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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:

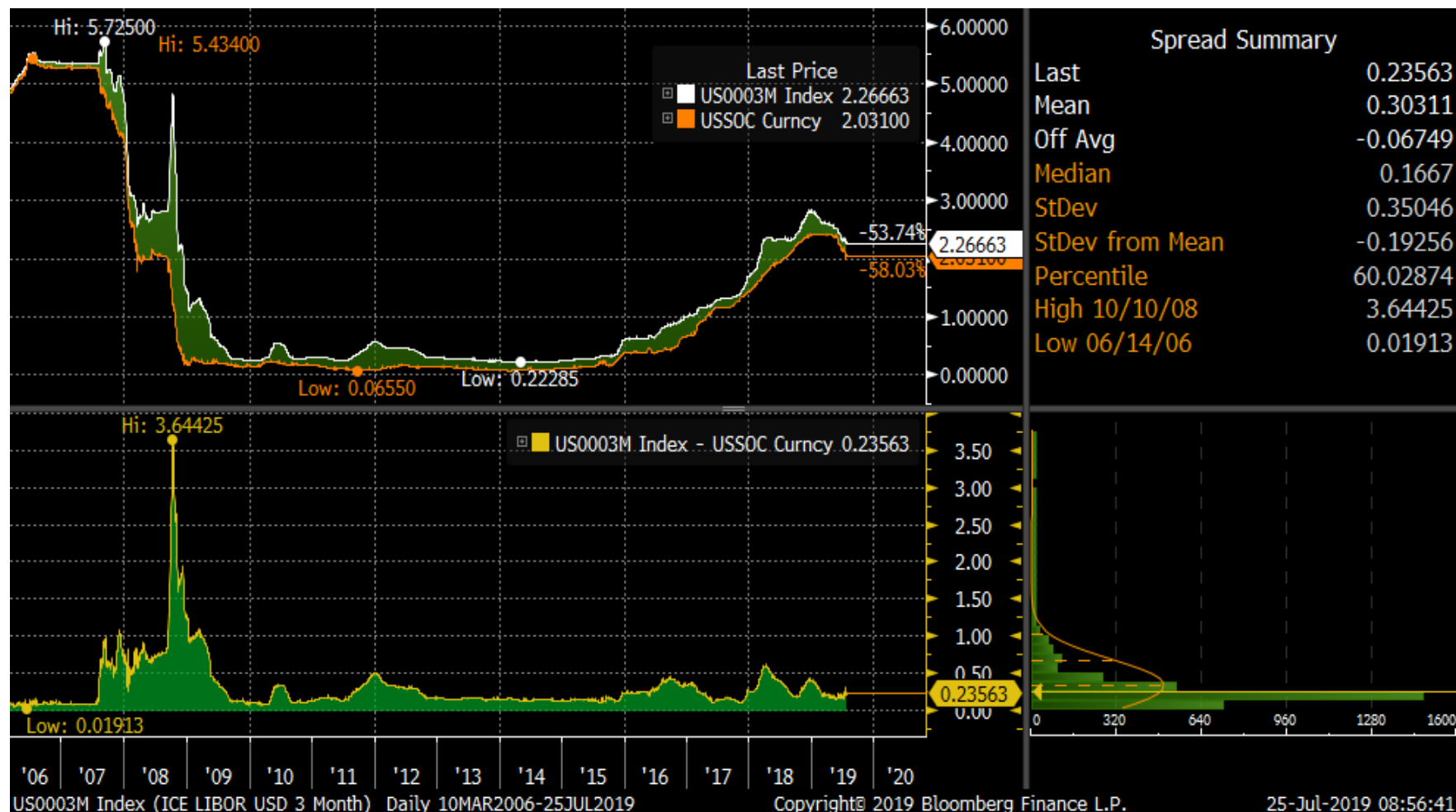
- Transparent
- Reflective of a deep underlying market
- Designed in line with the IOSCO principles for financial benchmarks

Why?



