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The End of LIBOR: On Interest Rate Benchmark Reform, Alternative Risk-Free Rates, IBOR Fallbacks, LIBOR Cessation and Transition

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Abstract: The reform of LIBOR by its administrator IBA to a transaction-based benchmark, completed 2019, has not succeeded due to lack of transactions. In July 2017 the UK FCA Chief Bailey prepared the market for the end of LIBOR by end-2021. National working groups have developed alternatives to LIBOR based on overnight Risk-Free Rates. For derivatives linked to LIBOR and other IBORs, ISDA developed an IBOR Fallbacks approach on the basis of term and spread adjusted Risk-Free Rates. Bloomberg started daily calculations of fallback rates for covered IBORs on 21 October 2020. An ISDA supplement and a protocol for new and legacy derivative contracts became effective on 25 January 2021. A future cessation and loss of representativeness for all LIBOR settings was declared by IBA and the FCA on 5 March 2021 triggering an index cessation event under ISDA. Some USD LIBOR settings will cease mid-2023 instead of end-2021. The FCA will use enhanced powers to produce Synthetic LIBOR for some settings in GBP and JPY LIBOR beyond end-2021. The standard-setting bodies IOSCO and FSB are closely following the impact of LIBOR cessation and transition on systemic risk at the global level.

Keywords: 2006 ISDA Definitions, 2021 ISDA Interest Rate Derivatives Definitions, Interest Rate Benchmark Reform, EURIBOR, €STR, fallback rates, IBOR, IBOR Fallbacks Protocol, IBOR Fallbacks Supplement, IOSCO Principles for Financial Benchmarks, LIBOR, LIBOR Cessation, LIBOR Transition, Risk-Free Rates (RFRs), Reference rates, SARON, SOFR, SONIA, Term SONIA Reference Rates (TSRR), TONA.

JEL classification: E43 (Interest Rates: Determination, Term Structure and Effects), G01 (Financial Crises), G15 (International Financial Markets), G18 (Government Policy and Regulation)

I. Interest Rate Benchmark Reform and LIBOR Evolution

I.1 LIBOR Scandal and The Wheatley Review of LIBOR (2012)

The year 2012 saw the uncovering of the worldwide manipulation scandal of interest rate benchmarks like the London Interbank Offered Rate (LIBOR) published by the British Bankers' Association (BBA). Other reference rates like the Euro Interbank Offered Rate (EURIBOR) and the Tokyo Interbank Offered Bank Rate (TIBOR) were affected as well. Some of the panel banks manipulated the submissions of the daily quotes in order to influence the benchmark settings.

After the unveiling of the LIBOR scandal in June 2012, the UK government appointed Martin Wheatley, managing director of the Financial Services Authority (FSA) and Chief Executive of the new Financial Conduct Authority (FCA), to establish an independent review. The Wheatley Review of LIBOR was the seed for all interest benchmark reform efforts by national authorities (FSA/FCA, Bank of England) and international organisations. The final report with a ten-point plan (Table 1) for comprehensive reform was issued in September 2012 (HM TREASURY 2012).

Regulation of LIBOR	1 The authorities should introduce statutory regulation of administration of, and submission to, LIBOR
Institutional reform	2 The BBA should transfer responsibility for LIBOR to a new administrator
	3 The new administrator should fulfill specific obligations as part of its governance and oversight of the rate, having due regard to transparency and fair and non-discriminatory access to the benchmark
The rules governing LIBOR	4 Submitting banks should immediately look to comply with the submission guidelines presented in this report
	5 The new administrator should, as a priority, introduce a code of conduct for submitters
Immediate improvements to LIBOR	6 The BBA and should cease the compilation and publication of LIBOR for those currencies and tenors for which there is insufficient trade data to corroborate submissions
	7 The BBA should publish individual LIBOR submissions after 3 months
	8 Banks, including those not currently submitting to LIBOR, should be encouraged to participate as widely as possible in the LIBOR compilation process
	9 Market participants using LIBOR should be encouraged to consider and evaluate their use of LIBOR
International co-ordination	10 The UK authorities should work closely with the European and international community and contribute fully to the debate on the long-term future of LIBOR and other global benchmarks

Table 1: Ten-point plan for comprehensive reform of LIBOR in the Wheatley Review. Source: HM TREASURY 2012.

The FCA started regulating LIBOR in the UK in April 2013. In 2014 the BBA had to hand over the benchmark administration to the newly appointed ICE Benchmark Administration (IBA).

I.2 IOSCO Principles for Financial Benchmarks (2013)

In January 2013, the International Organization of Securities Commissions (IOSCO) launched a consultation concerning Principles for Financial Benchmarks (IOSCO 2013a). A consultation report was published in April 2013 (IOSCO 2013b) and a final report in July 2013 (IOSCO 2013c). The 19 principles developed by IOSCO's Board Level Task Force on Financial Market Benchmarks relate to governance, quality of the benchmark, quality of the methodology and accountability. The IOSCO Principles are a set of recommended practices that should be implemented by benchmark administrators and submitters. Table 2 gives an overview of the 19 IOSCO Principles.

Governance: to protect the integrity of the Benchmark determination process and to address conflicts of interest	1 Overall Responsibility of the Administrator
	2 Oversight of Third Parties
	3 Conflicts of Interest for Administrators
	4 Control Framework for Administrators
	5 Internal Oversight
Quality of the Benchmark: to promote the quality and integrity of Benchmark determinations through the application of design factors	6 Benchmark Design
	7 Data Sufficiency
	8 Hierarchy of Data Inputs
	9 Transparency of Benchmark Determinations
	10 Periodic Review
Quality of the Methodology: to promote the quality and integrity of methodologies by setting out minimum information that should be addressed within a Methodology	11 Content of the Methodology
	12 Changes to the Methodology
	13 Transition
	14 Submitter Code of Conduct
	15 Internal Controls over Data Collection
Accountability: to establish complaints processes, documentation requirements and audit reviews.	16 Complaints procedures
	17 Audits
	18 Audit Trail
	19 Cooperation with Regulatory Authorities

Table 2: IOSCO Principles for Financial Benchmarks. Source: IOSCO 2013c and 2013d.

The IOSCO Principles were endorsed by the G20 Leaders and the Financial Stability Board at the St. Petersburg G20 summit in September 2013 as global standards (IOSCO 2013d).

In particular, for interest rate benchmarks IOSCO carried out a review of the implementation of the IOSCO Principles by the benchmark administrators of LIBOR, EURIBOR and TIBOR. Table 3 shows the assessment grades (Fully implemented, Broadly implemented, Partly implemented, Not implemented, Not rated) given to the benchmark administrators (IOSCO 2014).

	IOSCO Principle	LIBOR	EURIBOR	TIBOR
Governance	1	Fully	Fully	Fully
	2	Fully	Fully	Broadly
	3	Partly	Fully	Partly
	4	Broadly	Broadly	Broadly
	5	Broadly	Broadly	Broadly

Quality of the Benchmark	6	Partly	Partly	Not implemented
	7	Not rated	Not rated	Not rated
	8	Fully	Fully	Partly
	9	Not implemented	Not implemented	Not implemented
	10	Fully	Fully	Broadly
Quality of the Methodology	11	Broadly	Broadly	Broadly
	12	Broadly	Broadly	Broadly
	13	Partly	Partly	Broadly
	14	Broadly	Broadly	Broadly
	15	Not applicable		
Accountability	16	Broadly	Broadly	Broadly
	17	Broadly	Broadly	Broadly
	18	Broadly	Broadly	Fully
	19	Fully	Fully	Fully

Table 3: Assessment grades on implementation of IOSCO's Principles for Financial Benchmarks for administrators of LIBOR, EURIBOR and TIBOR. Source: IOSCO 2014.

For the IOSCO review team, the assessment of Principle 7 Data Sufficiency posed particular challenges. Principle 7 requires that "the data used to construct a Benchmark determination should be sufficient to accurately and reliably represent the Interest measured by the Benchmark and should a) Be based on prices, rates, indices or values that have been formed by the competitive forces of supply and demand in order to provide confidence that the price discovery system is reliable; and b) Be anchored by observable transactions entered into at arm's length between buyers and sellers in the market for the Interest the Benchmark measures in order for it to function as a credible indicator of prices, rates, indices or values." (IOSCO 2013c). Principle 7 requires sufficient and robust data on the underlying market measured by the relevant benchmark, coupled with data on any other markets on which the benchmark determination process draws, to enable an assessment of the accuracy and reliability of the benchmark. At the time, none of the administrators had provided IOSCO with data or analyses to demonstrate compliance with Principle 7. IOSCO's review team decided not to rate any of the administrators against Principle 7 (IOSCO 2014). A second review with no changes to the assessment grades was carried out in 2015 and published in February 2016 (IOSCO 2016a).

In December 2016 IOSCO published high-level guidance on how administrators of benchmarks should frame their annual statements of compliance with the IOSCO Principles. The statement of compliance should be sufficiently concise for users and stakeholders to quickly understand the administrator's approach. Administrators are expected to explain their use of proportionality in complying with the IOSCO Principles and should also explain any non-compliance (IOSCO 2016b).

I.3 FSB Report on Reforming Major Interest Rate Benchmarks (2014)

The manipulation scandal with LIBOR and other benchmarks undermined confidence in the reliability and robustness of major reference rates. This created a source of vulnerability and systemic risk. In February 2013, the G20 asked the Financial Stability Board (FSB) to perform a review of major interest rate benchmarks and to draw out plans for reform. The FSB established a high-level Official Sector Steering Group (OSSG) of regulators and central banks. The OSSG was assigned responsibility for coordinating and maintaining the consistency of reviews of existing interest rate benchmarks and for guiding the work of a Market Participants Group (MPG), which in turn was tasked to examine the feasibility and viability of adopting additional reference rates and potential transition issues.

In July 2014, the FSB published the report "Reforming Major Interest Rate Benchmarks" (FSB 2014) with a focus on the most widely used IBORs (LIBOR, EURIBOR and TIBOR). The 2014 Report recommends a multiple-rate approach:

- Strengthening existing IBORs and other reference rates based on unsecured bank funding costs by underpinning them to the greatest extent possible to transaction data ("IBOR+").
- Developing alternative, nearly risk-free reference rates (RFRs). Members of the MPG believe that there are certain financial transactions e.g. derivatives that are better suited to the application of nearly risk-free reference rates.

Starting point for any robust reference rates should be the IOSCO Principles for Financial Benchmarks.

In July 2016 the FSB OSSG formally launched a third major initiative: Developing fallback rates to improve contract robustness to address risks of discontinuation of widely-used interest rate benchmarks. The FSB OSSG invited the International Swaps and Derivatives Association (ISDA) to lead this work on derivatives.

Since the issuing of the FSB 2014 Report with recommendations, the FSB has published reports on a yearly basis concerning the progress made in implementing the recommendations (FSB 2015, 2016, 2017, 2018b and 2019b).

FSB member authorities in certain jurisdictions have moved away from a multiple rate approach (IBOR+ and RFR). In the case of LIBOR, the lack of wholesale unsecured funding markets is seen as a fundamental problem. There is a risk that LIBOR would end once official sector support was withdrawn end-2021. There is also the risk that LIBOR could be found not to be representative of its underlying market. FSB member authorities considered the transition away from LIBOR to be necessary (FSB 2018b).

