Progress Report:
The Transition from U.S. Dollar LIBOR

The Alternative Reference Rates Committee

March 2021

(Updated as of March 31, 2021)

The Endgame for USD LIBOR

The recent announcements from U.K. and U.S. regulators and LIBOR's administrator, ICE Benchmark Administration (IBA), have set out clear end dates both for new use of U.S. dollar (USD) LIBOR and for its cessation as a representative, panel-based rate:

- The Federal Reserve Board, the Office of the Comptroller of the Currency, and the Federal Deposit Insurance Corporation have issued supervisory guidance 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" , noting that new USD LIBOR issuance after 2021 would create safety and soundness risks. Foreign regulators have stated that they are considering similar steps.

- On March 5, 2021, IBA stated that it will cease the publication of (i) the overnight and 1, 3, 6 and 12 months USD LIBOR settings immediately following the LIBOR publication on Friday, June 30, 2023 and (ii) all other LIBOR settings, including the 1 week and 2 months USD LIBOR settings, immediately following the LIBOR publication on Friday, December 31, 2021. IBA stated that it will not have access to input data necessary to calculate LIBOR settings on a representative basis after those dates, IBA. The UK Financial Conduct Authority (FCA) issued a separate announcement confirming that IBA had notified the FCA of its intent to cease providing all LIBOR settings. The FCA confirmed that all 35 LIBOR settings will either cease to be provided by any administrator or will no longer be representative as of the dates set out by IBA. The FCA also stated that, subject to the establishment of new proposed powers under UK law, it would consult on the issue of requiring IBA to produce certain LIBOR tenors on a synthetic basis.

The International Swaps and Derivatives Association (ISDA) subsequently announced that the FCA statement constituted an "Index Cessation Event," setting the spreads that will be used for LIBOR derivatives among counterparties that have adhered to ISDA's IBOR Fallbacks Protocol or haven entered into new derivatives transactions using the standard ISDA definitions incorporating the IBOR Fallbacks Supplement. The ARRC also announced that the statements constituted a "Benchmark Transition Event" under its fallback framework. The ARRC has stated its recommended spread adjustments for fallback language in non-consumer cash products will be the same as the spread adjustments applicable to fallbacks in ISDA's documentation for USD LIBOR.

Taken together, these announcements lay out a definitive endgame for USD LIBOR: The cessation date for representative LIBOR is clear, the level of spread adjustments for ISDA and ARRC-recommended fallbacks has been set, and supervisory guidance has called for no new LIBOR contracts after end-2021, while allowing most legacy contracts to mature before the most widely used USD LIBOR tenors stop. The cessation of LIBOR will follow more than a decade of global reference rate reform efforts and extensive work within the U.S. to support the transition from USD LIBOR to robust alternative reference rates.

A Decade of Reference Rate Reform Efforts

Concerns about LIBOR rose to prominence following examples of manipulation of LIBOR's rate-setting process, which highlighted the secular decline in activity in the markets LIBOR is based on.

In 2013, the Financial Stability Board (FSB) began a fundamental review of major interest rate benchmarks and of plans for reform. The FSB established a high-level group of global regulators and central banks to examine these issues as well as a Market Participants Group, which was asked to examine the feasibility and viability of adopting additional reference rates. In line with the recommendations of these groups, the FSB endorsed a two-pronged approach to further reforms. First, the FSB recommended continued work to strengthen LIBOR and other major interest rate benchmarks, and second, it recommended developing alternative, nearly risk-free reference rates.

In the U.S., the Financial Stability Oversight Council (FSOC) supported this approach. Noting the vulnerabilities associated with LIBOR, FSOC recommended prompt identification of alternative interest rate benchmarks that are anchored in observable transactions and are supported by appropriate governance structures, and development of a plan to accomplish a transition to new benchmarks.

In response to the FSOC's recommendations and the objectives of the FSB, the Federal Reserve convened the Alternative Reference Rates Committee (ARRC). The ARRC's initial objectives were to identify risk-free alternative reference rates for USD LIBOR, identify best practices for contract robustness, and create an implementation plan with metrics of success and a timeline to support an orderly adoption. The ARRC accomplished its first set of objectives in 2017, identifying the Secured Overnight Financing Rate (SOFR) as the rate that represents best practice for use in certain new USD derivatives and other financial contracts. In its subsequent work, ARRC has developed a detail supporting framework for using SOFR, including tools such as fallbacks and recommended conventions for new use of SOFR in various products.

Despite substantive reforms enacted to strengthen the governance and oversight of LIBOR, sparse activity in term unsecured wholesale borrowing markets has remained a fundamental challenge to its production, with LIBOR sustained by use of "expert judgement" for many panel bank submissions.

In 2017, Andrew Bailey, then head of the U.K. Financial Conduct Authority (FCA), noted that the lack of an active underlying market raised a "serious question about the sustainability of [LIBOR]", and noted that the existence of LIBOR past 2021 could not be guaranteed. LIBOR's deficiencies have been further underscored during recent periods of market stress, such as March 2020, which saw further reductions in wholesale market activity.

In the ARRC's Second Report, the ARRC estimated that, as of the end of 2016, there were $199 trillion in outstanding exposures to USD LIBOR. Most of this (95 percent) arose from derivatives referencing USD LIBOR, but there were also about $10 trillion in cash market exposures. At that time, the ARRC estimated that more than 80 percent of these exposures would roll off by the end of 2021 if market participants stopped new use of USD LIBOR. However, despite warnings from the

official sector that LIBOR would end, use of LIBOR has continued and actually increased. Updating the analysis, the ARRC now estimates that there are $223 trillion in outstanding exposures to USD LIBOR. Most of this increase again comes from derivatives exposures, but the estimated amount of business loans referencing USD LIBOR has also increased.