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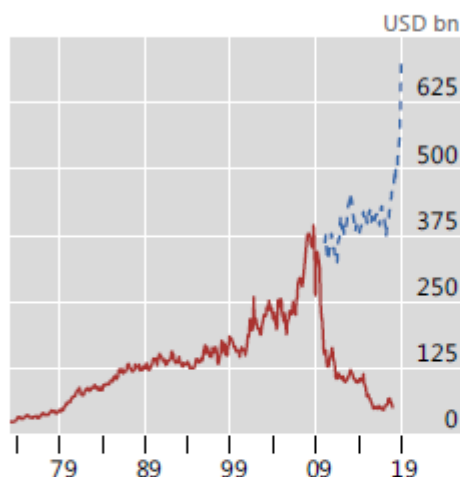
Libor-OIS spread



Core bank funding markets before and after the GFC

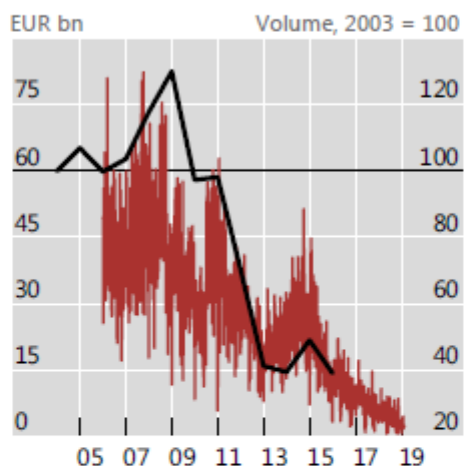
Graph 1

US short-term money market claims



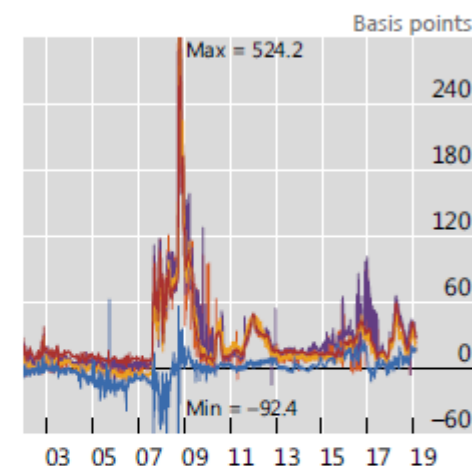
— Fed funds (discontinued)¹
- - - Fed funds and reverse repos

