



# **Packing the overnight bag: Risk-free rates after Libor**

June - 2018

## EXECUTIVE SUMMARY

From the end of 2021, banks will no longer be required to support Libor and may discontinue participation in the benchmark-setting panel. New risk-free overnight rates that will replace term-Libor as a benchmark have been agreed for most currencies and their roll-out process is well under way. The replacement of Libor with new benchmarks introduces significant challenges for market participants, especially those active in cleared derivatives, such as interest rate swaps. Upcoming changes will not be limited to the replacement of reference Libor rates by new benchmarks only. The changes will also affect currency valuations, at least where the new benchmark would differ from the current risk-free rate used to discount cash-flows. More significantly, change in the benchmark rates will also affect existing derivatives with maturities beyond 2022, as the continued availability of Libor rates is not guaranteed beyond the end of 2021. To properly prepare for challenges posed by the change in benchmarks will require a significant amount of time and effort. This paper discusses the areas that will most likely be affected and proposes solutions on how to make the transition easier as well as more cost-efficient.

## INTRODUCTION

Widely used as a benchmark for a broad range of debt instruments and derivatives contracts across the globe, Libor rates have major deficiencies. Following the financial crisis that began in 2007-2008, a range of initiatives was introduced to improve the reliability of Libor quotes and to reduce the scope for manipulation. These initiatives, although beneficial overall, do not sufficiently address the major change in the markets that, for a variety of reasons beyond the scope of this paper, led to the much-reduced volume of interbank unsecured borrowing used to calculate the Libor fixings<sup>1</sup>.

As a result, larger weight is being attributed to the 'expert judgement', especially as maturity of the Libor fixing increases beyond one or three months' tenor and in particular, in regard to less liquid currencies. To put these numbers into perspective, at the end of the second quarter

of 2017, the administrator of Libor (ICE Benchmark Administration) reported that actual transactions in the US dollar and sterling made up less than 30% of the data used to produce three- and six-month Libor rates<sup>2</sup>, the main benchmarks for swaps, bonds and loan contracts. This number is even lower for the Swiss franc and the yen. Similar sentiment was also expressed by Andrew Bailey, chief executive of the UK's Financial Conduct Authority, when he argued that serious questions exist regarding the sustainability of the Libor benchmarks in the long term<sup>3</sup>.

National regulators and market participants have been working to move to different and more realistic benchmarks in their efforts to facilitate compliance with the International Organization of Securities Commissions principle stating that "benchmark rates should be based on actual transactions or otherwise executable market quotes". The emerging consensus points to the use of near risk-free overnight interest rates (RFRs), with some divergence as to whether this overnight rate should be based on unsecured borrowing or secured by repo transactions collateralised by government issued securities. In any case, the FCA announced that banks will no longer be required to support Libor and can discontinue participation in the benchmark-setting panel from the end of 2021.

This paper aims to provide an overview of the inevitable changes resulting from the replacement of Libor with new benchmark rates. It also discusses the differences between Libor and new RFRs and analyses the impact on trade economics. The implications of the upcoming changes for the derivatives business as a whole will be discussed in the penultimate section, with a main summary and high-level recommendations offered at the end of this paper.

## WHERE DO WE GO FROM LIBOR

In the UK, the Working Group on Sterling Risk-Free Rates created by the Bank of England has identified the unsecured sterling overnight index average (Sonia) rate as the most suitable replacement to Libor. The reasons for selecting Sonia are multi-fold: Sonia is a well-established rate underpinned by £40 billion of actual daily transactions, it has a close correlation to the Bank of England's base rate and it has relatively liquid overnight index swap (OIS) market.