Table 1: USD LIBOR Market Footprint by Asset Class[1]

		Currrently Outstanding ($TN)	Maturing After June 2023 ($TN)
Over-the-Counter Derivatives	Interest rate swaps	81	46
	Forward rate agreements	47	0
	Interest rate options	20	12
	Cross currency swaps	23	8
Exchange Traded Derivatives	Interest rate options	32	0
	Interest rate futures	11	2
Business Loans	Syndicated loans[2]	2.0	1.1
	Nonsyndicated business loans	1.3	0.4
	Nonsyndicated CRE/Commercial mortgages	1.5	0.8
Consumer Loans	Retail mortgages[3]	1.3	0.8
	Other Consumer loans	0.1	0.1
Bonds	Floating/Variable Rate Notes	1.1	0.3
Securitizations[3]	Mortgage-backed Securites (incl. CMOs)	0.8	0.8
	Collateralized loan obligations	0.5	0.5
	Asset-backed securities	0.2	0.2
	Collateralized debt obligations	0.1	0.1
Total USD LIBOR Exposure:		**223**	**74**

[1] Source: Federal Reserve staff calculations, BIS, Bloomberg, CME, DTCC, Federal Reserve Financial Accounts of the United States, G.19, Shared National Credit, and Y-14 data. Data are gross notional exposures as of 2020Q4. [2] The figures for syndicated and nonsyndicated business loans do not include undraw n lines. Nonsyndicated business loans exclude CRE/commercial mortgage loans.[3] Estimated amounts maturing after June 2023 based on historical pre-payment rates

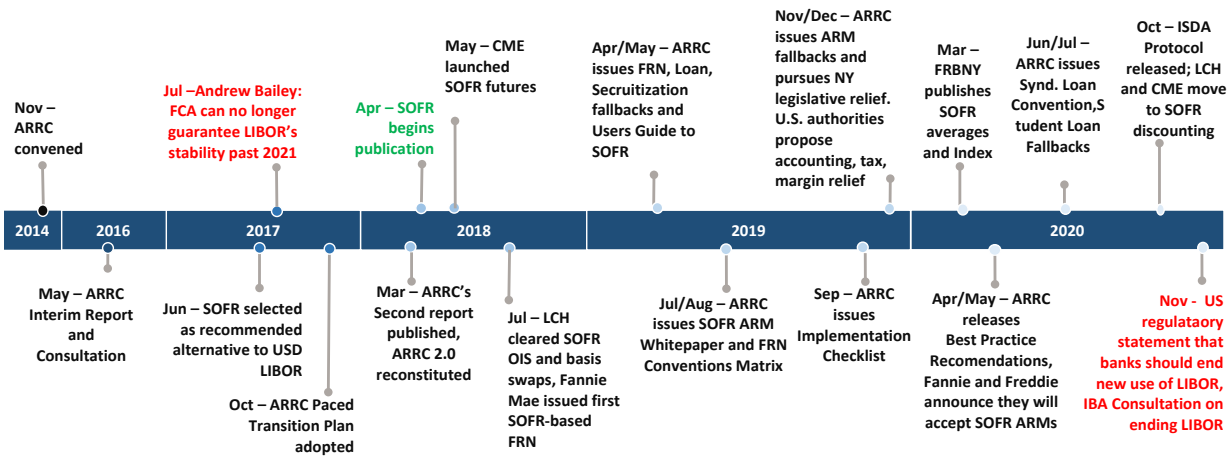
These figures indicate that the task now before market participants in ending new use of LIBOR this year will be challenging. An estimated 67 percent of current LIBOR exposures will mature before June 2023, markedly reducing the number of legacy LIBOR contracts that must be dealt with after LIBOR's cessation. However, a still substantial amount of USD LIBOR exposures, an estimated $74 trillion, will remain outstanding beyond June 2023, underscoring the necessity of finding solutions for legacy LIBOR contracts.[1] This third Report from the ARRC describes the progress that market participants have made in transitioning from USD LIBOR, and where progress will need to materially accelerate in order for them to be adequately prepared for the end dates that have been laid out.

[1] Of the estimated $74 trillion in USD LIBOR exposures outstanding beyond June 2023, the majority are derivatives which can be addressed through adherence to the ISDA Protocol. An estimated $1.9 trillion in exposures will remain in bonds and securitizations, many of which may have no effective means to transition away from LIBOR upon its cessation. See discussion around legislation and "tough legacy" contracts below.

The ARRC's Support for the LIBOR Transition

Since the ARRC was first convened in 2014, it has taken a number of steps to build an infrastructure that would enable market participants to move from LIBOR to a more robust reference rate. The first years of the ARRC's work were spent identifying an alternative to USD LIBOR. As part of that process, ARRC members reviewed existing interest rate benchmarks and collected data on each of the potential markets that a prospective benchmark could be based upon, culminating in its Interim Report and Consultation in 2016, which explained why existing term markets were not robust enough to support a LIBOR alternative and set out two leading candidates based on unsecured and secured overnight markets. As part of its consultation, the ARRC also formed an advisory group to collect views from a diverse set of key end users. Following its consultations, the ARRC selected SOFR as its recommended replacement, documenting its process and the reasons for its choice in its Second Report. The Federal Reserve Bank of New York, in cooperation with the Office of Financial Research, subsequently began publishing SOFR in April 2018.

Figure 1: Building Infrastructure: What Has Been Accomplished over 2014-2020



Since the selection of SOFR, the ARRC has focused on encouraging development of SOFR derivatives and cash markets and on addressing the problems in contractual fallback language used in LIBOR products. The ARRC first published its User's Guide to SOFR in 2019, which set out a range of ways in which SOFR could be used in cash products, along with conventions for floating rate notes (FRNs) and adjustable rate mortgages (ARMs), and it published further conventions for business loans, student loans, intercompany loans, and securitizations over 2020 and 2021. A full list is provided in Table 2.

Table 2: ARRC Conventions	
Product	**Conventions/Term Sheet Document**
Floating Rate Notes	**Compound SOFR in Arrears with Lookback (No Observation Shift)** **Compound SOFR in Arrears with Lookback and Observation Shift** **Compound SOFR in Arrears with Payment Delay** **Compound SOFR with Index Calculation**
Syndicated Business Loans	**Compound SOFR in Arrears with Lookback** **Simple SOFR in Arrears with Lookback**
Bilateral Business Loans	**Compound SOFR in Arrears with Lookback** **Simple SOFR in Arrears with Lookback**
Intercompany Loans	**30- or 90-Day SOFR in Advance**
Adjustable-Rate Mortgages	**30- or 90-Day SOFR in Advance**
Student Loans	**30- or 90-Day SOFR in Advance**
ABS, MBS, and CMBS Securitizations	**30-Day SOFR in Advance**

Over the same period of time, the ARRC has also published detailed fallback language for new issuance of cash products that continue to reference LIBOR. The ARRC's work includes fallback recommendations for the following products:

- Floating Rate Notes
- Syndicated Business Loans
- Bilateral Business Loans
- Securitizations
- Adjustable-Rate Mortgages
- Student Loans

Each of these recommendations was based on public consultation and reflected widespread support from respondents. The ARRC has also set out the details of the ARRC's recommended spread adjustments for those cash products using ARRC fallback language.

