

TMX | Montréal Exchange

# North American Interest Rate Benchmark Transition and CORRA Futures



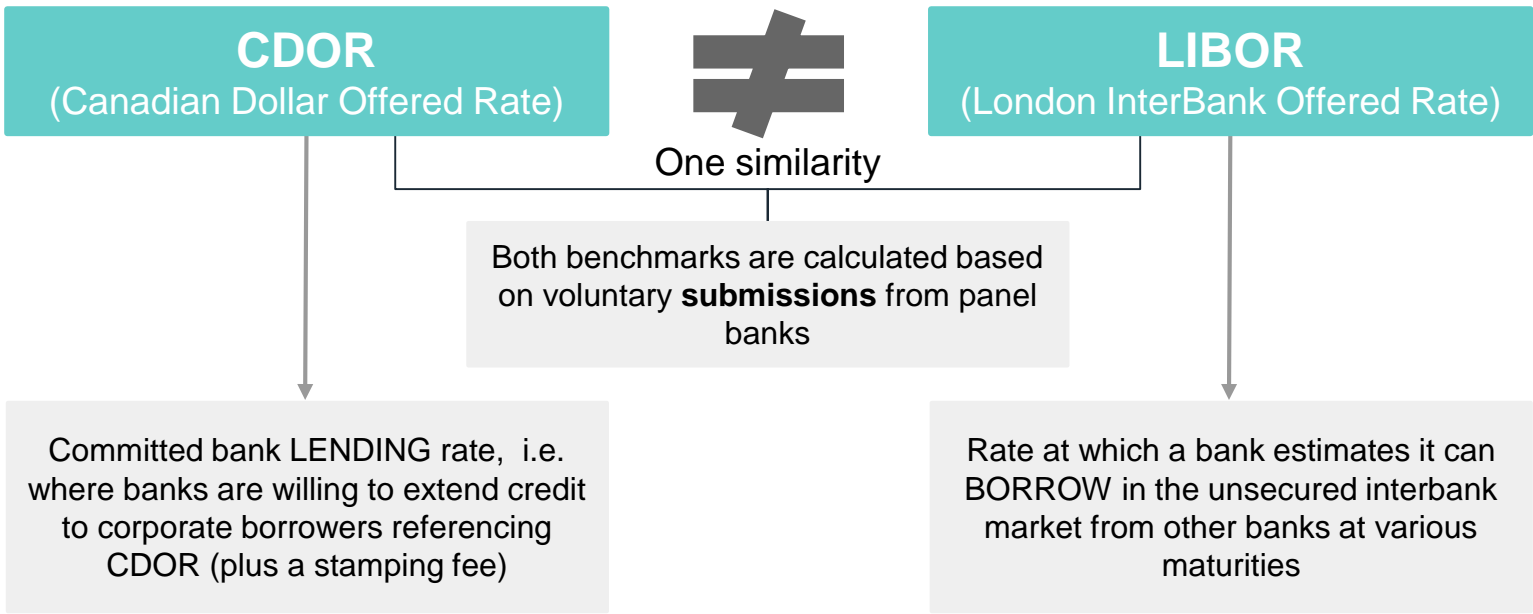
# Executive Summary

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- CDOR and LIBOR are deeply embedded in the operational activities of financial institutions and corporations. Transitioning from IBORs to RFRs is a highly complex task that will challenge the transformational capabilities of organizations large and small.
- The U.S. is attempting to transition the market completely off LIBOR by declaring that panel banks will not be persuaded or compelled to submit LIBOR beyond 2021. According to former CFTC Chairman Christopher Giancarlo, “The discontinuation of LIBOR is not a possibility, it is a certainty”. The U.S. is gradually shifting from LIBOR to SOFR as a benchmark rate.
- Domestically, the Bank of Canada and the Canadian Alternative Reference Rate working group (CARR) are also contributing to the global reform effort to promote the use of risk-free rate (RFR) benchmarks that are robust, reliable and resilient to market stress. The Bank of Canada expects CORRA to become increasingly adopted. The rate is expected to eventually become the dominant Canadian interest rate benchmark.
- CARR has determined that Canada will be a dual rate jurisdiction, enabling CDOR and CORRA to co-exist for an indeterminate period to minimize potential disruptions as the market transitions towards the RFR.
- Despite this difference in official approach, the current view of many market participants is that LIBOR will exist in some capacity after 2021, while in Canada CORRA and CDOR current coexistence may not be indefinite and possibly will not prevent the eventual demise of CDOR.
- The Montréal Exchange (MX) is involved in the CARR working group as an observer, as well as in the Transition subgroup where it chairs the Futures Market workstream. As a result of benchmark rate reform, the MX is actively working with the industry to develop a new robust CORRA Futures offering.
- The MX is planning to launch 12 3-month quarterly expiries soon after the publication of CORRA switches to the enhanced calculation methodology. Possibility to quickly support 1M CORRA Futures if needed. In the longer term, a product offering based on Bank of Canada Fixed Announcement Dates (FAD) will also be considered.
- This presentation aims to summarize the depth of the challenge facing the market and the mounting risks for derivative users who add to existing positions referencing IBORS that mature post 2021.

