European Bank
for Reconstruction and Development

Libor Reform

November 2019

Agenda

- Why and How?
- The main RFRs
- How is Libor different from RFRs?
- Transition of outstanding Libor linked products RFRs
- How to prepare for the transition
- How is the EBRD impacted
- New USD template definitions

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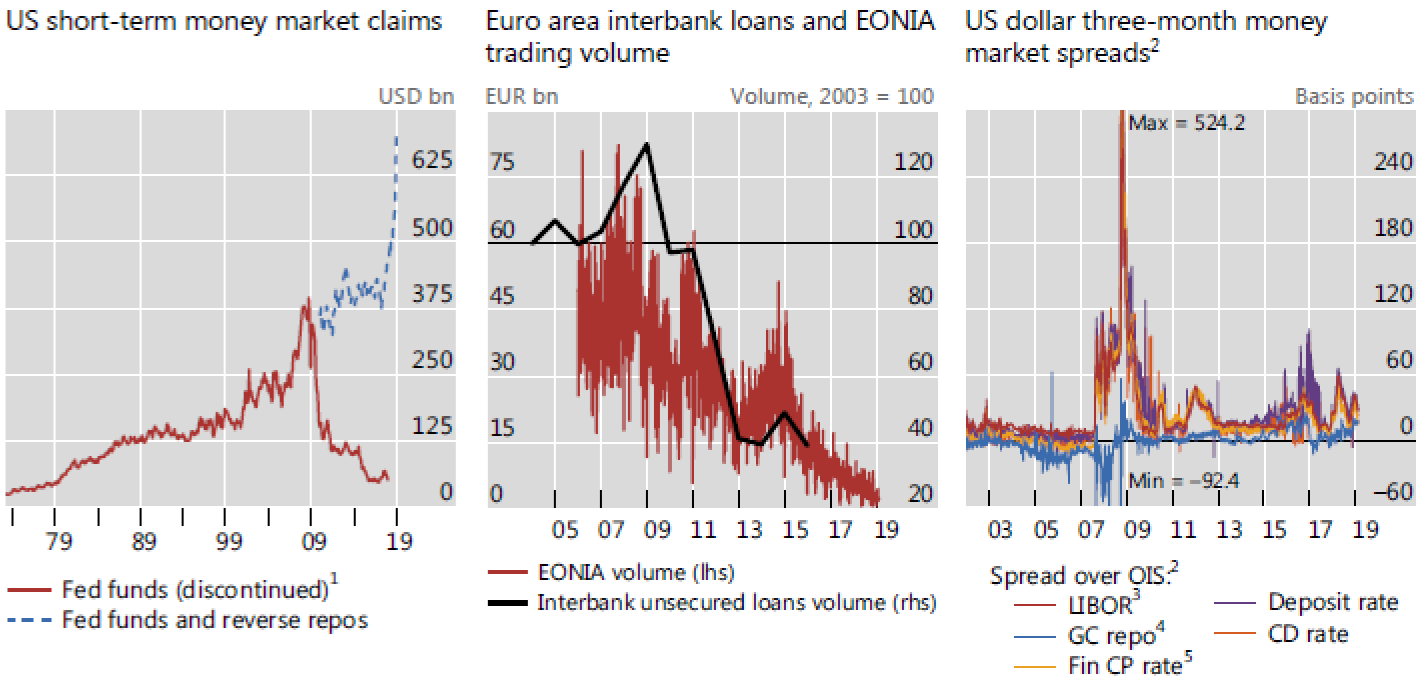
Why?

Core bank funding markets before and after the GFC

Graph 1



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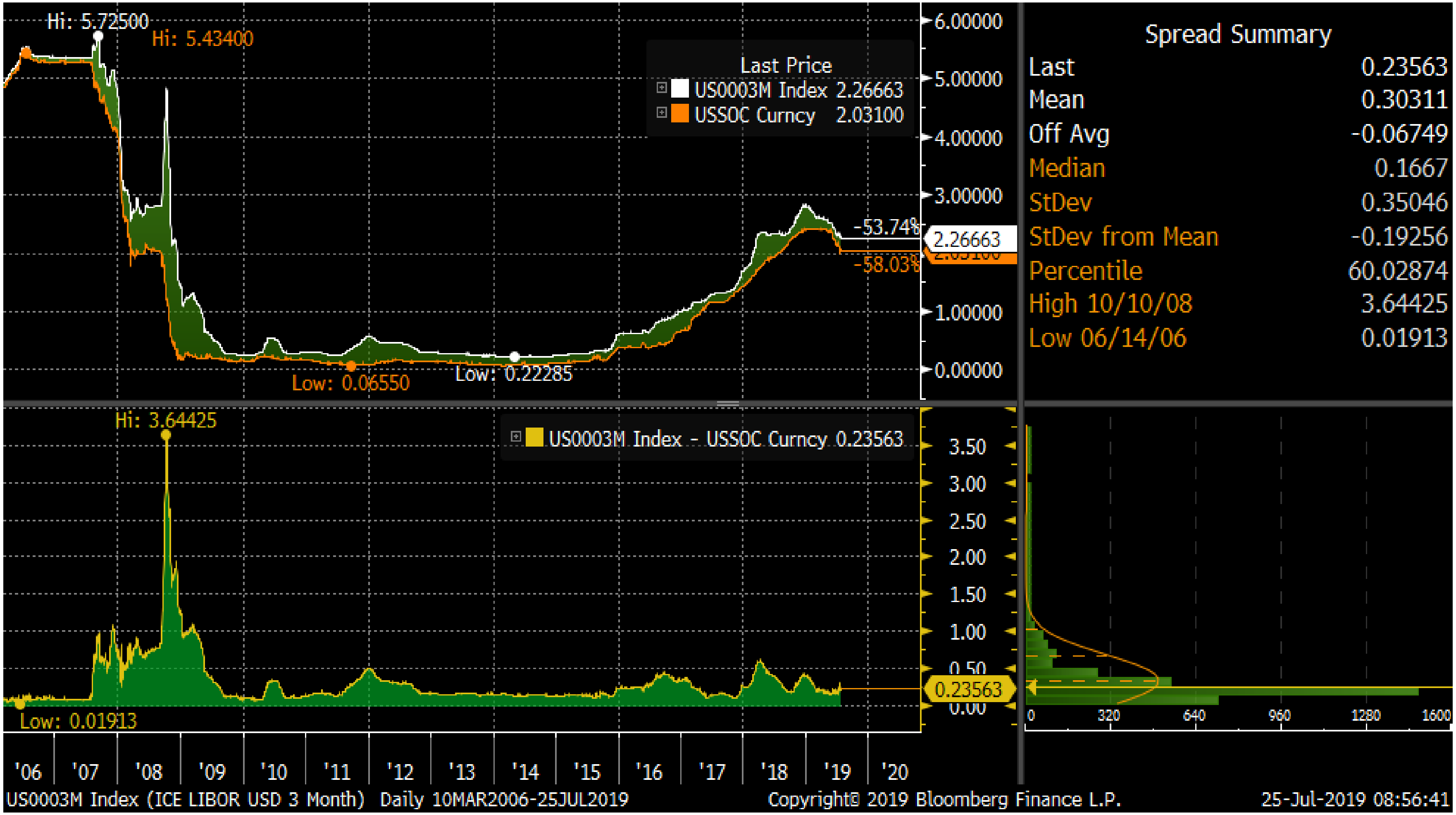
Report of the proportion of Panel Bank submissions used to calculate published LIBOR using the existing methodology that were Transaction-Based, Transaction-Derived or Market Data-Based for the period September 15, 2017 to December 15, 2017.