Transition Progress

Progress in Market Development

Derivatives

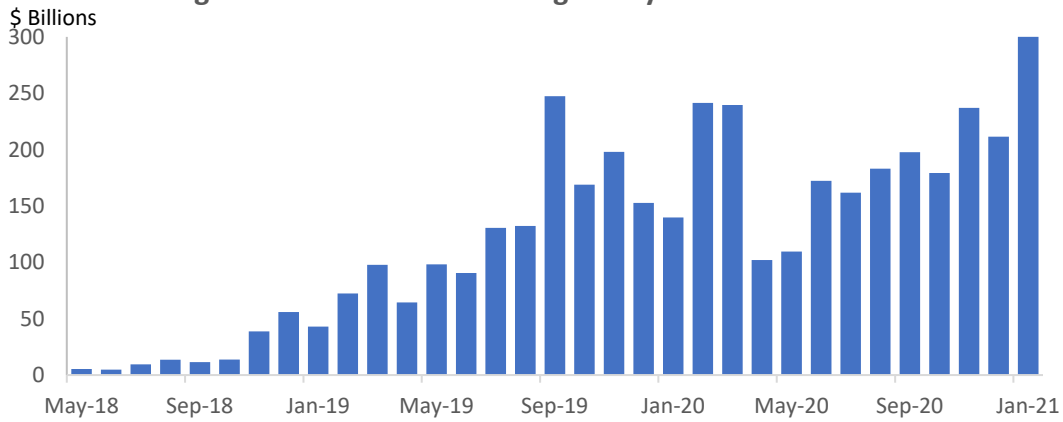
Very soon after SOFR began publication in April 2018, the CME Group (CME) began offering a variety of SOFR futures contracts on its exchange, and both LCH and CME began clearing SOFR swaps. Intercontinental Exchange, Inc. (ICE) subsequently also began offering SOFR futures contracts. By the end of the first year of trading, average daily trading volumes of SOFR futures rose to about $100 billion per day and by the end of 2020, volumes had risen to above $200 billion per day (Figure 2). SOFR trading activity then fell, as trading across all interest rates derivatives generally declined when interest rates moved back to near zero, but growth in trading volumes has again picked up in recent months. Much of the recent increase in trading volumes has been at longer maturities, helping to lengthen the SOFR curve.

SOFR swaps trading started more slowly, which was expected, with trading only materially beginning in 2019 (Figure 3). As with futures, trading activity declined in 2020 as rates fell back to near zero. Trading activity picked up noticeably in October 2020, when LCH and CME – the two major USD interest rate swap central counterparties (CCPs) – successfully transitioned from the Effective Federal Funds Rate (EFFR) to SOFR discounting and Price Alignment Interest (PAI) on all outstanding cleared USD-denominated swap products. This change was part of ARRC's Paced Transition Plan and supports use of SOFR as market participants that hedge discounting risk will likely manage this risk by transacting in SOFR derivatives.

As shown in Figure 3, there has also been some growth in trading of nonlinear swaps referencing SOFR, which is important in establishing a volatility curve. At present, trading is averaging roughly $5-$10 billion in per month, mostly in caps and floors referencing 30-day Average SOFR; this amount is still only about 5 percent of trading in nonlinear swaps referencing LIBOR, but is already larger than the level of nonlinear trading activity on fed funds.

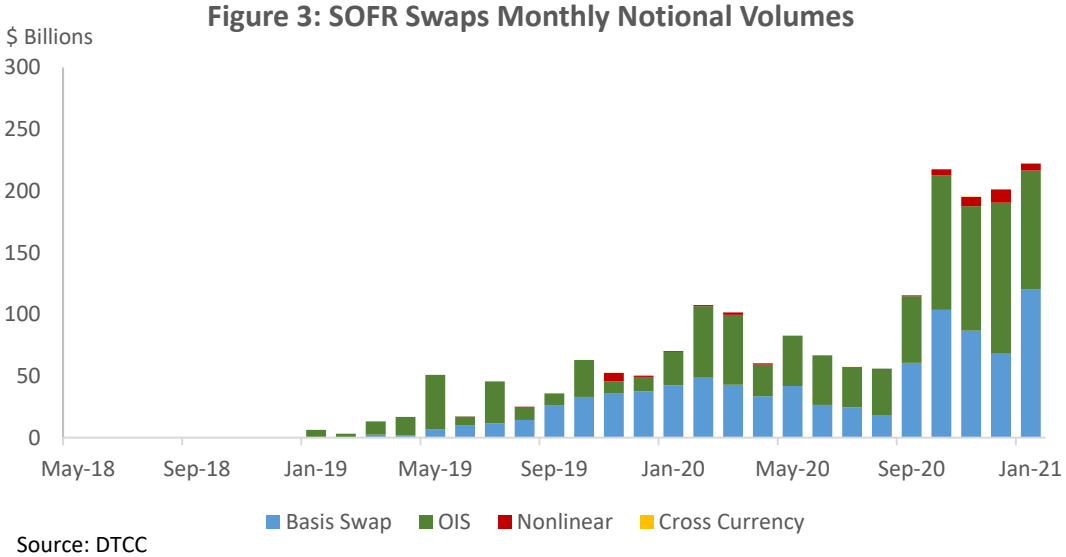
Overall, there are now over $6 trillion in open interest in SOFR-based futures and swaps, with growth in swaps outstanding rising noticeably since the move to SOFR PAI and discounting in October 2020 (Figure 4). However, as noted earlier, activity in LIBOR-based derivatives has increased since 2017, despite warnings that LIBOR will end, and the share of outstanding SOFR derivatives is still a small percentage of either LIBOR or fed funds derivatives (Table 3), and as is discussed further below, most growth in derivatives volumes over the past year has been at longer horizons, while trading activity in short-dated derivatives has been essentially flat.

