Box 4
The Transition from LIBOR and other International Benchmark Rates

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The recent experience of some countries in transitioning from their old benchmark rates (collectively known as ***interbank offered rates***, IBOR) to new rates is discussed in this box within the context of Legislative Bill 413 in Colombia. Among other provisions, this regulation establishes guidelines to complete an orderly migration from the DTF benchmark interest rate to the benchmark banking indicator (IBR).

1. General Information on the LIBOR transition

The London Interbank Offered Rate (LIBOR) has been the most important international benchmark interest rate for several decades. It is calculated based on the simple arithmetic average of the answers by a panel of banks to a survey about the rates they could borrow funds in the wholesale market on an uncollateralized basis.[1] LIBOR is calculated for a set of five currencies with maturities ranging from overnight to twelve months.[2]

After the LIBOR manipulation scandal in 2012, the authorities focused on improving the robustness of its calculation.[3] However, in mid-2017, the head of the UK's Financial Conduct Authority (FCA) suggested the possibility of permanently ceasing to publish LIBOR at the end of 2021. On March 5, 2021, the FCA formally announced the end or loss of representativeness of LIBOR for non-USD currencies at all maturities and LIBOR for USD currency at one-week and two-month maturities by the end of December 2021. The announcement stated the publication of LIBOR for the US dollar will end immediately after June 30, 2023.

In response to the foregoing and pursuant to the recommendations of the Financial Stability Board (FSB) and the International Organization of Securities Commissions (IOSCO), national authorities identified so-called "risk-free" rates (RFR) to replace LIBOR in the five currencies for which it was calculated. [4] In all cases, they opted for rates based on transactions in the uncollateralized money market or in the repo market. Some principal factors considered by the authorities when defining the type of market were the depth, breadth, and liquidity of the markets in which the rate is generated. Overnight maturity was chosen in each case, due to the difficulty of finding robust rates at longer maturities.

In defining RFRs, the authorities have had to address several challenges that emerged because of the different nature of LIBOR and RFRs. Specifically, LIBOR is forward looking while RFRs are backward-looking. [5] Also, LIBOR has a variety of maturities compared to the single maturity with RFRs. In other words, with a LIBOR-linked contract, the rate can be known ex ante, while it can be known only towards the end of the period with a RFR-linked contract.[6]

Although RFRs have an overnight term, there are alternatives to knowing the rate in advance and to completing the term structure of the yield curve based on them. This can be accomplished by using averages or a composite rate with the RFRs observed in past periods. To do so, the authorities need to define conventions to facilitate the conversion (e.g.: treatment of weekends and holidays, ways of rounding off, time conventions, etc.). Similarly, overnight index swaps (OIS) referencing the RFR can be used as well. [7]

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1 This average excludes the highest and lowest quartile in order to eliminate the effect of outliers in the calculation.

2 The currencies for which LIBOR is calculated are the U.S. dollar, the pound sterling, the euro, the Swiss franc and the yen.

3 Details on the conclusions and recommendations that were considered at the time to improve the robustness of the LIBOR calculation can be found in the document known as the *Wheatley Review*, which was commissioned by the Financial Conduct Authority (FCA) of the United Kingdom.

4 The document summarizing the FSB's main recommendations for setting benchmark rates was published in 2014 under the title "Reforming Major Interest Rate Benchmarks". The IOSCO document on this topic was published in 2013 under the title "Principles for Financial Benchmarks".

5 The difference between a forward-looking rate and a backward-looking rate is that the former has an expectations component, while the latter is made up entirely of realized transactions.

6 Knowing the interest rate at the end of a contract linked to an RFR with a longer period than overnight implies calculating the accrued interest using the rollover of the obligation for each day until the end date of the contract.

7 In this context, an OIS contract would allow exchanging daily payment flows tied to the RFR with flows at a fixed rate during the contract period.

