LIBOR TRANSITION
CANADIAN ANNUAL DERIVATIVES CONFERENCE

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MONTREAL

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Canadian Annual Derivatives Conference
LIBOR Transition
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Agenda

1. Context: Why is LIBOR Changing and What is the Impact?
2. Fallback Implications
3. Perspectives on positioning, mobilization and implementation
4. Questions

1 Context: Why is LIBOR Changing and What is the Impact?

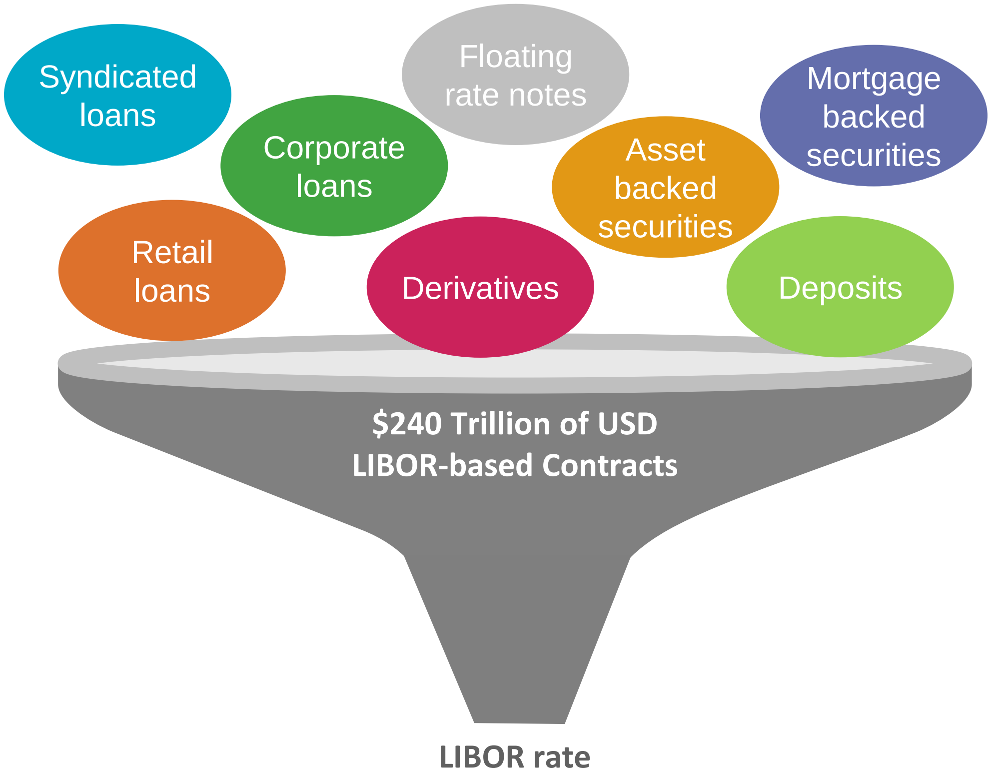
LIBOR – the reference rate for over $240 trillion in financial exposures – is likely to be discontinued after 2021

LIBOR is ubiquitous…

- Over US$240TN in notional exposures, typically 30-40% of the lending book
- Pricing models, systems, processes
- Understood, efficient, easily hedged

… But poorly constructed

- Based on daily bank-to-bank lending which is miniscule
- Regulators say this is unacceptable and are pushing banks off LIBOR
- The FCA will not “persuade or compel” banks to submit for LIBOR **beyond 2021**