Euro area interbank loans and EONIA trading volume



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

US dollar three-month money market spreads²



Spread over OIS:²
— LIBOR³ — Deposit rate
— GC repo⁴ — CD rate
— Fin CP rate⁵

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

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

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

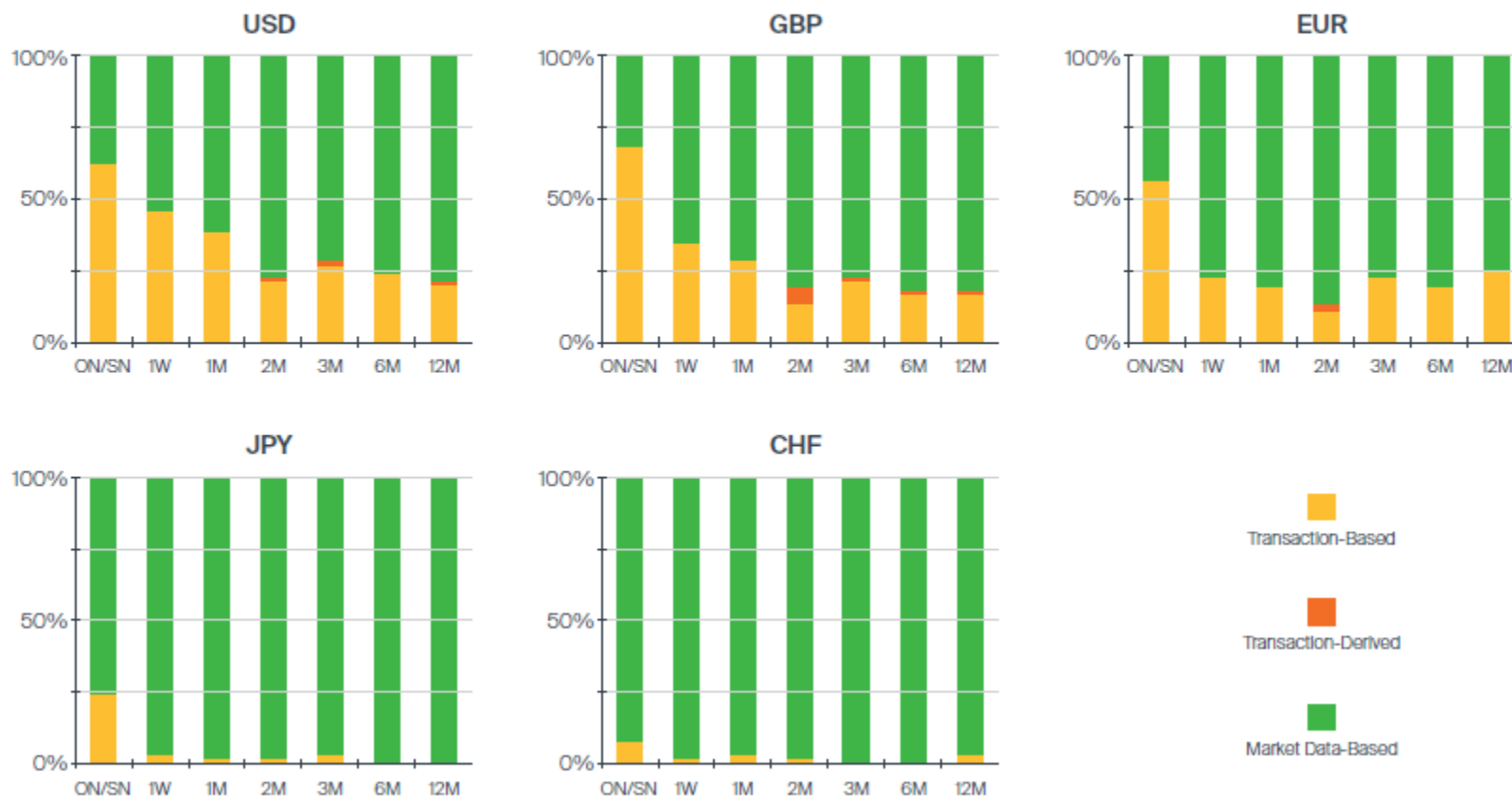
BIS Quarterly Review March 2019 -Beyond LIBOR: a primer on the new reference rates

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 Class¹

		Volume (Trillions USD)	Share Maturing By:			
			End 2021	End 2025	After 2030	After 2040
Over-the-Counter Derivatives	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%
Exchange Traded Derivatives	Interest rate options	34	99%	100%	0%	0%
	Interest rate futures	11	99%	100%	0%	0%
Business Loans ²	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%
Consumer Loans	Retail mortgages ³	1.2	57%	82%	7%	1%
	Other Consumer loans	0.1	—	—	—	—
Bonds	Floating/Variable Rate Notes	1.8	84%	93%	6%	3%
Securitizations	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%
Total USD LIBOR Exposure:		199	82%	92%	4%	2%

¹ 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. ² The figures for syndicated and corporate business loans do not include undrawn lines. Nonsyndicated business loans exclude CRE/commercial mortgage loans. ³ Estimated maturities based on historical pre-payment rates

How? — Reform timeline



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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

