

The LIBOR Transition

Update and Strategies

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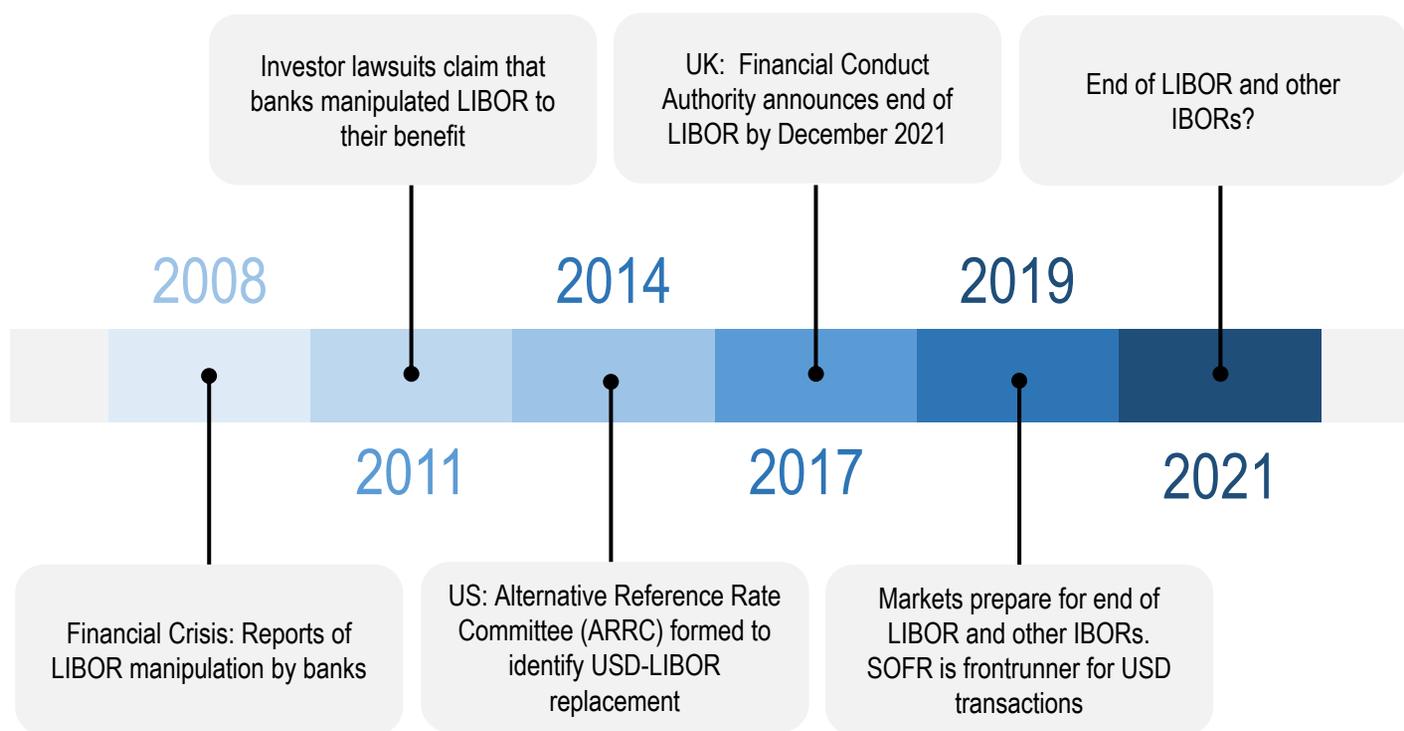
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LIBOR Transition Update

Timeline of Events

Market participants, including tax-exempt issuers, are faced with the prospect of the discontinuation of LIBOR sometime in 2021. This will affect a \$350 trillion market of securities and derivatives that reference LIBOR.

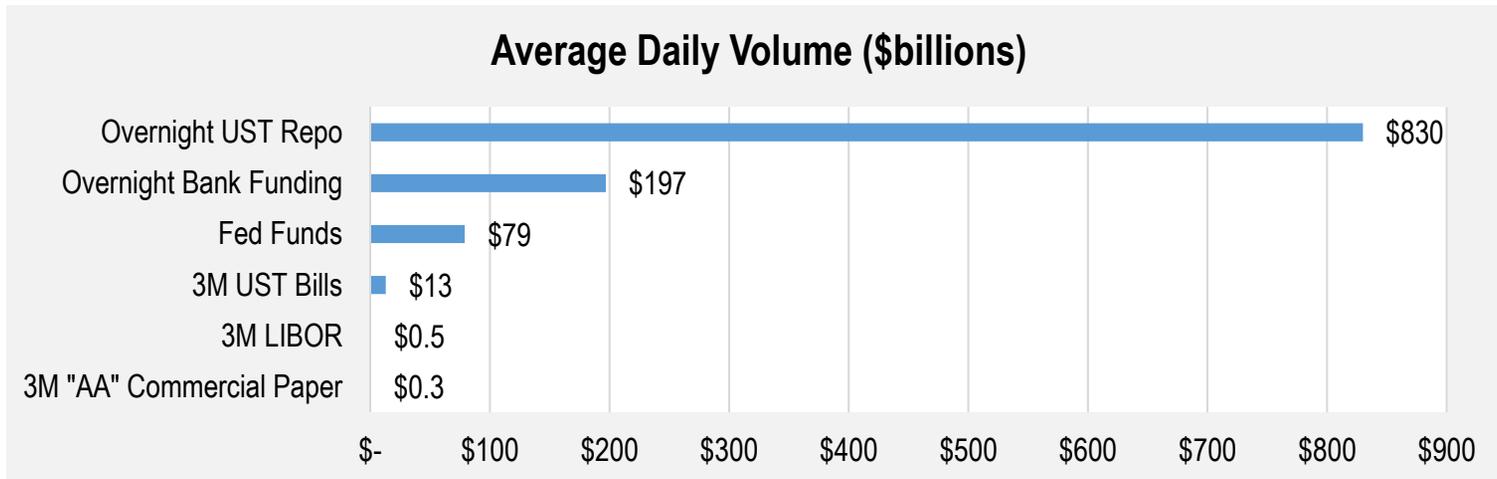


The London Interbank Offered Rate (LIBOR) is a benchmark interest rate at which major global banks lend to one another in the international interbank market for short-term loans. The Federal Reserve assembled the Alternative Reference Rate Committee (ARRC), comprising several large banks, to select the alternative reference rate for the United States. (www.investopedia.com)