Priced off $700 million or less of daily transactions

Over 90% of total gross notional exposure is in derivatives

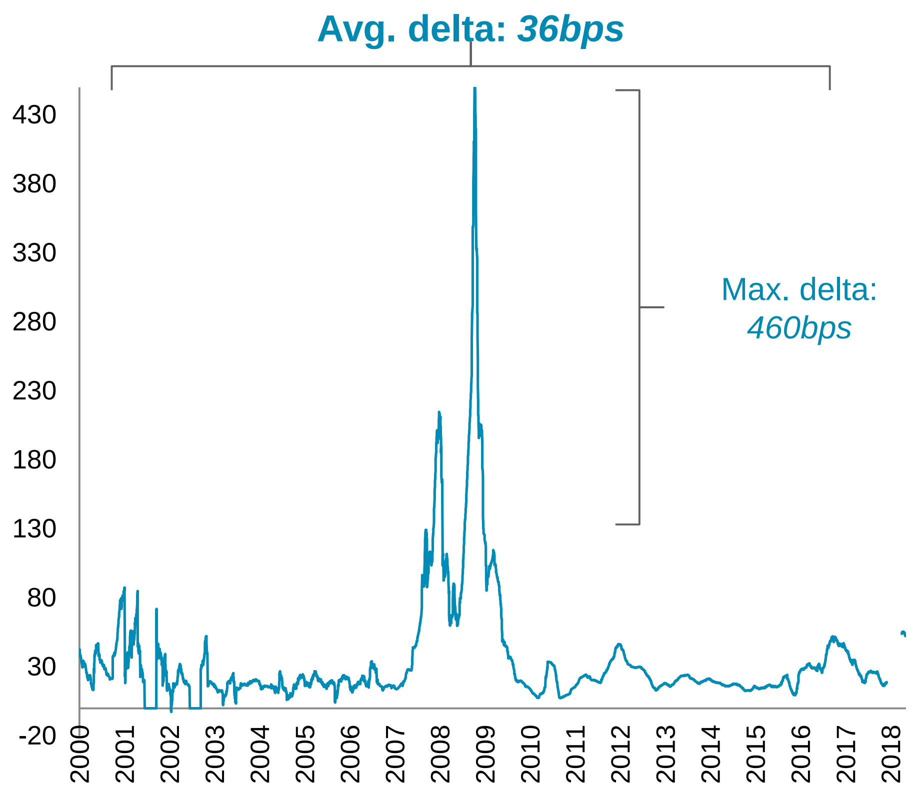
New alternative rates (ARRs) have been proposed but are structurally different than LIBOR

Proposed alternatives rates…

- **Have no credit risk component**
- **Are inconsistent across currencies**
  - USD, CHF rates secured
  - JPY, GBP, EUR unsecured
- **Only an overnight tenor**
  - Term structures to come
  - Available at different times perhaps as late as end of 2021
  - And may never be available

Illustration of credit component

3M LIBOR vs. 3M proxy for USD alternative rate[1]



1. Treasury repo rate is a component of SOFR, and is used as proxy for SOFR prior to SOFR publication in April 2017. 3M rate calculated based on a geometric average of the overnight rate over a 90 day period on a forward looking basis. The Treasury repo rate is the volume-weighted mean rate of primary dealers' overnight Treasury general collateral repo borrowing.

Source: Thomson Reuters, Federal Reserve Bank of New York, Oliver Wyman analysis

LIBOR transition will change bank and client economics across both Legacy and ongoing New product portfolios

Legacy portfolio

When LIBOR discontinues, instruments switch to "fallback" rates

- Contracts were not designed for the cessation of LIBOR. Some are silent, others revert to "last LIBOR," others to Prime
- Net: fallbacks alter "the deal" unpredictably
- Newer ARRC/ISDA fallbacks minimize value transfer but will not replicate LIBOR

New product portfolio

New products using ARRs will not match existing economics

- ARR differences mean product pricing and balance sheet strategy will need to evolve
- Products must allow for the lack of the credit spread and term **on 30-40% of the balance sheet**
- Significant new product development required

N.B. Transition of cash products much more complicated than derivatives

Summary: LIBOR transition problem statement

- **The transition is unprecedented, complex, and enormous… and not well understood. It will touch almost all areas of the financial system**
  - Trillions in exposures need to change
  - Affects clients, products, business results, internal operations
  - Many “ground zeroes” e.g. derivatives, lending, mortgage, corporate trust
  - Conduct risk exists if you are selling LIBOR-based products maturing after 2021
- **Transition requires “fallback” of positions with a significant uplift required**
- **A host of ARR products will be required; the result will be transformative**
- **Your firm needs to manage through uncertainty, execute complex operational changes, and minimize conduct issues**

