Federal Financial Institutions Examination Council

INDUSTRY OUTREACH

LIBOR & Alternative Reference Rates

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[1]Board of Governors of the Federal Reserve System, Bureau of Consumer Financial Protection, Federal Deposit Insurance Corporation, Office of the Comptroller of the Currency, National Credit Union Administration, and State Liaison Committee.

The Goals of Today's Session

Note: This session is for information only. It is not regulatory guidance.

- Describe what is happening with the LIBOR rates.
- Articulate the risks associated with the likely permanent discontinuation of LIBOR.
- Inform financial institutions that FFIEC member agencies have not issued rules or regulations related to LIBOR.
- Provide financial institutions with information to consider in developing plans for addressing risks arising from the potential discontinuation of LIBOR.

What is LIBOR?

- LIBOR is an interest rate benchmark that is intended to reflect the cost at which globally-active banks can borrow on an unsecured basis in wholesale markets for a given maturity, in a given currency.

- The LIBOR benchmark rate is calculated and published daily for five currencies and seven maturities.

<table>
<tr><th>Currency</th><th>Maturity</th></tr>
<tr><td>U.S. dollar (USD)</td><td rowspan="5">Overnight
1 week
1 month
2 months
3 months
6 months
12 months</td></tr>
<tr><td>Great Britain Pound</td></tr>
<tr><td>Japanese Yen</td></tr>
<tr><td>Swiss Franc</td></tr>
<tr><td>Euro</td></tr>
</table>

- USD LIBOR is estimated to be referenced in approximately $200 trillion worth of financial contracts.

Estimated USD LIBOR Market Footprint by Asset Class[1]

Broad Category	Product Category	Volume (Trillions of USD)	Share Maturing by End of 2021
Over-the-Counter Derivatives	Interest rate swaps	81	66%
	Forward rate agreements	34	100%
	Interest rate options	12	65%
	Cross currency swaps	18	88%
Exchange Traded Derivatives	Interest rate options	34	99%
	Interest rate futures	11	99%
Total Derivatives Exposure		**190**	
Bonds	Floating/Variable Rate Notes	1.8	84%
Securitizations	Mortgage-backed Securities (include. CMOs)	1	57%
	Collateralized loan obligations	0.4	26%
	Asset-backed securities	0.2	55%
	Collateralized debt obligations	0.2	48%
Business Loans[2]	Syndicated loans	1.5	83%
	Nonsyndicated business loans	0.8	86%
	Nonsyndicated CRE/Commercial mortgages	1.1	83%
Consumer Loans	Retail mortgages[3]	1.2	57%
	Other Consumer loans	0.1	
Total USD LIBOR Exposure		**199**	**82%**

[1] Source: Federal Reserve staff calculations, BIS, Bloomberg, CME, DTCC, Federal Reserve Financial Accounts of the United States, G. 19, Shared National Credit, Y-14 data, and JPMorgan Chase. Data are gross notional exposures as of year-end 2016. [2] The figures for syndicated and corporate business loans do not include undrawn lines. Nonsyndicated business loans exclude commercial real estate (CRE)/commercial mortgage loans. [3] Estimated maturities are based on historical prepayment rates.

The Challenges of LIBOR as a Major Reference Rate

- Following the global financial crisis, LIBOR has been increasingly based on the expert judgment of the panel banks due to the decline in unsecured, wholesale borrowings.

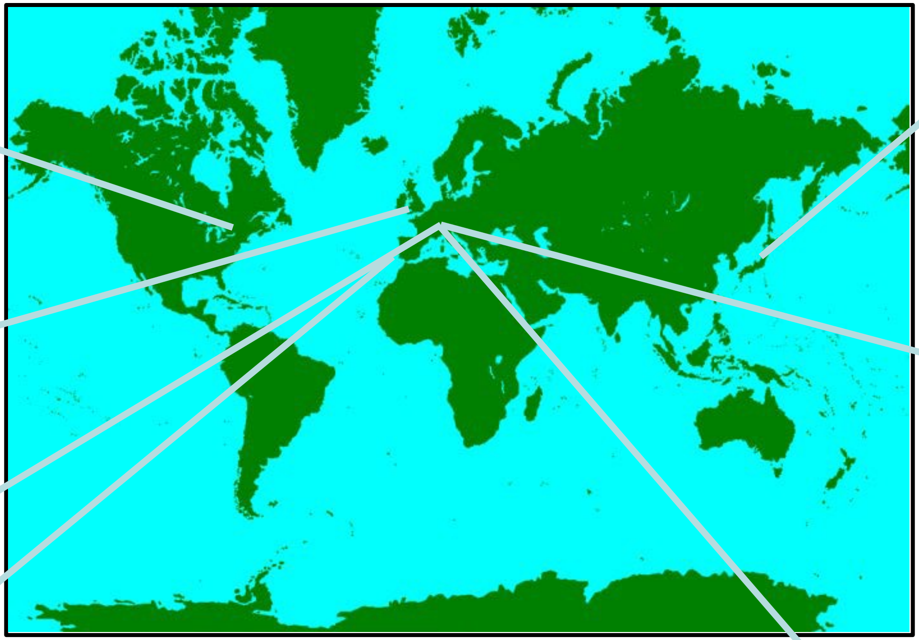
- The weaknesses in LIBOR, coupled with the large volume of contracts referencing these rates, has resulted in systemic risk concerns.