Secured Overnight Financing Rate (SOFR)

For US-dollar transactions, SOFR became the frontrunner replacement index after it was announced as the preferred solution by the ARRC

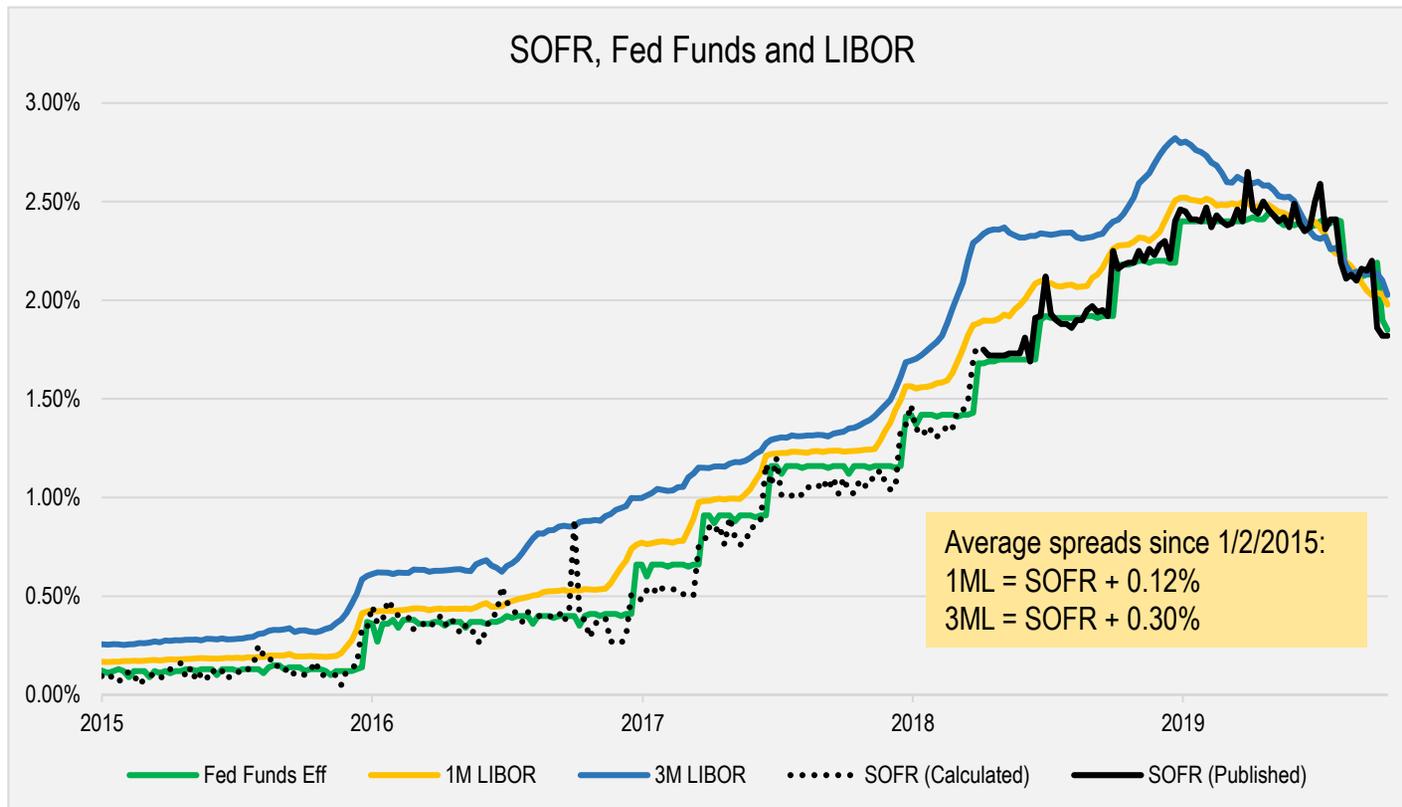
- ARRC was challenged to find a replacement that addressed LIBOR weaknesses
- **Reliable and Observable:** LIBOR based on banks' expectation of unsecured borrowing costs; SOFR is based on actual UST repo (secured) transactions
- **Daily Transaction Volumes:** LIBOR trades approximately \$500 billion daily; SOFR repo volume \$1.124 trillion on October 10, 2019
- LIBOR maturity ranges from 1 day to 1 year; SOFR is overnight only



Source: Bloomberg, Federal Reserve Bank of New York; data from 4/2/2018 through 10/10/2019

SOFR versus LIBOR

SOFR is calculated using overnight UST repo data. It tracks closely with the effective Fed Funds rate, and reasonably well with LIBOR. SOFR trades below LIBOR because it is an overnight rate and represents collateralized transactions



Source: Bloomberg, Federal Reserve Bank of New York, 1/2/2015 through 10/11/2019

Economic Considerations

There is the risk that the application of SOFR may not be economically neutral for existing transactions. That is, a universal “spread adjustment” may not represent the true relationship between LIBOR and SOFR on a prospective basis.



