Leaving LIBOR

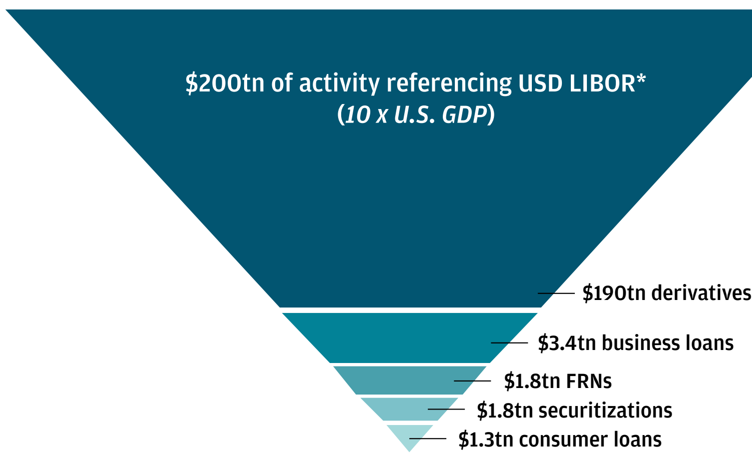
January 2021

Background and Key Global Developments

The transition to alternative benchmarks

Interbank Offered Rates (IBOR)s are interest rates that represent the average rates at which contributing banks could borrow in the interbank market on an unsecured basis from overnight to 12 months. The most widely used IBOR is the London Interbank Offered Rate (LIBOR), which is quoted in five currencies and seven tenors and is the reference interest rate for tens of millions of contracts worth more than USD 200 trillion, ranging from complex derivatives to residential mortgages. LIBOR is also hardwired into all manner of financial activity, such as risk, valuation, performance modelling and commercial contracts.

Volume of transactions in markets underlying LIBOR



~$500mm or less of underlying daily transactions underlying 3-month USD LIBOR

*Source: J.P. Morgan, Federal Reserve Board, BIS, Bloomberg, CME, DTCC, ARRC
*Note: Derivatives, floating rate notes, business loans, retail mortgages & other consumer loans data are gross notional exposures as of year-end 2016. Securitizations data exposures as of September 2018

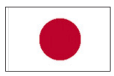
In recent years, the U.K. Financial Conduct Authority (FCA), tasked with overseeing LIBOR administration, has raised questions about the future sustainability of LIBOR in light of the relative decline in interbank lending. In response, regulators and market participants across the globe have worked to identify alternative risk-free rates (RFRs) that are compliant with the standards issued by the International Organization of Securities Commission.

Global regulators have previously indicated that they expected LIBOR and other IBORs to be phased out by the end of 2021. Most recently, US regulators (collectively, the agencies) issued a joint statement supporting the ICE Benchmark Administration's (IBA) proposal to cease the publication of one week and two month USD LIBOR at the end of 2021, at the same time as ceasing the British pound, Swiss Franc, Japanese Yen and Euro LIBOR. The remaining USD LIBOR settings are proposed to extend to June 30, 2023. The agencies encouraged banks to cease issuing new contracts referencing USD LIBOR as soon as practicable and in any event by December 31, 2021 and made clear the need to include robust fallback language, with a clearly defined alternative reference rate after LIBOR cessation, in contracts entered into before the end of 2021. The FCA released a statement welcoming and supporting the potential USD LIBOR extension and the agencies supervisory guidance.

Unlike LIBOR, which is centrally managed by a single administrator across all five currencies, all of which bear similar features, each alternative risk-free rate has different characteristics and administrators. As a result, the pace of market adoption has varied across regions.