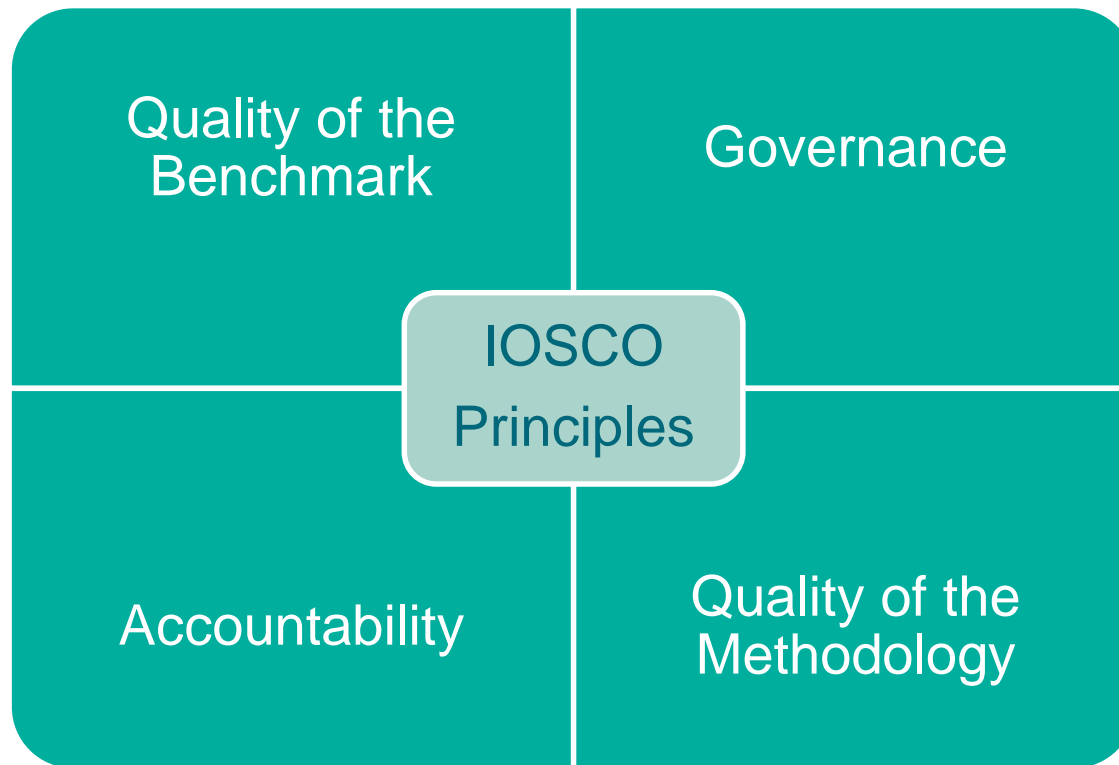
- **ISDA fall-back
consultation**

- Sonia RFR WG
consultation on
Term Benchmark

etc

Q4 2021:

**Libor
production
may be
discontinued**



What will replace it?

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



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Overview of identified alternative RFRs in selected currency areas

Table 1

	United States	United Kingdom	Euro area	Switzerland	Japan
Alternative rate	SOFR (secured overnight financing rate)	SONIA (sterling overnight index average)	ESTER (euro short-term rate)	SARON (Swiss average overnight rate)	TONA (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
Wholesale non-bank counterparties	Yes	Yes	Yes	No	Yes
Secured	Yes	No	No	Yes	No
Overnight rate	Yes	Yes	Yes	Yes	Yes
Available now?	Yes	Yes	Oct 2019	Yes	Yes

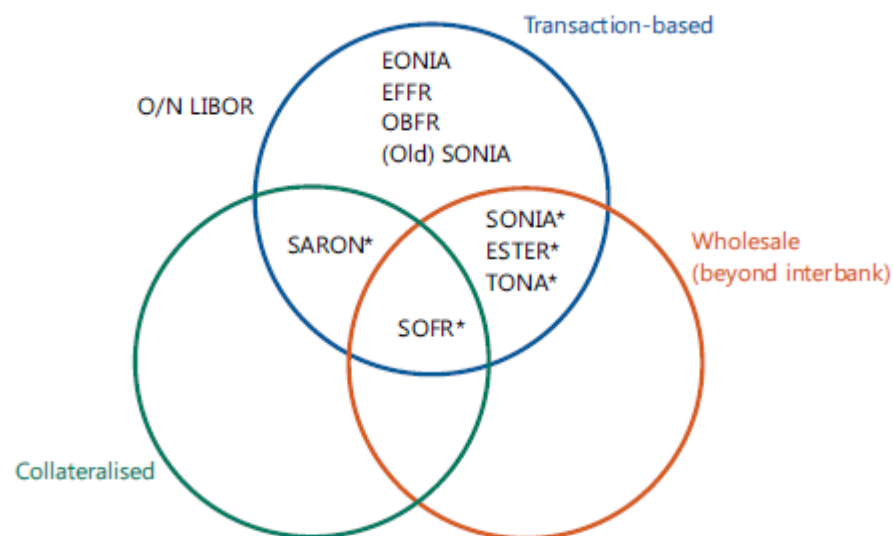
FICC = Fixed Income Clearing Corporation; GCF = general collateral financing; MMSR = money market statistical reporting; SMMD = sterling money market data collection reporting.