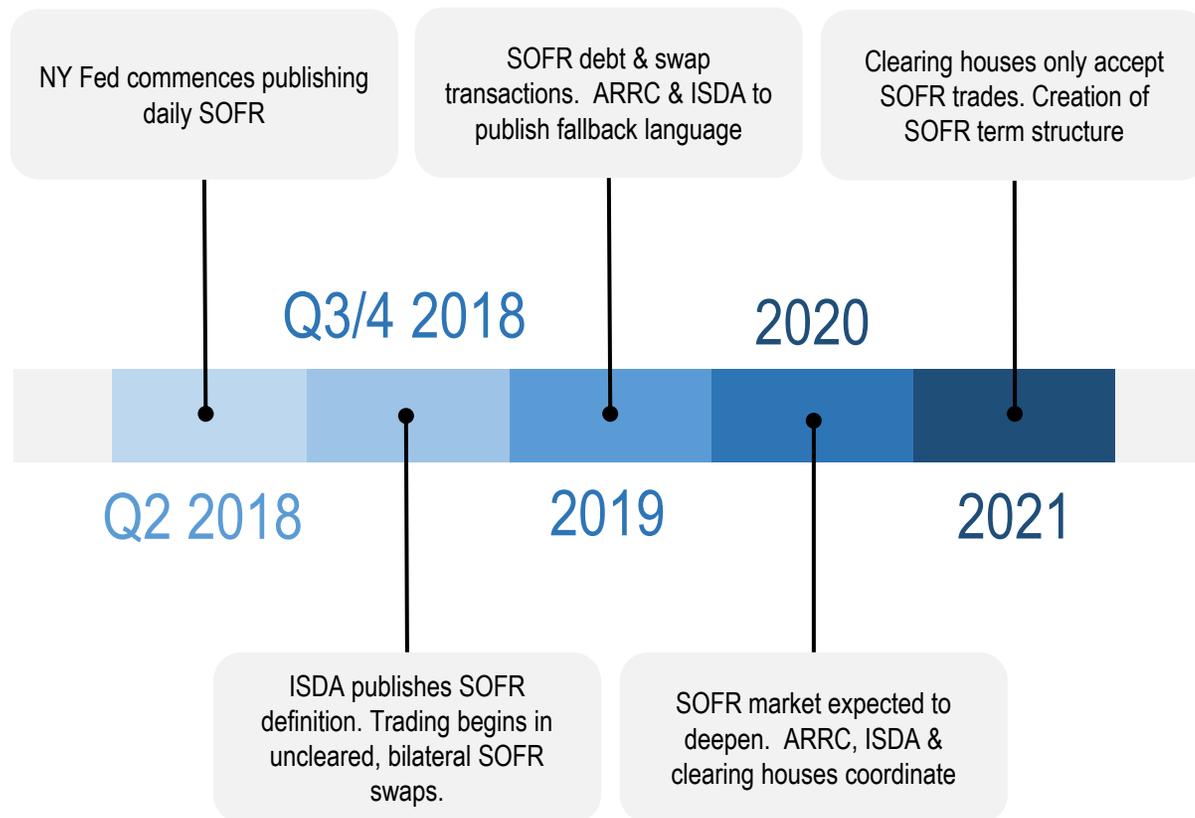
Three Potential Approaches

- 1. Forward Approach** – The spread adjustment is calculated based on observed market prices for the forward spread between LIBOR and SOFR in the relevant tenor at the time the fallback is triggered
 - Pros – Represents market expectation; present value neutral
 - Cons – Requires extensive market data models and specialists; vulnerable to manipulation and distortion
- 2. Historical Mean/Median Approach** – The spread adjustment is based on the mean or median spot spread between LIBOR and SOFR calculated over a significant, static lookback period (e.g., 5 years, 10 years) prior to the relevant announcement or publication triggering the fallback provisions
 - Pros – Based on historical information; readily available data; captures tendency towards historical mean (regression)
 - Cons – Unlikely that this approach will be present value neutral (winners and losers)
- 3. Spot-Spread Approach** – The spread adjustment could be based on the spot spread between LIBOR and SOFR on the day preceding the relevant announcement or publication triggering the fallback provisions
 - Pros – Simple to understand and easy to implement
 - Cons – Unlikely that this approach will be present value neutral (winners and losers)

Based on recent guidance, Historical Mean / Median Approach appears likely to become the chosen method

Transition to SOFR

An important milestone to the transition to SOFR began in April 2018 when the Fed began publishing daily rates. According to the ARRC, their “paced transition plan” for SOFR is ahead of schedule



Source: NY Federal Reserve, ARRC Paced Transition Plan (<https://www.newyorkfed.org/arrc/sofr-transition>)

The International Swaps and Derivatives Association (ISDA) is a trade organization created by the private negotiated derivatives market that represents participating parties. (www.investopedia.com)