The continued reliance of global financial markets on LIBOR poses risks to financial stability. There was a common view across FSB member jurisdictions that overnight RFR should be encouraged across the markets and that contracts referencing IBORs should have robust fallbacks (FSB 2019b).

I.4 LIBOR Evolution

In the aftermath of the LIBOR and EURIBOR scandals significant efforts were undertaken by benchmark administrators, regulators and standard-setting bodies to reform interest rate benchmarks. In particular, the standard-setting bodies International IOSCO and FSB recommended that the daily submissions by the panel banks should be anchored to actual transactions in the wholesale funding market (IOSCO 2013, p. 20; FSB 2014, p. 59).

Between 2016 and 2019 ICE Benchmark Administration (IBA), the newly appointed administrator of LIBOR, carried out a reform. The goal of the "ICE LIBOR Evolution" project was to develop a transaction-based LIBOR to the greatest extent as possible under a waterfall methodology (IBA 2016, 2017, 2018a, 2018b, 2019a, 2019b and 2019c). The transition to the reformed benchmark pursuant to the ICE LIBOR Output Statement from April 2018 (IBA 2018a) took place between 25 April 2018 and 1 April 2019. The panel banks switched to the new methodology sequentially in order to minimise operational and technology risk (IBA 2019c).

II. The Beginning of the End of LIBOR and Alternative Risk-Free Rates

II.1 Bailey's July 2017 End of LIBOR Speech

On 27 July 2017 the Chief Executive of the FCA, Andrew Bailey, gave an important speech about the future of LIBOR at the London office of the financial data and analytics service provider Bloomberg. Due to an ongoing lack of liquidity in the interbank money market, he saw no future for LIBOR. Therefore, he proposed an expected run-off by end-2021 ("LIBOR Cessation") and urged the market to begin work on a transition away from LIBOR ("LIBOR Transition") to other reference rates (FCA 2017a).

Before the successful completion of the LIBOR Evolution, the FCA observed that activity in the wholesale money markets for 3, 6 and 12 months in the remaining five LIBOR currencies (GBP, USD, EUR, CHF, JPY) was so limited, that the UK regulators had little hope of truly reforming LIBOR into a transaction-based interest rate benchmark. At the same time, the size of LIBOR panels (Table 4) had been decreasing because of the burden and risks for the submitting banks. FCA Chief Executive Bailey feared that a continued panel exodus would make the LIBOR rates less representative and robust. As a matter of fact, the FCA had been persuading the remaining LIBOR panel banks to stay in order to avoid an unplanned disappearance of LIBOR.

	Panel Bank	**USD**	**GBP**	**EUR**	**CHF**	**JPY**
1	Bank of America N.A. (London Branch)	Yes				
2	Barclays Bank plc	Yes	Yes	Yes	Yes	Yes
3	BNP Paribas SA (London Branch)		Yes			
4	Citibank N.A. (London Branch)	Yes	Yes	Yes	Yes	
5	Cooperatieve Rabobank U.A.	Yes	Yes	Yes		
6	Crédit Agricole Corporate & Investment Bank	Yes	Yes			
7	Credit Suisse AG (London Branch)	Yes		Yes	Yes	
8	Deutsche Bank AG (London Branch)	Yes	Yes	Yes	Yes	Yes
9	HSBC Bank plc	Yes	Yes	Yes	Yes	Yes
10	JPMorgan Chase Bank, N.A. (London Branch)	Yes	Yes	Yes	Yes	Yes
11	Lloyds Bank plc	Yes	Yes	Yes	Yes	Yes
12	Mizuho Bank, Ltd.		Yes	Yes		Yes
13	MUFG Bank, Ltd	Yes	Yes	Yes	Yes	Yes
14	National Westminster Bank plc	Yes	Yes	Yes	Yes	Yes
15	Royal Bank of Canada	Yes	Yes	Yes		
16	Santander UK Plc		Yes	Yes		
17	SMBC Bank International plc	Yes				Yes
18	Société Générale (London Branch)		Yes	Yes	Yes	Yes
19	The Norinchukin Bank	Yes				Yes
20	UBS AG	Yes	Yes	Yes	Yes	Yes
	Totals	**16**	**16**	**15**	**11**	**13**

Table 4: LIBOR panel banks since 2017. All currency panels are expected to remain as currently constituted for all LIBOR settings until end-2021. National Westminster Bank plc is expected to leave the USD panel after end-2021. Source: IBA https://www.theice.com/iba/libor.

According to Bailey, a transition to new reference rates would be less risky and less expensive if it was planned and orderly. To that purpose, an agreement was struck between the FCA and the remaining 20 LIBOR panel banks to sustain LIBOR until end-2021. This was publicly announced in November 2017 (FCA 2017b). From 2022 it would no longer be necessary for the FCA to persuade or compel panel banks to make rate submissions. The set date end-2021 was near enough to focus market participants on preparations for a transition, but far enough to avoid excessive risks and costs of a sudden cessation.

Bailey delivered further public speeches on the transition to a world without LIBOR (FCA 2018a and 2019b; Bank of England 2020 and 2021c). In 2018 he reiterated that the financial market should expect a cessation of LIBOR by end-2021 as a base case assumption. Even if

LIBOR did continue for a further period it might not pass regulatory tests of representativeness and might not be usable in new contracts (FCA 2018a). In September 2018 the UK regulators FCA and the Prudential Regulatory Authority (PRA) wrote to the Chief Executive Officers of major banks and insurance companies supervised in the UK ("Dear CEO LIBOR letter") asking them for the preparations and actions taken to manage transition from LIBOR to alternative interest rate benchmarks (FCA 2018b).

II.2 Working Groups Looking for Alternatives to LIBOR

After Bailey's July 2017 speech to prepare for the end of LIBOR, national public-private working groups were established for the five LIBOR currencies in the corresponding jurisdictions. One of the first tasks of these working groups was to identify an appropriate alternative overnight rate for wholesale loans in the corresponding jurisdiction (Table 5).

Jurisdiction	**United States**	**United Kingdom**	**Euro area**	**Switzerland**	**Japan**
Currency	USD	GBP	EUR	CHF	JPY
Working Group	Alternative Reference Rates Committee (ARRC)	Working Group on Sterling Risk-Free Reference Rates (RFRWG)	Working-Group on Risk-Free Rates for the Euro Area	The National Working Group on CHF Reference Rates	Study Group on Risk-Free Reference Rates
Alternative overnight Risk-Free Rate (RFR)	Secured Overnight Financing Rate (SOFR)	Sterling Overnight Index Average (SONIA)	Euro short-term rate (€STR)	Swiss Average Rate Overnight (SARON)	Tokyo Overnight Average Rate (TONA)
Publication Timing	Next business day, around 8:00 local time	Next business day at 9:00 local time	Next business day by 9:00 local time in Frankfurt	Same business day at 18:00 local time	Next business day at 10:00 local time
RFR Benchmark Administrator	Federal Reserve Bank of New York	Bank of England	European Central Bank	SIX Swiss Exchange	Bank of Japan
Data source	Triparty repo, FICC GCF, FICC bilateral	Form SSMD (Bank of England data collection)	MMSR	CHF interbank repo	Money market brokers
Wholesale non-bank counterparties	Yes	Yes	Yes	No	Yes
Secured	Yes	No	No	Yes	No
Overnight rate	Yes	Yes	Yes	Yes	Yes
Term rates	Yes	Yes	Yes	Yes	Yes

Table 5: Working groups and alternative overnight RFRs to LIBOR. Source: BLOOMBERG 2021c. Abbreviations: FICC: Fixed Income Clearing Corporation; GCF: General Collateral Financing; MMSR: Money Market Statistical Reporting; SMMD: Sterling Money Market Data Collection Reporting.

Some of the key factors that the working groups considered were the depth of liquidity in the underlying market, its volatility, any prior use of the rate and compliance with the IOSCO Principles for Financial Benchmarks. The alternative overnight rates recommended by the working groups are considered to be nearly risk-free:

- Secured Overnight Financing Rate (SOFR) for USD,
- Sterling Overnight Index Average (SONIA) for GBP,
- Euro short-term rate (€STR) for EUR,
- Swiss Average Rate Overnight (SARON) for CHF,
- Tokyo Overnight Average Rate (TONA or TONAR) for JPY.

Due to the very short term of the above reference rates, the default risk of the underlying overnight wholesale loan/deposit transactions is very small, nearly risk-free. Hence, the market uses the term overnight Risk-Free Rate (RFR).

The speed of transition to the overnight RFRs has been different across the jurisdictions. On one hand, SONIA and SARON were already in use. On the other hand, publication of SOFR started in April 2018 (OLIVER WYMAN 2018, p. 10; IBA 2018c) and €STR went live in October 2019.

II.3 Alternative Risk-Free Rate SONIA to Replace GBP LIBOR

In the UK, the Bank of England set up the Working Group on Sterling Risk-Free Reference Rates (RFRWG), a market-led working group to make recommendations on alternative rates to LIBOR in 2015. On 28 April 2017, the working group announced that the reformed SONIA would be its preferred RFR for sterling derivatives and relevant financial contracts (BANK OF ENGLAND 2017a).

The Bank of England had taken over the administration from the Wholesale Market Brokers Association (WMBA) in April 2016 and started the publication of SONIA with a reformed methodology on 23 April 2018 (BANK OF ENGLAND 2017b). The reformed SONIA captured a broader scope of overnight unsecured deposits by including bilaterally negotiated transactions. Also, the publication time was moved from the same business day to the following business day (BANK OF ENGLAND 2018). Key features and policies of SONIA are found on the website of the Bank of England.[1] The statement of underlying interest says: “SONIA is a measure of the rate at which interest is paid on sterling short-term wholesale funds in circumstances where credit, liquidity and other risks are minimal”. Eligible transactions are reported to the Sterling Money Market (SMM) daily data collection: unsecured loans of one business day maturity executed between 00:00 hours and 18:00 hours UK time and settled that same day and greater than or equal to GBP 25 million in value.

Before the search for alternative RFRs, SONIA was already widely used in the wholesale market as the reference rate for sterling Overnight Indexed Swaps (OIS). Unlike with the other LIBOR currencies, the GBP market has the advantage of starting with a traded SONIA interest rate curve at shorter maturities based on OIS swaps, supplemented by futures contracts which also settle on SONIA compounded in arrears (BANK OF ENGLAND 2019). Table 6 compares GBP LIBOR with SONIA.

	LIBOR	**SONIA**
Currency	GBP	GBP
Overnight and term rates	One overnight rate and 6 forward-looking term rates	Overnight rate, possibility to calculate backward-looking daily compounded term rates
Borrowing or lending rate	Borrowing rate (for unsecured wholesale funding)	Lending rate
Credit risk	Includes bank credit risk element	Nearly risk-free
Transaction-based	Derived from a small number of transactions	Derived from an active and liquid market
Secured or unsecured transactions	Based on unsecured transactions	Based on unsecured transactions
Calculation	Trimmed arithmetic mean where 25% of highest and lowest submissions are excluded	Volume-weighted mean rate based on the central 50% of the volume-weighted distribution of rates
Benchmark Administrator	ICE Benchmark Administration (IBA)	Bank of England
Regulator of the benchmark administrator	UK FCA	UK FCA

Table 6: Comparison between GBP LIBOR and SONIA. Source: IBA https://www.theice.com/iba/libor/calculating and Bank of England https://www.bankofengland.co.uk/markets/sonia-benchmark/sonia-key-features-and-policies.

