Executive Summary
The London Interbank Offered Rate (LIBOR) — the most commonly used reference interest rate in the financial world — is scheduled to be replaced by the Secured Overnight Financing Rate (SOFR) at the end of 2021. The Federal Reserve and other regulators have recently agreed to an extension of LIBOR past its scheduled end date, but have stated that this is only to facilitate the wind-down of longer term contracts without alternate rate fallback language. Therefore the timetable discussed below, using the original LIBOR end date, is what investors should focus on, notwithstanding the Fed’s technical extension. Some floating rate money market securities have interest rates that are linked to LIBOR, and investors have been concerned about the potential impact of this change on money market funds.

The challenges of replacing LIBOR in the money market are less daunting than in other credit markets. Short-term, LIBOR-based securities purchased by money market funds will have largely matured, or reached their final reset, by the practical year-end 2021 deadline, eliminating many of the difficulties inherent in the transition. Short-term, SOFR-based securities have already been issued by government agencies and are increasingly being issued by banks, supranational organizations, and insurance companies.

Two challenges have yet to be fully resolved. First, while LIBOR rates include a term structure of seven maturities, ranging from overnight to one year, SOFR is strictly an overnight rate. So, a SOFR term structure will need to be implemented. Second, because LIBOR is based on unsecured transactions, it reflects the credit risk of the borrower. In contrast, SOFR is secured by US Treasuries, so this rate does not incorporate a credit risk component.

These two issues are being addressed by industry groups, and a number of solutions are being considered. The term structure challenge could be resolved by the development of a SOFR futures market. SOFR futures have been traded on the Chicago Mercantile Exchange since 2018, so this may offer a realistic solution.

As for the credit-risk component, the New York Federal Reserve has created the Credit Sensitivity Group to examine this issue. Currently, market participants build in a credit element themselves, adjusting the spread at which they choose to purchase SOFR-based securities.

Using another index as an alternative to LIBOR could also resolve these two challenges. Two possible alternatives are Ameribor and the ICE Bank Yield Index. Unlike LIBOR, they are entirely transaction-based. However, similar to LIBOR, they include a term structure. In addition, because they are based on unsecured transactions, they also reflect credit risk.

In this paper, we will outline the issues, summarize what has been done to address them, and discuss solutions that are still being considered.

Why LIBOR Is Being Replaced?
Globalization of financial markets in the 1980s created a need for a reference interest rate to help standardize financial contracts in a variety of markets. LIBOR, which is currently based on a daily survey of 16 banks regarding the rate at which they can borrow from other banks, quickly caught on. Originally published daily in five currencies, LIBOR rates covered seven maturities: overnight, one week, and one, two, three, six, and twelve months.

Today, LIBOR serves as the basis for financial contracts worth approximately $200 trillion. These include derivatives such as interest rate swaps, currency swaps, and futures as well as floating-rate loans, adjustable-rate mortgages, and securitizations.

What’s Changed?
Banks are more aware of the risks associated with unsecured lending to other banks since the global financial crisis. This, combined with new regulations that require banks to maintain more capital to absorb potential losses, means that they no longer fund themselves in the short-term market to the degree they may have historically.

As a result, the demand for the number of transactions that form the basis for LIBOR has dwindled, making it less robust and more dependent on the estimates of a handful of experts and therefore more vulnerable to manipulation. International standards require that financial benchmarks be based upon transactions in transparent, widely traded markets. As a result of these factors, LIBOR will be phased out, and starting in 2022, banks will no longer be required to submit their daily LIBOR estimates.

How Is the Transition Being Managed?
The US Federal Reserve and other central banks created working groups to develop a reference rate to replace LIBOR. In the US, this group is the Alternative Reference Rate Committee (ARRC), which consists of private-sector, financial market participants.
Progress and Remaining Challenges

For the money market fund industry, the transition from LIBOR to SOFR will be relatively easy. This is in part because money market funds typically do not invest in derivatives such as interest rate or currency swaps, which rely heavily on LIBOR.

