Benchmark Reform - Enhancements to the calculation methodology for CORRA

CARR stakeholder presentation

Version July 2019

Canadian Alternative Reference Rate Working Group

- The Bank of Canada announced the creation of the Canadian Alternative Reference Rate Working Group (CARR), sponsored by the Canadian Fixed-Income Forum (CFIF), in March 2018
- Main objectives:
  - Review and enhance the existing Canadian overnight risk-free rate, 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

Being a multi-rate jurisdiction, any new term risk-free rate would act as a complementary reference rate for the Canadian market and would operate alongside CORRA and the Canadian Dollar Offered Rate (CDOR)

CARR’s Alternative rates subgroup

- Recommended enhancing CORRA as the preferred overnight Canadian RFR
- Developed a methodology and specifications for calculation enhancements to ensure that CORRA is as robust as possible
- Consultation paper on proposed enhancements published February 26th 2019
- Consultation period was open until April 30th 2019
- Reviewed consultation feedback and provided a final recommendation to CFIF for the enhancements to CORRA

What is CORRA?

- CORRA is Canada’s overnight risk-free rate and is a measure of the average cost of overnight general collateralized (GC) funding
- It is currently defined as the volume-weighted average rate of overnight repo transactions collateralized by general Government of Canada securities, as reported by designated inter-dealer brokers
- It is the main reference rate for overnight indexed swaps and used to price some commercial deposits at banks

➢ However, the current methodology is based on a relatively small number of GC repo transactions conducted through a limited set of counterparties

Specific enhancements to CORRA

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 GC funding
  - rate should be simple and easy to explain
- CARR considered consistency with existing CORRA in the evaluation of the preferred Canadian RFR

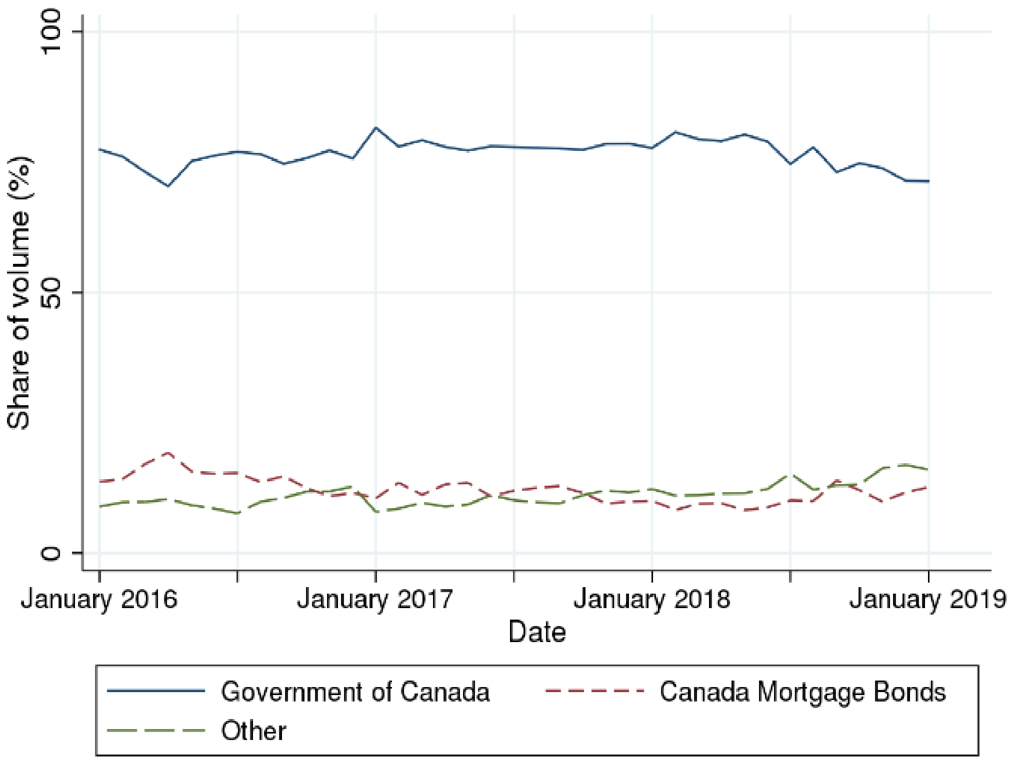
Enhancements focused on creating a larger set of transactions upon which daily CORRA calculations would be based in order to increase CORRA’s reliability, robustness and representativeness.