# North American Floating Rates: Past & Present

## Submissions Based Rates



## Transactions Based Rates



# Impetus for Change

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IOSCO principles strongly favour robust financial benchmarks based off transactional data as opposed to the judgement of banks

RFRs are transactions-based and are less susceptible to market manipulation

The ARRC determined that the volume of transactions used to generate USD LIBOR are not robust enough to justify the critical role this benchmark plays in the proper functioning of the financial markets

3-month USD LIBOR had a daily median transaction volume of \$500 million in 2018, yet LIBOR is used to value \$350 trillion USD of financial contracts. In contrast, SOFR is supported by over \$800 billion in daily transactions

CDOR is linked to the Bankers' Acceptances market as it was initially created to provide a benchmark reference rate for BA borrowings

The Canadian BA market has only \$100 billion in total outstanding securities of which 90% have a maturity of 1 month or less, yet the rate evolved to become the predominant floating rate benchmark for \$10 trillion dollars worth of swap, option and bond contracts

# Recent Official Statements

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“The expected discontinuation of LIBOR could have a significant impact on financial markets and may present material risk for certain market participants, including public companies, investment advisors, investment companies, and broker dealers. The risks associated with this discontinuation and transition will be exacerbated if the work necessary to effect an orderly transition to an alternative reference rate is not completed in a timely manner. The Commission staff is actively monitoring the extent to which market participants are identifying and addressing these risks”

- SEC staff statement on LIBOR transition, July 12, 2019

“The Bank expects that, over time, CORRA will be further adopted across a wide range of financial products and could potentially become the dominant Canadian interest rate benchmark, particularly in derivative markets”

- Lynn Patterson, Bank of Canada Deputy Governor, July 16, 2019

“In Q4, the FPC will consider further potential policy and supervisory tools that could be deployed by authorities to reduce the stock of legacy Libor contracts to an irreducible minimum ahead of end-2021,” says the FPC in its October report.

- Bank of England’s Financial Policy Committee, October 9, 2019

“I urge you not to have misplaced confidence that LIBOR as it exists today will survive. The FCA will not hesitate to make representativeness judgements that it is required, under law, to make.”

- Andrew Bailey , Chief Executive of the FCA, July 15, 2019

# North American Benchmark Reform: Progress to Date

<p><b>July 2013:</b> IOSCO publishes its Principles for Financial Benchmarks</p>	<p><b>June 2017:</b> SOFR selected as preferred USD RFR</p>	<p><b>May 2019:</b></p> <p>ISDA releases consultation on Spread and Term Adjustments for Fallbacks in Derivatives referencing LIBOR and CDOR</p> <p>ISDA releases consultation on Pre-Cessation Issues for LIBOR and CDOR</p>	<p><b>July 2019:</b></p> <p>CME publishes proposal for transitioning price alignment and discounting for cleared USD swaps from effective fed funds (EFFR) to SOFR</p> <p>Bank of Canada announces it will become the administrator of CORRA when enhancements to CORRA take effect</p> <p>LCH extends clearing of swaps vs CORRA from 2y to 31y</p> <p>ISDA selects Bloomberg to calculate and publish adjustments related to fallback provisions</p> <p>CARR releases results of consultation on enhancements to CORRA</p>
<p><b>November 2014:</b> ARRC formed in the U.S.</p>	<p><b>July 2017:</b> Andrew Bailey announces that FCA would not compel banks to submit LIBOR quotes after 2021</p>		



**March 2018:** CARR created in Canada

**April 2018:** SOFR published

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

**September 2018:**  
CDOR & CORRA size and scope summary report published

**November 2018:**  
Recommendation on "enhanced CORRA" methodology

**August 2019:**  
ISDA publishes preliminary summary of consultation on pre cessation issues which indicated "a wide variety" of views

**September 2019:**  
ISDA publishes Final Parameters for the Spread and Term Adjustments in Derivatives Fallbacks for Key IBORs

