Canadian Alternative Reference Rate Working Group

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Overview of CARR's Transition Roadmap

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The views expressed in this presentation are those of the presenters and do not necessarily reflect the views of the Bank of Canada or CIBC.

Background on CARR

CARR (the Canadian Alternative Reference Rate working group) was established in March 2018 by the Canadian Fixed-Income Forum* (CFIF) to ensure Canada's interest rate benchmark regime is robust, relevant and effective in the years ahead.

- On December 16, 2021 CARR published the results of its review of CDOR (White Paper) which recommended that CDOR's administrator, Refinitiv Benchmark Services (UK) Ltd (RBSL), cease publication of CDOR after June 2024
- CARR's primary objectives today are to:

Support the transition to CORRA as a key financial benchmark

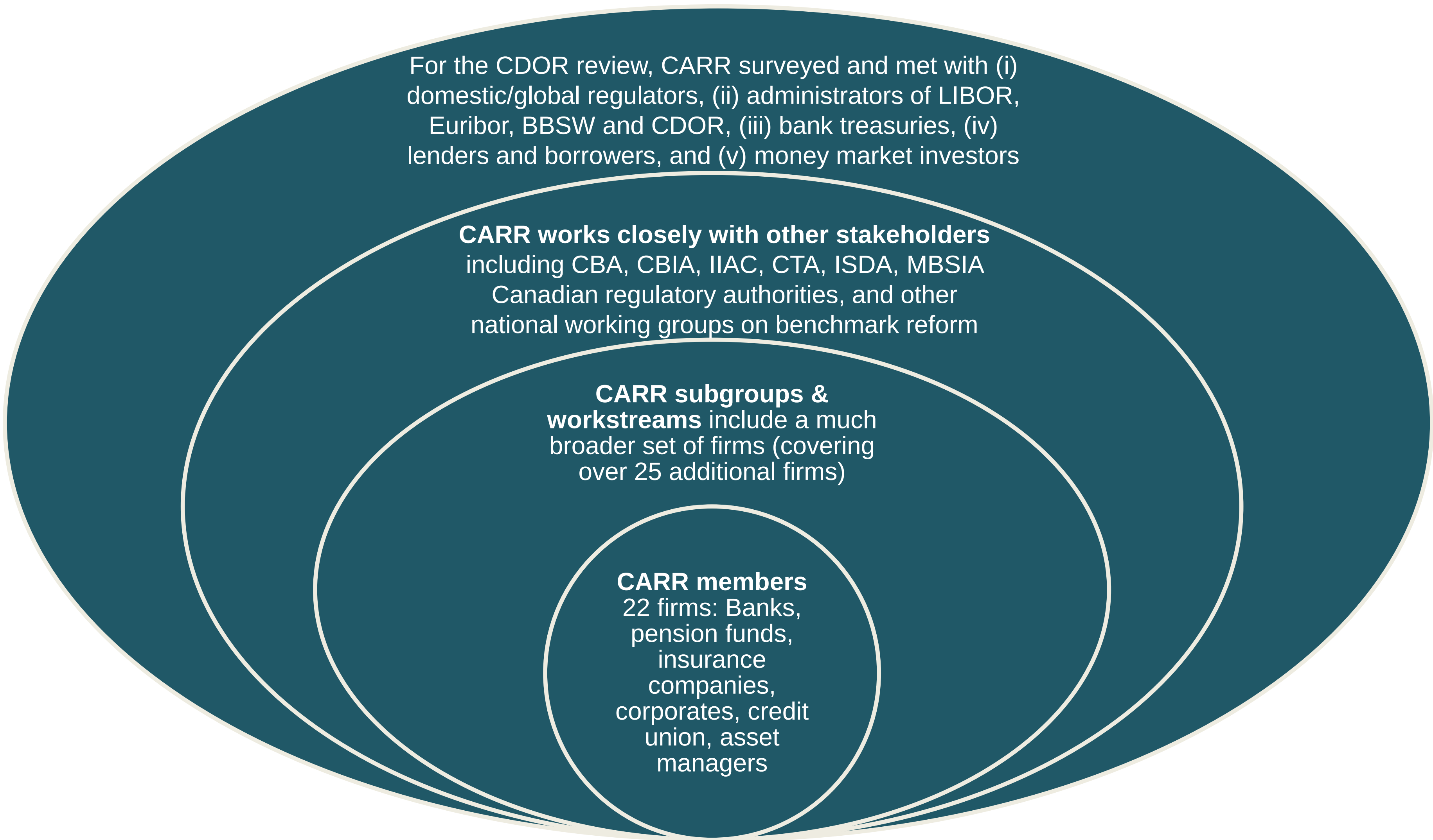
Design and execute a transition plan, encompassing all products referencing CDOR

