHF Reference Rates
Graphical timeline

The timeline below provides an overview of the IBOR-related milestones to date.

- The National Working Group on CHF Reference Rates (NWG) has been involved in the transition of two separate rates: TOIS fixing, which was an overnight rate whose publication ceased on 29 December 2017, and CHF LIBOR
- The NWG provides the foundation for transition, leading to the confirmation of SARON as the substitute for TOIS fixing in January 2016 and as the alternative to CHF LIBOR in October 2017
- The focus moving forward will be on the transition from CHF LIBOR to SARON. TOIS fixing was terminated on 29 December 2017. The development of a transition approach and timeline is planned for 2018

2013

2013
Establishment of the NWG

Feb 2013
G20 commissioned the FSB to review and reform major interest rate benchmarks

Jun 2013
OSSG was established

Jul 2013
IOSCO Principles for Financial Benchmarks published

2014

2014
NWG concluded that TOIS fixing market liquidity was insufficient for transaction-based fixing

Jul 2014
FSB OSSG published report on interest rate benchmark reform

Jul 2014
MPG published final report on reforming interest rate benchmarks

2015

2015
NWG established another subgroup, called the subgroup for alternative CHF reference rates (ARR), to evaluate the viability of TOIS fixing and ways to strengthen SARON

2016

Jan 2016
NWG decided that TOIS fixing was not the preferred choice and announced transfer of effort from reforming TOIS fixing to transitioning to SARON

Nov 2016
Termination of TOIS fixing announced

2017

Sep 2017
LCH removed outstanding SwapClear contracts with reference to TOIS fixing

Oct 2017
- SARON recommended as the alternative to CHF LIBOR
- First SARON swaps cleared

Dec 2017
Eurex removed all outstanding TOIS fixing contracts

6e. Switzerland NWG on CHF Reference Rates
Objectives and deliverables

The NWG and subgroups are collaborating to enhance CHF Reference Rates transition plan.

The NWG was established in 2013. The group mandate has evolved from enhancing TOIS fixing to implementing SARON as the alternative for CHF LIBOR.

Co-Chair – public sector
Marcel Zimmermann (Swiss National Bank)
Co-Chair – private sector
Martin Bardenhewer (Zürcher Kantonalbank)

NWG institutional membership
The Swiss Financial Market Supervisory Authority (FINMA), Swiss National Bank (SNB), Swiss public and private sector are represented.

Subgroups	Objectives of work
Loan and deposit market	• Examine CHF LIBOR-based product types and dependencies with a focus on loans and deposits
Derivatives and capital market	• Examine CHF LIBOR-based product types and dependencies with a focus on derivatives and capital market instruments

NWG deliverables include

1. **Identify new reference rate and best practices for SARON**
   Identify new reference rate to substitute TOIS fixing and CHF LIBOR; develop recommendations for new rate governance, methodology and fallback solutions
2. **Develop transition plan from TOIS fixing to SARON**
   Timeline and approach to terminate TOIS fixing in 2017 and adopt SARON
3. **Examine CHF LIBOR based product types and dependencies**
   Examine product types that reference CHF LIBOR in the loan and deposit market and the derivatives and capital market; examine dependencies between these products
4. **Develop timeline and transition plan from CHF LIBOR to SARON**
   Define approach and timeline to transition from CHF LIBOR to SARON

Official website of the Working Group:
Swiss National Bank (SNB) - Reform of reference interest rates

6e. Switzerland NWG on CHF Reference Rates

Rate selection

SARON was recommended as the CHF alternative RFR to CHF LIBOR.

Evaluation criteria for alternative RFRs:

- Follow IOSCO principles
- Fixed with the highest possible level of transparency
- Based on large, liquid markets that are hard to manipulate
- Strong governance
- Simple solution
- Mechanisms should be in place for findings even when market liquidity is low and transactions sparse

Range of rates considered based on criteria:

- TOIS fixing
- Repo – Swiss Average Rates (SAR)
- OIS
- FX swap implied
- Panel fixing in Zurich (ZIBOR)
- Commercial paper
- Futures-based curve

In October 2017, the NWG selected SARON as the Swiss alternative RFR to substitute CHF LIBOR.

