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DNA®

Secured Overnight Financing Option (SOFR) Adoption and LIBOR Migration Guide

This document is comprised of the following helpful sections.

Secured Overnight Financing Rate (SOFR)

There is a significant industry-wide change underway related to index rates. The London Interbank Offered Rate (LIBOR) index rate is expected to be discontinued at the end of 2021. LIBOR is a widely used index rate and is one of the primary benchmarks for short-term interest rates worldwide, including many variable rate consumer and commercial loans.

Based on the planned LIBOR sunset, the Federal Reserve and New York Fed created the Alternative Reference Rate Committee (ARRC) in 2014 to recommend a LIBOR index rate replacement, and to ensure a smooth transition. Secured Overnight Financing Rate (SOFR) is now the leading candidate to replace LIBOR. Therefore, Financial Institutions that use LIBOR, will require a replacement index including the ability to accrue loans based on SOFR accrual methods and options.

SOFR is not simply a new index rate. The ARRC has included options for SOFR that include multiple accrual methods such as both simple and compounding that work in conjunction with different index and billing options, and configuration options that control index spread adjustments, lookback days, business day due dates, and payment delays.

Fiserv has been actively monitoring the evolution of SOFR and planning for the transition-related activities that the LIBOR sunset will have on our clients. These activities include

- Participating in ARRC calls and updates
- Understanding the current and evolving SOFR requirements
- Evaluating product options and impact with our Development Teams
- Gathering relevant data
- Hosting an ongoing client focus group.

It is a priority for Fiserv to ensure a smooth SOFR implementation for those clients that plan to, or are required to, adopt SOFR.

What Actions Should You Be Taking?

We recommend that you review your loan portfolio for variable rate loans tied to LIBOR including purchased participations. If you determine that your Financial Institution will be impacted by the LIBOR planned sunset, we recommend that you please contact your Core Client Service Partner.

Defining SOFR Accrual Methods and Features

In this section, we expand on the SOFR background and describe the specific SOFR Accrual Methods and Features that are being considered to support a LIBOR to SOFR migration:

- SOFR accrual methods and features

- ARCC conventions

Accrual Methodology

Methodology	Details	Status
Forward Looking Term SOFR	This option is similar to the way LIBOR works today and is the preferred replacement for LIBOR, **however a Forward Looking Term SOFR rate is not yet available.**	**Currently Supported**
Compounded SOFR in Advance	This option uses one of the published backward looking compounded SOFR averages (i.e. 30, 90 or 180 day average) and the rate is set, in advance, for a fixed period of time, similar to a LIBOR loan.	**Currently Supported**
Simple Daily SOFR in Arrears	This option uses the daily SOFR and behaves like a daily floating rate loan.	**Currently Supported**
Compounded SOFR in Arrears using compounded rate	This option compounds the SOFR daily and applies the compounded rate to the principal balance. The rate is compounded for the duration of the interest period.	In process

Note: SOFR also describes a Compounded in Arrears using compounded Balance – DNA is not planning to support this Accrual Method

Features

Option	Details	Methodologies
Spread Adjustment	Applies to each converted loan to minimize the difference between LIBOR and SOFR, on the day that the loan is converted.	All methodologies
Payment Delay	The due date will be after the end of the interest period, so that billing can be done at the end of the interest period.	Simple Daily and Compounded SOFR in Arrears
Lookback	Determines the dates used when looking up the SOFR index, to enable billing in advance of the end of the interest period.	Simple Daily and Compounded SOFR in Arrears
Business Day Due Date	Payments due on a non-Business Day will be adjusted to the next succeeding business day, unless that business day falls in the next succeeding calendar month, in which case the interest payment date will be the preceding business day.	All Methodologies

SOFR Accrual Methods: Comparing In Arrears to In Advance

As previously stated, the SOFR *In Advance* methods are similar to how LIBOR is published today. *In Advance* means that the SOFR Rate is published and known prior to the current billing period.

In Advance refers to using backward looking published SOFR average rates that are made available prior to the current period. This method uses SOFR rates that are not as current as *In Arrears* but do provide borrowers with more advance notice of rate changes. *In Advance* SOFR published rates includes a 30-, 60- and 180-day index.

In Arrears refers to using the current period's SOFR overnight rate to compute the periodic interest due. This method uses the most recently published rates but provides the borrower with little advance notice of index changes.

A Spread Adjustment will be used for all LIBOR to SOFR transition Accrual Methods. The Spread Adjustment may be included in a spread-adjusted rate (i.e. 30-Day Compounded in Advance), or it may be included separately as part of the rate.

