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Clock auctions: a stitch in time for Libor?

MIT professor says Nobel-inspired mechanism could cut basis risk and ease $74trn Libor shift

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March 5, 2021 wasn't quite the Ides of March, but nonetheless, it set the scene for a historic end – the date that determined Libor's demise.

The Financial Conduct Authority (FCA) announced that for euro, Swiss franc, yen and sterling Libor – and for one-week and two-month US dollar tenors – final publication would be on **December 31, 2021**.

The end-date for one-month, three-month, six-month and 12-month dollar Libor, was set for **June 30, 2023**.

In their place, market-agreed fallbacks, such as the secured overnight financing rate (SOFR) in the US, will take effect at pre-determined spreads – also set on March 5 – in a major interval of the shift from Libor.

And yet, despite these known outcomes, much remains to be done to smooth the transition. At current levels, SOFR liquidity represents only 7.5% of overall US dollar **derivatives liquidity**, meaning that the Libor transition will require a quantum leap.

In this article, I propose the use of an auction mechanism, inspired by the work of two fellow academics, to help ease this transition – by reducing outstanding Libor exposures and facilitating liquidity development in the SOFR market.

But before we look at the details of the mechanism, we should first examine why fallbacks do not fully resolve the Libor problem.

Beat the clock

A key challenge is the value transfer onto fallbacks. For example, the three-month US dollar Libor fallback spread for derivatives is now **determined** at 26.161 basis points. After June 30, 2023, in place of three-month dollar Libor in derivatives contracts, the rate will be quarterly compounded, actual SOFR plus around 26bp.

Libor fallback spreads are calculated from historical data – in this case, the five-year median – but it would be something of a miracle if, immediately before June 30, 2023, three-month dollar Libor just happened to be 26bp above SOFR.

And if the Federal Reserve sticks to its commitment to maintain near-zero interest rates through 2023, the Libor/SOFR spread is likely to be much lower. As at April 8, 2021, for instance, the 90-day SOFR **average**, calculated in arrears, was 3.489bp. Whereas three-month Libor was 18.775bp, implying a spread between the two of roughly 15bp.

At these rates, replacing three-month dollar Libor with SOFR plus 26bp would suggest a value transfer of around 11bp from payers to receivers of three-month Libor.

Although Libor will cease to exist after June 2023, Libor cashflows can still be priced with reference rates that have a credit component – such as the Bloomberg short-term bank-yield index and the Ice bank-yield index. Another credit-sensitive spread is the AXI, across-the-curve credit spread index, which is calculated from the yields of bank debt with maturities up to five years.

Of course, the value transfer could also go in the opposite direction – but either way, the discontinuous jump in valuation is an undesirable risk.

Nobel-inspired design

The best way to eliminate this value transfer is to eliminate Libor cashflows before fallbacks are triggered. This is the precise rationale behind the design of a so-called **Libor clock auction** aimed at easing Libor transition.

The design of clock auctions is inspired by the Nobel Prize-winning **work** on spectrum auctions of two Stanford University professors – Paul Milgrom and Robert Wilson.

Compared with sealed-bid auctions, clock auctions offer plenty of transparency – while also encouraging liquidity and facilitating price discovery.

In the application proposed here, clock auctions would also help liquidity development in the SOFR market.

The clock auction for dollar Libor transition would produce market prices in Libor/SOFR spreads for a variety of maturities simultaneously.

The two sides in the auction would bid to enter Libor/SOFR basis swaps. Parties that currently receive Libor on derivatives and cash products would ideally negate their long-Libor exposure, so they would enter the auction as payers of Libor and receivers of SOFR plus a spread.

On the opposite side are parties that enter the auction as receivers of Libor and payers of SOFR plus a spread.

At auction

The auctioneer selects a set of maturities, potentially with the input of auction participants. The table below shows a hypothetical example with six tenors: three months plus one-, two-, five-, seven- and 10-year maturities.

The auctioneer also sets the basic parameters of any basis swaps – such as payment frequency and tenor of the Libor legs.

