



Term CORRA: Canada's Trusted Benchmark

Andre Langevin

June 8th, 2023





The financial market partner



The leading electronic exchange for Canadian rates products

Est. 2001



Incubator for new ideas and technologies to help our clients become more efficient and profitable

Est. 2018



The Data & Analytics business, providing bond valuations for 95K securities and related analytics to investors in Canadian fixed income securities

Est. 2020



Trusted Benchmark Administrator for the Canadian capital marketplace.
Benchmark Administrator of Term CORRA

Est. 2023



Independent Benchmark Administrator

- **CanDeal Benchmark Solutions** was formed to administer the Term CORRA benchmark:
 - Owns and manages the **Term CORRA Calculation Methodology**
 - Partners with TMX to calculate and publish Term CORRA
- **CanDeal Benchmark Solutions** is aligned with:
 - IOSCO *Principles for Financial Benchmarks*
 - Multilateral Instrument 25-102
 - Formal *designation* pending with both the OSC and AMF
- Independent oversight:
 - Separate legal entity to ensure independence
 - **Oversight Committee** comprised of representatives offering many different perspectives (i.e., buy side, sell side)



More information about CanDeal Benchmark Solutions

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation.



-  **Case Study 1:** Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod
-  **Video:** Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod
-  **Blog article:** Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod
-  **Podcast:** Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod

[Explore More Content](#)



Introduction to CORRA: Canada's Daily Risk-Free Rate

- The *Canadian Overnight Repo Rate Average* is the observed average interest rate paid on overnight repurchase agreements with Government of Canada bonds and treasury bills as collateral:
 - The IROC collects market data via *MTRS*
 - The Bank of Canada is the *calculation agent* and owns the methodology
 - Backward-looking: rate for day T-1 is published on day T
- Published **daily** at **11:30am** by the Bank of Canada as a public good:
 - No license required for use

Recent data: CORRA

Data available as: [CSV](#), [JSON](#) and [XML](#)



Our Valet API is designed to help you integrate your applications and processes with our data. For details, please see our [documentation](#).

Published every business day between 9:00 and 11:00 ET.

	2023-05-23	2023-05-24	2023-05-25	2023-05-26	2023-05-29
Canadian Overnight Repo Rate Average (CORRA) (%)	4.5000	4.5000	4.5000	4.5000	4.5000
Total dollar trading volume of all trades eligible for CORRA (\$)	22,255,854,921	15,713,542,501	16,892,054,813	16,281,455,938	17,009,857,370
Trimmed dollar volume of trades eligible for CORRA (\$)	16,691,891,191	11,785,156,876	12,669,041,110	12,211,091,954	12,757,393,028
Number of unique data submitters for CORRA	14	14	13	14	13
Rate at which daily CORRA trading volume is trimmed (%)	4.4200	4.4700	4.4600	4.4700	4.4600
Rate at 5th percentile of the trimmed trading volume (%)	4.4500	4.4800	4.4700	4.4900	4.4700
Rate at 25th percentile of the trimmed trading volume (%)	4.4900	4.5000	4.4900	4.5000	4.5000
Rate at 75th percentile of the trimmed trading volume (%)	4.5000	4.5000	4.5000	4.5000	4.5000
Rate at 95th percentile of the trimmed trading volume (%)	4.5100	4.5000	4.5000	4.5100	4.5100
Publication status	Published	Published	Published	Published	Published
Calculation methodology	Standard	Standard	Standard	Standard	Standard

Note: Revised data are marked with an R.

Source: Bank of Canada <https://www.bankofcanada.ca/rates/interest-rates/corra>



CORRA Compounded Index

- The **CORRA Compounded Index** is a helpful tool for computing interest at the CORRA rate, over an interval:
 - One-day offset: the **Observation Period** starts one day before the business date
 - Compounded daily
 - Published by the Bank of Canada **daily** at **11:30am**

CORRA in the capital marketplace today:

- Canadian swaps dealers now use CORRA as their primary swap curve
- NHA Mortgage Pools (981) & Canada Housing Trust FRNs
- Bank-issued FRNs

