Benchmark Reform – Global and domestic overview
CARR stakeholder presentation
Confidence in the reliability and robustness of major interest rate benchmarks was undermined by attempted market manipulation, false reporting and declining liquidity in the interbank unsecured market.

G20 tasked the Financial Stability Board (FSB) to undertake a review of widely used benchmarks globally in February 2013.

The FSB created the Official Sector Steering Group (OSSG), comprised of senior officials from central banks and regulatory agencies in June 2013 to conduct this review:

- Focus was on the three major interbank offered rate (IBOR) benchmarks (LIBOR, EURIBOR and TIBOR)
- Work was supported by a Market Participants Group of global buy- and sell-side institutions

In 2014, the FSB recommended a series of steps to strengthen the existing key IBOR benchmarks, and to promote the development and adoption of alternative nearly risk-free reference rates (RFRs) where appropriate:

► Reform IBORs by making them more transaction based
► Develop viable RFRs to potentially replace IBORs for certain types of transactions (e.g., derivatives which constitute the largest segment of products referencing IBORs)
► The FSB’s Market Participants Group also highlighted the weakness in the fallback provisions/language in contracts referencing IBORs

From 2014 to the middle of 2017 the global benchmark reform efforts focussed on:

i. Making existing IBORs more transaction based – primarily done by the benchmark administrators
ii. Refining existing or creating new RFRs – done by public-private partnerships
iii. Developing more robust fallback language for both derivative and cash products – done by public-private partnerships and industry associations
Expectation of market participants was that most jurisdictions would continue to have both an IBOR and an RFR as viable benchmarks – commonly referred to as the “multi-rate approach.”

This changed in July 2017 when the Financial Conduct Authority (FCA) announced that it would no longer compel LIBOR panel member banks to contribute to the benchmark after the end of 2021. This left open the potential for LIBOR to disappear after 2021.

- Exposure to LIBOR contributes to the bulk of the global IBOR exposure, with the vast majority being in USD LIBOR
- Participants in close to 120 jurisdictions have exposure to LIBOR (mostly USD) through syndicated loans

Benchmark reform has major global implications

Key areas of focus since the FCA speech:

- Market participants assessing their exposure to LIBOR
- Whether a term RFR is needed to support the transition to overnight RFR benchmarks
- Developing or modifying financial market infrastructures to handle overnight RFRs
- Developing robust IBOR fallbacks for new products and having processes to handle legacy contracts
Evolution of benchmark reform

