



# Libor Reform

February 2020



- **Why and how will Libor go?**
- **What will replace it?**
- **The main RFRs**
- **How is Libor different from RFRs?**
- **Transition of outstanding Libor linked products to RFRs**

## Why will Libor disappear?

- Manipulation risk with Libor
- No longer representative of underlying markets
- Too important for the financial system to remain unchanged

Needs replacing by a rate that is:

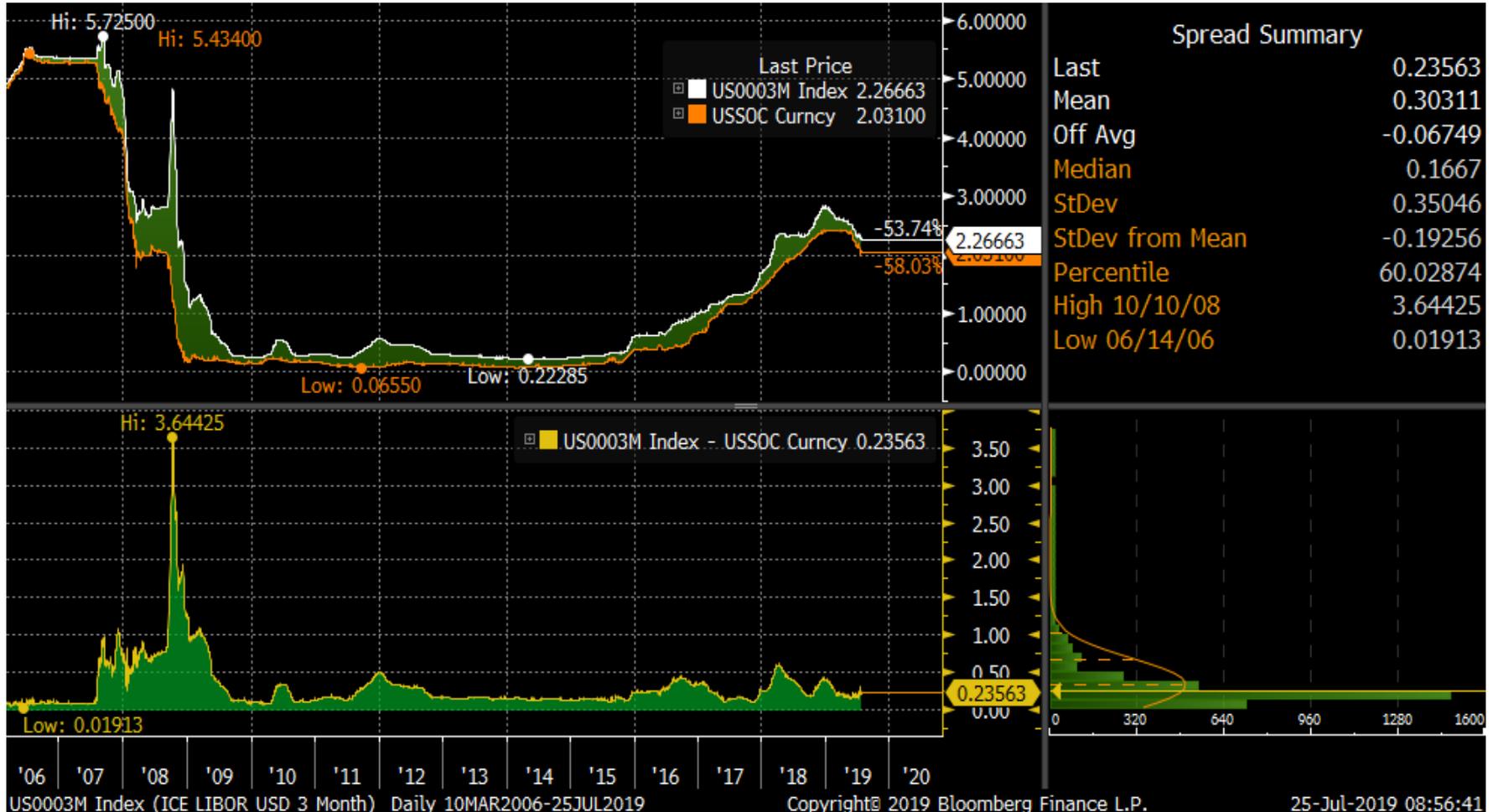
- Transparent
- Reflective of a deep underlying market
- Designed in line with the IOSCO principles for financial benchmarks

# Why?



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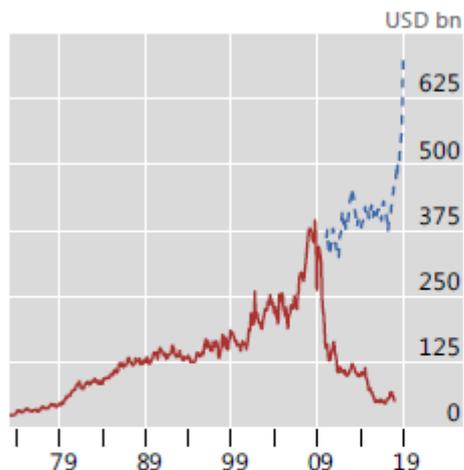
## Libor-OIS spread