Promote awareness of the need to prepare for CDOR's cessation

Consult on the need for a forward-looking term CORRA rate, potentially design the rate and find an administrator

* CFIF is a senior level industry committee established by the Bank of Canada to discuss developments in fixed income market structure and functioning, market practices and related policy issues

CARR has a broad reach across all relevant stakeholders



Last year CARR found four major risks to CDOR's future robustness

- In 2021, CARR analyzed CDOR in the context of the new, higher standards expected of critical interest rate benchmarks to ensure Canada's benchmark regime is robust and resilient in the future. While CDOR has served the Canadian dollar market well for many years, CARR found that there are certain aspects of CDOR's architecture that pose risks to its future robustness.

Lack of transparency

The global standard is for benchmarks to be primarily based on transactions. **CDOR is primarily based on expert judgement, and it cannot be directly tied to observable arms length transactions**

Lack of sustainability

BA funding model is no longer efficient. Banks now term fund most of their loans. **Banks have already started to shift to non-BA CDOR lending or not selling BAs.** It is likely that banks will continue to reduce or cease issuance of BAs

Inverted pyramid

The size of the market used to determine a benchmark should be commensurate with the size of the market based on the benchmark (i.e. proportionality).

There should be sufficient underlying data to support the benchmark in both normal times as well as stress periods.

Both of these issues are relevant to CDOR

Increased panel fragility

New CSA benchmark rules increase the obligations on both the benchmark's administrator and the benchmark's contributors. **Contributing banks may decide they no longer wish to remain on CDOR's panel given the increased obligations and costs to do so**

CARR determined it was not possible to reform CDOR

- CARR discussed the potential for reforming CDOR, similar to what had been done with CORRA and other key global credit sensitive benchmarks. This included either introducing a transaction-based waterfall methodology similar to the approaches followed by LIBOR and Euribor, or by making it primarily transaction based as had been done by ASX with BBSW

It was not possible to introduce a strict data hierarchy due to CDOR's design

Since CDOR's definition is not tied to specific, observable transactions, it is not possible to create a binding waterfall of inputs to CDOR submissions in which the first step is based on transactions. This leaves **CDOR as a benchmark inherently reliant upon expert judgement.** CARR concluded that CDOR does not definitionally or practically support the development of a formal waterfall of data inputs

It was not possible to make CDOR a transaction-based benchmark

If CDOR were changed to reflect the rate at which BA securities transacted in the market, it would be a legally different benchmark. Economically a benchmark based on BA security transactions would differ from the existing level of CDOR by the current CDOR/BA basis (currently over 20bps, vs. appx 1bp when CORRA or the UK's SONIA were reformed)

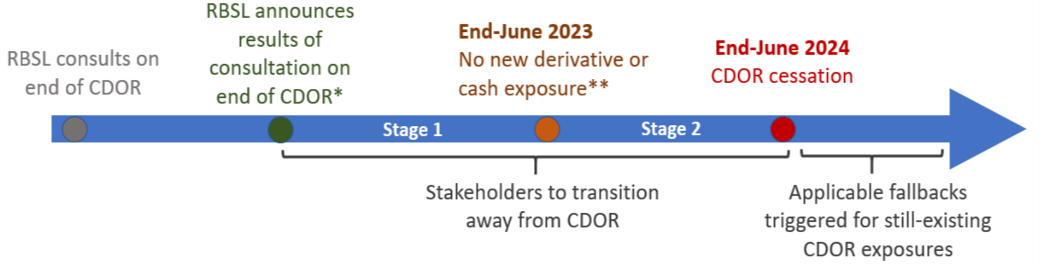
Even if the CDOR/BA basis were small, CDOR's long term viability is imperiled by the fact that BAs are no longer an effective funding tool for the banks and their use would be expected to decline in the future. If bank treasurers continued to issue BAs for uneconomic reasons, the "proportionality" issue would remain

