



Federal Home Loan Bank
NEW YORK

LIBOR Transition: Heading into Overtime

April 22, 2021

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Agenda: LIBOR Transition - Heading into Overtime

- April 2021 Recap
- SOFR Market Growth 2018-2021
- Banking Transition Concerns
- Transitioning Your Institution
- Appendices



LIBOR TRANSITION APRIL 2021 RECAP

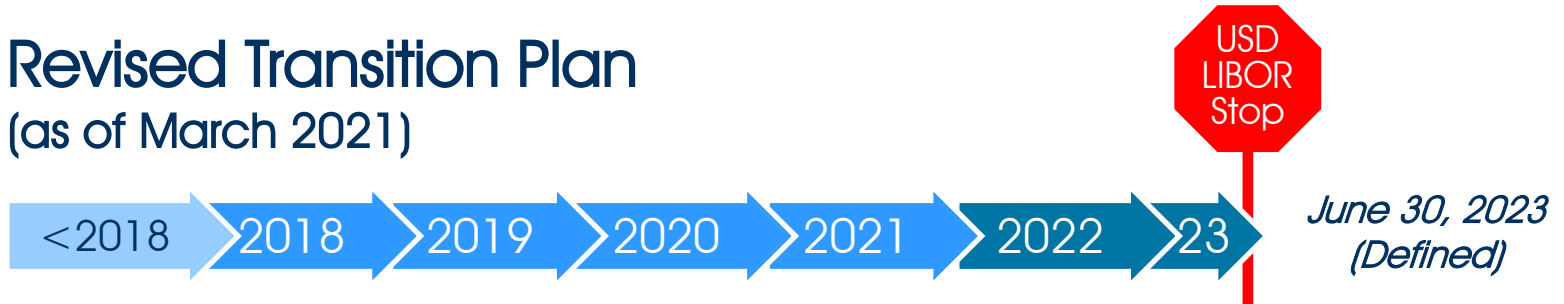


Nov 2020 News: USD LIBOR goes into Overtime

The Paced Transition Plan *



Revised Transition Plan (as of March 2021)



* Alternative Reference Rate Committee (ARRC) *Paced Transition Plan*, October 31, 2017



USD LIBOR Cessation Date Defined and Spread Adjustment Fixed

- ICE Benchmark Administration (IBA) announced proposal 11/30 to cease publication of 1- and 3-month LIBOR **after the June 30, 2023 publication**
- Fed, OCC & FDIC issued contemporaneous interagency guidance **SR20-27** 11/30 encouraging *“banks to cease entering into new contracts that use USD LIBOR as a reference rate as soon as practicable and in any event by December 31, 2021.”* Failure to do so *“would create safety and soundness risks”* and the agencies would *“examine bank practices accordingly.”*
- The IBA and FCA on 3/5 confirmed the June 2023 cessation date
- The IBA & FCA 3/5 statements **triggered fixing of the Spread Adjustment** for all 7 USD LIBOR tenors used by ISDA fallbacks and ARRC recommended-fallbacks
 - E.g., Fixings of 1m LIBOR fall back to SOFR + 11.448bp after cessation
 - E.g., Fixings of 3m LIBOR fall back to SOFR + 26.161bp after cessation
- Federal Reserve issues supervisory guidance **SR21-7** 3/9/2021 specifying examination criteria for Bank LIBOR Transition efforts



A New Endgame for USD LIBOR Transition

<2018	<p>2014 Federal Reserve Board forms working group (to become ARRC)</p> <p>2017 ARRC endorses SOFR as USD LIBOR replacement, defines Paced Transition Plan</p> <p>FCA sets 2021 as end of LIBOR support</p>
2018	<p>FRBNY begins publication of Daily SOFR & Repo rates</p> <p>SOFR Swaps, Futures, Floating Rate Notes begin to trade & develop markets</p> <p>FHLB issues SOFR FRNs, FHLBNY lends SOFR-linked Advances</p>
2019	<p>LIBOR Fallback principles emerge from ISDA & ARRC consultations</p> <p>FHFA Announces Restrictions on FHLBank LIBOR activities</p>
2020	<p>CCPs "Big Bang" SOFR discounting; SOFR Non-Linear Derivatives begin trading</p> <p>Agency MBS: SOFR MBS & Mortgage Loans replace LIBOR for new transactions</p> <p>ISDA Protocol & Supplement finalized, > 13K adherents (as of 4/2021)</p>

Original Endgame

2021	<ul style="list-style-type: none"> LIBOR Contracts amended & implemented SOFR replaces LIBOR Transactions & Curves <p>Dec 31, 2021 end of USD LIBOR</p>
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2022

2023

LIBOR in "Overtime"

<p>SOFR Swap Curve</p> <p>SR20-27 "cease ...new [USD LIBOR] contracts ... by 12/31/21"</p>



<ul style="list-style-type: none"> LIBOR Contracts amended & implemented SOFR replaces LIBOR Transactions & Curves <p>June 30, 2023 end of USD LIBOR</p>



LIBOR Legislation makes headway in 2020:

New York State enacts law; Federal Law is in progress

- April 7, 2021 New York Governor Cuomo signed ARRC-recommended LIBOR Legislation into law
- Applies to “**tough legacy**” contracts, securities or instruments which
 - contain **no fallback** provisions; or
 - use some form of **LIBOR as the fallback**; or
 - rely on **polls, surveys, inquiries** for quotes
- Grants Determining Person authority to utilize the recommended benchmark replacement (**SOFR plus spread adjustment** with conforming changes) in place of LIBOR
- **Safe harbor** declares aforementioned replacement to be commercially reasonable, comparable in methodology and performance to LIBOR and not an amendment or modification
- In mid-April, Rep Brad Sherman (D-CA) circulated a similar discussion draft for **Federal LIBOR legislation**



Other 2020 Transition Milestones

Dates	Events	Significance
July-Oct	<ul style="list-style-type: none"> Fannie and Freddie issued SOFR indexed resi CMOs (July), CMBS (Q4) Fannie and Freddie issued last resi LIBOR Securities (Oct), LIBOR CMBS sunsets Q2 2021 	Agency MBS investors: SOFR adoption and LIBOR phase-out for
Aug-Dec	<ul style="list-style-type: none"> Fannie and Freddie began took delivery of SOFR resi loans (Aug) and CRE loans (Sept) Phased out eligibility of LIBOR resi loans (Dec) 	Mortgage Loan Originators: SOFR adoption and LIBOR phase-out
Oct 16-19	<ul style="list-style-type: none"> “BIG BANG” CME & LCH adopted SOFR Price Alignment Interest and Discounting, replacing Fed Funds CME & LCH issued compensating cash and/or swap transactions 	SOFR discounting of cleared derivatives is expanding SOFR exposure across the full range of markets participants and enhancing liquidity in long-term SOFR and SOFR basis markets
Oct 23	<ul style="list-style-type: none"> ISDA published amended 2006 ISDA Definitions into Supplement effective Jan 25, 2021 ISDA Protocol for legacy transactions published with 13,000 adherents (as of 4/2021) Bloomberg published Spread Adjustment (running 5-yr median LIBOR-SOFR spread) 	<ul style="list-style-type: none"> Finalized Definitions lend certainty to post-fallback derivatives valuation Establishes fallback precedent for other products

Sources: ISDA, ARRC, CME, LCH, Fannie Mae and Freddie Mac



Is a Forward-Looking Term SOFR Index in our Future?

- ARRC's Paced Transition Plan targeted the development of a Forward-Looking Term SOFR by 2021
- ARRC established an RFP for the Administrator for an ARRC-recommended forward-looking SOFR term rate in 2020
- ARRC on 3/23/2021 updated forward-looking SOFR term expectations:
 - ARRC not yet in a position to recommend a term rate based on the current level of SOFR derivatives; nor can it guarantee a recommendation by end of 2021
- ARRC on 4/20/201 announced Term SOFR Principles:
 - Reiterated its requirement for forward-looking term SOFR to follow SOFR constraints; e.g., robust underlying transaction activity
 - Limited scope of use: avoid (i) the LIBOR "Inverted Pyramid" (ii) use which detracts from underlying SOFR derivatives used for term rate

