Abstract

The LIBOR countdown has begun and banks and financial institutions around the globe have drawn up their plans to consider the implications and prepare for transition to alternative benchmarks. This whitepaper examines the risks around LIBOR transition and recommends an approach to smoothly chart out a LIBOR exit.

Authors: Aneesh Ramani, Karthik Krishnamani
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Introduction

With its widespread adoption that started in the 1970s, LIBOR has been an industry benchmark for decades. But now with LIBOR being phased out, financial institutions need a clear exit strategy that will allow them to embrace a world with a different reference rate. In this paper we will discuss the basic groundwork and steps involved in phasing out LIBOR that all streams of a financial institution, such as Legal, Operations, Finance, Technology, and Business, would need to undertake.

How LIBOR Became Important

LIBOR (London Interbank Offered Rate) is a benchmark interest rate that banks charge each other in the interbank market. It also serves as the basis for calculating interest rates on various debt instruments and is used as a benchmark rate for mortgages, corporate loans, government bonds, calculating fair value of derivative, and determining the hedge effectiveness.

LIBOR was designed to be calculated based on an assessment of actual interest rates shared by leading member banks. However, much later, around 2011, it was observed that LIBOR could be manipulated because it was calculated using the expected lending rate collated from multiple banks and not the actual lending rates. Meanwhile, it was known that between 2003 and 2012, interest rate swap traders colluded with bankers for speculative gains. Such events led to multiple lawsuits against banks.

Hence in July 2017, Andrew Bailey, former chief executive of the UK’s Financial Conduct Authority (FCA), questioned the sustainability of LIBOR and announced that by the end of 2021, FCA would not compel member banks to submit their quotes for calculating LIBOR in future. Additionally, certain regional regulatory groups had already initiated key actions to manage the situation.
Steps Being Taken by Regulatory Groups

<table>
<thead>
<tr>
<th>Region/Proposed Alternative reference rates (ARR)</th>
<th>Working Group</th>
<th>Regulatory Body</th>
<th>Regulatory Actions</th>
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</thead>
</table>
| US/SOFR - Secured Overnight Financing Rate | Alternative Reference Rates Committee (ARRC) | Regulatory Body Federal Reserve Bank of New York | • The ARRC published a guide on how to use SOFR and how to calculate the fallback rate and spread adjustment factor.  
• The New York State Department of Financial Services issued a press release directing the New York regulated financial intermediaries to submit their plans for managing the risks relating to the likely discontinuation of LIBOR at the end of 2021.  
• The SEC encouraged Audit Committees to understand the management’s plan to identify and address the risks related to reference rate reform.  
• Federal Housing Finance Agency has been working towards developing a SOFR-based adjustable rate mortgage (ARM) and a more robust “fallback language” for ARMs in the event of the cessation of an ARM’s reference rate. |
<table>
<thead>
<tr>
<th><strong>UK/SONIA</strong>&lt;br&gt;<em>Sterling Overnight Interbank Average Rate</em></th>
<th>Working group on&lt;br&gt;Sterling risk-free interest rates</th>
<th>Bank of England (BoE)</th>
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<td>- BoE and FCA jointly announced an increase in the use of SONIA based swaps instead of LIBOR swaps.</td>
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<td>- By July 2020 bank intends to publish the compounded SONIA, that would provide the flexibility to market participants to construct term-based SONIA rates.</td>
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<thead>
<tr>
<th><strong>EU/ESTER (Euro Short Term Rate)</strong></th>
<th>Working group on a Risk-free rate (RFR) Rate for the Euro area</th>
<th>European Central Bank</th>
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<tr>
<td>- The working group published recommendations on the strategy for transitioning from EONIA to the €STR (ESTER) along with the summary of responses of the transition plan of the participant.</td>
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<td>- In October 2019 the group published a report on the risk management implications of the transition to €STR and the introduction of €STR-based fallbacks for EURIBOR with focus on banking, asset management and insurance sectors.</td>
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<tr>
<td>- The European Money Market Institute created a modified EONIA by using a €STR plus fixed spread of 8.5 basis point from the first publication date of the €STR (October 2, 2019) until the discontinuation of EONIA (January 3, 2020).</td>
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<tr>
<td>Japan/TONAR (Tokyo Overnight Average Rate)</td>
<td>Committee on Japanese Yen interest rate benchmarks</td>
<td>Bank of Japan (BoJ)</td>
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<td>BoJ mentioned that Entities should start with publishing “prototype rates” which do not presume use of actual transactions. This will allow market participants to transition smoothly from JPY LIBOR to the alternative reference benchmark.</td>
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<td>BOJ aims to publish the “production rates” no later than mid-2021 which will be based on actual transactions.</td>
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</table>

