

LIBOR Transition – The Current Picture

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The manipulation of reference interest rates, including LIBOR and EURIBOR, which was uncovered in 2011, served as motivation for IOSCO (International Organisation of Securities Commissions) to initiate a reform of benchmarks. In 2016, the European Union subsequently adopted the Benchmark Regulation (BMR). Critical benchmarks had to be replaced by the end of 2021 - these included EURIBOR, LIBOR and EONIA. All interest-linked products such as variable-rate securities, loans and derivatives are affected by a change in the benchmarks.

The system is to become more robust through the development of alternative reference interest rates. For this purpose, the interest rates will be derived from actual transactions as far as possible in the future – instead of on the basis of expert estimates by defined panel banks, as was previously the case. The IBOR rates will be replaced by new Risk Free Rates (RFR), often also referred to as Alternative Reference Rates (ARR).

Exceptions to this are the already reformed EURIBOR and the JBA TIBOR, which can continue to be used as reference interest rates, as well as some USD LIBORs (overnight, 1, 3, 6 and 12 months), which will continue to be used until 30 June 2023.

Currency	EUR		USD	GBP	CHF	JPY	
"Old benchmark"	EONIA	EURIBOR	USD LIBOR	GBP LIBOR	CHF LIBOR	TONA	JPY LIBOR
BMR Benchmark	ESTR	EURIBOR reformed	SOFR	SONIA reformed	SARON	TONA reformed	JBA TIBOR reformed
Collateral	No	No	Yes	No	Yes	No	No
Term	ON	Until 12 mo	ON	ON	ON	ON	Until 12 mo

Table 1: Overview of BMR-compliant benchmarks

1. "Old benchmarks" IBORs

Interbank Offered Rates (IBORs) are average interest rates at which banks can borrow in the interbank market. Maturities range from overnight to 12 months and IBORs are/were available in a wide variety of currencies. The total exposure of the IBOR market in 2021 was more than USD 370 trillion. Of this, the two reference rates USD LIBOR (London Interbank Offered Rate) and EURIBOR represented approximately 80%. Besides USD LIBOR and EURIBOR, the British GBP LIBOR, the Swiss CHF LIBOR, the European EUR LIBOR and the Japanese TIBOR/JPY LIBOR were among the most important IBORs worldwide.

Until now, the determination of IBORs was based on expert estimates of a number of banks (panel banks). As a result, IBORs were not always based on actual settled transactions, but in part merely reflected banks' perceptions of funding costs. A significant decline in the underlying markets and challenges to the sustainability of the banking panels quoting these benchmarks posed a serious risk to both individual financial market players and the stability of the global financial system. Therefore, in 2013, the G20 nations decided to fundamentally reform the global system of benchmark interest rates.

2. New benchmarks

2.1. Reformed benchmarks

2.1.1. EURIBOR Reformed

The EURIBOR (Euro Interbank Offered Rate), as one of the most important IBORs, is one of those reference interest rates that were reformed in line with BMR and will continue to exist for the time being. The reform of EURIBOR was completed in November 2019. This means that EURIBOR can continue to be used as a reference interest rate.

The core of the reform of the EURIBOR was the development of a legally compliant calculation methodology. At the beginning of the reform process, attempts were made to calculate a EURIBOR based exclusively on transaction data. Due to the insufficient number of suitable transactions, these efforts were discontinued after a test phase in May 2017. In cooperation with representatives of the financial industry, independent experts and the supervisory authorities, the Belgian administrator of EURIBOR, the European Money Market Institute (EMMI), then developed a calculation methodology known as the "hybrid methodology".

The hybrid methodology presents itself as a three-step process for selecting input data:

Level 1: On the part of the EURIBOR panel banks, transaction data of the respective EURIBOR maturities on the unsecured EUR money market of the previous TARGET day are to be used in a first step.

Level 2: If such defined transaction data are not available, transaction data from defined previous days and neighbouring maturities may be used.

Level 3: Only if these related transaction data are also not available in sufficient numbers may the panel bank contributing to the EURIBOR use expert estimates or model results, which must, however, be comprehensible and documented on the basis of market observations.

In addition, the EURIBOR panel banks are subject to a code of conduct established by the administrator and must establish a clear set of rules internally for the determination of the Level 3 input data. Expert estimates are thus still permissible, but the scope for discretion and thus the risk of manipulation has been significantly reduced in the new methodology.

In addition, the definition of EURIBOR was clarified and adapted to the current circumstances. Whereas EURIBOR was previously defined as "the interest rate at which (unsecured) interbank term deposits are offered by one prime bank to another within the EU and EFTA". The revised definition of EURIBOR is that "interest rate at which capital market funds in euro could be raised from credit institutions in the EU and EFTA countries on the unsecured money market".

