PIMCO

LIBOR Transition FAQ

London Interbank Offered Rate ("LIBOR") is a widely used benchmark for floating-rate and short-term investments. The index is administered by ICE Benchmark Administration ("IBA") and provides an indication of the average rate at which panel banks can obtain unsecured funding. As a consequence of the problems that arose with LIBOR during and after the global financial crisis, the U.K. Financial Conduct Authority ("FCA"), as primary regulator for the IBA, announced in July 2017 that it would eventually stop sustaining LIBOR through its influence and legal powers. Since then, market participants and policymakers have started work on transition plans and developed or identified alternative rates to LIBOR.

1. WHAT IS LIBOR AND WHY IS IT IMPORTANT?

- LIBOR provides an indication of the average interest rate that a bank estimates it would be charged by other banks for unsecured borrowing over a specified term.
- It is a widely used floating-rate benchmark index, which is utilized not only as a reference rate for a tremendous range of securities, derivatives and other instruments worldwide but also as a signal for market liquidity and changes in financial conditions.
- The rate is currently produced in five currencies (USD, GBP, CHF, EUR and JPY) and seven tenors (Overnight/Spot Next, 1 Week, 1 Month, 2 Months, 3 Months, 6 Months and 12 Months) based on submissions from a reference panel of 11 to 16 banks, depending on the particular currency.
- It is estimated that $223 trillion of financial contracts and securities are tied to USD LIBOR as of Q4 2020, according to the New York Fed Progress Report: The Transition from U.S. Dollar LIBOR (Source: https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/USD-LIBOR-transition-progress-report-mar-21.pdf).

2. WHY IS THE MARKET TRANSITIONING AWAY FROM LIBOR?

- Unsecured, wholesale borrowings by banks have declined since the global financial crisis. Thus, the market for pricing the underlying funding transactions represented by LIBOR is essentially nonexistent and submitted rates typically rely on "expert judgment" to determine funding rates. Trust in this judgment is crucial to markets that rely on LIBOR, and that trust was shaken in 2012 when several banks were accused of manipulating LIBOR.
- In response to concerns regarding the reliability and robustness of LIBOR and other reference rates across the globe, the Financial Stability Board ("FSB") and Financial Stability Oversight Council ("FSOC") called for the development of alternative "risk-free benchmark" rates supported by liquid and observable markets. In 2014, the FSB initiated efforts for global reform in reference rates, and in 2017 U.K. regulators (including the FCA) announced their intention to phase out LIBOR by 2021 after a transition to a new reference rate (or rates).

3. WHAT STEPS HAVE BEEN TAKEN TO REPLACE LIBOR IN THE MARKETPLACE?

- In 2014, the Federal Reserve System and the Federal Reserve Bank of New York established the Alternative Reference Rates Committee ("ARRC") to lead the transition away from LIBOR. The ARRC is a public/private partnership composed of representatives from investment banks, exchanges, trade associations, asset managers, corporate treasurers and regulatory agencies.

- The ARRC has selected the Secured Overnight Funding Rate ("SOFR") as the recommended alternative reference rate for the U.S. and continues to lead the transition from LIBOR to SOFR.
- Similarly, public/private working groups in jurisdictions outside of the U.S. have nominated alternative reference rates or overnight funding rates that reflect the majority of funding activity. For example, in the U.K., the unsecured Sterling Overnight Index Average ("SONIA") rate was selected to replace GBP LIBOR and is already experiencing robust derivative liquidity and market pricing.
- PIMCO is a participant in regulatory and industry working groups, including the ARRC, and will continue to participate and provide input in pursuit of an equitable transition process.
- The U.S. Securities and Exchange Commission's Office of Compliance Inspections and Examinations (OCIE) identified the preparedness of SEC-registered firms for the transition away from LIBOR as a priority for 2020. As such, OCIE announced it intends to assess registrants' preparations for LIBOR cessation and transition to alternative reference rates.
- The SEC also issued a risk alert regarding adviser preparedness for LIBOR transition on June 18, 2020. We believe PIMCO's current transition plan is consistent with the SEC's expectations that registrants assess and take steps to prepare for the expected discontinuation of LIBOR.
- The FCA has issued the formal announcement for the definitive cessation of LIBOR on the dates listed below:
  - To take effect after the publication of LIBOR on Friday December 31, 2021:
    - EUR LIBOR - all tenors (Overnight, 1 Week, 1, 2, 3, 6 and 12 Months)
    - CHF LIBOR - all tenors (Spot next, 1 Week, 1, 2, 3, 6 and 12 Months)
    - JPY LIBOR - all tenors (Spot next, 1 Week, 1, 2, 3, 6 and 12 Months)
    - GBP LIBOR - all tenors (Overnight, 1 Week, 1, 2, 3, 6 and 12 Months)
    - USD LIBOR - 1 Week and 2 Months
  - To take effect after the publication of LIBOR on Friday June 30, 2023:
    - USD LIBOR - Overnight and 1, 3, 6 and 12 Months
  - The announcement also triggered the setting of spread adjustments that will be applied to the coupons on securities that move to new reference rates upon the cessation of LIBOR. Please see a summary of those spread adjustments by currency and tenor below:

LIBOR Replacement Rate Spread Adjustments (%)

	USD SOFR	GBP SONIA	EUR ESTR	JPY TONA	CHF SARON
Overnight	0.01	(0.00)	0.00	(0.02)	(0.06)
1 Week	0.04	0.02	0.02	(0.02)	(0.07)
1 Month	0.11	0.03	0.05	(0.03)	(0.06)
2 Month	0.18	0.06	0.08	(0.00)	(0.02)
3 Month	0.26	0.12	0.10	0.01	0.00
6 Month	0.43	0.28	0.15	0.06	0.07
12 Month	0.72	0.46	0.30	0.17	0.20