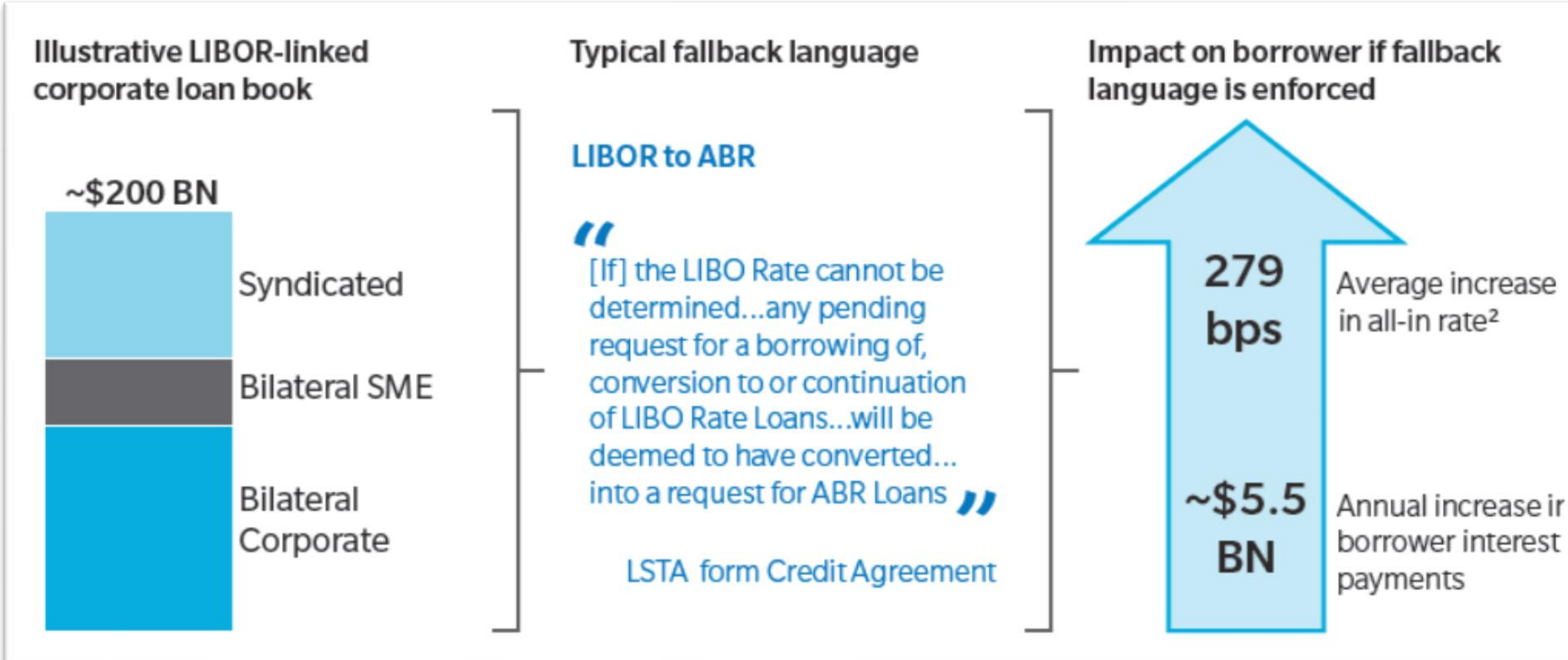
2 Fallback implications

Existing positions “fallback” when LIBOR discontinues

Product	Example legacy fallback language
Loans	• **Prime rate** or **alternative base rate**, such as Federal funds effective rate
Floating rate notes	• **Fixed** at last LIBOR
Securitizations	• **Agency MBS: Fannie or Freddie** may be asked to name successor rate • Average of quotes obtained by **polling banks** • **Other securitizations: Fixed** at last LIBOR
Derivatives	• Mean of **rates quoted by major banks** in New York City[1]
Other consumer	• **Noteholder** names successor rate[2]

1. ISDA is developing new fallback language that will be proposed as a change to definitions used for ISDA Master Agreements
2. “The New Landscape,” David Bowman, Special Advisor, New York Federal Reserve Board of Governors, 2017

Fallbacks change the bargain… the industry is driving towards new terms…. But for cash products **legacy language is generally enforceable**



