



Benchmark Reform – Global and domestic overview

CARR stakeholder presentation

Background

- 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
- The International Organization of Securities Commissions (IOSCO) published its [Principles for Financial Benchmarks](#) in July 2013

Background

- 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

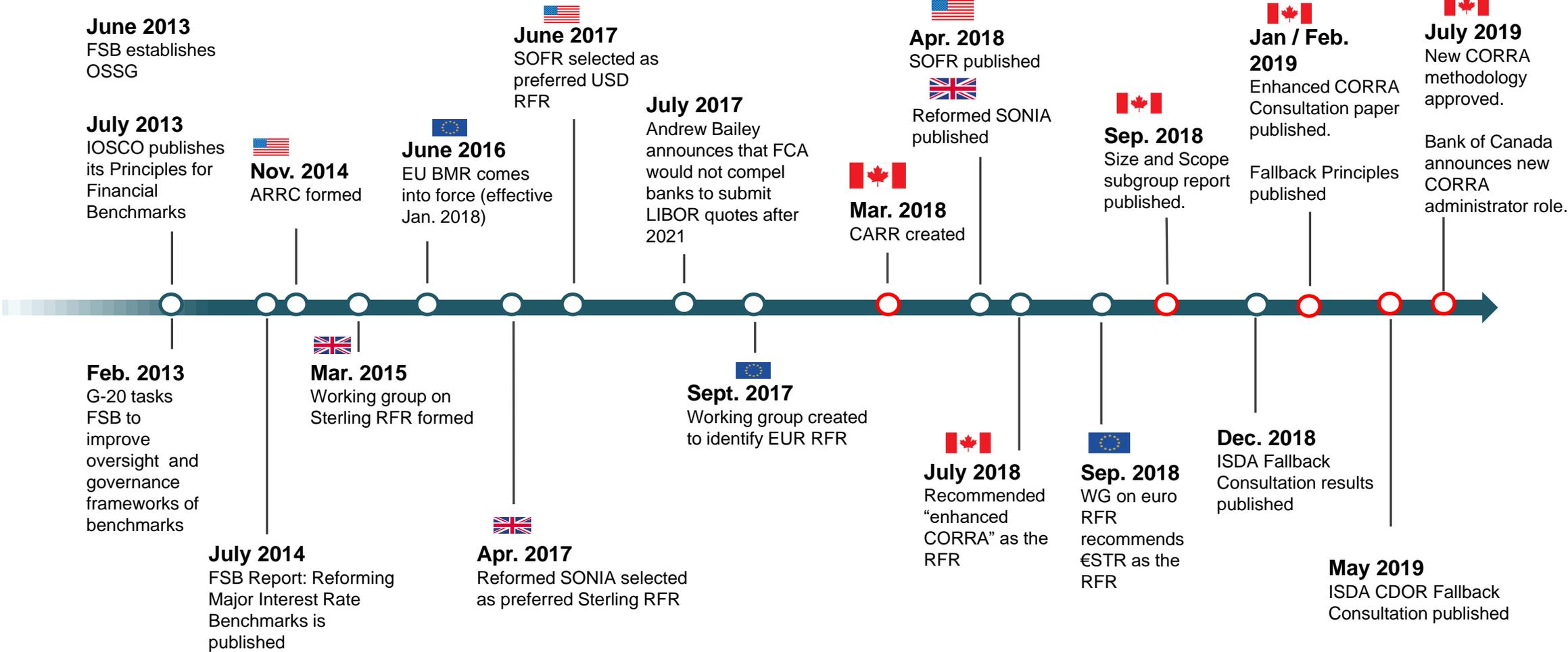
Background

- 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





Global RFR Initiatives

Key global RFRs

Jurisdiction		Overnight RFR	Description
US		Secured overnight financing rate (SOFR)	Secured overnight repo rate Calculated by FRBNY
UK		Reformed Sterling overnight Index Average (SONIA)	Unsecured overnight rate Calculated by Bank of England
Europe		Euro short-term rate (€STR)	Unsecured overnight rate Calculated by European Central Bank (ECB) (expected October 2, 2019)
Japan		Tokyo overnight average rate (TONA)	Uncollateralized call rate Calculated by Bank of Japan
Switzerland		Swiss Average Rate Overnight (SARON)	Secured overnight rate Published by SIX Swiss Exchange
Australia		Cash Rate (AUD Overnight Index Average)	Unsecured overnight rate Calculated by the Reserve Bank of Australia