= to be published until Jun 2023. All others ceasing at the end of Dec 2021

Currency	Reference Rate	Proposed Alternative Rate	Features	Working Group
USD	USD LIBOR	SOFR	Overnight, Secured	ARRC
Sterling	GBP LIBOR	Reformed SONIA	Overnight, Unsecured	Working Group on Sterling Risk-Free Rates
Swiss Franc	CHF LIBOR	SARON	Overnight, Secured	National Working Group on Swiss Franc Reference Rates
Japanese Yen	JPY LIBOR TIBOR	TONA	Overnight, Unsecured	Study Group on Risk-Free Reference Rates
Euro	EURIBOR Euro Over-Night Index Average ("EONIA")	€STR	Overnight, Unsecured	Working Group on Euro Risk-Free Rates

Source: International Swaps and Derivatives Association, http://assets.isda.org/media/ddcb20e0/76dd3ab8-pdf/

- On September 29, 2021, the FCA announced further arrangements for the orderly wind-down of LIBOR at the end of 2021. More specifically, for legacy contracts that reference the 1-, 3- and 6-month sterling and Japanese LIBOR settings, it will require the LIBOR benchmark administrator to publish these settings under a synthetic methodology, based on term risk-free rates for the duration of 2022. Additional information can be found in the following link: https://www.fca.org.uk/news/press-releases/further-arrangements-orderly-wind-down-libor-end-2021

4. WHAT PRODUCTS/INSTRUMENTS ARE MOST AFFECTED BY THE LIBOR TRANSITION?

- USD LIBOR is used in a large volume and broad range of financial products and the following assets comprise the majority of these: interest rate swaps, interest rate options, interest rate futures, forward rate agreements, cross currency swaps, syndicated loans, non-syndicated business loans, non-syndicated CRE/commercial mortgages, floating rate notes, mortgage-backed securities (MBS), collateralized loan obligations (CLO), asset-backed securities (ABS) and collateralized debt obligations (CDO). The following table, published by the ARRC, provides estimates of the respective footprint of each asset class across all USD LIBOR products as of Q4 2020:

USD LIBOR Market Footprint by Asset Class[1]

		Currently 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-backedSecurites (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 undrawn lines. Nonsyndicated business loans exclude CRE/commercial mortgage loans. 3 Estimated amounts maturing after June 2023 based on historical pre-payment rates

Source: https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/USD-LIBOR-transition-progress-report-mar-21.pdf

5. WHAT IS PIMCO'S VIEW ON THE LIBOR TRANSITION?

- Groundwork laid over the past several years supports market liquidity growth in alternative reference rates. We expect that market participants will increase utilization of these alternative benchmark rates and reduce reliance on LIBOR given the concerns regarding the size and frequency of transactions in the underlying market.

- PIMCO is supportive of market initiatives to establish alternative rates that are robust and representative of actual transactions. To truly replace LIBOR, the broader economy and the financial system need a standardized short-term reference rate to link personal, mortgage, and corporate debt. A standardized reference rate is essential to support efficient and transparent distribution of credit to the real economy through consumer and corporate credit.

- While SOFR has been established as the replacement for LIBOR in the U.S., progress on the transition has been slow. Issuance of SOFR-linked debt has largely been limited to financial firms, with the first corporate deals emerging in 2021 and no sovereign offerings. In addition, U.S. agency issuance has been gradually declining, while derivative volumes have only moderately increased.

- We think that if the U.S. Treasury starts issuing floating-rate notes based on SOFR, this would lend credibility to the new reference rate, as well as foster needed growth in the trading of SOFR-linked debt and derivatives. It would also expand the options available to address both U.S. borrowing needs and investor demand for floating-rate instruments.

- The Treasury could encourage the standardization of SOFR with any inaugural issuance. Expanded usage of notes that reference SOFR will help improve investor confidence, deepen the market, and enable better price discovery for instruments based on this rate, all key steps along any path toward more universal adoption.

- We believe that there needs to be clear requirements for any benchmark for markets to successfully move away from LIBOR. Those include the following:

  – The benchmark cannot be manipulated

  – The benchmark must be able to be modeled and analyzed

  – The benchmark must be executable in depth

  – An active derivative market must exist

- The Euro area will keep the reference rate duality, while other jurisdictions collapse term and overnight rates into their new risk-free rates. That is the key difference between Europe and the rest of the world, and the reason why in Europe we expect the transition to be a lot more seamless (because essentially the old rates continue to exist).

- For more information on PIMCO's views, please see the following publications:

  – 2017 LIBOR Viewpoint

  – 2018 LIBOR Viewpoint

  – The Future Without LIBOR, Part I: Transition Framework for Derivatives

  – The Future Without LIBOR, Part II: How Will Non-Derivative Markets Transition to Alternative Rates?

  – Treasury Issuance Could Aid Adoption of SOFR Benchmark

  – Short-Term Reference Rates at a Crossroads

  – Leveraged Loan Issuers: Just Do It (Transition to SOFR)

6. WHAT IS PIMCO DOING TO PREPARE FOR THE TRANSITION MORE BROADLY?

- PIMCO has organized internal working groups from various functional areas to assess the impact of a discontinuation of LIBOR indices on security holdings and to develop a transition plan. These groups include representation from Portfolio Management, Risk, Analytics, Product Strategy, Client Management, Legal, Compliance, Operations, Technology and Tax/Accounting and are governed by a LIBOR Transition Program Management team, which is overseen by a Steering Committee of senior members of the firm to coordinate efforts across the organization.