In cases where it is not possible to replace LIBOR with some other rate, fallbacks[8] are needed in contracts to indicate the path to follow the moment LIBOR is no longer published. In the case of derivatives, the International Swaps and Derivatives Association (ISDA) created a protocol with clauses that has been in force in derivative contracts since January 25, 2021.[9] In the case of unregulated securities, loans and contracts, further progress is needed, as not all of them have such clauses yet. The same is true for loans denominated in multiple currencies, which present even greater challenges due to the different nature of the two rates (collateralized vs. uncollateralized), the different publication schedule and the different methodologies used to calculate them.[10]

In this context, financial institutions in Colombia have been working to prepare the transition for contracts and operations indexed to LIBOR. Accordingly, the SFC issued Circular Letter 40 in July 2021 indicating that financial institutions that maintain operations with LIBOR must continue to move forward with technological, operative, financial and legal planning to mitigate the possible impact of the transition process. The same circular also outlines expectations with respect to the status of this planning for the second half of 2021.

The expectation is that, by the end of 2021, institutions will have identified the existing contracts maturing after 2021 that are tied to LIBOR, in addition to having assessed the features and applicability of alternative benchmark rates, disclosed information to clients about the risks associated with the transition process that have been identified, planned the business aspects to which the institutions are exposed (strategies, products, processes, reports, accounting, etc.), and updated their risk policies after identifying the impact the use of new benchmark rates might have on the valuation of financial instruments, hedge accounting, etc.

2. International Experience

The following is a summary of some of the progress made by jurisdictions whose currencies were referenced to LIBOR. Also outlined is the experience of other countries that opted to change the way their national benchmark rates are calculated or to migrate to new rates, in accordance with the LIBOR transition, new international standards and the recommendations of multilateral organizations.

2.1 European Union

The European Union currently has three main benchmark rates: Euribor, Eonia, and Euro Libor. The methodology for calculating Euribor, previously based on values estimated by market participants, was modified at the end of 2019 and is now based on a hybrid methodology that prioritizes the use of information on real transactions.[11] For its part, Eonia went from being an overnight rate formed in the uncollateralized interbank market by a restricted panel of banks to being calculated based on a new reference rate, plus a fixed spread of 8.5 bp. This new uncollateralized rate, known as the Euro Short-Term Rate (€STR), will replace the Eonia rate and Euro Libor on a permanent basis as of 2022.

It has yet to be formally decided if Euribor will cease to be published. So, the new scheme will be a multi-rate one, since Euribor will coexist with €STR. The European Central Bank, which manages the new rate, has been working to develop forward-looking rates based on €STR and to publish guidelines and recommendations to help market participants adopt the new rate.

2.2 United Kingdom

The new rate that will replace LIBOR in the United Kingdom is called the Sterling Overnight Index Average (Sonia). Created in 1997 and reformed in 2018, it is uncollateralized and calculated based on the rates banks must pay to other financial institutions and institutional investors for sterling-denominated funds.[12] The FCA and the Bank of England have determined several objectives and priorities to be accomplished before LIBOR ends. The following are some of the most important ones: 1) the issue of LIBOR-tied loans, bonds, securitizations and linear derivatives was to end by the first quarter of 2021; 2) all new or refinanced loans after the third quarter of 2020 are to include contractual clauses to facilitate the transition; and 3) all LIBOR-tied contracts expiring after 2021 that can

8 These clauses or fallbacks determine the procedure whereby the parties to a contract will proceed to replace the rate at which the contract is indexed.

9 The ISDA protocol contains clauses that rely primarily on the use of historical adjustment spreads based on the historical difference between LIBOR and RFR rates. The rates, plus the spread, are published by Bloomberg Index Services. If the foregoing is not available, the ISDA protocol establishes a waterfall fallback scheme whereby alternative rates are proposed and to be used in a hierarchical way.

10 A multi-currency denominated loan is a type of credit in which the lender may receive the proceeds in more than one currency, doing so at its discretion.

11 This is known as the waterfall methodology and defines three levels for calculating the rate in each of its terms. The first level is based purely on transactions in a particular infrastructure, the second is based on a wider range of transactions and data from past days, while the third is based on transactions in markets related to the European money market and includes modeling techniques or expert judgment. The level chosen should be applied progressively. In other words, if the conditions for using the level-one methodology are not met, the level-two methodology should be used, and if it cannot be used either, the level-three methodology should be applied.

