Head to Head Comparison: SOFR vs Ameribor

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Summary

Let us say you are a community banker, or at a bank of modest size. No doubt you have heard about the LIBOR transition and how it may affect many aspects of your business, from savings accounts to mortgages, auto loans, student loans, business loans, lines of credit, credit cards and so on. You probably have already done an impact study of how much of your business may be affected by the LIBOR sunset. And you may have developed plans (or plans to make plans) of what to do with your existing deals, as well as when to start issuing in the new "risk free rate" (RFR) framework.

One question looms large: which RFR do you use? The Alternative Reference Rates Committee (ARRC) recommends the Secured Overnight Financing Rate (SOFR), whereas the American Financial Exchange has marketed Ameribor specifically for small and medium sized enterprises. In this white paper, a head-to-head comparison of SOFR and Ameribor is performed. Replacing LIBOR in existing deals is discussed, as well as using RFRs for new issuance.

1 Origins

1.1 SOFR

SOFR is based on the daily repurchase market in US Treasuries. That is, it is based on a volume-weighted average of the rate of overnight borrowing at the Federal Reserve Bank of New York. The borrowers can be any bank or financial entity. The borrowing is viewed as collateralized by the government security, and therefore SOFR can be regarded as a secured rate. Relative to LIBOR, the US Treasury market is enormous (Trillions of USD), so it is extremely difficult to manipulate SOFR.

LIBOR is currently consumed at specific tenors (such as 1M and 3M), whereas SOFR is purely an overnight rate. Although for some applications, the overnight SOFR rate can be used directly, most issued instruments to date have incorporated one or more of the following, possibly as a waterfall from top to bottom:

1. Term SOFR (which would be closest to LIBOR)
2. Compounded SOFR
3. Averaged SOFR (i.e., an arithmetic mean)

At present, there is no official term SOFR, though indicative values have been published (e.g., by CME). The root of this is the lack of liquid swaps, as described in the next section.

Compounding clearly is backward looking, where term SOFR looks forward. However, the European Central Bank has noticed that this "advance basis" can be managed. In practical terms, a floating-rate payer may need to know the amount due in advance of the payment date, setting aside the notion of

issuing purely in-arrears swaps. The solution is generally to compound in arrears, but use a mechanism to inform the float payer in advance: a payment delay, a lookback, or a lockout.

Simple averaging is uncommon, as it misses the effect of daily accruals. It is however present in the 1M SOFR future (see below).

1.2 Ameribor

The American Interbank Offered Rate (Ameribor) is based on unsecured lending on the American Financial Exchange (AFX). The primary players on the AFX are small and medium size US banks. Like SOFR, Ameribor is volume weighted.

Simple averages of the 30 day and 90 day rate are available. AFX has also announced a 30-day forward rate for Ameribor ("Ameribor30"), described as deriving from "transactions[sic] that aligns with macroeconomic theory and academic research on the term structure of interest rates." No formal methodology for this forward rate has been made public, though at least one deal is using it.

2 Liquid Instruments

The presence of liquid instruments based on floating rates makes hedging exposure possible, and can be used to construct spot and forward curves. For both SOFR and Ameribor, the most liquid instruments are futures. Indeed, to construct a SOFR curve currently, one would use the well traded instruments in Table 1.

Not shown in the table are SOFR swaps, and the very recently added SOFR swap futures. There are two issues. First, SOFR conforms to money market (OIS) conventions. So a SOFR swap float leg

1. Accrues daily SOFR
2. Pays at maturity (if < 1Y) or annually (if >= 1Y)

Thus, it is not like a LIBOR swap, such as 3M vs fixed. All SOFR swaps pay as per Item 2 above.

The second issue is that SOFR swaps have not yet shown the liquidity of LIBOR swaps, and are currently at about 10% both in volume and DV01. Clearly, with the end of LIBOR, neither SOFR/LIBOR basis swaps, nor vanilla fixed-float LIBOR swaps will exist. The SOFR swaps have room to grow. As with the current LIBOR swaps, these will add to our understanding of SOFR term structure at long maturities.

Ameribor currently has 7 day, 14 day, 1 month, and 3 month futures. Except for the 3 month (compounded), the others are all computed with arithmetic means. The volumes of Ameribor futures are very low – most typically shown as zero. There are no swaps or futures on swaps.