- In addition, PIMCO is a member and participant in official sector working groups, including the ARRC in the U.S., ICMA's RFR Bond Market Sub-Group in the UK, ECB Cash products and derivatives Subgroup in Europe, as well as ISDA.

- PIMCO has identified and aggregated existing LIBOR exposure across the firm:

  – For exposures related to cash products:

- For existing securities, specialist PMs have engaged in a review of fallback language and performed sensitivity analysis for LIBOR setting equal to prior level (convert to fixed) and converting to an alternative reference rate plus a spread.
- For new securities, specialist PMs will review and disclose fallback language to the broader Portfolio Management team when recommending investments in these new securities.
- Continued engagement with the industry on potential solutions for legacy cash market.

– For exposures related to derivative contracts:

- Engagement with CCPs (e.g., LCH, CME) on implementing switches to SOFR-based valuations for all USD-denominated swap exposures.
- PIMCO adhered to the IBOR Fallbacks Protocol and IBOR Fallbacks Supplement published by ISDA and applicable to ISDA master agreements.
- The IBOR Fallbacks Protocol will have the effect of incorporating fallback language into legacy LIBOR-based derivatives contracts in anticipation of LIBOR's cessation for adhering counterparties.
- The IBOR Fallbacks Supplement will result in incorporation of the fallbacks in all new bilateral derivatives trades (e.g. interest rate swaps) executed after January 25, 2021.
- For legacy bilateral derivatives trades (i.e. executed prior to January 25, 2021), fallback language will follow the IBOR Fallbacks Supplement provided that both parties of the trade have adhered to the ISDA Protocol. Except where PIMCO and a client have expressly agreed to the contrary, PIMCO has adhered to the ISDA Protocol on behalf of all clients that trade pursuant to PIMCO's ISDA Master Agreements and a list all parties is available: https://www.isda.org/protocol/isda-2020-ibor-fallbacks-protocol/adhering-parties
- PIMCO has executed futures and swap trades on the alternative reference rates including SOFR and SONIA.

7. WHAT ARE THE GREATEST RISKS IN THE MARKET TRANSITION AWAY FROM LIBOR?

- In PIMCO's view, one of the greatest risks in the market transition away from LIBOR concerns non-derivative legacy securities or loans. These securities include agency adjustable-rate mortgages, asset-backed securities, mortgage-backed securities such as collateralized mortgage obligations, and collateralized debt obligations and corporate floating-rate notes.
- Many of these instruments do not provide adequate fallback provisions, while others articulate inadequate fallback provisions in their indentures, as they may present the risk of material changes in valuation or functioning of the securities given that those indentures do not contemplate the transitioning to the new reference rates. For example, certain floating rate notes set the coupon equal to the last available LIBOR print, which effectively toggles the security in question from a floating to a fixed-rated obligation.
- Broadly speaking, we see four categories of fallback provisions in legacy contracts:

  1. Converting to a fixed-rate obligation by setting the floating rate equal to a rate available in the preceding period;
  2. Providing determination agent discretion to estimate LIBOR with comparable sources;
  3. Allowing the determination agent flexibility to switch to a successor or alternative rate and
  4. Not providing explicit detail on how the security will perform if LIBOR is not readily available.

- Each of these categories present potential disadvantages in addressing a permanent LIBOR discontinuation, and it is generally impractical to amend the terms of legacy securities' contracts that require the consent of the holders of those securities.
- Some market participants are also concerned about the liquidity of the SOFR-linked market, given that this is a relatively new reference rate. While SOFR-linked transaction volumes have increased, as outlined in questions 9 and 11, the overall liquidity of this market may not yet be sufficient to ensure a seamless transition from U.S. LIBOR to SOFR.

8. WHAT IS PIMCO DOING TO MITIGATE RISK OR MINIMIZE THE IMPACT OF A LIBOR TRANSITION ACROSS CLIENT PORTFOLIOS?

- PIMCO's PM teams review existing portfolio holdings to uncover any legacy language that may impact market liquidity and valuations as the market gradually transitions from LIBOR to SOFR/SONIA/€STR.
- PIMCO reviews fallback language when recommending or transacting in those instruments.
- With respect to derivatives, PIMCO adhered to the ISDA Protocol on behalf of all clients that trade pursuant to PIMCO's ISDA Master Agreements (except as expressly agreed to the contrary with a client). Accordingly, generally all legacy derivative transactions entered into pursuant to PIMCO's ISDA Master Agreements prior to the Protocol Effective Date of January 25, 2021 will incorporate the ISDA fallback provisions, and all new transactions entered into after this date will reference the ISDA fallbacks through the new ISDA definitions. For reference, PIMCO's adherence letter can be found here: https://www.isda.org/protocol-adherence/313087/.

9. WHAT IS SOFR?

- In the U.S., SOFR is a broad measure of the cost of borrowing cash overnight collateralized by U.S. Treasury securities. It is based on the overnight repo markets, which have ~ $900 billion of daily transaction volume. Publication of the SOFR rate began in April 2018.
- SOFR is calculated as a volume-weighted median of transaction level tri-party repo data, GCF Repo transaction data and data on bilateral Treasury repo transactions cleared through Fixed Income Clearing Corp ("FICC") DVP service (from DTCC Solutions). SOFR is published each business day, reflecting the prior day repo rate, on the Federal Reserve Bank of New York's website.
- The Chicago Mercantile Exchange ("CME") launched futures contracts based on the SOFR rate in May 2018, and shortly thereafter, central counterparties ("CCPs") began accepting overnight index and basis swaps for central clearing. The CME launched options on the 3-month SOFR futures contract in January 2020.
- As part of the ARRC transition plan, and in order to facilitate the transition of certain cash products away from LIBOR, the ARRC intends to develop a forward-looking term SOFR rate based on the SOFR derivative market.