Rationale for SARON selection:

- Most liquid segment of the CHF money market
- Based on actual transactions and binding quotes
- Adheres to the IOSCO principles
- Negative outcomes from analysis of alternative unsecured overnight rates

Characteristics

- SARON is a secured rate that reflects interest paid on interbank overnight repo
- SARON was established as the reference interbank overnight repo on 25 August 2009
- SIX Swiss Exchange administers SARON

Rates production

- The Swiss Average Rates, of which SARON is the overnight rate, are ongoing, volume-weighted readings based on the transactions concluded and reference prices posted on the given trading day
- The reference price is calculated on the basis of tradable quotes in the order book of the SIX Repo Ltd electronic trading platform, provided the quotes lie within the parameters of the quote filter
- The quote filter is parameterized in a way that minimizes the possibilities of manipulation

Publication

- The Swiss Reference Rates (SRR) comprise the SAR and the Swiss Current Rates (SCR), covering a term spectrum ranging from overnight to 12 months. The first publication takes place at 8:30 a.m., and the last at the end of the trading day (6 p.m. at the earliest). SIX Swiss Exchange calculates and publishes the reference rates

Governance

- SIX Swiss Exchange (SSX) is the administrator of the SRR, which is a set of reference rates that includes SARON as the overnight rate
- The SRR Index Commission is an advisory body that reviews all aspects of the SRR. The composition of the committee includes subject matter experts of market participants, the SNB, SIX Repo Ltd., potential users of SSR as benchmarks and SSX

[redacted]

6f. Japan Study Group on Risk-Free Rates

Graphical timeline

The timeline below provides an overview of the alternative RFR-related milestones to date.

- Following the FSB mandate to review systemically important benchmark rates in 2013, market participants in Japan have taken a number of steps toward identifying and establishing a JPY alternative RFR
- The Study Group on Risk-Free Reference Rates (the Study Group), including its sub-Working Groups, mobilized quickly beginning in April 2015
- Following the Study Group's public consulting in March 2016, TONA was confirmed as the JPY alternative RFR in December 2016

2013

Feb 2013
G20 commissioned the FSB to review and reform major interest rate benchmarks

Jun 2013
OSSG was established

Jul 2013
IOSCO principles for financial benchmarks published

2014

May 2014
FSA amended the Financial Instruments and Exchange Act to set out general supervisory measures for financial benchmarks in Japan

Jul 2014
FSB OSSG published report on interest rate benchmark reform

Jul 2014
MPG published final report on reforming interest rate benchmarks

2015

Apr 2015
BOJ established Study Group to identify the preferred JPY alternative RFR

Dec 2015
Two sub-Working Groups were established: one to analyze the structure of the derivatives market and the other to develop measures to improve the OIS market in Japan

2016

Mar 2016
Study Group published public consultation summarizing findings, and requests comments from industry groups

Oct 2016
GC Repo sub-Working Group published a final report identifying two possible GC repo rates; based on the report, the Study Group determined that the GC repo benchmark will not be selected as the JPY alternative RFR

Dec 2016
Study Group identified TONA as the JPY risk-free rate

2017

Jan 2017
Sub-Working Group was established to focus on expanding use of TONA as the alternative RFR, specifically regarding OIS reforms and other transition needs

Jun 2017
BOJ established a code of conduct to improve TONA submission

6f. Japan Study Group on Risk-Free Rates
Objectives and deliverables

The Study Group was convened to lead financial benchmark reform efforts in Japan.

The Study Group was convened to identify JPY risk-free reference rates and to promote the identified alternative RFR. The Study Group deliberates on the administrators of potential alternative RFRs and issues related to the expected use, including market practices and contract design. The Study Group consists of senior experts from financial institutions that are potential alternative RFR users, ISDA, the JBA, Japan Securities Dealers Association (JSDA) and Tokyo Financial Exchange (TFX). Additionally, members from the BOJ and JFSA attend as observers.

Chair – Takeshi Ogura (Bank of Tokyo-Mitsubishi UFJ)
Vice Chair – Shigeru Hashimoto (Nomura Securities)

Study Group members and observers
Study Group firms, key industry associations and Japan regulators and policymakers

Subgroups	Objectives of work
Working group on market structure analysis	• Established prior to TONA selection with a mandate to examine the structure of derivatives market to understand the proportion of Japanese yen interest rate swap transactions for which the use of an alternative RFR is suitable
Working group on market infrastructure development	• Established prior to TONA selection with a mandate to develop measures to improve the OIS market for the purpose of promoting the use of alternative RFRs in derivatives market
Working group on GC repo reform	• Established prior to TONA selection with a mandate to discuss the characteristics of the repo rate that could be used as a risk-free rate; the Study Group has determined that the GC repo rate cannot be identified as a JPY alternative RFR, but will continue to follow developments on potential reform
Working group on use of risk-free rate	• Established after TONA selection with a mandate to consider and develop the necessary market convention revisions that would be needed to improve ease of use for OIS referencing TONA, as well other reforms such as end-user outreach