To get specific, let’s assume the basis swaps involve quarterly payments, where one leg is three-month Libor, and the other leg is quarterly compounded SOFR in arrears. The Libor/SOFR spread at these maturities are displayed to

all participants throughout the auction – like digital clocks. And all spreads start at zero.

Maturity	3m	1y	2y	5y	7y	10y
Current spread in basis points	0	0	0	0	0	0

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The bidding process

At the spreads displayed at the start, auction participants bid the direction and notional amount of the Libor/SOFR basis swap they are willing to enter. At the starting spread of zero, it is likely that participants will mainly want to pay SOFR plus a zero spread and receive Libor. And as the following hypothetical example shows, the supply of spread far exceeds demand.

The $200 billion amount at the two-year maturity means that, collectively, participants are willing to enter a two-year, $200 billion notional value Libor/SOFR basis swap, in which they are paying SOFR plus a zero spread and receiving Libor.

Maturity	3m	1y	2y	5y	7y	10
Current spread in basis points	0	0	0	0	0	0
Demand (receive Libor-SOFR spread in $bn)	0	0	0	0	0	0
Supply (pay Libor-SOFR spread in $bn)	60	100	200	200	150	25

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Dynamic price discovery

Price discovery takes place in multiple rounds. While the supply, or paying spread, differs substantially from the demand, or receiving spread on any

maturity, the auctioneer moves each spread in a direction that reduces the imbalance.

Sticking with the above example, let's suppose the auctioneer raises the spread to 15bp across all maturities. Supply and demand both adjust. In this hypothetical example, the new supply and demand roughly balance out at short maturities, but for long maturities, supply still exceeds demand.

Maturity	3m	1y	2y	5y	7y	10
Current spread in basis points	15	15	15	15	15	15
Demand (receive Libor-SOFR spread in $bn)	30	40	90	90	80	12
Supply (pay Libor-SOFR spread in $bn)	30	42	95	110	90	15

Given the new supply and demand from the last round, the auctioneer further adjusts the spreads, leading to further updates in supply and demand in the next round.

Convergence

Once the overall imbalance across maturities is sufficiently small, the price discovery process is deemed complete and auctions for all maturities end simultaneously.

In the following example, the final spreads for the six maturities range from 15bp to 18bp, at which the imbalance is small for each maturity. Wherever there is an imbalance, allocations on the heavy side are made pro-rata or according to time priority of order submission.

The benefit of ending the auction on all maturities simultaneously is that liquidity providers have maximal flexibility to allocate capital across the maturities as prices change – thus facilitating price discovery.

Maturity	3m	1y	2y	5y	7y	10
Current spread in basis points	15	15	16	17	17	18
Demand (receive Libor-SOFR spread in $bn)	30	40	92	100	85	13
Supply (pay Libor-SOFR spread in $bn)	30	42	90	105	90	13

Post-auction

The auction in this example results in transactions on basis swaps with notional amounts ranging from $30 billion to $130 billion for the six maturities. These swaps are sent to central counterparties (CCPs) for clearing, where Libor cashflows can net out substantially.

So, for example, if a participant who receives Libor on a $1 billion legacy swap contract also enters a $1 billion basis swap as the payer of Libor in the auction, Libor cashflows net out for this participant. In this case, the participant's net position becomes a SOFR swap, and she or he no longer face the value transfer shock on fallback.

Participants who have legacy cash products can also use the clock auction to hedge against revaluation risk on Libor fallback.

The final countdown

While Libor's future has been sealed, two challenges remain.

The first lies in the huge number of legacy products. The Federal Reserve-backed Alternative Reference Rates Committee estimates that $74 trillion of Libor contracts will remain **outstanding** after June 2023. Value transfers on these contracts are likely to be substantial in the event of Libor fallback.

The second is that SOFR liquidity development has been tepid.

The clock auction design helps to address both problems by substantially reducing Libor exposures and by generating additional liquidity and price

discovery in Libor/SOFR basis swaps.

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