Source: ICE – ICE Libor evolution, 25 April 2018

Why?

Libor-OIS spread



Why?

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Table 1: Estimated USD LIBOR Market Footprint by Asset Class[1]

		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 calcuations, BIS, Bloomberg, CME, DTCC, Federal Reserve Financial Accounts of the Unites 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 exlucde CRE/commercial mortgage loans. [3] Estimated maturities based on historical pre-payment rates

The Alternative Reference Rates Committee – Second Report – March 2018

Why?

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

How? – Reform timeline

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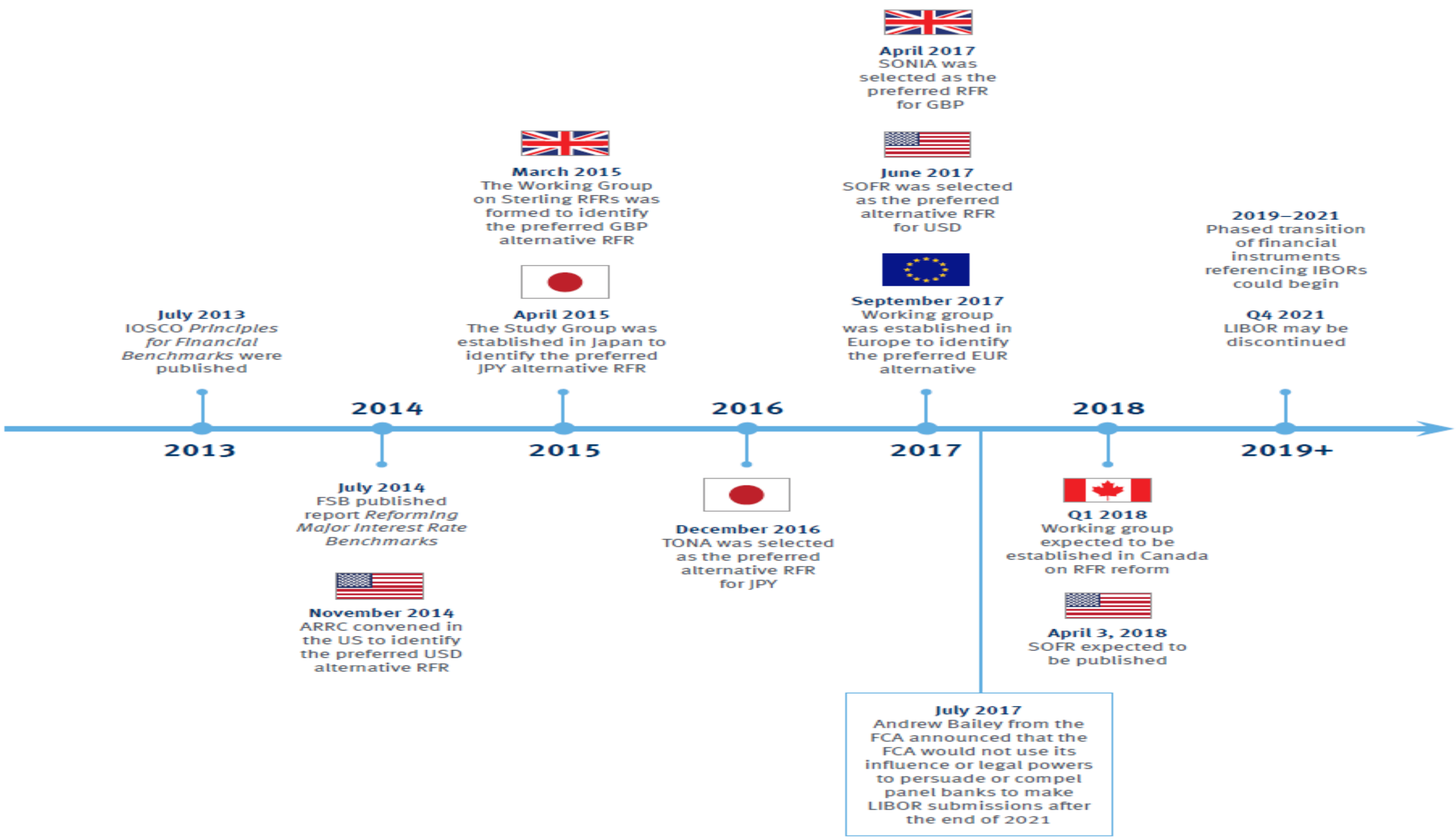
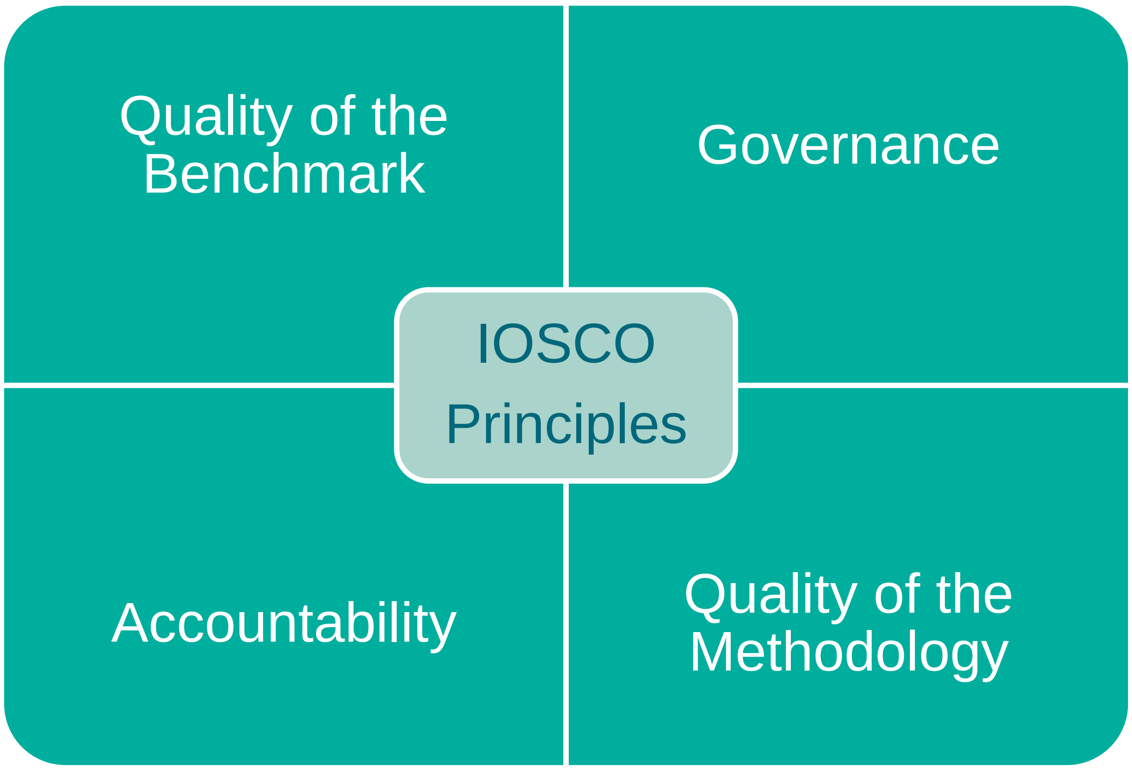