Study Group deliverables include

1. **Identify best practices for alternative reference rates**
   Consider the range of potential alternative RFRs and identify an alternative RFR(s) that would represent best practice for use in derivatives contracts
2. **Identify market convention reform to increase TONA use**
   Identify necessary market convention reforms to create a liquid market for OIS that will enable transition from IBOR referencing derivatives to OIS
3. **Develop an adoption plan**
   Identify the factors that would either facilitate or impede the adoption of TONA, including OIS reform, but also other factors
4. **Implementation plan and monitor adoption in the IRS market**
   Implement adoption plan and monitor the IRS market to track success in transitioning to the use of OIS

Contact address of the Working Group:
post.fmd33@boj.or.jp

6f. Japan Study Group on Risk-Free Rates

Rate selection

TONA was selected as the JPY alternative RFR.

Evaluation criteria for alternative RFRs:

- Risk-free nature of the rate
- Depth of the uncollateralized overnight call market underlying the rate
- Ease of use in financial transactions (particularly derivatives transactions)

Range of rates considered based on criteria:

- TONA
- GC repo rate
- Secured call rate
- T-bill rate
- OIS rate

In December 2016, the Study Group identified the TONA as its preferred JPY alternative RFR benchmark.

Rationale for TONA selection:

- Risk-free nature of the rate. Unsecured, but overnight, so limited credit risk component
- Depth of the underlying market. Considerable transaction volume and diversity of participants
- Ease of use. The BOJ administers TONA and it is referenced in certain financial transactions:
  - OIS transactions
  - Credit support annexes (CSAs) – Interest payment calculations for cash collateral
  - Japan Securities Clearing Corp IRS – Interest payment calculation on variation margin

Characteristics

- TONA is an unsecured, transaction-based benchmark for the robust uncollateralized overnight call rate market
- The BOJ calculates and publishes TONA on a daily basis using information provided by money market brokers known as Tanshi
- As an average, TONA is weighted by the volume of transactions corresponding to the rate

Rates production

- Current framework for TONA calculation and publication is expected to be maintained
- The Study Group launched a Working Group in January 2017 to deliberate on measures to expand the use of TONA. In 2018, the Study Group will focus primarily on how to implement the OIS market convention reform, and also on other reforms such as end-user outreach
- Discussion in the Working Group is ongoing

Publication

- TONA is published every business day in BOJ’s Statistics on Call Money Market. This includes the overnight uncollateralized call rate average (TONA), volumes of uncollateralized overnight call transactions, as well as uncollateralized and collateralized call rates across other tenors
- Provisional results are published at 17:15 during the current business day, and final results are published at 10:00 the following business day

Governance

- The BOJ is the TONA administrator and governs the process through a code of conduct and terms of use (est. 14 June 2017)
- The BOJ improved its publication of the rate in January 2017 to include more detailed data such as transaction volumes and outstanding amounts related to the rate

[redacted]

7a. Other key benchmark reform initiatives
IOSCO Principles for Financial Benchmarks

- In July 2013, IOSCO published the *Final Report*, which sets out 19 Principles for the operation of financial benchmarks
- The Principles are a set of recommended practices that should be implemented by benchmark administrators and submitters. They provide a framework of standards that administrators should implement according to the specificities of each benchmark
- The Principles are intended to promote the reliability of benchmark determinations. They address benchmark governance and benchmark and methodology quality, as well as accountability mechanisms

Governance

1. **Overall responsibility of the administrator.** The administrator is responsible for all aspects of benchmark determination
2. **Oversight of third parties.** The administrator must have appropriate oversight of third parties involved in determination
3. **Conflicts of interest for administrators.** Document policies and procedures for conflicts of interest
4. **Control framework for administrators.** Implement a control framework for determining and distributing the benchmark
5. **Internal oversight.** Establish an oversight function to review and challenge all aspects of the benchmark determination process

Quality of the benchmark

6. **Benchmark design.** Should seek an accurate and reliable representation of the economic realities of the interest it seeks to measure
7. **Data sufficiency.** Sufficiency and accuracy of data based on prices, rates, indices or values that have been formed by the competitive forces of supply and demand, anchored by observable transactions
8. **Hierarchy of data inputs.** Establish guidelines for data inputs hierarchy and the exercise of expert judgment
9. **Transparency of benchmark determinations.** Describe and publish each benchmark determination
10. **Periodic reviews.** Periodically review the benchmark

Quality of the methodology

11. **Content of the methodology.** Document and publish methodology used for benchmark determination
12. **Changes to the methodology.** Document and publish material changes to the methodology
13. **Transition**. Clear written policies and procedures that address possible cessation of a benchmark
14. **Submitter code of conduct.** Develop guidelines for benchmarks based on submissions
15. **Internal controls over data collection.** Ensure appropriate controls over data collection and transmission processes

Accountability

16. **Complaints procedures.** Establish a written complaints procedures policy
17. **Audits.** Appoint an independent internal or external auditor to review the administrator's adherence to its criteria
18. **Audits trail.** Retain written records for five years
19. **Cooperation with regulatory authorities.** Make relevant documents readily available to regulatory authorities

7a. Other key benchmark reform initiatives
European Benchmarks Regulation (BMR)

The BMR aims to improve governance on benchmark indices used for financial instruments, financial contracts and performance measurement of investment funds.

