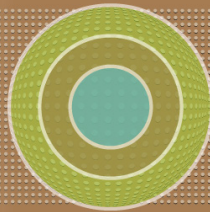


# Derivative Valuations in Practice

## WATCHLIST: LIBOR Replacement

Updated Nov 2018



The efforts to reform LIBOR and support alternative reference rates (ARR) make a clear case that significant changes are coming for derivatives market participants and it's time to start making plans. pasVal is committed to helping you meet these challenges and to making our powerful platform easily accessible for you and your clients.

Here's what we think you should be watching to stay on top of these changes to LIBOR (see overleaf for background and status updates):

### □ Market acceptance of ARR

How quickly will market players begin using ARRs and how does this impact their reliance on LIBOR?

**(New!)** By the end of November 2018, ISDA reported 584,713 USD LIBOR trades totaling over 104.5 billion. SOFR trades are still a very small fraction of that (less than 1 bp) but every week are increasing in volume and notional traded.

[ISDA SwapsInfo](#)

**(New!)** The total for all SOFR-based issuance was over \$26B by the end of November and while there have been more SOFR-fixed swaps, swap notional for SOFR-OIS exceed them.

[SOFR Market Update Detail](#)  
[SOFR CME Recap](#)

- New "compression" ideas are under consideration by relevant industry groups. This would involve amending the fallback documentation to include the new alternative rate and assessing the valuation change under that condition. Then auctioning bids between both receivers and payers of LIBOR to determine a "stop-out" rate.

[Risk Article](#)

- S&P recognized SOFR as an "anchor money market reference rate" in its principal stability fund ratings (PSFR) methodology.

[CME Rates Recap August 2018](#)

- CME Clearing confirmed that its existing collateral policy includes acceptance of floating rate US government agencies for performance bond requirements, including FRNs anchored to the SOFR.

[CME Clearing Notice 18-308](#)

### ? Will the authorities maintain a paced rather than a big-bang transition?

- ISDA published a transition report in late June 2018 highlighting the need for immediate action from market participants and providing a transition checklist.

[Transition Report and Checklist](#)

### ? How long will parallel markets remain liquid?

- Current fallback provisions in ISDA contracts are not viewed as sufficient for a permanent discontinuation of LIBOR nor will they be satisfactory with an illiquid LIBOR market.

### ? Will you have to amend agreements? (This includes ISDA masters and CSAs)

- **(New!)** ISDA has announced its intention to develop fallbacks based on the compounded setting in arrears rate and the historical mean/median approach to the spread adjustment.

[ISDA Announcement](#)

- The ARRC has released guiding principles for the development of fallback language for new financial contracts.

[Guiding Principles](#)

- The ARRC released consultations on fallback contract language for floating rate notes and syndicated business loans and held webinars in October.

[ARRC Fallback Consultation](#)  
[ARRC Webinars and Presentations](#)

### ? How will LIBOR v. OIS spreads behave?

- In April, US spreads had widened to at least 60 bps, a level not seen since 2009 but since then have narrowed again.

[ISDA Transition Roadmap](#)  
[ISDA Fallback Presentation](#)  
[ARRC FAQ](#)

### □ Development of futures & swap markets

The success of the ARRs will depend on the development of sufficient liquidity in the futures and swaps markets referencing these new rates.

### ? What futures exchange products will be offered around new ARR?

- **(New!)** SOFR futures trading has now surpassed 800k contracts and extend out to March 2021.

[SOFR CME Recap](#)

- 1M & 3M SOFR and 1M SONIA Futures are now trading on both the ICE and CME and the term structure for CME SOFR futures now extends past 3 years. SOFR futures on the CME surpassed \$1T in notional volume.

### ? How will clearing houses adapt for existing ARRs?

### ? When will ARR OIS trading become eligible for central clearing?

### ? Has a basis market developed?

- LCH began clearing SOFR swaps and basis swaps in July 2018. CME intends to begin in Q3 as well.

[What's Next for LIBOR and Eurodollar Futures?](#)

[LCH SOFR Swaps](#)

[CME SOFR Swaps](#)

### □ Tenor fixes

The ARR are overnight rates set in arrears, whereas LIBOR fixes for set tenors in advance. With sufficient liquidity in the swap OIS market, it might be possible to create such term fixings for these benchmark rates.