<table>
<thead>
<tr>
<th>Switzerland/ SARON Swiss Average Rate Overnight</th>
<th>National working group on Swiss Franc reference rates</th>
<th>SIX - Swiss Exchange</th>
</tr>
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<tbody>
<tr>
<td>Following are the recommendations by the Secretariat of the Competition Commission (COMCO) for greater standardization of SARON-based credit products:</td>
<td></td>
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<tr>
<td>a. In the case of syndicated loans, a recommendation towards a restriction to one or more options can be justified on the grounds of economic efficiency</td>
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<td>b. In the case of credit products for retail customers, a recommendation for a restriction must comprise at least three processing options and include at least one from the group “in advance” and one from the group “in area”</td>
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<tr>
<td>c. Usage of compounded SARON as an alternative of term rates.</td>
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<td>Furthermore, the International Securities and Derivatives Association (ISDA) gave an update on their fallback consultations and the Swiss Bankers Association presented the envisaged approach to amend the Swiss Masters agreement.</td>
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What is Needed to Solve LIBOR Transition?

It is estimated that the contracts using LIBOR are valued at over USD 250 trillion. Even a single glitch or error by an organization during the transition could prove disastrous as it could lead to credit market confusions and a wave of financial lawsuits. A transition to alternative rates will require close global collaboration and tighter communication in its handling, given that its impact lines flow across legal, financial, business, regulatory, technology, and business.

Transitioning from an established benchmark like LIBOR requires:

- Detailed impact analysis across multiple areas of contract renegotiations
- Legal standings of ‘fallback’ provisions in contracts in different jurisdictions
- Identifying tax implications arising due to adoption of new reference rate
- Addressing challenges linked to altering systems/applications to factor in the new reference rate. Usage of the same in calculations around pay-offs, pay-ins, discounting of cash flows, etc.
- Changes in financial reporting
- Any gaps post-transition to alternate rates can complicate matters for organizations ranging from legal suits to incorrect financial reporting to bad customer experience

Challenges with Replacing LIBOR

Replacing LIBOR presents its own set of challenges in terms of significant costs and risks for financial firms. Since the proposed ARRs are calculated differently with a difference in base fundamentals, cash flows arising out of contracts referencing the alternative reference rates will differ from the prior rate i.e. LIBOR. The transition will compel firms to change risk models, valuation tools, understand the fallback provisions, and making effective hedging strategies.
Following are some of the major challenges in core business functions:

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<tr>
<th>Sr No.</th>
<th>Category</th>
<th>Actions</th>
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| 1      | Legal                                         | • Replacement of the benchmark rate would impact contractual terms of legacy contracts  
• Agreements would require carefully worded amendments concerning the applicable ARR and the credit adjustment spread  
• Most of the fallback provisions that were drafted are prima facie embedded to take care of temporary non-availability of LIBOR rates. Interpreting for permanent non-availability and its substitution with ARR would be a challenging task legally and degrees of difficulty would vary with different legal jurisdictions |
| 2      | Unavailability of term-based rates            | • LIBOR was a comfortable rate for different tenors of 1M, 2M, 6M, etc. but it is not the same case with the developing ARRs.  
• Lack of depth in the present market for overnight weighted average reference rates like SONIA and SOFR, besides lack of clarity on the depth of the market going forward poses additional challenges.  
• Computed term rates based on RFR like SONIA/SOFR need to be made available for all stakeholders from a centrally published source so that this onerous task of computations is not left on the shoulders of the banks and corporates. Besides it will help minimize differences between different stakeholders thereby reducing the chances of protracted litigations. |
| 3      | Risk and valuation methodology                | • Some RFRs are secured and therefore exclude the credit spread related to default risks that were embedded in LIBOR. While the unsecured overnight rates such as SONIA and ESTER have negligible credit spread that does not resemble the credit spread present in the LIBOR term rates, contracts referenced to the new RFR would lead to differences in cash flow arising from contracts based on longer-tenor LIBOR rates. This could result in a lower market value of trade.  
• Due deliberation will have to be observed while calculating the spread to be added on the reference rate. |
Impact on the Financial Services Industry

Given the widespread use of LIBOR-based contracts across multiple industries, the impact will be seen majorly across real estate mortgages, trade finance loan contracts, private equity, and investment management.