IOSCO


Quality of the Benchmark
Governance
IOSCO Principles
Accountability
Quality of the Methodology

The main RFRs

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

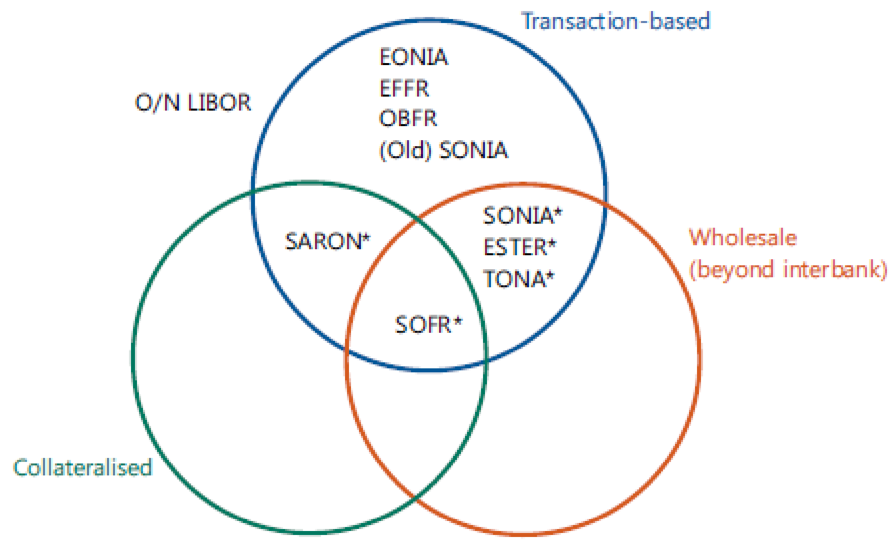
FICC = Fixed Income Clearing Corporation; GCF = general collateral financing; MMSR = money market statistical reporting; SMMD = sterling money market data collection reporting.

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.

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

The main RFRs

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

Some RFRs in EBRD CoOs

- EBRD has worked (and is still working) with local banks and authorities in many of it Countries of Operation to help improve the transparency and credibility of local interbank indices

- 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.

	Russia RUONIA	**Egypt CONIA**	**Turkey TLREF**	**Georgia Reformed TIBR**	**Kazakhstan Reformed TONIA**	**Morocco ?**
Available now?	Since 2010	From October 2019	Since June 2019	Since August 2018	Reformed index announced on 2/10/19 and yet to be implemented	Reformed index still under discussion by the WG
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

How is LIBOR different from RFRs?