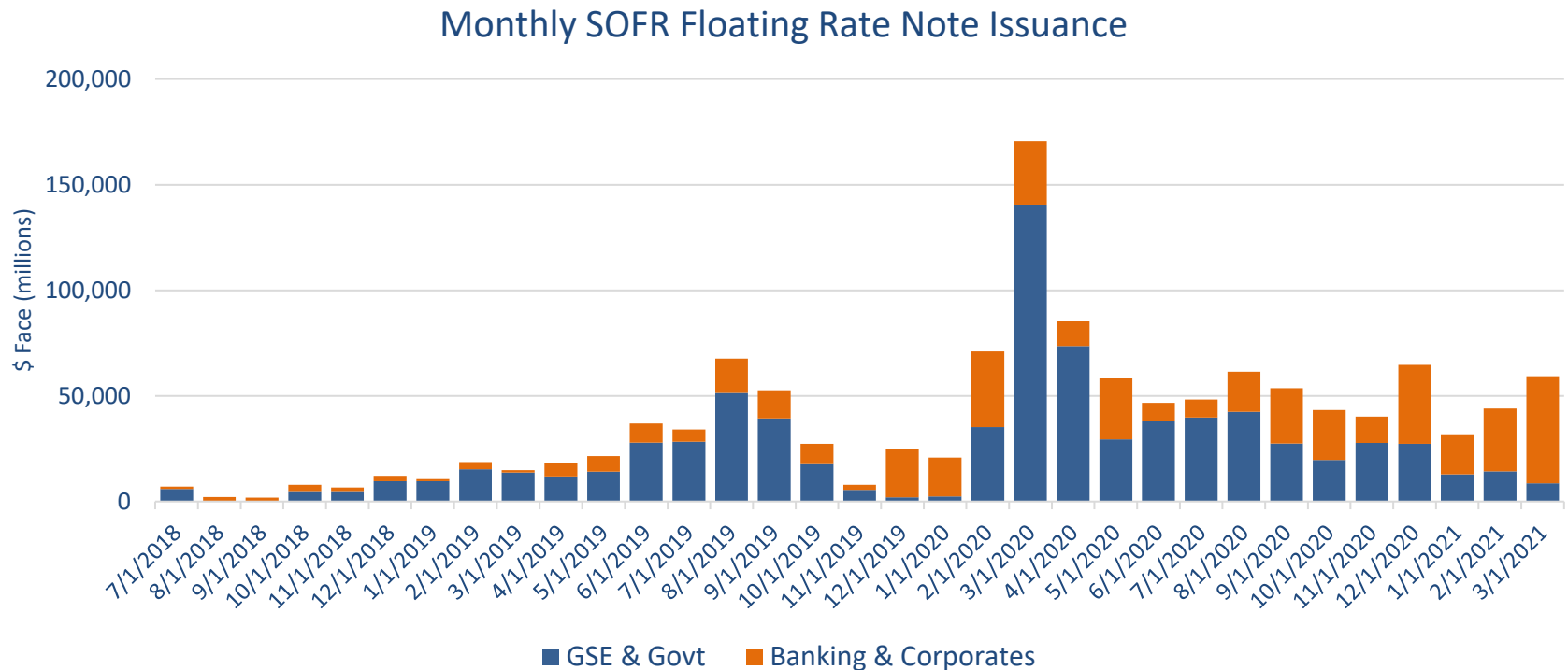


SOFR MARKET GROWTH 2018-2021



SOFR Floating Rate Note Issuance

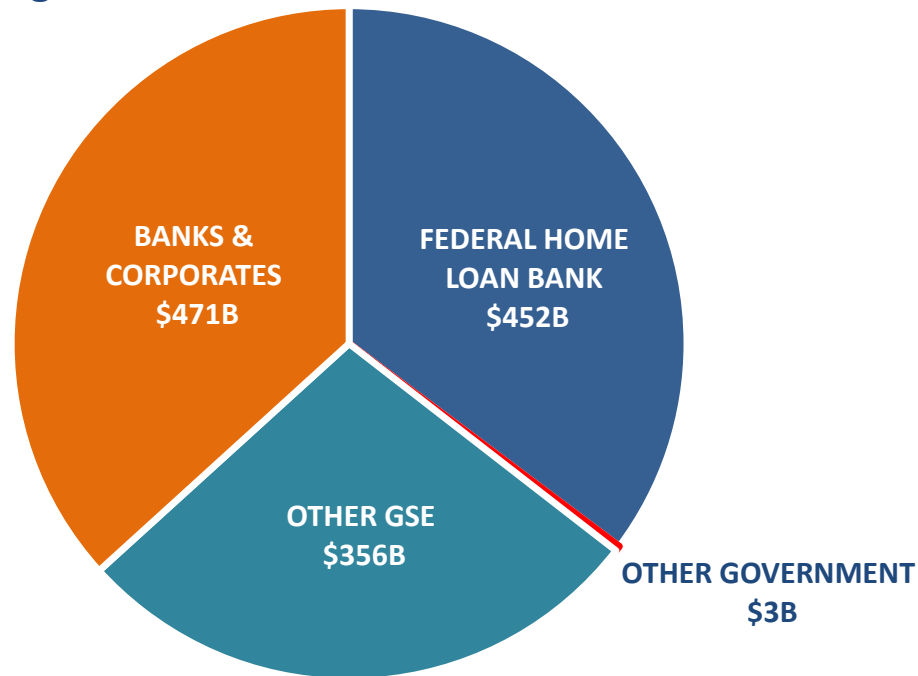
- GSEs dominated the first 2 years of SOFR FRN issuance
- Banks have emerged as SOFR funders since the Big Bang



Issuers of SOFR Debt

- FHLBank debt makes up 35% of SOFR issuance since 7/2018
- Other GSEs about 28%
- Banks make up balance of 37% and growing

Floating Rate Note Issuance to March 31, 2021



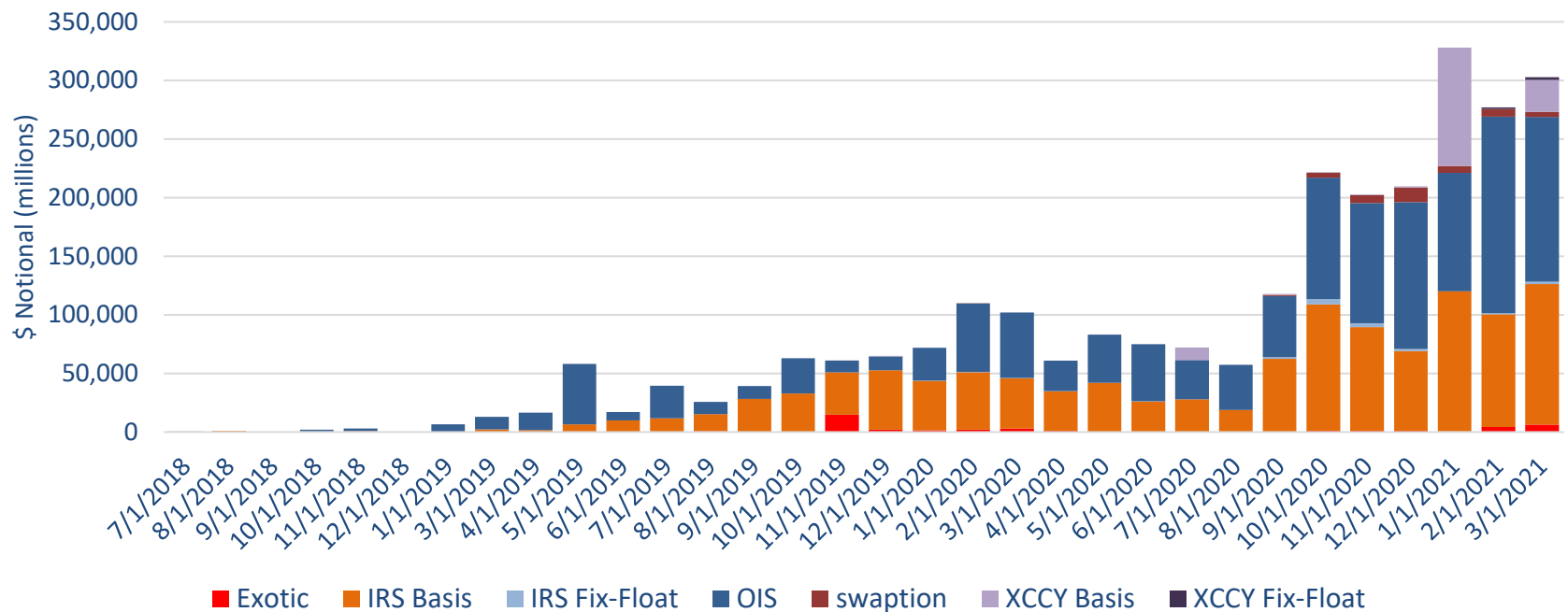
Since “Big Bang” non-GSEs have issued 63% of SOFR FRNs



SOFR Derivatives

- SOFR Derivatives doubled after the Big Bang CCP Discounting Switch in October 2020
- Bulk of notional are Overnight Indexed Swaps & Basis swaps
- Since Q4 2020, ~\$5B/month SOFR swaptions transactions

Monthly SOFR Derivatives Transacted



BANKING TRANSITION CONCERNS



General Banking Concerns with LIBOR Transition

- Is SOFR “the one alternative” index?
- What are the goals of Federal or State Legislation?
- Can Banks use a Secured Rate?
- Is an Overnight Rate operationally viable?

Disclaimer: the description of indexes included in this presentation is provided for informational purposes only. This presentation does not endorse any of the indexes described in this presentation nor represent any specific index as part of a transaction or financial strategy as suitable for any specific customer.

While market activity in SOFR-linked financial instruments has continued to develop, there can be no guarantee that SOFR will become widely accepted and used across market segments and financial products in a timely manner and any other alternative reference rate may or may not be developed.