12 The Sonia reform expanded the set of transactions on which it was based by including OTC-traded transactions and not only those in the trading market. The timetable for its publication was modified as well.

be converted to another rate are to be identified and, if feasible, converted by the third quarter of 2021.

According to the Bank of England, there has been significant progress in terms of adherence to ISDA protocols (these clauses have been applied to more than 80% of the bilateral derivatives market and to more than 97% of the derivatives cleared through clearing houses), and in defining procedures for settling contracts not covered by clauses and methodology for calculating a synthetic LIBOR for specific contracts in which no changes can be made in the denomination of the rate. On the other hand, there are still problems with the conversion of certain instruments such as bonds, securitizations, credits and non-linear derivatives.

2.3 United States

The Alternative Reference Rate Committee (ARRC), which is the entity in charge of implementing the transition plan, proposed the Secured Overnight Financing Rate (SOFR) as an alternative to the LIBOR calculated in USD (USD Libor). The SOFR, created in 2018, is calculated entirely on the basis of transactions carried out in the treasury repo market.[13]

One of the main concerns about the transition was because SOFR is only calculated for an overnight term. To address this drawback, the New York Federal Reserve (NYFed) began to publish SOFR averages in March 2020 for 30, 90 and 180-day tenors based on the observed overnight rate. Additionally, in May 2021, the ARRC brought out the *Guide to Published SOFR Averages*, [14] which functions as a manual on how to use these averages and outlines the factors market participants should consider before selecting one of these rates as an alternative to USD LIBOR.

The ARRC also established a strategy in 2018 called the *Paced Transition Plan for Developing SOFR Markets.* [15] The objective is to promote the use of SOFR and create a liquidity base for SOFR derivatives. To encourage liquidity in the market for these derivatives, the use of SOFR in the spot market has been encouraged as well. For example, ARRC members [16] and non-members have issued more than USD300 billion in floating rate notes (FRN) indexed to SOFR.

2.4 Switzerland

Switzerland will replace the Swiss franc-denominated LIBOR (CHF LIBOR) with the new Swiss Average Overnight Rate (Saron), which was established in 2009. It is based on transactions conducted in the repo market and is managed by a market infrastructure.

The Saron rate had already replaced the benchmark rate for tomorrow/next overnight indexed swaps (TOIS) since 2018. TOIS was a transaction-based rate calculated with information provided by a group of reference banks, which had begun to lose members as of 2013. This being the case, there were fewer and fewer transactions to support the benchmark rate. Efforts by the National Working Group on Reference Interest Rates (NWG) to increase the number of participating banks by, for example, changing the calculation of the rate, were not satisfactory. Consequently, the NWG decided to stop calculating the TOIS rate and recommended it be replaced by the Saron rate.

With respect to the transition from CHF LIBOR and even before the decision to discontinue it, the NWG had been preparing the transition based on three main recommendations for market participants: 1) subscribe to the ISDA protocol (explained in section one of this box); 2) subscribe to other protocols designed for other contracts; e.g., the amendment agreement for the Swiss Master Agreement contracts for OTC derivatives (SMA);[17] and 3) ensure robust language is used in the clauses for other contracts. In addition, the Swiss supervisory authority (Finma) published a document setting out deadlines and targets to be achieved by its supervisees prior to December 31, 2021.[18]

2.5 Japan

The case of Japan is like that of the European Union: it currently has three reference rates (JPY Libor, JPY Tibor [19] and EuroYen Tibor) and is looking to apply a multi-rate scheme. Once LIBOR is no longer being published, the scheme would be comprised of JPY Tibor, calculated for one-week, one-month, three-month, six-month and twelve-month maturities, and the Tokyo Overnight Average Rate (TONA). TONA is the uncollateralized RFR introduced in 2016 and is calculated for the overnight term.

13 The volume of overnight treasury repo transactions, which are used to calculate the SOFR rate, had already exceeded USD 1 trillion by 2019.

14 Available at: https://www.newyorkfed.org/medialibrary/Microsites/arrc/files/2021/20210511-guide-to-published-sofr-averages

15 Available at: https://www.newyorkfed.org/medialibrary/microsites/arrc/files/paced-timeline-plan.pdf

16 ARRC members are banks and private sector entities with a significant presence in the markets affected by the rate transition.