ARRC publishes Practical Implementation Checklist for SOFR Adoption

**November 2019:**  
CME Publishes LIBOR Fallback Proposal for Eurodollar Futures and Options

# Estimated USD LIBOR Market Footprint by Asset Class

OTC  
Derivatives  
**73%**

Exchange  
Traded  
Derivatives  
**23%**

Business  
Loans  
**2%**

Bonds  
**1%**

Securitizations  
**1%**

Consumer  
Loans  
**1%**

Asset Class	Volume (trillions USD)	Product	Volume (trillions USD)	Share Maturing By:			
				End 2021	End 2025	After 2030	After 2040
OTC Derivatives	145	Interest rate swaps	81	66%	88%	7%	5%
		Forward rate agreements	34	100%	100%	0%	0%
		Interest rate options	12	65%	68%	5%	5%
		Cross currency swaps	18	88%	93%	2%	0%
Exchange Traded Derivatives	45	Interest rate options	34	99%	100%	0%	0%
		Interest rate futures	11	99%	100%	0%	0%
Business Loans	3.4	Syndicated loans	1.5	83%	100%	0%	0%
		Non-syndicated business loans	0.8	86%	97%	1%	0%
		Non-syndicated CRE/Commercial mortgages	1.1	83%	94%	4%	2%
Bonds	1.8	Floating/variable rate notes	1.8	84%	93%	6%	3%
Securitizations	1.8	Mortgage-backed securities (incl. CMOs)	1	57%	81%	7%	1%
		Collateralized loan obligations	0.4	26%	72%	5%	0%
		Asset-backed securities	0.2	55%	78%	10%	2%
		Collateralized debt obligations	0.2	48%	73%	10%	2%
Consumer Loans	1.3	Retail mortgages	1.2	57%	82%	7%	1%
		Other consumer loans	0.1	-	-	-	-
<b>Total USD LIBOR Exposure</b>			<b>199</b>	<b>82%</b>	<b>92%</b>	<b>4%</b>	<b>2%</b>

Source: New York Fed, March 2018

# Total Outstandings of Securities Referencing CORRA/CDOR

Asset Class	Outstandings	Product	Outstandings
	(CAD billions)		(CAD billions)
OTC Derivatives	10,737	Interest rate swaps	9,449
		Interest rate options	59
		Cross currency swaps	1,171
		Total return swaps	45
		Other OTC derivatives	12
Exchange Traded Derivatives	1,089	Interest rate options	157
		Interest rate futures	932
Bonds	137	FRNs / subordinated debt	137
Securitized Products	131	Mortgage-backed securities	88
		Asset-backed securities	14
		Commercial mortgage-backed securities	8
		Collateralized loan obligations	7
		Collateralized mortgage obligations	1
		Other securitized products	12
Bankers Acceptances	103	Bankers Acceptances	103
Loans	61	Syndicated loans	39
		Non-syndicated business loans	14
		Non-syndicated CRE/Commercial mortgages	1
		Other business loans	6
		Consumer Loans	1
Others	26	Others	26
Deposits	22	Floating rate deposits and term deposits	11
		Interest bearing accounts	11
<b>Total Exposure to CORRA/CDOR</b>			<b>12,307</b>

OTC Derivatives  
87%

Exchange Traded Derivatives  
9%

Bonds  
1%

Securitized Products  
1%

Bankers Acceptances  
1%

Loans  
< 1%

Others  
< 1%

Deposits  
< 1%



# ISDA Master Agreements

Every entity having OTC derivatives referencing IBORs should look at fallback provisions in each agreement on a proactive basis.

