LIBOR Replacement

The Challenge for Financials and Corporates

Loans, Bonds & Derivatives

México City

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The Challenge for Financials and Corporates

Agenda

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2 **How does it impact my business?**

3 **How do I manage the transition?**

With You Today

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Replacing LIBOR - Why and When?

What is LIBOR

LIBOR, or the London Interbank Offered Rate, is a benchmark rate at which banks estimate they can lend money to other banks on an unsecured basis.

The gross notional value of all financial products tied to U.S. dollar LIBOR is around $200 trillion **– about 10 times U.S. GDP.** This include:

- $3.4 trillion of business loans
- $1.8 trillion of floating-rate notes and bonds
- $1.8 trillion of securitizations
- $1.3 trillion of consumer loans held by about four million individual retail consumers, including around $1.2 trillion of residential mortgage loans
- The remaining 95% of exposures are derivative contracts

Replacing LIBOR - Why and When

What is LIBOR

Post the financial crisis, it became apparent that LIBOR was being manipulated. Certain financial firms misstated their LIBOR submissions, sometimes colluding with other firms to improve returns and avoid perception of financial weakness.

- Rates submitted did not necessarily represent the rate at which the Banks actually borrowed
  - For a typical day, the Fed estimates the number of market transactions underpinning LIBOR are:
    - 1 month, 3 month tenors – 6-7 actual market transactions across all of the panel banks
    - 6 month tenor – 2-3 market transactions per day
    - 1 year tenor – 1 market transaction per day (or none)

- Majority of panelist submissions each day are based solely on "expert judgment"
- The financial crisis also brought about a change in the way banks funded themselves
  - Secured lending became the preference
- **The notion that a $400T market is predicated on a handful of transactions has lead the regulatory community to voice concerns**

When is the LIBOR transition occurring?

FED begins SOFR publication

23 April
Reformed SONIA publication begins

7 May
CME launches SOFR futures

18 May
ECB announces ESTER

TBD
ARRC expands to non-derivatives

1Q '19
Trading begins in cleared USD OIS swaps that reference SOFR in current PAI* and discounting environment

TBD
ISDA derivatives protocol launches

TBD
Amendment of 2006 ISDA definitions

Oct 2019
ESTER publication begins

TBD
Publication of 2019 ISDA definitions

1Q '20
CCPs[1] begin accepting new/modified swap contracts utilizing new discount curve

2Q '21
CCPs no longer accept new swap contracts for clearing with EFFR* as PAI and discounting

2H '21
Creation of a USD term reference rate

LIBOR Submission compulsion ceases

2018	2019	2020-21

How firms can prepare for the LIBOR transition

Planning and Industry Engagement

- Create enterprise wide program
- Identify objectives and develop short and mid term transition plans, gauge progress vs. plan
- Build business case for 2019 and beyond
- Participate in Central bank working group deliberations, ISDA and industry association groups, with a focus on products and associated transactions, fall-backs, term structures, and credit spreads
- Identification of relevant products and contracts, as well as systems / models impacted
- Assessment of economic, and operational impacts

Implementation and preparation

- Customer outreach, negotiation, and education
- Legacy contract reviews and fallback language modification
- Development of contract language to be used during the transition period
- Planning and execution of Infrastructure design changes
- Engagement by Industry with regulatory and governing bodies
- Build liquidity in alternate reference rates

Product transition and readiness

- Sequencing of product transitions
- Assessment of progress against plan
- Testing and readiness assessment
- Identification of any further changes required

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Replacing LIBOR - Why and When

If not LIBOR, then what?

Currency	Current Interest Rate Benchmarks	Alternative RFRs	Description	Borrowing Type[1]	Alternative RFR Administrator	Publication Date	RFR Working Group
	USD LIBOR	Secured Overnight Financing Rate (SOFR)	— Fully transaction-based — Encompasses a robust underlying market — Overnight, risk-free reference rate	Secured	Federal Reserve Bank of New York	April 2018	Alternative Reference Rates Committee (ARRC)
	GBP LIBOR	Reformed Sterling Overnight Index Average (SONIA)	— Fully transaction-based — Encompasses a robust underlying market — Overnight, risk-free reference rate	Unsecured	Bank of England	April 2018	Working Group on Sterling Risk-Free Rates
	EUR LIBOR; EURLIBOR EONIA	Euro Short Term Rate (ESTR)	— Transactions in Euros that are reported by banks in accordance with the ECB's money market statistical reporting (MMSR)	Unsecured	European Central Bank	October 2019	Working Group on Euro Risk-Free Rates
	CHR LIBOR	Swiss Average Rate Overnight (SARON)	— Repo rate that reflects interest paid on interbank overnight repo transactions	Secured	SIX Swiss Exchange	August 2009	National Working Group on Swiss Franc Reference Rates
	JPY LIBOR; TLIBOR; Euroyen TLIBOR	Tokyo Overnight Average Rate (TONA)	— Fully transaction-based for un-collateralized overnight call rate market — Calculated as a weighted average by the volume of transactions corresponding to the rate	Unsecured	Bank of Japan	December 2016	Study Group on Risk-Free Reference Rates