Select Recent SOFR-Linked Transactions

Corporate CUSIP SOFR-Linked Transactions								
Issuer	Pricing Date	Size	Maturity	Tenor (Years)	Spread @ Issuance	% of SOFR	Tax Status	CUSIP Type
Federal Home Loan Mortgage Corp	09/11/19	\$502,500,000	06/17/20	0.8	+3 bps	100%	Taxable	Corporate
Goldman Sachs Bank USA/New York NY	09/11/19	\$100,000,000	09/14/20	1.0	+30 bps	100%	Taxable	Corporate
Inter-American Development Bank	09/09/19	\$600,000,000	09/16/22	3.0	+26 bps	100%	Taxable	Corporate
Federal Agricultural Mortgage Corp	09/09/19	\$25,000,000	04/01/21	1.6	+10 bps	100%	Taxable	Corporate
Sumitomo Mitsui Trust Bank Limited/ New York	09/09/19	\$180,000,000	03/11/20	0.5	+21 bps	100%	Taxable	Corporate
Goldman Sachs Bank USA/New York NY	09/06/19	\$72,000,000	09/11/20	1.0	+30 bps	100%	Taxable	Corporate
Federal Farm Credit Banks	09/05/19	\$500,000,000	09/13/21	2.0	+8 bps	100%	Taxable	Corporate
JPMorgan Chase & Co	09/05/19	\$3,000,000,000	10/15/30	11.1	+151 bps	100%	Taxable	Corporate
JPMorgan Chase & Co	09/05/19	\$2,000,000,000	10/15/25	6.1	+116 bps	100%	Taxable	Corporate
Citigroup Inc	09/05/19	\$1,500,000,000	perp.	N/A	+381 bps	100%	Taxable	Corporate
Federal Farm Credit Banks	09/05/19	\$200,000,000	09/11/20	1.0	+4 bps	100%	Taxable	Corporate
Federal Home Loan Mortgage Corp	09/05/19	\$4,000,000,000	09/10/20	1.0	+4 bps	100%	Taxable	Corporate
Natixis SA/New York NY	09/05/19	\$160,000,000	09/04/20	1.0	+35 bps	100%	Taxable	Corporate
Credit Suisse AG/New York NY	09/05/19	\$10,000,000	09/08/20	1.0	+30 bps	100%	Taxable	Corporate
Credit Suisse Group AG	09/04/19	\$2,000,000,000	09/11/25	6.0	+156 bps	100%	Taxable	Corporate
Credit Suisse Group AG	09/04/19	\$2,000,000,000	09/11/25	6.0	+156 bps	100%	Taxable	Corporate
Federal Home Loan Banks	09/04/19	\$4,750,000,000	03/06/20	0.5	+3 bps	100%	Taxable	Corporate
Asian Development Bank	09/03/19	\$600,000,000	09/10/21	2.0	+24 bps	100%	Taxable	Corporate
F&M Financial Services Corp	09/03/19	\$50,000,000	09/15/29	10.0	+484 bps	100%	Taxable	Corporate
F&M Financial Services Corp	09/03/19	\$50,000,000	09/15/29	10.0	+484 bps	100%	Taxable	Corporate

Municipal CUSIP SOFR-Linked Transactions								
Issuer	Pricing Date	Size	Maturity	Tenor (Years)	Spread @ Issuance	% of SOFR	Tax Status	CUSIP Type
Connecticut Housing Finance Authority	05/15/19	\$100,000,000	05/15/22	3.0	+65 bps	100%	Taxable	Municipal
Triborough Bridge and Tunnel Authority	09/24/18	\$125,000,000	10/01/20	2.0	+50 bps	67%	Tax-Exempt	Municipal
Triborough Bridge and Tunnel Authority	09/20/18	\$107,280,000	09/26/19	1.0	+43 bps	67%	Tax-Exempt	Municipal

Source: Bloomberg and BofA Merrill

Addressing the LIBOR Transition

Market participants have not yet adopted a standard approach to address the transition, although central banks and trade organizations are developing standardized solutions for each major currency.

Current Status in 2019	<ul style="list-style-type: none">• The International Swaps and Derivatives Association (ISDA), the global derivatives trade organization, is coordinating US-dollar efforts with ARRC• ARRC publishes fallback language for loans, FRNs and securitizations in April/May 2019; ISDA expected to publish fallback language in November 2019• Many other market participants—issuers, banks, investors, vendors—still waiting on sideline for guidance
ISDA “Fallback” Protocol for Derivatives	<ul style="list-style-type: none">• ISDA will issue a LIBOR “fallback” protocol which can be easily integrated into the standard ISDA documentation set for derivatives• The protocol will define what determines a discontinuation of LIBOR, as well as a method to translate LIBOR to SOFR plus a spread• The spread could be based on historical averages, the then-prevailing (spot) relationship, or a prospective (implied forward) relationship• Latest developments indicate that the historical spread method may be adopted*
Bilateral Negotiation with Counterparties or Creditors	<ul style="list-style-type: none">• Depending on the economic effect of the chosen spread determination method, some issuers might prefer restructuring LIBOR contracts to reference another short term index• Examples of such indexes are Fed Funds and SIFMA

Considerations for Existing Agreements

Financial Impact to Issuers

LIBOR will affect our clients in a variety of ways. As it relates to the liabilities side of borrowers' balance sheets, the most common and profound affect will be through existing debt and derivatives.

Debt
Floating Rate Notes
Variable Rate Direct Placements
Revolving Lines of Credit
Other LIBOR Based Products

Derivatives
Floating Rate Swap
Fixed Rate Swap
Basis Swap
Constant Maturity Swap

Review Existing Agreements

- Issuers should perform internal and external review (advisors, bond counsel) to identify all language in debt and derivative agreements that relies on LIBOR
- Most existing contract language considers a temporary disruption of LIBOR, not a permanent discontinuation
- If an agreement contains replacement language:
 - What is the replacement rate?
 - When is the replacement rate triggered?
 - Who chooses the replacement rate? Does one party have unilateral ability to determine the replacement rate and/or adjustments to that rate?
- If silent to LIBOR replacement, the last rate determination date might continue – effectively becoming fixed rate debt

Review Existing Agreements

An issuer's primary focus should be on existing or anticipated debt that extends past 2021, especially those hedged by interest rate swaps. If LIBOR is a component of the debt, the swap or both, there is risk exposure.