Product	EURIBOR
	EURO Interbank Offered Rate
Currency	EUR
Administrator	EMMI
Underlying	Unsecured money market
Duration	1 W/1/3/6/12 Mo
Calculation	Simple average
Publication	11.00 CET

Table 2: EURIBOR specifications

2.1.2. JBA TIBOR reformed

Analogous to the Euribor, the so-called JBA TIBOR ("Japanese Bankers Association Tokyo Interbank Offered Rate") was also reformed and can thus continue to be used as a benchmark. The administrator is JBATA (Japanese Bankers Association Tibor Administration). As with Euribor, a hybrid methodology (waterfall methodology) was developed for the reformed JBA TIBOR, which ensures that transaction data is normally used as the basis for the calculation and that only in exceptional cases - with clearly defined rules - expert estimates of the panel banks are used as the basis for the calculation.

Product	JBATIBOR
	Japan Bankers Association Tokyo IBOR
Currency	JPY
Administrator	JBATA
Underlying	Unsecured money market
Duration	1 W/1/3/6/12 Mo
Calculation	Simple average
Publication	11.00 TKT

Table 3: JBA TIBOR specifications

2.2. New benchmarks

2.2.1. EURO: €STR

The €STR is an overnight interest rate reflecting unsecured overnight fixed rate deposits of euro area banks. The Euro Short-Term Rate (€STR) is published on each TARGET2 business day based on previous TARGET2 business day transactions made and settled. The €STR is published at 08:00 CET on each TARGET2 business day.

In the euro area, the ECB working group has chosen the €STR (Euro Short-Term Rate) as the successor reference for the EONIA. €STR has been published by the ECB since October 2019. The EONIA was published in parallel until 3 January 2022. However, the €STR not only serves to replace the EONIA, but also functions as a fallback rate for the EURIBOR.

Product	€STR
	Euro Short Term Rate
Currency	EUR
Administrator	ECB
Underlying	Unsecured money market
Duration	ON
Calculation	Volume weighted average
Publication	8.00 CET

Table 4: €STR specifications

2.2.2. USD: SOFR

SOFR (Secured Overnight Financing Rate) is an interest rate published by the Federal Reserve Bank of New York. The SOFR can be regarded as an average interest rate for secured loans in US dollars (USD) with a term of one day (overnight). The SOFR is a reference rate (benchmark rate) and an alternative to the LIBOR rate in US dollars.

The SOFR is calculated as the volume-weighted median of transaction data collected by The Bank of New York for tri-party repo transactions and other defined USD repo transactions settled through the Fixed Income Clearing Corporation's (FICC) delivery versus payment (DVP) service. The New York Fed publishes the SOFR each business day at approximately 8:00 a.m. New York Time.

Product	SOFR
	Secured ON Financing Rate
Currency	USD
Administrator	NY Fed
Underlying	Collateralised GM
Duration	ON
Calculation	Volume weighted median
Publication	8.00 NYT

Table 5: USD SOFR specifications

2.2.3. USD: EFFR

The EFFR (effective federal funds rate) is a USD benchmark for the fed funds market. The fed funds market consists of domestic unsecured US dollar loans that depository institutions borrow from other depository institutions and certain other entities, mainly government-sponsored enterprises. The effective federal funds rate (EFFR) is calculated as the volume-weighted median of overnight transactions reported. The New York Fed publishes the EFFR for the previous business day at approximately 9:00 a.m. on the New York Fed's website.

Product	EFFR
	Effective federal funds rate
Currency	USD
Administrator	NY Fed
Underlying	Unsecured money market
Duration	ON
Calculation	Volume weighted median
Publication	9.00 NYT

Table 6: USD EFFR specifications

2.2.4. GBP: SONIA

Sterling Overnight Index Average or "SONIA" for short is the official successor to GBP LIBOR and is calculated daily based on actual unsecured transactions (with volumes > GBP 25) reported to the Bank of England. The SONIA rate for a given London Business Day is published at 9:00 a.m. on the following London Business Day.

Product	SONIA
	Sterling Overnight Index Average
Currency	GBP
Administrator	BoE
Underlying	Unsecured money market
Duration	ON
Calculation	Volume weighted average
Publication	9.00 GMT

Table 7: GBP SOINA Specifications

2.2.5. CHF: SARON

The SARON is a volume-weighted average interest rate and is based on completed collateralised transactions that were traded on the SIX Repo Ltd trading platform. The SARON is calculated continuously in real time and published every ten minutes. Furthermore, fixings are carried out three times a day - at 12 noon, 4 pm and 6 pm. The 6 p.m. fixing serves as a reference value for derivative financial products and for the valuation of financial assets.

Product	SARON
	Swiss Average Rate ON
Currency	CHF
Administrator	SIX
Underlying	Collateralised Interbank Money Market
Duration	ON
Calculation	Volume weighted average
Publication	18.00 CET

Table 8: CHF SARON specifications

2.2.6. TONAR

TONA(R) (Tokyo Overnight Average Rate) is calculated from transactions in the unsecured overnight market in Japanese yen and is the volume-weighted average of the rates of all transactions settled on the same day as the trade date and maturing on the following business day. TONA is published at 10 a.m. Tokyo time for the previous business day.