Therefore CARR recommended the cessation of CDOR

- **CARR's analysis demonstrated that CDOR is not a sustainable benchmark over the longer-term**
  - The issues highlighted by CARR were expected to deteriorate over time
  - If CDOR would eventually cease, a carefully managed transition would be prudent since CDOR cannot be reformed
  - CARR believed that a transition sequenced after the end of the LIBOR transition would allow us to leverage the experience and lessons learned in different LIBOR jurisdictions

- **CARR recommended that RBSL should cease the calculation and publication of CDOR after June 30, 2024**

- **CARR proposed a two-staged approach to the transition from CDOR**
  - **First stage: After June 30, 2023 all new derivative and securities contracts would be expected to have transitioned to using CORRA**, with no new CDOR exposure after that date except with limited exceptions (such as loans or their associated derivative hedges or transactions that reduce legacy exposure)
  - **Second stage: After June 30, 2024 RBSL would cease publication of CDOR.** The second stage would provide firms with additional time to transition their loan agreements to alternative rates, including CORRA and Term CORRA if available, and deal with potential issues related to the redocumentation of "legacy" securities. The longer time window would also allow for more existing CDOR-based securities exposures to mature



- **These recommendations were unanimously endorsed by CARR and CFIF members**

* A notice from RBSL announcing the cessation of CDOR would trigger the calculation of the ISDA credit spread adjustment as well as the credit spread adjustment in CARR's recommended fallback language for FRNs.
** Except where derivatives hedge or reduce CDOR exposures in derivatives or securities transacted before end-June 2023 or in loan agreements transacted before end-June 2024.

RBSL has announced their decision to cease publication of CDOR

January 31, 2022

Refinitiv launches a public consultation on the potential cessation of CDOR

May 16, 2022

RBSL announces decision to cease the publication of CDOR after **June 28, 2024**.

- The decision to cease the publication of CDOR was authorized by the two lead provincial securities regulators for benchmark reform (the Ontario Securities Commission and the Autorité des marchés financiers); these regulators had designated CDOR both a critical and an interest rate benchmark under Multilateral Instrument 25-102 on September 15, 2021

- The International Swaps and Derivatives Association (ISDA) confirmed that RBSL's statement constitutes an "Index Cessation Event" under its IBOR fallbacks supplement. As a result, Bloomberg published, as ISDA's calculation agent, the spread adjustments that would apply to any applicable contracts after June 28, 2024. The announcement also serves to trigger the same fallback spread adjustment for CDOR based floating-rate notes that have CARR recommended fallback language

- **The Office of the Superintendent of Financial Institutions (OSFI) published their supervisory expectations for federally regulated financial institutions (FRFIs) and federally regulated private pension plans to transition from CDOR. These expectations directly reference and align with CARR's recommended two-staged transition plan**

CDOR transition: CARR's next steps

CARR has already laid some of the groundwork for a successful transition

- CARR has already:
  - enhanced CORRA (see Annex 4)
  - developed robust CDOR fallbacks for FRNs and
  - developed CORRA conventions for products referencing CDOR

CARR will continue to work with CDOR's stakeholders

- CARR will help develop and maintain the tools and milestones necessary to enable a smooth transition away from CDOR
- CARR is consulting on whether a forward-looking Term CORRA rate is necessary to support the loan market transition

CDOR's end will result in the disappearance of BAs

- Banks will move away from issuing short-dated BAs in favour of other forms of funding
- CFIF is working with industry to assess the impact of the disappearance of BAs and determine what additional work is needed to support the investment community in adapting to the resulting changes

Transition plan and next steps

Derivatives

- CARR is finalizing the transition path to CORRA based derivatives, including the various “CORRA First” initiatives to generate increased CORRA based liquidity
- CARR has developed a two-stage “CORRA First” approach to transition inter-bank liquidity:

January 9, 2023	March 27, 2023
Inter-bank linear derivatives	Inter-bank non-linear derivatives Inter-bank cross-currency basis swaps

- Client liquidity is expected to start transitioning to CORRA in earnest by the end of Q1-2023
- CARR is currently reviewing the best approach for other derivative products such as structured swaps
- CARR is working with the Montreal Exchange on the plan to transition liquidity in short term interest rate futures from BAX to CORRA futures:
  - MX introduced a market making for the current 3-month CORRA IMM based futures on May 2, 2022
  - MX will launch new 1-month serial futures in Q4-2022 (based on daily compounding)

New derivative transactions must have fully transitioned to CORRA after June 30, 2023 (except for loan-associated derivatives hedges, or transactions that reduce legacy CDOR risk)

Cash Securities (1)