Economic Considerations	<ul style="list-style-type: none"> • Will existing fixed payer swaps be adjusted to compensate for receiving a lower floating rate? Will existing debt have the same spread adjustment as comparable swaps? • Will the standardized method produce an economically neutral result? • Will the switch affect other indices like SIFMA?
Tax Implications	<ul style="list-style-type: none"> • Could a conversion of legacy debt to SOFR or another index trigger a reissuance? • Reissuance occurs under federal tax law when there are significant modifications to the terms of a bond so that the bond ceases to be the same bond for tax purposes • Triggers retesting of all the federal tax requirements, new 8038 & tax opinion, conduit issuer involvement • Could affect swap integration and the ability to finance termination payments with tax-exempt debt • CONSULT WITH YOUR BOND COUNSEL FOR ADVICE SPECIFIC TO YOUR SITUATION
Accounting Implications	<ul style="list-style-type: none"> • Does a swap conversion to SOFR result in the end of the current hedging relationship? • Many synthetic debt structures (floating rate debt with fixed payer swap) rely on hedge accounting treatment that minimizes exposure to swap mark-to-market volatility • Certain tests for hedge effectiveness (e.g., dollar offset) rely on the fact that the formula used for computing payments is the same throughout the life of the transaction. A modification of the swap agreement might require more advanced quantitative methods (e.g., regression analysis) for determining hedge effectiveness • CONSULT WITH YOUR ACCOUNTANT FOR GUIDANCE SPECIFIC TO YOUR SITUATION
Disclosure Requirements	<ul style="list-style-type: none"> • The conversion of legacy debt to SOFR may trigger material event notices under 15c2-12 requirements (or other notice/disclosure requirements)
Rating Agency Considerations	<ul style="list-style-type: none"> • The rating agencies may view an issuer's exposure to LIBOR as a source of additional risk • Other notification requirements?

Transition Challenges in the Direct Placement Market

Unlike the derivatives market where the ISDA will likely set up protocols to amend all agreements, the debt market is more nuanced and clients will likely need to negotiate with lenders directly.

Existing Bonds and Loans

- Existing bank and floating rate note (“FRN”) documents each provide a different mechanism for determining a rate if LIBOR is unavailable
- If the documents don’t specify change mechanics, changes to the index will require mutual consent
- While SOFR has been designated to replace LIBOR for interest rate swaps, lenders have not yet decided upon a replacement index for LIBOR

New Bonds and Loans

- Documents should incorporate language that anticipates a future, as yet undefined, replacement index (if possible)
- Language should provide that any change is mutually agreed upon by both parties and no change shall adversely affect either the market value or the expected cash flow of the transaction (banks differ on willingness to accept preferred language)

Typical Language Varies Across Products⁽¹⁾

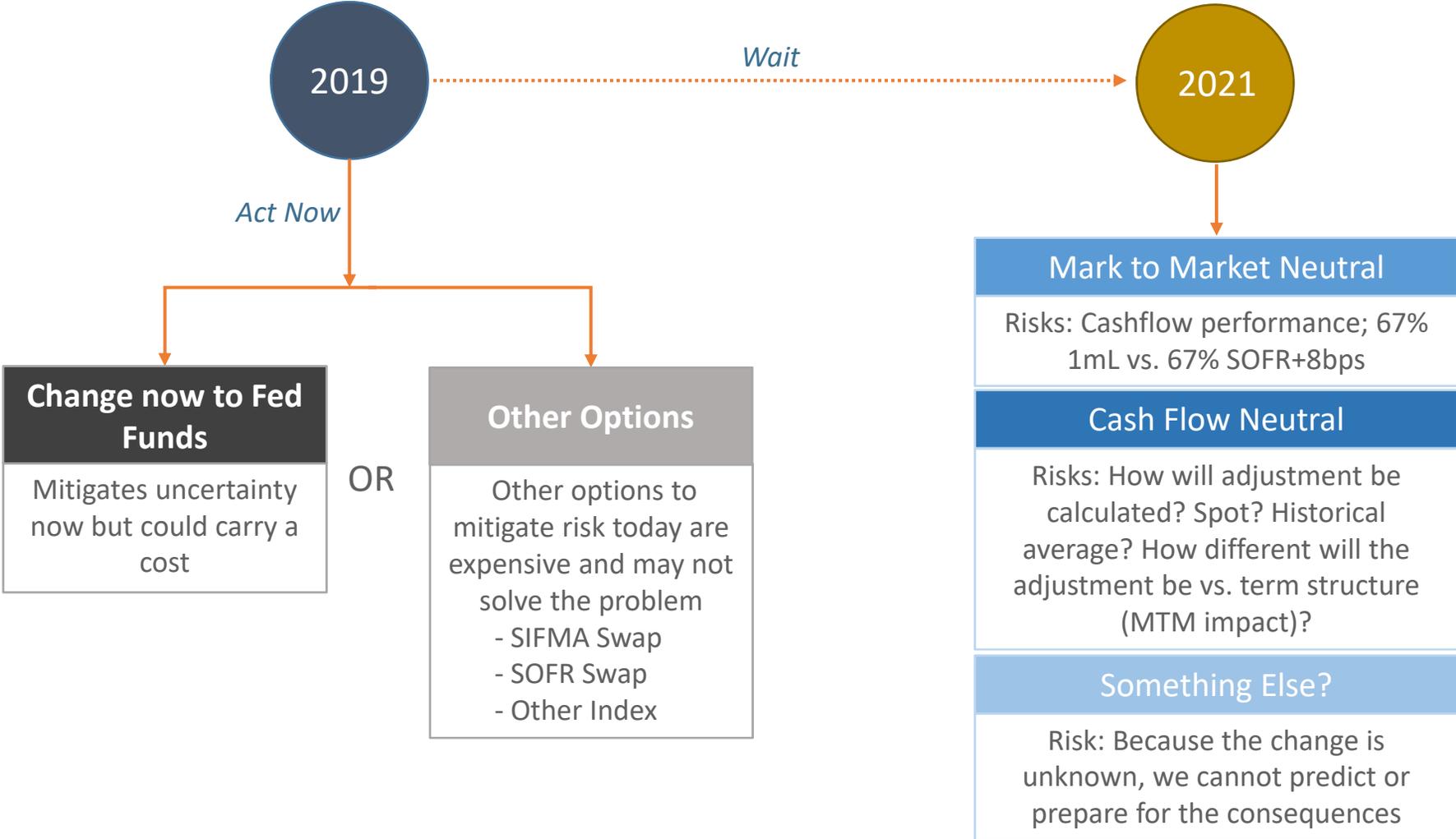
	Fallback Rate	Consent Required
Bonds (FRNs)	Obtain bank quotes → Fixed Rate at last published LIBOR set	Unanimous consent amongst bondholders
Bank Products	Obtain bank quotes → Alternative Base Rate –Prime Rate –EFFR plus fixed spread	Bilateral Loans: Agreement between borrower and lender Syndicated Loans: Unanimous consent