Figure 2: SOFR Futures Average Daily Notional Volume



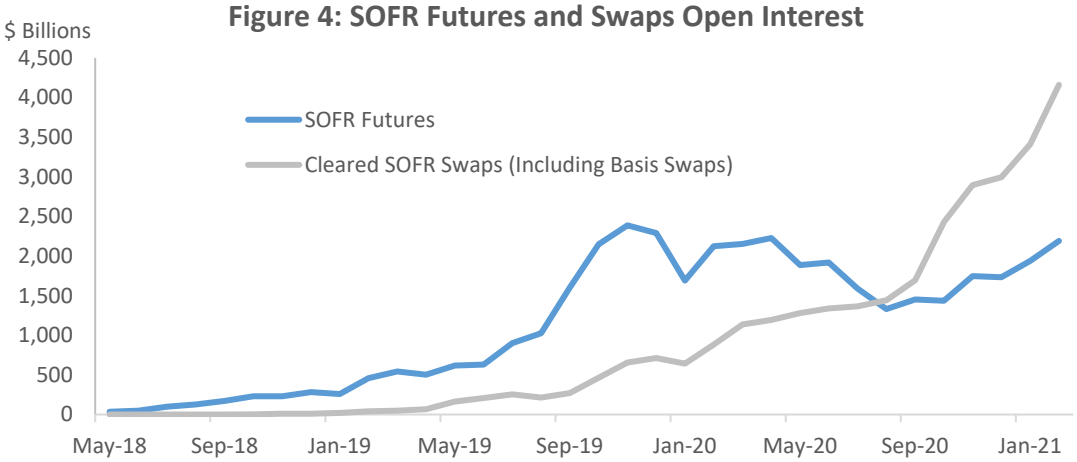
Source: CME Group and ICE

Figure 3: SOFR Swaps Monthly Notional Volumes



Source: DTCC

Figure 4: SOFR Futures and Swaps Open Interest



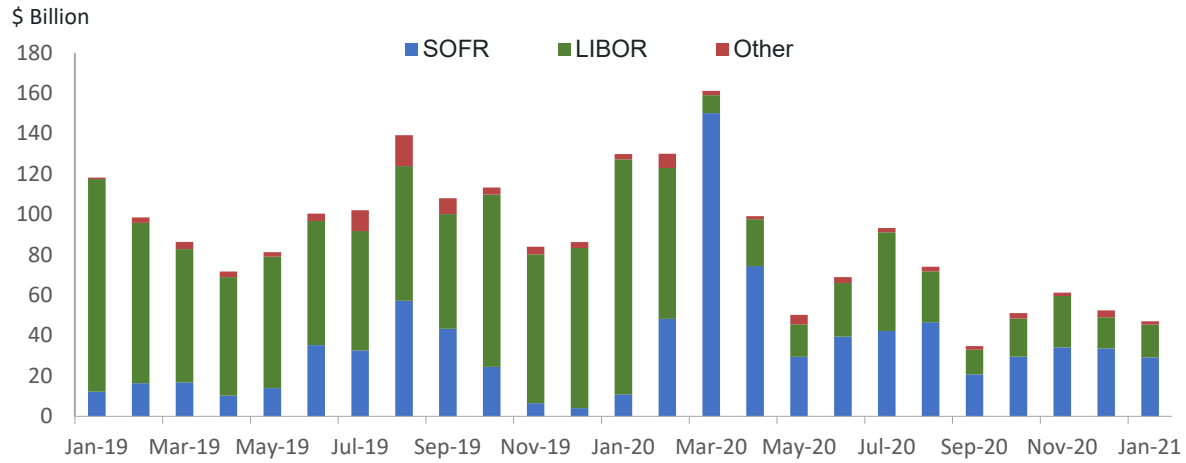
Source: CFTC

Cash Products

The ARRC's Paced Transition Plan focused on creating a baseline level of liquidity in derivatives markets, understanding that this would be necessary in order to encourage the development of cash products based on SOFR. As discussed below, there are clearly segments of cash products in which progress has been slow, but there are also areas in which progress has already been made, most notably in the FRN market and in consumer loans.

The first FRN referencing SOFR was issued in 2018, and since that time use of SOFR has grown (Figure 5), although overall issuance of floating rate debt has declined as rates have fallen, making fixed-rate issuance more attractive. Over the course of 2019, SOFR issuance was nascent and LIBOR issuance continued to dominate the market, but more SOFR debt was issued than LIBOR over the last year, and maturities increased. Much of this issuance came from the Federal Home Loan Banks and other Government Sponsored Enterprises (GSEs), who traditionally are large issuers of floating rate debt, but banks and the financing arms of some nonfinancial corporations also issued SOFR debt. In 2021, the first nonfinancial corporate issuance outside of a financing arm occurred, marking a new source of SOFR-based issuance.

Figure 5: Private Sector FRN Issuance by Reference Rate

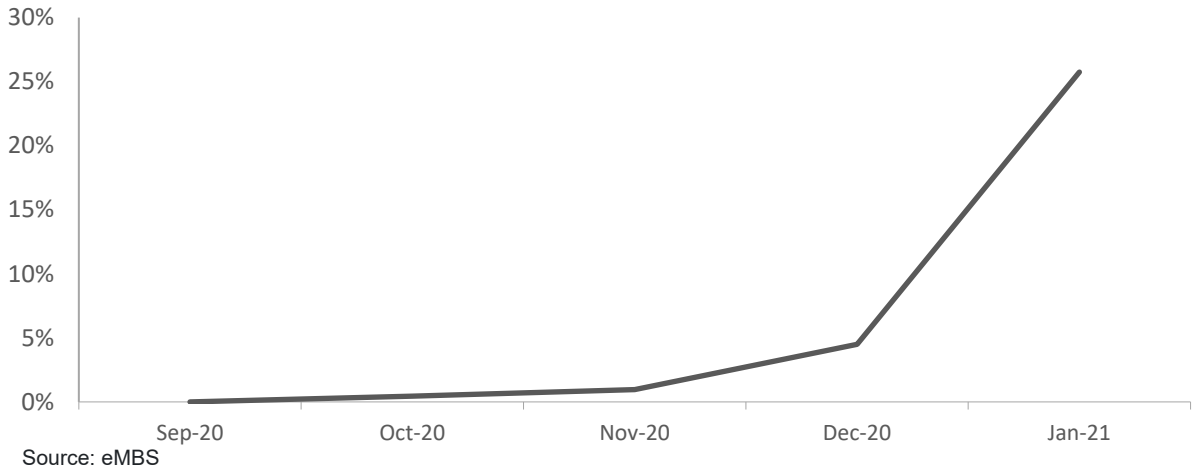


Note: Excludes issuance by U.S. Treasury. Source: Bloomberg

Progress is also evident in consumer products, where the GSEs have taken a strong leadership role. In 2020, Fannie Mae and Freddie Mac began accepting SOFR ARMs using conventions that were consistent with those set out in the ARRC's conventions whitepaper. Additionally, both GSEs stopped accepting single- and multi-family LIBOR ARMs as of December 31, 2020. Activity has begun to transition to SOFR, with the volume of SOFR linked issuance moving higher over the last few months of 2020 and particularly into January of 2021 (Figure 6). The Department of Housing and Urban Development has likewise prohibited further new use of LIBOR in their Home Equity Conversion Mortgage (HECM) reverse mortgage product for seniors and recently announced that they will accept SOFR-based HECMs.[2]