Table 1: Liquid SOFR instruments to build curves

Type	**Subtype**	**Tenors**	**Liquid Range**
Future	Arithmetic Average ON	1M	1 – 1.5 years
Future	Compounded ON	3M	1 – 3 years
Swap	EFFR[1]/SOFR basis	ON vs ON	2 - 5 years
Swap	LIBOR/SOFR basis	1M/3M/6M vs ON	5+ years

3 Comparison

The below Table 2 summarizes the differences as discussed so far, together with some additional distinguishing characteristics.

Both indices have a long (5+ year) time history, which facilitates the fallback discussion below.

As can be seen, the US agencies are planning to use SOFR and not Ameribor. So, if you plan to sell or transfer a book of ARM mortgages to a servicer, you should probably use SOFR. The one temporary exception is the reverse mortgage industry. Because of experience with the Constant Maturity Treasury (CMT) rate, they are doing an initial transition to CMT, but eventually will use SOFR.

It should be noted that Ameribor uses Ethereum technology, the type of blockchain that is used in digital and cryptocurrencies. SOFR does not have this feature.

[1] Fed Funds.

Table 2: Summary of differences between SOFR and Ameribor

Category	**SOFR**	**Ameribor**
Underlying Market	Treasury repo	Corporate loans
Secured?	Yes	No
Data Available Since	2014	2015
1M Futures Volume	6,887	0
3M Futures Volume	32,617	0
Swaps Notional Volume	$120 B	None
Mortgages / Reverse Mortgages	FNMA, FHLMC, FHLB banks, Federal Farm Credit Bank, GNMA	?
Uses blockchain	NO	YES

* Futures volumes as of 9/30/2020. Swaps volumes are average for August 2020.

4 Fallbacks

Under the assumption that LIBOR is close in value to SOFR or Ameribor, LIBOR can be replaced after its cessation by an adjusted value of the newer rates. This is the central idea of a fallback, and if this closeness can be captured statistically in historical data, then an unbiased estimate of LIBOR post-cessation can be obtained.

<*Estimated but unobservable LIBOR value*> =

<*Fallback index value (SOFR or Ameribor)*> + <*Spread*>

Note that the spread is static (time constant), and will be measured over a designated historical period. It differs only for each tenor. Examples of fallbacks are shown in Table 3. In the case of the curves, the spread is added at each maturity.

Table 3: Fallback Examples

Quantity to Replace	**Static spread added to**
3M LIBOR	90 Day Index
6M LIBOR	180 Day Index
1Y LIBOR	360 Day Index
3M LIBOR spot curve	Index spot curve
3M LIBOR forward curve	Index forward curve

SOFR fallbacks have been widely discussed in the community. The ARRC (for cash products) and ISDA (for derivatives) have solicited practitioner input and developed the following approach.

1. For a given LIBOR tenor, select a spot date from which lookback data are obtained.
2. Difference the historical SOFR tenor (as per the waterfall in Section 1.1) with LIBOR. Compute the five-year median, looking back from spot.
3. Apply steps 1 and 2 to all LIBOR tenors requiring fallbacks.

At the present, the spot dates are undetermined, but would be defined by the earlier of 12/31/2021 and a decision by the FCA that a LIBOR tenor is no longer representative ("Zombie LIBOR"). That said, the five-year median is insensitive to outliers, and shows little dependence on the historical period. The derived spread is typically some tens of basis points. It is reasonably stable.

The application of the static spread is purely additive as in the equation above in wholesale (i.e., non-consumer) products. Consumer products (nearly all under ARRC as they are predominantly cash, not derivatives) include mortgages, student loans, auto loans, credit cards, and so on. These would have a phase-in period of one year. For example, if payments are based on 1M LIBOR, and the static spread is 24 BPs, then two BPs would be added to each payment for a year. See Table 4.

Table 4:Example of Phase-In for SOFR Fallbacks for Consumer Products

Month number	**LIBOR 1m fallback**
1	SOFR 1m + 2 bps
2	SOFR 1m + 4 bps
3	SOFR 1m + 6 bps

Etc. to SOFR 1m + 24 bps for months 12 and later

ISDA<go> on Bloomberg gives indicative values of fallbacks based on SOFR

Ameribor fallbacks have not been discussed in the community to date. Clearly, historical data exists to compute statistics of differences. It remains to be seen whether the differences are stable, and a similar approach as that taken for SOFR can be employed.