General Banking Concerns with LIBOR Transition

- Is SOFR “the one alternative” index?
 - ARRC encourages *voluntary adoption* of SOFR as *preferred alternative* to USD LIBOR
 - SOFR is *defined* for ISDA fallback & *recommended* fallback for cash product
 - SOFR underlying repo transactions averaged \$1T daily in 2020-to date with no days <\$800B; no other market approaches this depth of activity
- What are the goals of Federal & State Legislation?
 - Minimize litigation, breach of contract arising from LIBOR cessation
 - Applies where contracts are silent or fall back to LIBOR-based rates
 - Permits updating contracts otherwise requiring unanimous consent
- Can Banks use a Secured Rate?
 - Viable alternatives? ICE data week of 3/16-20: only 2.5% 3m LIBOR submissions were transactional, 97.5% judgment or analysis-based
 - Ameribor spread to EFFR long term average 10-11bp, peak 12.4bp March
- Is an Overnight Rate operationally viable?
 - ARRC signaled a SOFR Term rate recommendation is not imminent
 - 30-, 90-, 180-day and cumulative average rates from FRBNY may be usable
 - Fannie and Freddie are indexing floating bonds and ARMs to SOFR Averages
 - Operational and technology issues may be eased by 2023 horizon



The Credit Term Indexes

Vendors Offer Transaction-driven, rules-based Indexes

	Ameribor Term-30	Bloomberg BSBY	ICE Bank Yield Index (BYI)
Description	The AMERIBOR® Term-30 index is calculated using only real-world transactions data, combining AMERIBOR® unsecured lending data from AFX's overnight and thirty-day markets alongside primary market wholesale, unsecured USD-denominated commercial paper and commercial deposit issuances from US-based financial institutions. (Sept 2020)	Bloomberg has developed the Bloomberg Short-Term Bank Yield Index (BSBY) that provides a series of credit-sensitive reference rates that incorporate systemic bank credit spreads and defines a forward term structure. BSBY aims to measure the average yields at which investors are willing to invest USD funds on a senior unsecured basis in a list of large international banks. (Dec 2020)	The U.S. Dollar ICE Bank Yield Index is designed to measure the average yields at which investors are willing to invest U.S. dollar funds over one-month, three-month and six-month periods on a wholesale, senior, unsecured basis in large, internationally active banks. (Jan 2019 - May 2020 updates)
Terms	30 Day 90-, 180- and 365-day TBD	O/N, 1M, 3M, 6M, 12M	1M, 3M, 6M
Data Sources	Overnight & 30-day interbank lending (AFX exchange) Commercial Paper & Commercial Deposits (DTCC)	Deposits, CDs , Yankee CDs, CP via Bloomberg's FX and money-market electronic trading solutions (BOOM, ECPX & FXGO) Bank 2ndary trades (FINRA)	Bank funding transactions from 14 of 16 LIBOR Panel Banks Bank 2ndary trades (FINRA)
Reference Trade Volume	\$25B minimum via 5-day rolling window	O/N (\$60B), 1M, 3M, 6M (\$10B) and 12M (\$9B) via 3-day rolling window, extendable to 5 days	\$15B via rolling 5-day average (hit 6 days in March 2020)
IOSCO Compliance	Adheres to the 19 principles of IOSCO Financial Benchmarks	Independently certified as IOSCO Compliant	Plan to seek assurance

Disclaimer: The information in this table does not represent or imply FHLBNY endorsement



TRANSITIONING YOUR INSTITUTION



Your Transition Checklist

- ✓ 1. Appoint a **Senior Executive** to oversee & coordinate Transition Program
- ✓ 2. Mobilize an enterprise-wide **Transition Management Program**: Build an implementation Roadmap, request resources and establish budgets
- ✓ 3. Implement a **Communication Strategy**: Customers, Regulators, Vendors & other external and internal stakeholders, facilitate education and training
- ✓ 4. **Exposure Management**: product and asset/liability exposure by asset class, tenor and maturity, evaluate alternative reference rates for new transactions, seek offsets for legacy instruments, data needs for valuation models
- ✓ 5. Assess **Contractual Remediation** Impact: Assess Fallback Provisions, improve language for new transactions, consider negotiating legacy transactions
- ✓ 6. **Product and Portfolio Strategy**: initiate new SOFR product development, SOFR index for funding, investments and hedging instruments
- ✓ 7. **Risk Management**: identify, measure, monitor, control transition risks, financial exposures
- ✓ 8. **Operational and Technology Readiness**: review Pricing, Accounting, Risk Systems and Data for onboarding alternative rate and fallback processing
- ✓ 9. **Accounting and Reporting**: changes to hedge accounting, fair value, benchmarks
- ✓ 10. **Taxation and Regulation**: evaluate tax implication of fallback

Patterned after ARRC Buy-Side Checklist 1/31/2020

https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2020/ARRC_Buy_Side_Checklist.pdf



Organizing the Transition Initiatives

Category	Objectives	Transactions & Contracts	Systems & Operational
Legacy LIBOR	Incorporate Fallbacks into LIBOR Transactions	<ul style="list-style-type: none"> • Inventory Transactions & documentation • Negotiate and document amendments • Follow developments in legislation 	<ul style="list-style-type: none"> • Model post-fallback LIBOR transactions & conversion processes • Develop requirements for systems vendors
	Manage existing LIBOR Exposures	<ul style="list-style-type: none"> • Monitor exposures • Liquidate or unwind; modify or amend; or hedge unwanted LIBOR exposures 	<ul style="list-style-type: none"> • Inventory LIBOR systems and processes • Report Consolidated cash & derivatives positions
Successor SOFR	Establish SOFR for floating rate funding, assets & hedging	Verify availability and depth of markets and products to meet ALM objectives	<ul style="list-style-type: none"> • Establish SOFR market data sources • Incorporate daily-reset, in-arrears data sources, valuation & accrual
Process Migration	Establish SOFR rate framework for pricing, relative value and accounting		<ul style="list-style-type: none"> • Incorporate SOFR Swap curves and market data sources into systems • Evaluate Fair value, Risk, Reporting effects • Determine migration timing



Regulatory and Standards Work offer Relief, motivate Disclosure and Action

“Regulators and self-regulatory organizations ... need to work cooperatively with market participants to ensure that there are no inadvertent hurdles that could inappropriately impede the development of SOFR markets” – ARRC, March 2018

Category	Body	Update
Taxation	Treasury/IRS Oct 8, 2019	Proposed regulations to avoid adverse tax and related (REMIC) consequences of changing terms of debt, derivatives, contract to accommodate LIBOR transition
Markets	CFTC Dec 18, 2019	No-action letter permits modification of uncleared legacy swaps without subjecting them to swap-clearing requirements
	FHFA Sept 27, 2019 Feb 5, 2020	<i>FHLBanks</i> : restriction of new LIBOR investments, derivatives and other transactions <i>Enterprises</i> : no LIBOR ARMs after 2020
Financial Reporting	SEC June 18, 2020	Office of Compliance Inspections and Examinations LIBOR Transition Preparedness to review entity’s LIBOR transition plans and disclosures
	FASB Mar 12, 2020	Accounting Standards Update 2020-04 (Topic 848) to provide relief from effects of modifying contracts for replacement indexes
Planning	Fed Board Nov 30, 2020 Mar 9, 2021	SR20-27 ...cease entering into new contracts that use USD LIBOR as a reference rate as soon as practicable and in any event by December 31, 2021, SR21-7 ...demonstrate progress towards moving away from referencing LIBOR in new products, includes guidance for <\$100B assets and >\$100B assets

Sources: *respective websites*



FHLBNY SOFR Products

FHLBNY Product	Description
SOFR ARC	<p>Terms: 3 months minimum Payment: Quarterly Accrual: Daily-reset in arrears, simple averaging, 1-day lookback, 1-day lockout, ACT/360 Business Day: Following and Modified Following</p>
Compounding SOFR ARC	<p>Terms: 3 months minimum Payment: Quarterly Accrual: Daily-reset in arrears, compounded, 2-day observation shift, ACT/360 Business Day: Following and Modified Following Min Size: \$5 million</p>
SOFR Callable ARC	<p>The Callable Adjustable Rate Credit (Callable ARC) Advance offers two distinct option structures that give members the flexibility to meet the demands of a fluctuating balance sheet. Members can use the call feature to strategically extinguish (and potentially rebook) the advance when the remaining term reaches either a 1-month-left-to-maturity or 1-year-left-to-maturity window, affording greater control in managing liquidity needs with no additional prepayment fees.</p> <p>Terms: 7mNC6m – 3yNC2y11m (1m Euro call prior maturity), 3yNC2y (1y Euro call prior to maturity)</p> <p><i>Please note: Due to limited amounts available at this time, funds will be distributed on a first-come, first-served basis.</i></p>
SOFR Member Swaps	<p>For institutions transacting derivatives with the FHLBNY, we offer SOFR-indexed swaps, subject to market pricing and availability</p>

For additional information please contact a Relationship Manager at (212) 441-6700 or a Member Services Desk Representative at 1-800-546-5101, option 1.