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.

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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.

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- 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
Available now?	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
Secured?	No	No	Yes	No	Yes	Yes

How is LIBOR different from RFRs?



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IBORs	RFRs
✓ Forward Looking Term including Credit and Term Liquidity premium	✓ Overnight 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?

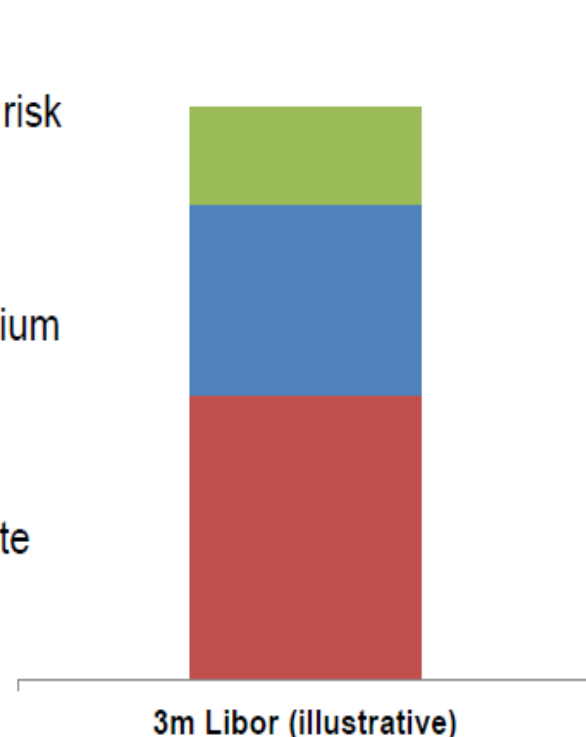
In principle, Libor for a given tenor (e.g. 3m) can be deconstructed into component parts:

- **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

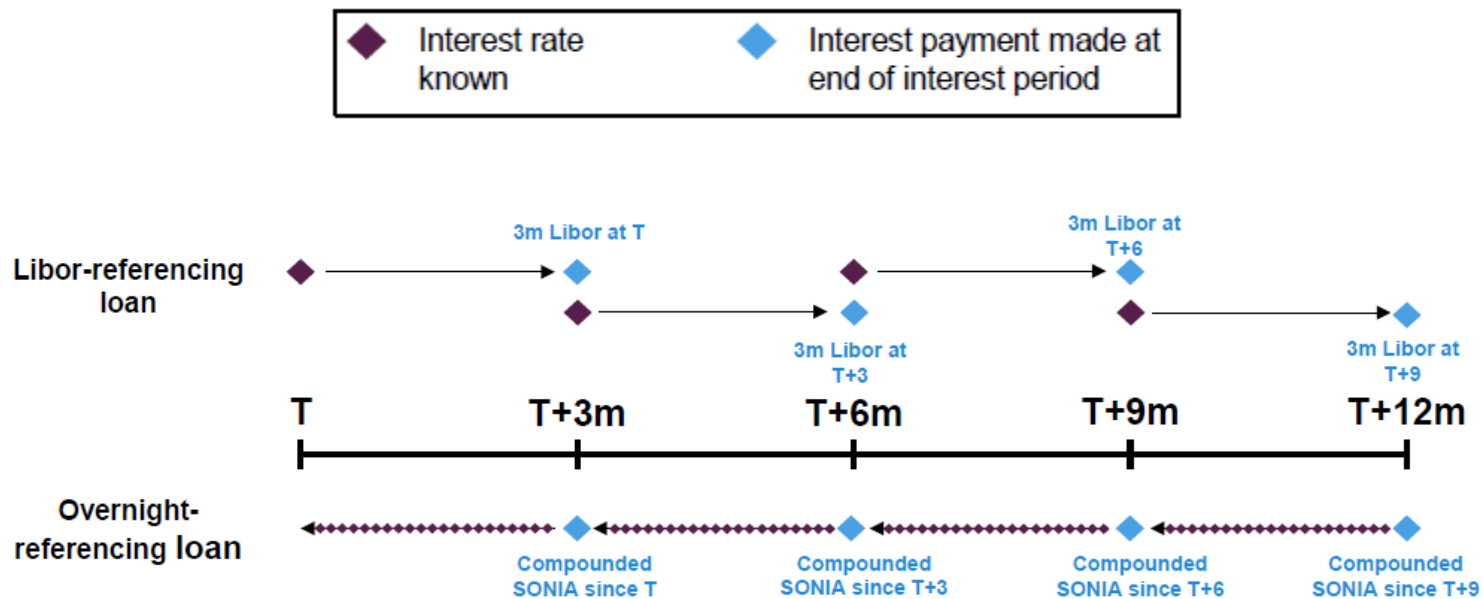
■ Risk-free rate



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



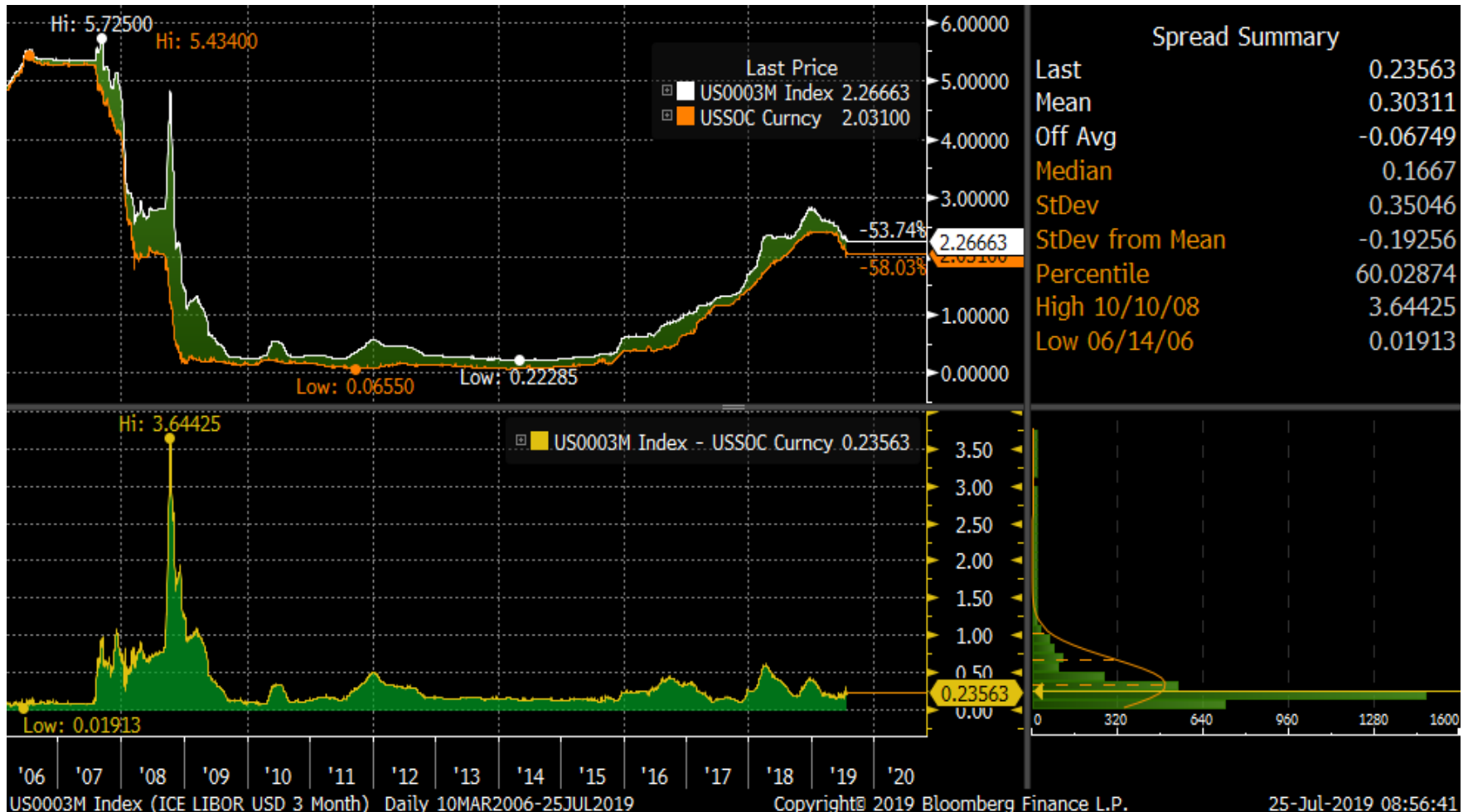
Working Group on Sterling Risk-Free Rate Transition

How is LIBOR different from RFRs?