To help address the *In Arrears* issues caused by using current period SOFR Rates, the following configuration Options have been included:

- Payment Delay
- Lookback Period
- Business Day Due Date adjustment

Note: The following link provides LIBOR-SOFR Transition information published by the ARRC committee:

Alternative Reference Rates Committee

SOFR Loan Conventions – In Arrears

The following conventions relate to using SOFR in arrears (Daily Simple SOFR and SOFR Compounded in Arrears) for business loans. Other forms of SOFR, including use of SOFR in advance or, if available, a SOFR term rate, would tend to have conventions similar to current LIBOR conventions. The Loan Conventions address both new loans that are originated using SOFR and loans that “fall back” from LIBOR to SOFR upon LIBOR cessation or being deemed to be unrepresentative. It is the In Arrears Accrual Methods that require support for features such as:

- Lookback
- Payment Delay
- Business Day Due Date

These features work to help borrowers understand current period billed amounts because the SOFR rate is current period rather than a prior period know rate.

As further background, please review the attached document published by the ARRC which provides more information on the SOFR In-Arrears Accrual Methods (Daily Simple SOFR and Compounded in Arrears). These In-Arrears Methods bring in the requirements for several SOFR features. **SOFR "In Arrears" Conventions**

Definitions Included in this Document for NEW SOFR Loans and LIBOR Legacy

- SOFR Index

- Compound versus Simple interest
- Holiday and Weekend Convention, Daycount, Business Day Convention, Timing
- Rounding, Floors
- Distribution of Interest
- Spread Adjustment

SOFR Daily Rates: Simple vs Compounded

We highlighted that the In Arrears methods adds new features. When comparing the In Arrears Simple vs Compounded, the Compounded method adds the complexity of a compounding rate or a compounding balance to compute periodic interest due. Currently, the ARRC appears to be favoring the In Arrears Simple interest methodology. Definition from ARRC:

Daily Simple SOFR

For any day, SOFR, with the conventions for this rate (which will include a lookback) being established by the Lender in accordance with the conventions for this rate selected or recommended by the Relevant Governmental Body for determining "Daily Simple SOFR" for business loans; provided, [for legacy LIBOR] that if the Lender decides that any such convention is not administratively feasible for the Lender, then the Lender may establish another convention in its reasonable discretion.

Daily Compounded SOFR

For any day, SOFR (compounded daily) with the methodology and conventions for this rate (which will include compounding in arrears with a lookback) being established by the Lender in accordance with the methodology and conventions for this rate selected or recommended by the Relevant Governmental Body for determining "Daily Compounded SOFR" for business loans; provided, [for legacy LIBOR loans] that if the Lender decides that any such convention is not administratively feasible for the Lender, then the Lender may establish another convention in its reasonable discretion.

SOFR Daily Compounded in Arrears: Math Example

Compounded SOFR in Arrears using Compounded Effective Rate:

In this example, we show a calculation of *SOFR Daily in Arrears Compounded using the Effective Rate* accrual method.

- This example assumes no lookback– i.e. – this example uses the current SOFR rate for daily accruals.
- The days method is 360

Note: An advanced example would include a principal payment which collect interest for the period to date

Day	Loan Balance	Daily SOFR Rate	Effective Rate	Cumulative Compounded Effective Rate	Accumulated Interest	Resulting Daily Interest Accrual
Day 1	5,000,000.00	2.42	0.0067222%	0.0067%	336.11	336.11
Day 2	5,000,000.00	2.51	0.0069722%	0.0137%	684.75	348.63
Day 3	5,000,000.00	2.45	0.0068056%	0.0205%	1,025.07	340.32

Using DAY 3 as an example: Daily Accrual is computed as follows:

1. Compute Daily Effective Rate by dividing the SOFR Rate by the Daily Eff Rate Basis (360)
   a. 2.45 % / 360 = .0068056%
   b. *Compute the Compounded Effective Rate*
   c. = ((1 + Today's Eff. Rate) X (1 + Prior Days Compounded Effective Rate) – 1)
   d. = ((1 +.0068056) X (1 +.0137) – 1) = .0205%

2. *Compute the Accumulated Interest*
   a. = (Balance X Cumulative Compounded Effective Rate)
   b. = $5,000,000 X .0205 = $1,025.07

3. *Compute the Daily Accrual*
   a. = Today's Accumulated Interest MINUS Yesterday's Accumulated Interest PLUS Today's Interest Paid
   b. = $1,025.07 - $684.75 = $340.32

DNA SOFR Support

As of November 2020, this is the planned DNA roadmap, subject to change based on market and client priorities:

Q4 2020

- Spread Adjustment support including notices
- Forward Looking, Simple Daily, and Compounded in Advance