Education and Resources to Keep Apprised of Transition Developments

- Federal Reserve Bank of New York
daily SOFR, TGCR, BGCR rates and volumes, historical data from 4/2/2018
<https://apps.newyorkfed.org/markets/autorates/sofr>
SOFR 30-, 90-, 180-day averages and (cumulative) Index
<https://apps.newyorkfed.org/markets/autorates/sofr-avg-ind>
- ARRC Alternative Reference Rates Committee
News, Presentations, Consultations, Meeting Minutes since 2014 <https://www.newyorkfed.org/arrc>
- ISDA International Swap and Derivatives Association
Evolving derivatives fallbacks, supplements, consultations, protocols <https://www.isda.org>
- CME Group: SOFR futures and cleared SOFR swaps exchange
SOFR page features trade data, news, and a running summary of SOFR issuance
<https://www.cmegroup.com/trading/interest-rates/secured-overnight-financing-rate-futures.html>
- ICE Intercontinental Exchange: LIBOR's administrator <https://www.theice.com/liba/libor>
- FASB Financial Accounting Standards Board
LIBOR and SOFR Hedge Accounting and Transition <http://fasb.org/referencereform>
- FHLBNY.com LIBOR transition articles, podcasts, product updates
<https://www.fhlbny.com/financial-intelligence/>
- Whitepapers from Consulting Firms
- Networking through industry & professional groups (ABA, MBA, CFA, GARP)
- LinkedIn (search #SOFR) <https://www.linkedin.com/in/reishinozuka>



APPENDICES



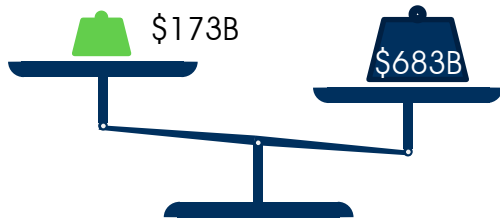
APPENDIX A: SOFR AS THE USD LIBOR REPLACEMENT



How did the Financial System Get Here?

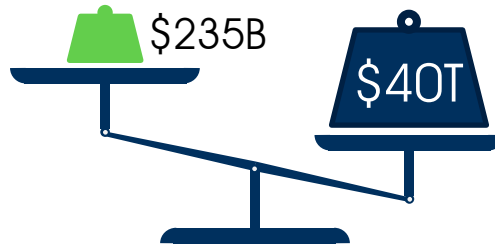
The Growing LIBOR Cash vs Derivatives Imbalance

1987



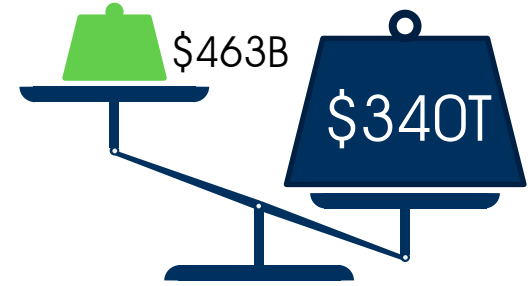
4X

1998



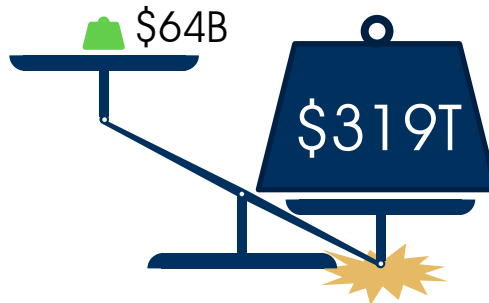
170X

2007



740X

2017



LIBOR was created in the 1970s for the syndicated loan market as a representative reference measure of banks' cost of funding.

Over the decades, LIBOR has become increasingly decoupled from this function-- particularly since the 2008 Crisis -- while indexing an ever-growing amount of derivatives

LEGEND



InterBank Lending
Outstanding Balance
(source: Federal Reserve Statistical Release Assets and Liabilities of Commercial Banks in the United States H.8)

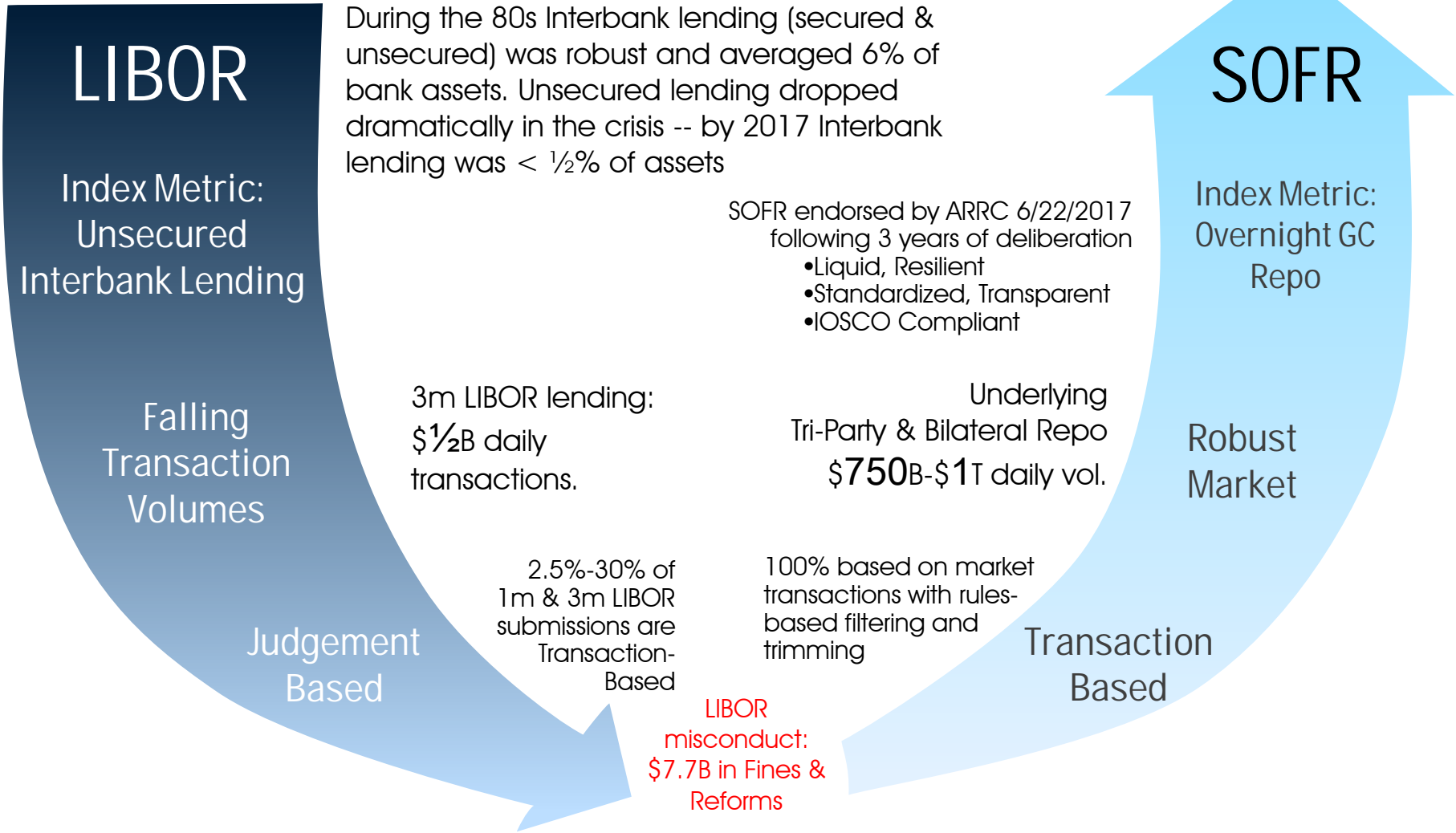


Interest Rate Swaps,
Notional Outstanding
(source: ISDA, IMF)

Interest Rate Swaps Notional = 5,000X Interbank Lending Balances



Why did LIBOR fall from grace? How did this give rise to SOFR?