- **CORRA-based cash securities**
  - CARR has already established a recommended convention for compounding-in-arrears and fallback language for both CDOR and CORRA FRNs
  - A number of Canadian banks have already issued in-arrears CORRA based securities, including bail-in senior floating rate notes and NVCC
  - Canada Housing Trust has moved to using in-arrears CORRA for their FRN issuance, with their inaugural CORRA-based Canada Mortgage Bond (CMB) issued on May 18, 2022
  - CMHC has enhanced its securitization programs by introducing four pool types of which the coupon is based on CORRA
  - CARR expects the bond market will increasingly move to using in-arrears CORRA as the primary benchmark through the remainder of 2022 until June 2023 after which time in-arrears CORRA will be the only available benchmark

Cash Securities (2)

➢ **CDOR-based legacy cash securities**

	Legacy exposure after June 28, 2024
Corporate securities	$75.2 billion
Government securities	$20.8 billion
Structured securities	$0.2 billion
MBS	$34.0 billion
Total	**$130.2 billion**

- CARR is currently trying to determine the size of Canada's "tough legacy" securities by identifying securities that:
  - Mature after CDOR's cessation date of June 28, 2024
  - Have weak or no fallbacks, and
  - Are difficult to modify (high threshold for modification or wide distribution)
- CARR's preliminary analysis has found that the amount and number of "tough" legacy securities is relatively small and therefore would not require a legislative solution
- The next step is to assess the various options available to resolve the fallback issue with these types of securities

Term CORRA

- CARR held a public consultation on the potential need for a forward-looking Term CORRA benchmark
  - The use of Term CORRA would be restricted to loan products and derivative products that are tied or linked to a cash product or hedging strategy that references Term CORRA. CARR expects that the vast majority of derivatives and all cash securities will transition to overnight CORRA
  - CARR is contemplating 1- and 3-month tenors, and will decide based on consultative feedback
- CARR believes that an IOSCO-compliant Term CORRA benchmark can potentially be constructed from CORRA futures, similar to the Term SOFR rate produced by the CME
  - The long-term viability of such a benchmark will depend on the underlying liquidity of the 1-month serial futures contract that is expected to be launched by the Montreal Exchange in Q4-2022
  - Any products referencing Term CORRA are expected to have a robust fallback to CORRA
  - CARR is currently engaged in determining the calculation methodology for Term CORRA
- Should the consultation confirm that a Term CORRA is necessary, CARR expects to launch a RFQ for a private sector administrator in Q3-2022. CARR expects that a Term CORRA could start to be published by the end of Q3-2023

CORRA-based loans

- **CORRA-based loan conventions**
  - CARR previously published conventions for loans based CORRA compounded-in-arrears
    - Uses CARR's methodology for compounding daily CORRA
    - 5-day lookback with no observation shift
    - Actual/365, day count follows Bank of Canada Holiday Schedule

- **Next steps**
  - CARR will publish recommended hard-wired fallback language for CDOR-based loan facilities by end-Q2
  - CARR will publish a white paper on the implications for the loan market of using CORRA as its pricing benchmark
  - While CARR is consulting on Term CORRA for the loan market, CARR encourages the use of CORRA-in-arrears, particularly where the loans are being hedged using derivatives
    - CARR expects that most of the liquidity in Canadian dollar derivatives will transition to overnight CORRA, and therefore the cost of hedging using Term CORRA derivatives may potentially be higher compared to using overnight CORRA based derivatives
  - Should the results of the Term CORRA consultation lead to the development of a Term CORRA benchmark, CARR will develop appropriate Term CORRA loan conventions