## Core bank funding markets before and after the GFC

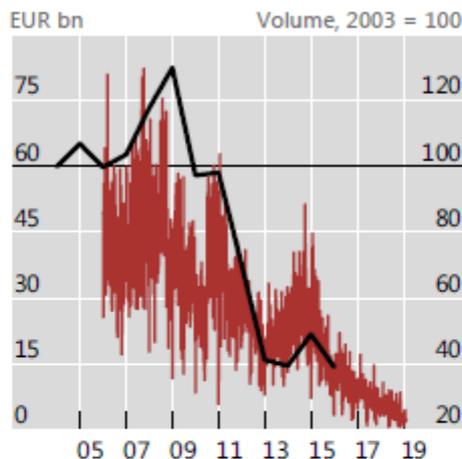
Graph 1

### US short-term money market claims



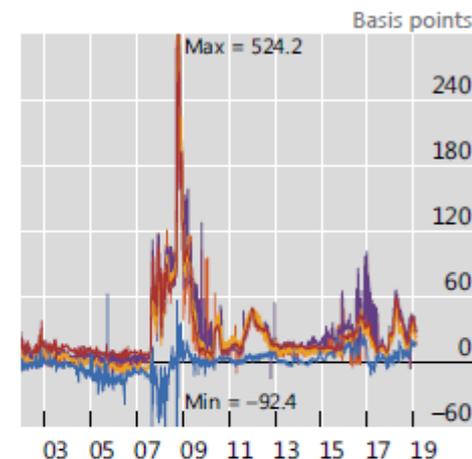
— Fed funds (discontinued)<sup>1</sup>  
- - - Fed funds and reverse repos

### Euro area interbank loans and EONIA trading volume



— EONIA volume (lhs)  
— Interbank unsecured loans volume (rhs)

### US dollar three-month money market spreads<sup>2</sup>



Spread over OIS:<sup>2</sup>  
— LIBOR<sup>3</sup> — Deposit rate  
— GC repo<sup>4</sup> — CD rate  
— Fin CP rate<sup>5</sup>

CD = certificate of deposit; CP = commercial paper; EONIA = euro overnight index average; GC repo = general collateral repo rate; OIS = overnight index swap.

<sup>1</sup> Discontinued as of 20 December 2017. <sup>2</sup> Spread over three-month USD OIS rate. <sup>3</sup> Intercontinental Exchange (ICE) Benchmark Administration Limited began administering ICE LIBOR in February 2014. Previously, LIBOR was administered by the British Bankers' Association. <sup>4</sup> GC government repo rate. <sup>5</sup> Financial CP rate; index based on A1-rated financial CP rates.

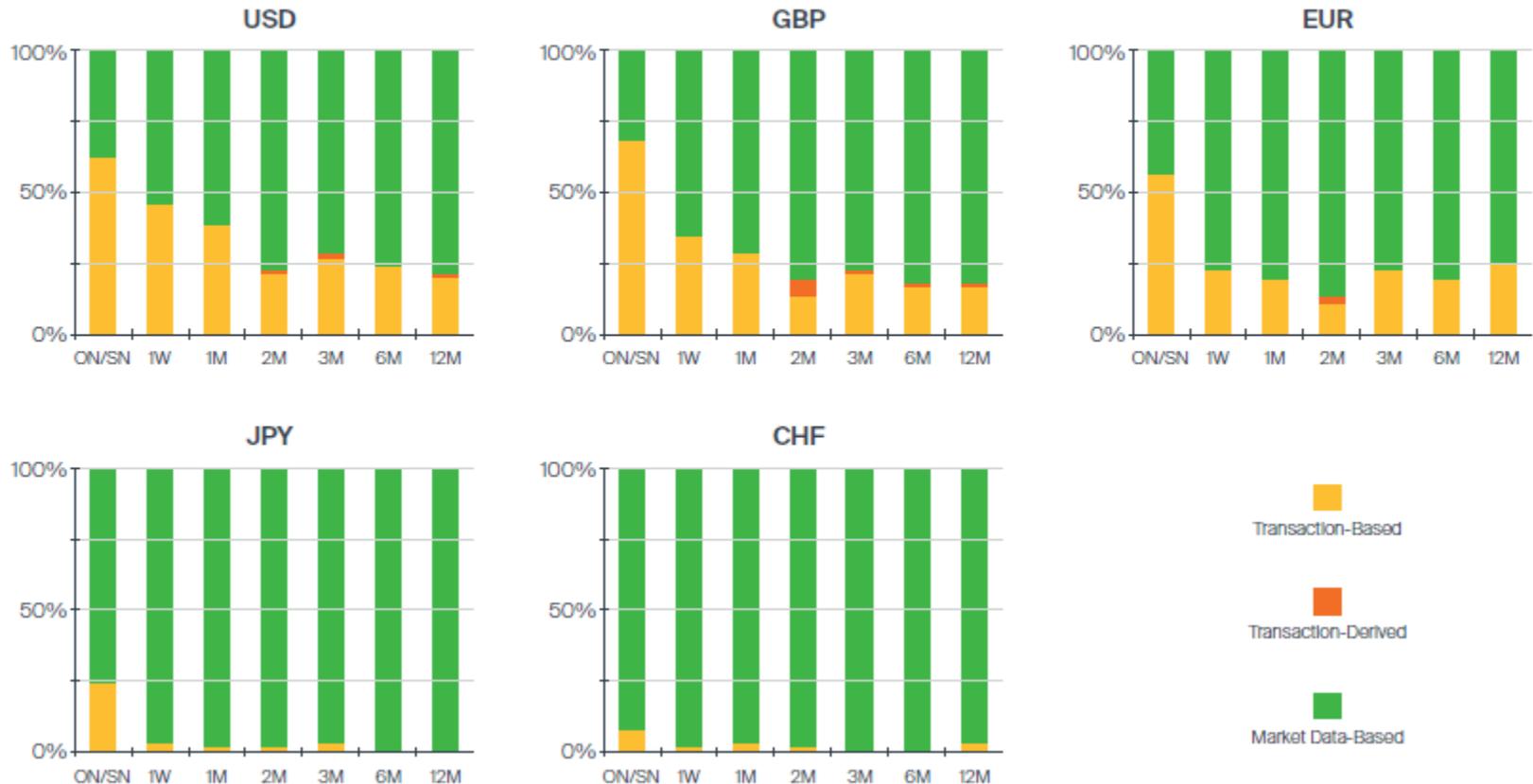
Sources: ECB; Bloomberg; Datastream; authors' calculations.