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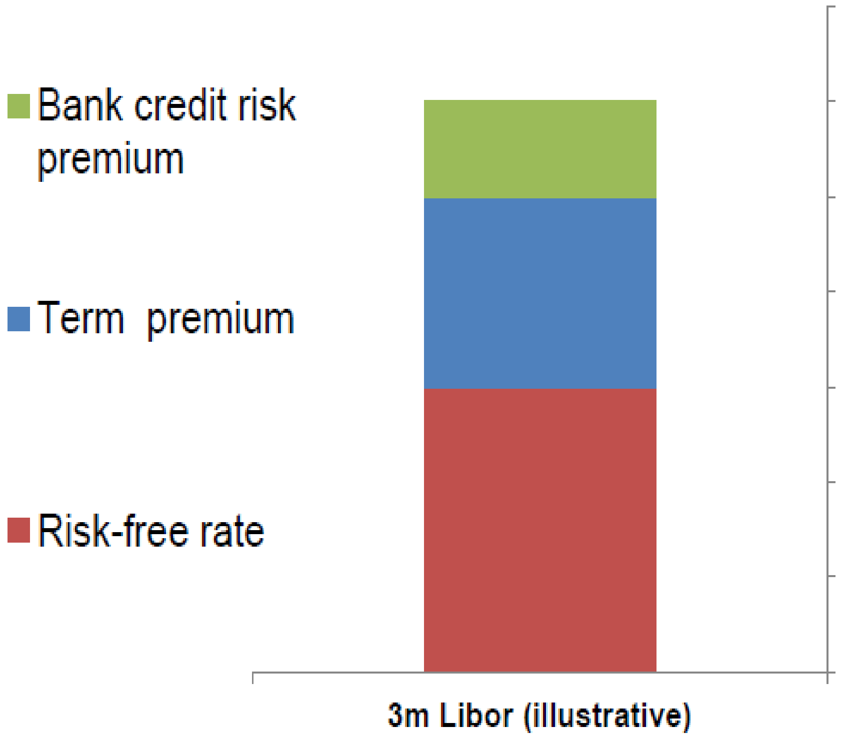
What's the difference between Libor and RFR?

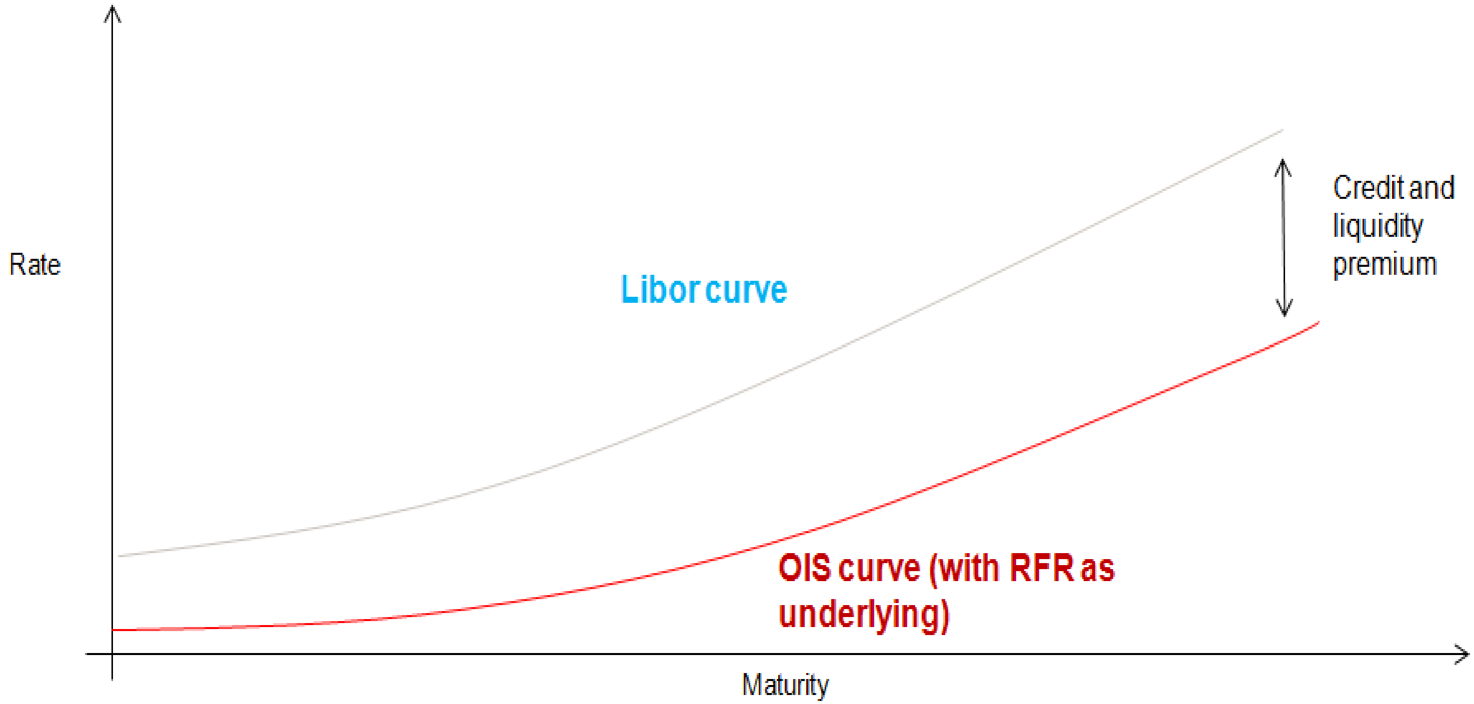
In principle, Libor for a given tenor (e.g. 3m) can be deconstructed into component parts:

- **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.