The following table gives a snapshot of the impact on several business functions and business stakeholders:

<table>
<thead>
<tr>
<th>Business Area</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real Estate Mortgages</td>
<td>Calculation of due interest payments will be done before due date of payment</td>
</tr>
<tr>
<td>Investment Managers</td>
<td>Change in rate for comparing the performance of asset allocations</td>
</tr>
<tr>
<td>Insurance Industry</td>
<td>The switch to an RFR may complicate the pricing for some long-duration insurance products</td>
</tr>
<tr>
<td>Bank Treasury</td>
<td>Difficulty in switching the issuances with alternative RFR at the same time</td>
</tr>
<tr>
<td>Syndicate Loans</td>
<td>Rise in operational issues as the loan systems are not modeled to process and calculate the interest payments based on overnight rates</td>
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**Real Estate Loans**

The differences between LIBOR and alternative reference rates (ARRs) make things complex for the loan market. The ARRs are based on actual daily transactions and there is no element of “forward-looking” to expected movements in the term interest rates. The overnight nature of upcoming RFRs and an absence of term-based rates may compel the borrowers to offers loans where interest payments will be calculated in advance, which could require the interest to be calculated at beginning of the interest period.

Borrowers in the real estate should proactively understand and plan for the impact of transition on their business. Entities should identify the floating-rate loan agreements and Interest Rate Swaps, which are tagged to LIBOR and are expected to continue post-2021. The entities involved should also understand the fallback provisions in the agreements and work on arriving at a consensus with both the parties (lender and borrower) to replace the LIBOR with an alternative rate.

**Investment Managers**

Benchmark rates such as LIBOR have been used by investment management for various purposes including hedging of interest payments using the interest rate swaps, benchmarking of their funds and portfolios for comparing the performance of returns from their asset allocation, and as an input for valuation, pricing, and risk models. In addition to these many firms hold LIBOR-based Floating Rate Notes or private debt. Replacements of the benchmark rate need to be carefully scrutinized by investment managers to preserve the client value.

**Private Equity Firms**

Private equity (PE) enterprises have significant reliance on debt. Such companies raise funds relying on agreements based on benchmark rates. Many such portfolio companies hold a substantial number of LIBOR-based credit agreements, and any amendment requires consent from all the stakeholders. A PE firm should consider guiding its portfolio companies through the LIBOR transition while taking a fresh look at its credit policies. Governance committees should be set to discuss with lenders and derivatives counterparties about fallback in existing contracts, including replacement of LIBOR with alternative reference rate, triggers for a switch to an RFR and calculation of a revised credit spread.

**Insurance Firms**

The transition from LIBOR to RFRs may have a significant impact on several aspects of an insurer’s business if not managed carefully. Even a slight change in the discount rate which was based on LIBOR could have a material impact on long-term liabilities with a floating interest rate. Insurers should measure and analyze the impact of these changes on their overall capital position. The switch to an RFR
may complicate the pricing for some long-duration insurance products, such as legacy contracts that were tied to LIBOR.

**Treasury**

Banking and corporate treasury organizations will have to understand the impact of upcoming RFRs on their business over the next couple of years. The treasury department of a bank is responsible for balancing and managing the daily cash flow and liquidity of funds within bank. The transition from the previously used benchmark rates on the existing and new issuances of instruments will significantly change the funding position of the bank.

It is challenging to switch all the issuances with the particular RFR at the same time. Also, changing the LIBOR that was being used as a discount rate will change the net present value (NPV) and cash flow of the LIBOR-linked notes and swaps. Thus, cash flow models and liquidity risk management frameworks require revisions that incorporate the usage of RFR.

**Syndicate Loans**

New RFRs cannot be considered as a direct alternative to LIBOR for the purpose of syndicated loans because LIBOR was an unsecured rate. It was embedded with the credit risk component and was quoted varyingly for different tenors and currencies. RFRs are quoted on an overnight basis and some of them are collateralized like SOFR. The usage of such RFRs could lead to a rise in operational issues as loan systems are not modeled to process and calculate interest payments based on overnight rates. There would also be uncertainty in calculating the cash flow in advance.