# Why?



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Report of the proportion of Panel Bank submissions used to calculate published LIBOR using the existing methodology that were Transaction-Based, Transaction-Derived or Market Data-Based for the period September 15, 2017 to December 15, 2017.



Source: ICE – ICE Libor evolution, 25 April 2018

**Table 1: Estimated USD LIBOR Market Footprint by Asset Class<sup>1</sup>**

		Volume (Trillions USD)	Share Maturing By:			
			End 2021	End 2025	After 2030	After 2040
<b>Over-the-Counter Derivatives</b>	Interest rate swaps	81	66%	88%	7%	5%
	Forward rate agreements	34	100%	100%	0%	0%
	Interest rate options	12	65%	68%	5%	5%
	Cross currency swaps	18	88%	93%	2%	0%
<b>Exchange Traded Derivatives</b>	Interest rate options	34	99%	100%	0%	0%
	Interest rate futures	11	99%	100%	0%	0%
<b>Business Loans<sup>2</sup></b>	Syndicated loans	1.5	83%	100%	0%	0%
	Nonsyndicated business loans	0.8	86%	97%	1%	0%
	Nonsyndicated CRE/Commercial mortgages	1.1	83%	94%	4%	2%
<b>Consumer Loans</b>	Retail mortgages <sup>3</sup>	1.2	57%	82%	7%	1%
	Other Consumer loans	0.1	—	—	—	—
<b>Bonds</b>	Floating/Variable Rate Notes	1.8	84%	93%	6%	3%
<b>Securitizations</b>	Mortgage -backed Securites (incl. CMOs)	1.0	57%	81%	7%	1%
	Collateralized loan obligations	0.4	26%	72%	5%	0%
	Asset-backed securities	0.2	55%	78%	10%	2%
	Collateralized debt obligations	0.2	48%	73%	10%	2%
<b>Total USD LIBOR Exposure:</b>		<b>199</b>	<b>82%</b>	<b>92%</b>	<b>4%</b>	<b>2%</b>

<sup>1</sup> Source: Federal Reserve staff calculations, BIS, Bloomberg, CME, DTCC, Federal Reserve Financial Accounts of the United States, G.19, Shared National Credit, and Y-14 data, and JPMorgan Chase. Data are gross notional exposures as of year-end 2016. <sup>2</sup> The figures for syndicated and corporate business loans do not include undrawn lines. Nonsyndicated business loans exclude CRE/commercial mortgage loans. <sup>3</sup> Estimated maturities based on historical pre-payment rates

# How? — Reform timeline



**2007-2008 crisis:** Libor-OIS spread explosion

**2009:** Libor manipulation scandal

**July 2013:** IOSCO publishes report on 'Principles for financial benchmarks'

**July 2014:** FSB recommendations on interest rate benchmarks => **Recommending multi-benchmark approach: IBOR+ and Risk Free Rates (RFR)**

**2017:**  
**April:** WG for £ RFR recommends Sonia  
- **June:** ARRC announces Broad Repo Rate as its Preferred Alternative Reference Rate (SOFR)  
- ISDA working group working on Libor fall-back referencing RFR  
- **July:** Announcement that mandatory contribution to **Libor to be discontinued by 2021**

=> **Focus on transition to RFRs**

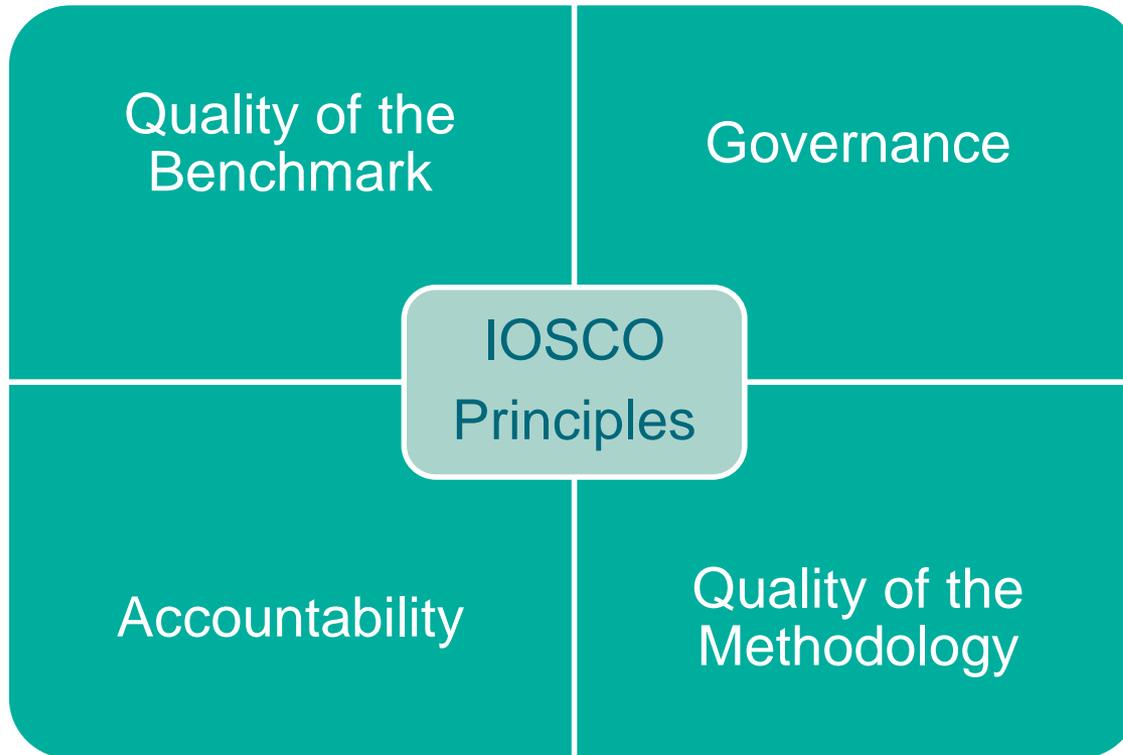
**1/1/2018: EU regulation on financial benchmarks effective:** Supervised entities must not use benchmarks in financial instruments in the EU unless benchmark is provided by an authorised/registered EU administrator or is a qualifying non-EU benchmark (full implementation by 1/1/20)