10. HOW DOES USD LIBOR DIFFER FROM SOFR?

- SOFR is fully transaction-based (does not rely on expert judgment) and therefore is regarded as more robust than any tenor of LIBOR. However, SOFR and LIBOR differ in many other key characteristics as summarized in the following table.
- LIBOR is a forward-looking term rate, while SOFR is an overnight rate published with a one-day lag. Issuance of SOFR bonds has linked the overnight rates over the interest period via a simple average or compounded average of the overnight rate. The applicable interest is therefore not known until the end of the interest period ("in arrears"). To address market concerns regarding this methodology, the ARRC was able to recommend that in limited cases using term SOFR- a forward looking rate based on expectations for what SOFR will be over the relevant time period- would be appropriate.

SOFR	LIBOR
Overnight rate (published in arrears); Federal Reserve Bank of NY publishes 30, 90, 180 day SOFR Averages and a SOFR Index; Forward expectations of SOFR may be traded via futures market and OIS swaps	Forward looking term rate
Secured (collateralized by Treasuries)	Unsecured bank financing rate
Calculated by Federal Reserve Bank of NY	Calculated by ICE Benchmark Administration
Transaction-based	Based on submissions from Contributor Banks, that are determined by transaction data-driven waterfall methodology
~$900 Billion in daily transactions (USD repos)	~$500 Million in daily transactions

Source: SIFMA Insights: Secured Overnight Financing Rate (SOFR) Primer.
https://www.newyorkfed.org/markets/reference-rates/sofr
https://www.newyorkfed.org/arrc/sofr-transition

- A key difference between SOFR and LIBOR relates to credit risk. Specifically, SOFR is conceived of as a "risk-free" rate that measures the cost of borrowing cash overnight collateralized by U.S. Treasury securities using Treasury repurchase agreement (repo) market data. LIBOR is an estimate of the average interest rate banks would charge another bank for an unsecured loan over a particular period.
- SOFR issued bonds have utilized different conventions in the approach to linking overnight rates to a term rate applicable for an interest period. Different approaches have been

utilized to shift observation periods or lockout the rate at the end of the period in order to address operational constraints in calculating interest amounts. Overnight repo markets, and as a result SOFR, may exhibit volatility due to various technical factors.

- Securities with standardized fallback language will see a switch to SOFR from LIBOR in the US when it is discontinued and will also see as a spread adjustment applied to SOFR. For securities that referenced 1 Month and 3 month USD LIBOR, the adjustment will be +11 and +26 basis points respectively. Similarly, 3 month GBP LIBOR securities will see an adjustment of +12 basis points upon conversion to SONIA.

11. WHAT IS THE CURRENT MARKET FOR SOFR?

- Since SOFR's publication, approximately $1,049 billion notional in floating rate instruments tied to SOFR have been issued, with over $501 billion outstanding notional at June 2021 month-end. https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/20210803-arrc-newsletter-june-july-2021-final
- Issuance of SOFR-linked products has ebbed over time, although the overall volume has steadily increased. Volumes of related derivatives, however, have been less than robust. LIBOR remains the prevalent benchmark rate in markets for derivatives such as futures, options, and interest rate swaps.
- Institutions have hesitated to be early adopters in a nascent SOFR market that lacks the broad-based liquidity of LIBOR-linked instruments. The longer they wait, the greater the risk that rival standards could take root, potentially splitting the market. Alternatives such as Ameribor and the Bloomberg Short-Term Bank Yield Index received attention in April 2021 as potential challengers to SOFR.
- However, on July 29, 2021, the ARRC formally recommended CME Group's forward-looking SOFR term rates after the CFTC adopted the SOFR First convention on July 13. SOFR First is a phased initiative for switching trading conventions from LIBOR to SOFR for USD swaps and other derivatives. The ARRC's formal recommendation of SOFR Term Rates is a major milestone in the transition away from USD LIBOR and should help accelerate the progress toward SOFR based derivatives (Source: https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/ARRC_Press_Release_Term_SOFR.pdf)
- PIMCO believes that greater liquidity (i.e., higher trading volumes) in the SOFR-indexed derivative market is a necessary pre-condition for greater issuance in larger and longer-maturity corporate floating-rate debt, and for an expanded use of the rate in other products such as loans, mortgages and other consumer products. In addition, more issuers (both financial and nonfinancial) utilizing SOFR more frequently as a viable index will be an indication of meaningful progress toward widespread market adoption of SOFR.