In October 2018 the LIBOR benchmark administrator issued a proposal for forward-looking term rates based on SONIA (IBA 2018c and 2019d). On 11 January 2021 IBA launched the ICE Term SONIA Reference Rates (TSRR) for 1M, 3M, 6M and 12M terms following a testing period from 25 June 2020. The TSRR are calculated using prices and volumes for SONIA-

[1] SONIA key features and policies: https://www.bankofengland.co.uk/markets/sonia-benchmark/sonia-key-features-and-policies.

linked interest rate swaps and futures under a waterfall methodology (IBA 2021c and 2021d). Table 7 displays an example of TSRR published by IBA.

	ICE RFR - Forward Looking		**ICE RFR - Realised**	
	Term SONIA Reference Rate (TSRR)	**Futures Derived**	**Average**	**Compounded in Arrears**
1M	0.0513 %	0.0498 %	0.0505 %	0.0505 %
3M	0.0544 %	0.0524 %	0.0504 %	0.0504 %
6M	0.0789 %	0.0779 %	0.0498 %	0.0498 %
12M	0.1693 %	0.1656 %	-	-

Table 7: Example of Term SONIA Reference Rates (TSRR). Source: IBA https://www.theice.com/marketdata/reports/244.

II.4 Alternative Risk-Free Rate €STR to Replace EUR LIBOR and to Act as Fallback to EURIBOR

In the euro area, which is much less affected by the LIBOR transition because of the continued publication of EURIBOR, €STR was recommended as RFR by the Working Group on Euro Risk-Free Rates (WG-ERFR) in September 2018 (ECB 2018) in order to replace the Euro Overnight Index Average (EONIA). The European Central Bank (ECB), in its role as benchmark administrator, went live with the daily publication of €STR as overnight rate on 2 October 2019. From 14 April 2021 the ECB started publication of backward-looking €STR-based term rates, called Compounded €STR average rates (ECB 2021a and 2021b). The working group has worked on €STR-based term rates and EURIBOR fallbacks, which will also serve as replacement for EUR LIBOR (READ/BEIẞER 2021a and 2021b). Following industry consultations, a differentiated recommendation on forward-looking and backward-looking €STR-based term rates was published on 11 May 2021 (WG-ERFR 2021).

III. Future LIBOR Cessation/Loss of Representativeness, UK Regulatory Initiatives and Synthetic LIBOR

III.1 LIBOR Consultation and March 2021 LIBOR Cessation Announcement by IBA

On 18 November 2020 IBA announced the intention to consult on the potential cessation of GBP, CHF, JPY and EUR LIBOR in all seven tenors (IBA 2020a). The FCA issued a statement acknowledging IBA's announcement and setting out its potential approach to the use of proposed new powers under the Financial Services Bill to ensure an orderly wind down of LIBOR (FCA 2020b). ISDA issued a statement confirming that neither of these statements constitute an index cessation event for derivatives contracts (ISDA 2020p).

On 30 November 2020 IBA also announced the intention to consult on the potential cessation of the 1W and 2M USD LIBOR settings after Friday 31 December 2021 and the five remaining USD LIBOR settings immediately after Friday 30 June 2023 (IBA 2020b). The Federal Reserve Board in the US welcomed the USD LIBOR consultation (FEDERAL RESERVE BOARD 2020). The Board of Governors of the Federal Reserve System together with the Federal Deposit Insurance Corporation (FDIC) and the Office of the Comptroller of the Currency (OCC) issued a joint statement encouraging banks to transition away from USD LIBOR as soon as practicable (BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM/FDIC/OCC 2020). Extending the publication of five USD LIBOR settings by another 18 months compared to the other currencies would allow most legacy contracts to mature. Also, the FCA issued an acknowledging statement (FCA 2020c). ISDA stated that neither the IBA nor the FCA statement constituted an index cessation event (ISDA 2020q).

The actual consultation for all LIBOR currencies was launched by IBA on 4 December 2020 (IBA 2020c). Table 8 summarises the proposed cessation of LIBOR in the five currencies and seven tenors subject to rights of the FCA to compel the benchmark administrator to continue publication.

Currency and LIBOR	**Tenors**	**Cessation immediately after 31.12.2021**	**Cessation immediately after 30.6.2023**
GBP LIBOR	ON, 1W, 1M, 2M, 3M, 6M, 12M	All 7 tenors	-
USD LIBOR	ON, 1W, 1M, 2M, 3M, 6M, 12M	2 tenors (1W, 2M)	5 tenors (ON, 1M, 3M, 6M, 12M)
CHF LIBOR	SN, 1W, 1M, 2M, 3M, 6M, 12M	All 7 tenors	-
JPY LIBOR	SN, 1W, 1M, 2M, 3M, 6M, 12M	All 7 tenors	-
EUR LIBOR	ON, 1W, 1M, 2M, 3M, 6M, 12M	All 7 tenors	-
Totals	**35**	**30**	**5**

Table 8: LIBOR cessation proposed by IBA on 4 December 2020. Source: IBA 2020c. Abbreviations: ON: overnight; SN: spot/next; 1W: 1 week; 1M: 1 month etc.

A majority of the panel banks does not intend to continue contributing daily submissions to LIBOR after such dates. Respondents to the LIBOR consultation were requested to provide feedback by 25 January 2021. The results of the LIBOR consultation were published by IBA on 5 March 2021 (IBA 2021a and 2021b) simultaneously with statements by the FCA, the Bank of England, Bloomberg and ISDA. This actually constituted the official future LIBOR cessation announcement by the benchmark administrator IBA subject to the FCA exercising its new regulatory powers. The proposed splitting of the most widely-used USD settings from the other currencies, which delays the cessation by 18 months, was supported by the vast majority of the consultation respondents.

III.2 LIBOR Cessation and Loss of Representativeness Statement by FCA

On 5 March 2021 the FCA confirmed the future cessation or loss of representativeness of all 35 LIBOR settings published by IBA (FCA 2021b). The FCA decided not to require the panel banks to provide submissions for the following 26 LIBOR settings (future LIBOR cessation):

- 24 LIBOR settings immediately after 31 December 2021, being
    - all 7 EUR LIBOR and 7 CHF LIBOR settings,
    - 4 GBP LIBOR and 4 JPY LIBOR settings (ON or SN, 1W, 2M, 12M),
    - 2 USD LIBOR settings (1W, 2M),
- and 2 USD LIBOR settings immediately after 30 June 2023, being ON and 12M.

For the remaining 9 LIBOR settings the FCA saw a future loss of representativeness.

- For 3 GBP LIBOR and 3 JPY LIBOR settings (1M, 3M and 6M) the FCA intended to consult on requiring the IBA to continue publishing after end-2021 on the basis of a changed methodology (synthetic LIBOR) using the new powers of the UK Benchmark Regulation granted to the FCA. For the 3 JPY LIBOR settings a one-year period with synthetic rates until 30 December 2022 was being considered.
- For 3 USD LIBOR settings (1M, 3M and 6M), which would be running on a representative basis until 30 June 2023, the FCA may require continued publication on a synthetic basis beyond the set date.

Table 9 shows the overall situation as per 5 March 2021 based on the IBA announcement and the FCA confirmation:

Currency and LIBOR	**Tenors**	**Cessation immediately after 31.12.2021**	**FCA may require continued publication on a synthetic basis beyond 31.12.2021**	**Cessation immediately after 30.6.2023**	**FCA may require continued publication on a synthetic basis beyond 30.6.2023**
GBP LIBOR	ON, 1W, 1M, 2M, 3M, 6M, 12M	4 settings (ON, 1W, 2M, 12M)	3 settings (1M, 3M, 6M)	-	-
USD LIBOR	ON, 1W, 1M, 2M, 3M, 6M, 12M	2 settings (1W, 2M)	-	2 settings (ON, 12M)	3 settings (1M, 3M, 6M)
CHF LIBOR	SN, 1W, 1M, 2M, 3M, 6M, 12M	All 7 settings	-	-	-
JPY LIBOR	SN, 1W, 1M, 2M, 3M, 6M, 12M	4 settings (SN, 1W, 2M, 12M)	3 settings (1M, 3M, 6M)		
EUR LIBOR	ON, 1W, 1M, 2M, 3M, 6M, 12M	All 7 settings	-	-	
Totals	**35**	**24**	**6**	**2**	**3**

Table 9: LIBOR cessation including FCA feedback from 5 March 2021. Source: FCA 2021b.

The FCA made this announcement about the future cessation (26 settings) and the future loss of representativeness (9 settings) on 5 March 2021 in the awareness that it would engage contractual triggers for the application of LIBOR fallbacks that are activated by so called pre-cessation announcements. In a statement from 11 March 2020 on contractual triggers, the FCA told the market that the announcement on cessation or loss of representativeness of LIBOR settings could occur before end-2021, even if the cessation or loss of representativeness would not occur until the panel banks had left at end-2021 or another date of panel banks departure (FCA 2019a and 2020a).

For Andrew Bailey, at this point in time Bank of England Governor, the 5 March 2021 announcements mark "the final chapter in the process that began in 2017 to remove reliance on unsustainable LIBOR rates and build a more robust foundation in the financial system" (BANK OF ENGLAND 2021b).

III.3 FCA and Bank of England Initiatives to Remove Reliance on LIBOR

In January 2021 and July 2021, Edwin Schooling Latter, Director of Markets and Wholesale Policy at the FCA, delivered speeches urging the market to press on with LIBOR transition to new reference rates. For the LIBOR settings ceasing end-2021 the central challenge would be ensuring the conversion of all legacy contracts. The FCA was looking at exceptions for some GBP and JPY LIBOR settings to deal with tough legacy contracts (FCA 2021a and 2021i).

The FCA as well as the Bank of England have set out clear expectations for regulated entities to remove reliance on LIBOR. The large majority of sterling markets is expected to be based on SONIA compounded in arrears i.e. backward-looking term rates. Certain parts of the market may use TSRR as forward-looking term rates (BANK OF ENGLAND 2021a).

The Working Group on Sterling Risk-Free Reference Rates published "Priorities and roadmap for transition by end-2021" (RFRWG 2021) with the following top-level priorities (updated version from May 2021):

- Be fully prepared for the end of GBP LIBOR, by the end of 2021.
- Continue to enable and promote widespread use of SONIA compounded in arrears throughout wholesale sterling markets.

- By end Q1 2021, cease initiation of new GBP LIBOR linked loans, bonds, securitisations and linear derivatives that expire after the end of 2021.
- By end Q1 2021, complete identification of all legacy GBP LIBOR contracts expiring after end-2021 that can be actively converted, and progress active conversion where viable through to completion by end Q3 2021.
- Take steps to enable a shift of volumes from GBP LIBOR to SONIA in non-linear derivative markets:

  a) by end Q2 2021, cease initiation of new GBP LIBOR linked non-linear derivatives that expire after the end of 2021; and,

  b) by end Q3 2021, complete active conversion where viable.