(1) Source: Morgan Stanley Research

Virtually all variable rate bank products are callable at par on any interest payment date. If borrowers are unhappy with their replacement index, they have the ability to refinance into a different product or enter into a new bank loan with a different lender.

Transition Alternatives in the Derivatives Market

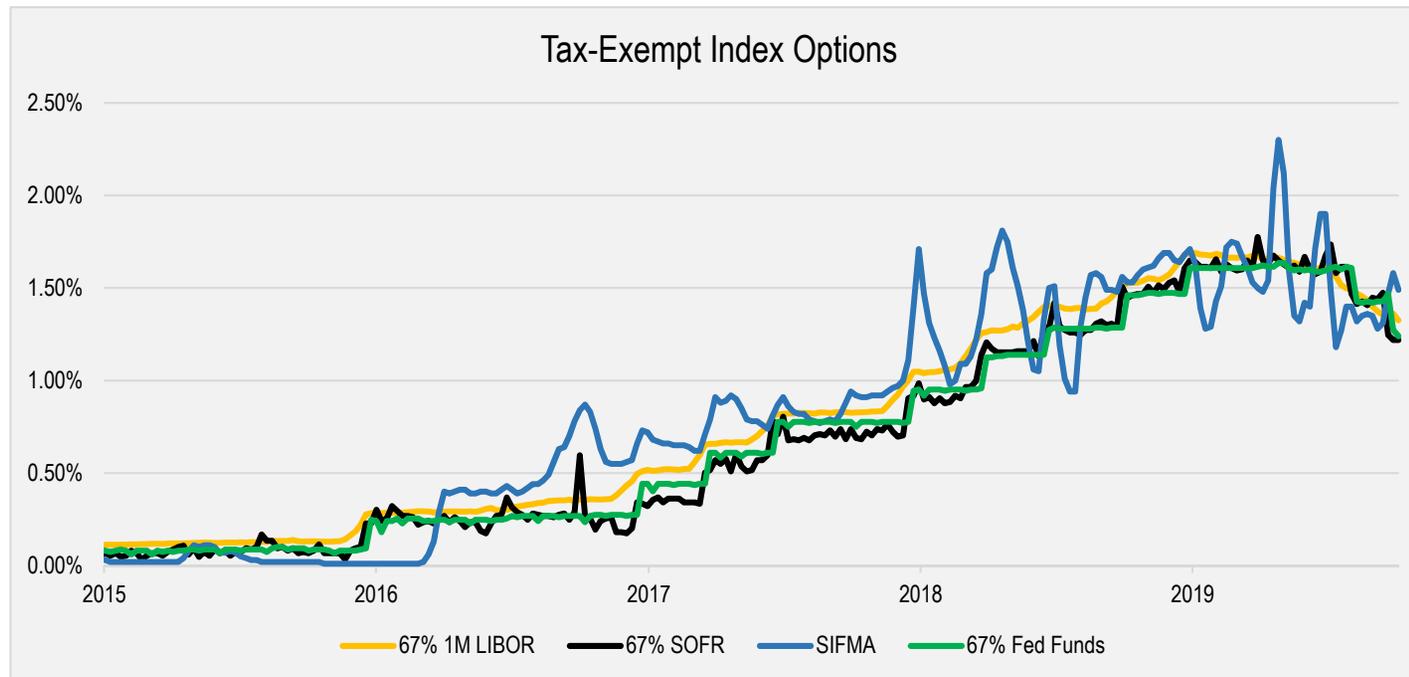
Potential actions and outcomes for existing swap agreements.



Derivatives Conversion Strategies

An issuer or borrower may determine that it is in its best interest to proactively eliminate or reduce “LIBOR Index” risk by modifying agreements prior to any LIBOR discontinuation event.