Background and Key Global Developments

RFRs Launched Across Jurisdiction

Currency LIBOR	Alternative Rate	Secured vs. Unsecured
	**SOFR** Secured Overnight Financing Rate	Secured
	Reformed **SONIA** Sterling Overnight Index Average	Unsecured
	**SARON** Swiss Average Rate Overnight	Secured
	**TONAR** Tokyo Overnight Average Rate	Unsecured
	**€STR** Euro Short Term Rate	Unsecured

Key uncertainties and challenges

Several significant hurdles remain in the path to RFR adoption:

- Contract Fallback Language – Existing contractual language may not have considered a permanent cessation of LIBOR or may be impracticable to implement. As a result, amended fallback language may need to be incorporated into existing contracts.
- Forward Looking Term Rates – RFRs are overnight rates and therefore may not be suitable for markets requiring forward-looking term rates.
- Tough Legacy – Tough legacy contracts are those that do not have robust fallback language and may be difficult to amend prior to LIBOR cessation. Certain legislative solutions are being considered.
- Tax and Accounting – The transition away from LIBOR and other IBORS that are being discontinued raises important tax, accounting and financial statement considerations.

Global industry and regulatory developments

National regulators, authorities and working groups have published their priorities and identified milestones for market adoption; additional actions from the official sector are expected in 2021. Globally, regulators have issued calls to action and pronouncements of the importance of firms' transition preparation. This includes the Hong Kong Monetary Authority (HKMA) and the Bank of Japan in Asia, the Bank of England, the FCA, the New York Department of Financial Services and the U.S. Office of Comptroller of the Currency (see select LIBOR Transition developments).

Given the importance of IBORs across the industry, the move away from them poses significant transition risk if not addressed in a timely and comprehensive manner. The transition risk spans the economic risk of portfolios, operational risk, funding risk, conduct risk and legal risk. Each market participant's planning for the transition will vary depending on their exposure to IBORs.

Impacted entities should consider reviewing and addressing their overall exposure to IBORs, including: portfolio holdings, IBOR fallback provisions, portfolio performance benchmarks, liquidity and valuation impacts, technology and infrastructure, third-party readiness and coordination (e.g., custodians, brokers, administrators, vendors, etc.), and contractual agreements with third parties. For firms with material exposure, the transition work may span the organization – from product strategy and counterparty management to risk models, contracts, finance processes and systems.

J.P. Morgan Service and Operating Model

LIBOR transition program

J.P. Morgan Securities Services (Securities Services) commenced its LIBOR Transition program in 2018. The program is comprised of subject matter experts from across the organization who developed and are executing a multi-year plan, driven by client and product-focused work streams, to manage the transition from the IBORs to alternative RFRs. The Securities Services' program is closely integrated with the J.P. Morgan enterprise-wide LIBOR Transition program to leverage the resources of the broader firm and to coordinate our efforts.

Primary program work streams

- Document strategy and remediation – Identification of all client executed documentation that references IBORs and assessment of remediation strategies where applicable. This effort is being conducted one-on-one with impacted clients and is largely complete.
- IBOR exposure assessment and risk management – Analyze client holdings, create inventory of instrument types tied to IBORs and develop a plan (including investments in technology and data systems and dependencies on client and vendor data) to support the transition.
- Regulatory and industry development tracking – Ongoing monitoring of all IBOR transition-related developments including from national working groups (e.g., the Alternative Reference Rate Committee), key industry groups (e.g., the ISDA), global agencies (e.g., the FSB) and regulators globally. The program is also closely observing guidance and regulation being published and considered to address tax and accounting transition challenges.
- Client education and communication – Develop an IBOR transition education and communication plan for our staff and clients. Staff education and client communication is ongoing, keeping pace with program, industry and regulatory developments and challenges and will continue into 2021 and beyond.
- New rate implementation – Ensure technology and operations are fully capable to support OTC derivatives (cleared and non-cleared) and Cash Products (Floating Rate Notes and Bank Loans) linked to alternative RFRs. Engagement with third party vendors to accommodate necessary changes, including market reference data for RFRs and valuations.

Below we describe in greater detail our efforts to implement the alternative RFRs into our systems.