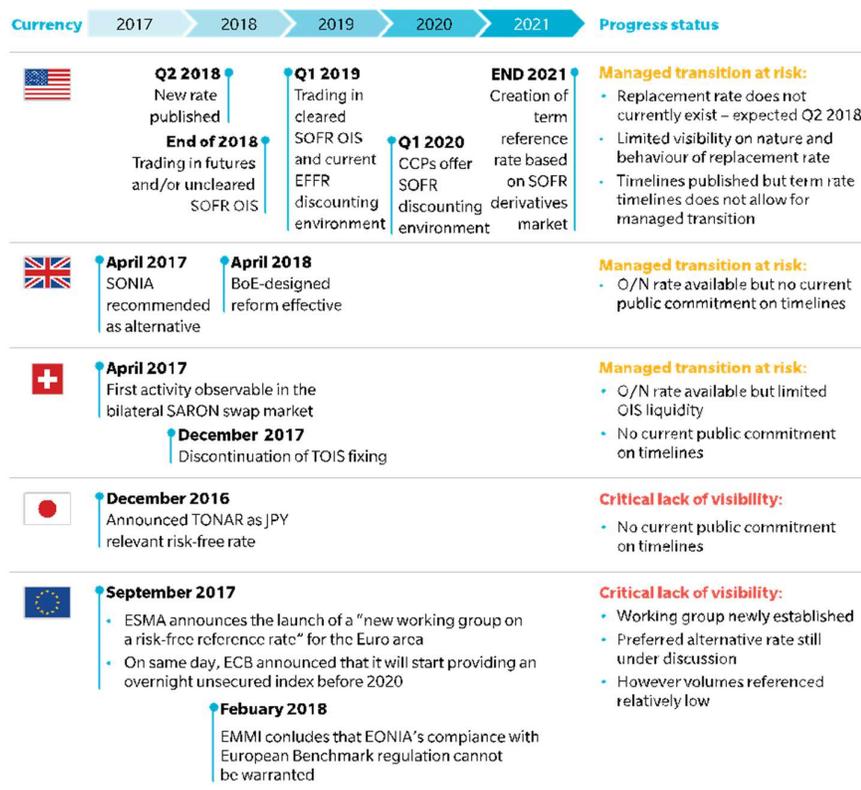
Similarly, unsecured overnight Tokyo overnight average rate (Tonar), fixed by the Bank of Japan, emerged as the leading replacement candidates for the yen.

Conversely, in the US and Switzerland, secured overnight repo rate gained the upper hand. Transaction-based secured overnight funding rate (SOFR), sometimes referred to as broad treasury financing rate (BTFR), was identified as a preferred alternative to Libor by the Alternative Reference Rates Committee (ARRC) in the US and its publication is scheduled to commence in Q2 2018. This rate is based on the cost of overnight loans that use US government debt as collateral, with about \$660 billion in daily transactions. SOFR correlates closely with money market rates<sup>4</sup> and encompasses robust underlying repo market segments that allow for future market evolution.

In the eurozone, no decision has been taken yet over the replacement rate, but the authorities seem willing to continue with Euribor, although the rate setting is likely to become voluntary rather than compulsory, as it is at present. At the same time, work is also being done to develop a repo overnight benchmark rate. Since 2012, the RepoFunds Rate published by BrokerTec (Nex Markets) and MTS is a family of three transaction-weighted overnight rate benchmarks for repos against French, German and Italian euro-denominated government bond collateral, and a general eurozone benchmark. The problem, however, unique to the eurozone, is the credit divergence between different sovereign issuers that is reflected in the repo rate.

Country	Proposed Alternative Rate	Rate Administrator	Secured / Unsecured	Tenor	Term Structure
US	BRFR / SOFR	NY Fed	Secured	o/n	Under Discussion
UK	SONIA	BoE	Unsecured	o/n	Under Discussion
Japan	TONAR	Bank of Japan	Unsecured	o/n	Under Discussion
Switzerland	SARON	Six Exchange	Secured	o/n	Under Discussion
EU	TBD	ECB	TBD	TBD	TBD

The following table, compiled by Oliver Wyman<sup>5</sup> provides the current timeline for transition implementation and make it very clear that regardless of the defined target dates for the cessation of mandatory Libor reporting requirement, much work still needs to be done to allow a smooth transition.