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 (GC) 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 • 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

Recommendation #1: Only include GoC bill and bond repos

Share of repo volumes by collateral type



Source: MTRS

- CARR recommended a focus on GoC bill and bond repos because they represent the largest share of this volume and fit today's definition of GC and CORRA
  - Including other collateral types may also introduce new sources of variability to the rate
- Total overnight repo volumes for all collateral types, with same-day settlement of the opening leg, range between \$40 and \$55 billion per day (reported to Market Trade Reporting System)
- For GoC collateral, the range is \$30 to \$40 billion per day (before applying any filters – discussed later)
  - This volume includes both general collateral funding and specific bond repos

Recommendation #2: Expand universe of trades beyond inter-dealer

- CARR recommended that the CORRA calculation capture as much of the underlying overnight GoC repo market as possible
- Transaction universe broadened to include all overnight GoC repo trades between all unaffiliated counterparties:
  - Analysis showed an important share of volume would be lost by focusing only on inter-dealer trades
  - No conclusive difference in rates was seen in trades between inter-dealer trades and those between dealers and unaffiliated clients
  - Inter-affiliated repo trades could be subject to other pricing factors, such internal transfer pricing and including them was not consistent with global best practices

Recommendation #3: Only include spot overnight repo trades

- CARR recommended that only overnight repo trades with an opening leg on t+0 and a closing leg on t+1 should be included
  - Tom-next* trades make up an increasing share of overnight repo trades, but have been excluded because they are often executed based on delivering specific collateral and may skew rates lower or may affect the rate around Bank of Canada meeting dates
  - Open repos, i.e. those without a fixed maturity date, that can be terminated by either party with a one day notice, have been excluded due to factors that bias open repo rates higher

* A "tom-next" repo trade is an overnight repo trade that is executed on T+0, with the opening leg of the transaction settling on T+1 (tomorrow), and the closing leg of the transaction settling on T+2 (next).

Recommendation #4: Eliminate the impact from “specials” using trimmed mean approach

- The large transaction set exhibits mean and median daily rates that trend below existing CORRA and the Bank of Canada target rate
  - This trend was attributed to “specials” being included in the data
- CARR opined that “specials” typically do not provide information on general collateral funding conditions and should therefore be excluded
  - “Specials” are motivated by the need to source specific securities rather than to source cash
- However, there is no industry accepted definition of “specials” or means to easily identify them in the data

Current CORRA vs. average of all GoC overnight repo transactions

January 2016–December 2018

Spread to target rate (basis points)	Current CORRA	Average of all GoC transactions
Mean	0.1	-2.3
Standard deviation	2.2	1.6

Four proposed methodologies to correct for “specials”

- CARR identified the need to correct for “specials” in enhancing CORRA
- Four filter methodologies were proposed:
    1. No filter at all: Final rate includes “specials” and general collateral transactions
    2. “Trimmed median”: Drop a fixed lower percentile of trades each day by rate
    3. “Bond-rate method”: Drops a variable number of trades each day based on the rate at which a bond is pledged
    4. “Mixture method”: Separate the distributions of “specials” and general collateral
- The Trimmed median and Bond-rate method were shortlisted by CARR as the options to consider