Supporting instruments tied to new RFRs

Our transition program is focused primarily on three asset classes that are linked to a benchmark rate: OTC Derivatives, Floating Rate Notes (FRNs) and Bank Loans. These include existing instruments/contracts that are currently linked to a benchmark rate or new instruments/contracts that are linked to one of the alternative overnight RFRs (i.e., SOFR, SONIA, SARON, €STR and TONA). At an asset class level, the readiness efforts for our Fund Accounting, Middle Office and Hedge Fund Services are similar.

Floating rate notes and bank loans

The implementation program is driven by two work streams: (i) sourcing market reference data (e.g., benchmark rates and instrument terms underpinning interest calculations) in an efficient manner and (ii) enhancing system interest accrual calculation capabilities to address new methodologies required by relevant instruments.

J.P. Morgan Service and Operating Model

Benchmark rate inputs are readily available and already incorporated into our processes. Work has been required to ensure full coverage of newer data points, aligned with calculation terms and features, which have become prevalent on instruments tied to RFRs. Vendors have been engaged to define mandatory data points and secure delivery through agreed feeds. Committed timelines exist for data feeds and accompanying processes to consume and apply content. Corporate debt was delivered in the fourth quarter of 2020 and subsequent enhancements are being delivered for Asset Backed Securities in the first quarter of 2021. Additional feeds to cover asset sub-classes including Municipals and Money Market Instruments are scheduled for delivery before the end of 2021. For Bank Loans, the third party provider utilized for security master reference data will be operationally ready to support the new RFRs in the first quarter of 2021.

System and process enhancements are being delivered to support newer interest calculation methodologies, which are being pursued by issuers of instruments tied to daily overnight RFRs. These interest calculations are typically more complex than the calculations which apply to instruments tied to term rates such as LIBOR and introduce features which previously were not needed in systems supporting cash instruments. FRNs linked to RFRs such as SONIA and SOFR are typically being structured with interest calculations, which balance the use of a daily/overnight rate whilst minimizing potential impacts in short-term fluctuation in that rate and facilitating certainty of cash flow at settlement dates. In contrast to the single rate, fixed in advance of the coupon period for a LIBOR-linked instrument, instruments referencing an RFR may use a period average of the rates published daily through the coupon period. This period average rate may be a simple/weighted rate or a compounded rate and furthermore, the rate at which the coupon is actually paid may be fixed towards the end of the coupon period 'in arrears'. Such a methodology is usually accompanied by a brief period in advance of payment to set the interest rate and calculate payment (measures include lookback, observation period shifts and payment delays).[1]

These platform solutions will fully automate the accrual process on instruments tied to RFRs whether acquired at issuance or where terms are changed on a legacy instrument. Until these solutions are fully implemented, we are able to support clients today through a range of operational processes and controls.

Additional considerations may apply to specific issuer-driven events (e.g., amended terms and conditions, tender/exchange offers) facilitating the transition from legacy positions. To the extent the updated information is provided through the standard market data channels (e.g., reference data vendors, corporate action announcements), it will be collected and processed by Securities Services. Clients may need to notify Securities Services where information about such events is not publicly and readily available.

Cleared OTC derivatives

In July and October 2020, central counterparty clearing houses (CCPs) changed the way they calculate payments associated with the interest rate swaps they clear. The CCP changes were effected with the goal of promoting liquidity in two RFRs - €STR and SOFR - and ultimately to support the swap market's transition from EUR and USD LIBOR. Specifically:

- In July, the largest CCPs, the London Clearing House (LCH), the Chicago Mercantile Exchange (CME) and the Eurex Exchange, changed the discounting of future cash flows and the calculation of Price Alignment Interest (PAI) for EUR OTC derivatives from Euro Overnight Index Average (EONIA) to €STR.
- In October, the same CCPs changed the discounting of future cash flows and the calculation of PAI for USD cleared interest rate OTC derivatives from EFFR to SOFR.