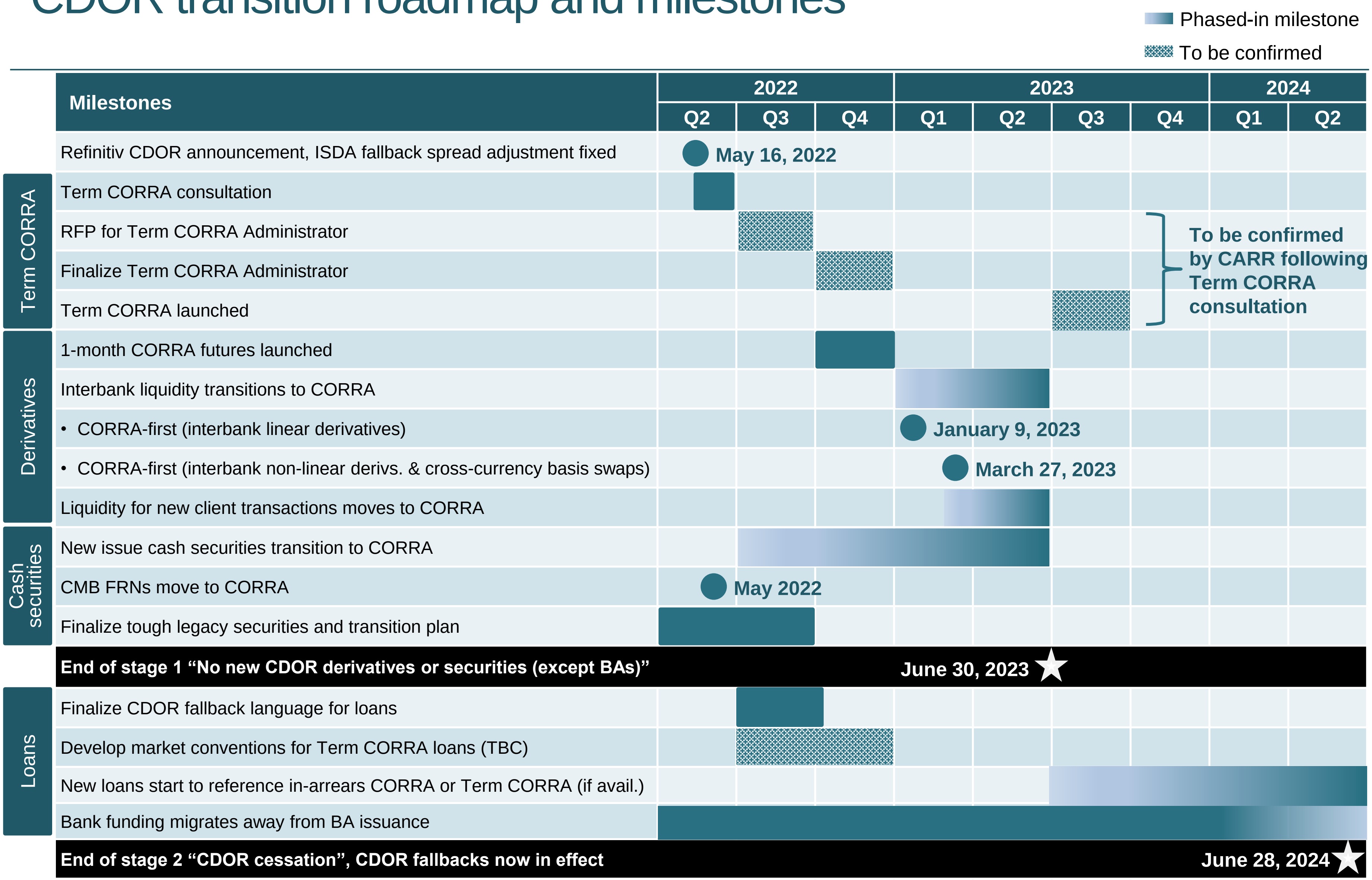
Infrastructure and outreach

- **Systems readiness**
  - CARR will work with major system vendors as they prepare their systems to transition to CORRA within the applicable transition timelines
  - CARR will develop user guides and checklists
- **Resource material**
  - CARR will continue to update this transition roadmap and milestones as the work progresses. CARR's website will be a key source for further information on the transition
  - CARR will hold numerous roundtables over the next two years to discuss any issues related to the transition

Impact of CDOR cessation on BA securities

- Bankers' acceptances (BAs) are debt instruments created by banks as a result of a client loan drawdown from certain types of lending facilities that have a BA based borrowing option:
  - They are short-term discount instruments primarily issued in the 1-month tenor (the tenor of the BA matches the tenor of the client drawdown)
  - They account for about 20% of Canada's money market assets (~$90 billion) and are an especially important asset in the 1-month tenor for money market investors
- With the cessation of CDOR, the BA lending model and BA security issuance will disappear. With this change, banks will replace their short-dated BA funding with longer-dated bearer deposit notes (BDNs) or bank deposits. This will leave a gap in bank-issued money market securities, particularly in the 1-month tenor
- CARR identified this eventual shortfall in money products and, as a result, CFIF is holding a series of workshops with a wide range of stakeholders to discuss the availability of alternative investment products, as well as any constraints that that investors currently have in transitioning to other products

CDOR transition roadmap and milestones



Thank you

To sign up for email notifications on CARR's website:

Canadian Alternative Reference Rate Working Group

The Canadian Alternative Reference Rate Working Group (CARR) was created to ensure Canada's interest rate benchmark regime is robust, relevant and effective in the years ahead. Find more information about our **background**, access our **key documents**, **market notices**, **publications**, **meetings**, and **membership**.