1 - Some of the overnight rates are unsecured with only a very small credit spread and some are secured and exclude credit risk completely. Especially in times of stress, secured and unsecured rates behave very differently – secured lending dries up. The economic difference to LIBOR, as well as the structural differences among the secured overnight rates corresponding to various currencies raise additional complexity.

What is SOFR?

Secured Overnight Financing Rate (SOFR)

- It measures the cost of overnight borrowings through repo transactions collateralized with U.S. Treasury securities (the deepest and most liquid money market in the U.S.)
- It is based on actual transactions and takes in more transactions than any other Treasury repo rate available, recently around a trillion dollars each day
- It is relevant to the cost of borrowing for a wide array of market participants
- It is constructed to meet the best practices for benchmarks set out by IOSCO and has been built to accommodate future market evolution

Replacing LIBOR - Why and When

Is there a difference?

LIBOR

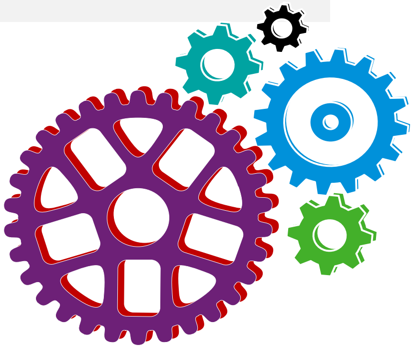
London Interbank Offered Rate

- Unsecured
- Reflects bank cost of funds (ish)
- Widens to reflect COF in stress periods
- Term structure
- Easily manipulated

SOFR

Secured Overnight Funding Rate

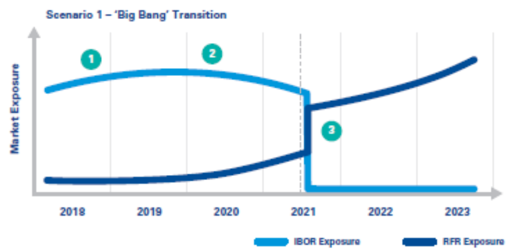
- Secured
- Risk-free rate
- Will not widen in periods of credit stress
- Overnight (to begin)
- Will not be easily manipulated