[1] For additional information on these methodologies, see https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2019/ARRC_SOFR_FRN_Matrix_Appendix.pdf

J.P. Morgan Service and Operating Model

In order to neutralize the valuation impact of the discounting changes, the CCPs applied a mandatory cash compensation that equaled the calculated valuation impact. The method used to apply the cash compensation amount differed among the CCPs. The mandatory cash compensation applied also to the EFFR to SOFR change and, additionally, LCH and CME booked mandatory risk transfer trades on each impacted account to restore the original market risk profile of the portfolio before the change. CCP clients had the option to keep those positions or take part in an auction facilitated by the same CCPs to close out the risk transfers trades. For additional details of the €STR and SOFR events, please refer to ISDA Research Note: Adoption of Risk-Free Rates: Major Developments in 2020

Working in partnership with our clients who held impacted positions, requisite information and trade details were received, and the cash compensation amounts and risk transfer trades and/or auction proceeds were successfully processed to client accounts.

In 2021, we will focus on understanding how the CCPs will support legacy trade deals. Following the October SOFR change and the ISDA fallback protocols announcement, we have had discussions with LCH and CME about their approach to support the ISDA fallback protocol language as it pertains to legacy contracts. LCH and CME are focused on ensuring the fallback details are applied timely and accurately to ensure proper cash flows. Currently, in order to avoid having to re-confirm deals, they do not plan to change the terms of the contracts. Securities Services is assessing the impact of the CCP approach to our operating model.

Non-cleared OTC derivatives

In a significant announcement on October 23, 2020, ISDA launched the IBOR Fallbacks Supplement to the 2006 ISDA Definitions (which applies to new trades executed on or after the effective date of the supplement) and the ISDA 2020 IBOR Fallbacks Protocol (which provides market participants with a mechanism to embed fallbacks into certain legacy trades). The fallbacks for a particular currency will apply following a permanent cessation of the IBOR in that currency. For derivatives that reference LIBOR, the fallbacks in the relevant currency would also apply following a determination by the FCA that LIBOR in that currency is no longer representative of its underlying market. In each case, the fallbacks will be adjusted versions of the risk-free rates identified in each currency plus a spread. The Supplement and the amendments made by the ISDA 2020 IBOR Fallbacks Protocol will take effect on January 25, 2021. It is expected that many market participants will take advantage of the protocol, even if it does not represent a universal fix for all IBOR-based derivatives. The ISDA 2020 IBOR Fallbacks Protocol does not apply to particular products as such; rather, it amends certain ISDA and specified non-ISDA documents that reference a relevant IBOR. In practice, it is expected that the protocol will be used principally to amend derivatives transactions governed by both ISDA and certain non-ISDA documents and that reference a relevant IBOR. For more information about the protocols please see ISDA 2020 IBOR Fallbacks Protocol FAQs.

Securities Services will engage with clients to understand whether clients have adhered or plan to adhere to the protocol and which legacy contracts will or will not be subject to the protocol and then work through the application of the protocol (e.g., amendment of terms with deal reconfirmation) when cessation occurs.

Client Considerations

Depending on investment strategy and structure, clients may be impacted differently by the IBOR transition, including, but not limited to, the following:

- Clients should consider assessing their overall exposure to IBORs, including contractual agreements with third parties, and their portfolio holdings. Clients should consider reviewing securities terms to determine fallbacks if LIBOR or another IBOR temporarily or permanently ceases.
- To the extent that data is not readily available with regard to a security's transition from IBOR to a new RFR (e.g., issuer amendments to IBOR-linked debt securities), clients may be required to provide the details of such transitions to Securities Services.
- Clients with exposure to certain asset classes may need to make select changes in internal systems and processes to enable trading in the new RFRs and to support new products linked to RFRs.
- Clients utilizing LIBOR-linked performance/incentive fee arrangements should consider changes required in the anticipation of the cessation of LIBOR. Transition planning should consider, amongst other matters, necessary revision of terms ahead of the benchmark cessation, taking into account whether changes are best implemented at the start of a performance reference period and the lead time required to provide suitable investor notifications and/or receive investor approvals.
- Clients will need to consider the tax and accounting implications of the transitions:
    - Accounting/Financial Reporting Implications: If the benchmark interest rate in a legacy contract is replaced with an RFR, counterparties need to assess whether this constitutes a substantial modification and therefore "de-recognition" for the purposes of accounting standards.
    - Tax Consequences: For amendments made to existing contracts (loans, derivatives, etc.), firms should assess whether this could give rise to a disposal of the existing contract for tax purposes. If amendments are considered material, in certain jurisdictions this may constitute a disposal of the existing contract and entering into a new contract for tax purposes, i.e., recognizing realized gains and losses. Please note that J.P. Morgan does not provide legal, tax, financial or accounting advice, and clients should consider any amendments and the appropriateness of the fallbacks incorporated therein with their legal, tax, financial and accounting advisers, taking into consideration their own particular circumstances and the fallbacks that may be applicable in any related products.

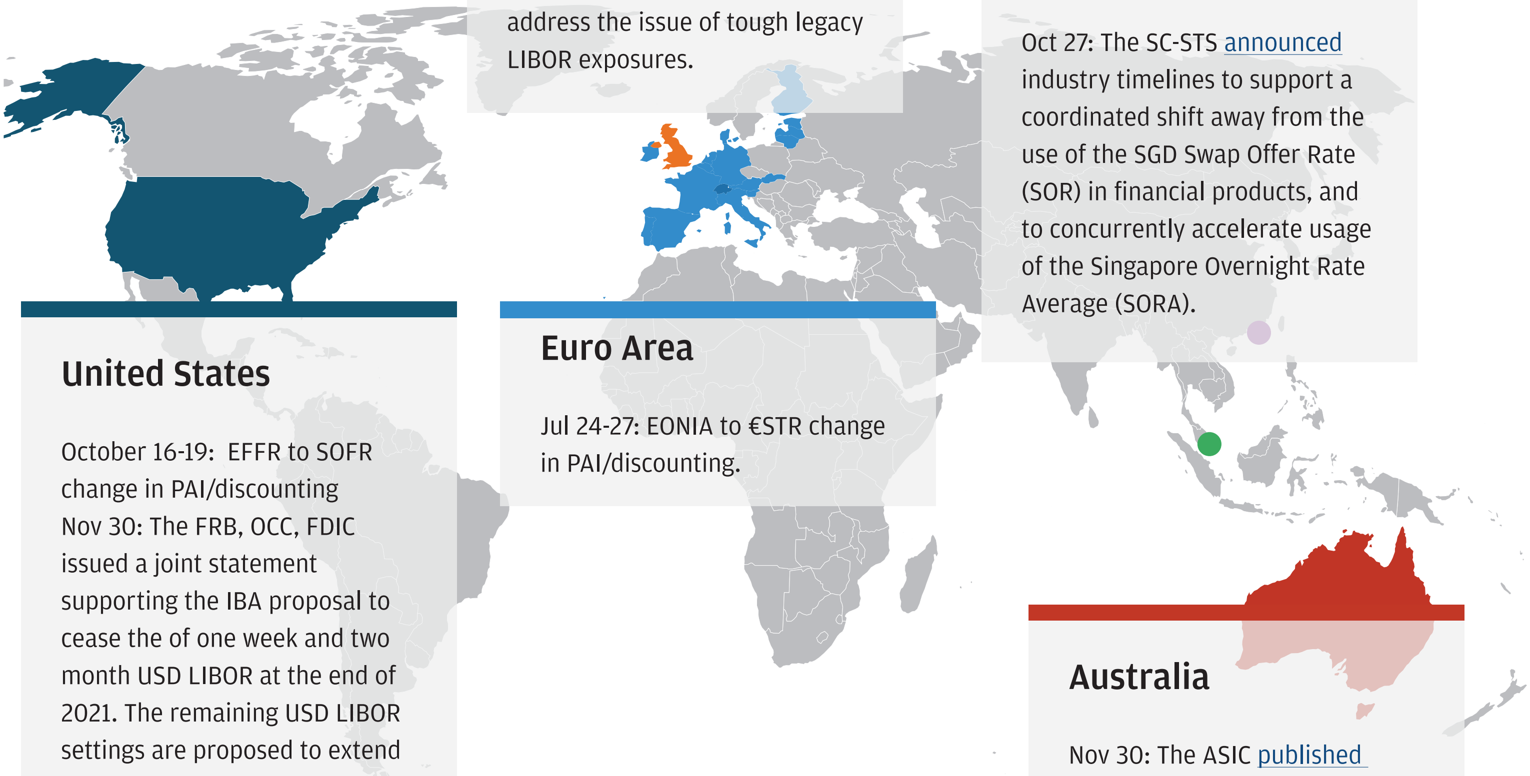
In recognition of these significant questions/issues, tax authorities and accounting standards setters have published and continue to release updated transition guidance to help reporting entities and taxpayers transition away from LIBOR. Securities Services is closely monitoring these developments and is prepared to discuss these transition considerations. However, clients should consult with their audit firms and tax advisers to determine appropriate treatment and with their appropriate advisors with respect to the LIBOR transition more generally.