CORRA Compounded Index

Calculation methodology

The CORRA Compounded Index is a measure of the cumulative impact of CORRA compounding over time, starting from a base value of 100 on June 12, 2020. The index can be used to calculate CORRA compounded rate between any two dates. Each day, the CORRA index would be set as follows:

$$\text{CORRA Compounded Index}_i = \text{CORRA Compounded Index}_{i-1} \times \left(1 + \frac{\text{CORRA}_{i-1} \times d_{i-1}}{365} \right)$$

Where:

- *CORRA Compounded Index_i* = the CORRA Compounded Index for business day *i*
- *CORRA_{i-1}* = CORRA for business day *i - 1*, which is published on business day *i*
- *d_{i-1}* = number of calendar days for which *CORRA_{i-1}* is compounded (*d* = 1, 2, ...)
- *i* = series of ordinal numbers since the base date (*i* = 1, 2, ...)

CORRA Compounded Index is published to eight decimal places (i.e., XXX.XXXX XXXX).

If a contract accumulated interest between two dates, *x* and *y*, parties to the contract could apply the following formula to get the aggregate compounding between these dates:

$$\left(\frac{\text{CORRA Compounded Index}_y}{\text{CORRA Compounded Index}_x} - 1 \right) \times \left(\frac{365}{d} \right)$$

Where:

- *CORRA Compounded Index_x* = CORRA Index on start date of calculation period
- *CORRA Compounded Index_y* = CORRA Index on end date of calculation period
- *d* = number of calendar days in the calculation period



Term CORRA Benchmarks

- Strong demand for a **forward-looking** version of the CORRA interest rate so that interest costs can be known at the **start** of a transaction:

Term CORRA Benchmarks

1-month
Term CORRA Rate

3-month
Term CORRA Rate



**Published at
1:00pm ET daily**
on Canadian
business days

- CARR Approved Use Cases for Term CORRA:
 - Loan products
 - Trade finance
 - Single currency derivatives for end-users



Term CORRA Benchmarks: Methodology

- The Term CORRA calculation methodology was set by the CARR in their paper *Term CORRA Methodology - CARR Recommended Approach*:

- The calculation of Term CORRA follows the now-familiar waterfall approach used for Term SOFR:

Level 1:
*Heitfield & Park
Methodology
using observed MX
trading data*



Level 2:
*Adjust prior day's
Term CORRA
using historical
sensitivities*

- Term CORRA Methodology will be owned and managed by the designated benchmark administrator, *CanDeal Benchmark Solutions*



Term CORRA Methodology - CARR Recommended Approach

1. Overview

This document provides an overview of the Canadian Alternative Reference Rate Working Group's (CARR) recommended methodology for calculating a forward-looking Term CORRA interest rate benchmark. While the primary interest rate benchmark in Canada will be the Overnight CORRA (Canadian Overnight Repo Rate Average), CARR has developed a methodology to support the creation of a robust Term CORRA reference rate for select uses in the transition away from CDOR. The calculated rate is meant to reflect, at a point in time, the CORRA overnight index swap (OIS) rate¹ for the 1- and 3-month tenor. It builds on academic work as well as the term risk-free rates already established in other jurisdictions, including the US and UK, and has been developed by a working group of subject matter experts across the Canadian industry, including the Bank of Canada.

The case for creating a Term CORRA was first mentioned in CARR's 2021 [CDOR White Paper](#), where it was noted that CARR would consult on a potential forward-looking rate. The resulting [public consultation](#) found that Canadian non-financial corporates, in particular, had a strong desire for a Term CORRA benchmark, as a term rate would be less operationally complex and facilitate cash flow forecasting. Based on the results of its consultation, CARR has decided that a Term CORRA benchmark would be important for the successful transition of the Canadian loan and trade finance market from CDOR to CORRA. As a result, CARR is establishing the parameters for the creation of an IOSCO-compliant benchmark with the appropriate stakeholders. While most financial instruments will reference Overnight CORRA, CARR is identifying specific use cases for the use of Term CORRA. These use cases will be embedded in the benchmark administrator's licensing arrangements (for more details see CARR's Term CORRA Use Cases).

1.1 Term CORRA tenors

Term CORRA will be a forward-looking measurement of overnight CORRA for 1- and 3-month tenors, based on market-implied expectations from CORRA derivatives markets. The rate will be calculated from 1- and 3- month CORRA futures trading on the Montréal Exchange using both transactions and executable bids and offers in the central limit order book (CLOB) over a specific calculation period.² Term CORRA will complement both [overnight CORRA](#) and the [CORRA Compounded Index](#) that are administered and published by the Bank of Canada.