- Several index alternatives exist, including SIFMA, Fed Funds and SOFR
- Each strategy has its own set of benefits and considerations



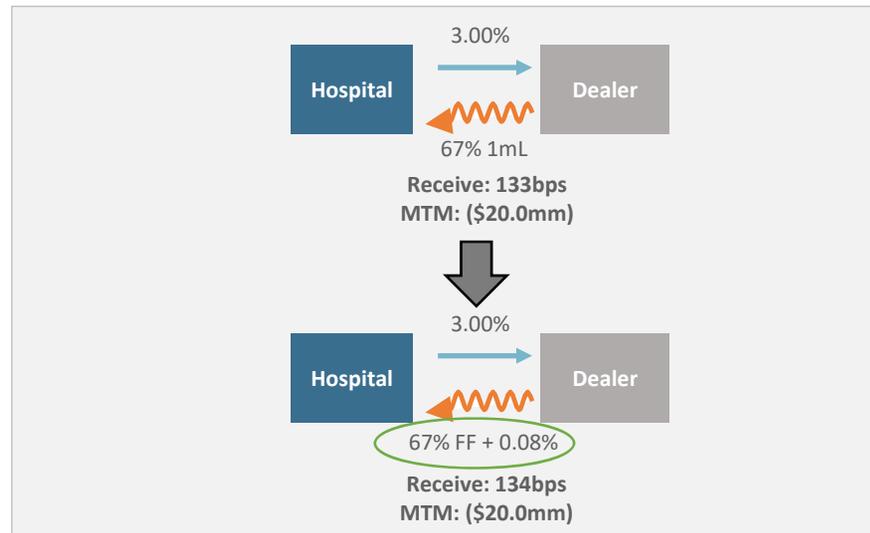
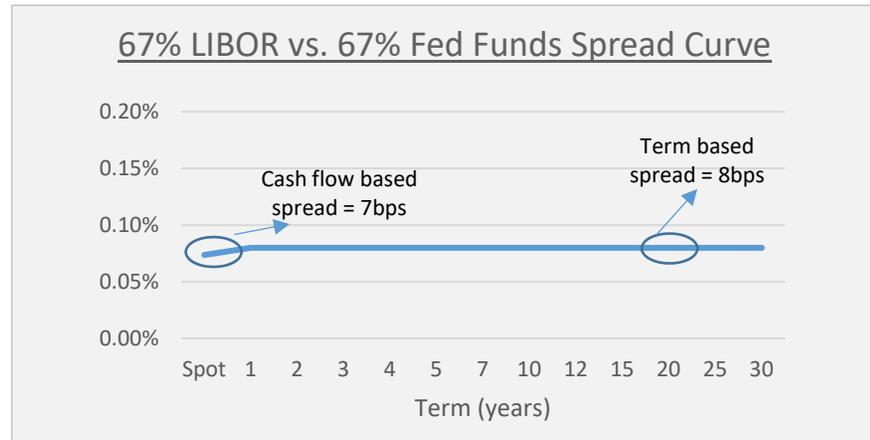
Source: Bloomberg, Federal Reserve Bank of New York, 1/2/2015 through 10/11/2019

Fed Funds Index Conversion

Modify existing derivatives agreements with an index conversion to Fed Funds, which historically has tracked closely to SOFR.

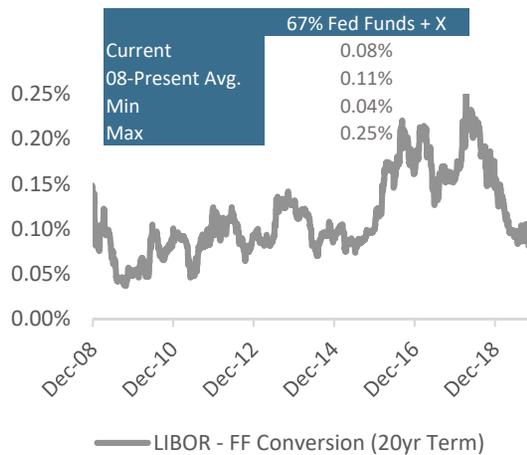
Conversion Overview

- For existing LIBOR swaps
- Mitigate uncertainty and lock-in economics today by converting LIBOR to Fed Funds
 - Fed Funds is a known index with long history
 - High correlation to LIBOR and SOFR
 - Term structure is currently available and market is liquid
- Conversion determined by the spread difference in long term rates
- Result of the conversion
 - MTM unchanged – before transaction cost
 - Cash flow benefit
 - Lock-in current economics, but also retain ability to convert to SOFR in 2021

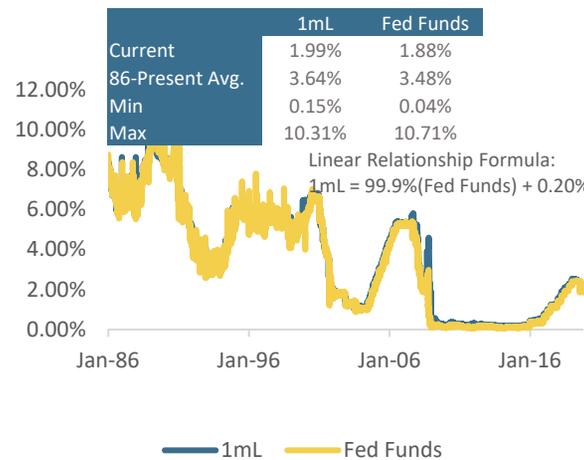


Fed Funds Index Conversion

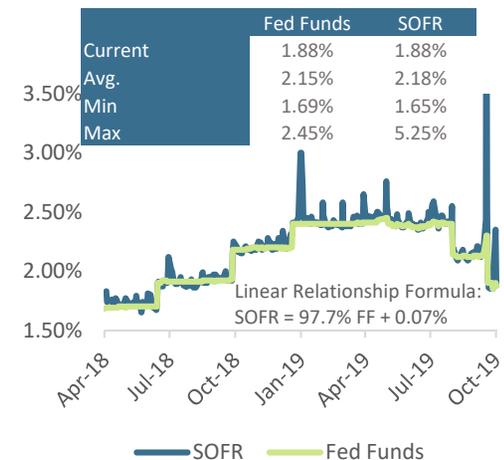
Risks and considerations



Current conversion economics are approximately equal to the historical average



99% correlation between 1mL and Fed Funds



98% correlation between Fed Funds and SOFR

Cash flow risk: risk that the conversion nets negative to the Hospital

- Based on historical observations, there is a very high correlation between 1mL and Fed Funds