Receive **notification by email** whenever new CARR material is added to the website.

For questions on any aspect of the transition please email: CARR-WG@bankofcanada.ca

Annexes

Annex 1 - Background resource material

- CDOR White Paper
  See the executive summary and size and scope of CDOR and BAs.
  Read related statements from RBSL and ISDA.
- CARR transition road map
- Term CORRA consultation
- Bank of Canada's CORRA web page
- Recommended conventions
  - CORRA FRN conventions
    Contractual terms for floating rate notes referencing CORRA
  - Inter-bank swap conventions for CDOR-SOFR and CORRA-SOFR
    Contractual terms for swaps between two banks that reference CORRA and either CDOR or SOFR
  - CORRA loan conventions
    Also: a worked Excel example of these conventions and a comparison to conventions in other jurisdictions
  - Methodology for CORRA compounded-in-arrears
    Overview of the methodology
- Recommended fallback language
  - CDOR FRN fallback language
    Language to include in FRNs referencing CDOR to describe what happens to the FRN if CDOR is discontinued. See also the consultation paper.
  - CORRA FRN fallback language
    Language to include in FRNs referencing CORRA to describe what happens to the FRN if CORRA is discontinued.
  - ISDA's Fallbacks Supplement
    Legal language that describes what happens to derivatives written under ISDA's standard definitions. See pages 69-76 for Canadian rates.

Annex 2 - CARR membership

Co-chairs

- Karl Wildi, Canadian Imperial Bank of Commerce
- Harri Vikstedt, Bank of Canada

Members (Buy-side)

- Alberta Investment Management Corporation
- Brookfield
- Canadian Mortgage and Housing Corporation
- Invesco
- Ontario Financing Authority
- Ontario Teachers' Pension Plan
- Public Sector Pension
- Quebec Ministry of Finance
- Rogers Communications
- Samuel, Son & Co
- Sunlife

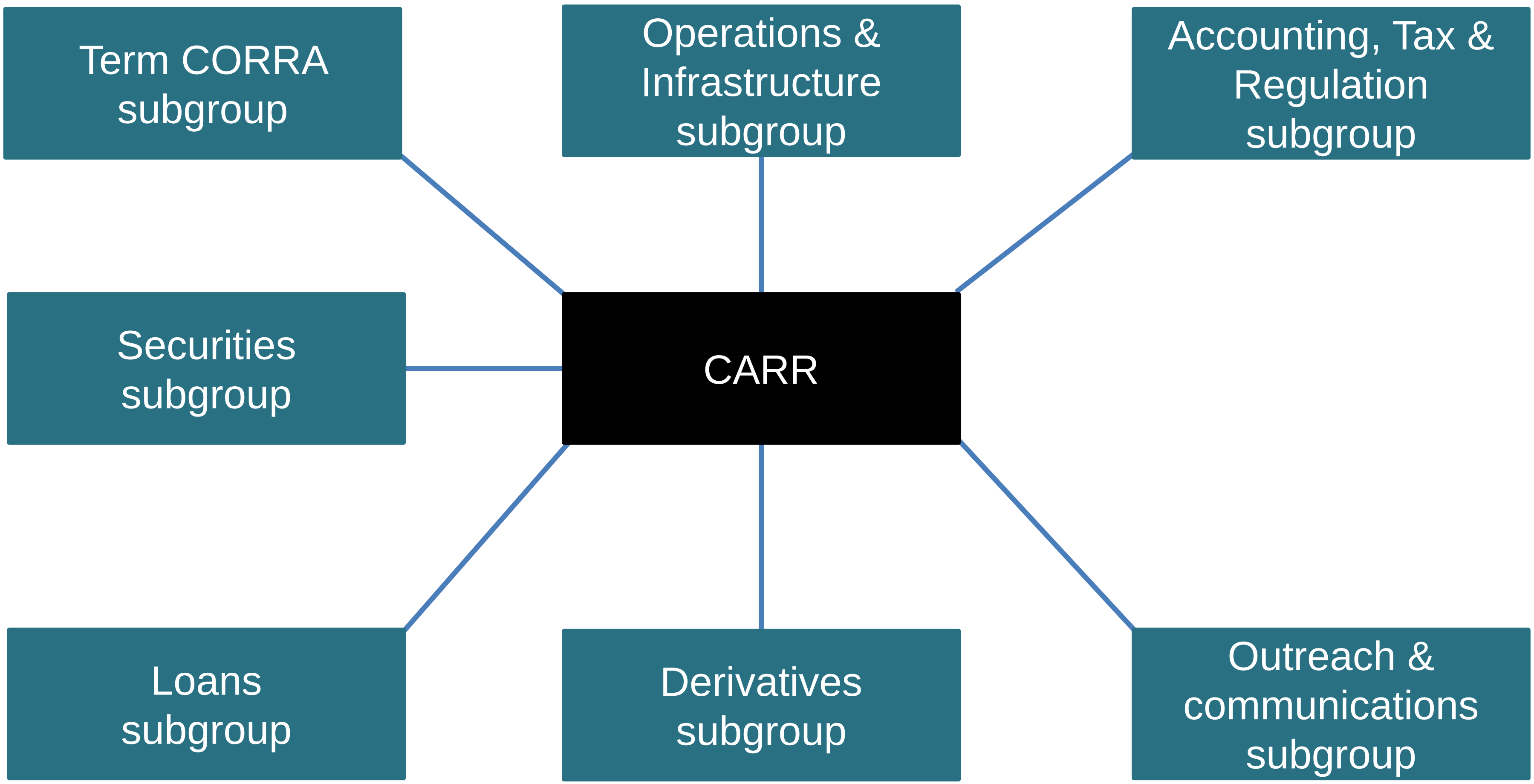
Members (Sell-side)