Both secured and unsecured overnight rates offer the benefit of liquid, near risk-free and executable quotes that avoid reliance on the 'expert judgement' currently used to fix Libor. Some argue that existing derivatives markets in some of these rates, such as Sonia OIS in the UK, are a good starting point for building upon new products needed to create a fully functioning market essential to managing and hedging risk. New RFR benchmarks, however, when adapted as a fully-fledged replacement for Libor, will require both exchange-traded derivatives (ETD) and over-the-counter (OTC) derivatives offerings to be enhanced. The CME Group has already announced its intention to offer future and option contracts referencing the new SOFR benchmark; similarly, ICE and CurveGlobal have announced the launch, respectively, of one- and three-month future contracts on Sonia, and LCH is looking to extend maturities of Sonia OIS contracts from its current 31 years to 50.

## FORWARD-LOOKING LIBOR VERSUS OVERNIGHT RATES

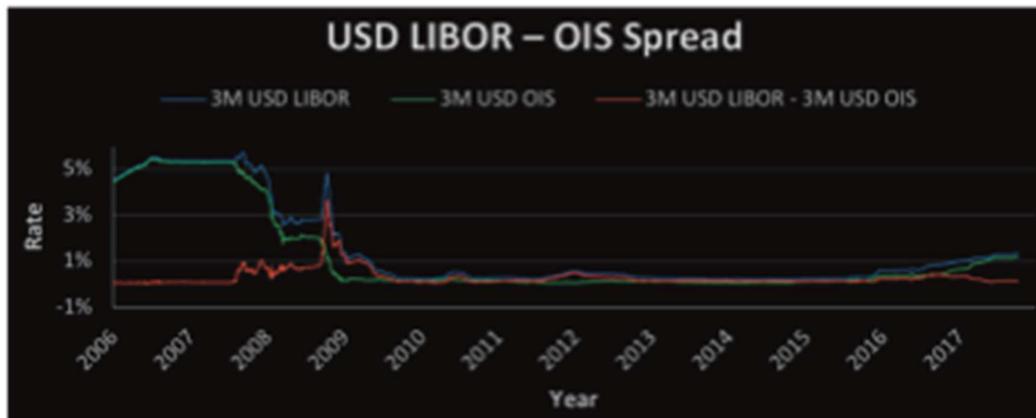
When moving away from Libor to alternative RFR benchmarks based on the overnight rate, as is currently envisaged, the difference in the term structure between the two must be considered. Effectively, Libor is a forward-looking rate that is fixed at the start of a term, providing certainty in advance on necessary payments, while all alternative overnight benchmark rates are unknown until the end of term. Although this is not a major problem on its own, forward-looking rates can provide some operational convenience and make advance management of cashflows significantly easier.

In the UK, the Working Group on Sterling Risk-Free Rates identified two potential methods of deriving a forward-looking RFR using pricing data from Sonia-referencing derivatives markets<sup>6</sup>. One method involves taking the fixed leg of a set maturity OIS contract – for example, three or six months – as the term reference rate. Such a rate could, for example, be produced either from executable quotes for OIS contracts on regulated electronic trading platforms, or by using rates on executed transactions of OIS on a particular day. Alternatively, term fixings could be derived from the book data on Sonia futures orders. In this case, and in order to fix constant maturity of three- and six-month OIS rates, it may be necessary to interpolate between futures settlement dates. One disadvantage of creating a forward-looking term RFR is that the robustness of the ultimate benchmark becomes a function of the depth of the derivatives market referencing the RFR rather than being based on the overnight unsecured cash market, thus deviating from the original objective to base RFRs on executable market quotes.