As of 30 June 2021

Source: CME Group, LCH, ICE **Note:** Cleared SOFR swaps figures represent one side of each transaction (single-sided)

12. HOW DOES SOFR COMPARE TO U.S. T-BILL RATES?

SOFR	T-Bills
Overnight rate (published in arrears); Federal Reserve Bank of NY publishes 30, 90, 180 day SOFR Averages and a SOFR Index; Forward expectations of SOFR may be traded via futures market and OIS swaps	Short-term U.S. government debt backed by the U.S. Treasury with maturity of 1yr or less; Liquid primary and secondary market for buying and selling Treasury Bills
Secured (collateralized by Treasuries)	US Treasury collateral
Calculated by NY Federal Reserve	3-month T-bill index calculated by ICE and FTSE
Transaction-based	Transaction-based
~$900 Billion in daily transactions	~$150 Billion in daily transactions

Source: https://www.newyorkfed.org/markets/counterparties/primary-dealers-statistics & https://www.newyorkfed.org/markets/reference-rates/sofr

13. WHAT ARE THE KEY FACTS ABOUT OTHER ALTERNATIVE CREDIT SENSITIVE RATES (CSRS) THAT HAVE EMERGED, SUCH AS THE BLOOMBERG SHORT-TERM BANK YIELD INDEX (BSBY) AND AMERIBOR?

- BSBY and Ameribor are similar to LIBOR in that they represent term rates which are not government guaranteed, and therefore have a credit component.
- BSBY is a Bloomberg developed term index based on a series of fitted regression to both traded and posted money market levels for each tenor (o/n, 1, 3, 6, 12 months). Ameribor reflects the borrowing costs of small and medium sized banks based on transactions done on the American Financial Exchange.
- Regulators are critical of credit sensitive rates due to their small market size, which offers the potential for manipulation. This was the rationale for the discontinuation of LIBOR. They are also concerned with the potential fragility of the money markets that underpin BSBY.
- Both BSBY and Ameribor currently have a limited derivatives market and negligible issuance volumes.
- Market participants are also concerned with the potential confusion of multiple reference rates. If issuers utilize a series of CSRs in addition to SOFR, the loan market will likely have difficulty monitoring and settling varied reference rates, particularly for CLOs that represent a large majority of loan demand.
- Forward Looking Term SOFR is designed to help meet the needs of market participants that must have a term rate known in advance. SOFR is a broad measure of the cost of borrowing cash overnight collateralized by Treasury securities, representing trillions of notional debt.

14. WHAT IS SONIA?

- Sterling Overnight Index Average ("SONIA") is based on actual transactions and reflects the average of the interest rates that banks pay to borrow sterling overnight from other financial institutions.
- Introduced in 1997, Bank of England took responsibility of SONIA in 2016 and, after consultation, reformed it in 2018.

15. HOW DOES LIBOR DIFFER FROM SONIA?

- LIBOR is calculated to reflect bank credit risk, therefore, the rate for each of the seven different time periods for which LIBOR is available reflect the banks' credit risk associated with that time period (i.e., 3-month LIBOR could generally be expected to be lower than 6-month LIBOR, which in turn would be expected to be lower than 12-month LIBOR, etc.). Also, LIBOR embeds a liquidity premium (for longer dated funds).
- SONIA, by contrast, does not look at future periods of time and so is an almost entirely "risk-free rate". SONIA is calculated on actual transactions that have taken place the day before.

SONIA	LIBOR
Overnight rate (backward-looking)	Forward looking term rate
Unsecured	Unsecured bank financing rate
Calculated by the Bank of England	Calculated by ICE Benchmark Administration
No term structure	Term structure

Source: https://www.bankofengland.co.uk/markets/sonia-benchmark

16. WHAT IS THE CURRENT MARKET FOR SONIA?

- SONIA is used to value approximately £30 trillion of assets each year according to the Bank of England ("BoE") (https://www.bankofengland.co.uk/markets/sonia-benchmark).

- By Q2 2020, the value of transactions underpinning SONIA was approximately £60 billion per day according to the Bank of England.
- According to PWC and Bloomberg, there has been nearly £80 billion of cumulative SONIA Floating Rate Note issuance since January 2019 (https://www.pwc.com/us/en/industries/financial-services/library/pdf/pwc-libor-transition-market-update-americas-june-1-15.pdf)

17. HOW IS THE TRANSITION TO SONIA PROGRESSING?

- The BoE, the FCA and the Working Group on Sterling Risk-Free Reference Rates ("RFRWG") continue to press ahead to transition to SONIA by the end of 2021.
- An update to the RFRWG's priorities and roadmap was published in January 2021 (https://www.bankofengland.co.uk/-/media/boe/files/markets/benchmarks/rfr/rfr-working-group-roadmap.pdf) outlining the key steps and milestones towards LIBOR Transition. Some of the key milestones are:
  - Cease initiation of GBP LIBOR-linked loans, bonds, securitizations and linear derivatives that expire after the end of 2021 by end Q1.
  - Cease initiation of new GBP LIBOR-linked non-linear derivatives that expire after the end-Q2 2021.
  - Continue to progress active conversion of all legacy GBP LIBOR contracts where viable to completion by end Q3 2021.

18. WHAT IS €STR?

- EONIA in its previous form was deemed non-complaint given the lack of underlying transactions and the European Money Market Institute ("EMMI") announced that it would stop publishing EONIA on January 3, 2022. As a result, after a public consultation, on March 14, 2019 the working group on Euro risk-free rates recommended the €STR as its replacement and established a transition period until EONIA will be discontinued.
- The €STR reflects the wholesale euro unsecured overnight borrowing costs of banks located in the Euro area. The €STR is published on each TARGET2 business day based on transactions conducted and settled on the previous TARGET2 business day which are deemed to have been executed at arm's length and thus reflect market rates in an unbiased way.
- The €STR was published for the first time on October 2, 2019 and it is based entirely on daily confidential statistical information relating to money market transactions collected in compliance with the Money Market Statistical Reporting Regulation ("MMSR"). The MMSR sample currently covers the 50 largest banks in the Euro area in terms of balance sheet.
- The €STR is governed by the €STR Guideline which establishes the European Central Bank's ("ECB") responsibility for the administration and oversight of the €STR and the tasks and responsibilities of the ECB and Eurosystem national central banks with respect to their contribution to the €STR determination process and related procedures.
- During the transition phase, the EONIA methodology has been redefined as the €STR plus a fixed spread, calculated using the methodology adopted by the EMMI as the difference between the underlying interest rate of the EONIA and the pre-€STR using daily data from April 17, 2018 to April 16, 2019. The ECB has calculated this spread as 0.085% (8.5 basis points).
- On January 3, 2022 the EONIA publication will be discontinued and will be replaced by €STR.
- The working group on Euro risk-free rates is recommending to market participants to gradually replace the EONIA with the €STR for all products and contracts, making the €STR their standard reference rate.