[2] See https://www.hud.gov/sites/dfiles/OCHCO/documents/2021-08hsgml.pdf

Figure 6: Share of SOFR-indexed ARM MBS Issuance by Fannie Mae and Freddie Mac



Source: eMBS

Progress in Addressing Legacy Products

As noted in the ARRC's Second Report, at that time most legacy contracts referencing LIBOR had fallback language that was not intended for a permanent LIBOR cessation. To address these risks, the ARRC worked cooperatively with ISDA as ISDA developed its IBOR Fallbacks Protocol and separately created its own fallback recommendations for new cash products referencing LIBOR, making sure that those fallbacks were consistent where possible with ISDA's work. The ARRC has also developed a legislative proposal currently being considered by the State of New York, which would help to address the significant number of products referencing USD LIBOR that have no effective means to transition away from LIBOR upon its cessation.

ISDA's IBOR Protocol

In January 2021, ISDA's IBOR Fallbacks Protocol and IBOR Fallbacks Supplement went into effect. With the Protocol going into effect, legacy derivatives contracts now incorporate ISDA's new fallbacks if both counterparties have adhered to the Protocol or otherwise bilaterally agreed to include the new fallbacks in their contracts. The Supplement ensures that any new derivatives contracts that incorporate the 2006 ISDA Definitions and reference a relevant IBOR will also incorporate the new fallbacks. For USD LIBOR, the fallback rate will be SOFR compounded in arrears, with a fixed spread adjustment.

Take up of the Protocol has been successful, which greatly reduces the financial stability risks that would otherwise be associated with LIBOR cessation. As of March 12, there were 13,540 adhering parties to the IBOR Fallbacks Protocol. There was widespread uptake among dealers and banking institutions, and a number of buyside and some nonfinancial corporations have adhered as well. Although the number of additional parties adhering to the Protocol had slowed in February, a number of new parties chose to adhere following the March 5 announcements on end dates for LIBOR.

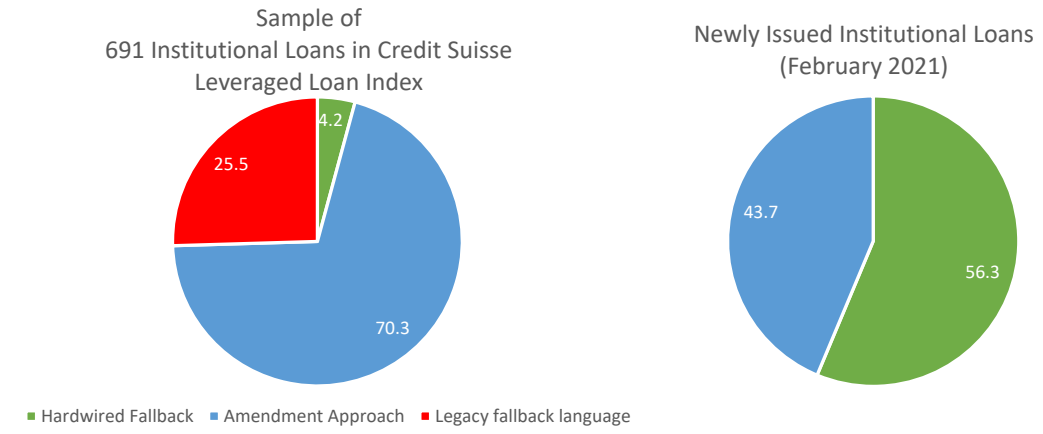
LCH and CME have both adopted the IBOR Fallbacks Protocol into their rulebooks. The two CCPs are also exploring additional options to facilitate a smooth transition of existing LIBOR exposures to risk-free reference rates. CME and LCH recently consulted on proposals to transition LIBOR swaps to corresponding risk-free rate (RFR) swaps a short period of time before the LIBOR end date in order to ease operational burdens by ensuring that the structure of legacy LIBOR swaps converting to RFRs is similar to the structure of new market-standard RFR-based swaps. LCH recently announced plans to move forward with plans to transition cleared LIBOR swaps to corresponding RFR swaps.

Cash Products

As with uptake of the ISDA Protocol, use of the ARRC's recommended fallbacks, or language that is similar to it, has been fairly prevalent in new issuances of most cash products over the last two years. As noted in the ARRC's Second Report, beginning in 2018, new syndicated loans were moving to incorporate improved fallback language. To encourage use of more robust fallback language, in 2019, the ARRC published both a form of "amendment language," which would allow the calculation agent to propose a successor rate if LIBOR ceases (subject to a form of negative lender consent in the ARRC's recommendation), and "hardwired language," which sets out a direct waterfall for the successor rate and spread adjustment.

Through 2020, most new syndicated loans incorporated some form of amendment language, either the ARRC's version or a variant. A sample of nearly 700 institutional leveraged loans shows that about 70 percent contain some version of this kind of amendment language (Figure 7). In 2020, the ARRC recommended that hardwired language should be used beginning by 2020 Q4, noting that hardwired language would be operationally easier to implement at the time of a transition, and would also help to ensure that borrowers (and lenders) understood the rates that they would move to. Since that time, use of hardwired language has increased. As shown in the right panel of Figure 7, more than half of recently issued institutional loans have used the ARRC hardwired language.

Figure 7: Fallback Language in Institutional Leveraged Loans



Source: Covenant Review, a Fitch Solutions Service.