Regulatory objectives

1. Improve governance and controls over the benchmark process
2. Improve quality of input data and methodologies
3. Ensure adequate controls across contributors to benchmarks and the data they provide
4. Protect consumers and investors

Scope

Applies to benchmarks across a wide variety of products and of all sizes, including IBORs and alternative RFRs, when used in the European Union.

The regulation defines and applies to the following stakeholders:

- Benchmark administrators
- Supervised contributors
- Benchmark users

Impact on IBORs and alternative RFRs used in the EU

- A benchmark may be designated “critical” when the value of contracts underlying the benchmark is at least €500BN or when a benchmark has been recognized as “critical” in a Member State
- EURIBOR and LIBOR have been classified as critical benchmarks
- For critical benchmarks, the maximum period of mandatory contributions from supervised entities shall not exceed 24 months in total

[redacted]

7b. List of abbreviations and acronyms

ABS	Asset-Backed Securities	FRN	Floating rate note	OSSG	FSB Official Sector Steering Group
AFME	Association of Financial Markets in Europe	FSB	Financial Stability Board	OTCD	Over-the-Counter derivatives
ARRC	Alternative Reference Rates Committee (US)	FSMA	Financial Services and Markets Authority	PAI	Price alignment interest (the overnight cost of funding collateral payable in relation to cleared derivatives)
BMR	European Benchmarks Regulation	GC	General collateral (in relation to repos)	Alternative RFR	Alternative nearly risk-free rate
BOE	Bank of England	The Group	The Working Group on Sterling Risk-Free Reference Rates	SARON	Swiss Average Rate Overnight
BOJ	Bank of Japan	IBA	ICE Benchmark Administration Ltd.	SIFMA	Securities Industry and Financial Markets Association
CCP	Central counterparty	IBOR	Interbank Offered Rate – interest rate at which banks lend to and borrow from one another in the interbank market	SIFMA AMG	Securities Industry and Financial Markets Association Asset Management Group
CME	Chicago Mercantile Exchange	ICMA	International Capital Market Association	SNB	Swiss National Bank
ECB	European Central Bank	IOSCO	International Organization of Securities Commissions	SOFR	Secured Overnight Financing Rate
EFFR	Effective Federal Funds Rate	ISDA	International Swaps and Derivatives Association	SONIA	Sterling Overnight Index Average
EMMI	European Money Markets Institute	JBA	Japanese Bankers Association	SRR	Swiss Reference Rates
EONIA	Euro OverNight Index Average	JBATA	JBA TIBOR Administration	TIBOR	Tokyo Interbank Offered Rate
ESMA	European Securities and Markets Authority	JFSA	Japan Financial Services Agency	TONA	Tokyo Overnight Average Rate
ETD	Exchange-traded derivatives	LIBOR	London Interbank Offered Rate	TOIS	Tomorrow/Next Indexed Swaps (Switzerland)
EURIBOR	Euro Interbank Offered Rate	MPG	Market Participants Group, established by the OSSG		
FCA	UK Financial Conduct Authority	NWG	National Working Group on CHF Reference Rates		
FINMA	Swiss Financial Market Supervisory Authority	OBFR	Overnight Bank Funding Rate (US)		
FRB	Federal Reserve Board	OIS	Overnight indexed swap		

[redacted]

7c. Inventory of key document sources (1 of 2)