19. DO WE EXPECT ANY CHANGES TO EURIBOR?

- EURIBOR, the predominant risk-free rate in Europe, is expected to continue to exist for the foreseeable future. The administrator for EURIBOR is the EMMI and reforms have been implemented to the rate-setting process by incorporating more transaction-based market information. These reforms have been reviewed by the local regulator and deemed compliant under EU Benchmarks Regulation. Trading in EUR denominated swaps and other derivatives is primarily in products linked to EURIBOR.
- The working group on Euro risk-free rates is also looking at identifying fallbacks for EURIBOR based on the €STR and

developing a term structure in the context of fallbacks for EURIBOR. Both backward and forward-looking term structure options are being considered.

- As part of its work on forward-looking options, in March 2019 the working group recommended a methodology based on (tradeable) OIS quotes for calculating a €STR based forward-looking term structure and is now inviting benchmark administrators to express their interest in producing such a term structure.
- The working group is also analyzing backward-looking methodologies, including the methodology to calculate credit spreads to be embedded in the fallback.

20. WHAT IS TONA?

- Tokyo Overnight Average Rate ("TONA") is an unsecured, transaction-based benchmark for the robust uncollateralized overnight call rate market.
- Following the Study Group on Risk Free Reference Rates' public consulting in March 2016, TONA was confirmed as the JPY alternative risk-free rate in December 2016. Thereafter, Bank of Japan has established a code of conduct to improve TONA submission. A Sub-Working Group was also established to focus on expanding use of TONA as the alternative risk-free rate, specifically regarding OIS reforms and other transition needs.
- The Bank of Japan calculates and publishes TONA on a daily basis using information provided by money market brokers known as Tanshi.
- As an average, TONA is weighted by the volume of transactions corresponding to the rate.
- There is a considerable transaction volume and diversity of participants for the market.

21. ARE THERE ANY PUBLICLY AVAILABLE BENCHMARKS TIED TO THE PROPOSED ALTERNATIVE RATES?

- Yes. In August 2019, ICE Data Indices, LLC announced changes to their overnight deposit rate indices where LIBOR was previously used. The revised indices are as follows:
  - ICE BofAML SONIA Overnight Rate Index
  - ICE BofAML SARON Overnight Rate Index
  - ICE BofAML TONAR Overnight Rate Index
  - ICE BofAML SOFR Overnight Rate Index
- PIMCO anticipates that other publicly available indices tied to these alternative reference rates may be developed with sufficient demand, including those with maturity terms greater than overnight. On March 2, 2020, the Federal Reserve Bank of New York began publishing 30-, 90-, and 180-day SOFR Averages, along with a daily index, that allows for the calculation of compounded average rates over certain time periods. Official published rates can be found here: https://apps.newyorkfed.org/markets/autorates/SOFR

22. WHAT HAPPENS TO EXISTING AND NEW DERIVATIVES MATURING AFTER 2021?

- On October 23rd, 2020, ISDA launched the IBOR Fallbacks Supplement and IBOR Fallbacks Protocol, which will have the effect of incorporating fallbacks into covered derivative contracts. The fallbacks will have the effect of falling back to the alternative risk free rate plus a spread in the case of a permanent cessation of an IBOR in covered derivative contracts.
- The IBOR Fallbacks Supplement will result in the incorporation of the fallbacks in all new trades executed after Jan 25, 2021 which are governed by the updated 2006 ISDA Definitions.
- The IBOR Fallbacks Protocol allows market participants to amend legacy contracts to incorporate fallbacks if both parties to a contract agree to adhere to the Protocol.
- PIMCO adhered to the ISDA Protocol on January 22, 2021. To the extent that PIMCO enters into trading agreements on your behalf, no further action is necessary from you with respect to the application of the ISDA Protocol and Supplement.
- With respect to cleared swaps, the central clearing counterparties (CCPs) have discretion to determine the fallback and they have communicated that they anticipate following the ISDA approach.
- CCPs transitioned price alignment and discounting from EONIA to €STR on all € denominated products on July 24, 2020 and transitioned from Effective Federal Funds Rate (EFFR) to SOFR on U.S. Dollar denominated products on October 16, 2020.