Similar surveys of fallback language in FRNs indicates that ARRC hardwired language or close variants of it are now prevalent in new FRN issuances. The Federal Farm Credit Banks Funding Corporation also conducted a debt swap providing holders of their existing LIBOR-linked bonds with an opportunity to exchange these bonds for new LIBOR-linked bonds with fallback language based on the ARRC's recommended fallback language for FRNs.

In consumer products, Fannie Mae and Freddie Mac required use of ARRC fallback language in June 2020. Market intelligence indicates that use of ARRC fallback recommendations is also prevalent in new student loans.

Legislation

Some legacy LIBOR contracts have no effective means to transition away from LIBOR upon its cessation. In 2020, the ARRC published draft New York State legislation as a potential approach to help address challenges surrounding these contracts (largely securitizations and FRNs) governed by New York law. The legislation would apply if LIBOR either permanently ceased publication or were determined by the FCA to no longer be representative. For contracts that have no fallback language, or fallback language that would result in a poll of banks or reliance on some previous LIBOR value, the legislation would replace LIBOR with the ARRC's recommended fallbacks and spread adjustments based on SOFR. The legislation would have no impact on contracts that fall back to a non-LIBOR-based floating rate, a type of fallback language that is commonly found in most legacy business loans. For any contract in which a person has discretion to name a new rate that was similar to LIBOR, the proposal would provide a safe harbor if the person chooses the ARRC-recommended rate. Contract parties would be able to agree to opt out of the legislation. The table below summarizes the main features of the proposal.

The ARRC's proposed legislation was included in the State of New York's Fiscal Year 2022 Executive Budget. This inclusion marked an important step toward having the ARRC's legislative proposal passed and signed into law.

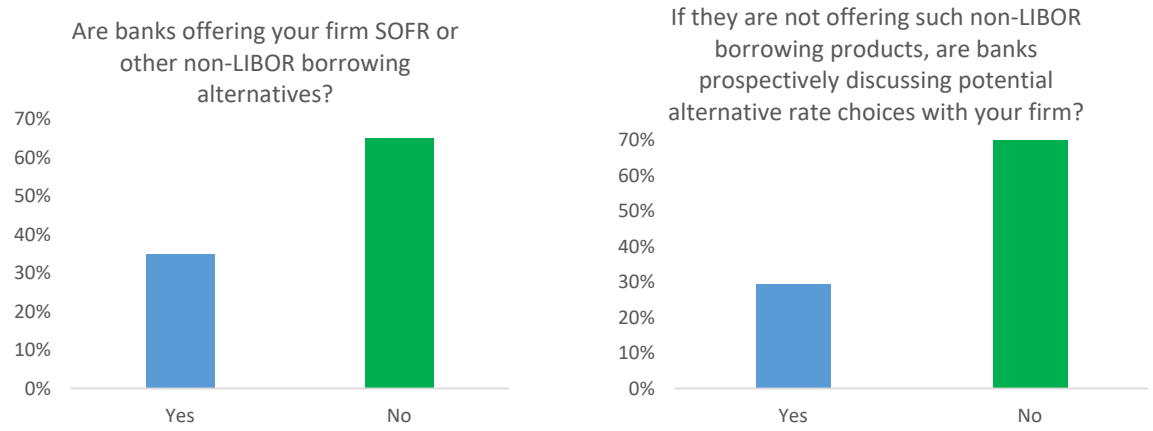
Key Components	Proposed Legislation Structure
"Mandatory" v. "Permissive" Application of the Statute	• **Mandatory**: If the legacy contract is *silent* as to fallbacks. • **Mandatory**: If the legacy language falls back to a *Libor-based rate* (such as last-quoted Libor). • **Permissive**: If the legacy language gives a party the right to exercise *discretion or judgment* regarding the fallback, that party can decide whether to avail itself of the statutory safe harbor.
Degree of Override of Legacy Contract Fallback Provisions	• **Override**: Where the legacy language falls back to a *Libor-based rate* (such as last quoted Libor). • **Override**: If the legacy language includes a fallback to *polling for Libor or other interbank funding rate*, the statute would mandate that the polling not occur. • **No Override**: Where the legacy language is *silent* as to fallbacks or gives a party the right to exercise *judgment or discretion* regarding the fallback. *In these instances, there is nothing to override.* • **No Override**: The statute would not override legacy language that falls back to an express *non-Libor-based rate* (such as Prime).
Mutual "Opt-Out"	• Parties would be permitted to mutually opt-out of the application of the statute, in writing, at any time *before or after* the occurrence of the Trigger Event.
Trigger Events and Replacement Date	• The statute would become applicable or available (as described in "Mandatory" v. "Permissive" above) upon the occurrence of statutory trigger events • The statutory trigger events would be based on the ARRC permanent cessation and pre-cessation trigger events, with ensuing replacement dates that match those in the ARRC fallbacks and ISDA's IBOR protocol.
Conforming Changes	• The statute would provide safe-harbor protection for parties who add conforming changes to their documents to accommodate administrative/operational adjustments for the statutory endorsed benchmark rate.

Where Progress Has Been Slow

Although the FRNs and consumer mortgage markets are already on their way to transitioning from LIBOR, most other cash products are not. While a few banks have begun to offer SOFR-based bilateral business loans and are in the process of moving their new business away from LIBOR, most U.S. banks are continuing to offer LIBOR as their primary or sole floating-rate business loan option.

Most worrying, many borrowers report that lenders are not communicating with them about LIBOR alternatives. The two charts below show recent responses to questions about lender outreach to members of the ARRC's Nonfinancial Corporate Working Group, which has roughly 90 nonfinancial corporate members representing firms of all sizes, including some very large U.S. nonfinancial corporations. Among members responding to the survey questions, roughly two-thirds reported that they are not being offered any alternatives to LIBOR, and the same proportion reported that banks are not even prospectively discussing the potential alternatives that might be offered to them.