## What is an ISDA Master Agreement and Why Does it Matter?

### ISDA

#### International Swaps and Derivatives Association

Standard document used to govern over-the counter derivatives transactions

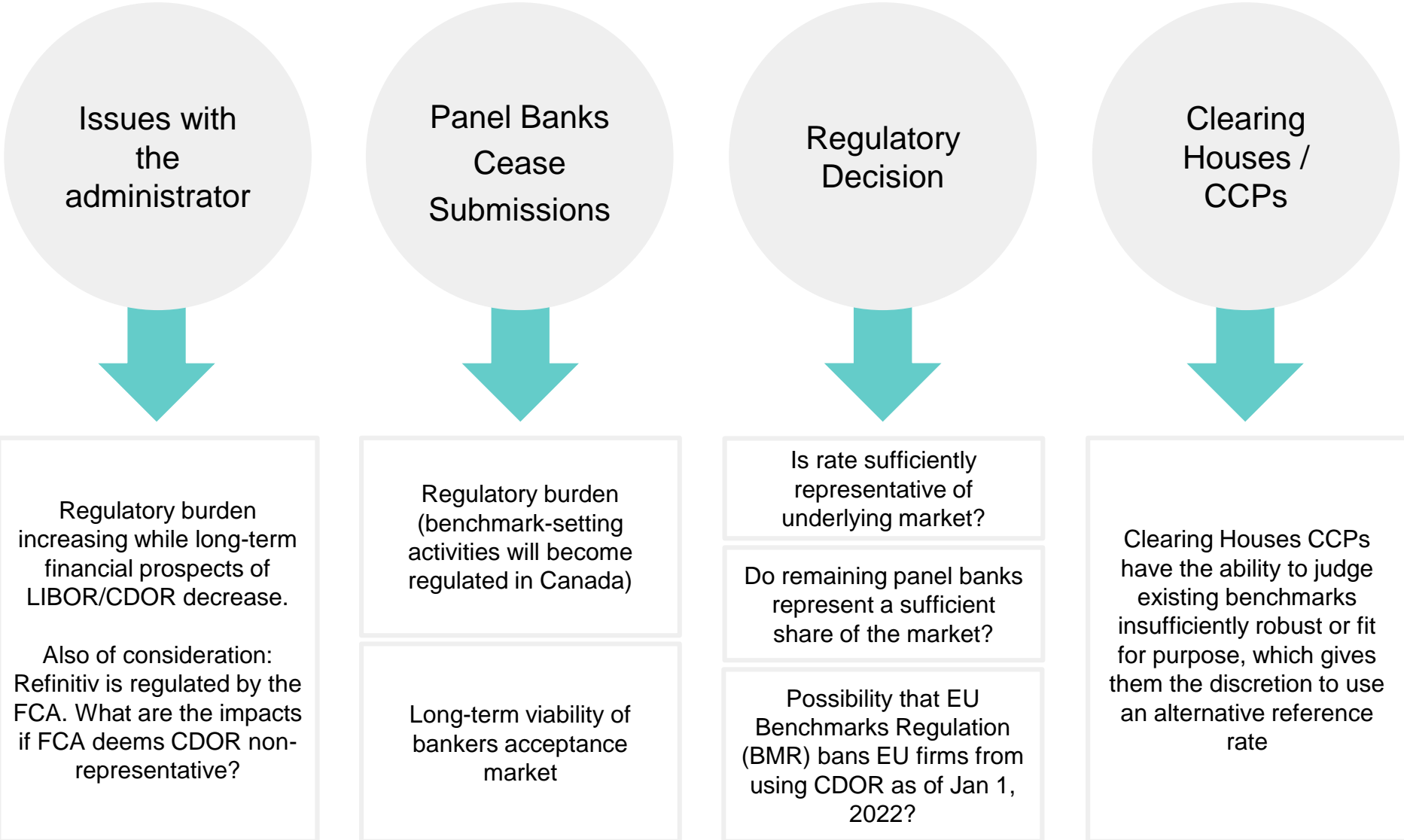
Quite simply, any two entities that have entered into an OTC swap of any kind sign an ISDA to create a legally binding framework in the event of a termination event such as failure to pay or bankruptcy

Given the likelihood that certain key IBORS will cease to exist, ISDA intends to amend its standard documentation (the Master Agreement) to implement fallback provisions (pre-cessation triggers, reference rate adjustments) for certain key IBORs

When an IBOR is no longer published, the spread that will be added to the local Risk Free Rate is calculated as follows: Using a look back period of 5 years and averaged using a median methodology where every data point is included regardless of level. For operational and payment purposes, a 2 day backward shift is applied

# Potential Risks to IBORs

## What Could Cause a Potential Structural Impairment of CDOR/LIBOR?



# Key Drivers to Facilitate Benchmark Tipping in Derivatives Markets

1 Bonds, loans and securitized products need to be issued referencing CORRA, increasing the need for derivatives hedges which reference the same floating benchmark

2

Visible fixed rate quotes vs CORRA in dealer and broker markets out to 30 years

3

SOFR/CORRA cross-currency basis market to develop as an alternative to CDOR/LIBOR basis

4

U.S. and European adoption of RFRs will precipitate the need for a domestic response

5

Availability of CORRA futures to provide an additional hedging tool, alongside 3-month Canadian BA futures (BAX)

6

Clients should become more aware of potential transition risks associated with new swap contracts vs CDOR that mature in 2022 and beyond

7

Cleared swap market Big Bang: LCH and CME will perform a discounting transition from Fed Funds rate to SOFR on October 16, 2020.

8

The adoption of backward looking pricing methodology for bond issues like FRNs or the eventual development of forward looking CORRA term rates based on CORRA futures

# How to Prepare for Benchmark Transition?

Regulators continue to articulate that market participants need to speed their transition towards RFRs away from Global IBORs

Should a LIBOR or CDOR discontinuation event occur, firms will no longer be able to rely on these rates for current and new transactions