- Bank of America
- Bank of Montreal
- Central1
- Canadian Imperial Bank of Commerce
- Desjardins
- Morgan Stanley
- National Bank of Canada
- Royal Bank of Canada
- Scotiabank
- Toronto Dominion Bank
- HSBC

Observers

- LCH
- ISDA
- McMillan LLP
- CORRA Advisory Group Chair
- Rotman School of Management
- TMX

Annex 3 - CARR's structure



Annex 4 - CORRA is similar to SOFR

Canadian Overnight Repo Rate Average (CORRA)

- CORRA has been published since 1997 and its calculation methodology was enhanced in June 2020
- Risk-free measure that reflects the overnight risk-free rate, closely tracks the Bank of Canada's Target Rate
- Measures the cost of overnight lending via general collateral repo transactions secured by Government of Canada debt
- Transparent, transaction-based (i.e. reflects actual market transactions)
- Overnight rate
- Needs to be compounded in arrears to calculate a payment
- Administrator: Bank of Canada
- CARR is currently consulting on whether a 1- and 3-month term rate is needed

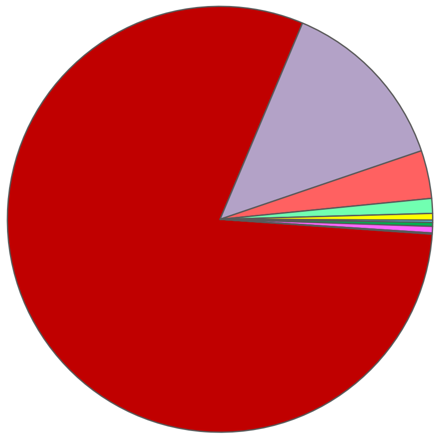
Secured Overnight Financing Rate (SOFR)

- SOFR is a relatively new rate having been introduced in 2018
- Risk-free measure that reflects the overnight risk-free rate, closely tracks the effective Federal Funds rate
- Measures the cost of overnight lending via general collateral repo collateralized by Treasury securities
- Transparent, transaction-based rate (i.e. reflects actual market transactions)
- Overnight rate
- Needs to be compounded in arrears to calculate a payment
- Administrator: Federal Reserve Bank of New York
- Term SOFR available

Annex 5 - Products referencing CDOR[1]

- Total notional exposure to CDOR is approximately $20 trillion
- Over 97% of CDOR exposure is related to derivatives, with centrally cleared derivatives accounting for the bulk of the exposure, with most referencing the 3-month CDOR tenor
- Floating rate notes represent the second largest exposure with nearly all (~99%) referencing the 3-month rate. Just under half of **FRNs** outstanding have a remaining term of less than 3 years
- Loans represent the third largest exposure with the majority referencing 1-month CDOR as this is most common drawdown tenor.
- **Securitized products** referencing CDOR represent the fourth largest exposure, most of which reference 1-month CDOR. Just over 65% of these products have a remaining term to maturity of less than 3 years