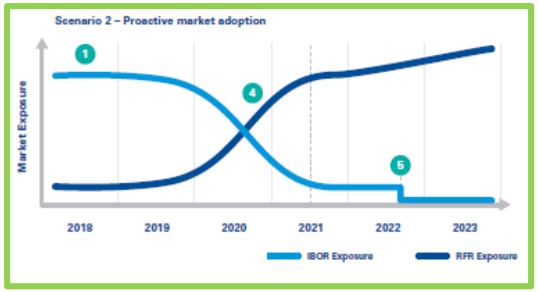


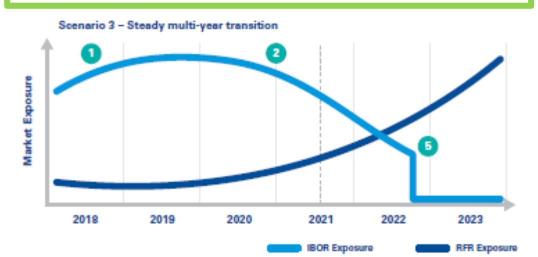
Replacing LIBOR - Why and When

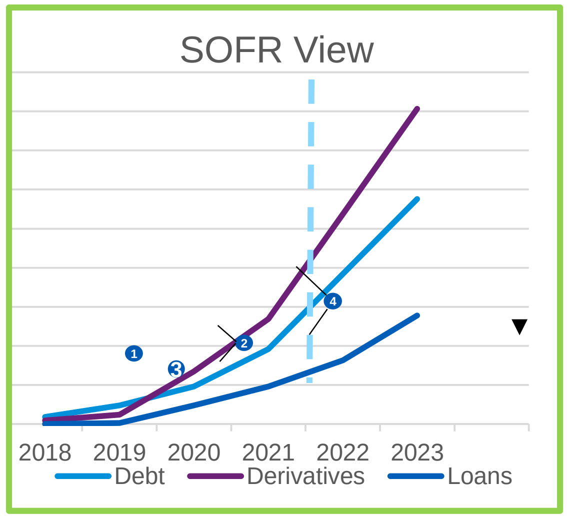
LIBOR is going away and will be replaced by alternative benchmark rates

Evidence of market adoption in SOFR debt based products will stimulate demand for loans and derivatives increasing customer expectations for SOFR product from year end 2019 to mid – year 2020









1. **SOFR Debt Issuance total $87 Billion** as of May 2019 ($9 billion in the first two weeks of 2019) with $47 billion notional in swaps traded by May 3.

2. Slow build-up of positions in new RFR products (including loans) are **expected to rise as banks are able to fund using SOFR debt.**

3. **Derivatives are expected to ramp-up in the 4th Qtr of 2019 / 1st of Qtr. of 2020,** overtaking debt as there are issuers that are currently hedging short-term debt against LIBOR.

4. Based on accelerated market adoption of **RFR should push the acceleration of SOFR indexed loans products**. As well, the push for RFR will push to renegotiate contracts on a bulk bilateral basis.
   - Creates self-fulfilling liquidity in RFR products, accelerating the decline in reliance on LIBOR.
   - But requires significant coordination among market participants.

How does it impact my business?

How does this impact my business?
Key risks and challenges

SCOPE

- Impacts all market participants, all clients and counterparties, all contracts
- Spans multiple functions and businesses and has a direct impact on strategic planning
- Develop a transition plan to incorporate new risk free rates into products that have historically relied upon IBOR
- Adopt a flexible and agile approach in order to adapt quickly to the changing environment
- Need to consider implications and to reprioritize investments for the next 2/3 years

CONTRACT MANAGEMENT

- Identification of new and existing impacted contracts may be of a larger scale
- IBOR related cash products may be more difficult to identify than derivatives
- Locating, gathering, and identifying all related documentation and direct/indirect references to IBOR, fallback clauses, etc. is onerous

The time for digitalization has come

INTERNAL AND EXTERNAL COMMUNICATION

- Enhance employee awareness through the design and deployment of communications and trainings
- Develop retail and commercial communication strategies
- Execute call center and relationship manager trainings
- Reach out to clients and counterparties: scale of response and potential negotiation may be huge
- Communication to investors

RISK MANAGEMENT

- Change is needed for multiple valuation/risk systems and models
- RFR rates will need term structure and credit spreads applied

MARKET DEVELOPMENT

- Market transition may be occurring more quickly than participants are prepared for
- Identifying and monitoring correct metrics to measure market development and firm participation
- Liquidity need in new reference rate based products
- Business opportunity/threat managing with clients economic condition of the contracts

ACCOUNTING, ALM, TAX

- Changes in Day 1 balance sheet, fair value measurement, and leveling
- Accounting standards and hedge effectiveness tests require change
- ALM position change and FTP implication
- Tax acceleration impact

OP. & CONDUCT RISK

- High level of conduct risk
- Risk of strain to relationships through protracted negotiation over transition, e.g. fallback for legacy
- Existing operational processes need to be checked and updated
- Potentially systems will need to run parallel processes for certain operational activities

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How does this impact my business?

Replacement will dramatically affect Treasury operations, LIBOR-linked products, and commercial activity

Products and contracts affected by the discontinuation of LIBOR include both contracts that directly and indirectly reference LIBOR (e.g. for valuation purposes)

OTC Derivatives	Leasing	Repo, Cash, and Other Short Term Financing	Escalation clauses
Exchange Traded Derivatives	Loans and Revolving Credit Lines	Bonds	Late payment clauses
Structured Finance Arrangements	Inter-entity Loans	Employee Pension Funds	Non-LIBOR hedges (RFR component)

Based on impacted exposures, the decommission of LIBOR will significantly impact not only products, but <u>most functions and businesses</u> within institutions. Examples include, but are not limited to:

Business Units

- Treasury
- Finance
- Legal
- Marketing and Sales
- Operations
- Accounting
- Contracts & Legal

Infrastructure and Systems

- Pricing
- Risk applications
- Vendor applications
- Policy Admin Systems
- Data Management
- System Migration Management
- Undeveloped Infrastructure
- Contract management systems

Operations

- Cost Management
- Customer Management
- Third Party Vendor Management
- Controls Updates
- Procurement Functions with Variable Rate Provisions
- Late payment provisions
- Cash market, revolvers, & other short-term financing

Risk Management

- Interest Rate Risk
- Treasury Risk
- Model Risk Management
- Funds Transfer Pricing
- Treasury Risk
- Customer Compliance
- Hedging
- Regulatory Reporting

Finance

- Valuation of Assets / Liabilities
- Funding and Liquidity
- Asset / Liability Management
- Hedge Accounting
- Forecasting and planning

How does this impact my business?

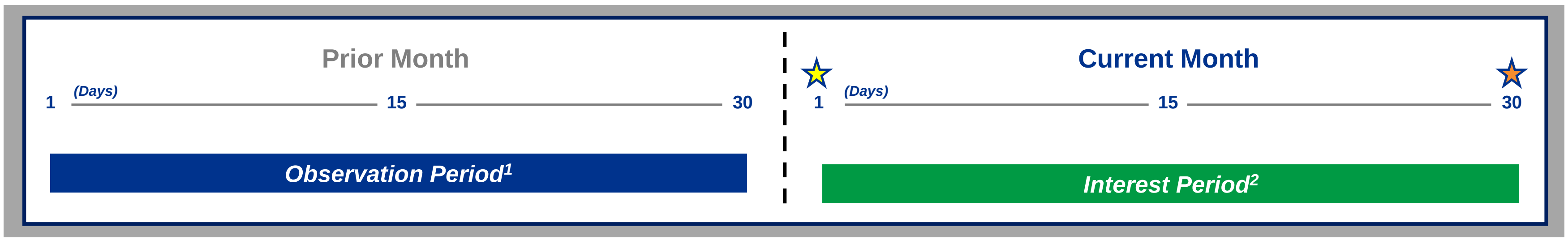
What are the SOFR alternatives?

	Description	Example Calculation
Simple In Advance	This rate is available daily, but it is not compounded. Observed daily SOFRs or average SOFR are applied from the period before the current interest period begins	If a borrower wanted a 30-day SOFR loan, the interest rate would be calculated from the previous 30 days. The payment due at the end of the period being the sum of those amounts
Simple In Arrears	This rate is available daily, but it is not compounded. Daily rate is applied to the notional during interest period. It is not paid until the first day of the next interest period	If a borrower wanted a 30-day SOFR loan, the interest rate would be calculated by applying overnight SOFR to the outstanding balance each day, with the payment due at the end of the period being the sum of those amounts
Compounded in Advance	This rate would be determined by compounding the observed daily SOFRs or average SOFR from the period before the current interest period begins	If a borrower wanted a 30-day SOFR loan, the interest rate would be calculated by compounding the overnight SOFRs from the previous 30 days
Compounded in Arrears	This rate is determined by compounding an average SOFR during the interest period. It is not paid until the first day of the next interest period	If a borrower wanted a 30-day SOFR loan, the interest rate would be calculated by compounding overnight SOFR for the 30 days from loan initiation to loan maturity, i.e. the rate is determined at the end of the interest period

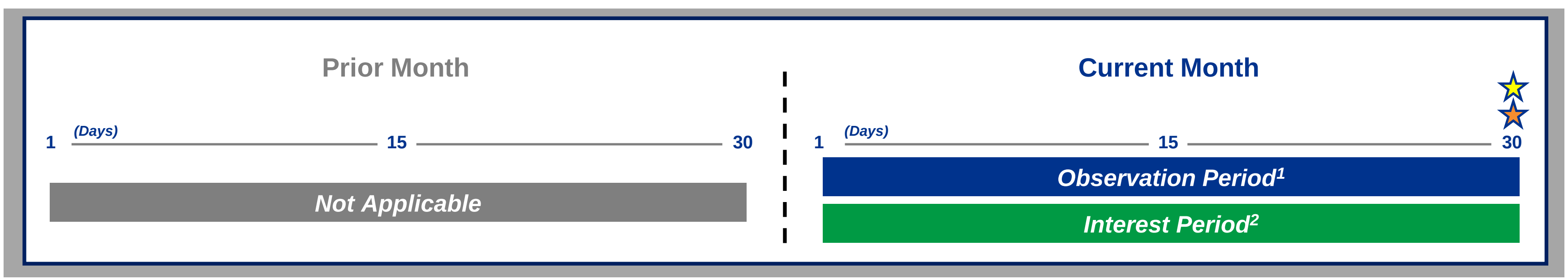
How does this impact my business?