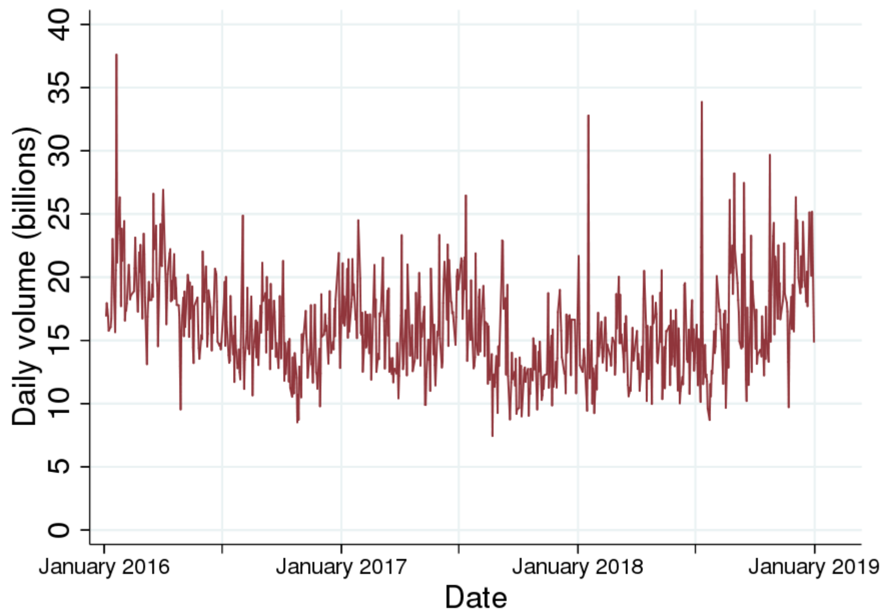
Recommendation to use the Trimmed median with a 25% filter

- CARR found consensus on its recommendation of a Trimmed median:
  - The low volatility in the resulting rate using this approach was seen as positive: hedgers will benefit from a rate that more closely tracks the Bank of Canada overnight rate and issuers will benefit from stability in payments
  - In a market with extreme levels of "specials", the rate will trend lower to reflect a different nature of funding
  - The Bond-rate approach was seen as too complex
  - The Trimmed median is simple and consistent with the US approach for SOFR
- The calibration is to trim the bottom 25th percentile of transactions each day to account for "specials":
  - This calibration was based on historical analysis that looked at the spread and volatility of CORRA under the enhanced calculation to the Bank of Canada overnight target rate and to the current CORRA calculation
  - The selection of the "25th" percentile was based on optimizing between maximizing volume and minimizing dispersion around the target rate

What do these changes mean for CORRA?

A substantial increase in CORRA's robustness

Unaffiliated overnight GoC repo volume

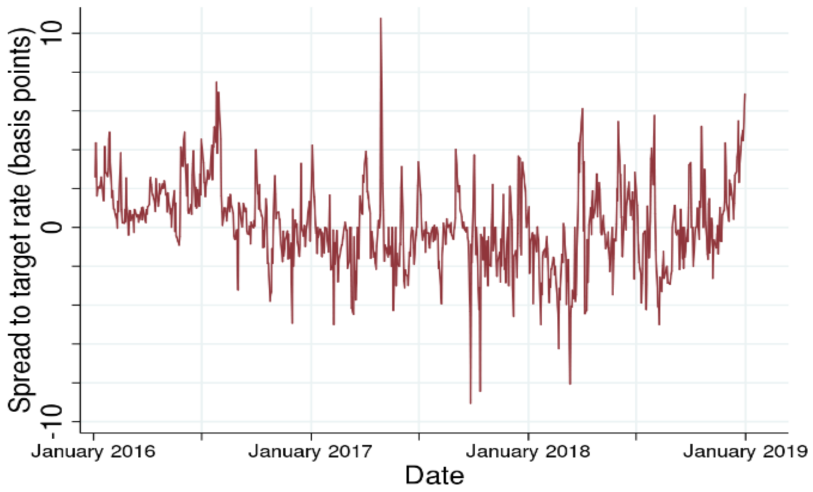


Source: MTRS

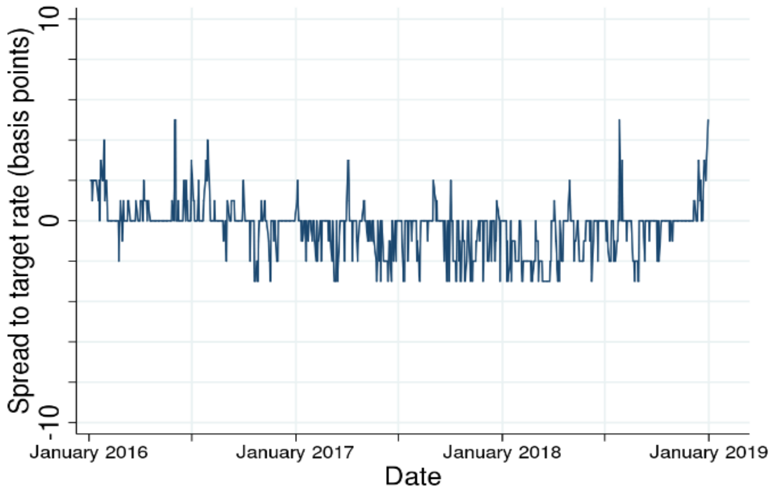
- The enhancements result in CORRA being based on approximately $10 to 20 billion in daily repo transactions instead of the current $1 to 5 billion
  - On average we expect the underlying volume to increase by at least fivefold
- CORRA is currently set at the Bank of Canada's target rate on those dates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