1.2 Role of the benchmark administrator

The benchmark administrator will be responsible for all aspects of Term CORRA, including ensuring that the benchmark aligns with the IOSCO Principles for Financial Benchmarks, as well as any applicable Canadian regulation. It is expected that Term CORRA and its administrator will be subject to Canadian benchmark regulation under Multilateral Instrument 25-102 *Designated Benchmarks and Benchmark Administrators* (MI 25-102) and Ontario Securities Commission Rule 25-501 (Commodity Futures Act)

¹ OIS rates reflect market expectations for overnight CORRA settings for specific maturity tenors.

² As transactions are a key ingredient to the methodology, it should be expected that dealers hedging OIS exposure may impact the calculated Term CORRA rate.

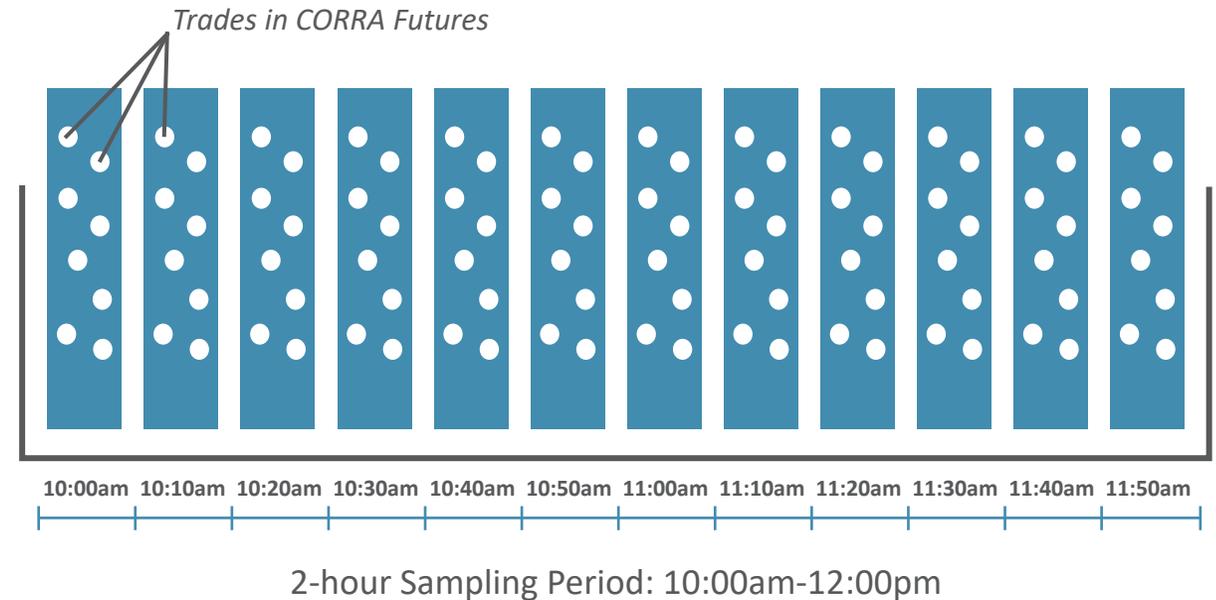


Observed Input to Term CORRA

- The MX samples trading in 1-month (COA) and 3-month (CRA) CORRA futures:
 - Samples are taken on twelve 10-minute intervals
 - Each sample is a vector of VWAP by contract tenors
 - Outright trades, strategy trades and committed quotes are all considered valid observations
 - All samples are independent: some tenors in a period can be valid while others are not
- There is an open interest of **~290,000 contracts** in CORRA futures on the MX:
 - Trading in CDOR futures is expected to migrate to CORRA futures by September 2024 when CDOR cessation is complete
 - MX has engaged market makers to ensure a liquid market in both CORRA futures contracts