**2018:**  
Acceleration of global work done on benchmarks with RFR WGs reflecting on Libor transition:  
- **April:** Reformed Sonia and SOFR start being published  
- Sept.: WG on EUR RFR announces ESTER as preferred EUR RFR  
- **ISDA fall-back consultation**  
- Sonia RFR WG consultation on Term Benchmark

etc

**Q4 2021:**

**Libor production may be discontinued**



# What will replace it?



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LIBOR => RFR + Adjustment spread

(! Not all 'IBORs' will necessarily be replaced by RFRs e.g. EUR loans will most likely remain indexed to EURIBOR)

# The main RFRs



Overview of identified alternative RFRs in selected currency areas

Table 1

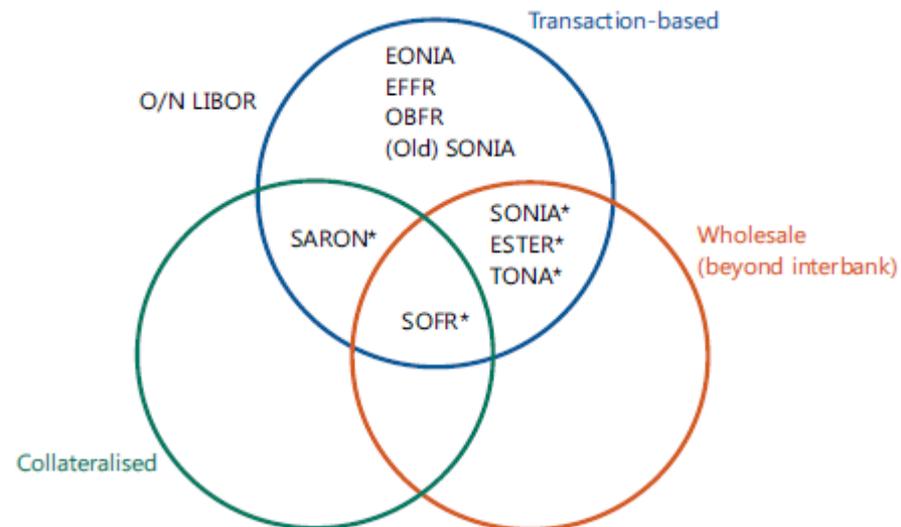
	<b>United States</b>	<b>United Kingdom</b>	<b>Euro area</b>	<b>Switzerland</b>	<b>Japan</b>
Alternative rate	<b>SOFR</b> (secured overnight financing rate)	<b>SONIA</b> (sterling overnight index average)	<b>ESTER</b> (euro short-term rate)	<b>SARON</b> (Swiss average overnight rate)	<b>TONA</b> (Tokyo overnight average rate)
Administrator	Federal Reserve Bank of New York	Bank of England	ECB	SIX Swiss Exchange	Bank of Japan
Data source	Triparty repo, FICC GCF, FICC bilateral	Form SMMD (BoE data collection)	MMSR	CHF interbank repo	Money market brokers
<b>Wholesale non-bank counterparties</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>	<b>Yes</b>
<b>Secured</b>	<b>Yes</b>	<b>No</b>	<b>No</b>	<b>Yes</b>	<b>No</b>
<b>Overnight rate</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Available now?	Yes	Yes	Oct 2019	Yes	Yes

FICC = Fixed Income Clearing Corporation; GCF = general collateral financing; MMSR = money market statistical reporting; SMMD = sterling money market data collection reporting.

Sources: ECB; Bank of Japan; Bank of England; Federal Reserve Bank of New York; Financial Stability Board; Bank of America Merrill Lynch; International Swaps and Derivatives Association.

## Taxonomy of select overnight reference rates

Graph 2



EFFR = effective federal funds rate; EONIA = euro overnight index average; ESTER = euro short-term rate; LIBOR = London interbank offered rate; OBFR = overnight bank funding rate; SARON = Swiss average overnight rate; SOFR = secured overnight financing rate; SONIA = sterling overnight index average; TONA = Tokyo overnight average rate.

\* Indicates new (or reformed) transaction-based overnight risk-free rates.

