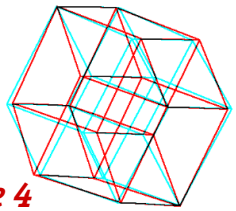
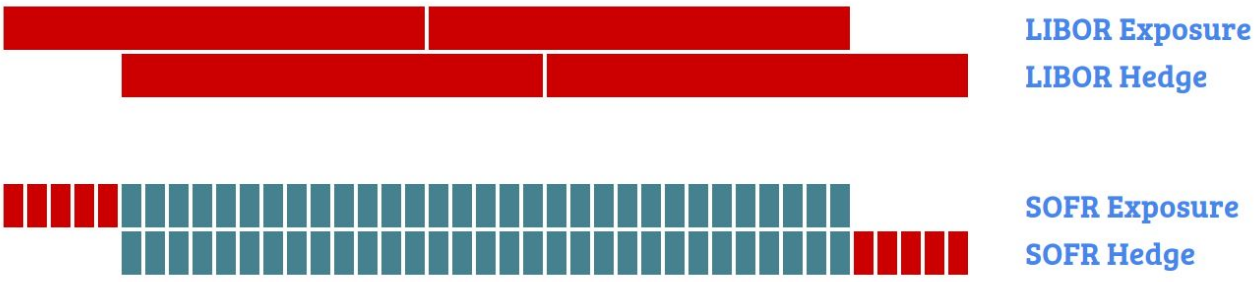


*Simplifying interest rate swaps*

# Eris SOFR futures minimize reset risk, improving market efficiencies

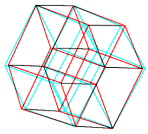
- Unlike with LIBOR swaps, overlapping portions of opposing SOFR exposures are perfectly hedged.
- Residual SOFR stub risks comprise a whole number of SOFR periods, whereas with LIBOR stubs, costly interpolation is usually necessary. SOFR stubs will therefore be much more efficient to hedge.
- Ease of stub hedging means standardized SOFR futures are likely to become the canonical instrument, obviating the need for custom-dated instruments, and bringing all the benefits of listed futures.
- Eris SOFR Swap Futures provide a transparent, accessible and more cost and operationally efficient way for anyone to trade or use SOFR swaps.




Amongst the greatest problems faced by users of LIBOR and interest rate swaps (IRS) indexed to LIBOR, is managing the recurring problem of LIBOR fixing mismatches. The floating rate of any LIBOR exposure and the LIBOR resets included in interest rate swaps typically fix (or reset)



Eris|SOFR

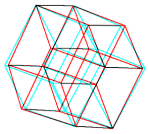


every 1, 3, 6, or 12 months, when the LIBOR rate is locked in for the immediately following interest period. Perfectly hedging a LIBOR exposure fixing therefore requires trading an equivalent IRS or futures product such that its LIBOR fixings (dates and thus the rate) exactly match those of the exposure. For existing exposures whose LIBOR fixing dates do not coincide with the LIBOR fixings of a new swap starting out of spot or quarterly March, June, September or December IMM dates, this is inconvenient, and often costly, as counterparties will typically charge more for interpolated periods, as these are not directly hedgeable. This imposes a cost on users of LIBOR swaps requiring customized dates to exactly offset an exposure fixing schedule. Equally so, large swap books and frequent users of LIBOR swaps often choose not to match fixing dates precisely to avoid this interpolation cost premium. However, in doing so they expose themselves to costly rate mismatch risk for the entire duration of the LIBOR fixings. This also results in a proliferation of imperfectly matched swaps in large swap books, which can be operationally expensive and in many cases, increases margining requirements.

By contrast, SOFR fixes daily, and therefore overlapping portions of an exposure and its hedging instrument is perfectly matched. This is elegantly illustrated in the diagram above. Only the stubs remain unhedged, and this is easily offset, since, as SOFR is a daily fixing, daily hedging contracts or multi-day combinations are easily tradable. For large swap books, SOFR stubs may even start to substantially offset each other, simplifying swap book management operations, and reducing risk and margin requirements. This resulting reduction of contract line-items in swaps users' books will reduce costs and is naturally highly desirable.