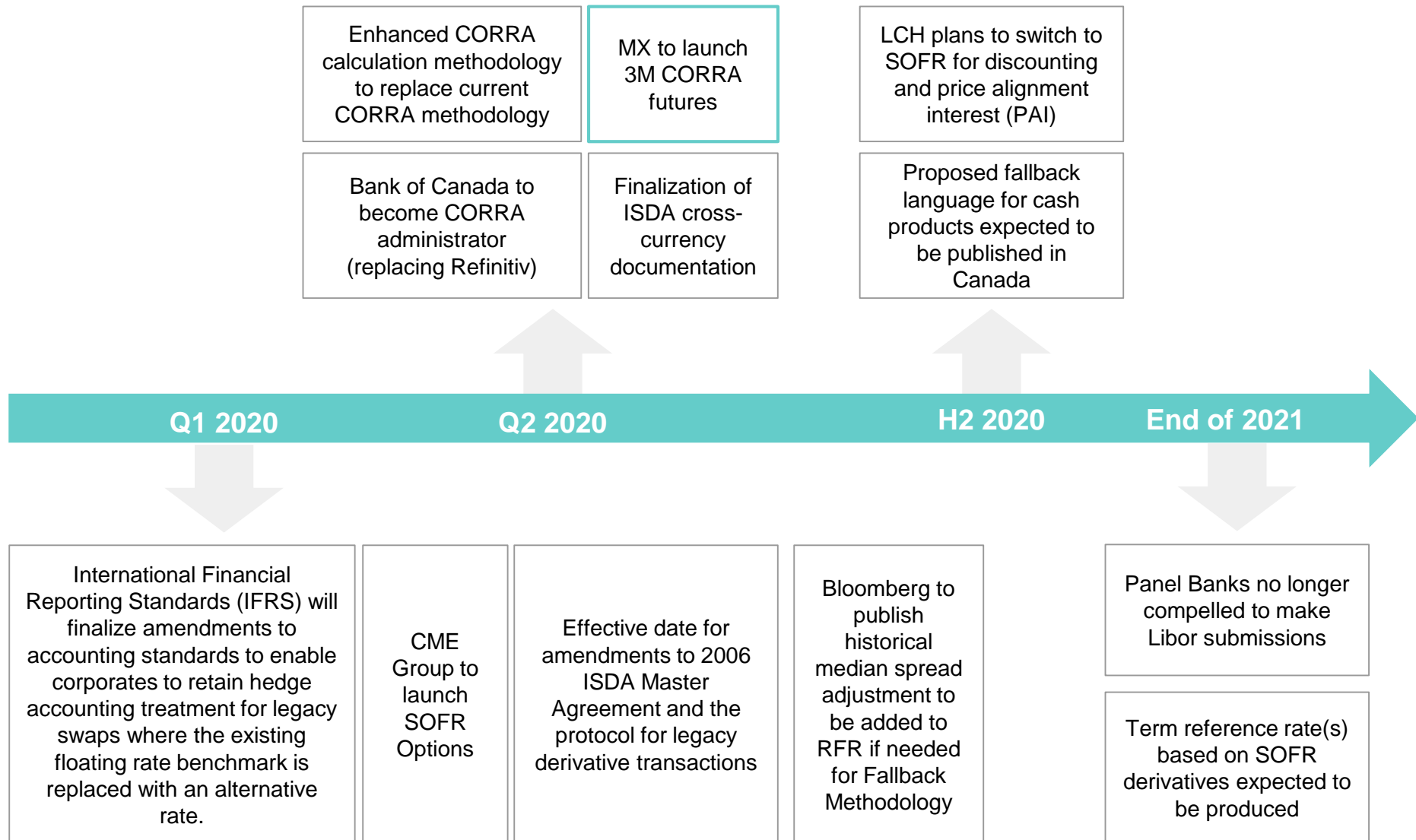
Clients are left with two choices regarding derivatives contracts that expire post 2021

They can negotiate a voluntary migration to the RFR in advance. This can be done by actively searching out pockets of term liquidity to migrate “on market”.

The best approach for clients and dealers who participate in the derivatives market is to voluntarily migrate to the new risk free rates before the permanent cessation of relevant IBORs. Portfolios of reasonably offsetting transactions referencing IBORs should be compressed when possible.

Maintaining longer dated swaps vs CDOR acknowledges that the user is comfortable with the inherent risk, however minimal, that the trades may be forced to involuntarily migrate to a new benchmark during a period of market stress. There is no guarantee that the ISDA fallback provision of CORRA plus historical spread will be at the then current market level for swaps of all maturities. Relying on fallback provisions to transition could lead to operational risks given the potential volume of transactions and given that changes to risk, valuation and payments are all happening simultaneously.