- Panel banks are growing more reluctant to contribute quotes due to liability concerns. According to the United Kingdom's Financial Conduct Authority (FCA), current panel banks agreed to voluntarily support LIBOR through the end of 2021.

- LIBOR may continue after 2021, but there is no guarantee that LIBOR publication will still be available after that date.

International Developments

Alternative Reference Rates Committee (ARRC): Established in 2014 by the Federal Reserve to identify an alternative USD benchmark rate



Japan: Study Group on Risk-Free Reference Rates

International Organization of Securities Commissions: Issued Principles for Financial Benchmarks

United Kingdom: Working Group on Sterling Risk-Free Reference Rates (SONIA)

Switzerland: National Working Group on Swiss Franc Reference Rates (SARON)

European Union: Industry led working group set up by the European Central Bank, European Securities and Markets Authority, European Commission and Financial Services and Markets Authority (ESTER)

Financial Stability Board (FSB) formed two groups.

- The Official Sector Steering Group, a public sector group, issued recommendations in 2014 for strengthening the interbank offer rates and identifying alternative rates.
- The Market Participants Group, a private sector group, evaluated the feasibility of alternative reference rates and identified transition paths and related issues (report issued in 2014).

Alternative Reference Rates Committee (ARRC)

- Financial Stability Oversight Council's 2014 annual report recommended regulators and market participants work together on alternative USD benchmarks.

- The ARRC was convened in November 2014 by the Federal Reserve to:
  - Identify one or more alternative USD reference rates that both fit the needs of the market and meet the standards of best practice
  - Develop a transition plan for the voluntary adoption of these rates
  - Identify best practices for contract robustness
  - Create an implementation plan with metrics of success and a timeline

- In 2017, the ARRC identified the Secured Overnight Financing Rate (SOFR) as its preferred alternative to USD LIBOR and the ARRC is encouraging market participants to adopt SOFR and build liquidity in derivative products that reference SOFR.

Secured Overnight Financing Rate (SOFR)

- The ARRC has recommended SOFR and has been promoting the voluntary adoption of SOFR, but financial institutions are free to choose other alternatives.

- SOFR is a short term USD interest rate based on overnight treasury repo transactions.

- The Federal Reserve Bank of New York began publishing SOFR on April 3, 2018.

- SOFR is based on trade-level data from various segments of the repo market.

- Characteristics of SOFR:
  - Fully transaction-based and encompasses a robust underlying market ($700 billion daily volume reported in the Second Report of the ARRC issued March 2018).
  - Overnight, risk-free reference rate that correlates closely with other money market rates.

Impact on Derivatives

- LIBOR has been referenced in a wide variety of derivatives contracts for hedging, market making and other purposes.

- Without preparation, a cessation of LIBOR could cause considerable disruption.
  - Derivatives are not sufficiently robust to handle permanent discontinuance of LIBOR
  - Contractual fallback language states that if LIBOR is not available, parties must solicit quotes from major London banks (essentially create their own LIBOR).
  - Originally contemplated for short period of unavailability

- International Swaps and Derivatives Association (ISDA) has established working groups to define and implement a fallback methodology if LIBOR ceases to exist.