17 This protocol establishes four clauses: i) incorporation of ISDA protocol in case the SMA contract references an IBOR, ii) a protocol in case a rate other than an IBOR ceases to be published (in this case a waterfall protocol is also defined to choose the new rate), iii) guidelines on how to incorporate RFRs into SMA contracts, and iv) a specific protocol for contracts that reference EONIA.

18 Document available at: https://www.finma.ch/en/~/media/finma/dokumente/dokumentencenter/myfinma/4dokumentation/finma-aufsichtsmitteilungen/20201127-finma-aufsichtsmitteilung-10-2020.pdf?la=en

19 TIBOR is an acronym for *Tokyo InterBank Offered Rate.*

The committee in charge of the transition has chosen to use OIS as the main strategy to generate rates on the curve for terms longer than overnight in the case of TONA. It also published a timetable with deadlines and objectives for ceasing to issue debt referenced to the rates that are going to disappear and for developing the systems and operations that are necessary for the new TONA rate to operate. Progress has also been made toward defining clauses for some products and creating a methodology for calculating adjustment spreads applicable to the new rates.

2.6 Australia

Unlike the countries that will discontinue publication of their IBOR rates, Australia decided to adopt a multi-rate scheme that will make it possible to choose between the current IBOR (bank bill swap rate, BBSW) and the uncollateralized overnight interbank rate (also known as Aonia).[20] In 2018, the BBSW calculation methodology was modified to be transaction-based (waterfall methodology).[21] However, due to the lack of transactions for calculating the one-month rate, the Reserve Bank of Australia (RBA) advises that alternative reference rates be used in this case.

Despite the decision by the authorities in Australia, the ISDA issued clauses for derivative contracts as a form of prudential risk management in case the BBSW ceases to be published. These clauses replace the BBSW with Aonia, plus a spread based on the historical difference between the two rates. Accordingly, the RBA announced it will require that instruments tied to the BBSW include robust clauses to be eligible as collateral in its open market operations.

2.7 Canada

The decision in this country also was in favor of adopting a multi-rate scheme that uses the existing Canadian Dollar Offered Rate (CDOR)[22] and a version of the Canadian Overnight Repo Rate (Corra) that was enhanced in early 2019 (and is based on transactions in the overnight repo market). The purpose in upgrading that rate was to increase the set of transactions on which it is based, thereby making in more reliable, robust and representative, as well as to adjust it to the IOSCO guidelines.

The authorities expect the adoption of Corra on a mass scale will diminish the importance of CDOR. Some maturities ceased to be calculated for CDOR in May 2021 and were replaced by clauses that included an adjusted version of Corra calculated by Bloomberg.

2.8 Hong Kong

Like Australia, this jurisdiction chose not to discontinue its IBOR (Hong Kong Interbank Offered Rate, Hibor). It will coexist with the Hong Kong Dollar Overnight Index Average (Honia) and market participants will be free to choose between the two. Honia is an uncollateralized overnight rate, while Hibor is calculated based on a methodology like LIBOR.

As there is no plan to discontinue Hibor, the Hong Kong Central Bank (HKMA) is working continuously, in partnership with the Treasury Markets Association (TMA), to revise the term structure and calculation methodology for this rate to ensure it follows the IOSCO principles. In this case, the authorities have focused their efforts on improving market conditions for OIS and encouraging the adoption of clauses in contracts to avoid disruptions if one or more of the reference rates are not available at any point in time.

2.9 Singapore

The decision in this country was to transition from Sibor (Singapore Interbank Offered Rate) and SOR (Swap Offer Rate) to SORA (Singapore Overnight Rate Average). The methodology for calculating the Sibor rate is like that of LIBOR; it is calculated by surveying a panel of twenty banks. The six-month Sibor rate will be discontinued in March 2022, while the one-month and three-month Sibor rates (more commonly used) will be discontinued after 2024. The SOR rate is calculated using the USD LIBOR rate and information on the USD/SGD exchange rate.[23] In accordance with the disappearance of USD LIBOR, the SOR rate will be discontinued definitively after June 30, 2023.