Figure 8: Survey of Nonfinancial Corporate Views of Lender Communication



Source: March 2020 Survey of ARRC Nonfinancial Corporate Working Group

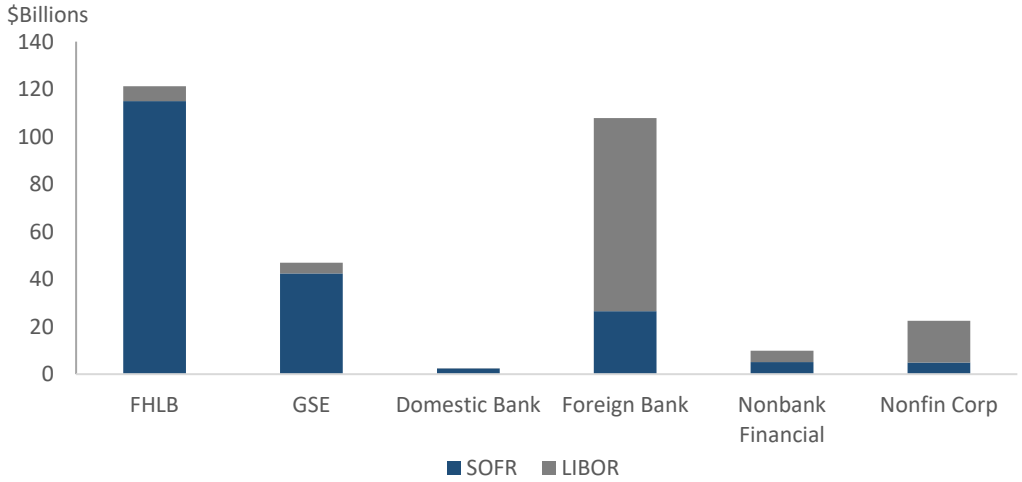
This lack of progress in the business loans market is concerning for several reasons. First, nonfinancial businesses need to be prepared for the end of new LIBOR lending and the end of LIBOR itself, and in order to be prepared they (like lenders) will need to work with their vendors and systems in order to be sure that they can accommodate new rates. Second, it is unlikely that a borrower would wish to move their entire set of new loan agreements away from LIBOR in one go: instead, many would likely wish to move more gradually, which cannot occur if lenders do not offer alternatives soon. Third, one other point of clear agreement in responses to the Working Group survey was that borrowers wished to be offered a range of SOFR alternatives. Ideally, this would occur through active conversations between borrowers and lenders, so that lenders might determine which combination of SOFR offerings would best suit their customers. And, lastly, the delay in offering alternatives to LIBOR in the business loans market slows overall market development in the derivatives markets that may be required to hedge these loans and in the markets that structure and securitize these loans and that also need to transition.

Related to this last point, securitizations have also been slow to move away from LIBOR. While Ginnie Mae issued the first securitization based on SOFR two years ago, almost all securitizations continue to reference LIBOR. Freddie Mac has been a leader in offering several billion dollars in SOFR-based collateralized mortgage obligations and Credit-Risk Transfer securities, but few other

issuers have thus far followed, despite strong investor demand for the SOFR securitizations that have been issued.

Finally, while the FRN market is well on its way to transitioning from LIBOR, and a number of conventions have successfully been established for SOFR issuance, LIBOR does continue to be used by certain classes of issuers. As shown in Figure 9, while the Federal Home Loan Banks, other GSEs, and domestic U.S. banks have issued very little in LIBOR-based FRNs over the last six months, foreign bank and nonfinancial corporates have continued to issue LIBOR-based FRNs. In a hopeful sign, as noted above, the first nonfinancial corporate issuance outside of a financing arm occurred recently, and foreign bank issuance of SOFR-based FRNs picked up notably in January, but further progress will be required.

Figure 9: Issuance of SOFR and LIBOR, Aug 2020-Jan 2021



Note: Excludes issuance by U.S. Treasury.
Source: Bloomberg

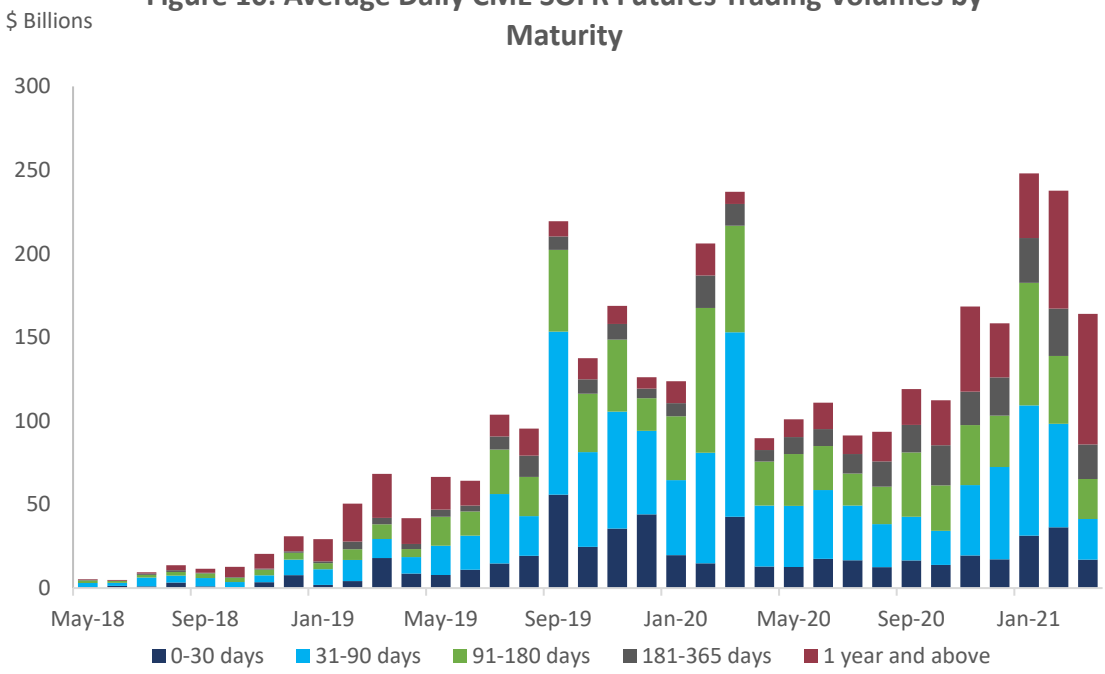
One of the reasons it is important that cash markets begin to transition more quickly is that markets and broader market liquidity are interrelated. Cash markets depend on derivative market liquidity, and derivative market liquidity depends on use in cash markets. Although growth of SOFR derivatives has been notable, LIBOR remains the dominant rate used and SOFR derivatives are still a fraction of Eurodollar and fed funds derivatives markets. As shown in the Table below, SOFR swaps are already about half the size of outstanding fed funds swaps at longer maturities, but only 1-2 percent of corresponding LIBOR swaps, and are still less than 10 percent of either fed funds or LIBOR swaps at shorter maturities.