CONCLUSION: LIBOR Panel Banks have little motivation to participate beyond 2021



Sources: FRBNY *Introducing SOFR* 11/2/2017, ICE *ICE LIBOR Evolution* 4/25/2018, Federal Reserve H.8 reports, Reuters, NY Times, Financial Times

SOFR: The Endorsed USD LIBOR Successor

- In 2013 the **Financial Stability Board (FSB)** and the **Financial Stability Oversight Council (FSOC)** recommended global regulators cooperate with international bodies and market participants to “promptly identify alternatives” to LIBOR. In 2014 the **Federal Reserve** created the **Alternative Replacement Rates Committee (ARRC)** of which FHLBNY has been a member since 2016
- **Secured Overnight Financing Rate (SOFR)** endorsed by ARRC in June 2017, begins daily publication by FRBNY in April 2018
- UK’s **Financial Conduct Authority (FCA)** will not compel LIBOR Panel Banks to submit LIBOR **past 2021** (revised to mid 2023 for USD LIBOR in March 2021)
- As of April 2021, over \$1.3T of SOFR FRNs have been issued, with Futures and Swaps markets trading SOFR derivatives
- The GSEs including FHLBNY as key SOFR Issuers and Stakeholders shaped the early SOFR market (2018-2020)
- How big is the potential Market? In 2017 LIBOR indexed \$8T Loans, \$1.25T Bonds, \$2.5T Securitized Product and hundreds of \$T of derivative transactions (source: Citi Research)

Sources: <https://www.newyorkfed.org/medialibrary/microsites/arrc/files/2016/arrc-interim-report-and-consultation.pdf>
<https://www.newyorkfed.org/medialibrary/microsites/arrc/files/2016/arrc-interim-report-and-consultation.pdf>



SOFR is not a rebranded LIBOR

Many differences are Integral to the Design Objectives of the Index

	LIBOR	SOFR
Index Methodology	Average of 16 Panel Bank survey submissions with outliers filtered	Average of Tri-Party and Bilateral Repo transactions of Government Securities
Transaction-Based	<30% Transaction-based	100% Transaction-based
Reference Volume	<\$500M daily	>\$1T daily (2020)
Administrator	Intercontinental Exchange	Federal Reserve Bank of New York
Tenors	7 Tenors: Overnight, Week, 1,2,3,6,12 Months	Overnight (Forward-looking Term SOFR <i>may appear in 2021</i>)
Credit Spread	Implied Bank Credit	None (Risk-Free)
Typical Coupon Set	In advance	In arrears



Sources: *Intercontinental Exchange, Federal Reserve*

FHLBNY and FHLBank System are committed to SOFR

- FHFA-supervised GSEs have issued > 70% of SOFR FRNs to date
- FHLBank System is #1 issuer of SOFR FRNs to date
- FHLBNY has been an ARRC Member since March 2018 and member of the ARRC Advisory Group since November 2016
- *"We have about 7,000 financial institutions that are members, and all of those institutions have to develop a LIBOR transition plan. We need to be there and help develop the market for our members."*
John Fisk, CEO FHLB Finance Office, November 13, 2018
- *"[The inaugural issue of FHLB SOFR-indexed FRNs] is a significant step, both for the FHLBank System and the market: as the leading issuer of LIBOR-linked securities, the Federal Home Loan Banks have a unique role and responsibility in both the development of the SOFR market and the transition away from LIBOR."* FHLBNY President's Report, December 3, 2018



APPENDIX B: UNDERSTANDING SOFR INSTRUMENT TERMS AND CONDITIONS



It All Starts Here: NYFRB SOFR Data

Published Daily at 8:00am EST, referencing the Prior Day's Repo Activity

Secured Overnight Financing Rate

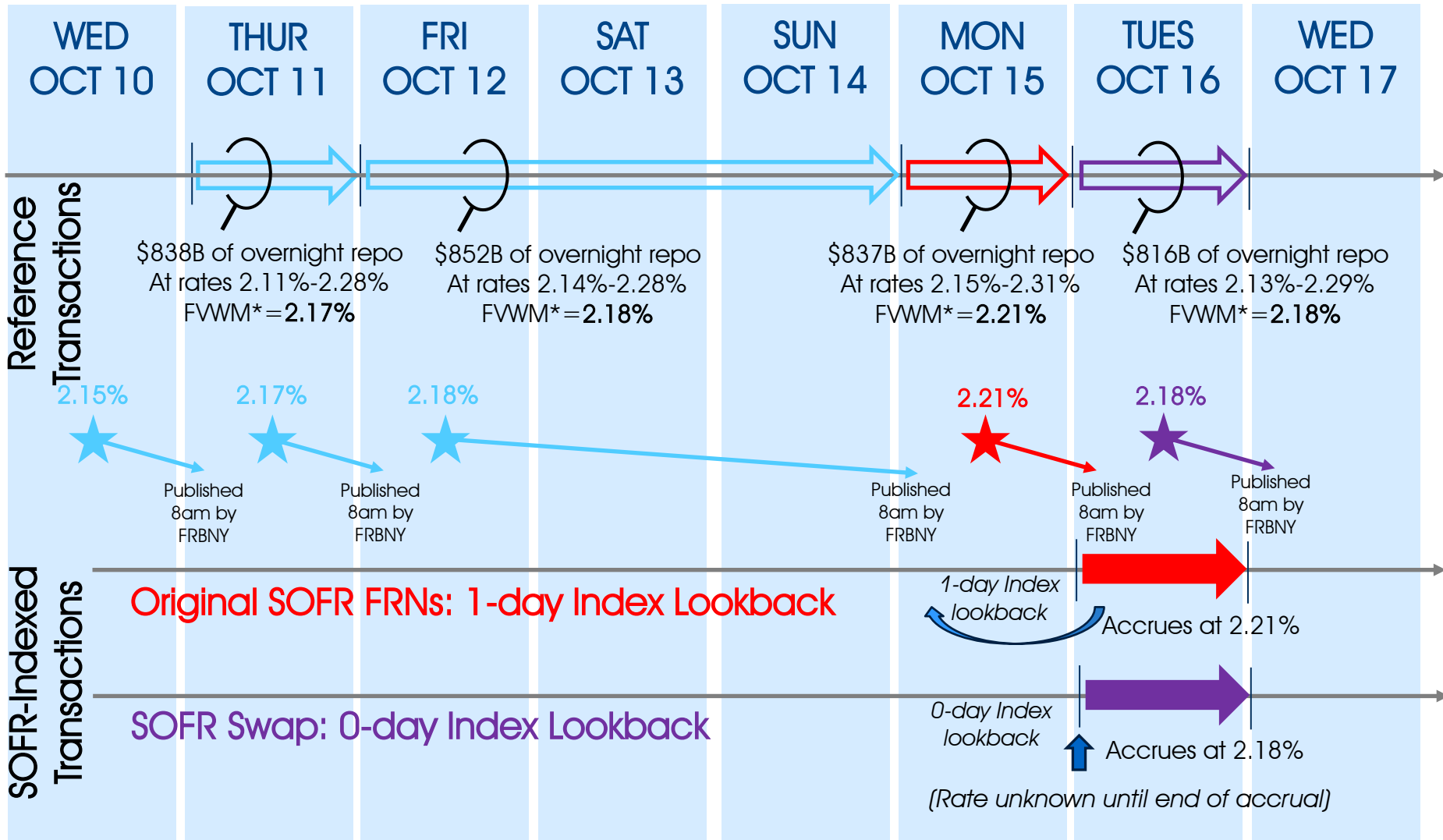
<https://apps.newyorkfed.org/markets/autorates/sofr>

DATE	RATE (PERCENT)	PERCENTILES				VOLUME (US\$BILLIONS)
		1ST (PERCENT)	25TH (PERCENT)	75TH (PERCENT)	99TH (PERCENT)	
2018-11-06	2.22	2.10	2.22	2.28	2.34	802
2018-11-05	2.24	2.15	2.23	2.30	2.36	842
2018-11-02	2.25	2.20	2.24	2.32	2.38	853
2018-11-01	2.22	2.16	2.20	2.29	2.45	835
2018-10-31	2.22	2.15	2.19	2.28	2.35	849
2018-10-30	2.18	2.14	2.17	2.24	2.29	788
2018-10-29	2.18	2.12	2.17	2.24	2.30	806
2018-10-26	2.19	2.14	2.17	2.25	2.30	779
2018-10-25	2.19	2.14	2.17	2.25	2.30	822
2018-10-24	2.18	2.12	2.16	2.24	2.29	828
2018-10-23	2.17	2.13	2.15	2.23	2.28	779
2018-10-22	2.18	2.13	2.17	2.24	2.29	791
2018-10-19	2.19	2.15	2.17	2.25	2.30	785
2018-10-18	2.19	2.15	2.18	2.26	2.30	810
2018-10-17	2.18	2.14	2.17	2.25	2.29	771
2018-10-16	2.18	2.13	2.17	2.25	2.29	816
2018-10-15	2.21	2.15	2.19	2.27	2.31	837
2018-10-12	2.18	2.14	2.16	2.25	2.28	852
2018-10-11	2.17	2.11	2.16	2.24	2.28	838
2018-10-10	2.15	2.11	2.14	2.22	2.27	839
2018-10-09	2.15	2.10	2.13	2.21	2.27	855
2018-10-05	2.16	2.12	2.14	2.22	2.27	873
2018-10-04	2.18	2.14	2.17	2.24	2.28	816
2018-10-03	2.20	2.14	2.18	2.26	2.30	855
2018-10-02	2.20	2.15	2.19	2.27	2.30	861