Source: Authors' elaboration.

*BIS Quarterly Review March 2019 -Beyond LIBOR: a primer on the new reference rates*

- For example, in Russia, EBRD actively promoted the development of MOSPRIME (launched in 2005), RUONIA (2010) and ROISFIX (2011) and subsequently indexed (loans, bonds and swaps) transactions to these benchmarks.
- Experience with Risk Free Rates

	Russia RUONIA	Georgia Reformed TIBR	Turkey TLREF	Egypt CONIA	Kazakhstan Reformed TONIA	Morocco MONIA
<b>Available now?</b>	Since 2010	Since August 2018	Since June 2019	Since October 2019	Reformed index announced on 2/10/19 and yet to be implemented	Since 2/1/20
<b>Secured?</b>	No	No	Yes	No	Yes	Yes

# How is LIBOR different from RFRs?

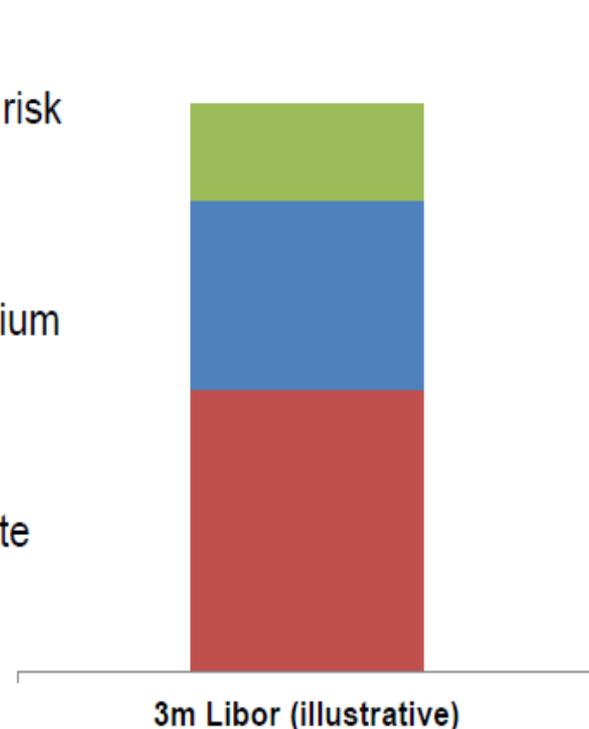
IBORs	RFRs
✓ <b>Forward Looking Term including Credit and Term Liquidity premium</b>	✓ <b>Overnight</b> with minimum credit and term liquidity premium
✓ Indicative Rates or partially transaction based at best	✓ Wholly transaction based
✓ Shallow and declining underlying markets	✓ Deeper underlying markets
	✓ Comply with IOSCO principles
✓ Private Administrators	✓ Mainly Administered by central banks

## What's the difference between Libor and RFR?

In principle, Libor for a given tenor (e.g. 3m) can be deconstructed into component parts:

- **Bank credit risk premium** – Libor includes term bank credit risk and has historically spiked during times of perceived stress in the banking system.
- **Term premium** – a 3m Libor rate will include a term premium to reflect interest rate expectations over the period and the cost of lending money for a term period.
- **Risk-free rate** – which reflects the general level of interest rates. SONIA is a good measure of the RFR as it includes virtually no credit risk or term premium.

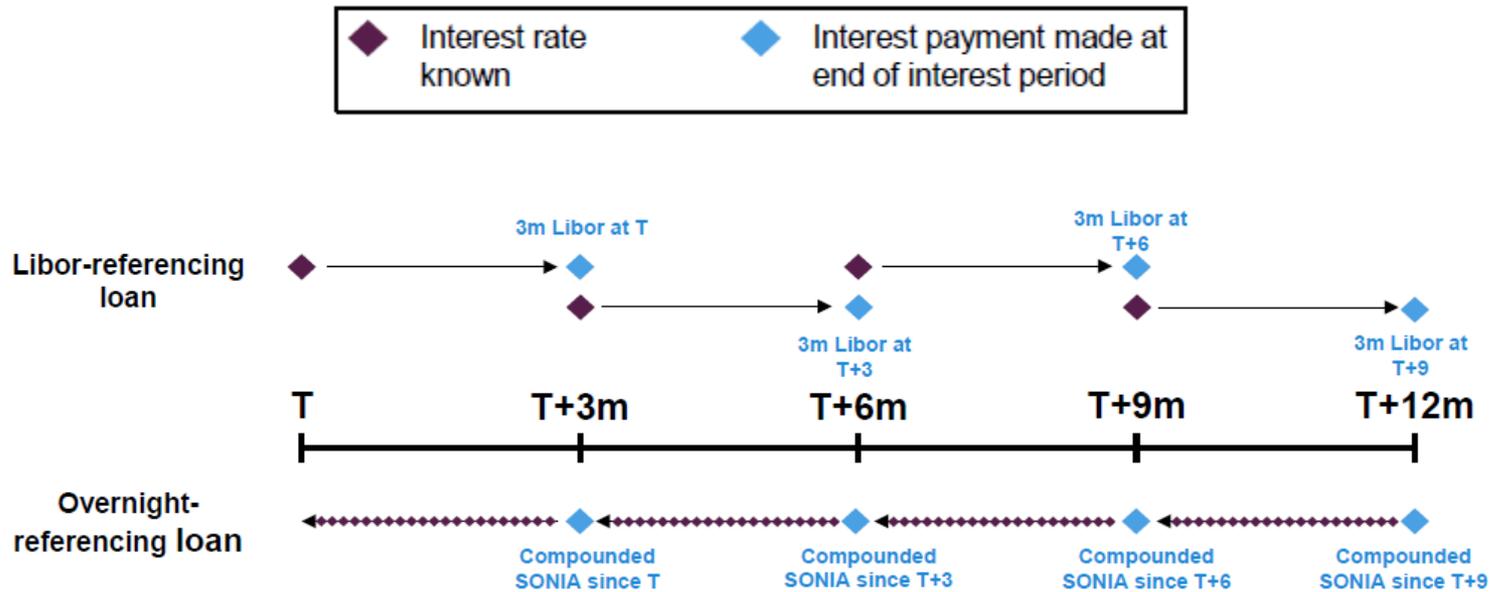
- Bank credit risk premium
- Term premium
- Risk-free rate