**Why odd periods will become more liquid**

In the same way that LIBOR forward rate agreements (FRAs) and IRS exist and are liquid for contracts whose maturities exactly match contiguous sets of LIBOR fixings, SOFR contracts composed of any number of contiguous SOFR fixings are already readily tradable. The reason for this is that the market maker is guaranteed that there will be a fixing (LIBOR or SOFR) corresponding to each reset period. As the periodicity of LIBOR fixings is limited to large discrete periods of time (1, 3, 6, etc months), and as there is a residual basis swap cost between these LIBOR fixing periods in the market, there is a high burden of cost and operational inefficiency to offsetting LIBOR stub periods which require interpolation, as there is no traded stub fixing. In SOFR's case however, since the periodicity is daily, any number of what are usually deemed "odd" or "broken" periods, otherwise known as "stubs" in LIBOR parlance, are now contiguous blocks of compounded overnight SOFR. And since SOFR fixings are daily, instruments of any number of days can be hedged. This will encourage a liquid market in daily "SOFR FRAs" to arise, which makes hedging future stubs trivial and cheap relative to LIBOR.



**LIBOR Cessation**

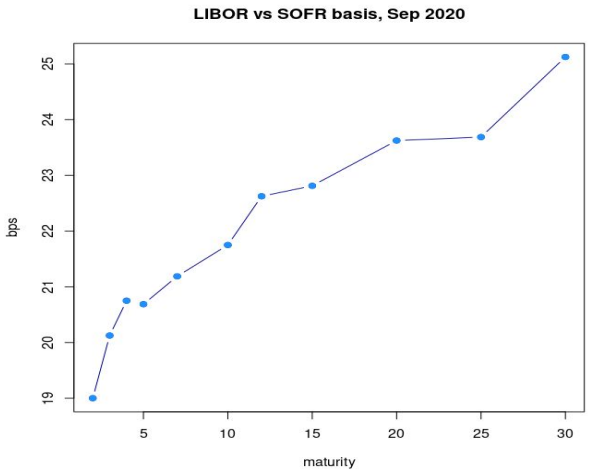
Despite the attractive characteristics of LIBOR, limitations have resulted in it's cessation as an eligible benchmark rate. To meet the December 2021 timeline agreement with the UK's Financial Conduct Authority (FCA), after which contributing panel banks will no longer be obligated to provide submissions that support the Benchmark Admisitrator's publication of LIBOR fixings, the industry backed Alternative Reference Rate Committee designed and anointed SOFR as the replacement for LIBOR.

Despite this widely and long known timeline of LIBOR's cessation, LIBOR has significant inertia contributing to its continued use today. For instance, LIBOR Futures contracts ("Eurodollar Futures") are extremely liquid and efficient to trade, as are the many IRS products derived from LIBOR. Many users report taking a "wait and see" approach before adopting SOFR, and for now LIBOR is more liquid, and therefore cheaper to trade. Recognising this inertia, financial markets authorities have concluded that a regulatory approach will be needed to push the market towards SOFR. We expect that 2021 will be "crunch time", and pressure may be applied on leading banks and funds to move over to SOFR. It is never optimal to unwind an exposure which others are also being forced to unwind at the same time, and we have written at length in our Eris Strategy Series: Trade Note 3 how and why to start unwinding LIBOR exposure into SOFR *before being forced to.*

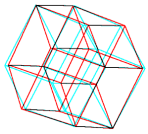
**Why futures make more sense with SOFR**

For new exposures, investors have two choices in SOFR: using over the counter (OTC) products analogous to equivalent OTC LIBOR swaps, or using CME Group's Eris SOFR Swap Futures which will be available for trading commencing Q4 2020. As centrally traded and cleared CME Group futures contracts, Eris SOFR futures will have substantial benefits over using OTC products:

- Clear and transparent, listed pricing.
- Concentration of liquidity on IMM dates.
- Reduced margining requirements due to standardisation and easier offsetting.
- Easier access without counterparty credit agreements.
- Lower credit risk facing an exchange.