Client communication and outreach

Securities Services has a continuing internal education program for our client-facing teams to provide updates on regulatory/industry developments and to share the progress and key highlights of our implementation program. We engaged closely with clients who were impacted by the 2020 CCP discounting curve changes and we have been meeting with clients on a one-to-one basis and will continue to do so into and throughout 2021 to discuss the impacts of regulatory and industry developments, our readiness and any dependencies our program may have on clients. For more information, please contact your J.P. Morgan representative.

Global LIBOR Transition

Selected Recent Developments



Hong Kong

Oct 16: The HKMA, in consultation with the Treasury Markets Association, developed transition milestones that authorized institutions are expected to achieve.

United Kingdom

Oct 21: The UK Parliament published a draft of the Financial Services Bill 2020, which provides the FCA with additional powers to address the issue of tough legacy LIBOR exposures.

Singapore

Oct 27: The SC-STS announced industry timelines to support a coordinated shift away from the use of the SGD Swap Offer Rate (SOR) in financial products, and to concurrently accelerate usage of the Singapore Overnight Rate Average (SORA).

United States

October 16-19: EFFR to SOFR change in PAI/discounting

Nov 30: The FRB, OCC, FDIC issued a joint statement supporting the IBA proposal to cease the of one week and two month USD LIBOR at the end of 2021. The remaining USD LIBOR settings are proposed to extend to June 30, 2023.

Euro Area

Jul 24-27: EONIA to €STR change in PAI/discounting.

Australia

Nov 30: The ASIC published Information Sheet 252: Managing conduct risk during LIBOR transition on practical guidance that Australian entities can adopt to manage conduct risk during the LIBOR transition.

Regulatory / Industry Body

Oct 19: The FSB published a global transition roadmap for LIBOR. The roadmap sets out a timetable of actions for financial and non-financial sector firms to take in order to ensure a smooth LIBOR transition by end-2021.

Oct 23: ISDA launched the IBOR Fallbacks Supplement to the 2006 ISDA Definitions and the ISDA 2020 IBOR Fallbacks Protocol, which will take effect on January 25, 2021.

Nov 18: The IBA announced that it will consult on its intention to cease publication of euro, sterling, Swiss franc and yen LIBOR after December 31, 2021.

Nov 30: The IBA announced it will consult on its intent to cease the publication of the one week and two month USD LIBOR settings after the deadline. The remaining USD LIBOR settings are proposed to extend to June 30, 2023.

Source: FRB/OCC/FDIC; UK Parliament; FSB; ISDA; IBA; HKMA; SC-STS; ASIC

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