Working Group on Sterling Risk-Free Rate Transition

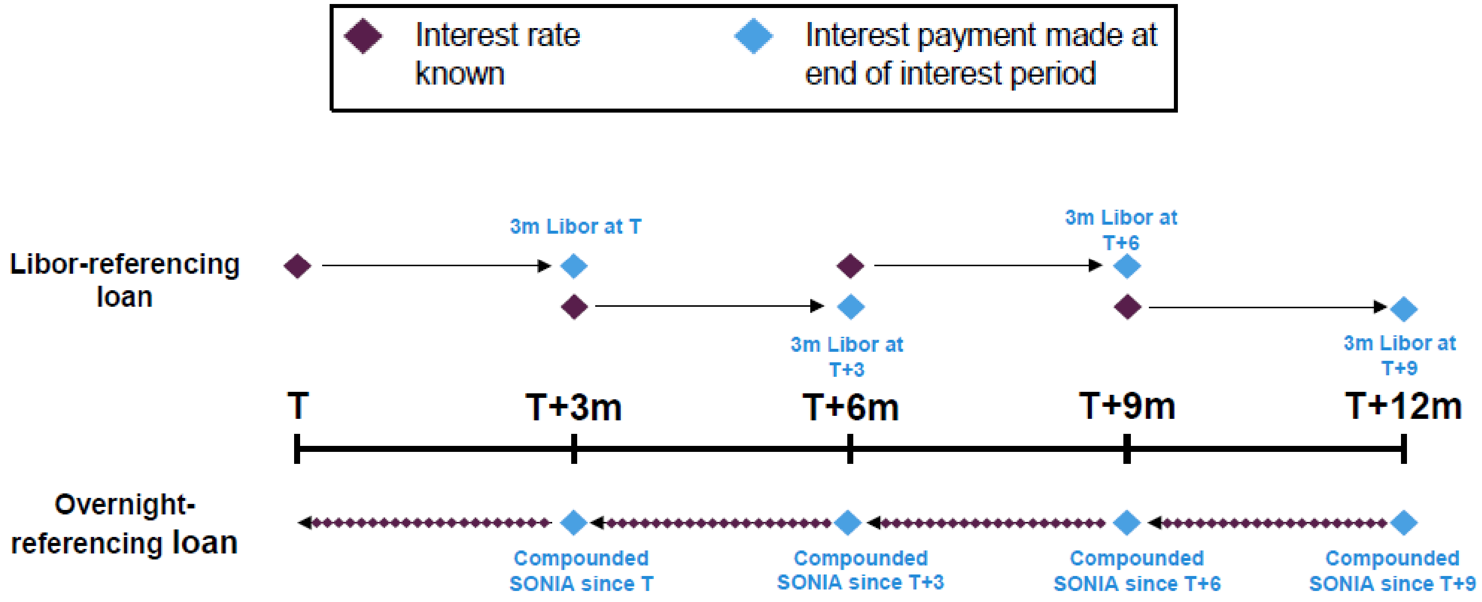
How is LIBOR different from RFRs?



Source: Bank of England

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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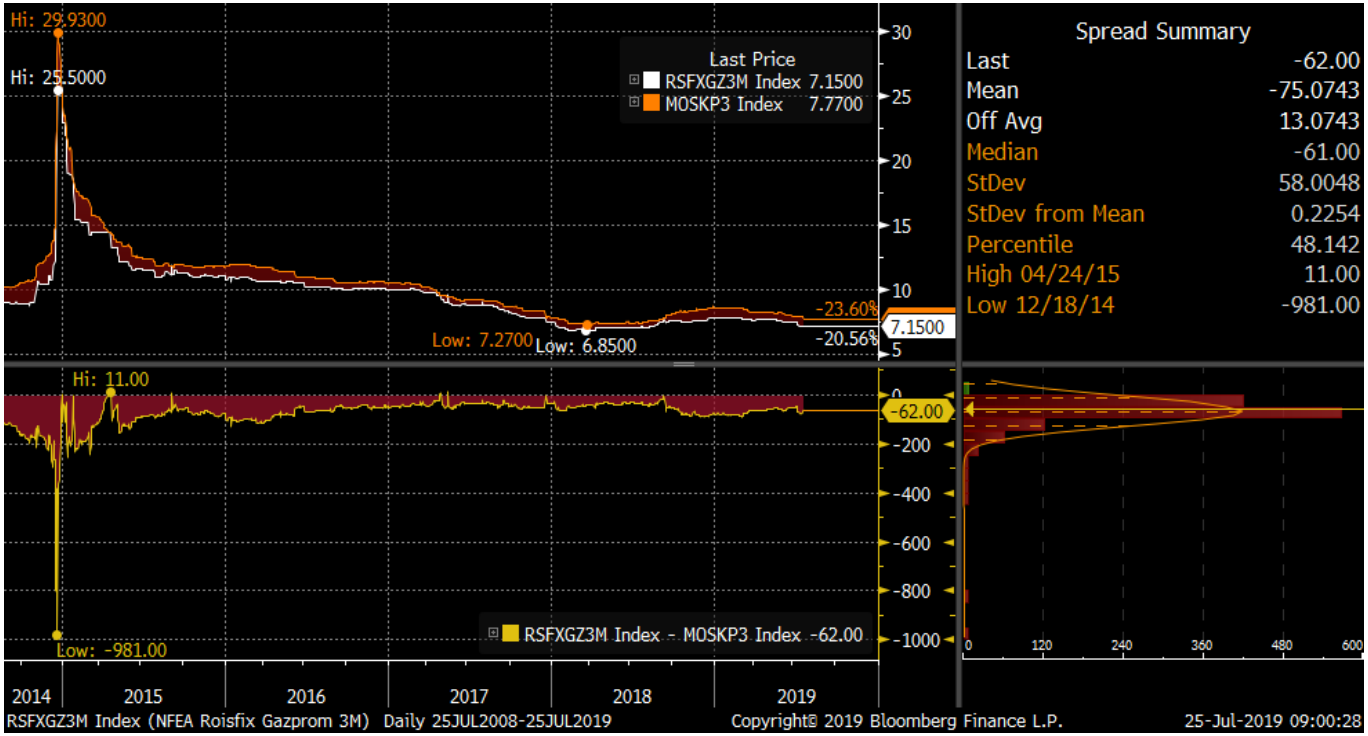
Forward looking benchmark? ROISfix example