SOFR Daily Accrual – the Reference Rate

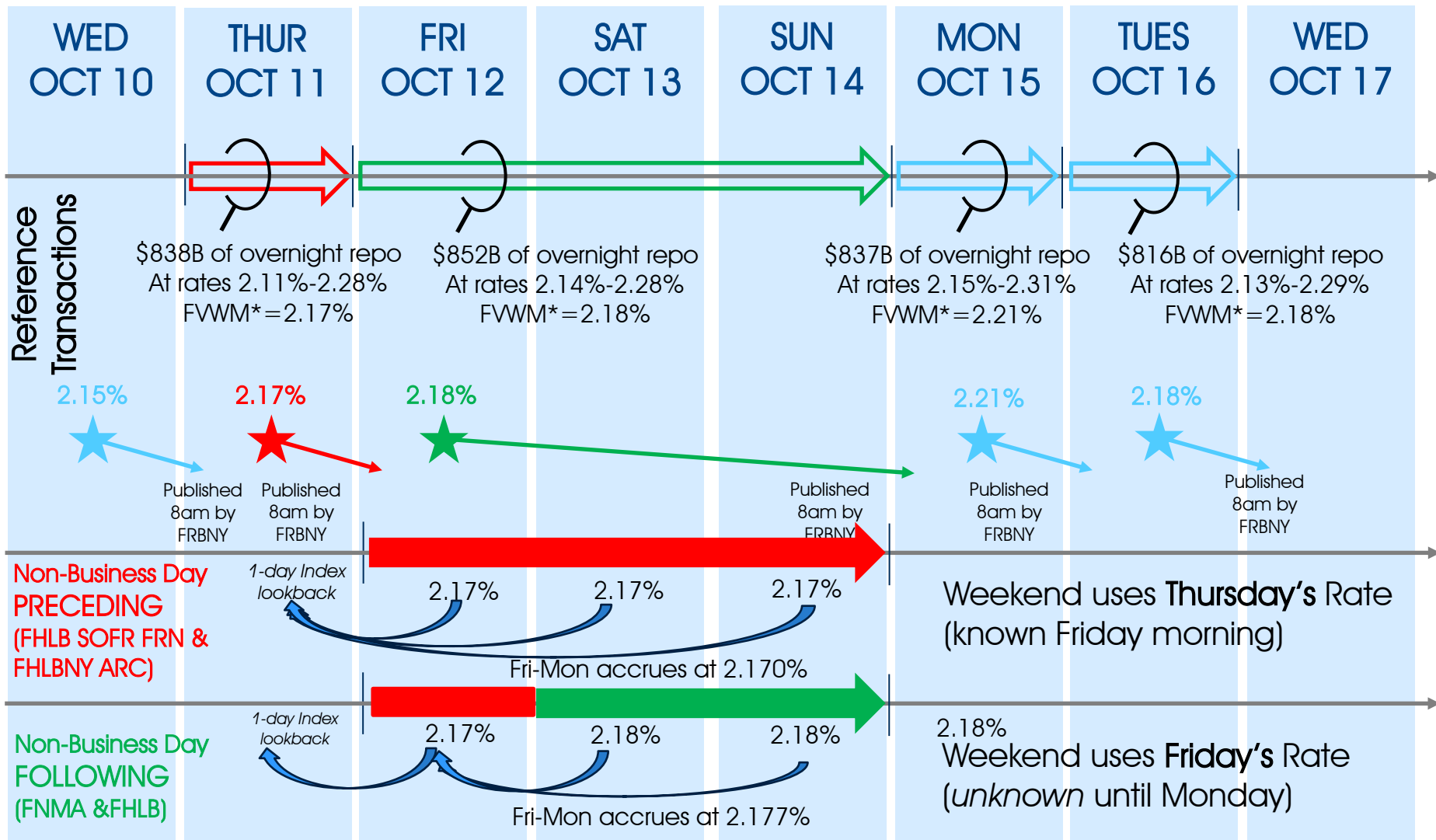
Reference Transactions and Indexed Cash and Derivatives Transactions



* FVWM = Filtered Volume Weighted Median, as per FRBNY SOFR documentation

SOFR Daily Accrual – Non-Business Days

Non-Business Day Fixings with Lookback: Following/Preceding Conventions

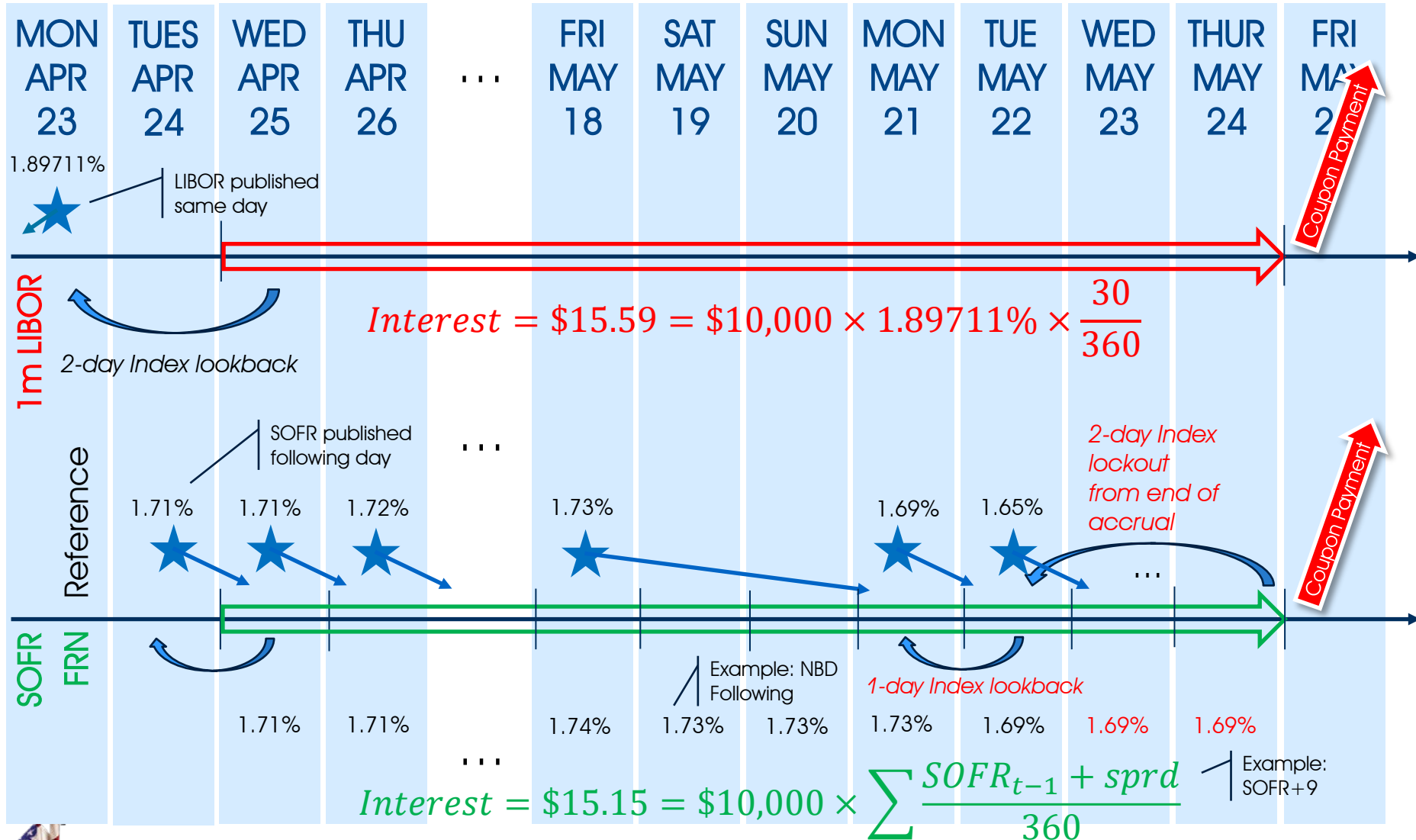


* FVWM = Filtered Volume Weighted Median, as per FRBNY SOFR documentation



SOFR Coupon Accrual (Averaging)

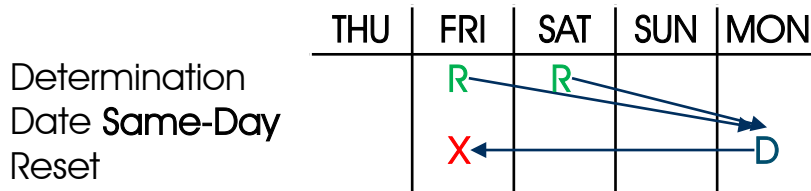
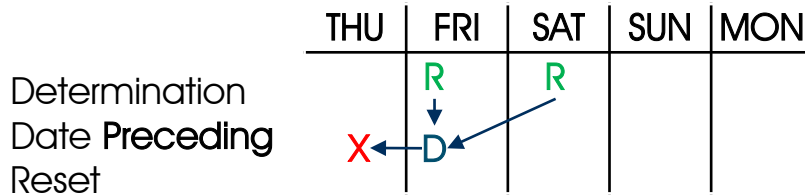
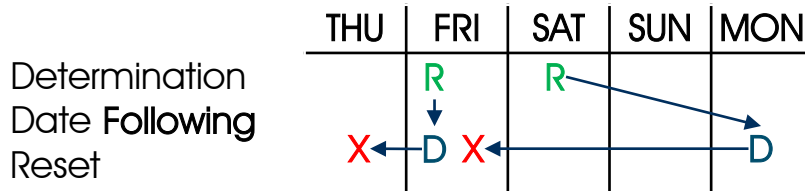
Example: 1 mL vs monthly-pay SOFR with 1-day Lookback, 2-day Lockout