Global RFR Initiatives: United States

- 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

Global RFR Initiatives: United States

- 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

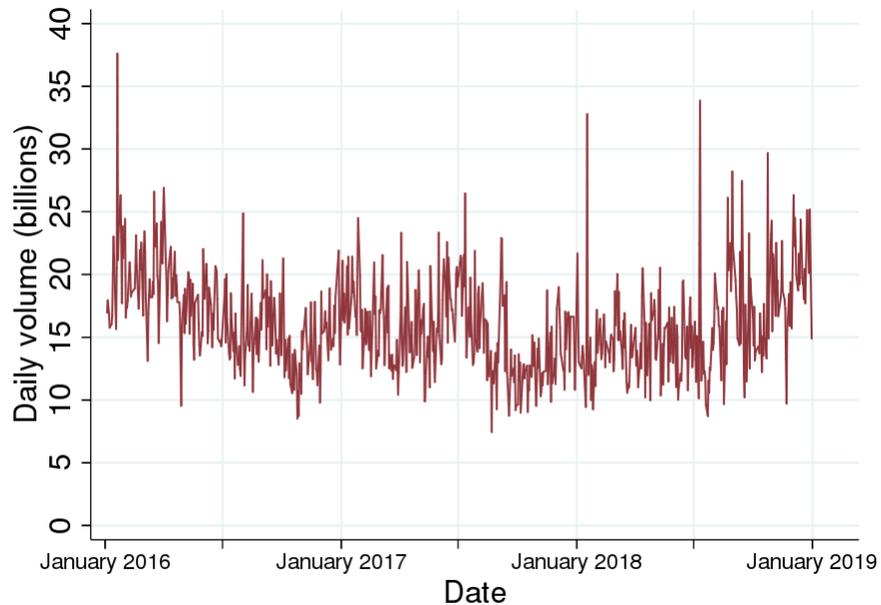
The enhancements proposed by CARR focus on creating a larger set of transactions upon which daily CORRA calculations would be based in order to increase CORRA's reliability, robustness and representativeness.

Enhancements to the CORRA calculation

	Current CORRA	Enhancements to CORRA
Securities and currency	Transactions involve only GoC bonds or GoC treasury bills and are settled in Canadian dollars.	
Counterparty types	Inter-dealer General Collateral repo transactions conducted through three inter-dealer brokers.	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.
Term and time to settlement	Transactions are for an overnight term for same-day settlement (i.e., trades that are agreed to and settled on T+0).	
Rate calculation	Volume weighted average of eligible trades.	Trimmed volume weighted median of eligible transactions. <ul style="list-style-type: none"> • Lowest volume weighted 25th percentile of trades trimmed to remove influence of “specials” from the calculation.
Floor rate	CORRA is set at the Bank of Canada target rate if daily eligible repo volume is less than \$500M.	To be finalized

Enhancements result in a substantial increase to CORRA's robustness...

Unaffiliated overnight GoC repo volume

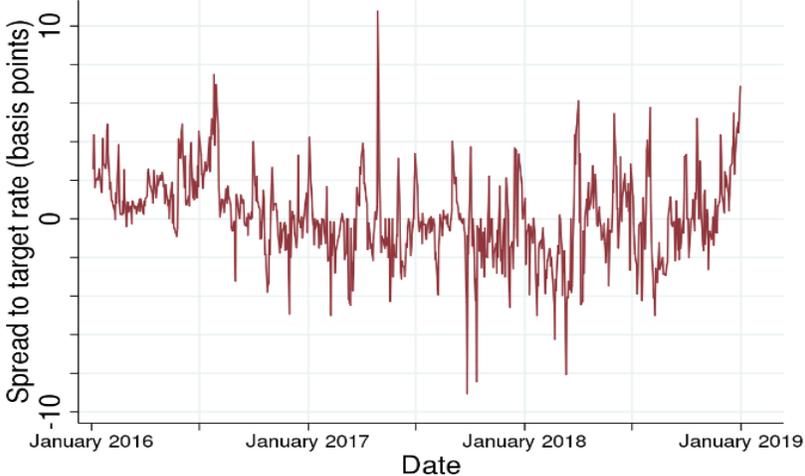


Source: MTRS

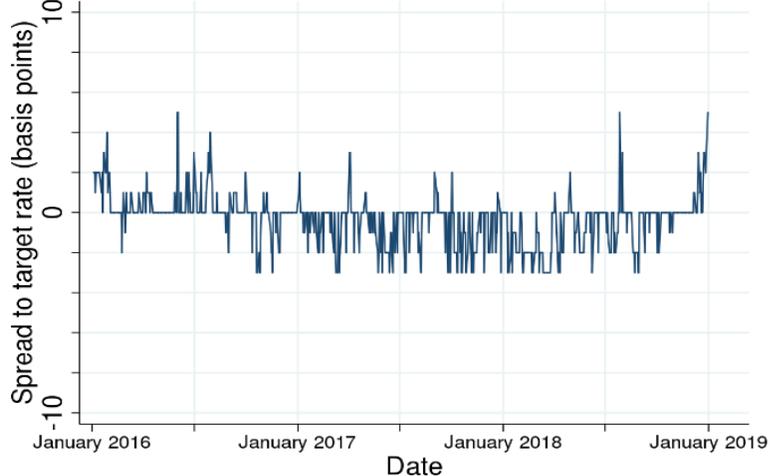
- The enhancements result in CORRA being based on approximately \$10 to 20 billion in daily repo transactions instead of the current \$1 to 5 billion
 - On average we expect the underlying volume to increase by at least fivefold
- CORRA is currently set at the Bank of Canada's target rate on those dates 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