*Working Group on Sterling Risk-Free Rate Transition*

# How is LIBOR different from RFRs?

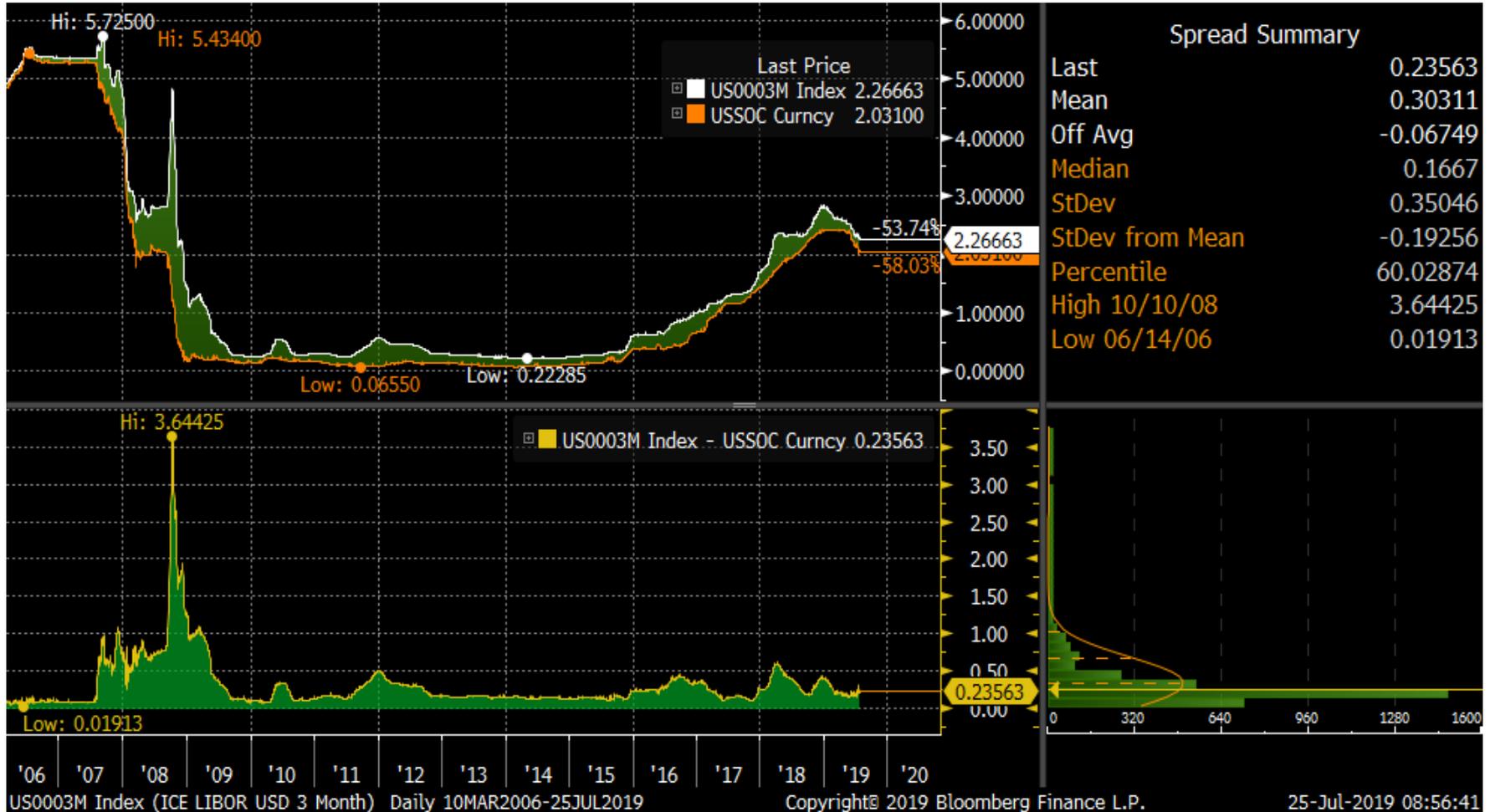
## Example of impact of using an overnight rate – overnight compounding in arrears