**Project Financing**

Transitioning to a risk-free rate will involve major changes to project financing documents that reference LIBOR. Project finance transactions are often complex transactions involving different categories of lender - commercial banks, development finance institutions, and multilateral agencies. This could lead to delays in decision-making regarding the new rate, particularly where all lender consent is required.

LIBOR is widely used in project finance transactions as the basis for calculating a floating interest rate for sterling and US dollar loans. Floating interest-based financing will be affected by the discontinuation of LIBOR after 2021 and new project financing arrangements will be based on the new rate. Alternate RFRs such as SONIA and SOFR are backwards-looking as they are published on an overnight basis the day after the period to which they relate. This creates challenges for loans, making it more difficult for borrowers to know at the outset of the interest period what will be payable at the end. The transition to a new RFR may impact the financial ratios for the project, although it is anticipated that methodologies to compute the fallback rate and credit spread will introduce the RFR which may bring the same economic effect as a LIBOR-based rate.
In terms of contracts that are referenced on LIBOR, the interest rate derivatives market outsizes all other asset classes. Based on the report by ISDA (International Swaps and Derivatives Association), the outstanding gross notional of interest rate derivative (IRD) referencing the US dollar, LIBOR, was about USD35.89 trillion at the end of Q1 2020. Approximately 23% of over-the-counter OTC derivatives are set to mature after December 31, 2021, with a notional value of around USD 30 trillion. One of the major issues prevalent in this segment is related to the new fallback rates relevant to the RFRs for OTC derivatives contracts. The key challenge is to determine term rate and credit spread adjustments that need to be computed for relevant RFR for OTC derivatives that were associated with IBOR such as LIBOR.

It is expected that ISDA will amend its 2006 definitions to help dealers and customers transition their IBOR portfolios to RFRs. On July 31, 2019, the ISDA had announced that Bloomberg Index Services Limited (BISL) has been selected to calculate and publish adjustments related to fallbacks that ISDA intends to implement for certain interest rate benchmarks in its 2006 Definitions’. BISL will be responsible for providing the fallback rate, which will be equal to the:

a. Adjusted RFR that is calculated by compounding overnight rate in arrears

b. Spread adjustment that is based on the mean or median spot spread between the LIBOR and the adjusted RFR for the relevant tenor over a five year period before an announcement triggering a fallback

The published rates may provide market participants clarity on the calculation of the spread and term adjustments to the RFRs that would apply to fallback rates. This information may help market participants value their portfolios as they decide how and when to migrate existing portfolios from LIBORs to RFRs.
## Applying Digital to Manage LIBOR Transition

Financial institutions need to explore how digital technologies can help solve some of these business problems, automate some of the manual interventions, and offer assisted decision-making capabilities.

### Here are a few digital interventions to accelerate LIBOR transition:

<table>
<thead>
<tr>
<th>Category</th>
<th>Digital Tenets solving core business problems</th>
</tr>
</thead>
</table>
| **Legal**                       | • OCR based reading of the contracts  
• Reading of predefined entities and clauses from the contracts using NLP and ML algorithms  
• **A database of impacted contracts that can be shared with banks**  
  **This database can also be enriched with additional attributes like:**  
  ◦ Impacted Jurisdictions (Country codes – like GB, IN, DE, US, JP, etc.)  
  ◦ Contract value expected to be outstanding as of December 31, 2021  
  ◦ Impacted industries  
  ◦ Contract values based on value outstanding as of December 31, 2021  
  ◦ Presence or absence of “fallback provisions” (or provisions similar to fall back provisions legally) in the contracts  
  ◦ Alternate RFR applicable  
• Studying the fallback provisions in the contract documents and where required replacement of text with respective fallback language using RPA. |
| **Unavailability of term-based rates** | **Term Structure**  
• Creating a simple platform that can pull-in RFRs like SONIA, SOFR, ESTER, TONAR, and others that have been published overnight in near real-time using APIs from official websites publishing overnight rates.  
• If the computed term structure is also published (there is no clarity on this as of date) that can also be pulled in on near real-time. Alternatively, the Term Structure can be computed mathematically using the published overnight RFRs following the compounded setting in arrears methodology. |
### Risk and Valuation Methodology

- Machine learning-based model for valuations of financial instruments by using the RFR.
- Models for calculating the fallback rate for each tenor and spread adjustment factor corresponding to each RFR in accordance with methodologies suggested by the ISDA and respective RFR working group.
- Using APIs to replace the interest rate by respective RFR fallback rate from Bloomberg terminal in the cash flow model.