Mark to Market: risk that MTM will deteriorate post conversion

- Based on historical observations, the current conversion economics are at the 10 year average

Basis risk: Fed Funds to SOFR

- Risk that the conversion from Fed Funds to SOFR is not economically beneficial in the future if the Hospital decides to switch to SOFR

Additional Information

Bio and Contact Information

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- Mr. Konkel manages high-yield banking, bank loan syndication, alternative funding solutions, interest rate/commodity/foreign exchange derivatives, and structured investment products for Hilltop Securities. His team has provided advisory, bidding agent and consulting services on approximately \$148 billion par/notional amount since January 1, 2015*.
- Mr. Konkel has over 20 years of experience in public finance banking and technical project management in the financial services, healthcare, transportation/logistics and insurance industries.
- Mr. Konkel holds a B.S. in Applied Mathematics from Florida State University. He also holds an M.B.A. from Rollins College where he was the Claudio Milman Scholar and the recipient of the Financial Executives International Award.
- Mr. Konkel is registered with FINRA as a General Securities Representative (Series 7), Uniform Securities Agent (Series 63), Municipal Securities Principal (Series 53), Municipal Advisory Principal (Series 54), Municipal Securities Representative (Series 52), Municipal Advisory Representative (Series 50), and an Investment Banking Representative (Series 79).

*Source: Hilltop Securities Inc. internal database

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- Ms. Blackford joined Ponder & Co. in 2019. As a vice president in the Capital Advisory Group, she is responsible for evaluating the financial performance of hospitals and healthcare systems, assisting with rating agency strategies, and developing and executing finance plans for her clients.
- Previously, Ms. Blackford worked for nine years at a leading investment bank specializing in tax-exempt financings for not-for-profit healthcare providers. Ms. Blackford's experience includes over \$8.0 billion of senior managed transactions for leading health systems across the country funding system growth, facility and business line expansion, and debt refunding and restructuring. She has also worked on engagements focused on strategic growth through acquisition or partnership, asset monetization, and divestitures.
- Prior to covering healthcare, Ms. Blackford spent two years providing investment banking services to transportation issuers.
- Ms. Blackford holds a B.A in economics from Amherst College and an executive M.B.A. from Columbia Business School with Dean's Honors and Distinction.

Risks

The following are normal and customary risks associated with interest rate swaps.

Termination Risk – Most swap agreements give you the right to voluntarily terminate a swap for economic (refinancing) or other reasons, but do not grant this right to the swap provider. However, such a voluntary termination may not be feasible if a significant termination payment is owed by you. Furthermore, there is the risk that the swap could be involuntarily terminated as a result of an event of default or other termination events and you could owe a termination payment. More details regarding such termination events are described on the following page.

Basis Risk – exists if there is mismatch between the interest rate received from the swap contract and the interest actually owed on the underlying loan. Your risk is that the floating interest payments received from the counterparty will be less than the variable interest payments actually owed on your floating rate debt. The mismatch between the actual loan rate and the LIBOR swap rate could cause financial loss. This mismatch could occur for various reasons, including the deterioration of your credit quality.

Counterparty Risk – the risk that the swap counterparty will not perform pursuant to the contract's terms. Under a fixed payer swap, for example, if the counterparty defaults, the borrower would be exposed to an unhedged floating rate loan position. The creditworthiness of the counterparty is indicated by its borrower credit rating.

Interest Rate Risk – the possibility that your debt service costs associated with floating rate debt increase and negatively affect coverage ratios and cash flow margins. The interest rate you pay can increase as interest rates increase generally or because of credit concerns relating to you or the sector/industry of which you are a part.

Amortization Risk – the potential cost to you of servicing debt or honoring swap payments resulting from a mismatch between the loan principal balance and the notional amount of swap outstanding. Amortization risk occurs to the extent bonds and swap notional amounts become mismatched over the life of the transaction. This could occur to the extent you have used bond proceeds to finance an asset that is liquidated and used to prepay your loan advance of the swap notional schedule, causing an unhedged swap position. Conversely, you could be faced with unhedged floating rate exposure to the extent the financed asset does not generate the expected cash flow to repay bonds in accordance with a relatively faster amortizing swap notional schedule. Amortization mismatches could potentially force you to terminate a portion of the swap prior to maturity under unfavorable market conditions.

Accounting Risk – For many borrowers, the fair value (mark-to-market) of effective derivative instruments are reported on the balance sheet. Fair values of ineffective derivatives are reported as investment income/loss on the income statement. Ineffective hedges have the potential to significantly increase revenue volatility.

Tax Risk – borrowers who issue tax-exempt floating rate debt inherently accept risk stemming from changes in marginal income tax rates. Decreases in marginal income tax rates for individuals and corporations could result in tax-exempt variable rates rising faster than taxable variable rates. This is a result of the tax code's impact on the trading value of tax-exempt bonds. Percentage of LIBOR swaps expose borrowers to tax event risk. This risk is a form of basis risk under swap contracts.

Disclosure

Derivative instruments are often complex financial arrangements used by borrowers to manage specific risks. This presentation, and the concepts which are described, use vocabulary which is specific to derivative markets. This presentation assumes the reader is familiar with this vocabulary since they may be parties to derivative instruments.

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