The FCA and the Bank of England have encouraged market participants to switch away from LIBOR in derivative market segments way before end-2021 (BANK OF ENGLAND/FCA 2020, 2021a, 2021b, 2021c and 2021d):

- In January 2020: Switch sterling interest rate swaps from GBP LIBOR to SONIA from 2 March 2020.
- In March 2021: Switch sterling non-linear derivatives from GBP LIBOR to SONIA from 11 May 2021.
- In May 2021: Switch sterling exchange traded derivates from GBP LIBOR to SONIA from 17 June 2021.
- In June 2021: Switch USD interest rate swaps from USD LIBOR to SOFR from 26 July 2021.
- In July 2021: Switch Cross currency swaps from LIBOR to RFRs from 21 September 2021.

III.4 Enhanced FCA Powers and Synthetic LIBOR

On 5 March 2021, simultaneously with the LIBOR announcements by IBA and FCA, the FCA published a set of documents (FCA 2021b, 2021c and 2021d) informing about amendments to the UK Benchmarks Regulation (BMR) under the Financial Services Bill from 21 October 2020 (HOUSE OF COMMONS 2020). The amendments would give the FCA enhanced powers for winding down critical benchmarks, in particular certain LIBOR settings. Following enactment of the Bill the FCA can require the administrator of a critical benchmark to change how the benchmark is determined, rules of the benchmark and code of conduct. This way the FCA can change the methodology of LIBOR in such a way that does not rely on panel bank contributions, to support an orderly wind-down (FCA 2021b). This opens the door for the generation of a synthetic LIBOR by the regulator.

Under the new Art. 23A BMR the FCA can designate an unrepresentative critical benchmark as Art. 23A BMR benchmark. Once done, there is no mechanism to revoke the designation. The designation results in general prohibition on the use of the benchmark by supervised entities, but gives the FCA the power to exempt some or all existing use of the benchmark from the prohibition. Under Art. 23D BMR the FCA can impose requirements on the benchmark administrator relating to the way in which the benchmark is determined, including by amending the benchmark's methodology (FCA 2021c). The FCA Statement of Policy on the designation of benchmarks under Art. 23A BMR (FCA 2021d) explains which factors the FCA would consider when deciding about the designation as Art. 23A BMR benchmark. The FCA Statement of Policy on the exercise of the FCA's powers under Art. 23D BMR (FCA 2021e) lists criteria the FCA would consider when deciding on whether and how to use the powers (Table 10).

FCA Decision	**Criteria**
Whether to use the powers of Art. 23D BMR	Appropriateness of using the powers having regard to the desirability of securing an orderly cessation of a critical benchmark
	Desirability of using the powers to advance the consumer protection and/or integrity objectives
How to use the powers 23D BMR	Fair approximation of the value the benchmark would have had
	Least disturbance to affected parties
	Market support
	Availability to the benchmark administrator of robust and transparent inputs
	Impact on the benchmark administrator
	Length of publication on a changed basis
	Likely effect outside the UK of exercising the power

Table 10: FCA decision on whether and how to use the powers under Art. 23D BMR. Source: FCA 2021e.

The Financial Services Act 2021 which gave the FCA new powers under the BMR received Royal Assent on 29 April 2021. In May 2021 the FCA launched a consultation (CP21/15) on how to use the new FCA powers over use of critical benchmarks (FCA 2021f). This consultation sets out factors the FCA would consider when making decisions to exercise its "legacy use power" (i.e. permitting legacy use of an Art. 23A BMR benchmark) and "new use restriction power" (i.e. restricting new use of a critical benchmark that is ceasing). Another consultation (CP21/19), which started on 24 June 2021, looked at the proposed decision under Art. 23D

BMR for the GBP LIBOR and JPY LIBOR settings for the tenors 1M, 3M and 6M (FCA 2021h). The consultation periods closed on 17 June 2021 and 27 August 2021 respectively.

The FCA intends to compel the publication of the three JPY LIBOR settings for 1 year only until end-2022, after which they will cease. The FCA proposes to use Art. 23D BMR powers to require a synthetic LIBOR to be calculated. The synthetic rate would be made up of a forward-looking term version of the relevant RFR (i.e. SONIA for GBP and TONA for JPY) and the fixed ISDA spread adjustment published for the purposes of the IBOR Fallbacks Supplement and Protocol for the respective LIBOR setting (FCA 2021g). The FCA selected the following forward-looking term versions of the RFR:

- Term SONIA Reference Rate (TSRR) provided by IBA for the synthetic GBP LIBOR,
- and Tokyo Term Risk Free Rate (TORF) provided by QUICK Benchmarks Inc (QBS) for the synthetic JPY LIBOR.

The FCA is planning to publish a Statement of Policy and feedback statement in 2021 Q3. Also, the FCA intends to run another consultation in 2021 Q3 on what legacy use to allow for any synthetic GBP and JPY LIBOR. Final decisions should follow in 2021 Q4 (FCA 2021g).

Clearly, the end-2021 deadline for LIBOR put forward Bailey’s end of LIBOR speech, has been partly contradicted by the following measures:

- delaying the cessation of five USD LIBOR settings by 18 months by the administrator IBA and the panel banks;
- setting up enhanced FCA powers to allow publication of synthetic GBP and JPY LIBOR for some time after they are no longer representative.

Effectively, the end-2021 was not a deadline cast in stone, but an “anchor” as part of an expectation setting process driven by the UK regulators for the market to seriously focus on transitioning away from LIBOR.

IV. IBOR Fallbacks for Derivatives under ISDA Documentation

IV.1 ISDA Consultations on IBOR Fallbacks

The legal documentation of a very large volume of derivatives worldwide is based on the 2006 ISDA Definitions. Already before Bailey’s end of LIBOR speech, a potential cessation of LIBOR as well as the uncertainty surrounding the approval of EURIBOR and EONIA as critical benchmark under the EU Benchmark Regulation drew the attention of the ISDA.

Upon request by the OSS in the FSB, ISDA started working in 2016 on the identification of robust fallback rates for derivatives linked to LIBOR and other IBORs. On 1 February 2018 ISDA and other financial industry organisations launched a “Benchmark Transition Roadmap” highlighting key challenges involved in transitioning financial market contracts and practices from IBORs to alternative RFRs. Based on publicly available data, the roadmap contained an estimate of total outstanding notional exposure to the IBORs at over $370 trillion. Derivatives, syndicated loans, securitizations, business and retail loans, floating-rate notes and deposits are all significantly exposed to LIBOR and other IBORs. The roadmap set out challenges that needed addressing for transitioning to RFRs, including market adoption of the new RFRs, valuation and risk management complexities, documentation issues, infrastructure requirements, and regulatory, tax and accounting implications. It outlined steps by the national working groups to resolve these challenges (ISDA / AFME / ICMA / SIFMA / SIFMA AMG 2018a and 2018b).

Between 2018 and 2020 ISDA undertook six industry consultations to develop a new methodology for the IBOR Fallbacks based on the RFRs. The idea was to include fallback rates to the existing IBORs as a safety net against benchmark cessation or similar events in new and legacy derivatives contracts under ISDA documentation. These are the ISDA consultations:

- 2018 Benchmark Fallbacks Consultation: This looked at the approach for addressing certain technical issues associated with adjustments that would apply to RFRs if the fallbacks were triggered. Adjustments are needed due to differences between the IBORs and the RFRs.
- 2019 Supplemental Consultation: This covered the adjustments that would apply to alternative RFRs if fallbacks took effect for USD LIBOR, Canadian Dollar Offered Rate (CDOR) or Hong Kong Interbank Offered Rate (HIBOR). It also covered fallbacks for Singapore Dollar Swap Offer Rate (SOR), which uses USD LIBOR as an input.
- 2019 Pre-Cessation Consultation: It sought comments on how derivatives should address a regulatory announcement that LIBOR is no longer representative of an underlying market.
- 2019 Consultation on Final Parameters: It sought views on the final parameters for the adjustments that apply to alternative RFRs if derivatives fallbacks are triggered.
- 2019 Euro Consultation: This covered the adjustments that would apply to €STR, the new RFR in Euro, if fallbacks in EURIBOR or EUR LIBOR took effect, including the final parameters for these adjustments. It also asked about adjustments that could apply if fallbacks take effect in less widely used IBORs.

- 2020 Pre-Cessation Consultation: It sought input on whether to add a pre-cessation trigger to the permanent cessation fallbacks that ISDA intended to implement for LIBOR in its standard documentation.

Table 11 gives an overview of the ISDA consultations on IBOR Fallbacks.

Consultation Process	**Date**	**Document**	**Source**
2018 Benchmark Fallbacks Consultation "Fallbacks for 2006 ISDA Definitions: Consultation on Certain Aspects of Fallbacks for Derivatives Referencing GBP LIBOR,1 CHF LIBOR, JPY LIBOR, TIBOR, Euroyen TIBOR and BBSW" a.k.a. "Consultation on Term Fixings and Spread Adjustments Methodology"	12.7.2018	Press release on consultation launch	ISDA 2018a
		Consultation paper	ISDA 2018b
	27.11.2018	Press release on preliminary results	ISDA 2018c
		Statement on preliminary results	ISDA 2018d
	20.12.2018	Press release on final results	ISDA 2018e
		Brattle Group Report	Brattle Group 2018
2019 Supplemental Consultation "Interbank Offered Rate (IBOR) Fallbacks for 2006 ISDA Definitions: Supplemental Consultation on Spread and Term Adjustments for Fallbacks in Derivatives Referencing USD LIBOR, CDOR and HIBOR and Certain Aspects of Fallbacks for Derivatives Referencing SOR"	16.5.2019	Consultation paper	ISDA 2019b
	30.7.2019	Statement on preliminary results	ISDA 2019d
	18.9.2019	Brattle Group Report	Brattle Group 2019a
2019 Pre-Cessation Consultation "Consultation on Pre-Cessation Issues for LIBOR and Certain Other IBORs"	16.5.2019	Consultation paper	ISDA 2019c
	9.8.2019	Statement on preliminary results	ISDA 2019f
	21.10.2019	Press release on final results	ISDA 2019i
		Brattle Group Report	Brattle Group 2019b
2019 Final Parameters Consultation "Interbank Offered Rate (IBOR) Fallbacks for 2006 ISDA Definitions: Consultation on Final Parameters for the Spread and Term Adjustments in Derivatives Fallbacks for Key IBORs"	18.9.2019	Press release on consultation launch	ISDA 2019g
	18.9.2019	Consultation paper	ISDA 2019h
	15.11.2019	Press release on final results	ISDA 2019j
		Brattle Group Report	Brattle Group 2019c
2019 Euro Consultation "Interbank Offered Rate (IBOR) Fallbacks for 2006 ISDA Definitions: Supplemental Consultation on Spread and Term Adjustments, including Final Parameters thereof, for Fallbacks in Derivatives Referencing EUR LIBOR and EURIBOR, as well as other less widely used IBORs"	18.12.2019	Press release on consultation launch	ISDA 2019k
		Consultation paper	ISDA 2019l
	24.2.2020	Press release on final results	ISDA 2020b
		Statement on final results	ISDA 2020c
	5.3.2020	Brattle Group Report	Brattle Group 2020a
2020 Pre-Cessation Consultation	5.2.2020	Press release	ISDA 2020a
	25.2.2020	Press release on consultation launch	ISDA 2020d
		Consultation paper	ISDA 2020e
	15.4.2020	Press release on preliminary results	ISDA 2020f
	14.5.2020	Press release on final results	ISDA 2020g

		Brattle Group Report	BRATTLE GROUP 2020b

Table 11: ISDA consultations on IBOR Fallbacks. Source: ISDA https://www.isda.org/2021/07/19/benchmark-fallback-consultations-2/.