## ECONOMIC DIFFERENCES BETWEEN LIBOR & REPLACEMENT BENCHMARK RATES

The new benchmark rates are likely to differ materially from Libor, especially during periods of financial stress. The Libor rates are published for multiple tenors, the most commonly used being one, three and six months. The replacement rates are overnight rates that either do not contain any credit-spread at all for the secured rates such as SOFR or contain only a negligibly small credit spread for the unsecured overnight rates such as Sonia. This contrasts with Libor,

which involves an indication for an actual unsecured loan of cash. As such, the corresponding hypothetical credit exposure to the borrower over an extended period of time is not embedded in the new RFR, which will be somewhat lower than Libor. Historically, the spread between the three-month Libor and three-month OIS has been very small. During the financial crisis that began in 2007-08, however, this spread reached a peak of several hundreds of basis points and, the average over the past decade since the 2008 crisis was around 30bp for the dollar, euro, sterling and Swiss franc and around 15bp for the yen.



Contracts based on the new benchmark rates derived from the overnight rates will unavoidably have different economics from those currently based on term Libor rates. Even though the exact methodology with which to derive the term structure of new reference rates, if at all, is still under discussion, the payments under contracts referencing new rates will be different from Libor rates, thus creating significant valuation differences for legacy contracts where a change of methodology would be required.

By way of example, the valuation of cleared swaps portfolios is based on projecting future cash flows based on reference Libor/Euribor rates, and then discounting these cash flows using Sonia, Eonia or federal funds OIS funding curves. However, adding the average spread difference of say, 30bp to the new reference rate will not produce the same future payments because the actual difference between Libor and OIS varies over time. Also, the discounting of cashflows, currently performed using the OIS funding curve, will need to be based on the new RFR. While the funding curve will not change in case of Sonia or Tonar, for the dollar and Swiss franc new funding curves will be required to replace federal funds OIS and tomorrow/overnight index swaps (TOIS) used at present. In fact, use of secured repo rates to

discount cashflows will more accurately reflect the true cost of derivatives trades as, in most cases, both cash or government securities are eligible to be delivered to cover initial margin requirements.

Inevitable change in discounting curves and possible replacement of reference Libor rates with new benchmarks (for existing contracts) is bound to create discontinuity in derivatives valuations at the time of transition. It is also very likely that valuation adjustments will occur in two separate steps. The funding curve replacement is relatively straightforward, while replacement of the reference Libor rates for existing contracts is not so because it involves amendments, either through agreement between parties or through legislation.

It appears very likely that the change from Libor to new reference rates will be significantly more complex than a simple conversion in order to arrive at economically equivalent contracts. Switching to RFR will have long-term implications not only in terms of valuations, but also in the context of new product development and risk management.

## WHAT THIS MEANS FOR THE MARKET & ITS PARTICIPANTS

Tens of trillions of dollars in debt and hundreds of trillions of dollars in derivatives transactions, with maturities of up to 50 years or longer, currently have cashflows linked to both Libor and to its close cousin, Euribor. For market participants, and especially those involved in ETD and OTC derivatives, replacing benchmark rates will create a number of challenges. The following points attempt to outline key implications of the inevitable transition on market participants:

- The elephant in the room is the huge universe of existing contracts with maturities in 2022 and beyond, when the mandatory requirement to support Libor setting ends. The obvious options currently under consideration are transitioning existing contracts onto a new replacement rate or amending contracts based on the so-called fallback clause in the documentation from the International Swaps and Derivatives Association (ISDA) that sets out, somewhat vaguely, the reference rate to choose if the original benchmark, in this case Libor, ceases to exist. To prepare for this scenario, ISDA has been asked by the Financial Stability Board to propose a firm approach with the objective of avoiding any discontinuity in valuations

if a fallback is triggered and of ensuring that the change will not impede, as far as possible, any efforts towards voluntary transition to new benchmarks. A third option, also possible in the medium term, is for the banks and the ICE Benchmark administrator to agree voluntarily to continue with the publishing of Libor rates, at least so long as five contributors mandated by the rules are available. This option is, however, unlikely to be sustainable over the long term. Whatever solution to treating legacy portfolio will eventually emerge, the implications for the market will be huge, spanning areas such as accounting, legal, trade valuations and more.