# Key Dates Going Forward



# Canadian Regulatory & Legal Landscape

## 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 objective:**

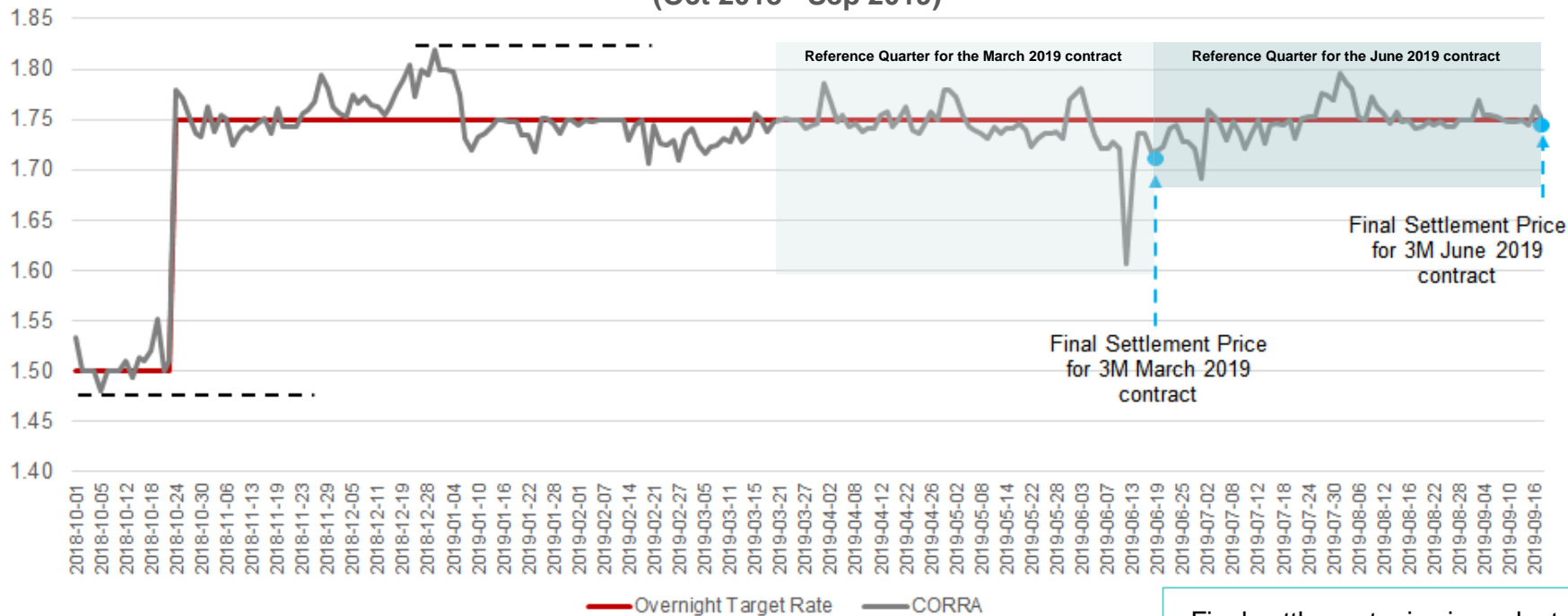
- Review and enhance the existing Canadian overnight risk-free rate, the Canadian Overnight Repo Rate Average (CORRA).

## Canadian Alternative Reference Rate Working Subgroups

Alternative Rates Subgroup	Fallback Language Subgroup	Term RFR Subgroup
<ul style="list-style-type: none"> <li>• Recommended “enhanced CORRA” as the preferred overnight RFR</li> <li>• Developed a methodology and specifications for calculation enhancements to ensure CORRA is robust</li> </ul>	<ul style="list-style-type: none"> <li>• Published fallback language <u>principles</u> for cash non-derivatives products</li> <li>• Developing draft fallback language</li> </ul>	<ul style="list-style-type: none"> <li>• Assess the need for a Canadian term risk-free rate benchmark. If required, develop the methodology and specifications for the term rate</li> </ul>
<b>Transition Subgroup</b>		
<ul style="list-style-type: none"> <li>• Provide the underlying framework to help financial products transition to enhanced CORRA</li> <li>• Communicate developments / progress to CARR and market participants</li> </ul>		
<p><b>Futures Market Workstream</b></p> <ul style="list-style-type: none"> <li>• Design CORRA futures contracts</li> <li>• Develop strategies to support initial liquidity/trading in CORRA futures and support transition efforts (BAX/CORRA spreads)</li> <li>• Canvas clients for interest in 1M and 3M tenors and bring product to market in conjunction with enhanced CORRA calculation methodology and market demand</li> </ul>	<p><b>CORRA Production Workstream</b></p> <ul style="list-style-type: none"> <li>• Establish governance around the production, calculation methodology and publication of CORRA</li> </ul> <p><b>Swap Market Conventions Workstream</b></p> <p><b>Cash Calculation Conventions Workstream</b></p>	<p><b>Necessity of Term Benchmark Workstream</b></p> <p><b>Architecture of Term Benchmark Workstream</b></p> <p><b>Adoption of Term Benchmark Workstream</b></p>

# Recent Price History of 3M CORRA

3M CORRA vs. Canada Overnight Target Rate  
(Oct 2018 - Sep 2019)



Final settlement price is evaluated on the basis of realized 3M CORRA values during contract Reference Quarter (100 - R)