Table 3: SOFR Derivatives Open Interest Compared to LIBOR and Fed Funds

	Percent of LIBOR	Percent of Fed Funds
Cleared Swaps		
Maturity:		
0-3 Months	5.8%	7.0%
3-12 Months	0.9%	8.3%
1-3 Years	2.6%	14.1%
3-5 Years	1.9%	25.2%
5-7 Years	1.7%	19.1%
7-10 Years	1.6%	29.3%
10-15 Years	1.0%	50.0%
15-25 Years	1.0%	47.9%
25 Years +	0.4%	25.0%
Futures		
Maturity:		
0-3 Months	67.0%	45.5%
3-12 Months	27.0%	24.7%
1-3 Years	4.6%	37.7%
3-5 Years	0.2%	---

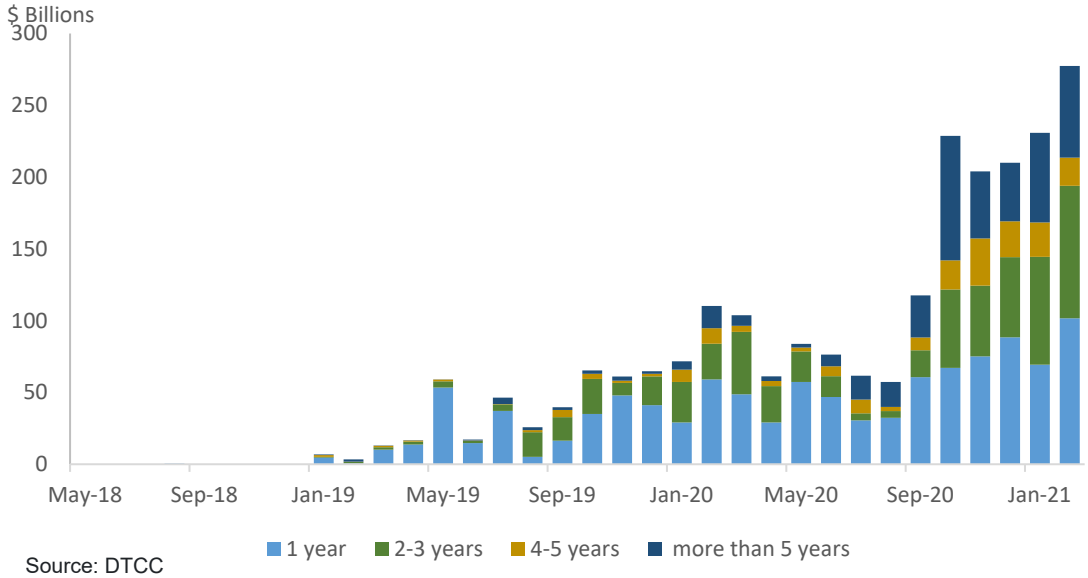
Compared to the development of most new markets, growth in SOFR derivatives has been quick, but time is short. Banks and their customers need to be prepared for the transition, and this cannot occur if liquidity is slow to develop over the remaining months. One area where growth in activity has slowed is the short end of the SOFR derivatives curve. As shown in Figures 10 and 11, while there has clearly been an acceleration in growth of trading in longer dated SOFR futures and swaps, trading activity in short-dated SOFR derivatives has been essentially flat over the last year. There are still days with a small number of trades in these short-dated contracts, for example, in roughly a fifth of the days over the fourth quarter of 2020, there were fewer than 10 trades per day in each of the first four monthly SOFR contracts offered by CME. Growth in long-dated maturities is vital to the transition, but lack of progress in short-dated trading, which is what any potential term rate would need to be based on, has made it difficult for the ARRC to recommend a term rate. In part, the lack of progress in the short end of the curve can be attributed to the decline in interest rates to near zero, which has diminished short-term trading activity across all derivative rates markets, but progress has also been slow for the simple reason that many market participants have continued to use LIBOR.

Figure 10: Average Daily CME SOFR Futures Trading Volumes by Maturity



Source: CME Group

Figure 11: Monthly SOFR Swaps Notional Volumes by Maturity



Source: DTCC

Key Steps Ahead

The ARRC issued Recommended Best Practices last year for completing the transition from LIBOR including recommended dates for completing the transition across floating-rate notes, business loans, consumer loans, securitizations, and derivatives. While this was not supervisory guidance and some firms may choose to adopt other transition timelines, with essentially 9 months left, the transition needs to accelerate quickly. Many firms appear to be waiting for markets to develop while waiting on the sidelines. Given the timeline set out for the transition, there is no time for market participants to take a wait and see approach. Market participants need to be actively taking steps to support the transition, and doing so with tools available now and in a manner that does not reintroduce the very vulnerabilities that have prompted this very significant transition of financial markets.

The official statements on the end of LIBOR provide clarity on the key steps needed in 2021. Supervisory guidance has emphasized the importance of transition planning related to financial exposures, operational preparedness, legal contract preparedness, and communication efforts. The ARRC continues to support progress in each of these areas and has set for itself the following objectives and priorities for 2021:

ARRC 2021 Objectives and Priorities	
Supporting SOFR Use and Liquidity	• Promote liquidity in derivatives markets • Track progress in adoption of SOFR in cash markets, identify and help address challenges across product types as needed, including as it relates to the loan and securitization markets. • Continue to assess the possibility of a term SOFR recommendation
Market Infrastructure and Operations	• Conduct tabletops or similar to promote readiness related to fallback procedures • Track and establish a testing regime to execute system and infrastructure readiness across both sell side and buy side
Contractual Fallbacks	• Work with the ARRC's chosen vendor to produce a full playbook laying out the ARRC's recommended spread adjustments and spread-adjusted rate fallback, with beta versions to be produced this year • Address potential fallbacks for the ICE Swap Rates tied to USD LIBOR
Legal, Tax, Accounting, Regulatory Clarity	• Continue to support work on NY, other priority states and federal legislative approaches; consider conforming changes as relevant • Consider whether there are any updates required around existing tax, regulatory, and accounting measures in light of proposed mid 2023 end date for certain USD LIBOR tenors or other relevant developments
Outreach, Education, Global Coordination	• Conduct extensive outreach to support transition education and awareness, including extensive engagement with end users across the relevant markets.