Working Group on Sterling Risk-Free Rate Transition

# How is LIBOR different from RFRs?

## Libor-OIS spread

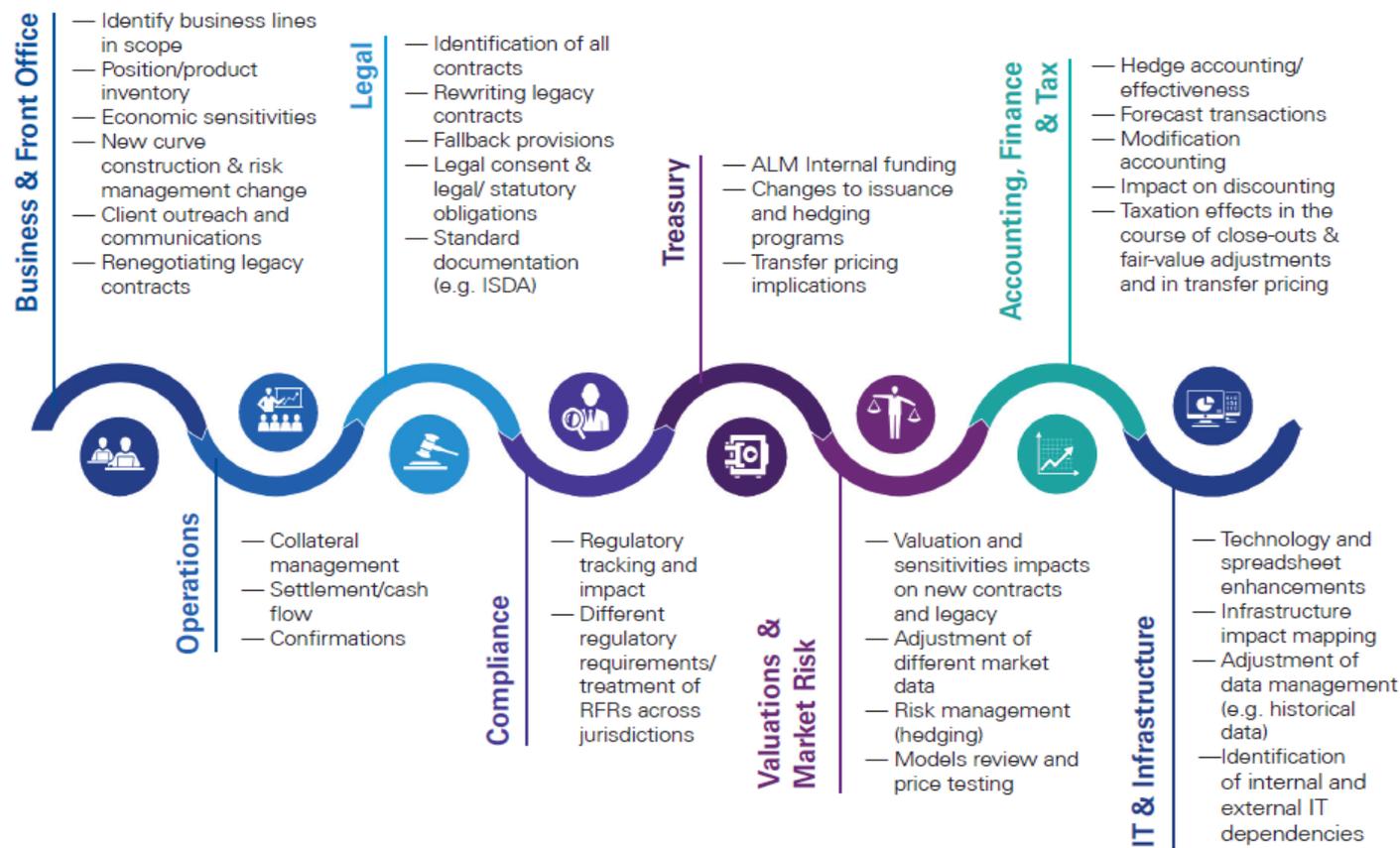


# From IBORs to RFRs



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## Design of a change process



KPMG – IBOR transition – Managing the transition to new RFRs

# Transition of outstanding Libor linked products to RFRs - Derivatives



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## Derivatives fall backs

**On July 12, 2018**, ISDA launched a **market consultation** (of ISDA members and non-members) to inform final decisions regarding the approaches to **term and spread adjustments** for derivatives' fallbacks.

The aim was to ensure:

- Minimum economic value of transfer on conversion day
- contract continuity

The consultation covered GBP LIBOR, JYP LIBOR, CHF LIBOR, JPY TIBOR, EuroyenTIBOR and BBSW. It asked preliminary questions

**On December 20, 2018**, ISDA published the **consultation results** and an aggregated and anonymized summary of the responses received:

For the benchmarks covered by the consultation, ISDA is developing fallbacks based on:

- the **compounded setting in arrears rate** and
- the **historical mean/median approach** to the **spread adjustment**.

**On November 15 2019**, ISDA announced the results of its consultation on the final parameters for IBOR derivative fallbacks for most currencies except the euro:

- **A median approach over a 5-year lookback**, without a transitional period, no exclusion of outliers or negative spreads was chosen.
- For the compounded setting in the arrears rate, **a two banking day backward shift adjustment for operational and payment purposes** was chosen.

# Transition of outstanding Libor linked products to RFRs - Derivatives



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## TERM ADJUSTMENT

(to be calculated on an ongoing basis)  
Compounded Setting in Arrears Rate

= Daily compounding of RFR observed throughout the IBOR period



## CREDIT SPREAD ADJUSTMENT

(to be calculated as of the day before the fallback is triggered –then frozen)  
Historical 5 year median approach

= Median of [spot IBOR vs term RFR] spreads over a 5 year lookback period



## FALLBACK RATE FOR IBOR

# Transition of outstanding Libor linked products to RFRs - Derivatives



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# Transition of outstanding Libor linked products to RFRs – Syndicated loans and FRNs



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## ARRC recommended fallback language for syndicated loans and FRNs:

The recommended fallback language generally addresses the following key terms:

- **Benchmark Transition Events:** trigger events that represent a significant shift away from LIBOR;
- **Benchmark Replacement:** successor adjusted rate that replaces LIBOR; and
- **Benchmark Replacement Adjustment:** the spread adjustment applied to the successor rate to preserve the economic terms of the relevant contract.