CORRA moves in the same direction as the general overnight target rate

Reflects where unaffiliated counterparties fund themselves on average in the overnight GC market

## Example using 3M CORRA

- March 2019 contract:**
- Reference period: Mar 20, 2019 to Jun 18, 2019 (inclusively)
  - Settlement date: Jun 19, 2019
  - Final settlement price would have been 98.2504 (CORRA = 1.7496)
- June 2019 contract:**
- Reference period: Jun 19, 2019 to Sep 17, 2019 (inclusively)
  - Settlement date: Sep 18, 2019
  - Final settlement price would have been 98.2482 (CORRA = 1.7518)

Source: Bank of Canada, MX calculations

# CORRA vs Enhanced CORRA

The enhancements to CORRA will focus primarily on increasing the transaction volumes upon which CORRA is based with the aim of improving the robustness and representativeness of the measure. In addition to dealer volume (D2D), client volume will also be considered. The average daily volume of repo transaction considered will increase from approximately \$1.5B to \$12B.

	CORRA	Enhanced CORRA
<b>Administrator</b>	Refinitiv	Bank of Canada
<b>Eligible transactions</b>	Repo transactions based on Government of Canada collateral conducted on inter-dealer broker market	Government of Canada repo transactions between any 2 unaffiliated counterparties where data can be sourced (thus, including dealer-to-client transactions)
<b>Calculation methodology</b>	Volume-weighted average	Trimmed median is computed after removing the lower volume-weighted 25th percentile of transactions (deemed as “Special” transactions)
<b>Precision</b>	Published to 4 decimals	Published to 2 decimals

The proposed enhancements to CORRA would result in a rate that is less volatile and closer to the Bank of Canada’s target for the overnight rate than the current CORRA, on average. A methodology document and a historical Enhanced CORRA series will be made available on the Bank of Canada’s website in early 2020. Proposed enhancements will be implemented as a change to the existing CORRA methodology and will not result in two different CORRAs active simultaneously.

**CORRA = CORRA!**



# CORRA Futures Offering

## Initial focus on the 3M CORRA Futures

- Possibility to quickly support 1M CORRA Futures if needed

## 3M CORRA Futures specs aligned with international standards (SOFR and SONIA)

Trading Unit	Compounded daily CORRA values during the Reference Quarter
Reference Quarter	Based on IMM Dates (3rd Wed of Mar/Jun/Sep/Dec)
Contract Size	C\$2500 x Index
Price Quotation	100 - R (like BAX)
Expiry Cycle	Nearest 12 quarterly (IMM)
Tick Size	0.005 = C\$12.50 for all quarterly contracts* <small>*Note that the minimum price fluctuation for the nearest quarterly contract will be 0.005 = C\$12.50 until further notice. The Bourse expects to change this minimum price fluctuation to 0.0025 = C\$6.25 in the coming months.</small>
Final Settlement Price (FSP)	Evaluated on the basis of realized CORRA values during the contract Reference Quarter (100 - R). <ul style="list-style-type: none"><li>• Geometric average or realized CORRA values during the Reference Quarter</li><li>• FSP is backward-looking vs forward-looking for BAX</li></ul>

Target launch date is Q2 2020 (after “enhanced” CORRA implementation)

More information available on the MX website (Products -->CORRA Futures)

[https://www.m-x.ca/produits\\_taux\\_int\\_corra\\_en.php](https://www.m-x.ca/produits_taux_int_corra_en.php)