- The lack of credit-spread component embedded in the reference rate is likely to be problematic on two levels. For the existing contracts, with maturities beyond 2022, new RFRs will be below corresponding Libor (that include the credit spread) and this will affect the economic value of contract, including continuity of valuations if the transition were to occur from one day to the next. The effect is likely to be felt particularly by buy-side institutions, especially those with directional exposures. In addition, and regardless of the deficiencies that led to Libor's demise, credit spreads embedded in Libor reflect the genuine cost of unsecured funding obtainable by financial institutions as a whole for term funding (i.e. borrowing). Term lending and liabilities will need to include this risk premium in some form or shape. Effective hedging of the risk will also need to account for this cost. Among the possible solutions currently under discussion is the creation of a certain, and currently undetermined, credit risk component to be added to the new risk-free benchmark. As mentioned above, this credit spread is unlikely to remain static over time, thus introducing additional complexity.
- Secured benchmark rates may also exhibit some seasonality as firms re-adjust their balance sheets at the end of reporting periods or require more collateral at a time of increased market volatility. As the sovereign repo market is driven to a significant extent by demand for high-quality liquid assets, the rate is likely to exhibit some spikes around year-end and, more generally, be affected by supply and demand factors also linked to monetary or regulatory policies such as quantitative easing.
- For the evolution of derivative markets, it is essential to ensure viability of new benchmarks and availability of realistic term structures for these rates. Despite the emergence of such, sufficient liquidity in these markets will be key to guarantee success of these new rates to replace Libor. As an example, nearly 90% of Sonia OIS, which is already actively traded and

cleared, have tenors of less than five years, with some 75% of contracts being less than one year. Until this change, the reliability of term structures will remain questionable. This is problematic as these interest rates' term structures are required for pricing of swap contracts in terms of projection and discounting of cashflows.

- In case of direct replacement of cleared Libor-based swaps with OIS, initial margins required by central counterparties (CCPs) are likely to increase by around 10%. This will especially impact buy-side market participants such as pension funds due to the directional nature of their risk exposure.
- The hedging of Libor-based liabilities or alternatively, moving Libor-based floating rate debt instruments such as mortgage-backed securities or loan agreements to alternative rates such as SOFR may require renegotiation of existing agreements. Divergence between currencies in selecting Libor replacements such as Sonia and SOFR may pose a price-sensitive issue for multi-currency agreements that are currently expressed as say, three-months Libor plus a fixed spread. Following the replacement of Libor with new benchmarks, pricing is likely to differentiate between the secure and unsecure nature of such rates such as Sonia and SOFR.

As new secured benchmark rates such as SOFR and the Swiss average rate overnight (Saron) become a standard for RFRs, the discounting of cleared derivatives will need to be switched over to a new funding curve. In the US, the target date for CCPs to start offering SOFR discounting was set to Q1 2020. In the case of the Swiss franc, discontinuation of TOIS and its replacement with Saron were discussed in some detail in a recent paper published by the Swiss National Bank<sup>7</sup>, but it remains to be seen how this will be implemented in practice.

The introduction of the new RFRs has some analogy in the 2010 derivatives markets, when LCH switched cashflow discounting of collateralised derivatives from Libor to OIS curves. In that case, however, the change was market-led; client clearing did not exist at that time and cleared house portfolios were, in most cases, already discounted internally by dealers using OIS curves. At the end, LCH simply got in line with the rest of the market by giving a mere two weeks' notice to implement OIS discounting. This time, however, the change would not only be limited to discounting curves but would also involve the reference rate and vary from one currency to another, each likely to be implemented according to different timeframes by various CCPs.

One of the inevitable implications of the transition to new RFR benchmarks is more fragmentation – less global and more domestic regimes, and different solutions with respect to secured vs. unsecured funding, cash versus derivatives instruments and overnight versus term interest rate structures. All institutions will be equally affected by the change, but the pressure will be felt more strongly by medium and small domestic players that may lack the infrastructure and know-how to support transition to different and changing valuation methodologies for diverse exposures.