Futures in general have always conferred these benefits, and that includes those for LIBOR interest rate swap futures, such as Eris LIBOR



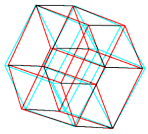
swap futures. However being LIBOR based, they inherit the same fixing and stub risk disadvantages discussed earlier. Since SOFR reduces these risks inherently, futures based on it become substantially more interesting.

**Example of SOFR's suitability for standardisation**

Assume a fund enters a 2 year spot starting 3 month LIBOR receiver swap on 1 September 2020, with dates 3 September 2020 - 2022. Rates move lower by 10bps over the following 9 days and the fund wishes to take profit. For convenience, cost, and expediency, the fund enters into a new standard 2 year payer swap on 10 September 2020, with dates 14 September 2020 - 2022. Although the fund is now duration hedged, and has locked in a profit, all of the future LIBOR fixing dates are mismatched by 11 days. Every 3 months, the fund takes the risk that the LIBOR fixings of the offsetting 2 year swaps will not match. This is a risk which is not only costly, materially, but introduces volatility which for obvious reasons requires some margining and/or capital. Moreover, operationally, someone must manage these offsetting swaps for their lifetime. The alternative would have been to trade a swap with the original dates, shifting the problem onto the swap dealer counterparty, who assumes the fixing risks and operational costs, for which the fund must of course be charged. The underlying reason for these problems is the lack of an 11-day LIBOR stub fixing, which the market making counterparty would need to correctly price to take on this risk, relative to available liquidity in the market. There are close-enough LIBOR fixings, such as a 1 week, 2 week or 1 month LIBOR fixing, but these fixings are survey rates and may not be efficiently traded, therefore introducing basis risk to the 3 month LIBOR fixing which is the only fixing that may be efficiently traded (with CME Eurodollars or FRAs).

Now let's examine the same scenario but using SOFR-based swaps. First let's imagine a spot starting non-futures 2y OTC SOFR fixed receiver is entered into on 1 September. On 10 September, the fund trades out by entering into a 2y OTC SOFR fixed payer to trade out of the risk. Now every single fixing between 14 September 2020 and 2 September 2022 is exactly offset, since SOFR fixes daily. There are no overlapping-area fixing risks. What is left is only a small 11-day stub starting on 3 September 2022 and ending on 14 September 2022. If this duration risk is significant, then it may be easily hedged using available SOFR futures (remember there will be no basis risk between overlapping SOFR fixings) or a single period SOFR swap. When the SOFR stub approaches maturity, due to the prevalence of 1-day "FRAs", it may be easily traded out of.

However this SOFR scenario is not even the most likely one. Instead, with CME Group's Eris SOFR Swap Futures, it is likely that the fund will enter into SOFR Swap *Futures* trades, which start on IMM dates. Therefore, on 1 September, instead of entering an OTC spot starting SOFR



swap, the fund might otherwise buy the September IMM (16 September) dated 2y SOFR Eris Swap Future, receiving fixed, and on 10 September simply trade out of it on the exchange. No mismatches. Liquid listed instruments. A complete unwind of the initial position and with zero residual risks or ongoing operational cost.

**Conclusion**

The transition to SOFR vastly improves efficiencies for traders, hedgers and risk managers alike, as the transition to daily SOFR fixings from periodic (1, 3, 6, 12 month) LIBOR fixings removes the only disadvantage of standardized futures. And with Eris SOFR futures providing an additional source of liquidity in IRS from both bank and non-bank market makers, and the concentration of risk and price discovery in standardized instruments, hedging efficiencies will improve for all, for both end-users and intermediaries.