Q1 2021

- Compound the Rate accrual method, Lookback,, and Business Day Due Dates
- Forward Looking, Simple Daily, Compounded in Advance, and Compounded in Arrears using compounded rate

Notes:

- SOFR published rates would be entered into DNA Rate Calculation Schedules like LIBOR
- Spread Adjustment, if applicable, can be added to the existing loan margin until Phase 1 is complete

DNA support for LIBOR Transition for Accrual Methods:

- Forward Looking Term SOFR (no published rate yet but anticipated)
- Compound SOFR in Advance
- Simple Daily SOFR in Arrears (Features such as lookbackon roadmap)

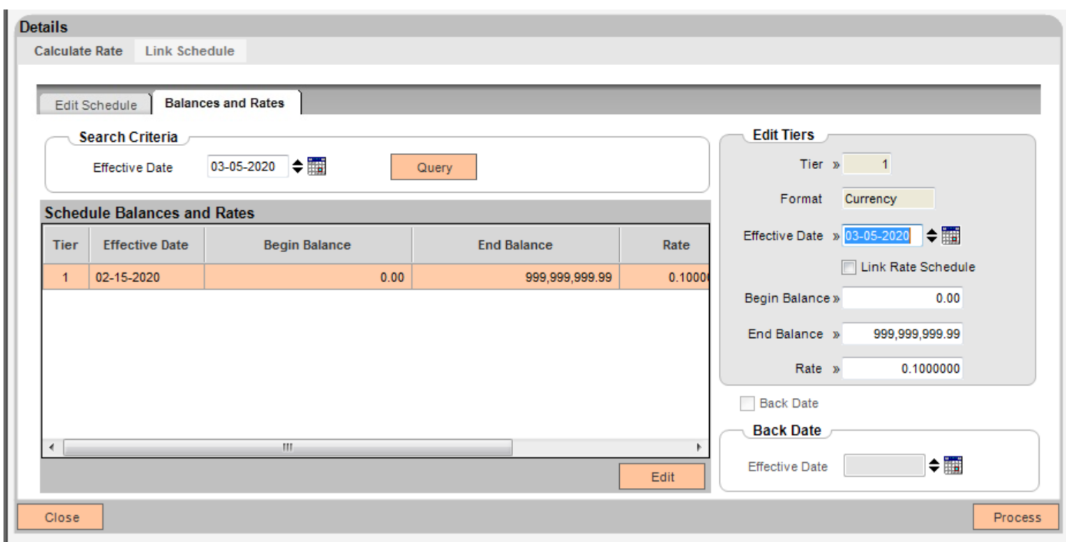
In this section, we provide some examples of existing and planned functionality (Spread Adjustment) in DNA to support the LIBOR transition to SOFR for those LIBOR portfolio's that can leverage these simpler methods.

Note: The complexity of the accrual method, Daily Compound SOFR in Arrears using Daily Compound Rate, is likely to only be required for complex syndicated commercial loans and possibly some bilateral loans as well, and even with these types of loans, the ARRC seems to be leaning toward a simple daily, rather than a compounding accrual method.

Entering/Updating SOFR Rates

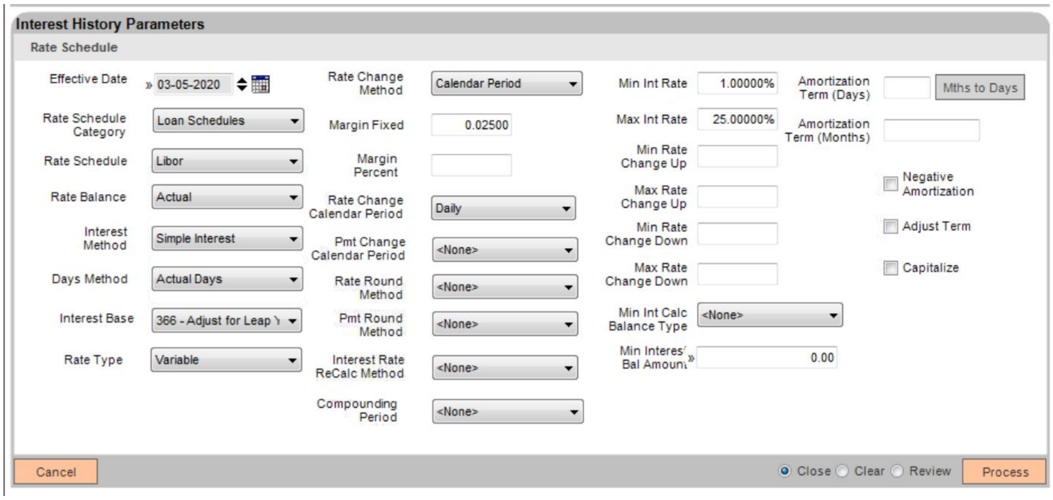
- In DNA, published SOFR Rates would be entered as Calculation Rate Schedules similar to LIBOR, Prime, 1 Year T-Bill.
- For SOFR, create a unique SOFR Rate Calc Schedule for each SOFR Rate used, i.e. Daily, 30-Day, 90-Day, 180-Day, etc.
- For SOFR Overnight Daily Rate is published with a one business day lag