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

Enhanced CORRA = CORRA

From an end user's perspective, the CORRA calculated under the enhanced methodology will be equivalent to the current existing CORRA

Next steps for CORRA

- Transition to the new CORRA methodology is expected to take place in Q2-2020 when the Bank of Canada becomes the administrator of CORRA
- CARR Transition subgroup has established production workstream:
  - Establish transparent publication process for CORRA and prepare a comprehensive calculation methodology document
  - Create 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

Broad adoption of CORRA across Canadian financial products

- CARR Transition subgroup will 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 transition
- Current workstreams:
  - Production of enhanced CORRA
  - Calculation conventions for cash products
  - Futures products/conventions
  - Swap market conventions

Stakeholder Engagement

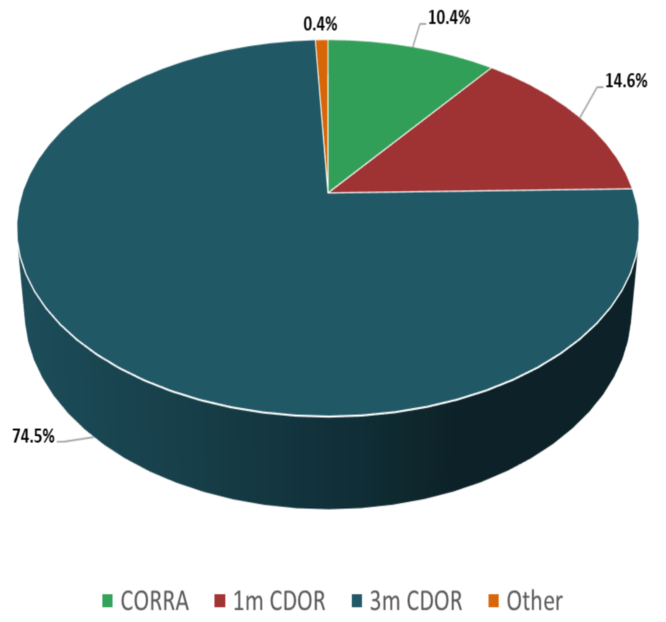
- Broad outreach across the range of stakeholders, including through:
  - Participation in CARR subgroups
  - CARR roundtables/webinars
  - Industry input/feedback on CARR consultation papers
- Information on CARR's activities including the terms of reference, membership, meeting dates, agendas and summaries will be available on the CARR website
- 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

- 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.

CORRA consultation questions

- Question 1:
  Do you support expanding the trades used for the calculation of an enhanced CORRA to include repo transactions between all unaffiliated counterparties, but excluding those relating to repos conducted with the Bank of Canada or as part of the Receiver General auctions? If you do not support this, please explain why.

- Question 2:
  Do you support including only overnight repos for same-day settlement in an enhanced CORRA? If you do not support this, please explain why.

- Question 3:
  Do you agree with the proposal to limit the calculation of an enhanced CORRA to repos in Canadian dollars and that involve Government of Canada securities only? If you disagree, please explain why.

- Question 4:
  Do you agree with CARR's recommendation of using a 25 per cent trimmed median methodology for calculating the enhanced CORRA? If you disagree, please explain why.

- Question 5:
  Do you believe that the differences between the proposed enhanced CORRA and the current CORRA are material enough to impact the transition to the enhanced rate? If yes, please explain why.

- Question 6:
  Are there any other considerations pertaining to the calculation methodology that you believe CARR should discuss?

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