**June 2013**
FSB establishes OSSG

**July 2013**
IOSCO publishes its Principles for Financial Benchmarks

**Feb. 2013**
G-20 tasks FSB to improve oversight and governance frameworks of benchmarks

**March 2015**
Working group on Sterling RFR formed

**April 2017**
Reformed SONIA selected as preferred Sterling RFR

**June 2016**
EU BMR comes into force (effective Jan. 2018)

**Nov. 2014**
ARRC formed

**March 2018**
CARR created

**April 2018**
SOFR published
Reformed SONIA published

**June 2017**
Reformed SONIA selected as preferred USD RFR

**July 2017**
Andrew Bailey announces that FCA would not compel banks to submit LIBOR quotes after 2021

**September 2017**
Working group created to identify EUR RFR

**September 2018**
WG on euro RFR recommends €STR as the RFR

**July 2013**
FSB Report: Reforming Major Interest Rate Benchmarks is published

**July 2017**
Reformed SONIA published

**April 2018**
Recommended "enhanced CORRA" as the RFR

**July 2018**
Recommended "enhanced CORRA" as the RFR

**September 2018**
ISDA Fallback Consultation results published

**December 2018**
ISDA Fallback Consultation published

**Jan/Feb. 2019**
Enhanced CORRA Consultation paper published

**July 2019**
New CORRA methodology approved.

Bank of Canada announces new CORRA administrator role.
## Key global RFRs

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Overnight RFR</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Secured overnight financing rate (SOFR)</td>
<td>Secured overnight repo rate Calculated by FRBNY</td>
</tr>
<tr>
<td>UK</td>
<td>Reformed Sterling overnight Index Average (SONIA)</td>
<td>Unsecured overnight rate Calculated by Bank of England</td>
</tr>
<tr>
<td>Europe</td>
<td>Euro short-term rate (€STR)</td>
<td>Unsecured overnight rate Calculated by European Central Bank (ECB) (expected October 2, 2019)</td>
</tr>
<tr>
<td>Japan</td>
<td>Tokyo overnight average rate (TONA)</td>
<td>Uncollateralized call rate Calculated by Bank of Japan</td>
</tr>
<tr>
<td>Switzerland</td>
<td>Swiss Average Rate Overnight (SARON)</td>
<td>Secured overnight rate Published by SIX Swiss Exchange</td>
</tr>
<tr>
<td>Australia</td>
<td>Cash Rate (AUD Overnight Index Average)</td>
<td>Unsecured overnight rate Calculated by the Reserve Bank of Australia</td>
</tr>
</tbody>
</table>
The Alternative Reference Rate Committee (ARRC) recommended the Secured Overnight Financing Rate (SOFR) in June 2017 as the preferred US dollar overnight RFR:

- Broad-based overnight repo rate
- The Federal Reserve Bank of New York began publishing SOFR in April 2018

ARRC was reconstituted in March 2018 to focus on implementing its transition plan for SOFR, including developing a term rate and addressing fallback language

Key developments include:

- Active issuance of SOFR based floating rate notes (FRN)
  - Lack of issuance standard(s) regarding lockout versus lookback approaches and calculation types
    - Lockout varies between 0 to 4 days and lookback (reset) period varies between 1 to 5 days
    - Both simple average and daily compounded average methodologies are being used
Key developments (continued):

- Liquidity in SOFR futures and OIS swaps continues to build
- LCH plans to switch to SOFR for discounting and PAI on October 17, 2020. CME is targeting a transition date of July 17, 2020
- FASB approved SOFR to be hedge accounting compliant
- US Federal Reserve Bank staff have published a potential calculation methodology for forward-looking SOFR term rates
  - Creation of a term reference rate based on SOFR derivatives markets expected by end of 2021 under ARRC’s transition plan
- ARRC published a white paper on how an average of SOFR can be used in newly issued adjustable-rate mortgages (ARMs)

More details on the SOFR transition can be found in the ARRC’s paced transition plan
Global RFR Initiatives: United Kingdom

- The Working Group on Sterling Risk-Free Reference Rates recommended reformed Sterling Overnight Index Average (SONIA) in April 2017 as the preferred alternative RFR for GBP:
  - Overnight unsecured rate
  - Increased the number of transactions in the calculation of SONIA by including transactions arranged both via brokers and negotiated bilaterally
  - The Bank of England began publishing reformed SONIA in April 2018

- Key developments:
  - In July 2018, a public consultation was launched to develop a term SONIA RFR based on firm OIS quotes on regulated, electronic trading platforms. Term rate(s) expected to be produced by Q1 2020
  - GBP FRN market has fully transitioned to reference SONIA, with all major GBP FRN investors having the capability to invest in SONIA in arrears FRNs
  - Majority of securitized transactions now referencing SONIA in arrears
  - Traded monthly notional value of LCH cleared SONIA swaps is now broadly equivalent to that of GBP LIBOR swaps
  - SONIA based corporate loan products have been launched. The Loan Market Administration (LMA) is developing syndicated overnight RFR (in arrears) documentation
Global RFR Initiatives: Europe

- Following a consultation, in September 2018, the Working Group on Euro Risk-Free Rates recommended the euro short-term rate (€STR) as the Euro RFR:
  - Reflects the wholesale euro unsecured overnight borrowing costs of euro area banks
  - ECB to start publishing €STR on October 2, 2019

- Recommended a transition plan from EONIA to €STR:
  - As of October 2, EONIA will be calculated as €STR + 8.5bps
  - EONIA can be used as a reference rate until the end of 2021, after which it will no longer be compliant with the European Benchmark Regulations

- Working group on Euro term RFR
  - Recommended the OIS (tradable) quotes-based methodology as the €STR-based forward-looking term structure methodology as a fallback to Euribor-linked contracts
  - To be published within a reasonable time period following the launch of the daily €STR
Global RFR Initiatives: Other

Japan

- The Study Group on Risk-free Reference Rates recommended the unsecured Tokyo Overnight Average Rate (TONA) as the preferred alternative RFR for JPY:
  - "Cross-industry Committee on Japanese Yen Interest Rate Benchmarks" launched public consultation on term RFR July 2019

Switzerland

- The National Working Group on Swiss Franc Reference Rates recommended the secured Swiss Average Rate Overnight (SARON) as the preferred alternative RFR for CHF. SARON replaced the Tomorrow/Next Indexed Swaps (TOIS) benchmark:
  - Recommended a compounded ‘in arrears’ or ‘in advance’ SARON rate as an alternative to a term CHF LIBOR rate depending on need

Australia

- The risk-free benchmark for the Australian dollar is the unsecured overnight cash rate, also known as AONIA (AUD Overnight Index Average)
Global RFR Initiatives: Fallback language (derivatives)

- Fallbacks are provisions in legal documents/contracts on how to calculate future payments and receipts in the event of a material change to or cessation of the referenced benchmark.