More important, because money market instruments mature in 397 days or less, floating rate holdings within money market funds will be tied to other reference rates (with the exception of agency or treasury floating rate notes which can be out to two years), including SOFR, the Overnight Bank Funding Rate (OBFR), Treasury bill rates, and the SIFMA Index, by the time LIBOR comes to an end. SOFR-based securities have been available in the market since 2018, and issuance and holdings continue to grow substantially. This eliminates complications confronting other credit markets.

As of late 2020, SOFR-based debt outstanding totaled over $500 billion. While most of this issuance has come from federal agencies, some banks, supranational organizations, and insurance companies are also incorporating the new rate into their debt offerings (see figure 2).

Comparing LIBOR to SOFR

In the US, the ARRC recommends that LIBOR be replaced by SOFR. SOFR, which has been published since April 2018, is based on overnight lending rates in the repurchase (repo) market. SOFR is a composite of three repo rates:

1. Tri-party repo rates (collected by BNY Mellon),
2. General collateral repo rates, and

The repo market also includes term repo, which can include maturities of up to a few months. While trading volumes in the overnight repo market are large, the term market is much smaller. Furthermore, according to international standards for financial benchmarks, the number of transactions is too small to serve as the basis for a SOFR term structure.\(^2\)

Like LIBOR, SOFR is published each business day. In addition, the New York Federal Reserve publishes a compounded average of SOFR, based on the trailing 30-, 60-, and 180-day rates. The Fed also publishes a SOFR Index that indicates the cumulative compounding impact of SOFR.

SOFR improves on LIBOR in three ways:

1. **Fully transaction-based:** SOFR is derived from the large, active, and well-defined overnight repo market. This market’s depth, with approximately $1 trillion in daily transactions, makes it difficult to manipulate or influence.
2. **Transparency:** SOFR is produced in a transparent, direct manner and is based on observable transactions rather than depending upon expert judgment or financial models.
3. **Robustness:** SOFR is derived from a market that was able to weather the global financial crisis and that the ARRC believes will be sustainable throughout a wide range of market conditions (see figure 1).

FIGURE 1: LIBOR VS. SOFR

<table>
<thead>
<tr>
<th>LIBOR</th>
<th>SOFR</th>
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<tr>
<td>Unsecured</td>
<td>Secured by US Treasuries</td>
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<tr>
<td>Based on transactions and expert estimates</td>
<td>Based only on transactions</td>
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<tr>
<td>Seven maturities (overnight to one year)</td>
<td>Overnight rate only, currently no term structure</td>
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<tr>
<td>Reflects credit risk</td>
<td>Reflects little or no credit risk</td>
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</tbody>
</table>

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FIGURE 2: SOFR-BASED DEBT OUTSTANDING HAS SURGED

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<td>GSEs*</td>
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<td>87%</td>
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<td>Banks</td>
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<tr>
<td>Supranationals</td>
<td>3%</td>
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<td>Insurance</td>
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<td>Other</td>
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* Government-Sponsored Enterprise.
Source: Bloomberg and Insight Investment Management.

\(^1\) General collateral is made up of liquid assets that are similar in quality. It includes Treasury bills, notes, bonds, and TIPS as well as other securities issued by government-sponsored enterprises.

\(^2\) User’s Guide to SOFR, the Alternative Reference Rates Committee, April 2019.
Although the SOFR transition will be relatively easy for money market funds, it presents some challenges, including:

1 **Technical Issues:** Accounting and trading systems will have to be modified. BNY Mellon has largely addressed this challenge, and necessary modifications will be complete by year-end 2020.

2 **Term Structure:** Unlike LIBOR, which has a term component for setting interest rates one, three, six, and twelve months out, the new SOFR rate is only an overnight rate. So, a term structure is lacking at this point.