Document title	Source	Date Published
Wheatley Review of LIBOR	UK Treasury	1 September 2012
IOSCO Principles for Financial Benchmarks	IOSCO	1 July 2013
Market Participants Group on Reforming Interest Rate Benchmarks	FSB	July 2014
Reforming Major Interest Rate Benchmarks (FSB OSSG Report 2014)	FSB	22 July 2014
Interim progress report on implementation of July 2014 FSB recommendations (2015)	FSB	9 July 2015
Progress report on implementation of July 2014 FSB recommendations (2016)	FSB	21 July 2016
The Future of LIBOR (Speech)	FCA	27 July 2017
Progress report on implementation of July 2014 FSB recommendations (2017)	FSB	10 October 2017
FCA statement on LIBOR panels	FCA	24 November 2017
The potential discontinuation of LIBOR and the impact on the syndicated loan market	LMA	21 December 2017
Quarterly Report First Quarter 2018	ICMA	10 January 2018
Minutes of the Working Group on Sterling Risk-Free Reference Rates	BOE	March 2015 – November 2017
SONIA recommended as the sterling near risk-free interest rate benchmark	BOE	28 April 2017
SONIA as the RFR and Approaches to Adoption	BOE	1 June 2017
The Bank and Benchmark Reform - Speech by Chris Salmon	BOE	17 July 2017
Summary responses to white paper questions	BOE	9 November 2017
Bank and FCA launch next phase of sterling Libor transition work	BOE	29 November 2017
Minutes of the Alternative Reference Rates Committee (ARRC)	FRB	December 2016 – August 2017
ARRC Interim Report and Consultation	FRB	20 May 2016
Comments received on the Interim Report	FRB	16 July 2016
The Cleared Bilateral Repo Market and Proposed Repo Benchmark Rates	FRB	27 February 2017
The ARRC Selects a Broad Repo Rate as its Preferred Alternative	FRB	22 June 2017
What's Next for LIBOR and Eurodollar Futures?	CME	14 August 2017
Request for Information Relating to the Production of Rates	FRB	30 August 2017
Fitch: LIBOR Transition Creates Uncertainty for SF Market	Fitch Ratings	7 September 2017
Libor's sunset sees US repo market cast a longer shadow	Risk Magazine	11 September 2017
Links to LIBOR in securitization markets are widespread, but impact of phase-out unclear	Moody's	13 September 2017
With a LIBOR Phase-Out Likely after 2021, How will structured finance ratings be affected?	S&P Global	19 October 2017

7c. Inventory of key document sources (2 of 2)

Document title	Source	Date Published
ARRC Roundtable - Agenda	FRB	2 November 2017
ARRC Roundtable - Introductory remarks by Federal Reserve Board Governor Jerome Powell	FRB	2 November 2017
ARRC Roundtable - Presentation slides by ARRC Chair Sandra O'Connor	FRB	2 November 2017
ARRC Roundtable - Presentation slides and underlying data by Joshua Frost, Federal Reserve Bank of New York	FRB	2 November 2017
ARRC Roundtable - Presentation slides by David Bowman, Federal Reserve Board of Governors	FRB	2 November 2017
Fed's Powell: Libor death is 'big stability risk'	Risk Magazine	8 November 2017
Fed's Powell on Libor reform, repo, and clearing	Risk Magazine	9 November 2017
Federal Reserve Board announces final plans for the production of three new reference rates based on overnight repurchase agreement (repo) transactions secured by Treasury securities	FRB	8 December 2017
Alternative Reference Rates Committee (ARRC) Frequently Asked Questions	FRB	N/A
The EU Benchmarks Regulation	ISDA	6 July 2017
Working Group on a Risk-Free Reference Rate for the Euro area	ESMA	21 September 2017
FSB report highlights Eonia worries	Risk Magazine	10 October 2017
Minutes - 14th Meeting of the Working Group, 27 October 2016	SNB	17 November 2016
Discontinuation of TOIS fixing and replacement with SARON	SNB	22 February 2017
Minutes - 16th Meeting of the Working Group, 15 May 2017	SNB	8 June 2017
Minutes - 17th Meeting of the Working Group, 5 October 2017	SNB	24 October 2017
Output Statement for SARON, administrated by SIX Swiss Exchange	Swiss Exchange	N/A
Minutes of the Study Group on Risk-Free Reference Rates	BOJ	June 2015 – October 2017
Public Consultation on Identification and Use of a Japanese Yen	BOJ	31 March 2016
Feedback Statement on the Public Consultation of a Japanese Yen Risk-Free Rate	BOJ	30 June 2016
Report on the Identification of a Japanese Yen Risk-Free Rate	BOJ	28 December 2016
Release of "Call Money Market Data"	BOJ	28 December 2016
Study Group on Risk-Free Reference Rates Terms of Reference	BOJ	28 April 2015
Uncollateralized Overnight Call Rate Code of Conduct	BOJ	14 June 2017
What is the uncollateralized overnight call rate	BOJ	26 November 2017
How have the Bank's guidelines for money market operations changed	BOJ	26 November 2017
Explanation of "Statistics on Call Money Market"	BOJ	N/A
Terms of Use for the Uncollateralized Overnight Call Rate	BOJ	June 2017