- ISDA conducted a consultation on the fallback methodologies for GBP, CHF, JPY and AUD derivatives linked to their respective IBORs. The consultation found that the industry preferred the following:
  - To the designated overnight RFR in each currency
  - Term adjustment is calculated using compounded setting in arrears
  - Spread adjustment is calculated using an historical mean or median approach
    - The exact parameters for this adjustment are expected to be published for consultation by late summer

- ISDA recently concluded two consultations:
  - Consultation on the spread and term adjustments for fallbacks in derivatives referencing USD LIBOR, CDOR, HIBOR and SOR (preliminary results were published on 30 July)
  - Consultation on pre-cessation triggers and other issues related to how derivatives contracts should address a regulatory announcement that IBORs are no longer representative of an underlying market
Global RFR Initiatives: Fallback language (cash products)

- Numerous benchmark committees and industry associations are working on fallback language for cash products, including FRNs and loans.

- The ARRC has published recommended fallback language for:
  - Floating rate notes
  - Bilateral loans
  - Syndicated loans
  - Securitizations

- The ARRC released a consultation on fallback contract language for new residential adjustable-rate mortgages (ARMs).

- A working group on euro risk-free rates has set up a subgroup tasked with examining contractual robustness for legacy and new contracts that reference EONIA or EURIBOR.

- The LMA has updated its loan replacement of screen rate clause.
Canadian RFR Initiatives
Canadian Alternative Reference Rate (CARR) Working Group

- The Bank of Canada announced the creation of CARR, sponsored by the Canadian Fixed-Income Forum (CFIF), in March 2018
- Main objectives:
  - Review and enhance the existing Canadian overnight risk-free rate, the Canadian Overnight Repo Rate Average (CORRA)
  - Assess the need for and if required, seek to develop a Canadian term risk-free rate benchmark that is robust, reliable and resilient to market stress and manipulation

CORRA will act as a complementary reference rate for the Canadian market and will operate alongside the Canadian Dollar Offered Rate (CDOR)
Current CARR subgroups

- **Fallback language subgroup:**
  - Develop robust fallback language for non-derivatives products or contracts (i.e. floating rate notes, securitizations, hybrid capital notes and bank loans)

- **Transition subgroup:**
  - Provide the underlying framework to transition toward the widespread use of CORRA as a reference rate in Canadian dollar financial products

- **Term risk-free rate subgroup:**
  - Assess the need for a Canadian term risk-free rate benchmark. If required, develop the methodology and specifications for the term rate
Revisions to CORRA methodology
CARR’s objectives for enhancing CORRA

- Enhancements to CORRA should satisfy the below criteria:
  - rate should remain risk-free
  - rate should be calculated from more volume than CORRA today
  - rate should represent General Collateral (GC) funding
  - rate should be simple and easy to explain

- CARR considered consistency with existing CORRA in the evaluation of the preferred Canadian RFR

The enhancements proposed by CARR focus on creating a larger set of transactions upon which daily CORRA calculations would be based in order to increase CORRA’s reliability, robustness and representativeness.
## Enhancements to the CORRA calculation

<table>
<thead>
<tr>
<th>Securities and currency</th>
<th>Current CORRA</th>
<th>Enhancements to CORRA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Transactions involve only GoC bonds or GoC treasury bills and are settled in Canadian dollars.</td>
<td>GoC repo transactions conducted between any two unaffiliated counterparties and where data can be sourced. Repos conducted with the Bank of Canada or as part of the Receiver General auctions are excluded.</td>
</tr>
<tr>
<td>Counterparty types</td>
<td>Inter-dealer General Collateral repo transactions conducted through three inter-dealer brokers.</td>
<td></td>
</tr>
<tr>
<td>Term and time to settlement</td>
<td>Transactions are for an overnight term for same-day settlement (i.e., trades that are agreed to and settled on T+0).</td>
<td>Trimmed volume weighted median of eligible transactions.</td>
</tr>
<tr>
<td>Rate calculation</td>
<td>Volume weighted average of eligible trades.</td>
<td>Lowest volume weighted 25th percentile of trades trimmed to remove influence of “specials” from the calculation.</td>
</tr>
<tr>
<td>Floor rate</td>
<td>CORRA is set at the Bank of Canada target rate if daily eligible repo volume is less than $500M.</td>
<td>To be finalized</td>
</tr>
</tbody>
</table>
The enhancements result in CORRA being based on approximately $10 to 20 billion in daily repo transactions instead of the current $1 to 5 billion. On average we expect the underlying volume to increase by at least fivefold.