How does Accrual Accounting differ from Arrears & Advance?

In Advance Last Reset Period



In Arrears Base Case Example



Legend:

Observation Period[1]: Period used to calculate the average reference rate

Interest Period[2]: Period for which an interest installment is paid

Payment Rate is Known

Payment Date

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How does this impact my business?

Each SOFR alternative may have different implications

	Simple in Advance	Compounded in Advance	Simple in Arrears	Compounded in Arrears
Rate Certainty	Interest rate is known at the **start of the payment period**		Interest rate is not known until the **end of the payment period**	
Cash Flow Management	Interest payment cash flows are known at the **start of each interest rate period**		Interest payment cash flows not known until the **end of each interest rate period**	
Ease of Hedging	**Limited market availability** - primarily OTC		**Substantial market availability** - exchange based	
System Readiness	**Minor system customization required**		**Substantial system customization required**	

How does this impact my business?

Pricing Implications & Spread Adjustment

Rate and Pricing Construction

Index LIBOR

- Profit Margin
  Client Credit
  LIBOR Hedging
  Costs

Profit

- Term Risk
- Tenor Basis Risk
- Bank Funding
  Cost
- Unsecured Rate
- Credit Spread

LIBOR

Index SOFR

- SOFR v. LIBOR
  Hedging SOFR v.
  LIBOR Liquidity
  Valuation Uncertainty

Basis risk

- Profit Margin
- Client Credit
- Credit Spread

Profit

Credit Spread Adj.

- Overnight Tenor
- Secured Rate

SOFR

Basis SOFR vs. LIBOR Basis Risk

- Hedging Program
- Cost of Regulatory
  Uncertainty

Hedging

- Largely short-dated
  Instruments
- Limited market for
  non-swap derivatives

Market Liqudiity

- Inconsistent Curve
  Construction
- Limited Price
  Discovery
- Increased Volatility

Valuation Uncertainty

Pricing with SOFR will require a re-think of the pricing, cashflow, and risk profiles of financial instruments

Potential Considerations for Modelling future Product Strategy

Pricing Implications
- Changes in SOFR/OIS Spreads
- Changes in correlations between SOFR/OIS
- Changes in industry approaches to building SOFR curves for pricing

Financial Impacts
- Changes in Costs of Funds
- Increase in longer-term SOFR instrument liquidity
- Development of SOFR derivatives market and ability to hedge with different products

Credit Spread Adjustment
- Static Spread Adjustment
- Credit Worthiness Spread Adjustment
- Changes in product mix
- Potentially varying pricing spreads over time

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How does this impact my business?

As the market converts, corporate treasuries will need to address replacements for term structure and value transfer

CRITICAL SUCCESS FACTORS

TERM STRUCTURE

- Alternative reference rates are based on overnight rates which are backwards looking, whilst LIBOR is a forward-looking term rate
- Cash products are traditionally priced on 'forward-looking' term rates because they define interest payments in advance:

Without term rates, there is uncertainty about funding costs

As this part of the market is focused on hedging of interest rates rather than credit risk over time, they can be managed using overnight rates, compounded where necessary

- Due to interdependencies between cash and derivatives products (i.e., floating rate notes are hedged with interest rate swaps), the development of term rates has been a key focus point
- Until a forward-looking SOFR term rate is developed, some issuers are using a backward-looking, daily compounded average of SOFR

VALUE TRANSFER

- For firms with legacy positions, basis difference is a material issue
- Trades maturing beyond the end of 2021 may need to be rebooked using new rates:

This introduces basis risk as the alternative reference rates are not a 1:1 match to their LIBOR predecessors

USD LIBOR is an unsecured rate, and therefore, trades higher than ARR

Rebooking trades from LIBOR to SOFR & other ARR can cause a material P&L impact

- Market participants await the market bodies' recommendation on a basis adjustment required to compensate them for moving to SOFR and other ARRs
- This replacement benchmark spread will lead to a transfer in value for legacy contracts

How do I manage the transition?