Sampling MX CORRA Future Trading

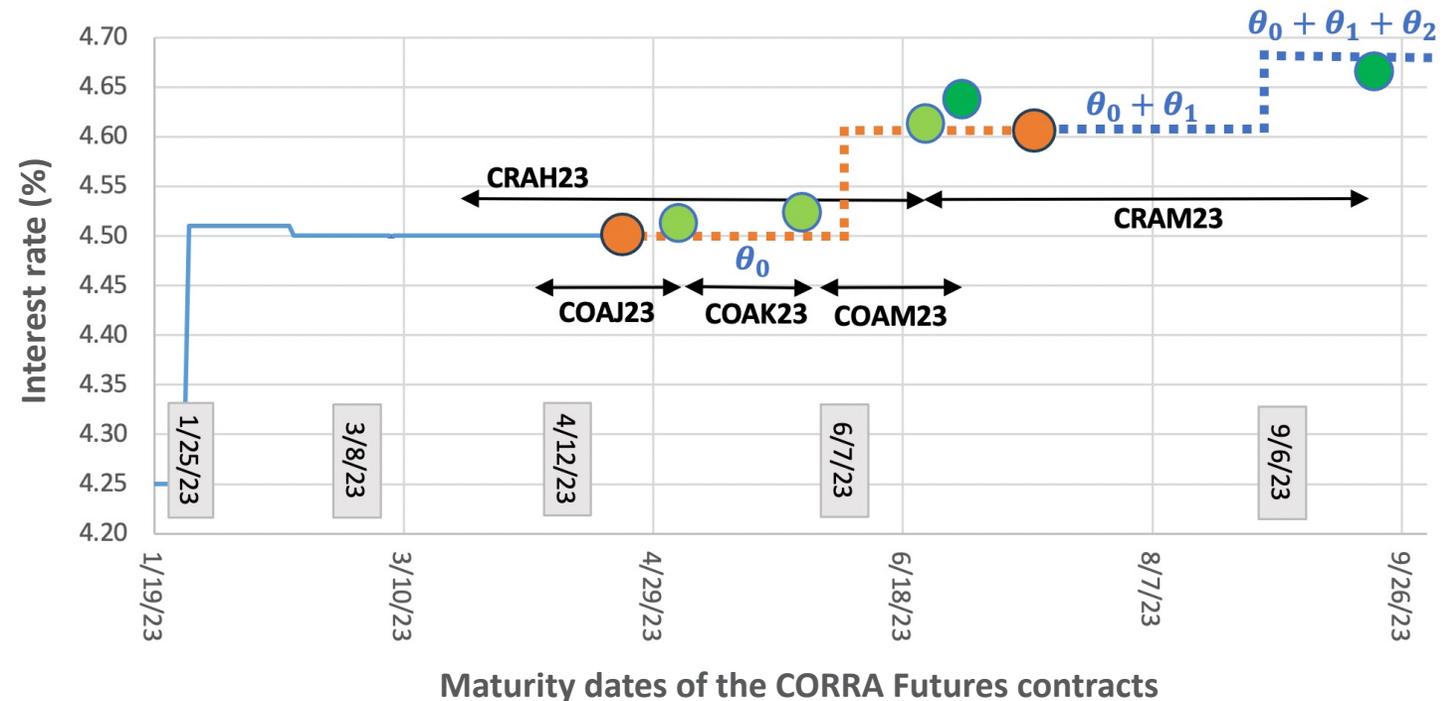
Twelve 10-minute Slots



Building the Future CORRA Path from Observed Inputs

- *Heitfield & Park's* method assumes that the daily CORRA rate would only change on the Bank of Canada's *Rate Setting Dates*:
 - The CORRA path should be drawn as *flat forward* – a “staircase” shape – between the *Rate Setting Dates*
 - MX CORRA futures expire on *IMM Wednesdays*, and so each contract may encapsulate zero or more of the Bank of Canada *Rate Setting Dates*
 - The CORRA path is optimized so that the rate changes on the *Rate Setting Dates* best fit the observed market prices of the MX future contracts
- The **Term CORRA Rate** is the annualized return of the daily compounded CORRA rates over the forward path