### Key Recommendations

**Summarizing the proposed strategy to move away from LIBOR, here are some key elements that financial institutions need to focus on:**

<table>
<thead>
<tr>
<th>Awareness</th>
<th>Technology</th>
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<tr>
<td>A committee comprising of all the major stakeholders should be established for continuous communication and to build awareness within the working groups and clients to understand the impact of LIBOR transition and draft an action plan. The committee should initiate with inventory assessment of LIBOR linked agreements, assess their maturity profile, and then analyze the fallback language concerning a trigger of benchmark rate changes.</td>
<td>Enabling advanced technology-based solutions such as artificial intelligence, machine learning, and optical character recognition models that will assist in considerable data capture, data processing, system updates and contract review. Firms incorporating natural language processing to extract information using a trained model will be able to automate and extract key contractual information such as benchmark rate, maturity, counterparty details and fallback provisions etc. Models to be built for pricing LIBOR based instruments and assess the credit spread adjustment factor to be added on the alternative reference rate to minimize the valuation effects.</td>
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</table>
The COVID-19 pandemic will impact the global economy. However, this downturn will be more recession led than what happened during the sub-prime crisis.

Financial institutions are expediting their programs to solve key business problems such as branchless banking, enabling proximity to customers, zero-touch transactions, etc. From a risk standpoint, as organizations file bankruptcy and loan defaults increase, banks are also focusing on their credit risk modeling and on any additional regulatory requirements.

LIBOR will be retiring at the end of 2021, as planned, and the pandemic so far has not impacted this change. On March 25, 2020, a meeting took place between FCA, Bank of England and members of the Working Group on Sterling Risk-Free Reference Rates to discuss the impact of the COVID-19 pandemic on LIBOR transition plans over the coming months. It was recognized that there might be no extension of LIBOR discontinuation date and organizations were encouraged to continue with the plans of replacing the LIBOR with alternative RFR.
Conclusion

After the announcement of FCA regarding the discontinuation of submitting interest rate quotes for the publishing of LIBOR, significant developments have taken place for the transition of LIBOR to alternative risk-free reference rates. Several RFR committees and central bank working groups have been working for the publishing of rates and facilitating the adoption of new rates.

To ensure the smooth replacement of LIBOR to other RFRs, financial institutions and market participants can follow practices such as:

- Stakeholders and market participants to coordinate and collaboratively work towards a transition to eliminate the risks involved with replacement of rates in existing LIBOR-based rates
- Adopt modern technologies to review the contracts and understand the fallback provisions
- Take an active stance to introduce products and contracts based on alternate reference rate and re-evaluate the transition milestones based on feedback received from stakeholders and regulatory pronouncement on LIBOR transition.

Key References

- https://www.newyorkfed.org/Sc
- https://www.fhfa.gov/SupervisionRegulation/LIBORTransition
- https://www.bis.org/review/r200219b.pdf
Aneesh Ramani
Head, BFSI Consulting, LTIMindtree

Aneesh is a consulting advisor to global financial services organizations in areas of business transformation, digital strategy, innovation, sourcing, solutions, and delivery. In his role, he acts a senior client partner to engage with CIOs, COOs, and Innovation Champions of leading global banks and financial institutions to deliver large scale transformation programs in Corporate, Retail Banking and Wealth Management businesses. His key focus areas include experience transformation, intelligent automation, platform modernization, and business-driven insights.

Karthik Krishnamani
Senior Consultant, Banking & Financial Services, LTIMindtree

Karthik is a subject matter expert in trade finance, cash management, and retail banking. He brings to the table rich experience in both operations and technology areas of Trade Finance and Retail Banking. He has handled large multi-country and transformative projects in trade finance that includes, inter alia, IMEX (v.7.1) implementation, blockchain implementation as part of a consortium, process automations, and application development for asset sales, among others.