How do I manage the transition?

A LIBOR-focused framework should be used to guide your transition

1. Governance and Oversight

—Assess and implementation of policies, procedures and stakeholder roles and responsibilities
—Establish issues and escalation framework for issue escalation, QA/QC review, and senior leadership review
—Monitor remediation efforts

2. Strategy

—Industry development, involvement, and monitoring
—Timing for cutting over internal products to new reference rates
—Product pricing decisioning and global rate reference rate impacts

3. Scope / Impact Inventory

—Business Units
—Products
—Systems / Applications (in-house and third party dependent)
—Vendors (systems / application and operations)
—Models
—Internal Functions (FTP, IRR, hedging, CCAR, CECL)

Robust Change Management

4. Contract Change Management

—Assess impact across portfolio of contracts
—Define amendment language
—Execute amendments and track compliance

5. Modeling Remediation

—Update models
—Back-testing and validation
—Update model documentation

6. Ops and Tech Remediation

—Reference data systems
—New product implementation
—Existing contract / position migration

7. Client and Regulatory Communication

—Enhance employee awareness through the design and deployment of coms and trainings
—Develop retail and commercial communication strategies
—Execute call center and relationship manager trainings

8. Accounting & Tax

—Determine exposure to transition value
—Assess impact to hedge accounting & disclosures/reporting requirements
—Quantify any potential tax impact

9. Risk Management & Internal Audit

—Follow the Business' actions and have active voice, but not a primary Transition participant

10. Post Transition Activities

—Ongoing monitoring and reporting
—Remediation activities

How do I manage the transition

The initial focus would define exposure in underlying LIBOR activities and operations, resulting in a plan that is right sized for your operations

Illustrative Plan

Phase	Workstream	Description	Deliverable	Timing
ASSESSMENT	Transition Strategy	Develop transition scenarios, monitor evolution of the marketplace, and provide guidance on remediation actions and timing	Scenario analysis and strategy around adoption	Week 1-2
ASSESSMENT	Exposure Assessment	Identify the impacted positions, supported by a scalable and repeatable process to re-perform the analysis through the course of the transition	Impact analysis on exposure, contractual provisions and operations	Week 1-6
ASSESSMENT	Contracts Assessment	Identify contracts with LIBOR exposure, developing cohorts, and sampling the contracts to determine fallback language exposure and estimating the effort required remediate the contracts		
ASSESSMENT	Models, Systems & Processes	Estimate impact associated with changing from global single-rate LIBOR models to alternative replacement rates, supporting introduction of new products and migration of the legacy positions		
ADVICE	Strategic Advice and Insight	Advice on the different procedures considered by market participants for calculation of the spread between LIBOR and its replacement reference rate, and fitness of term floating rates used for WB loan products	Market activities and trends, impact of different potential procedures and analysis of other potential floating rates	Week 4-5
PLANNING	Governance & Oversight	Effective program governance for the right level of top down influence and transparency, while that addresses control and engagement of critical stakeholders and business functions	Governance model, RACI matrix, KPIs and metrics	Week 5-7
PLANNING	Implementation Plan	Develop overall implementation plan focused on WB's preparation for adoption, issuance of alternative benchmark based offerings and taking into consideration KPMG's industry insights on LIBOR	Holistic transformation plan to incorporate a bottom-up estimation and budgeting approach promoting traceability	Week 5-8
PLANNING	Change Management	Facilitate identification, development, and execution of key communications and training activities across all of the impacted workstreams in an effort to minimize customer impact along with operational, reputational, and conduct risks	Baseline change readiness and effective communications plan to socialize with stakeholders and borrowers	Week 5-8

Ongoing strategic advice and insight on industry activity of the LIBOR replacement including update on the recommended alternative reference rates (SOFR, ESTER, SONIA, SARON, TONIA)

Libor survey – KPMG in Mexico

As a result of the potential discontinuance of LIBOR rate indexes in 2020-2022, financial institutions worldwide have been working around six main dimensions:

- Governance & Strategy
- Contracts & Legal
- Models
- Financial & Accounting
- Communications
- Operational Readiness

The following survey has been developed to gauge the current state of your program or to help you find out the level of awareness within your Institution.

The results of the survey will be anonymized and shared with all participants in the survey.

Upon completion, share your responses and feel free to reach out at any opportunity if there are any questions, thanks.

KPMG in Mexico

Thank you

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