Constructing Term CORRA from CORRA Futures

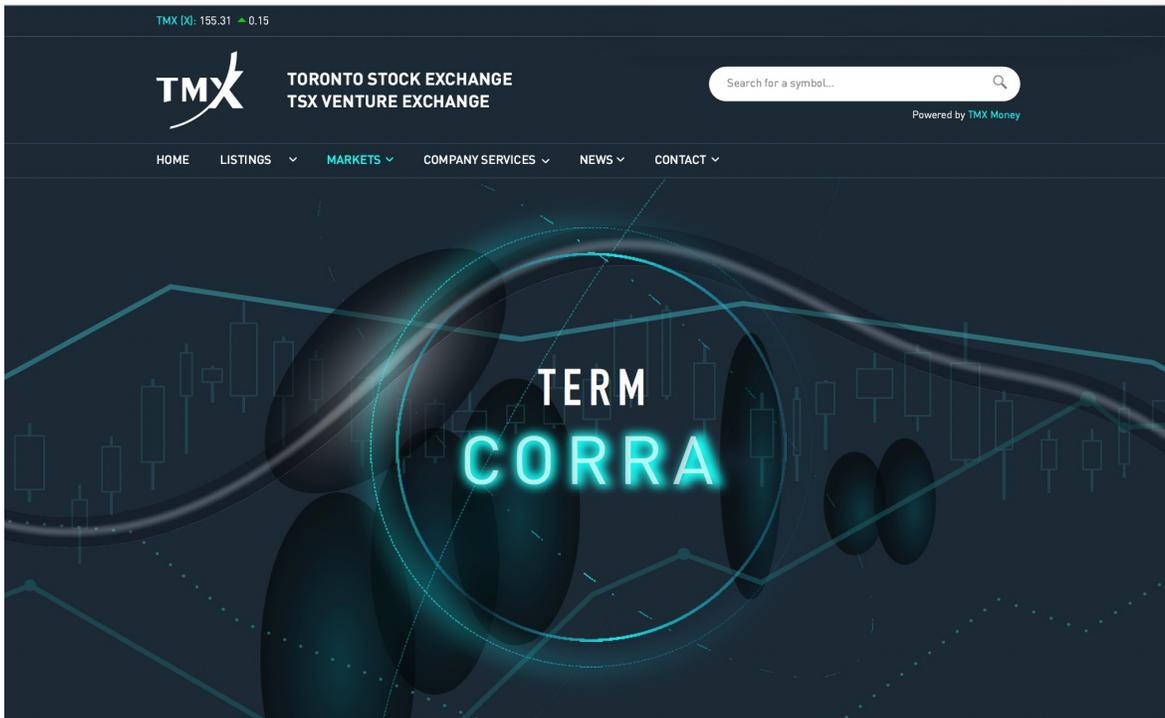


- Bank of Canada *Rate Setting Dates*
- 1-month MX Futures Price Observations
- 3-month MX Futures Price Observations
- Daily CORRA Rates in 3M Term CORRA Rate



Accessing Term CORRA

- Term CORRA is a licensed data product, available from the TMX Datalinx webstore:



Methodology

Administration

Timeline

Resources

Contact Us

1-month
Term CORRA Rate

3-month
Term CORRA Rate

1:00pm ET daily
on Canadian
business days

Launching September 2023



Term CORRA Resources

Helpful Websites

- **CanDeal Benchmark Solutions.** <https://www.canddeal.com>
- TMX CORRA Futures. <https://app.tmx.com/corra>
- Canadian Alternative Reference Rate (CARR) Working Group. <https://www.bankofcanada.ca/markets/canadian-alternative-reference-rate-working-group>
- Canadian Overnight Repo Rate Average. <https://www.bankofcanada.ca/rates/interest-rates/corra>

Methodology in Detail

- International Organization of Securities Commissions (2013 July). *Principles for Financial Benchmarks*. Retrieved from <https://www.iosco.org/library/pubdocs/pdf/IOSCOPD415.pdf>.
- Bank of Canada (2020, June 15). *Methodology for calculating the Canadian Overnight Repo Rate Average (CORRA)*. Retrieved from <https://www.bankofcanada.ca/rates/interest-rates/corra/methodology-calculating-corra>.
- Canadian Alternative Reference Rate Working Group (2023, January 11). *Term CORRA Methodology - CARR Recommended Approach*. Retrieved from <https://www.bankofcanada.ca/wp-content/uploads/2023/01/term-corra-methodology.pdf>.
- Heitfield, Erik, and Yang-Ho Park (2019). "Inferring Term Rates from SOFR Futures Prices," *Finance and Economics Discussion Series 2019-014*. Washington: Board of Governors of the Federal Reserve System. Retrieved from <https://doi.org/10.17016/FEDS.2019.014>.





Thank you

Andre Langevin
CanDeal

alangevin@canddeal.com
www.canddeal.com