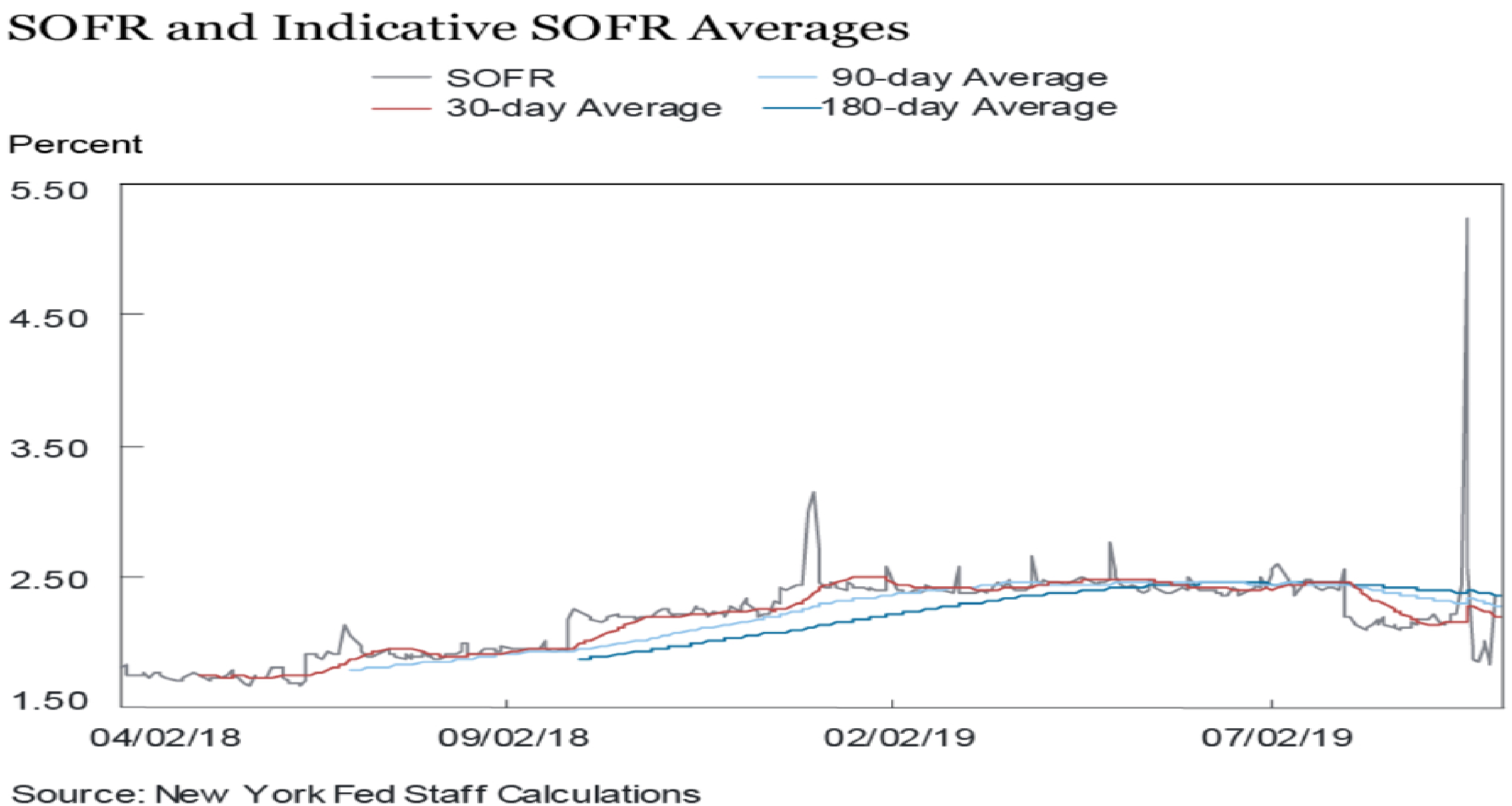
Example of 3m Mosprime vs 3m Roisfix



=> Will an 'acceptable' USD forward looking benchmark (or Term RFR) be available on time for the transition?

Additional consideration on RFRs

Overnight compounded (average) rates are not so volatile – but may be operationally difficult to compute for some market participants



=> Or is the solution to publish a compounded rate?

From IBORs to RFRs

Design of a change process

Business & Front Office
- Identify business lines in scope
- Position/product inventory
- Economic sensitivities
- New curve construction & risk management change
- Client outreach and communications
- Renegotiating legacy contracts

Legal
- Identification of all contracts
- Rewriting legacy contracts
- Fallback provisions
- Legal consent & legal/ statutory obligations
- Standard documentation (e.g. ISDA)

Treasury
- ALM Internal funding
- Changes to issuance and hedging programs
- Transfer pricing implications

Accounting, Finance & Tax
- Hedge accounting/ effectiveness
- Forecast transactions
- Modification accounting
- Impact on discounting
- Taxation effects in the course of close-outs & fair-value adjustments and in transfer pricing

Operations
- Collateral management
- Settlement/cash flow
- Confirmations

Compliance
- Regulatory tracking and impact
- Different regulatory requirements/ treatment of RFRs across jurisdictions

Valuations & Market Risk
- Valuation and sensitivities impacts on new contracts and legacy
- Adjustment of different market data
- Risk management (hedging)
- Models review and price testing

IT & Infrastructure
- Technology and spreadsheet enhancements
- Infrastructure impact mapping
- Adjustment of data management (e.g. historical data)
- Identification of internal and external IT dependencies

KPMG – IBOR transition – Managing the transition to new RFRs

Transition of outstanding Libor linked products linked to RFRs

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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. It is necessary to address these issues because

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**.