LIBOR transition may result in massive repricing – e.g. winners and losers

The industry is working on improving fallbacks for cash products

- The ARRC is developing fallbacks for **cash products** in the US
- Recommended fallback language for **Floating Rate Notes** and **Syndicated Loans** were published **April 25, 2019**
  - FRNs use a **waterfall approach**
  - Loans allow for either a **hardwired waterfall** approach similar to that for FRNs, or an **amendment approach** where the alternative rate is not defined upfront, but is agreed to by parties at the time of trigger
- Fallback language for **Bilateral Business Loans** and **Securitizations** was released for consultation on **December 7, 2018,** with comments being reviewed before the recommendations are published this month
- All fallback options include **pre-cessation triggers** (which differs from the current ISDA draft – **and is driving the latest ISDA consultation)**
- Fallbacks are go-forward – largely do not apply to existing positions

Example: Recommended fallbacks for FRNs - Waterfall

Waterfall for rate fallback

1. Term SOFR + Adjustment
2. Compounded SOFR + Adjustment
3. Relevant Government Body Rate + Adjustment
4. ISDA Fallback Rate + Adjustment
5. Issuer or its Designee Selected Rate + Adjustment

Waterfall for spread

1. ARRC Selected Adjustment
2. ISDA Fallback Adjustment
3. (Issuer to Select) Relevant Government Body Rate + Adjustment

NY Fed: https://www.newyorkfed.org/medialibrary/microsites/arrc/files/2019/Creating_Safer_Fallbacks.pdf

Existing ISDA fallback language requires firms to request rate quotes, probably not workable. ISDA is developing new fallbacks with ARRs, waterfall logic, and spread to minimize differences.

ISDA credit spread criteria

> "
> 1. Eliminate or minimize value transfer at the time the fallback is applied
> 2. Eliminate or minimize any potential for manipulation
> 3. Avoid distortion due to market stress at the time the fallback is applied
>
> "

– ISDA[1]

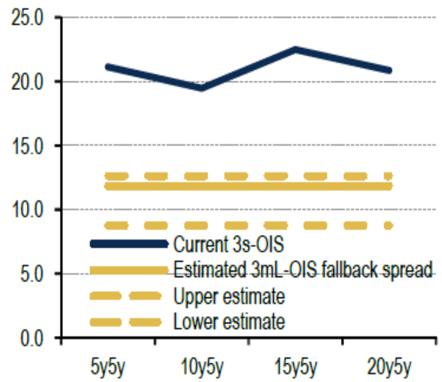
Drivers	Impact
Value transfer at the time the fallback is applied	• Economic impact even with minimal spread with replacement rate at time fallback is applied
Future cashflows	• Uncertainty around future floating leg cash flows when fallback is applied may impact value of swap
Future sensitivities	• Difference in rate sensitivities of LIBOR versus replacement rate instruments may warrant rebalancing
Margin requirements	• Though rate or fallback language amendment is not expected to trigger margin requirements, clarification is needed across jurisdictions

https://www.newyorkfed.org/medialibrary/microsites/arrc/files/2017/OMaliaDarraspresentation.pdf

Status of ISDA fallbacks

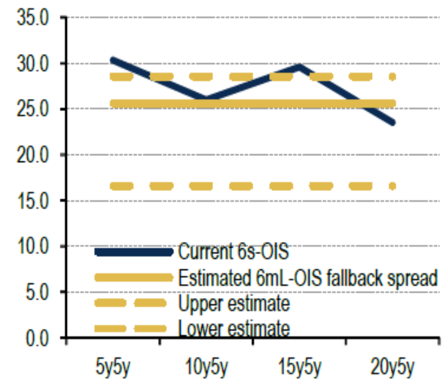
- On July 12, 2018, ISDA launched a market consultation regarding approach for term and spread fallback adjustments for derivatives for **GBP LIBOR, JYP LIBOR, CHF LIBOR, JPY TIBOR, Euroyen TIBOR, BBSW.**
- On Dec 20, 2018, ISDA published said it will use fallbacks based on **compounded setting in arrears rate** and **historical mean/median** for the spread adjustment
- In **May,** ISDA published two consultations which close **July 12** for:
  – Term and spread fallbacks for **USD LIBOR, CDOR, and HIBOR**
  – Pre-cessation triggers