IV.2 IBOR Fallbacks Approach

The overall methodology for the IBOR Fallbacks, being an outcome of a series of ISDA consultations[2], is explained in several documents including the factsheet "Understanding IBOR Benchmark Fallbacks" (ISDA 2020i), the "User Guide to IBOR Fallbacks and RFRs" (ISDA 2020k) and the "IBOR Fallback Rate Adjustments Rule Book" jointly published by Bloomberg and ISDA in April 2020 and updated in October 2020 (BLOOMBERG/ISDA 2020).

The results of the ISDA consultations have been analysed and summarised in reports produced by an independent advising firm, the Brattle Group. In December 2019, as an outcome of the 2019 Final Parameters Consultation, ISDA made available an Excel Model[3] with instructions prepared by the Brattle Group (BRATTLE GROUP 2019d) to help illustrate the calculations of the fallback rates. Furthermore, the Brattle Group performed a review of the April 2020 version of the Bloomberg/ISDA Rule Book. The report, published in July 2020 (BRATTLE GROUP 2020c), compares the implemented calculation of the adjusted reference rate and the spread adjustment in the Bloomberg/ISDA Rule Book against the results of the ISDA consultations and against Brattle's Excel Model. Finally, ISDA and the Brattle Group launched the Microsite "Understanding IBOR Benchmark Fallbacks"[4] in July 2021 to provide background information to the public.

Following the 2018 Benchmark Fallbacks Consultation ISDA first decided to develop fallback rates based on

- an adjusted RFR as a compounded setting in arrears rate,
- and a spread adjustment between IBOR and the term-adjusted RFR based on a historical mean/median approach.

Market participants voted for the implementation of the compounded setting in arrears rate primarily for its compatibility with the OIS swap market and its ability to reflect the daily

[2] Benchmark Reform and Transition from LIBOR InfoHub: https://www.isda.org/2020/05/11/benchmark-reform-and-transition-from-libor/ .
[3] Excel model available under https://www.isda.org/a/T2yTE/Excel-Model-Signed-Shell.zip via ISDA webpage "Benchmark Fallback Consultations" https://www.isda.org/2021/07/19/benchmark-fallback-consultations-2/
[4] ISDA-Brattle Microsite Understanding IBOR Benchmark Fallbacks: https://www.brattle.com/understanding-ibor-benchmark-fallbacks/.

interest rate movements during the relevant period. Concerning the spread adjustment, the historical mean/median approach was seen as robust and simple, resistant to market distortions, and it would reduce the potential for market manipulation. In the 2019 Final Parameters Consultation, when asked to choose between the median approach over a five-year lookback period and the trimmed mean approach over a ten-year lookback period, the majority of respondents preferred a spread adjustment calculation based on a historical median over a five-year lookback period (BRATTLE GROUP 2020c, p. 4-5). Following the 2019 Euro Consultation, ISDA published a statement on 24 February 2020 (ISDA 2020c) announcing that it would proceed with developing fallbacks for EUR LIBOR and EURIBOR based on

- an adjusted RFR compounded setting in arrears with a backward shift adjustment (e.g. 2 business days),
- and a spread adjustment based on the historical median approach over a five-year lookback period.

Respondents of the 2019 Euro Consultation had a strong desire to apply a consistent approach across all covered IBORs.

In summary, the fallback rates developed by ISDA are adjusted versions of the alternative overnight RFRs recommended by the national working groups. The overnight RFRs are adjusted for term and spread to account for the differences between IBORs and RFRs.

Covered IBORs under the IBOR Fallbacks approach by ISDA are:

- the LIBORs in the five currencies
- plus three IBORs in the LIBOR currencies, being EURIBOR, TIBOR, Euroyen TIBOR
- plus three IBORs in other currencies, being BBSW in AUD, CDOR in CAD, HIBOR in HKD.

See overview of covered IBORs under ISDA documentation in Table 12 (ISDA 2020i and Bloomberg/ISDA 2020).

Currency	**IBOR**	**IBOR Administrator**	**Value Lag**	**Day Count**	**RFR**	**RFR Administrator**
AUD	Bank Bill Swap Rate (BBSW)	Australian Securities Exchange: ASX Benchmarks Limited	0	365	Reserve Bank of Australia Interbank Overnight Cash Rate (AONIA)	Reserve Bank of Australia

CAD	Canadian Dollar Offered Rate (CDOR)	Refinitiv Benchmark Services (UK) Limited (RBSL)	0	365	Canadian Overnight Repo Rate Average (CORRA)	Bank of Canada
CHF	LIBOR	IBA	2	360	Swiss Average Rate Overnight (SARON)	SIX Swiss Exchange
EUR	LIBOR	IBA	2	360	Euro Short-term Rate (€STR)	European Central Bank
	Euro Interbank Offered Rate (EURIBOR)	European Money Markets Institute (EMMI)	2	360		
GBP	LIBOR	IBA	0	365	Sterling Overnight Index Average (SONIA)	Bank of England
HKD	Hong Kong Interbank Offered Rate (HIBOR)	Treasury Markets Association (TMA)	0	365	Hong Kong Dollar Overnight Index Average (HONIA)	TMA
JPY	LIBOR	IBA	2	360	Tokyo Overnight Average Rate (TONA)	Bank of Japan
	Tokyo Interbank Offered Rate (TIBOR)	Japanese Bankers Association TIBOR Administrator (JBATA)	2	360		
	Euroyen TIBOR	JBATA	2	360		
USD	LIBOR	IBA	2	360	Secured Overnight Financing Rate (SOFR)	Federal Reserve Bank of New York
	11 IBORs					

Table 12: Covered IBORs under ISDA. Source: ISDA 2020i and BLOOMBERG/ISDA 2020.

In addition to the covered IBORs there are two FX swap implied interest rate benchmarks which use USD LIBOR as an input, being the Singapore dollar Swap Offer Rate (SOR) and Thai Baht Interest Rate Fixing (THBFIX).

The IBOR Fallback would be triggered in the ISDA documentation following a permanent discontinuation of a covered IBOR or, in the case of LIBOR, a non-representativeness determination. See triggers for IBORs covered under ISDA in Table 13.

IBOR Group	**Currency**	**IBOR**	**New permanent discontinuation trigger and fallback**	**New non-representative determination trigger and fallback**
LIBOR (5)	CHF, EUR, GBP, JPY, USD	LIBOR	Yes	Yes
IBORs in the 5 LIBOR currencies (3)	EUR	EURIBOR	Yes	No
	JPY	Yen TIBOR	Yes	No
	JPY	Euroyen TIBOR	Yes	No

IBORs in additional currencies (3)	AUD	BBSW	Yes	No
	CAD	CDOR	Yes	No
	HKD	HIBOR	Yes	No
FX swap implied IBORs (2)	SGD	SOR	Yes	Yes
	THB	THBFIX	Yes	Yes
Total		**13 IBORs**		

Table 13: Triggers for IBORs covered under ISDA. Source: ISDA 2020k.

IV.3 IBOR Fallbacks Protocol and Supplement to 2006 ISDA Definitions

On 29 July 2020 ISDA published a statement from its Board of Directors announcing its intention to soon publish the IBOR Fallback Protocol (spelling "Fallback" in singular) to facilitate inclusion of the new fallbacks in existing non-cleared IBOR derivatives transactions between counterparties that both adhere to the protocol. The Board strongly supported broad adherence to the protocol among market participants (ISDA 2020h). ISDA told the market that it was planning to amend the 2006 ISDA Definitions by publishing a supplement, the IBOR Fallback Supplement, which allows ISDA to amend certain "rate options" in the 2006 ISDA Definitions to include fallbacks that would apply upon the permanent discontinuation of LIBOR and other key IBORs and upon a non-representative determination for LIBOR. ISDA also would amend certain floating rate options that use USD LIBOR as an input (SOR and THBFIX) to include fallbacks that would apply if USD LIBOR is permanently discontinued. Transactions incorporating the 2006 ISDA Definitions entered into on or after the amendment date will include the floating rate option with the fallback. Transactions entered into prior to the date (legacy derivatives contracts) will not (ISDA 2020h).

On 9 October 2020 the ISDA Board (ISDA 2020j) announced the expected launch of

- the IBOR Fallbacks Supplement (Supplement number 70 to the 2006 ISDA Definitions),
- and the ISDA 2020 IBOR Fallbacks Protocol ("Fallbacks" spelled this time using the plural).

Both documents (ISDA 2020m and 2020n) were in fact published as final versions on 23 October 2020 and effective on 25 January 2021 (ISDA 2020l). The protocol was accompanied by a document with responses to Frequently Asked Questions (FAQ) (ISDA 2020o).

The supplement amended ISDA's standard definitions for interest rate derivatives to incorporate robust fallbacks. From 25 January 2021 all new cleared and non-cleared derivatives that incorporate the 2006 ISDA Definitions and reference one of the covered IBORs contain the new fallbacks.

Derivatives contracts existing as of 25 January 2021 incorporate the fallbacks if both counterparties have adhered to the protocol or otherwise bilaterally agreed to include the fallbacks in their contracts. The protocol enables market participants to incorporate the revisions into their legacy non-cleared derivatives trades with other counterparties that choose so. By adhering to the protocol, market participants agree that their legacy derivatives contracts with other adherents shall include the amended floating rate option for the relevant IBOR and therefore include the fallback. The protocol became effective on 25 January 2021 and is open for adherence. By early December 2020 more than 1,500 entities had adhered to the protocol. As of 31 March 2021, more than 13,600 entities had adhered (ISDA 2021f). The FSB welcomed the launch encouraging broad and timely adherence (FSB 2020a).

The fallbacks included as a result of adhering to the protocol are exactly the same as the fallbacks included in new transactions entered into from 25 January 2021 that reference the 2006 ISDA Definitions. Firms also have the option to include the fallbacks into legacy non-cleared derivatives contracts through bilateral negotiation. For cleared derivatives, central counterparties (CCPs) have incorporated the ISDA IBOR Fallbacks in their rule books for both new and legacy contracts (ISDA 2021f).

IV.4 ISDA Guidance on LIBOR Cessation and Loss of Representativeness

ISDA followed very closely the LIBOR cessation consultation when it was launched by IBA on 4 December 2020 (ISDA 2020r). On 5 March 2021 ISDA reacted to the announcements by IBA and FCA on future LIBOR cessation and loss of representativeness by issuing the following documents:

- An “ISDA Statement on UK FCA LIBOR Announcement” (ISDA 2021a and ISDA 2021b);
- Informal comments on “LIBOR Cessation and the Impact on Fallbacks” by ISDA CEO Scott O’Malia (ISDA 2021c);
- A “Future Cessation and Non-Representativeness Guidance” (ISDA 2021d and ISDA 2021e), which was subsequently updated on 8 March and 16 April 2021.