On the other hand, the SORA rate uses the transactions in the overnight uncollateralized SGD interbank market as input. In terms of transition risk management and recommendations, the Steering Committee for SOR & Sibor Transition to SORA (SC-STS) published a report in July 2021 establishing the guidelines for the transition. [24] For example, to reduce the risks involved in the rate change, the report states that a gradual transition of contracts should be made starting with 20% by September 30, 2021. The SC-STS also determined adjustment spreads to be implemented in the clauses on transition from the old rates to SORA.

20 Aonia is calculated based on interbank loan transactions.

21 The BBSW is calculated for maturities of one, two, three, four, five and six months.

22 CDOR is a measure of the rate at which a group of banks are willing to issue bankers' acceptances in the primary market. The CDOR rate is calculated for terms of one, two and three months.

23 SGD is the abbreviation for the Singapore dollar.

24 Documento disponible en: https://abs.org.sg/docs/library/sc-sts-recommendations-for-transition-of-legacy-sor-contracts.pdf

2.10 Mexico

Banco de México (BdM) began to calculate and publish a new RFR in January 2020 called the interbank equilibrium funding rate (Tiief) (overnight and collateralized). The objective is to transition to the Tiief from the interbank equilibrium benchmark rates (Tiie) which, unlike the Tiief, are based on quotes submitted by credit institutions and not on actual transactions.

Although no transition schedule has been established and there are no plans for an early disappearance of the Tiie rates, measures have been taken to promote the use of Tiief. For example, in October 2021, BdM held the first auction of development bonds indexed to Tiief (Bondes F). Likewise, in February of the same year, the Mexican Derivatives Exchange, together with BdM, launched a futures contract with Tiief as the underlying asset.

2.11 Brazil

The CDI rate (certificate of interbank deposit) is the main rate at which financial instruments are indexed in Brazil and is calculated based on the transactions carried out in the overnight uncollateralized interbank market. The problem in using this rate stems from the fact that there is very little activity in the market. So, the CDI rate is not considered representative of the real cost of funding.

This being the case, institutions such as the IMF believe reforming the CDI benchmark is an urgent requirement. In fact, transition to Selic is its main recommendation. [25] The Selic (overnight) rate is calculated using repo transactions collateralized with government debt instruments.

As such, a contingency mechanism has been implemented since October 2018 for contracts tied to the CDI rate. If certain terms of transactions in the market underlying the CDI rate are not met, the CDI rate is matched to the Selic rate on that day.

3. Implications for Financial Stability

While both local and foreign authorities have taken steps to ensure an orderly transition in rates, there are risks that may impact the system. These arise from the need to put in place new infrastructures, processes and regulations, as well as the timing in adopting new rates and their characteristics. In general, transition risks can be classified as operational, liquidity, risk management and valuation risks.

Operational risk arises because the rate transition will require the calculation of new interest payments, valuations and collateral requirements for many contracts tied to the rate to be replaced. It is also a process that needs coordination among the various areas involved in defining and implementing the contracts. Moreover, there is a legal risk that may materialize if there are ambiguities in the legal terms of the transition programs. Hence the importance of achieving sufficiently clear and robust clauses.

In terms of liquidity, the main concern deals with the time it will take for different market participants (both issuers and investors) to adopt the new reference rates as benchmarks. Also, although several jurisdictions have implemented measures to generate the long-term curve, there is a risk that it may not be completed due to a lack of operations in the OIS market or a lack of long-term transactions. This could have an impact on valuation, especially for products with longer settlement dates.

On the other hand, the limited supply of products to hedge the risks associated with the new rates also could make risk management more difficult. [26] Finally, there is a risk the adjustment spreads defined in the clauses of the contracts do not reflect the reality of the market (including credit risk), thereby distorting price formation.

25 Document available at: https://www.imf.org/en/Publications/CR/Issues/2018/12/11/Brazil-Financial-Sector-Assessment-Program-Technical-Note-on-Fund-Management-Regulation-46449

26 There is a circular causality problem in this case: the supply of hedging products depends positively on the mass issue of assets tied to the new rate. In turn, a mass issue of this sort depends on the supply of hedging products.