### ? Do end-users of derivatives need ARR term fixings?

### ? Will tenor fixes based on the ARR evolve?

- LIBOR's administrator, the IBA, is launching a portal to provide users with the first forward-looking term risk-free rates. While they will begin with SONIA,

the methodology could be applied to SOFR and other RFRs in the future.

[IBA Whitepaper](#)

- In their second report, the ARRC added tenors to their paced transition plan.

- **(New!)** The EMMI is ceasing publication of 2W, 2M and 9M EURIBOR tenors in December 2018.

### □ Risk-free rate and credit premiums

LIBOR is based on unsecured interbank borrowings, whereas the ARRs are near risk-free rates. The proposed alternatives SOFR, SARON are secured while SONIA, TONAR and ESTER are unsecured.

### ? How will fallback provisions account for this credit spread premium?

- **(New!)** ISDA has announced its intention to use a historical mean/median approach for spread adjustments. This is will be finalized in 2019.

[ISDA Announcement](#)

### ? Will new ARRs replace currently used discounting/risk-free rate (e.g. Effective Fund Funds rate in the US)?

- **(New!)** CME is already discounting their SOFR swaps with a SOFR curve. LCH has announced their intention to do the same. It seems very likely that for the US at least, this will occur.

[CME Swaps Overview](#)

[Risk Article](#)

### ? How quickly will CCP price alignment interest (PAI) transition to new ARR?

### □ Development of options market

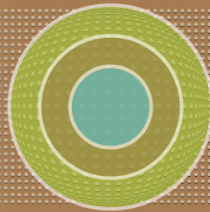
The lack of an options market will place limitations on the derivatives markets' ability to replace LIBOR fully. Without one, valuations of non-linear ARR-based OTC derivatives with embedded options, calls, puts or convexity will be very challenging.

### ? How long will it take to establish an active option market?

### ? Will cap/floor and swaption ARR products develop?

For example, CME has an active US Fed Funds futures and futures options exchange, which they have committed to extend to SOFR.

Updated Nov 2018



### □ Hedge accounting implications

End-users of derivatives may find the new rates are not as appropriate for hedging their obligations or may introduce ineffectiveness in the hedge relationship.

#### ? Will FASB accept these new ARR as eligible indices for hedging interest rate risk?

- FASB officially added SOFR as an approved rate for hedge accounting.

[FASB update 2018-16](#)

- In February, FASB issued a proposed standards update to allow SOFR as an allowed benchmark interest rate.
- The ARRC has requested inter-agency guidance from U.S. Regulators that, in the event of an IBOR fallback or replacement event, certain interest rate derivatives will not result in a change in regulatory status under Title VII of Dodd-Frank.

[ARRC Title VII Letter](#)

#### ? Will contract amendments or LIBOR fallback provisions require de-designation existing hedging relationship?

#### ? How will the ARR change hedge effectiveness?

[FASB update 2017-12](#)

[FASB update 2018-02](#)

### □ Valuation and system requirements

In the long term, a move from LIBOR to ARR could simplify certain aspects of derivative valuations by eliminating the need for OIS discounting. However, the uncertainty and phased transition to ARR will add complexity in all aspects of derivatives processing.

#### ? Can you capture the new ARR and associated futures and swaps for curve construction?

- This is available with a subscription to *pasVal*.