In the ISDA statement it is confirmed that the FCA announcement from 5 March 2021 constitutes an index cessation event under the IBOR Fallbacks Supplement and the ISDA 2020 IBOR Fallbacks Protocol for all 35 LIBOR settings. As a result, the fallback spread adjustment published by Bloomberg is fixed as of the date of the announcement for all LIBOR settings (ISDA 2021a, ISDA 2021b).

ISDA CEO O'Malia commented that the spread adjustment is an important part of the overall fallback rate, and reflects a portion of the structural differences between IBORs (incorporating a credit risk premium) and RFRs (nearly risk-free). While the LIBOR spread adjustments were fixed at the point of the FCA announcement on 5 March 2021, the fallbacks will apply when each LIBOR setting ceases or becomes non-representative. For outstanding derivatives that continue to reference all LIBOR settings in CHF, EUR, JPY, GBP this is going to be immediately after 31 December 2021. For USD LIBOR the following applies: (ISDA 2021c)

- All USD LIBOR settings will continue to be published until the end of 2021.
- After 31 December 2021 the 1W and 2M USD LIBOR settings will cease, but the new fallbacks will not immediately take effect. The rate will be computed by each calculation agent using linear interpolation between the next shorter and next longer tenors that continue to be published.
- After 30 June 2023, when the five remaining USD LIBOR tenors cease or become non-representative, the fallbacks for all USD LIBOR settings will apply.
- As USD LIBOR is a component in the calculation of SOR and THBFIX, fallbacks for these rates will also apply after 30 June 2023.

The "Future Cessation and Non-Representativeness Guidance" was issued by ISDA to promote orderly and consistent application of triggers and fallbacks by market participants, but it is not legal advice. It describes how the terms of the IBOR Fallbacks Protocol and the IBOR Fallbacks Supplement apply to the FCA LIBOR announcement from 5 March 2021 as well as how the terms of the 2018 ISDA Benchmarks Supplement apply to that announcement (ISDA 2021d). The relevant dates and information in the guidance are summarised in Table 14.

LIBOR	**LIBOR Setting**	**Last date of publication / representativeness**	**Index Cessation Effective Date**	**Spread Adjustment Fixing Date**	**Interpolation**	**Potential for Non-Representative, Synthetic Publication**
CHF LIBOR	All 7 settings	31.12.2021	First London Banking Day on or after 1 January 2022 i.e. 4.1.2022	5.3.2021	N/A	N/A
EUR LIBOR	All 7 settings	31.12.2021		5.3.2021	N/A	N/A
GBP LIBOR	ON, 1W, 2M, 12M	31.12.2021		5.3.2021	N/A	N/A
GBP LIBOR	1M, 3M, 6M	31.12.2021		5.3.2021	N/A	1.1.2022 onward
JPY LIBOR	SN, 1W, 2M, 12M	31.12.2021		5.3.2021	N/A	N/A

JPY LIBOR	1M, 3M, 6M	31.12.2021		5.3.2021	N/A	1.1.2022 through 31.12.2022
USD LIBOR	ON, 12M	30.6.2023	First London Banking Day on or after 1 July 2023 i.e. 3.7.2023	5.3.2021	N/A	N/A
USD LIBOR	1W, 2M	31.12.2021		5.3.2021	First London Banking Day on or after 1 January 2022 through July 2023	N/A
USD LIBOR	1M, 3M, 6M	30.6.2023		5.3.2021	N/A	1.7.2023 onward

Table 14: Relevant dates in "Future Cessation and Non-Representativeness Guidance" issued by ISDA following the FCA LIBOR announcement from 5 March 2021. Source: ISDA 2021e.

IV.5 2021 ISDA Interest Rate Derivatives Definitions

On 19 April 2021 ISDA announced that the 2006 ISDA Definitions will be replaced by new 2021 ISDA Interest Rate Derivatives Definitions as the standard definitional book for interest rate derivatives (ISDA 2021g and 2021h).

The 2021 Definitions contain the triggers and fallbacks introduced by Supplement 70 to the 2006 Definitions (the IBOR Fallbacks Supplement). They also substantively contain the triggers and fallbacks set out in other recent supplements in respect of the RFRs that have been identified as alternatives to certain IBORs, including SOFR, SONIA, TONA and €STR. These IBOR and RFR-related supplements have introduced temporary non-publication fallback provisions and permanent cessation fallback provisions. For LIBOR only, a non-representativeness trigger was also included (ISDA 2021i). The new definitions were first published on 14 June 2021 with an implementation scheduled for the first weekend of October 2021 (ISDA 2021j).

On 4 October 2021 ISDA announced the successful implementation of the 2021 Definitions as its new standard definitional electronic booklet. The new definitions consolidate nearly 90 supplements that have been added over time to the main book. Most major central counterparties including LCH plan to immediately reflect the new definitions for cleared derivatives. Implementation in the non-cleared derivatives market may take some time. Firms can continue using the 2006 ISDA Definitions for new transactions, however ISDA will no longer update these from 4 October 2021. ISDA informed that among the enhancements there is a new fallback trigger that would take effect if a party is prohibited from using a benchmark to perform its obligations. Also, to complement the IBOR Fallbacks, generic fallbacks have been added for those floating rate options without existing fallback arrangements (ISDA 2021k).

V. Bloomberg Data and Calculations on IBOR Fallbacks

On 4 February 2019 ISDA issued a public invitation to tender looking for an independent service provider to calculate and publish the adjustments related to the IBOR Fallbacks approach (ISDA 2019a). On 31 July 2019 ISDA announced that Bloomberg Index Services Limited (BISL) was selected as fallback adjustment vendor, to be authorised by the FCA as benchmark administrator (ISDA 2019e).

On 21 July 2020 Bloomberg began with publication of calculations related to IBOR Fallbacks (ISDA/Bloomberg 2020). Since then, Bloomberg has been providing daily data on the Fallback Rates for the covered IBORs under ISDA (Bloomberg 2021a and 2021b) including:

- Adjusted Reference Rate: compounded setting in arrears for each RFR, for each relevant tenor, based on daily compounding of the publicly available RFRs;
- Spread Adjustment: median of the historical difference, calculated for each tenor, between the IBOR and the compounded RFR for that tenor over a five-year period prior to an announcement triggering a fallback;
- Fallback Rate: sum of Adjusted Risk-Free Rate and Spread Adjustment.

According to the IBOR Fallback Rate Adjustments Rule Book, jointly issued by Bloomberg and ISDA on 22 April 2020 and last updated on 8 October 2020, the Fallback Rate with respect to an IBOR setting with tenor f and Rate Record Day t ($FR_{IBOR,f,t}$) is calculated as the sum of an Adjusted Reference Rate ($ARR_{RFR,f,t}$) based on an overnight RFR and a specific fixed Spread Adjustment ($SA_{IBOR,RFR,f,t}$) (Bloomberg/ISDA 2020):

$$FR_{IBOR,f,t} = ARR_{RFR,f,t} + SA_{IBOR,RFR,f,t}$$

The Adjusted Reference Rate is a backward-looking term rate setting in arrears calculated by simply compounding the overnight RFR:

$$ARR_{RFR,f,t} = \frac{DayCount_{IBOR}}{DayCount_{RFR}} \cdot \frac{1}{\delta_{S_{f,t},E_{f,t}}} \cdot \left[\prod_{u \epsilon AP_{f,t}} \left(1 + \delta_{u,u+1} \cdot RFR_u\right) - 1 \right]$$

$$\delta_{S_{f,t},E_{f,t}} = \frac{Days\left(S_{f,t}, E_{f,t}\right)}{DayCount_{RFR}}; \qquad \delta_{u,u+1} = \frac{Days(u, u+1)}{DayCount_{RFR}}$$

where

$DayCount_{IBOR}, DayCount_{RFR}$: day count with respect to the IBOR and RFR e.g. 360 or 365;

$\delta_{S_{f,t},E_{f,t}}, \delta_{u,u+1}$: day count fractions;

$Days(S_{f,t}, E_{f,t})$: number of Calendar Days from and including Accrual Start Date to and excluding Accrual End Date;

$Days(u, u+1)$: number of Calendar Days from and including RFR Business Day u to and excluding RFR Business Day u +1;

RFR_u: value of the RFR on the RFR Business Day

$AP_{f,t}$: set of RFR Business Days occurring in the period from and including the Accrual Start Date to the Accrual End Date

In general, the Spread Adjustment with respect to an IBOR is computed daily by Bloomberg prior to the Spread Adjustment Fixing Date (being the earlier of an IBOR Cessation Trigger Date and a Tenor Cessation Trigger Date) as a historical median of the spread difference between the IBOR and the Adjusted Reference Rate:

$$SA_{IBOR,RFR,f,t} = Median\left(\left\{u\epsilon MP_{f,t}\middle|L_{IBOR,f,u} - ARR_{RFR,f,u}\right\}\right)$$

where

$MP_{f,t}$: Median Period with respect to tenor f and Rate Record Day t;

$L_{IBOR,f,u}$: Value of the IBOR with respect to tenor f on Median Period Day u if u is prior to the Tenor Cessation Trigger Date, otherwise an interpolated value is calculated

After a Spread Adjustment Fixing Date, the Spread Adjustment remains constant:

$$SA_{IBOR,RFR,f,t} = SA_{IBOR,RFR,f,t-1}$$

Table 15 provides an overview of IBORs and corresponding overnight RFRs used as basis for the IBOR Fallbacks under ISDA.

<table>
<tr><th>Currency</th><th>IBOR</th><th>Tenors</th><th>RFR</th><th>RFR Day Count</th><th>RFR Spot Lag</th></tr>
<tr><td>CHF</td><td>LIBOR</td><td>SN, 1W, 1M, 2M, 3M, 6M, 12M</td><td>SARON (18:00)</td><td>360</td><td>2</td></tr>
<tr><td>EUR</td><td>LIBOR</td><td>ON, 1W, 1M, 2M, 3M, 6M, 12M</td><td rowspan="2">€STR</td><td rowspan="2">360</td><td rowspan="2">2</td></tr>
<tr><td>EUR</td><td>EURIBOR</td><td>1W, 1M, 3M, 6M, 12M</td></tr>
<tr><td>GBP</td><td>LIBOR</td><td>ON, 1W, 1M, 2M, 3M, 6M, 12M</td><td>SONIA</td><td>365</td><td>0</td></tr>
<tr><td>JPY</td><td>LIBOR</td><td>SN, 1W, 1M, 2M, 3M, 6M, 12M</td><td rowspan="3">TONA</td><td rowspan="3">365</td><td rowspan="3">2</td></tr>
<tr><td>JPY</td><td>Euroyen TIBOR</td><td>1W, 1M, 3M, 6M, 12M</td></tr>
<tr><td>JPY</td><td>TIBOR</td><td>1W, 1M, 3M, 6M, 12M</td></tr>
<tr><td>USD</td><td>LIBOR</td><td>ON, 1W, 1M, 2M, 3M, 6M, 12M</td><td>SOFR</td><td>360</td><td>2</td></tr>
<tr><td>AUD</td><td>BBSW</td><td>1M, 2M, 3M, 4M, 5M, 6M</td><td>RBA Cash Rate</td><td>365</td><td>0</td></tr>
<tr><td>CAD</td><td>CDOR</td><td>1M, 2M, 3M, 6M, 12M</td><td>CORRA</td><td>365</td><td>0</td></tr>
</table>

HKD	HIBOR	ON, 1W, 2W, 1M, 2M, 3M, 6M, 12M	HONIA	365	0

Table 15: IBORs and RFRs for the IBOR Fallback under ISDA. Source: BLOOMBERG 2020, 2021a and 2021c.