CORRA is currently set at the Bank of Canada’s target rate on those dates that the eligible daily repo volume is below $500 million (this occurred on 10 occasions in 2018). Under the enhancements the minimum daily CORRA repo volume would have been approximately $9 billion in 2018, or at least 18 times higher than seen under the current methodology.

Enhancements result in a substantial increase to CORRA’s robustness…

Source: MTRS
And lead to a reduction in CORRA’s volatility

Comparison of current CORRA and CORRA with the proposed enhancements
January 2016–December 2018

<table>
<thead>
<tr>
<th>Spread to target rate (basis points)</th>
<th>Current CORRA</th>
<th>Enhanced CORRA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.1</td>
<td>-0.3</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>2.2</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Source: MTRS
Transition to the new CORRA methodology is expected to take place in 2020Q2 when the Bank of Canada becomes the administrator of CORRA.

CARR Transition subgroup has established a CORRA production workstream, charged with:
- Establishing transparent publication process for CORRA and prepare a comprehensive calculation methodology document
- Creating a governance structure around CORRA to ensure appropriate publication process, methodology revisions and resolution of issues

The Bank will make historical data available to market participants:
- CORRA data based on current methodology is currently available back to August 1997
- CORRA data based on new methodology will be made available for analytical purposes back to January 2016

The Bank is committed to ensuring CORRA is consistent with the IOSCO principles for financial benchmarks.
Other CARR work on Canadian RFR initiatives
CARR Transition subgroup

- Provide the underlying framework to help transition toward the widespread use of CORRA as a reference rate in Canadian dollar financial products
- Develop broad communication/consultation plan for the transition
- Workstreams:
  - Production of CORRA
  - Calculation convention for cash products
  - Futures products/conventions
  - Swap market conventions
CARR Fallback Language subgroup

- Published [fallback language principles](#) for cash products in early 2019
- Currently developing fallback language for cash products that reference CDOR. A [first draft of the language](#) was published in May 2019, but will be finalized based on:
  - international fallback language best practices, and;
  - conclusion of the ISDA fallback consultation on CDOR
- The updated language is expected to be released for public consultation in Q4 2019
CARR Term risk-free rate subgroup

- Assess the need for a term risk-free rate benchmark in the Canadian dollar cash market through soliciting feedback from a broad range of market participants.
- If required, develop methodology and specifications for the Canadian term risk-free rate benchmark, including which maturities should be published.
**Industry timelines**

* Dates represent current work plans and are subject to change

<table>
<thead>
<tr>
<th>Calendar</th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q2</td>
<td>Q3</td>
<td>Q4</td>
<td>Q1</td>
</tr>
<tr>
<td>CORRA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CARR recommends new CORRA methodology</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LCH to clear CORRA IRIS to 31Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>CORRA FRN test trade executed</td>
<td></td>
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<tr>
<td></td>
<td>Corra Consultation</td>
<td></td>
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<tr>
<td></td>
<td>CORRA liquidity development</td>
<td></td>
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<tr>
<td></td>
<td>Launch of Transition Working Group</td>
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<tr>
<td></td>
<td>Launch of term risk-free rate Working Group</td>
<td></td>
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</tr>
<tr>
<td>SOFR</td>
<td></td>
<td>SOFR liquidity development</td>
<td>Fed to publish backwards-looking SOFR term rate and SOFR averages</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SONIA</td>
<td>SONA liquidity development</td>
<td>Term SONIA rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GBP fallback language agreed and implementation begins</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ESTR</td>
<td>Oct 2019 Publication of daily ESTR</td>
<td>ESTR liquidity development</td>
<td></td>
</tr>
<tr>
<td>Industry Wide</td>
<td>ISDA consultation on CAD, USD, HKD and SOR</td>
<td></td>
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</tbody>
</table>
Stakeholder Engagement