3 **Credit Risk Component:** LIBOR reflects interest rates negotiated on unsecured borrowing among major banks. It therefore reflects in part the creditworthiness of the borrower. SOFR is based on transactions secured by Treasuries and other high-quality collateral, which removes any credit risk. Interest rates on SOFR-based securities will need to incorporate an adjustment that reflects credit risk and makes SOFR comparable to LIBOR.

**A Term Structure**

Since SOFR is an overnight lending rate, there is currently no term structure, or yield curve, that would serve as a reference for the interest rates on maturities that are longer. A term structure is important because it indicates what investors expect interest rates to be in the future. In addition, many securities are based on one-, three-, six-, and twelve-month points on the curve.

Because there is no term cash market with enough depth to form the basis of a robust, transactions-based rate that could serve as the basis for a SOFR yield curve, the ARRC has suggested that a term structure could be developed from SOFR derivatives. The markets for these derivatives have developed quickly, and the ARRC believes “[t]he reasonable expectation is that they would be sufficiently liquid and robust to construct a forward-looking term rate...” In fact, major exchanges have begun offering futures and swaps in recent years. The Chicago Mercantile Exchange (CME) started offering one- and three-month futures in May 2018, and trading volumes have grown substantially.

**A Credit Risk Component**

Because Treasuries and other securities that are used as collateral in the repo market are considered risk-free or nearly so, SOFR does not include a spread component that reflects credit risk. Adding a credit component is an issue that industry observers are concerned about, and it’s not clear yet how this will be resolved. The New York Federal Reserve has convened a Credit Sensitivity Group that is examining how a credit spread could be developed. It is worth noting that with SOFR, the manner by which investors build in a credit element is by adjusting the spread. In fact, major exchanges have begun offering futures and swaps in recent years. The Chicago Mercantile Exchange (CME) started offering one- and three-month futures in May 2018, and trading volumes have grown substantially.

One solution to both the term structure and credit component challenges could come from other indices. Two possible alternatives are Ameribor and the ICE Bank Yield Index. Unlike LIBOR, they are entirely transaction-based and a term structure is available. In addition, because they are based on unsecured transactions, they also reflect credit risk. Ameribor is based on nearly $1 trillion in interbank transactions among regional and community banks. The Bank Yield Index, designed by Intercontinental Exchange (ICE), is still being tested.

For these indexes to be adopted, credit ratings agencies would have to give their approval, and for this to happen, trading volumes in issues linked to these rates would have to increase. In turn, for trading volumes to increase, issuers would have to begin issuing debt linked to these indices. These indices may become a viable option, but at this point, trading volumes appear to be insufficient (see figure 3).

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**FIGURE 3: DAILY TRADING VOLUMES IN CME SOFR FUTURES HAVE SOARED**


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What to Expect in 2021

BNY Mellon is moving ahead on the assumption that the practical deadline will arrive as scheduled. Regarding the technical challenges, the modification of our trading and accounting systems will be complete by 2020 year-end. As for the term structure and credit component issues, we will continue to monitor the developments in the public and private sector and advocate for suitable solutions.

Transition Challenges that Will not Affect Money Market Funds

- Short-term, LIBOR-based securities purchased by money market funds will have largely either matured or set its final coupon by the year-end 2021 deadline, eliminating many of the difficulties inherent in the transition.
- The move from LIBOR to SOFR will affect the value of derivative positions. Money market funds, which are considered “safe” investment vehicles, are subject to Rule 2a-7, which prohibits the use of derivative instruments.
- Prior to the December 31, 2021 deadline, floating-rate notes and other investment vehicles still outstanding will have to add “fallback language” to their contracts to address the transition from LIBOR to SOFR as the new reference rate. In the money market industry, this will likely not be necessary because SOFR-based securities will gradually replace LIBOR-based securities that will mature prior to the deadline.
- Because SOFR differs from LIBOR, the transition to SOFR may affect the value of LIBOR-based holdings. This could make it necessary to track an alternative rate to LIBOR to recalculate the value of securities upon LIBOR’s cessation.

Learn More

For further information, call your Dreyfus Cash Solutions Representative, or call 1-800-346-3621.

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