#### ? What model changes are needed for valuation of ARR based products?

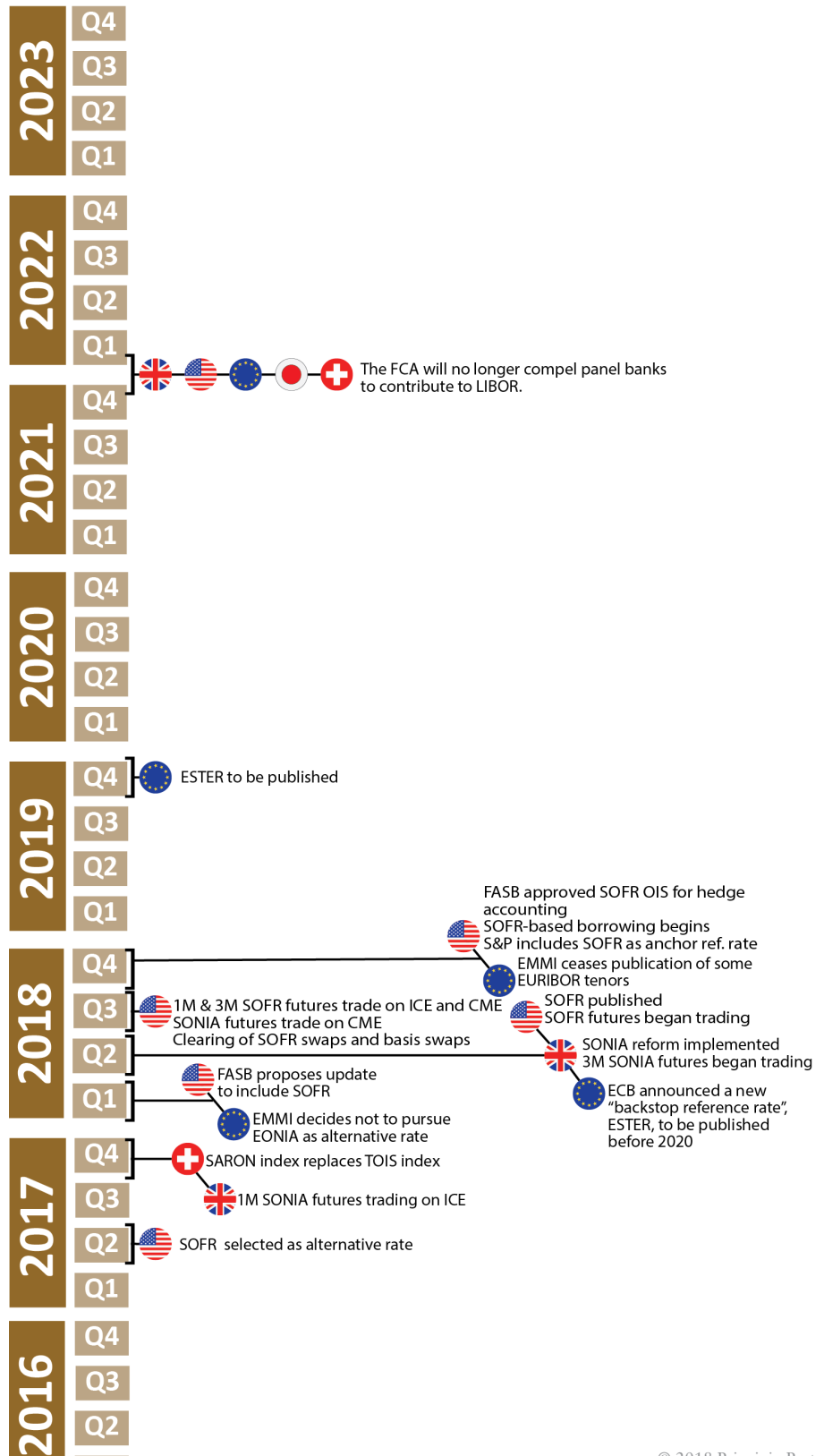
#### ? How will you extend the SOFR curve?

- pasVal* allows you to extrapolate the curve in the absence of SOFR market benchmarks.

#### ? How will this impact hedge effectiveness tests and risk measures?

- pasVal* offers comprehensive HET and a wide range of risk metrics.

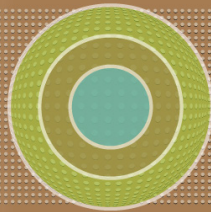
#### ? What is the impact on your overall operational and accounting process?



# Derivative Valuations in Practice

## Status Update: Replacing LIBOR

Updated Nov 2018




While there is still an effort to reform LIBOR to make it more transaction based, there is a lot of effort underway to offer alternative benchmarks which could also completely replace it. New benchmark rates will be introduced in all LIBOR jurisdictions. These changes will have far-reaching impacts for the market and pose very specific challenges for individual businesses. We want you to have our most up-to-date understanding of the situation, so you can minimize the risks and make the switch as effortlessly as possible.


### What is involved?

London Interbank Offer Rate (LIBOR) is a benchmark rate based on the rates at which designated panel banks charge each other for short-term loans for 0N, 1W, 1M, 2M, 3M, 6M and 1Y terms. In recent years, the manipulation of these rates by contributing banks has highlighted the urgent need for reform.


Originally offering 15 maturities and covering 10 jurisdictions, it was reformed in 2013 to apply to just the 7 maturities noted above and only 5 jurisdictions (the US, UK, EU zone, Japan, and Switzerland). Now, each of these has its own body dedicated to reviewing and proposing alternatives to LIBOR.

