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CDOR Review and Analysis: CARR Update

Presentation to CFIF

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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.



Executive Summary

- CDOR is currently the primary interest rate benchmark in Canada. It is referenced in \$20 trillion of notional exposure across the Canadian financial system (derivatives, bonds and loans)
- It is similar to LIBOR in that it is a 'credit-sensitive' benchmark, and is calculated from panel bank submissions including expert judgement, however, it is a lending rate and not a borrowing/funding rate
- CDOR is based on the rate at which panel banks offer their balance sheet to their corporate clients under a Bankers' Acceptance (BA) facility
- CARR analyzed certain aspects of CDOR's architecture that would potentially pose risks to its future robustness, namely:
 - ▶ Sustainability - BA's utility as a source of funding has decreased as banks have taken a more sophisticated approach to liquidity management. Basel III regulations have further reduced banks needs for short term funding
 - ▶ Transparency – not directly tied to transactions in the public markets
 - ▶ Proportionality - \$20 trillion of overall exposure referencing CDOR is based on \$80-90 billion worth of BAs sold to market
 - ▶ Fragility - There are currently 6 panel banks, down from 9 banks in 2012
- Important considerations:
 - ▶ Money market investors - BAs are an integral part of the Canadian money market (currently comprising 20% of Canadian money market securities)
 - ▶ Corporate borrowers - BA facilities are a core funding program for many corporates
- CDOR was deemed a critical benchmark under the recently released CSA benchmark regulation, impacting the administrator and panel banks alike
- Other jurisdictions have recently reformed their credit-sensitive benchmarks to be more transactions based with a prescribed waterfall of objective data

Background on CDOR Review

The Bank of Canada created [CARR](#) (the Canadian Alternative Reference Rate working group), sponsored by the [Canadian Fixed-Income Forum](#) (CFIF), in March 2018

- CARR's membership includes 18 institutions, plus the Bank of Canada, from both the public and private sectors with equal representation from both the buy- and sell-side
 - ▶ CARR also works closely with other stakeholders including the CBA, CBIA, IIAC, CTA, ISDA, Canadian regulatory authorities and other national benchmarks working groups
- CFIF expanded CARR's [terms of reference](#) in September 2020 to encompass two main objectives:
 1. **RFR Transition** - supporting the adoption of, and transition to, CORRA as a key financial benchmark for Canadian derivatives and securities
 2. **Credit Benchmarks** - analyzing the current status of CDOR and its efficacy as a benchmark, as well as making recommendations based on the analysis to ensure Canada's benchmark regime is robust, relevant and effective in the years ahead (CDOR Review)
- For the CDOR Review, the Credit Sensitive subgroup formed three workstreams to analyze and review the:
 1. Size and scope of the use of CDOR
 2. CDOR submission process
 3. Efficacy of the BA market

Background on CDOR

CDOR is Canada's credit-sensitive benchmark

- CDOR is often referred to as the Canadian interbank offered rate (IBOR), but it is materially different from other IBORs which reflect some directly measurable short-term bank funding cost
 - ▶ In contrast CDOR measures the rate that Canadian banks are willing to lend (offer their balance sheet) to corporate borrowers with existing BA facilities
 - ▶ It is a committed bank lending rate that was originally developed to establish a daily benchmark reference rate for BA borrowings (it is now also used for other types of floating rate loans)
 - ▶ The submitted CDOR rate is not specific to a type of borrower or amount but is a generic benchmark rate for each respective tenor
- **CDOR is a voluntary, survey-based rate** (i.e., it is not a transaction-based benchmark) that reflects both term and credit risk
 - ▶ The CDOR submission panel has shrunk since 2012 from 9 to 6 banks (the last withdrawal was in January 2018)
 - ▶ The 6 submitting banks originate over 90% of BAs outstanding in Canada
- On [September 15](#), the OSC and AMF designated CDOR a domestically critical interest rate benchmark, making it subject to the OSC and AMF's [regulatory regime](#) for financial benchmarks

CDOR was originally developed to act as a reference rate BA based lending

How is CDOR calculated?