Total outstanding's of products referencing CDOR



Source: Survey results, LCH, CME, CMHC, Bloomberg

Last observation: 31/10/2020

97% of CDOR exposure relates to derivatives while only about 1% is related to BA/CDOR loans. Most products reference the 3-month CDOR rate, while the majority of BA issuance is 1-month

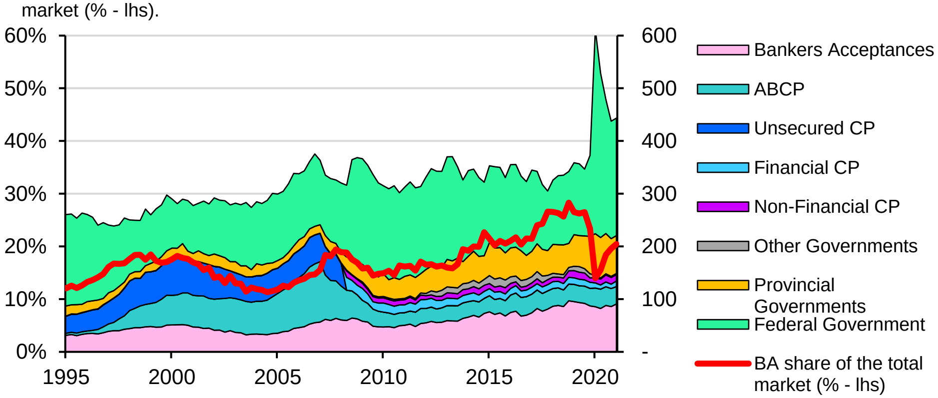
[1]: Data reflect exposures as of end-Oct 2021, Source: CARR Survey, LCH, CME, CMHC, Bloomberg.

Annex 6 - BAs are an important investment asset

- BAs are a particularly important money market asset, accounting for about of 20% of assets, second only to GoC T-bills
  - Approximately $70 to 90B in BAs are sold into the market, with 90% in the 1-month tenor
  - The amount of one-month issuance provides a maturity ladder for investors
  - Depth and breadth of liquidity
  - Investors find BAs attractive because of their high credit ratings, yield pickup relative to GoC and provincial T-bills (~20bps to GoC T-bills)
- The three largest net purchasers of BAs from dealers in the secondary market in 2021 have been pension funds (31%), big 6 Asset Managers (19%), and provinces (16%)
- CARR recognizes that its decision is likely to have material implications for BA issuance

Evolution of money market instruments over time

End of quarter market value of short-term paper, by sector ($bn - rhs)[1] and BA's share of the total market (% - lhs).

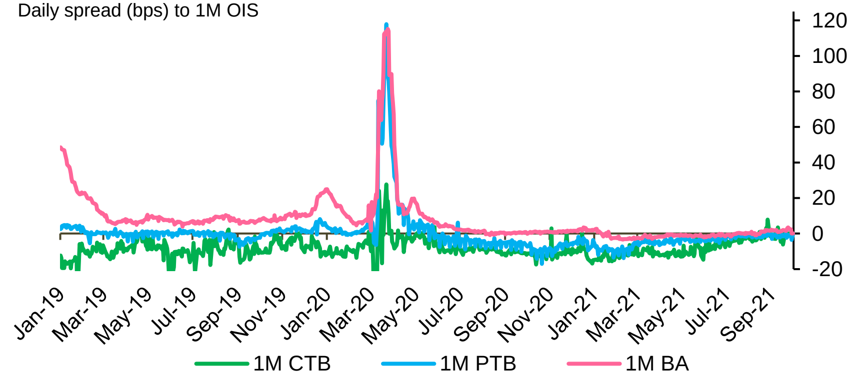


[1] Note: Bankers acceptances outstanding are sourced from OSFI consolidated bank balance sheets and then excluded from the 'Chartered banks & quasi banks' sector short-term paper liabilities
Source: Statistics Canada. Table 36-10-0580-01 National

Last observation: Q2-21

BAs provide yield pickup compared to other MM products

Daily spread (bps) to 1M OIS



Source: Bloomberg, IIROC, CDS.

Last observation: 29/09/2021