Product	TONA
	Tokyo ON Average
Currency	JPY
Administrator	BoJ
Underlying	Unsecured money market
Duration	ON
Calculation	Volume weighted average
Publication	10.00 TKT

Table 9: JPY TONA specifications

3. Major differences RFRs vs. IBORs

The basis for setting IBORs are expert estimates from various, defined panel banks. As such, the previous forward-looking IBOR rates inherently contain a forward premium for future interest rate development and a credit spread.

In contrast, the new RFRs are based on overnight interest rates and are calculated retrospectively. The new RFRs are no longer determined by expert opinions of bank panels, but are derived from actual transactions. As the determination is based on

actual transactions, RFRs in most currency areas are published daily with a delay of one day. The interest rate for the interest period can therefore only be determined at the end of the fixed-interest period.

While the current IBOR fixings make it possible to determine the next interest payment at the beginning of the period (forward looking approach), the reference interest rate based on the new RFRs will only be determined at the end of the interest period (backward looking approach), since the determination of the new RFRs is based on real transactions. This changeover from the current forward looking approach to the future backward looking approach means that a large number of IT systems and transactions will have to be adapted on both the bank and the customer side.

Since the new benchmarks also lead to corresponding changes in the conventions of derivative products, we would like to offer a summary of the main changes.

4. Changes Conventions Derivatives

4.1. Interest Rate Swaps (IRS)

Changes here mainly concern the variable index.

IBOR conventions:

Interest rate (usually 3 mo or 6 mo IBOR) is fixed at the beginning of the period and paid at the end of the period.

RFR (Risk free rate) conventions:

Since the new benchmarks are ON rates, the variable index also corresponds to the ON rate for interest rate swaps - which is then calculated as the effective interest rate from the historical rates of the past for the interest period and paid at the end of the period. Thus, in essence, interest rate swaps are traded against ON and thus become overnight index swaps.

In some currencies (currently USD and GBP), a so-called "term rate" is also published for the new benchmarks. If this term rate is used as a variable benchmark, the conventions remain unchanged compared to the LIBOR conventions.

4.2. Overnight Index Swaps (OIS)

While normal IRS are typically used in the capital market, overnight index swap markets have developed in the short-term interest rate area and have gained enormous importance in the money market in recent years. Among other things, this swap offers the possibility to manage the interest rate risk in the money market and to minimise the risk of fluctuating overnight rates.

Due to the introduction of the ARRs in the various currencies, the conventions in the OIS were adjusted accordingly and the new benchmarks were introduced as a variable index. Depending on the currency and the relevant overnight index, new names were thus introduced for the corresponding OIS. The essential OIS are:

EUR:	ESTR-OIS
USD:	Fed Funds Swap (EFFR OIS) / SOFR OIS
GBP:	SONIA Swap
CHF:	SARON OIS
JPY:	TONA Swap

4.3. Money market futures

Money market futures are exchange-traded interest rate futures. Unlike their counterpart in the OTC market - the FRA – the specifications of futures are highly standardised. After the LIBOR reform, the underlying instrument is usually the ARR (alternative reference rate) corresponding to the currency, and in those currencies where there are still corresponding term rates, a 3-month term rate. In some currencies, futures on a 1-month reference rate are also traded.

Currency	Stock exchange	Contract volume	Underlying	Tick size	Tick value	BP value
EUR	EUREX	1,000,000	3 Mo EURIBOR	0.25 BP	6.25 EUR	25 EUR
EUR	ICE	3,000,000	1 Mo ESTR	0.5 BP except Front Mo (0.25)	EUR 12.5/6.25	25 EUR
GBP	ICE	1,000,000	3 Mo SONIA	0.5 BP except Front Mo (0.25)	GBP 12.5/6.25	25 GBP
JPY	TFX	100,000,000	3 Mo TIBOR (Euroyen)	0.5 BP	1,250 JPY	2,500 JPY
JPY	TFX	300,000,000	1 Mo TONA	0.5 BP	1,250 JPY	2,500 JPY
CHF	ICE	1,000,000	3 Mo SARON	0.5 BP except Front Mo (0.25)	12.5/6.25 CHF	25 CHF
USD	ICE/CME	1,000,000	3 Mon SOFR	0.5 BP except Front Mo (0.25)	USD 12.5/6.25	25 USD

Table 10: The most important money market futures contracts

5. Consequences

The replacement of LIBOR and other reference rates represents a paradigm shift in the financial industry. In many currencies - which have not introduced BMR-compliant IBOR successors – only ON interest rates are now available as benchmarks. The elimination of forward rates (or forward looking benchmarks) and the switch to ON rates (backward looking benchmarks) has implications in many other areas such as

- Customer products: de facto, for variable products, the interest rate is only known at the end of the period
- ALM: through OIS curves, all positions are de facto managed against ON, basis swap risks must be managed additionally
- Trading: new products and trading opportunities, new valuation curves
- Controlling: new curves for setting transfer prices (de facto switch to OIS curve), new transfer prices for Euribor loans (taking into account basis swap prices)
- Risk management: conversion of valuation curves, consideration of basis risks

Note

The Libor Transition has already been implemented in the Finance Trainer Cyber*School:

- Treasury Cyber*School
- AEFMA Financial Market Certificate Cyber*School
- ALM Cyber*School