Table 16 contains the Bloomberg tickers for IBORs, RFRs, ARRs, Spread Adjustments and Fallback Rates by tenor (with the 1M tenor as an example).

Currency	**IBOR**	**IBOR by tenor: Bloomberg Ticker <Index>**	**RFR**	**RFR: Bloomberg Ticker <Index>**	**ARR by tenor: Bloomberg Ticker <Index>**	**SA by tenor: Bloomberg Ticker <Index>**	**Fallback Rate by tenor: Bloomberg Ticker <Index>**
AUD	BBSW	BBSW1M	RBA Cash Rate	RBACOR	XAONIA1M	YBBSW1M	VBBSW1M
CAD	CDOR	CDOR01	CORRA	CAONREPO	XCORRA1M	YCDOR1M	VCDOR1M
CHF	LIBOR	SF0001M	SARON	SRFXON3	XSARON1M	YSF0001M	VSF0001M
EUR	LIBOR	EE0001M	€STR	ESTRON	XESTR1M	YEE0001M	VEE0001M
EUR	EURIBOR	EUR001M				YEUR001M	VEUR001M
GBP	LIBOR	BP0001M	SONIA	SONIO/N	XSONIA1M	YBP0001M	VBP0001M
HKD	HIBOR	HIHD01M	HONIA	HOISHHKD	XHONIA1M	YHIHD01M	VHIHD01M
JPY	LIBOR	JY0001M	TONA	MUTKCALM	XTONA1M	YJY0001M	VJY0001M
JPY	TIBOR	TI0001M				YTI0001M	VTI0001M
JPY	Euroyen TIBOR	EUYN01M				YEUYN01M	VEUYN01M
USD	LIBOR	US0001M	SOFR	SOFRRATE	XSOFR1M	YUS0001M	VUS0001M

Table 16: Bloomberg tickers for IBORs, RFRs, ARRs, Spread Adjustments and Fallback Rates. Source: BLOOMBERG 2021a, 2021c and 2021e.

The above tickers for ARRs, Spread Adjustment and Fallback Rates correspond to the new set of tickers that Bloomberg started publishing on 22 March 2021 in parallel to an old set of tickers. The Fallback Rate gets a "V" before the relevant IBOR ticker. The Spread Adjustment gets a "Y". For the ARRs, the tickers follow the convention of a adding an "X" at the beginning and a two-character tenor identifier at the end. For the overnight and spot next tenors, the "/" is removed (BLOOMBERG 2021b). In September 2021 Bloomberg announced that the old set of tickers will be deprecated following the publication on Friday 29 October 2021 (BLOOMBERG 2021e).

In connection with the IBA and FCA LIBOR announcements on 5 March 2021 Bloomberg immediately issued a technical notice of a "Spread Fixing Event for LIBOR" (BLOOMBERG 2021a). Going forward the Fallback Rate calculated for each Rate Record Day t from and including 5 March 2021 will use the fixed Spread Adjustments displayed in Table 17.

	USD LIBOR	**GBP LIBOR**	**EUR LIBOR**	**CHF LIBOR**	**JPY LIBOR**

LIBOR Tenor f	$FR_{usdlibor,f,t} = ARR_{SOFR,f,t} + SA_{usdlibor,SOFR,f}$	$FR_{gbplibor,f,t} = ARR_{SONIA,f,t} + SA_{gbplibor,SONIA}$	$FR_{eurlibor,f,t} = ARR_{€STR,f,t} + SA_{eurlibor,€STR,f}$	$FR_{chflibor,f,t} = ARR_{SARON,f,t} + SA_{chflibor,SARON,f}$	$FR_{jpylibor,f,t} = ARR_{TONA,f,t} + SA_{jpylibor,TONA,f}$
ON or SN	0.00644 %	-0.0024 %	0.0017 %	-0.0551 %	-0.01839 %
1W	0.03839 %	0.0168 %	0.0243 %	-0.0704 %	-0.01981 %
1M	0.11448 %	0.0326 %	0.0456 %	-0.0571 %	-0.02923 %
2M	0.18456 %	0.0633 %	0.0753 %	-0.0231 %	-0.00449 %
3M	0.26161 %	0.1193 %	0.0962 %	0.0031 %	0.00835 %
6M	0.42826 %	0.2766 %	0.1537 %	0.0741 %	0.05809 %
12M	0.71513 %	0.4644 %	0.2993 %	0.2048 %	0.16600 %

Table 17: Spread adjustments for LIBOR Fallback Rates fixed on 5 March 2021. Source: BLOOMBERG 2021a.

A sample calculation for SONIA-based Fallback Rates for GBP LIBOR between 19 and 25 August 2021 published by Bloomberg is shown I Table 18.

	Thursday 19.8.2021	**Friday 20.8.2021**	**Monday 23.8.2021**	**Tuesday 24.8.2021**	**Wednesday 25.8.2021**
Adjusted Reference Rate based on SONIA					
ON – XSONIAON	0.0503 %	0.0505 %	0.0510 %	0.0508 %	0.0505 %
1W – XSONIA1W	0.0504 %	0.0505 %	0.0507 %	0.0507 %	0.0507 %
1M – XSONIA1M	0.0505 %	0.0505 %	0.0505 %	0.0505 %	0.0505 %
2M – XSONIA2M	0.0504 %	0.0504 %	0.0504 %	0.0504 %	0.0504 %
3M – XSONIA3M	0.0503 %	0.0503 %	0.0503 %	0.0503 %	0.0503 %
6M – XSONIA6M	0.0496 %	0.0496 %	0.0496 %	0.0496 %	0.0496 %
12M – XSONIA12M	0.0507 %	0.0507 %	0.0507 %	0.0507 %	0.0507 %
Spread Adjustment fixed from 5 March 2021 for GBP LIBOR and SONIA					
ON – YBP00ON	-0.0024 %				
1W – YBP0001W	0.0168 %				
1M – YBP0001M	0.0326 %				
2M – YBP0002M	0.0633 %				
3M – YBP0003M	0.1193 %				
6M – YBP0006M	0.2766 %				
12M – YBP001Y	0.4644 %				
Fallback Rates for GBP LIBOR = Adjusted Reference Rate + Spread Adjustment					
ON – VBP00ON	0.0479 %	0.0481 %	0.0486 %	0.0484 %	0.0481 %
1W – VBP0001W	0.0672 %	0.0673 %	0.0675 %	0.0675 %	0.0675 %
1M – VBP0001M	0.0831 %	0.0831 %	0.0831 %	0.0831 %	0.0831 %
2M – VBP0002M	0.1137 %	0.1137 %	0.1137 %	0.1137 %	0.1137 %
3M – VBP0003M	0.1696 %	0.1696 %	0.1696 %	0.1696 %	0.1696 %
6M – VBP0006M	0.3279 %	0.3279 %	0.3275 %	0.3271 %	0.3268 %
12M – VBP0001Y	0.5234 %	0.5208 %	0.5208 %	0.5208 %	0.5208 %

Table 18: Sample calculation of Fallback Rates for GBP LIBOR. Source: Bloomberg https://www.bloomberg.com/professional/solution/libor-resource-center/.

The calculations for the first 5 tenors ON, 1W, 1M, 2M and 3M are as expected. However, the values of the Fallback Rates for the 6M and 12M tenors don't quite match. For these tenors the ARR does not visibly change. The Spread Adjustment is fixed anyway, therefore the Fallback Rates should be approximately the same for the dates t in Table 18 in line with the following:

$$FR_{GBPLIBOR,6M,t} = ARR_{SONIA,6M,t} + SA_{GBPLIBOR,SONIA,6M,t}$$

$$=0.0496\% + 0.2766\% = 0.3262\%$$

$$FR_{GBPLIBOR,12M,t} = ARR_{SONIA,12M,t} + SA_{GBPLIBOR,SONIA,12M,t}$$
$$=0.0507\% + 0.4644\% = 0.5151\%.$$

VI. Global View by Standard-Setting Bodies on LIBOR Transition

VI.1 IOSCO Statements on LIBOR Transition

Until 2017 the IOSCO publications set the focus on benchmark administrators and submitters, but not on users. In January 2018 IOSCO issued a statement directed for the first time at users of financial benchmarks setting out two matters to consider: (IOSCO 2018)

- Assessing the appropriateness of a benchmark for their own current and future needs, as well as those of their clients. Users are encouraged to assess the considerations, in both its initial selection and ongoing use.
- Contingency planning, such as if the selected benchmark becomes unavailable. IOSCO Principle 13 deals with the scenario of a possible cessation of a benchmark, mainly in relation to measures for administrators. Administrators should encourage users to have robust fallback provisions in relevant contracts and instruments that reference a benchmark.

IOSCO motivated the statement to benchmark users with decreased activity in underlying reference transactions for LIBOR and other reference rates and an increased concern about long-term sustainability. Background for the statement was most likely the July 2017 end of LIBOR speech.

To deal with an impending LIBOR cessation, IOSCO issued on 31 July 2019 a statement setting out matters to market participants with exposure to USD LIBOR (IOSCO 2019). It is recommended to include robust fallbacks for USD LIBOR like SOFR for both new and existing contracts, already move from LIBOR to RFRs and engage early in the LIBOR transition process. In another statement on benchmarks transition from 2 June 2021, the IOSCO Board reiterated the importance of ensuring a smooth and timely transition away from LIBOR. The mid-2023 dates would allow most of USD LIBOR-linked legacy contracts to roll off. In particular, due to the significant use of USD LIBOR globally, the IOSCO Board encouraged market participants to cease entering into new contracts that use USD LIBOR as a reference rate as soon as practicable and by end-2021 (IOSCO 2021a).

On 8 September 2021 the IOSCO Board published a statement on the use of credit sensitive rates as a possible alternative to USD LIBOR. Credit sensitive rates are interest rate benchmarks that seek to measure the credit risk component of unsecured borrowing in certain markets, which SOFR does not contain. IOSCO points out that regulators are concerned that some of LIBOR's shortcomings may be replicated through the use of credit sensitive rates that lack sufficient underlying transaction volumes. IOSCO calls for greater attention to IOSCO Principles 6 and 7 (IOSCO 2021b).

VI.2 FSB Reports on Risk-Free Rates, Term Rates and LIBOR Transition

Regarding the development of overnight RFRs and term rates the FSB published papers in July 2018 and June 2019 (FSB 2018a and 2019a). According to the FSB, markets facing the disappearance of IBORs need to transition to new reference rates. Market-led working groups have identified overnight RFRs as suitable alternatives or fallbacks to IBORs.

The markets are also in need of term rates. A term rate could be calculated at the end of a period or term based on observed rates during the period ("backward-looking") by compounding the actual overnight rate over the length of the period. A compounded overnight rate refers to the realised rate calculated from overnight rates over a given period. Another possibility for a term rate is for it to be fixed at the outset of a given period ("forward-looking") like with most IBORs (FSB 2018a). The working groups have considered the development of new RFR-derived forward-looking term rates based on transactions or executable quotes in overnight index swaps and futures. The robustness greatly depends on liquidity of the derivatives market. The development was at an earlier stage and uncertain (FSB 2018a).