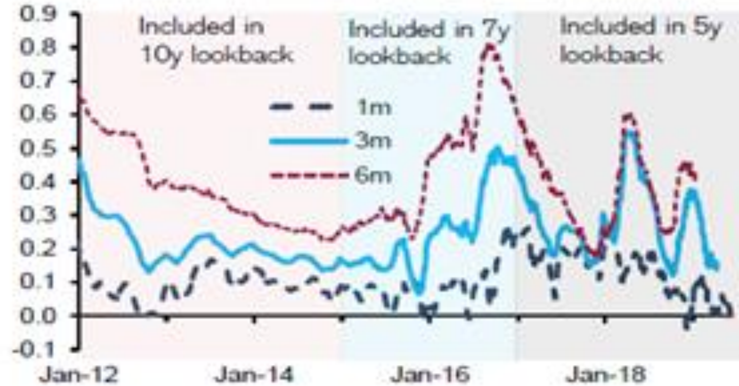
What Adjustment Spreads

We expect ISDA's USD Libor consultation to yield a preference for a compounded in arrears SOFR rate and historical median spread adjustment over a 5y lookback period.

Only about half of the observations implied from a 5y lookback period exist if we assume a YE2021 trigger.

Long dated FF/Libor bases look about in line with 5y lookback spread, whereas 6s3s bases look too wide

Libor – Compounded in arrears SOFR (%)



% of Obs Known (YE21 trigger)	Spread lookback		1mL-SOFR	3mL-SOFR	6mL-SOFR	3s1s	6s3s	1m SOFR-FF	3m SOFR-FF	1mL-FF (RFR adj)	3mL-FF (RFR adj)
		10y10y				9.9	11.3			14.2	24.5
46%	5y	Mean	13.5	28.3	37.6	14.0	8.5	-2.8	-2.6	10.7	25.7
		Median	**15.3**	**25.7**	**37.3**	**11.4**	**6.6**	**-0.4**	**0.5**	**15.0**	**26.2**
61%	7y	Mean	11.4	26.7	41.4	15.0	14.3	-2.1	-2.2	9.2	24.5
		Median	9.8	24.8	38.0	13.6	13.5	-0.9	-0.4	8.9	24.4
73%	10y	Mean	10.5	24.4	39.8	13.7	15.3	-1.8	-1.8	8.8	22.6
		Median	9.6	21.6	36.8	11.0	13.6	-1.3	-1.5	8.3	20.1

Transition of outstanding Libor linked products to RFRs

ARRC recommended fallback 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 products linked to Libor to RFRs

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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.

Transition of outstanding products linked to Libor to RFRs

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FRNs

Triggers:

Two permanent cessation triggers cover public statements from the benchmark administrator or the administrator's regulator or the central bank for the relevant currency announcing that the benchmark administrator has ceased or will cease to provide the benchmark and **one pre-cessation trigge**r covers when the benchmark administrator's regulatory supervisor announces that the benchmark is no longer representative.

Benchmark Replacement Waterfall

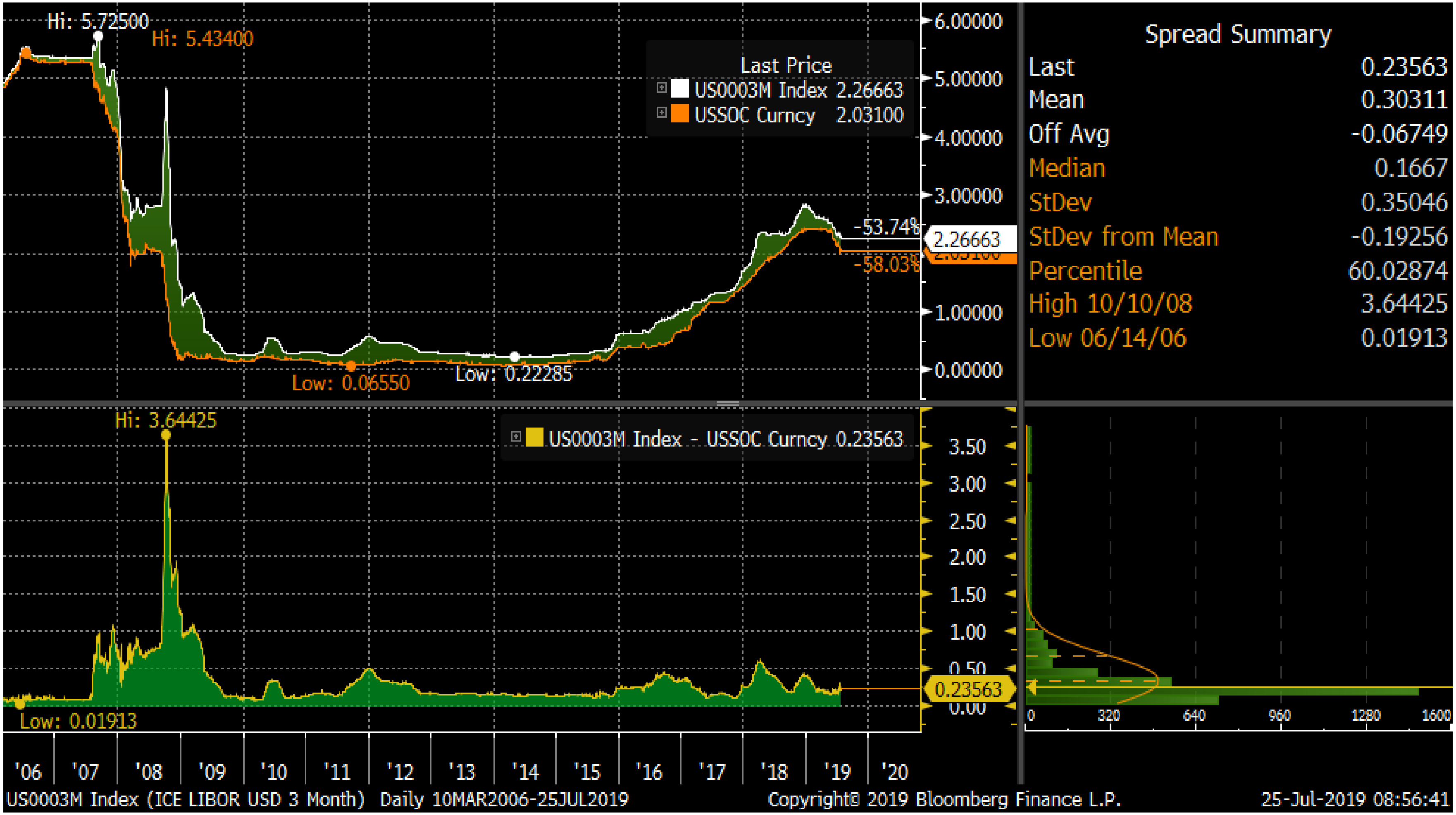
- Step 1: Term SOFR + Adjustment
- Step 2: Simple Average SOFR (uncompounded simpler calculation) + Adjustment
- Step 3: Relevant Governmental Body Selected Rate + Adjustment (if SOFR-based rate is discontinued)
- Step 4: ISDA Fallback Rate (the fallback rate embedded in the ISDA standard definitions) + Adjustment
- Step 5: Issuer or its Designee Selected Rate + Adjustment