Diversity in Fixing and Nomenclature

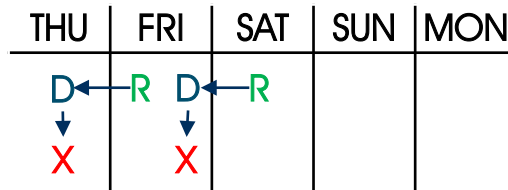
FHLBank, Fannie and Freddie Fixing Conventions, Saturday Example

FNMA Fed Funds Daily



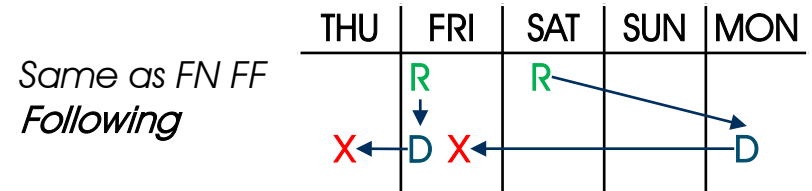
FNMA SOFR

Performs as FN FF Following

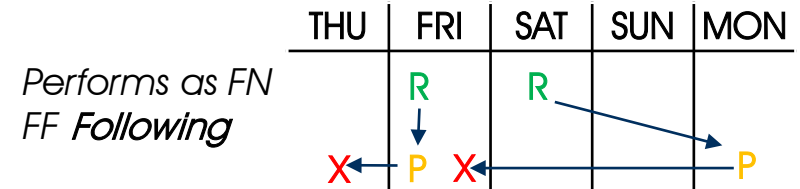


- R – reset date
- D – determination date
- P – published date (by inference)
- X – reference transaction (FF or Repo) execution date

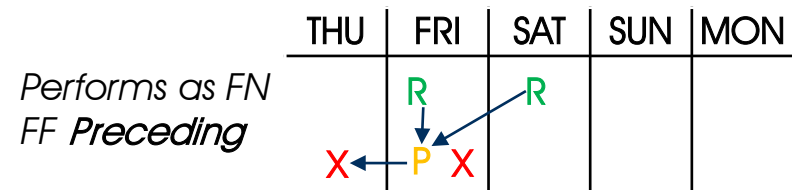
FHLMC Fed Funds Daily



FHLMC & FHLB SOFR (pre 5/2019)

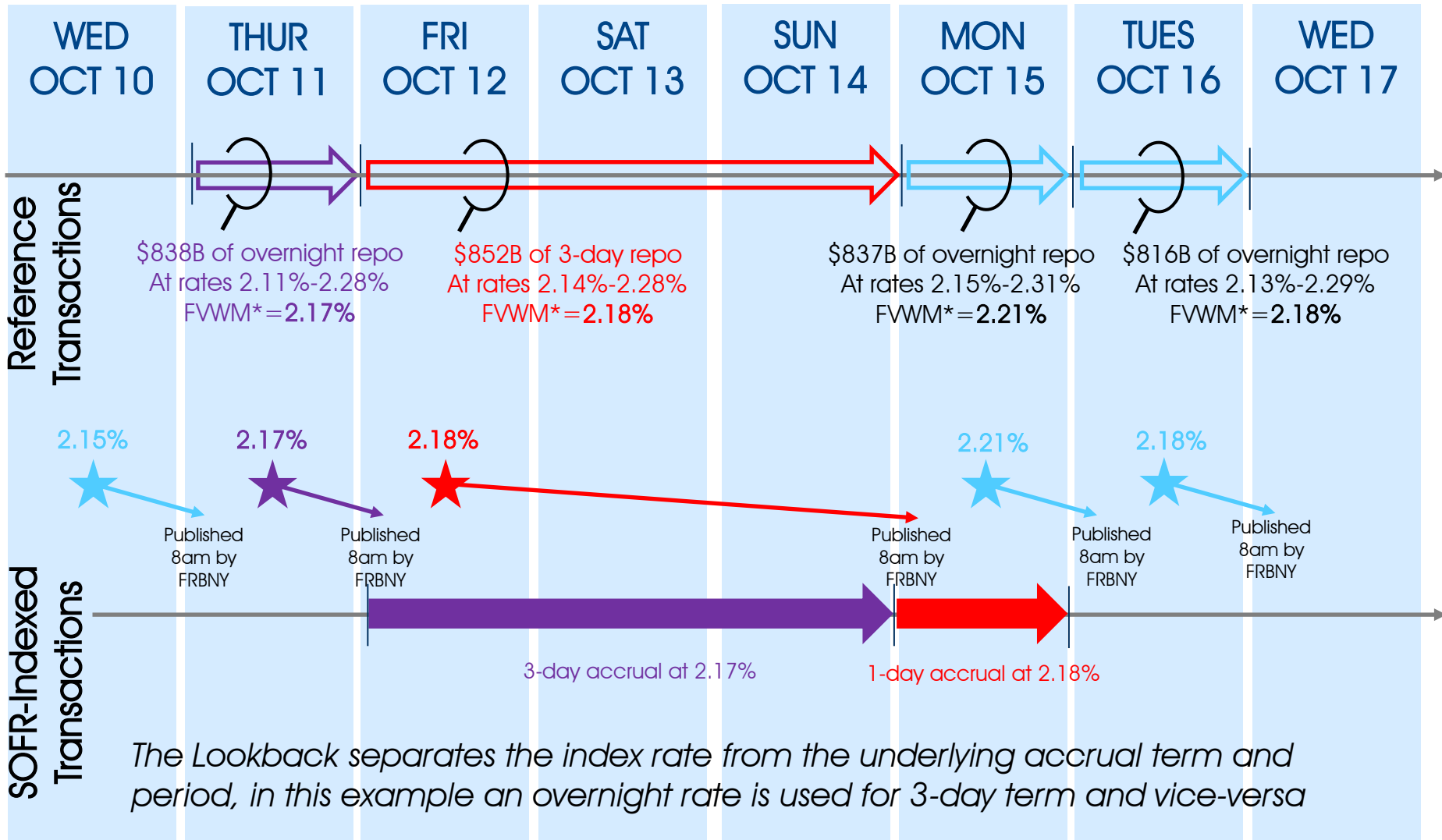


FHLB SOFR (5/2019 and after)



The Problem with Lookbacks

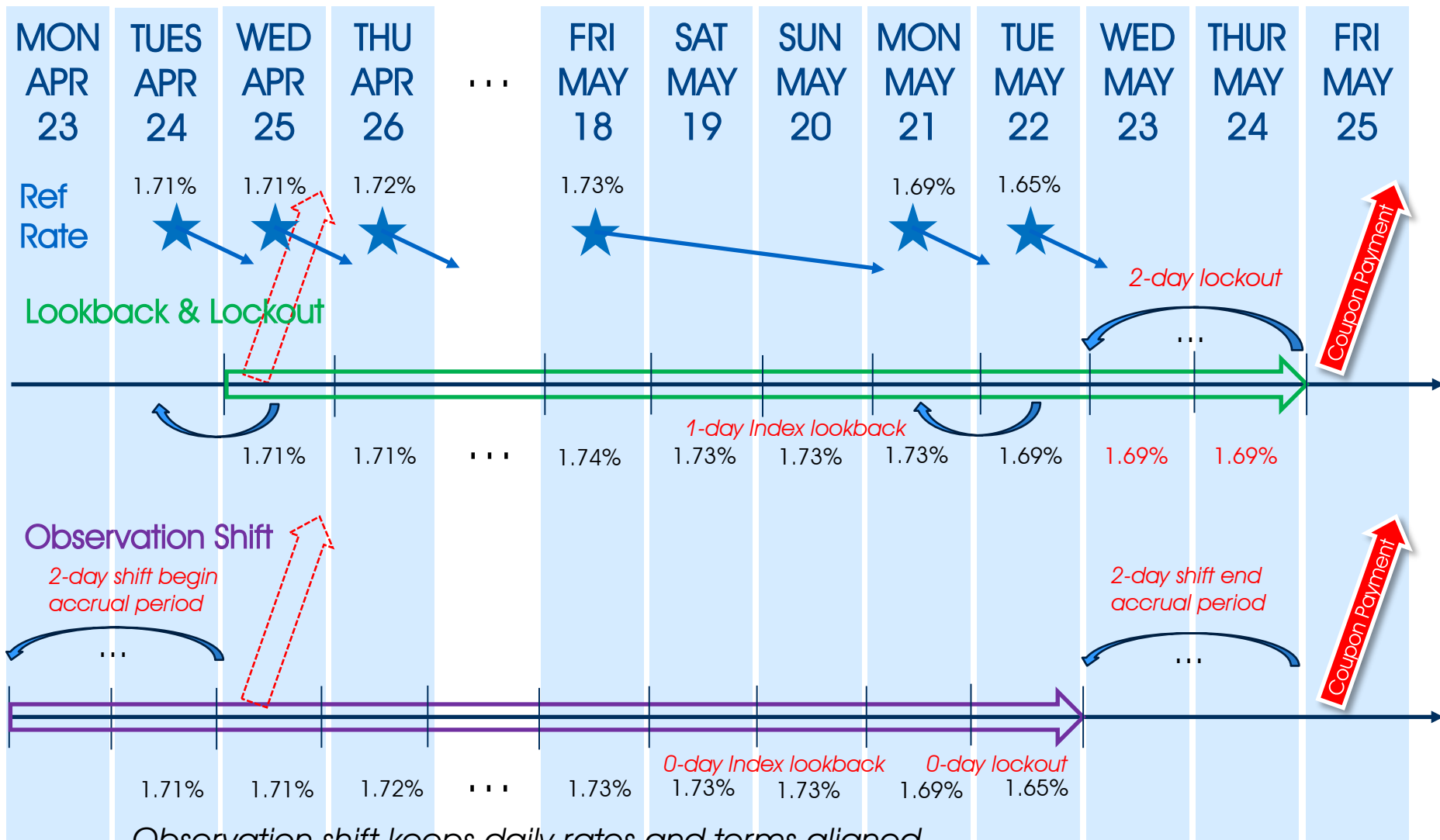
Reference Transactions and Indexed Cash and Derivatives Transactions