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Libor-OIS spread

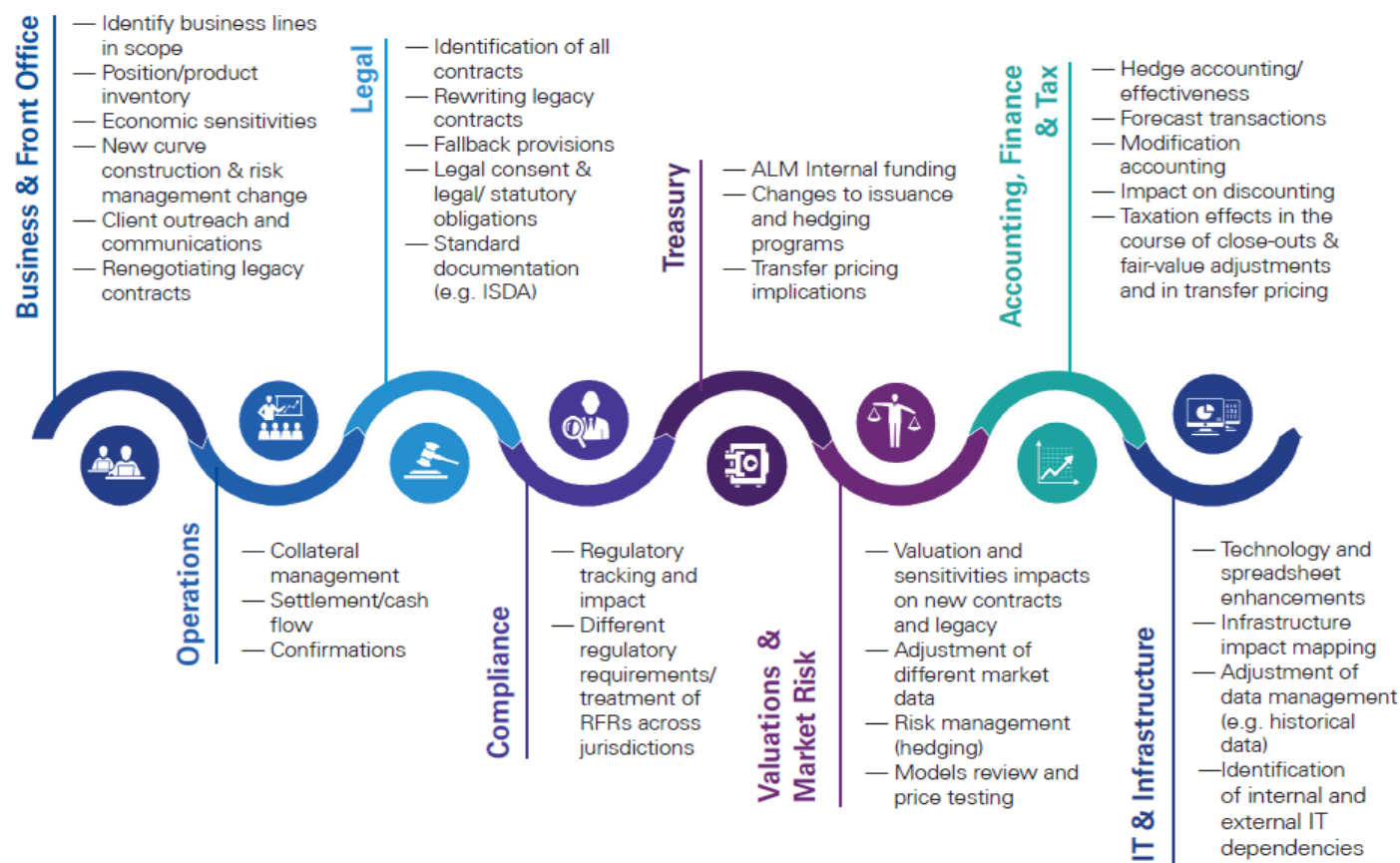


From IBORs to RFRs



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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