23. WHAT HAPPENS TO EXISTING AND NEW DEBT MATURING AFTER 2021?

- The impact on certain instruments will depend on the fallback terms contained in the relevant instruments' documentation, the action or inaction of trustees or designated agents, and any potential future changes in law which could impact contract terms.
- The magnitude of the valuation or liquidity impact on individual securities will depend on the remaining term of the instruments and the shape of the yield curve at the time of LIBOR discontinuation.
- Based on the existing debt that PIMCO has reviewed so far, the fallback language across impacted securities is as follows:
  - For many floating rate securities, the bond will effectively convert to a fixed rate security where the new fixed rate will be set to the last LIBOR setting for the remaining life of the bond.
  - In other cases, bonds may provide flexibility to convert to a new benchmark that is selected at the discretion of the issuer or designated agent.
- PIMCO's portfolio management ("PM") team has reviewed various impacted securities and considered both the fallback language and the sensitivity of these securities to various potential scenarios. The PM team will continue to monitor these securities as the LIBOR/SOFR transition evolves and will make adjustments to portfolios accordingly.
- For USD LIBOR, PIMCO's preference is for new issuances to incorporate the ARRC's published fallback language, as it provides a more consistent, transparent and resilient approach to contractual fallback arrangements for new LIBOR products.
  - Link to ARRC Fallback Contract Language
- With respect to the remaining terms of the instruments, the longer dated instruments will be most impacted, while instruments maturing in the second half of 2023 may not be impacted, if the last USD LIBOR setting is during June 2023 when LIBOR is still available.

24. IS PIMCO STILL PURCHASING INSTRUMENTS THAT USE LIBOR AS THE REFERENCE RATE?

- While PIMCO recognizes the importance of transitioning from LIBOR to risk free rates, LIBOR related assets continue to be issued or traded in the primary and secondary markets and PIMCO continues to transact in these securities for the time being when the risk/return trade-off is favorable for our client portfolios. As noted above, PIMCO reviews the fallback language for new instruments that utilize LIBOR as a reference rate and gives consideration to potential valuation impacts.
- In the U.S., the ARRC has published recommended fallback language for addressing the risks in the cash (non-derivative) product contract language with the goal of reducing the risk of serious market disruption following a LIBOR cessation.
- Generally, the proposed fallback language specifies that, following a trigger event (e.g., the cessation of LIBOR or other "triggers"), interest will be calculated using a SOFR-based rate, with an adjustment, so that the successor rate will be more comparable to LIBOR.
- PIMCO is carefully and actively evaluating current market conditions, including liquidity, applicable jurisdictional regulatory guidance and client portfolio needs, to evaluate whether purchasing certain IBOR-referencing securities with appropriate fallbacks is reasonable and is in the best interest of clients.

25. CAN YOU DETAIL WHAT WILL HAPPEN TO CURRENT LIBOR-RELATED HOLDINGS AFTER THE PROJECTED TRANSITION?

- Our general market observation is that the majority of older legacy floating rate products contain fallback language that require a determining party (e.g., a trustee) to go out and obtain reference bank quotes with respect to LIBOR. If the determining party is unable to obtain any quotes from the reference banks, then the last available LIBOR rate will be used for the current interest period. With respect to certain floating rate products that have been issued to the market relatively recently, the language permits the determining party to designate an appropriate successor rate, in the event that reference bank quotes are unavailable.

- The Alternative Reference Rate Committee ("ARRC") in the United States has also published recommended fallback language for floating rate notes and other instruments that includes a waterfall rate and defined triggers in respect of a benchmark transition. PIMCO is supportive of the language that was published by the ARRC, which can be found here: https://www.newyorkfed.org/arrc/fallbacks-contract-language.
- Both U.S. and UK regulatory groups are looking at a number of solutions and have published some useful information regarding fallbacks:
  - https://www.newyorkfed.org/arrc/announcements
  - https://www.bankofengland.co.uk/markets/transition-to-sterling-risk-free-rates-from-libor
  - https://www.fca.org.uk/news/statements/fca-statement-planned-amendments-benchmarks-regulation

26. PLEASE COMMENT ON THE PROPOSED LEGISLATIVE SOLUTIONS IN THE U.S. AND UK.

- The UK Treasury announced in June 2020 that it will amend the Benchmarks Regulation to ensure the FCA's powers are sufficient to manage an orderly transition from LIBOR. It will allow the FCA to require a Benchmark Administrator (ICE for LIBOR) to change the methodology of a critical benchmark in order to protect consumers and/or ensure market integrity. The FCA will publish statements of policy on its approach to potential use of these powers following further engagement with stakeholders.
- In the U.S., two separate legislative solutions seek to address LIBOR in contracts, a New York State law and a U.S. federal law. The State of New York legislation was signed into law in April 2021 while, as of end of August 2021, the U.S. federal legislation is still in process in Congress.
- The New York law applies only to New York law governed contracts, securities or instruments and to USD LIBOR. Among, other things, if the contract, security or instrument falls-back to a LIBOR-based rate (such as last quoted LIBOR) or requires a dealer poll (see also below) for LIBOR or other interbank funding rates, these are overridden and on the LIBOR Replacement Date, the replacement rate is inserted into the contract, security or instrument instead and various provisions related to LIBOR mechanics are made null and void. The NY law would replace USD LIBOR with the Fed, NY Fed or ARRC's recommended benchmark replacement (which includes the recommended spread adjustment), i.e. a SOFR based rate. In addition, where contracts provide discretion to choose a fallback, the legislation provides a safe harbor intended to encourage the selection of the recommended benchmark replacement.
- The proposed U.S. federal bill provides a mechanism for parties to a contract with USD LIBOR-based rates that have no fallbacks or a fallback to another USD LIBOR-based rate. The replacement will be SOFR-based with a fixed spread adjustment. The rate can vary depending on the type of contract and will be recommended by the Federal Reserve Board separately. The U.S. federal bill would impact contracts in products subject to an indenture governed by the U.S. Trust Indenture Act and may ultimately preempt the New York law in many cases.
- As of the end of August 2021, discussions in Congress are ongoing with respect to the U.S. federal bill. PIMCO's current assessment is that legislation is likely to pass and be signed into law at some point in the foreseeable future; given some delays in both the House and Senate, however, the most realistic timeframe is in 2022.
- PIMCO is actively monitoring developments in this space and will engage on these topics where deemed necessary. In addition, we are engaging with the relevant House and Senate committees in Congress to ensure that the ultimate legislation includes provisions that will ensure a seamless transition for relevant legacy contracts and that will mitigate significant disruption to our holdings and clients.
  - https://www.fca.org.uk/news/statements/fca-statement-planned-amendments-benchmarks-regulation