* FVWM = Filtered Volume Weighted Median, as per FRBNY SOFR documentation

Observation Shift addresses Lookback Problems

Example: SOFR with 1-day Lookback, 2-day Lockout vs 2-day Observation Shift



Observation shift keeps daily rates and terms aligned



SOFR Instrument Terms and Conditions

Converging toward Market Conventions

Terms & Conditions	SOFR Conventions
Index Lookback	<ul style="list-style-type: none"> • Same-day (derivatives and observation shift) • 1-day lookback (most cash)
Observation Shift	<ul style="list-style-type: none"> • None (most legacy SOFR) • 2-day shift (ISDA fallback standard)
Lockout / Cut-Off at end of accrual period	<ul style="list-style-type: none"> • 1 or 2-day (common for FRNs) • 4-day (was common for FRNs) • 0-day with 2-day payment delay (derivatives and obs. shift)
Non-Business Day accrual fixing	<ul style="list-style-type: none"> • Preceding (e.g. SAT uses THUR ref rate) • Following (.e.g. SAT uses FRI ref rate, deriv. and obs. shift)
Averaging Method	<ul style="list-style-type: none"> • Simple Arithmetic Average (most existing FRNs, 1m Futures) • Geometric Compound Average (swaps, 3m Futures)
Flooring	<ul style="list-style-type: none"> • Floored – FRNs floor coupon, or daily SOFR+spread • Derivatives - unfloored
Index Fixing	<ul style="list-style-type: none"> • In Arrears (common) • In Advance (Ginnie, Agency SOFR ARMS & MBS)
Index Tenor	<ul style="list-style-type: none"> • SOFR Overnight Only • (Forward) Term SOFR (proposed)



APPENDIX C: LIBOR FALLBACK



Treating Legacy LIBOR: Fallback and Value Transfer

LIBOR Transition Risk is ultimately the uncertainty regarding the treatment of LIBOR fixings beyond 2021 and resulting economic risk

- **Fallback:** How does a party calculate a LIBOR-indexed coupon after permanent cessation of LIBOR? Older documentation contemplated temporary unavailability of the rate while more recent language recognizes permanent cessation. Common options are:
 - Substitution by Trustee or Calculation Agent of alternative Index (cash)
 - Polling or request for quotes from NY and London Bank (legacy cash)
 - As last resort, Index fixing at final published LIBOR (legacy cash)
 - Substitution by Contract or Protocol to successor Index (derivatives)
- **Spread Adjustments** are intended to alleviate economic differences between indexes
- **Trigger:** How can all parties agree on a permanent cessation event?
- **Value Transfer:** any change to the index will inevitably result in a one-time transfer of value from one counterparty to the other; contract fallback language seeks to minimize value transfer
- **Fallback Consultations:** Groups such as ARRC and ISDA engage industry participants to create robust fallback language. In October 2020, **ISDA** published fallback amendments to the 2006 ISDA Definitions as SOFR compounded with 2-day observation shift plus spread adjustment of 11.448bp (1mL) and 26.161bp (3mL)

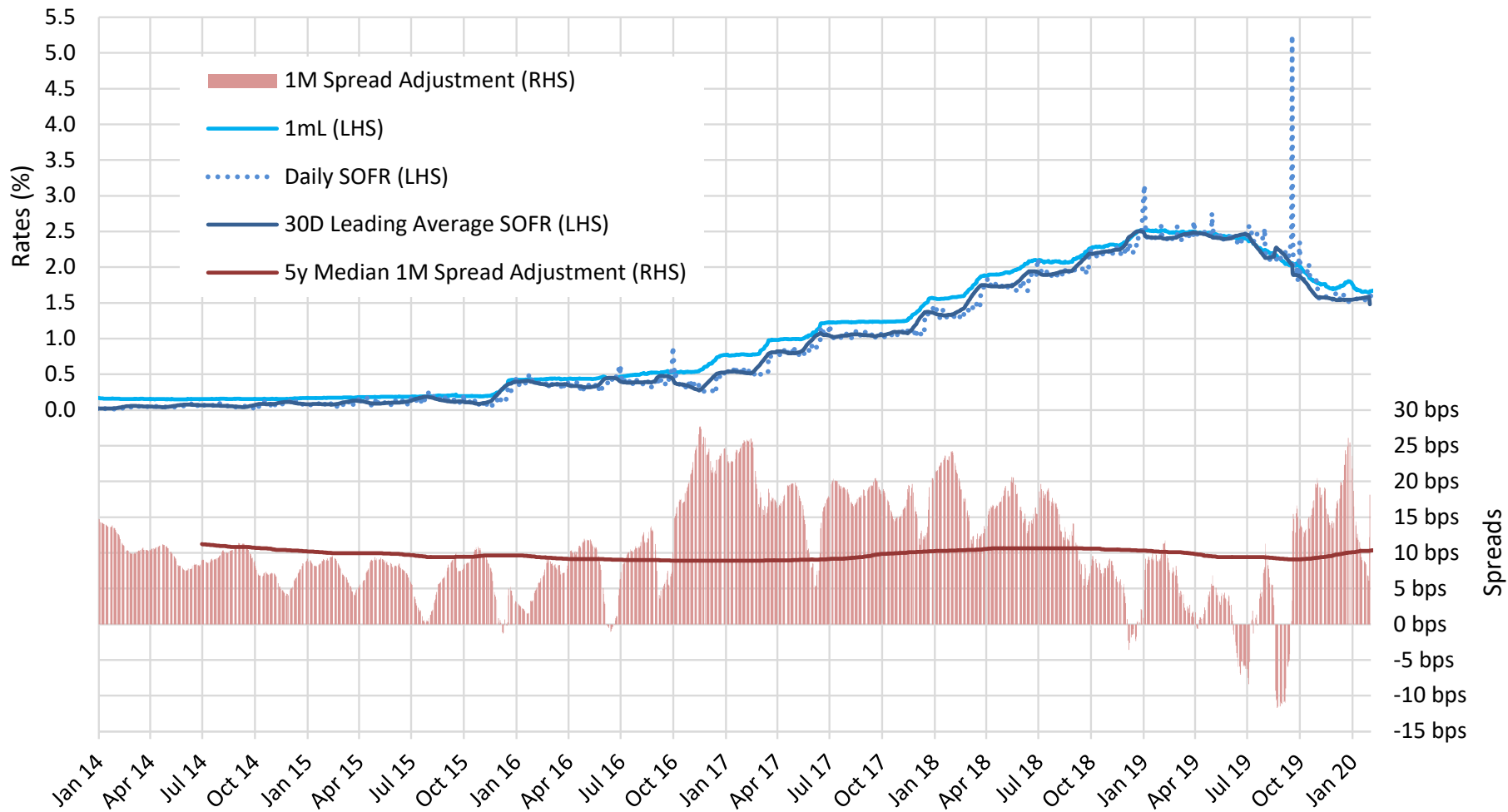
Sources: ARRC Guiding Principles for Fallback July 2018, ISDA IBOR Fallbacks for 2006 ISDA Definitions – FAQs 9/17/2018



Example ISDA Spread Adjustment

Spread Adjustments finalized: 1mL = 11.448bp, 3m = 26.161bp

1m LIBOR SOFR Spread Adjustment





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