DNA Index Rates



Loans are then setup to point to the appropriate Calculation Schedule and a Rate Type (Fixed vs Variable) and a Rate Change Frequency can be setup.

DNA Loan Interest Control



DNA SOFR Configuration Options

Spread Adjustment: In DNA, we are planning to add a Loan Level Account Calculation Variable to support the LIBOR to SOFR Spread Adjustment.

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The Spread Adjustment field will be used to track the spread adjustment and be included in customer notices.

New Loan Margin = contractual loan margin + the SOFR-related spread adjustment.
Note: This New Loan Margin needs to be entered into the DNA Margin field.

Note on DNA Spread Adjustment: this is supported by a new field that will be used to track the spread adjustment and be included in customer notices.

Spread Adjustment	
Adjust for LIBOR and SOFR differential	
SOFR Rate – 6 Month	2.50%
Contractual Loan Margin	3.00%
Spread Adjustment	0.25%
NEW LOAN MARGIN	3.25%
All In Loan Rate	5.75%

Note: Bloomberg began publishing spread-adjustments on July 17, 2020 (Bloomberg LIBOR Transition). In June 2020, the ARRC further announced, with respect to business loans, that the ARRC's recommended spread adjustments will match the value of ISDA's spread adjustments to USD LIBOR.

LIBOR to SOFR Migration Considerations:

Recommended Steps:

1. Identify LIBOR-based loans and maturity dates
   The LIBOR sunset is set to occur by 12/31/2021. Identify the loans that might be impacted by the LIBOR sunset.

   - Variable Rates
   - Tied to a LIBOR index rate
   - Are scheduled to mature after 12/31/2021?
   - How many LIBOR loans exist?
   - How many loans are there by Loan Type?

2. Do you have any purchased participations / syndications?

   - Be sure to review any purchased participations / loan syndications and work to understand from the lead servicer what their migration plan is to convert loans that are tied to LIBOR.

3. What is your policy for newly originated loans and purchased participations?

   - When will you adopt a LIBOR alternative?
   - What are purchased participation loans linked to?
   - What is supported for DNA and what is not?

4. What is your migration strategy?

   - For each loan, or portfolio of loans, that is tied to LIBOR, map out the new SOFR Rate that will be used to replace LIBOR.
   - Are there industry best practices?
   - Loan contract provisions?

5. When and how will you transition your LIBOR portfolio?

   - What is your migration to SOFR timing?
   - Do you need Fiserv Professional Services support to assist with your migration?
   - Consider Spread Adjustments
   - Consider other billing features
   - Communicate with the borrowers

Accrual Methods and Features mapping by Portfolio Type

The following are potential examples for how SOFR may be operationalized

	SOFR Accrual Methodologies			
Loan Types	Term SOFR	SOFR in Advance	Simple Daily SOFR	Compounded SOFR
Consumer	x	x		
ARMS		x		
Student Loans	x	x		
SBL Loans	x	x	x	x
Commercial (Bilateral)	x		x	x
Syndications	x		x	x
Club Deals	x		x	x

	SOFR Features and Configurations			
Loan Types	Spread Adjustment	Payment Delay	Lookback	Due Dates
Consumer	x			
ARMS	x			
Student Loans	x			
SBL Loans	x		x	x
Commercial (Bilateral)	x	x	x	x
Syndications	x	x	x	x
Club Deals	x	x	x	x

	SOFR Method and Features/Configurations Combinations			
SOFR Accrual Methods	Spread Adjustment	Payment Delay	Lookback	Due Dates
Term SOFR	x			
SOFR in Advance	x			
Simple Daily SOFR	x	x	x	x
Compounded SOFR	x	x	x	x

Additional Resources:

Alternative Reference Rate Committee
Freddie Mac LIBOR Transition Playbook
Freddie Mac LIBOR Transition FAQs
Fannie Mae LIBOR Playbook
Fannie Mae LIBOR FAQs
Consumer Financial Protection Bureau LIBOR Transition FAQs
Resources assembled by the Loan Syndications and Trading Association