27. DOES PIMCO FORESEE ANY ISSUES WITH FINDING OTHER SUITABLE AND LIQUID INSTRUMENTS / ASSETS TO REPLACE IBOR-LINKED SECURITIES?

- We continue to monitor market liquidity in derivatives such as swaps linked to alternative rates. In certain markets, such as USD interest rate swaps, the USD LIBOR linked swap market has much greater liquidity, including both higher trading volumes and lower trading costs (bid/ask spread) at this time relative to the SOFR swap market. In loan and cash markets, while there has been increased issuance in floating rate debt linked to alternative rates, there continues to be primary issuance linked to IBORs. In the U.S., the ARRC has endorsed and published fallback language which has been incorporated in certain new issues which provides a waterfall for the IBOR linked bond to fall back to the alternative rate plus a spread. This spread is calculated to limit the value transfer between IBOR and the alternative rate.

28. I HAVE AN INVESTMENT IN A PIMCO COMMINGLED VEHICLE THAT HAS A LIBOR-BASED BENCHMARK OR COMPARATIVE INDEX – WHAT IS THE NEW BENCHMARK OR COMPARATIVE INDEX AND WHEN WILL THE CHANGE TAKE PLACE?

- Many of PIMCO's commingled fund complexes have already transitioned their benchmarks in preparation of the cessation of LIBOR. If you have an investment in a PIMCO commingled fund that was benchmarked to LIBOR and you want to determine if the benchmark transition has been completed, please contact your client service representative.

- While we cannot comment on potential future changes for specific funds, we continue to review all portfolios whose benchmarks will be impacted by the LIBOR cessation. Given that the cessation of non-USD LIBOR is scheduled for 12/31/21 and USD LIBOR will continue to be published until 6/30/23, our current focus will be on portfolios which are benchmarked to non-USD LIBOR. We anticipate being able to share more information on benchmark changes for portfolios with USD LIBOR benchmarks in 2022.

- Broadly speaking, we believe that the new benchmark for any impacted portfolio should be closely aligned with the outgoing benchmark to the extent possible.

29. HOW CAN I LEARN MORE ABOUT THE IMPACT OF THE LIBOR TRANSITION ON MY SEPARATELY MANAGED ACCOUNT?

- Please contact your client service representative with any questions regarding your PIMCO separately managed account.

Resources

INFORMATION ON THE RISK FREE RATES

Each of the central bank led working groups set up at the recommendation of the Financial Stability Board have established specific websites to provide market participants with information regarding key transition topics and steps, meeting minutes, feedback on consultations, and other relevant data.

Currency	Working Group Link
USD	https://www.newyorkfed.org/arrc
GBP	https://www.bankofengland.co.uk/markets/transition-to-sterling-risk-free-rates-from-libor
EUR	https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/WG_euro_risk-free_rates/html/index
JPY	https://www.boj.or.jp/en/paym/market/jpy_cmte/index.htm/
CHF	https://www.snb.ch/en/ifor/finmkt/fnmkt_benchm/id/finmkt_reformrates

INDUSTRY BODIES REPRESENTING DIFFERENT STAKEHOLDERS HAVE PRODUCED CONSIDERABLE MATERIAL WHICH IS AVAILABLE ON THEIR WEBSITES

Industry Body	Website
ISDA	https://www.isda.org/category/legal/benchmarks/
ICMA	https://www.icmagroup.org/Regulatory-Policy-and-Market-Practice/benchmark-reform/
LMA	https://www.lma.eu.com/libor
LSTA	https://www.lsta.org/
APLMA	https://www.aplma.com/
ACT	https://www.treasurers.org/
SIFMA	https://www.sifma.org/explore-issues/alternative-reference-rates/
AFME	https://www.afme.eu/Key-issues/IBOR-Transition

REGULATORS AND RELATED INSTITUTIONS HAVE FURTHER RESOURCE ON LIBOR TRANSITION AND BENCHMARK REFORM

Official Body	Website
FCA	https://www.fca.org.uk/markets/libor
FSMA (Euribor)	https://www.fsma.be/en
ESMA	https://www.esma.europa.eu/policy-rules/benchmarks
IOSCO	https://www.iosco.org/
FSB	https://www.fsb.org/work-of-the-fsb/policy-development/additional-policy-areas/financial-benchmarks/

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The "**risk-free benchmark**" or "**risk-free rate**" can be considered the return on an investment that, in theory, carries no risk. Therefore, it is implied that any additional risk should be rewarded with additional return. All investments contain risk and may lose value.

Forecasts, estimates and certain information contained herein are based upon proprietary research and should not be interpreted as investment advice, as an offer or solicitation, nor as the purchase or sale of any financial instrument. Forecasts and estimates have certain inherent limitations, and unlike an actual performance record, do not reflect actual trading, liquidity constraints, fees, and/or other costs. In addition, references to future results should not be construed as an estimate or promise of results that a client portfolio may achieve.

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