### Who is responsible?

 The United States of America (USD) has the [Alternative Reference Rate Committee \(ARRC\)](#) at the Federal Reserve.

 The United Kingdom (GBP) has the [Risk Free Rate Working Group](#) at the Bank of England.

 The European Union (EUR) has a [joint working group](#).

 Japan (JPY) has a [study group](#) on risk-free rates at the Bank of Japan.

 Switzerland (CHF) has the [National Working Group](#) at the Swiss National Bank.

[Intercontinental Exchange \(ICE\)](#) is the current administrator of LIBOR.

[UK Financial Conduct Authority \(FCA\)](#) ensures panel banks contribute to LIBOR.

[European Money Market Institute \(EMMI\)](#) publishes [EURIBOR](#) which works similarly to LIBOR but specific to EU interbank loans. The EMMI also publishes EONIA.


[Financial Stability Board \(FSB\)](#) is the international body which originally recommended reform to LIBOR.


[International Swaps and Derivatives Association \(ISDA\)](#) will contribute critical guidance specific to derivatives markets.


### What is *definitely* happening?


ICE is currently making a concerted effort to [reform LIBOR](#), so it is more transaction-based. They have begun requiring Panel Banks to transition to a [new waterfall methodology](#). Likewise, the EMMI is undertaking a [reform of EURIBOR](#).

The relevant authorities have each selected alternative rates: SOFR (United States), SONIA (United Kingdom), ESTER (Euro Area), SARON (Switzerland), and TONAR (Japan). Only TONAR and SONIA were already established market rates and SOFR is well on its way. The EU has decided against EONIA and will [publish the Euro Short-term Rate \(ESTER\) by 2020](#).

 In March, the ARRC produced a [second report](#) which outlines anticipated dates for a paced transition plan. They have also published a helpful [FAQ](#).

 The FASB has issued [Accounting Standards Update \(2018-16\)](#) to make SOFR an eligible benchmark interest rate.

 The Bank of England implemented [SONIA reforms](#) in April 2018.

 The ECB announced in May that it will [cease publication of 2W, 2M and 9M EURIBOR tenors](#) in December 2018.

At the end of 2021, the FCA will no longer compel panel banks to contribute to LIBOR.

ISDA's working group has [published a Transition Roadmap](#) and their latest [Transition Report](#) includes a Transition Checklist for market

participants.

ISDA also published [Supplement 57](#) to the 2006 Definitions to include "USD-SOFR-COMPOUND" and its designated fallbacks.

### What is still undecided?

It is still undecided if any of these alternative rates will *replace* LIBOR. That will depend on market adoption. Regardless, any of these alternative rates could still replace the OIS in a given jurisdiction, which would still have a significant impact to valuations.

While all jurisdictions have working groups committed to proposing *alternate* rates, the ECB and SNB have *yet to make formal proposals*.

The main questions that the market must answer, described in detail overleaf, are:

- ? Will futures & swap markets develop?
- ? Will tenor fixes become established?
- ? Will any ARRs replace risk-free rates?
- ? Will an options market develop?
- ? What hedge accounting impacts will there be?
- ? What valuation and system changes will be required?

## About Principia

### A practical solution

Principia SFP provides clients with a multi-curve valuation and risk management environment to forecast using appropriate tenor LIBOR forward curves and to select the relevant discounting curves for accurate, independent valuations.

Beyond valuations, the system is an end-to-end operational platform for derivatives portfolios allowing users to perform detailed impact analysis, risk management and the full operational implementation of OIS discounting into daily mark-to-market and

hedge effectiveness processes. Principia also provides and automates delivery of extensive daily market data and curves as standard, for precise valuations, proven to closely match the interdealer market.

In a world moving towards central clearing, Principia users have the tools to implement industry best practices in the analysis, trading and risk management of vanilla and complex derivatives. With this single coherent platform, clients can streamline derivatives operations from trade capture and risk, through to accounting and central clearing.

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### About Principia Partners

Principia Partners LLC (Principia) provides a comprehensive single platform solution for the end-to-end management of structured finance and derivative investments. Global financial institutions and independent asset managers have used the award winning Principia Structured Finance Platform since 1995 to unify investment analysis, portfolio management, risk surveillance, accounting and operational control across the breadth of structured credit assets, fixed income investments and complex derivatives. In 2015, Principia launched its Analytic Service, pasVal, to make its award-winning pricing and analytics available to an even broader range of businesses.