# 3M CORRA Futures - Detailed Contract Specs

## 3M CORRA FUTURES - PRODUCT SPECIFICATIONS

<b>Trading unit</b>	Compounded daily CORRA during the Reference Quarter, such that each basis point per annum of interest = \$25 per contract. Contract size is C\$2500 x Index
<b>Reference Quarter</b>	Based on International Monetary Market ("IMM") dates. For a given contract, interval from (and including) 3rd Wednesday of 3rd month preceding Delivery Month, to (and not including) 3rd Wednesday of Delivery Month.
<b>Expiry Cycle</b>	Nearest 12 quarterly Contract Months
<b>Contract Month</b>	For each contract, Contract Month is the month in which Reference Quarter begins. Example (IMM date): For a September contract, Reference Quarter starts on IMM Wednesday of September and ends with Termination of Trading on the first business day before IMM Wednesday of December, the contract Delivery Month.
<b>Price Quotation</b>	Index: 100 – R R = the compounded daily CORRA for the Reference Quarter.
<b>Minimum Price Fluctuation</b>	0.005 = C\$12.50 for all quarterly contracts*. *Note that the minimum price fluctuation for the nearest quarterly contract will be 0.005 = C\$12.50 until further notice. The Bourse expects to change this minimum price fluctuation to 0.0025 = C\$6.25 in the coming months.
<b>Contract Type</b>	Cash-settlement
<b>Last Trading Day</b>	First business day preceding the 3 <sup>rd</sup> Wednesday of the Delivery Month
<b>Final Settlement Price</b>	<p>Index evaluated on the basis of realized CORRA values during the contract Reference Quarter. The final settlement price shall be 100 minus the compounded daily CORRA over the Reference Quarter. It is calculated in accordance with the following formula:</p> $R = \left[ \prod_{i=1}^d \left( 1 + \frac{CORRA_i \times n_i}{365} \right) - 1 \right] \times \frac{365}{D} \times 100$ <p>Where:            "d", the number of Business Days in the Reference Quarter;            "i" is a series of whole numbers from one to d, each representing the relevant Business Day in chronological order from, and including, the first Business Day in the relevant Reference Quarter;            CORRA<sub>i</sub> = Canadian Overnight Repo Rate Average ("CORRA") value calculated and representative of the i<sup>th</sup> day of the Reference Quarter;            "n" is the number of calendar days in the relevant Reference Quarter on which the rate is CORRA<sub>i</sub>;            "D" is the number of calendar days in the relevant Reference Quarter.</p> <p>Weekend and holiday<sup>1</sup> rates are considered to be the rate applicable on the previous business day for which a rate was reported. For example, Friday's rate is used for Saturday and Sunday rates. The value of R is rounded to the nearest 1/10th of one basis point (0.001)*. In the case a decimal fraction ends with 0.0005 or higher, the value shall be rounded up. The final settlement price is determined on the first business day following the last day of trading. <sup>1</sup>Holidays are determined based on Canadian Banks holiday (Toronto) calendar.</p>
<b>Block thresholds</b>	2am – 6am ET: 100 contracts, 1h reporting time; 6am – 4:30pm ET: 500 contracts, 15 minutes reporting time
<b>Trading Hours</b>	Regular session: 2:00 a.m.** to 4:30 p.m. ET ** +/- 15 seconds Note: During early closing days, the regular session closes at 1:30 p.m. ET.
<b>Clearing Corporation</b>	Canadian Derivatives Clearing Corporation (CDCC)
<b>Ticker Symbol</b>	CRA

The CORRA used in the determination of the final settlement price is published by the CORRA administrator, and includes any fallback provision. In a similar way to BAX contracts, CDCC will offer intra-commodity spreads for 3M CORRA Futures. Strategies between 3M CORRA Futures and BAX (inter-group strategies) will be also be offered, allowing each leg to be traded simultaneously in a single transaction.

\*The value of R will be rounded to 1/100th of one basis point (0.0001) when the tick size of the nearest quarterly contract will change to 0.0025 = C\$6.25. In that case, a decimal fraction ending with 0.00005 or higher will be rounded up.

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# APPENDIX

# Key Websites and Links

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Financial Stability Board (FSB) - Interest Rate Benchmark progress reports

[https://www.fsb.org/publications/progress-reports/?policy\\_area%5B%5D=77](https://www.fsb.org/publications/progress-reports/?policy_area%5B%5D=77)

ISDA publications and consultation reports

<https://www.isda.org/category/news/press-releases/>

Financial Conduct Authority (FCA) - Transition from LIBOR

<https://www.fca.org.uk/markets/libor>

Bank of Canada - Canadian Alternative Reference Rate (CARR) working group

<https://www.bankofcanada.ca/markets/canadian-alternative-reference-rate-working-group/>

New York Fed - Alternative Reference Rates Committee (ARRC)

<https://www.newyorkfed.org/arrc>

Montreal Exchange - CORRA Futures page:

[https://www.m-x.ca/produits\\_taux\\_int\\_corra\\_en.php](https://www.m-x.ca/produits_taux_int_corra_en.php)

# List of Abbreviations

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ARRC: Committee	Alternative Reference Rates	FCA:	Financial Conduct Authority (U.K)
BA:	Bankers' Acceptance	ICE:	Intercontinental Exchange
BoC	Bank of Canada	IDB:	Inter-Dealer Broker
BIS	Bank for International Settlements	IOSCO:	International Organization of Securities Commissions
CCP:	Central Counterparty	LIBOR:	London Interbank Offered Rate
CDOR:	Canadian Dollar Offered Rate	OIS:	Overnight Indexed Swap
CORRA:	Canadian Overnight Repo Rate Average	OSFI	Office of the Superintendent of Financial Institutions
CARR: Rates Committee	Canadian Alternative Reference	ONX:	30-Day Overnight Repo Rate Futures
ESTER:	Euro Short Term Rate	RFR:	Risk Free Rate
FMI:	Financial Market Infrastructure	SOFR:	Secured Overnight Financing Rate
FSB:	Financial Stability Board (Basel)	SONIA	Sterling Overnight Index Average

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