This is particularly relevant for financial institutions in the context of cleared products. As described in Regime Change! The Democratization of the Clearing Landscape<sup>8</sup>, the market for clearing services changed significantly during and after the financial crisis. The number of CCPs and the variability of products have increased. Liquidity has been amplified, and markets have become more disintermediated, with an increasing number of financial institutions choosing to self-clear rather than gaining access to CCPs through direct clearing members because of cost, capital, liquidity, balance sheet and counterparty risk considerations. Large banks have also reduced the scope of those clearing services offered to the market as revenue opportunities have been greatly diminished and associated balance-sheet costs increased.

While increased complexity and regulatory overheads concerning derivatives clearing has led to more fragmentation, thus implicitly favouring Tier 1 financial institutions by rising entry barriers, this is not what was intended by the regulators driving the changes and, fortunately, does not need to be the case in practice. As medium, small and regional financial institutions outsource some of the more cumbersome elements of derivatives clearing such as real-time CCP connectivity and access for ETD and OTC derivatives, reporting, valuations and analytics (including replacement RFR benchmarks), they can potentially benefit from the economies of scale with regard to infrastructure costs and the know-how offered by utility providers. Such benefits can also be augmented by added-value services in derivatives pricing, margining and improved efficiencies of collateral utilisation.

## CONCLUSION & RECOMMENDATIONS

The evolution of the derivatives market poses significant challenges for both financial institutions and their clients. Over the past decade, the derivatives market went through a range of significant changes, with the proposed RFR replacement being only the latest of many. Using derivatives becomes progressively more complex and requires ever-increasing resources to both implement and maintain all required changes to remain involved with proposed developments. Technology can significantly simplify such efforts but cannot, on its own, replace human expertise, be this in-house personnel or the know-how obtained through qualified third parties.

The changes surrounding the introduction of the new RFR benchmarks, once finalised and implemented by CCPs, will be broad and will go well beyond derivatives and clearing businesses. Expected increase in the use of OIS is likely to result in higher initial margin requirements thus, once again, placing cross-margining and utilisation of available collateral under renewed focus. This, in turn, cannot be separated from repo, money market and collateral management activities. The currently flat short-term euro interest rate term structure is also not expected to remain unchanged indefinitely. Steepening of the curve will put greater emphasis on the use of available non-cash collateral to meet collateralisation requirements to the larger extent possible. The ability to connect to multiple CCPs is equally important to optimise exposures, reduce initial margin, efficiently allocate required collateral and reduce overall cost of doing derivatives business. In addition, the outcome of the Brexit negotiations may also result in the imposition of regulatory requirements to bring clearing of euro-denominated derivatives 'on-shore', thus complicating an already complex CCP landscape and driving clearing costs up.

While Tier 1 financial institutions may have the resources, know-how and personnel to continuously adapt to this ever-evolving market, regional banks and smaller financial institutions may find this process extremely daunting and prohibitively expensive. Clearing utility providers, such as Sernova Financial can offer a new, smart gateway to clearing.

Hosted utility solutions offered by Sernova provide a central point of derivatives competence. Its services allow clients to benefit from the ability to bring together the clearing of ETD and OTC derivatives on multiple CCPs, efficiently manage and optimise their collateral, provide risk reporting, what-if scenarios and simulations, all on a single platform with a centralised view and in a real-time environment. Importance of risk expertise and tools for managing Libor transition through ability to maintain multiple pricing and valuation environments, as well as ability to manage the varying time-lines of transition for different currencies and CCPs will become paramount as complexities increase. Another major benefit of Sernova's hosted infrastructure solution is that it allows for a single point for system configuration and market data feeds, and facilitates high speed-to-market, ensuring cost-efficient and scalable solutions designed to meet the challenges of a continuously evolving derivatives market now and in the future.

Financial institutions interested in having more information about Sernova Financial Smart Gateway to Clearing are invited to visit our website at [www.sernovafinancial.com](http://www.sernovafinancial.com) or to get in touch via [info@sernovafinancial.com](mailto:info@sernovafinancial.com).

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