Chart 1: 3s-OIS curve versus range of spread adjustment estimates, bp



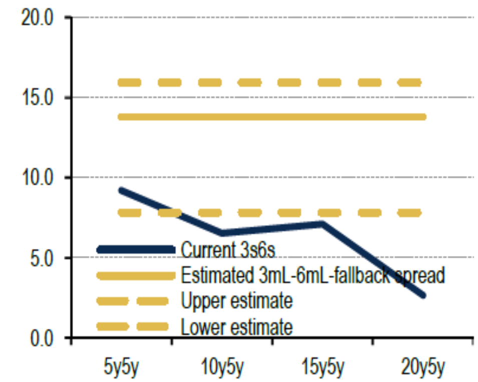
Note: the estimated fallback spread uses the median of realised data from 01 Jan 2012 to 27 Nov 2018.
Source: BofA Merrill Lynch Global Research

Chart 2: 6s-OIS curve versus range of spread adjustment estimates, bp



Note: the estimated fallback spread uses the median of realised data from 01 Jan 2012 to 27 Nov 2018.
Source: BofA Merrill Lynch Global Research

Chart 3: 3s-6s curve versus range of spread adjustment estimates, bp



Note: the estimated fallback spread uses the median of realised data from 01 Jan 2012 to 27 Nov 2018.
Source: BofA Merrill Lynch Global Research

Overall implications

- There is potential for lack of synchronization between cash / derivative markets
  - Legacy cash position fallbacks will not match the new standards
  - Newer cash position fallbacks will be close, but also may not match
  - Derivative fallbacks may be inconsistent if the protocol is not mandatory
  - Even under the ISDA protocol, economics will change
  - Upcoming: precessation triggers, which seem unlikely to be mandatory
- Firms will need to—
  - Monitor market developments
  - Differentiate between applicable fallbacks
  - Value positions with legacy fallbacks… and when LIBOR ends move to those
  - Value positions with new fallbacks.. and when LIBOR ends move to those
- Notable extra credit:
  - If clients use "hedge accounting" … fallbacks probably break the relationship
  - Liquidity and value changes as LIBOR positions decrease
  - Expect a spate of new derivatives based on the new rates

Not to worry: USD notional value ~$200 trillion, cash products ~10 trillion

3 Perspectives on positioning, mobilization and implementation

The largest firms need a comprehensive book of work for transition; your mileage may vary

Transition program oversight
Monitors program progress across work blocks and reports to senior management

External industry engagement & regulatory response
Helps set industry direction and responds to regulatory requests

Communications
Keeps internal and external stakeholders informed of transition developments

Strategic decision-making
Sets strategic direction for transition program

- ARR selection
- Execution timing
- Fallback approach
- Client strategy
- Product strategy
- …

Change implementation

IBOR-indexed book
Transitions existing contracts indexed to IBORs

New rate book
Develops and supports new products indexed to ARRs

Product pricing (IBOR-indexed book and New rate book)

IBOR-indexed book:
- Legacy book transition
- Fallbacks for new IBOR book
- Operational readiness for fallback execution

New rate book:
- New product design and approval
- System and model updates
- Data and tech updates
- Contract development
- Marketing and comms

Central financial management
Manages financial impact of transition to the bank

- Funds transfer process
- Scenario forecasting
- B/S and I/S reporting
- Hedging
- Liquidity management
- Funding activities

Cross-business activities

- Compliance
- Op risk
- Market risk
- Conduct risk
- Accounting
- Tax

Foundational impact assessments
Identifies exposure to IBOR across the enterprise and assesses potential transition impact to bank and to clients

- Models
- Technology systems
- Contracts
- Financial exposure
- Clients

Regardless of size, there are 6 Actions to Take Now

1. **Take Inventory:** ***Understand where LIBOR exists within your organization.***

2. **Do Your Homework:** ***Educate yourself about the new rates and behavior vs. LIBOR.***

3. **Assess the Impacts:** ***Assess firm-wide exposure to understand the impacts & challenges. Include key vendors on a "life cycle" basis.***

4. **Understand Fallback Language Implications:** ***Your LIBOR contracts need to address replacement rates. So do your valuation and processing systems. Get going.***

5. ***Your customers need to be informed – now.***

6. **Get Involved:** ***Get feedback from your partners and become involved in industry working groups.***

4 | Questions and Thank You