Typical Legal Contract Language for Cash Products

Product*	Typical Fallback Contract Language
Floating rate notes	Direct the calculation agent to first poll a sample of banks (similar to the ISDA fallback language) and then convert to fixed-rate at the last published value of LIBOR if quotes are not received.
Securitizations	Agency mortgage-backed securities allow Fannie Mae and Freddie Mac to name a successor rate if LIBOR is discontinued. Other securitizations would require a poll of banks and then convert to fixed-rate at the last published value of LIBOR if quotes are not received.
Business loans	Appears to name the Prime Rate or the Effective Federal Funds Rate plus a spread as the fallback if LIBOR is discontinued.
Retail mortgages	Gives the noteholder the ultimate authority to name a successor rate if LIBOR was discontinued, although it is unclear if the spread can be adjusted.
Other consumer products	May be more varied but thus far seem to have similar flexibility as retail mortgages.

Note: *Most legacy contracts will mature before 2021, but new contracts are being written daily.*

Transitioning From LIBOR

- Planning considerations will vary by institution based on the institution's exposure to LIBOR.

- Financial institutions that proactively assess their LIBOR exposures and review fallback language in the relevant documents should be better prepared for transitioning.

- The ARRC is working with the industry to draft more robust fallback contract language and has released several consultations.

- The ARRC and its various working groups will consider future challenges associated with the transition to a new reference rate, including:
  - Need for credit spreads (moving from an unsecured to a secured rate)
  - Need for a term structure
  - Building liquidity (voluntarily) in derivatives markets linked to SOFR

- The FFIEC member agencies are working to raise awareness and educate financial institutions and examiners.

Suggested Questions for Planning Process

- Which of my existing assets and liabilities (including off-balance sheet) reference a LIBOR rate?
- What contracts/loan agreements will I need to revise?
- What risk management system will I need to revise? For example, governance, compliance, internal controls systems (including information technology systems), accounting (including hedge accounting and valuation).
- What disclosures or communications with retail consumers will I need to provide?

Supervisory Matters

- None of the FFIEC member agencies have issued rules and regulations regarding transition from LIBOR.

- At this time, examiners are not examining financial institutions to assess LIBOR exposures or transition plans.

- Examiners may have discussions with institutions regarding their familiarity with the transition away from LIBOR to alternative rates and if they have started to consider the effects on their institutions.

Appendices

Membership of the ARRC

- AXA
- Bank of America
- BlackRock
- Citigroup
- CME Group
- Deutsche Bank
- Fannie Mae
- Freddie Mac
- GE Capital
- Goldman Sachs
- Government Finance Officers Association
- HSBC
- Intercontinental Exchange
- International Swaps and Derivatives Association
- JP Morgan Chase & Co.
- LCH Clearnet
- MetLife
- Morgan Stanley
- National Association of Corporate Treasurers
- Pacific Investment Management Company
- TD Bank
- Federal Home Loan Bank of New York
- Independent Community Bankers of America
- Loan Syndications and Trading Association
- Securities Industry and Financial Markets Association
- Wells Fargo
- World Bank Group

Ex Officio Members

- Board of Governors of the Federal Reserve System
- Bureau of Consumer Financial Protection
- Federal Deposit Insurance Corporation
- Federal Housing Finance Agency
- Federal Reserve Bank of New York
- Office of Financial Research
- Office of the Comptroller of the Currency
- U.S. Commodity Futures Trading Commission
- U.S. Securities and Exchange Commission
- U.S. Treasury Department

ARRC Paced Transition Plan

- SOFR futures (one-month and three-month contracts) launched on May 7; infrastructure for futures and/or Overnight Indexed Swaps (OIS) trading in SOFR is put in place by ARRC members.

- By end of 2018, trading begins in futures and/or bilateral, uncleared, OIS referencing SOFR.

- Trading began in cleared OIS that reference SOFR. (CME Group and LCH Clearnet have started offering SOFR OIS and basis swap clearing in Q3 2018)

- By end of 2021, a term reference rate based on SOFR derivatives is created.

Selected References

- ARRC Frequently Asked Questions: https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-Sept-20-2018-FAQ.pdf

- ARRC Website: https://www.newyorkfed.org/arrc/index.html

- Second Report of the ARRC (March 2018): https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2018/ARRC-Second-report

- Ask the Fed Webinar - LIBOR and Reference Rate Reform (log in required): https://www.webcaster4.com/Webcast/Page/584/26025

- LIBOR: Origins, Economics, Crisis, Scandal, and Reform Federal Reserve Bank of New York Staff Report (2014): https://www.newyorkfed.org/medialibrary/media/research/staff_reports/sr667.pdf