- Broad outreach across the range of stakeholders, including through:
  - Participation in CARR subgroups
  - CARR roundtables/webinars
  - Industry input/feedback on CARR consultation papers
- Information on CARR’s activities including the terms of reference, membership, meeting dates, agendas and summaries will be available on the CARR website
- Stakeholder presentation will be updated with relevant new information
- Market participants interested in contributing to these efforts are invited to email CARR-WG@bankofcanada.ca with their contact details
Appendices
Scope subgroup published a report on the estimated notional value of securities that reference CORRA / CDOR

<table>
<thead>
<tr>
<th>Product</th>
<th>Outstandings (CAD billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OTC Interest Rate Derivatives</td>
<td>10,737</td>
</tr>
<tr>
<td>Exchange Traded Derivatives</td>
<td>1,089</td>
</tr>
<tr>
<td>Business Loans</td>
<td>60</td>
</tr>
<tr>
<td>Consumer Loans</td>
<td>1</td>
</tr>
<tr>
<td>Deposits</td>
<td>22</td>
</tr>
<tr>
<td>Bonds</td>
<td>137</td>
</tr>
<tr>
<td>Securitized Products</td>
<td>131</td>
</tr>
<tr>
<td>Others</td>
<td>26</td>
</tr>
<tr>
<td>Bankers Acceptances</td>
<td>103</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>12,307</strong></td>
</tr>
</tbody>
</table>

Source: CARR data survey, OSC (trade repository data), TMX, Bloomberg.
CARR organization details

- **Organization:**
  - Membership composition is meant to capture all aspects of benchmark usage:
    - Co-chairs: Bank of Canada and CIBC
    - Members: Big-6 Canadian banks, foreign bank, insurance companies, pension funds and institutional asset managers
    - Observers: CDCC, LCH, TMX (Montreal Exchange)
  - Advisory subgroups will be established to focus/study specific issues and will reach out to, and seek feedback from, a wide range of stakeholders
  - Bank of Canada provides secretariat functions
  - Monthly, in-person meetings
Summary of responses to CORRA consultation

- Total of 15 respondents largely from sell-side and buy-side institutions were very supportive of the proposed methodology.
- The most frequent responses focused on:
  - The treatment of “tomorrow-next” (tom-next) trades; and
  - Ensuring that the methodology proposed for an enhanced CORRA remained appropriate going forward.
- Respondents also provided comments on the inclusion of various types repo trades into the enhanced CORRA calculation.
- A respondent noted that the current definitions of CORRA in Credit Support Annexes may not be exactly in line with an enhanced CORRA.
- More detailed discussion on the consultation responses, as well as CARR’s replies, can be found in CARR’s consultation response document.
# Committees working on interest rate benchmark reform

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>Committees</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>Alternative Reference Rate Committee (ARRC)</td>
<td><a href="https://www.newyorkfed.org/arrc">https://www.newyorkfed.org/arrc</a></td>
</tr>
</tbody>
</table>
### Other useful links

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description</th>
<th>Link</th>
</tr>
</thead>
</table>
| International Swaps and Derivatives Association, Inc. (ISDA) | • ISDA is working to develop robust fallback language for derivatives contracts that reference certain key IBORs  
• Detailed presentation on issues around benchmark reform: ISDA roadmap document and Global Benchmark Transition Report  
• Results of first consultation on benchmark fallbacks; Charts on adjustment options  
• Consultation on fallbacks for LIBOR, CDOR, HIBOR, SOR  
• Consultation on pre-cessation issues | [https://www.isda.org/category/legal/benchmarks/](https://www.isda.org/category/legal/benchmarks/) |
| Financial Stability Board - Official Sector Steering Group (OSSG) | • International policy developments on benchmark reform  
## Other useful links

<table>
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<th>Description</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Conduct Authority (FCA)</td>
<td>• The FCA is the competent authority responsible for authorization and registration of EU benchmark administrators, recognition of third country administrators, endorsement of third country benchmarks, enforcement, and supervision of benchmark administrators, users, and contributors in the UK.</td>
<td><a href="https://www.fca.org.uk/markets/benchmarks">https://www.fca.org.uk/markets/benchmarks</a></td>
</tr>
<tr>
<td>ICE Benchmark Administration (IBA)</td>
<td>• Administrator of LIBOR</td>
<td><a href="https://www.theice.com/iba">https://www.theice.com/iba</a></td>
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</tbody>
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