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

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

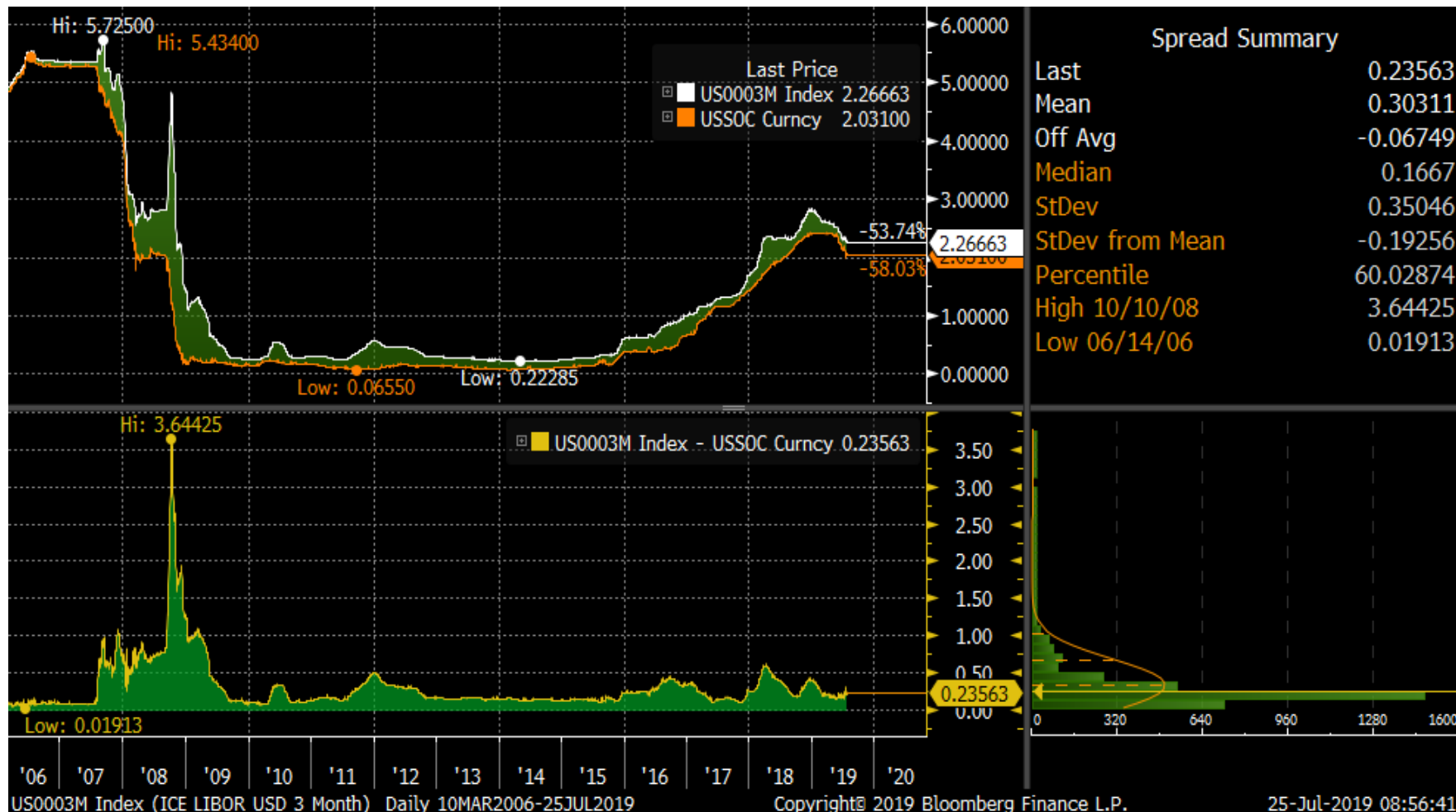
Instead of the predetermined waterfalls, the amendment approach provides the process and procedures for parties to agree on a benchmark replacement for LIBOR and the adjustments that should apply.

Libor = OIS + Adjustment spread



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Libor-OIS spread





Q&A

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