In June 2019 the FSB issued the document "Overnight Risk-Free Rates: A User's Guide" giving an overview on alternative nearly RFRs and presenting options how the rates could be used in cash products (FSB 2019a). The FSB recognised that there may be a role for forward-looking rates, but considered that the greater robustness of overnight RFRs makes them a more suitable alternative in most of the cases where an IBOR was currently used.

The FSB produced a list of options (Table 19) using averaged RFRs ("backward-looking"), which has been taken over by national working groups and other organisations.

In arrears, in advance or mixed	**Conventions**	**Explanation**
In arrears: Next payment is known close to the end of interest period	0 Plain / Base Case	The observation period is identical to the interest period.
	1 Payment Delay	The interest payments are delayed by a certain number of days and are thus due a couple of days after the end of an interest period
	2 Lockout Period	The RFR is no longer updated (i.e. frozen) for a certain number of days prior to the end of an interest period (lockout period). During

		this time, the RFR of the day prior to the start of the lockout period is applied for the remaining days of the interest period
	3 Lookback	The observation period for the interest rate calculation starts and ends a certain number of days prior to the interest period
In advance: Next payment is known at the beginning of interest period	4 Last Reset	Interest payments are determined on the basis of the averaged RFR of the previous period
	5 Last Recent	A single RFR or an averaged RFR for a short number of days, are applied for the entire interest period.
Mixed: part of payment known at the beginning of interest period	6 Principal Adjustment	Combination of a first payment (instalment payment) known at the beginning of the interest period with an adjustment payment known at the end. The calculation of the instalment payment could be based on latest RFRs. The adjustment payment is calculated from the differential between the instalment payment and the averaged RFR during the interest period and paid at the end of the interest period by either party (i.e. additional payment by the client or a repayment by the product provider)
	7 Interest Rollover	Combination of a first payment (instalment payment) known at the beginning of the interest period with an adjustment payment known at the end. The difference to the previous option is that the adjustment payment is delayed. The adjustment payment can be made a few days later or at the end of the next period

Table 19: Options for using averaged RFRs. Source: FSB 2019b.

In June 2021 the FSB published a note concerning the choice of term rates. Some of the working groups have considered the development of forward-look term rates (the FSB calls these RFR-derived term rates) as they provide market participants advance knowledge and certainty of their interest rate obligations. The main drawback for this type of term rates is that deep and liquid derivative markets based on the overnight RFRs are a prerequisite (FSB 2021c). Liquidity is the reason why the reformed transaction-based LIBOR was no longer viable. In the case of derivatives, the FSB believes that transition to the more robust overnight RFRs is important to ensuring financial stability. Derivatives represent a particularly large exposure to most IBORs. Forward-looking term rates can only be robustly created if the derivatives markets on the overnight RFRs are actively and predominantly used. RFR-derived term rates may be more volatile than RFRs themselves (FSB 2021c).

In July 2020 the FSB and the Basel Committee on Banking Supervision (BCBS) published a report to the G20 presenting the findings from a questionnaire on supervisory issues associated with the LIBOR transition and recommendations. Continued reliance of global financial markets on LIBOR posed clear risks to global financial stability. Transition away from LIBOR by end-2021 required significant commitment and sustained effort from both financial and non-financial institutions (FIs and non-FIs) across many jurisdictions. The aim of this survey was to improve the collective understanding of LIBOR transition progress so far and to increase awareness of the importance of ensuring timely transition. The report sets a focus on LIBOR, but the recommendations may also be considered for other IBORs. The recommendations (Table 20) are grouped into three areas: (i) identification of transition risks and challenges, (ii) facilitation of LIBOR transition, (iii) coordination (FSB/BCBS 2020).

Group of recommendations	**Recommendation**
Identification of transition risks and challenges	Authorities and SSBs issue public statements as well as letters to CEOs to promote awareness of LIBOR cessation and associated risks, both within FIs and across the financial system. This includes the identification of LIBOR-referenced contracts and an assessment of the impact on infrastructure and operations.
	Authorities evaluate the need and then undertake regular surveys to monitor financial institutions' exposure to LIBOR and identify possible areas of risk concentration.
	Authorities request from regulated FIs regular updates on key risks and action plans, as well as steps already taken, including identification of senior management responsible for transition.
	Authorities and standard-setting bodies, in collaboration with national working groups and industry associations where appropriate, engage with trade associations to raise awareness of non financial institutions on the potential impact of LIBOR discontinuation and provide information on resources that may help the transition
Facilitation of LIBOR transition	Authorities establish and discuss with national working groups a formal LIBOR transition strategy.
	Authorities, in collaboration with national working groups and industry association where appropriate, (i) communicate clearly to FIs and market participants on the timing of the proposed change in market convention for new contracts from LIBORs to alternative reference rates and (ii) provide further clarifications of existing requirements, e.g. issues related to conduct risk.
	SSBs coordinate on guidance for transition where necessary and supervisory authorities communicate to market participants on the applicability of statements and guidance issued by SSBs and international bodies at the jurisdictional level.
	Authorities dedicate adequate resources and capacity to support transition efforts through active monitoring and regular supervisory dialogue.
	Authorities carry out further desktop reviews or on-site examinations, with potential coverage on types and levels of LIBOR exposures, transition plans, governance over the transition work and progress of negotiation with counterparties on LIBOR-referenced contracts
	Supervisory authorities consider increasing the intensity of supervisory engagement when the preparatory work of individual banks is unsatisfactory, where needed
Coordination	Authorities promote industry-wide coordination by sharing latest developments and best practices on transition
	Authorities maintain dialogue with national working groups and industry associations (domestically and internationally) on the adoption of fallback language for various products and identify steps that would facilitate the transition of legacy products where feasible
	Authorities consider working with relevant national bodies to identify legislative solutions, where necessary, to mitigate exposures of legacy contracts that have no or inappropriate fallbacks, and cannot realistically be renegotiated or amended
	Authorities exchange information on best practices and challenges, as well as progress across jurisdictions through the work of international fora such as the FSB, BCBS and IOSCO or existing channels (e.g. supervisory colleges and bilateral exchanges).
	FSB and standard-setting bodies coordinate at the international level to identify key common metrics for monitoring transition progress
	International bodies, standard-setting bodies and authorities encourage financial institutions to maintain good understanding of wider market developments.

Table 20: LIBOR transition recommendations by FSB and BCBS to G20 in June 2020. Source: FSB/BCBS 2020.

The survey and the analysis were undertaken before the COVID-19 pandemic. On 16 October 2020 the FSB published a Global Transition Roadmap to inform those with exposure to LIBOR benchmarks of some of the steps they should be taking and over the remaining period to end-2021 to successfully mitigate these risks. The roadmap draws upon detailed transition timelines developed by the national working groups (FSB 2020b).

On 2 June 2021, three months after the LIBOR cessation / non-representative announcements by IBA and FCA, the FSB issued a set of documents which include an update of the Global Transition Roadmap (FSB 2021a). The roadmap differentiates the following timeline:

- Firms should already have at minimum (and if not, should promptly):
    - Identified and assessed all existing LIBOR exposures.
    - Identified other dependencies on LIBOR outside of its use in financial contracts.
    - Agreed a project plan, including specific timelines and resources to address or remove any LIBOR reliance identified.
    - Understood industry or regulator recommended best practices in relevant jurisdictions.
    - Assessed what changes may be needed to supporting systems and processes in order to enable use of alternative reference rates in new and existing contracts.
    - Those who currently provide clients with products that reference LIBOR should have begun to implement a plan for communicating with end-users.
    - Adhered to the ISDA protocol.
    - Providers of cleared and exchange-traded products linked to LIBOR should also have ensured that these incorporate equivalent fallback provisions as appropriate.
    - Lenders should be in a position to offer non-LIBOR linked loan products to their customers.
- By mid-2021, firm should:
    - On the basis of a full assessment of their stock of legacy contracts, have determined which can be amended in advance of end-2021 and establish formalised plans to do so in cases where counterparties agree.

  - Where LIBOR linked exposure extends beyond end-2021, make contact with the other parties to discuss how existing contracts may be affected and what steps firms may need to take to prepare for use of alternative rates.
  - Have implemented the necessary system and process changes to enable transition to robust alternative rates.
  - Aim to use robust alternative reference rates to LIBOR in new contracts wherever possible.
  - Take steps to execute formalised plans, where realistic, to convert legacy LIBOR-linked contracts to alternative reference rates in advance of end-2021.
- By end-2021, firms should: Be prepared for all GBP, EUR, CHF and JPY LIBOR settings, and the 1W and 2M USD LIBOR settings, to cease, and to cease entering into new contracts that use USD LIBOR.
- By June 2023, firms should: Be prepared for all remaining USD LIBOR settings to cease.

In another document from 2 June 2021, the FSB made a statement encouraging all global market participants to discontinue new use of USD LIBOR-linked contract as soon as reasonably practicable and not later than end-2021 (FSB 2021d).

In yet another FSB statement from 2 June 2021, the FSB OSSG supports the potential benefits to use the ISDA spread adjustments for cash products (e.g. syndicated loans, floating rate notes, corporate bonds, securitisations and retail and commercial mortgages, as well as exchange-traded futures contracts) that are to fall back or move from an IBOR to overnight RFRs or to RFR-based term rates. This is supported by the extensive consultations undertaken by ISDA and many national working groups and the desirability of homogeneous spread adjustments for both derivatives and cash products, so these can operate smoothly together (FSB 2021b).

On 6 July 2021 the FSB presented a progress report to the G20 on LIBOR transition issues (FSB 2021f) as attachment to a letter by the FSB Chair to the G20 Finance Ministers and Central Bank Governors (FSB 2021e). The report addresses the following: progress in transitioning legacy contracts, progress in discontinuing new use of LIBOR-linked products, and need for communication, outreach and collaboration. Regarding discontinuing new use of LIBOR, the FSB highlights that a particular area of concern is the loan market where much new lending is still linked to LIBOR. It is emphasized that the continuation of major USD LIBOR panels through 30 June 2023 is not meant to support new USD LIBOR activity. The national working group in the US issued a recommendation to stop new lending linked to USD LIBOR by end-June 2021. The progress report also informs about a follow-up survey on supervisory issues related to LIBOR transition carried out among members of the FSB, the BCBS and other non-FSB members.

VII. Outlook

All the work concerning LIBOR transition has a very high priority for financial market participants and regulators. Since the Bailey speech on the end of LIBOR in July 2017 it has been a question of how LIBOR transition would happen, not if. The announcements by IBA and FCA on 5 March 2021 on the future cessation and loss of representativeness for the LIBOR settings in all five currencies and seven tenors have given the market clear deadlines (end-2021 for four currencies and mid-2023 for USD LIBOR). Benchmark administrators, national working groups, trade organisations, regulators and standard-setting bodies have done a lot of work over the years to prepare for transition from LIBOR to RFRs and LIBOR Fallbacks. Potential systemic risks have been significantly reduced. Approaching the finishing line, the market seems to be prepared for the end of LIBOR.

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