# Transition of outstanding Libor linked products to RFRs - Loans



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## Bilateral and syndicated loans

**Triggers:** The same **two permanent cessation triggers** and the **pre-cessation trigger applicable to FRNs** apply to syndicated loans, but **syndicated loans also have an additional “early opt-in election” trigger**, which takes advantage of a syndicated loan’s flexibility for parties to agree to switch to an alternative rate before LIBOR is discontinued or becomes unrepresentative

### Hardwired Approach

#### Benchmark Replacement Waterfall

- Step 1a: Term SOFR + Adjustment
- Step 1b: Next Available Term SOFR (SOFR for longest tenor that can be determined that is shorter than the applicable tenor) + Adjustment
- Step 2: Compounded SOFR + Adjustment
- Alternative Step 2: Simple Average SOFR + Adjustment
- Step 3: Lender and Administrative Agent Selected Rate + Adjustment

#### Benchmark Replacement Adjustments:

- Step 1: ARRC Selected Adjustment
- Step 2: ISDA Fallback Adjustment
- Step 3: Lender and Administrative Agent Selected Adjustment

### Amendment Approach

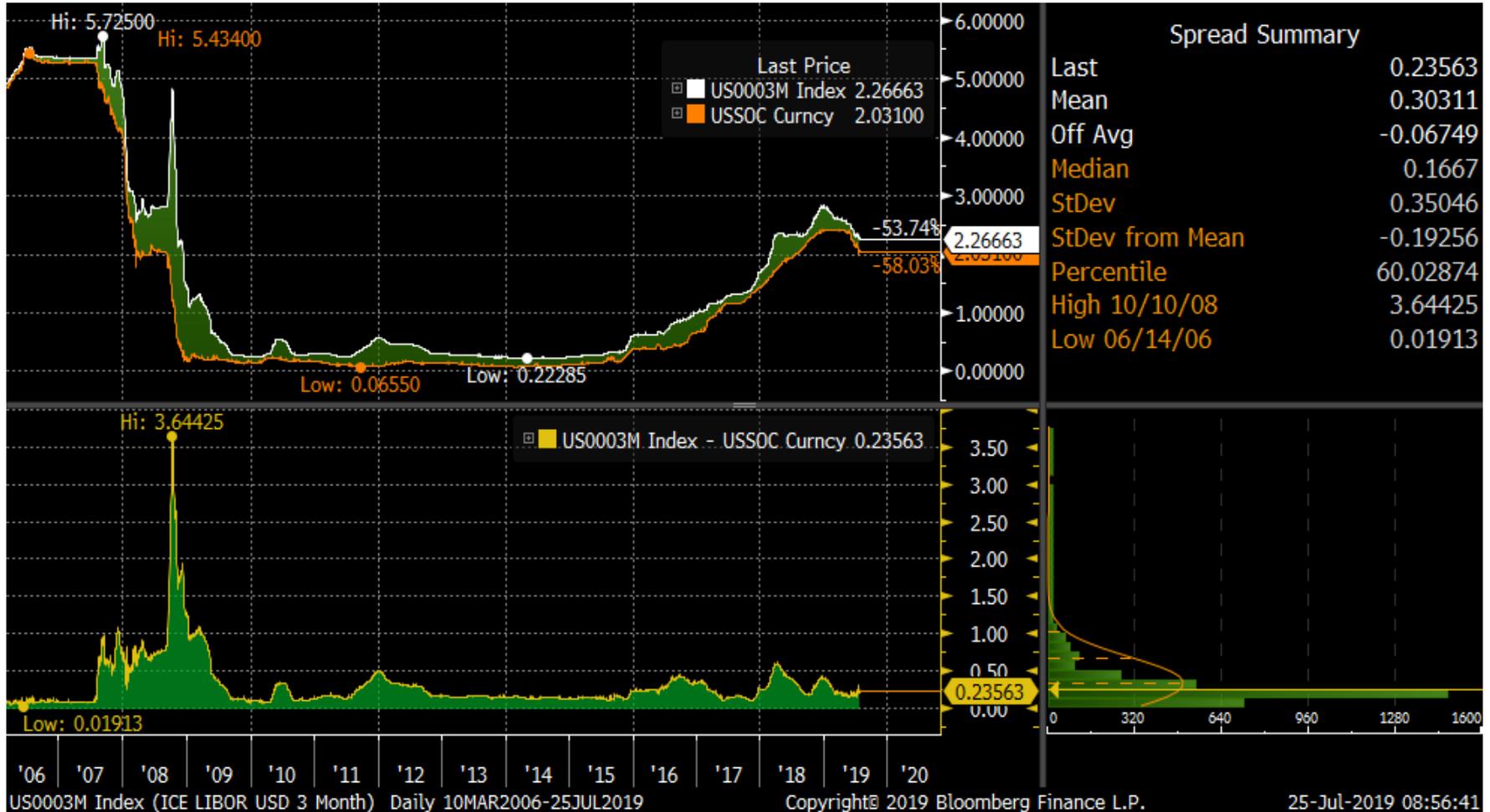
Instead of the predetermined waterfalls, the amendment approach provides the process and procedures for parties to agree on a benchmark replacement for LIBOR and the adjustments that should apply.

# Libor = OIS + Adjustment spread



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## Libor-OIS spread





# Q&A



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