It should be noted that, without the ability for LIBOR to fallback to Ameribor, a bank wanting to issue in Ameribor would have a bit of a two-headed monster. It would have to manage both an Ameribor and a SOFR book. The Ameribor book would be for new instruments, but the SOFR book would be for the legacy LIBOR instruments.

5 Discounting

Fixed-income instruments (such as swaps and swaptions) traded on central-clearing counterparties and exchanges and denominated in USD switched from using EFFR to SOFR for discounting and price-alignment interest (PAI) in October, 2020. In the longer term, SOFR likely will be the interest rate of choice for all types of overnight lending, regardless of asset class. So, for example one might see margin for equities and equity options being calculated with SOFR.

There are no reports of discounting and PAI calculations using Ameribor. In the event that Ameribor swaps become available, it is conceivable that the payments could be discounted in Ameribor.

6 Credit Sensitivity

As noted in Section 1, SOFR differs from LIBOR and Ameribor in being a collateralized rate. It therefore is less credit sensitive than an unsecured rate. How would one add in credit sensitivity? To first order, the fallback spread addressed above incorporates credit. It is a direct differencing of unsecured LIBOR and secured SOFR. So, the five-year median can be interpreted as a static credit spread.

The search for a dynamic credit spread, meaning a residual to any static spread, is currently being undertaken by Markit, Bloomberg, and some others. However, based on the author's own experience, this is a quixotic task. Doing the math of subtracting the static spread over historical periods gives mostly noise. There is no pattern in this noise matching the credit cycle, or credit proxies such as the CDX index, or the spread between AAA and BBB.

What then is the way to correct SOFR for credit? Unsurprisingly, there is no one-size-fits-all solution. If you know your customer, you have some idea how to charge them for a LIBOR loan or other obligation. You add a spread. And you will learn how to charge them for a SOFR loan. You add a spread.

Of course, Ameribor is unsecured, so you may elect to lend at Ameribor flat. Or Ameribor with an additive spread, again based on the customer. The only hesitation would be the inability to manage rate risk, given that, as discussed in Section 2, there are no ways to hedge most long-term Ameribor risk. If rates were near their historical averages, you might argue that they could move up or down with equal probability. However, rates are so close to zero, that they are almost certain to go up in the medium-to-long term.

7 Who Uses Ameribor?

Following dueling articles in American Banker, Signature Bank and a list of other small and medium sized banks stated that SOFR was unfit for their use and that they would be adopting Ameribor. Some deals are illustrated below. There is little news in general about Ameribor uptake. Either Ameribor users want to be out of the limelight, or else it really isn't very common.

Brookline Bank (Mass.) provides customer SOFR and Ameribor products ($ 50M to $100 M). ServisFirst issued a $20 M loan based on Ameribor30. Both banks are using Ameribor futures to hedge rate exposure.

8 Diagnostic Questions

It may be helpful to ask yourself diagnostic questions to choose whether SOFR, Ameribor, or both best suit.

1. Do you expect to hold all your positions in house, or would you rather sell them to servicers, larger banks, and Government agencies?
2. Do you want a single RFR for both fallbacks to existing LIBOR products and for new deals, or are you comfortable with supporting multiple RFRs?
3. Will you hedge your book with standard market interest-rate instruments such as futures and swaps?
4. Is having an RFR based on blockchain an advantage or disadvantage?

9 How to Find Out More

Delta Vega provides LIBOR transition services including a weekly newsletter available by subscription about global developments, a blog of timely topics, and full-length papers such as this for in-depth discussions.

Both the ARRC and ISDA have outreach and regular meetings, other media such as podcasts. Some consultancies, particularly PWC and Oliver Wyman, have good conferences and regular publications on sites like LinkedIn.

10 Glossary

AFX: The American Financial Exchange

Ameribor: The American Interbank Offered Rate

ARRC: The Alternative Reference Rates Committee

CME: The Chicago Mercantile Exchange

CMT: The Constant Maturity Treasury Rate

EFFR: The Effective Federal Funds Rate, sometimes called just “fed funds”

FCA: The Financial Conduct Authority (UK)

FHLB: The Federal Home Loan Bank system

FHLMC: Freddie Mac

FNMA: Fannie Mae

GNMA : Ginnie Mae

ISDA: The International Swaps and Derivatives Association

ON: Overnight

PAI: Price-alignment interest

PRMIA: The Professional Risk Manager’ International Association

PWC: Price Waterhouse Coopers

SOFR: The Secured Overnight Financing Rate