Benchmark Replacement Adjustment

- Step 1: ARRC Selected Adjustment (as selected or recommended by the ARRC or other Relevant Government Body)
- Step 2: ISDA Fallback Adjustment (to be used with the ISDA Fallback Rate)
- Step 3: Issuer or its Designee Selected Adjustment

Libor = OIS + Adjustment spread

Libor-OIS spread



What are the key challenges of the transition?

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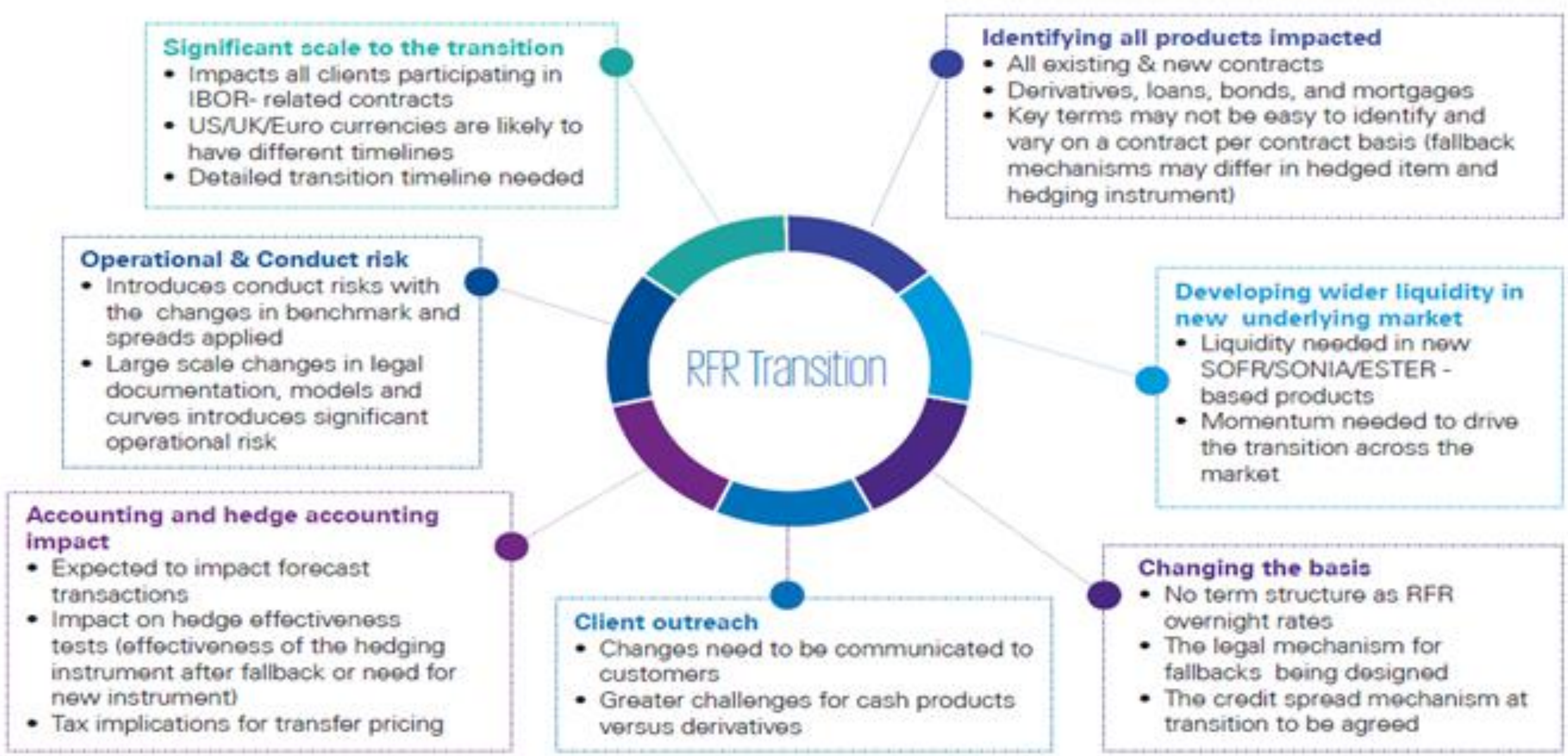

KPMG – IBOR transition – Managing the transition to new RFRs

Q&A

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