And lead to a reduction in CORRA's volatility

Current CORRA



Enhanced CORRA



Comparison of current CORRA and CORRA with the proposed enhancements

January 2016–December 2018

Spread to target rate (basis points)	Current CORRA	Enhanced CORRA
Mean	0.1	-0.3
Standard deviation	2.2	1.3

Source: MTRS

Next steps

- 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*

Calendar	2019			2020				2021
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
CORRA 	 CARR recommends new CORRA methodology  CORRA FRN test trade executed CORRA Consultation CORRA liquidity development Launch of Transition Working Group Launch of term risk-free rate Working Group	 LCH to clear CORRA IRS to 31Y	 CARR publish recommended cash conventions	 CARR publish recommended fallback language	 CORRA Publication  MX launches CORRA futures			
SOFR 	SOFR liquidity development				 Fed to publish backwards-looking SOFR term rate and SOFR averages	 CCPs move to SOFR PAI/Discounting		
SONIA 	SONIA liquidity development			 Term SONIA rate				
	GBP fallback language agreed and implementation begins							
€STR 			 Oct 2019 Publication of daily €STR	ESTR liquidity development			 Dec 2021 EU Benchmark regulation take effect	
Industry Wide	ISDA consultation on CAD, USD, HKD and SOR							

* Dates represent current work plans and are subject to change

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

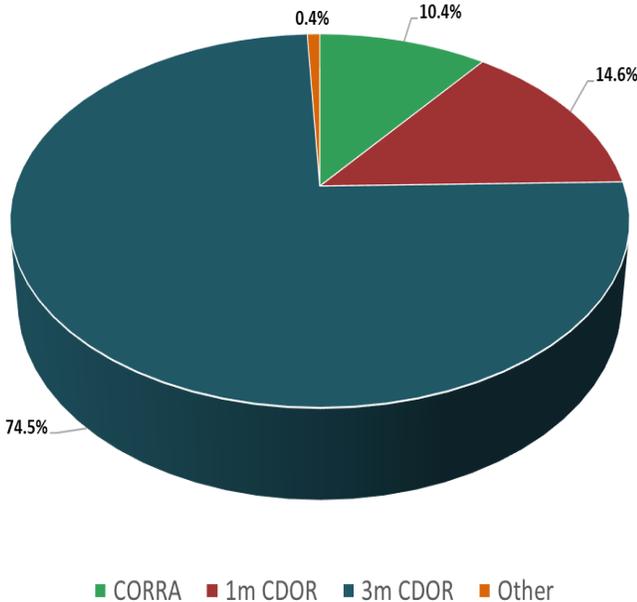


Appendices

Size and Scope of CORRA / CDOR

- Scope subgroup published a [report](#) on the estimated notional value of securities that reference CORRA / CDOR

Product	Outstandings (CAD billions)
OTC Interest Rate Derivatives	10,737
Exchange Traded Derivatives	1,089
Business Loans	60
Consumer Loans	1
Deposits	22
Bonds	137
Securitized Products	131
Others	26
Bankers Acceptances	103
Total	12,307



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

Jurisdiction	Committees	Link
US 	Alternative Reference Rate Committee (ARRC)	https://www.newyorkfed.org/arrc
UK 	The Working Group on Sterling Risk-Free Reference Rates	https://www.bankofengland.co.uk/markets/transition-to-sterling-risk-free-rates-from-libor
Europe 	Working group on euro risk-free rates	https://www.ecb.europa.eu/paym/initiatives/interest_rate_benchmarks/WG_euro_risk-free_rates/html/index.en.html
Japan 	Cross-Industry Committee on Japanese Yen Interest Rate Benchmarks	https://www.boj.or.jp/en/paym/market/jpy_cmte/index.htm/
Switzerland 	National Working Group on Swiss Franc Reference Rates	https://www.snb.ch/en/ifor/finmkt/fnmkt_benchm/id/finmkt_reformrates

Other useful links

Organization	Description	Link
International Swaps and Derivatives Association, Inc. (ISDA)	<ul style="list-style-type: none">• 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/
Financial Stability Board - Official Sector Steering Group (OSSG)	<ul style="list-style-type: none">• International policy developments on benchmark reform• Background reports on benchmark reform	http://www.fsb.org/work-of-the-fsb/policy-development/additional-policy-areas/financial-benchmarks/

Other useful links

Organization	Description	Link
Financial Conduct Authority (FCA)	<ul style="list-style-type: none">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.	https://www.fca.org.uk/markets/benchmarks
ICE Benchmark Administration (IBA)	<ul style="list-style-type: none">Administrator of LIBOR	https://www.theice.com/iba
Canadian Securities Administrators (CSA)	<ul style="list-style-type: none">Proposed benchmark regulation in Canada	https://www.osc.gov.on.ca/en/SecuritiesLaw/ni_20190314_25-102_designated-benchmarks.htm