CDOR is calculated as the average of the CDOR contributions from Canada's big-6 banks, after trimming the highest and lowest contributions

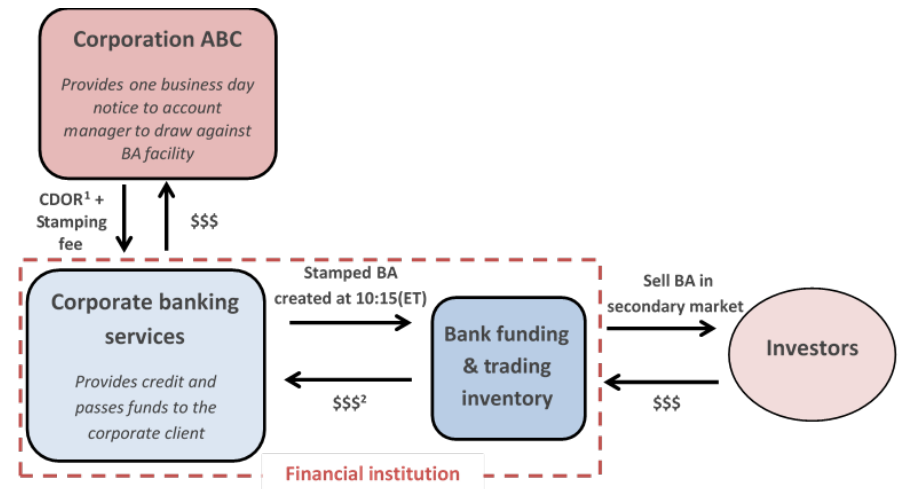
- CDOR has been administered by [Refinitiv Benchmark Services \(UK\) Limited](#) (RBSL) since December 31, 2014
- Submitting banks provide RBSL with the rate they are willing to lend their balance sheet to corporate borrowers with existing BA facilities that reference CDOR between 9:40am and 10:10am ET
- The highest and lowest quotes are dropped, and a simple arithmetic average of the remaining quotes is calculated to set the daily CDOR benchmark
- CDOR currently has three tenors: 1-month; 2-month and 3-month
 - ▶ After a public consultation, RBSL [discontinued](#) CDOR's 6- and 12-month tenors from May 17, 2021 due to a lack of underlying BAs issued in those tenors. From November 2016-2019, daily average dollar value of 6- and 12-month BAs created in the primary market has been 0.3% and 0.1% respectively of total BA issuance
- CDOR and the submitted quotes from the 6 banks are published at 10:15 ET by RBSL
- More details on CDOR's calculation methodology can be found [here](#)

Each CDOR tenor is calculated from only four submitted rates as the highest and lowest rates are removed

Lending mechanics of BA loans*

- A BA is a **direct and unconditional order from a corporate borrower to draw down against its established line of credit (“BA facility”)** at a Canadian bank. BA facilities are usually negotiated for a term of 18 months to 5 years
- **Most BA facilities reference CDOR as the interest rate benchmark** for establishing the base borrowing rate
- Corporates can borrow cash up to the full committed amount of the credit line for a set term, ranging **up to 12 months** depending on loan agreement. This funding is typically rolled at maturity effectively making BA facilities a source of term funding.
- In terms of the typical mechanics of a BA issuance:
 - A corporate provides notice to their account manager to draw against their BA facility
 - The prevailing CDOR rate set at 10:15 plus the stamping fee will be paid by the corporate in exchange for funds
 - After 10:15 ET, the draw is approved, and the stamped BA (“BA liability”) is transferred to the investment bank/dealer’s trading book
 - The bank/dealer may sell the BA to investors in the secondary market (offer side) or hold it on their balance sheet (“BA asset”). Banks may also hold other bank’s BAs
- Some larger corporates retain the BA and sell it to the market directly
- In practice, despite the short tenor of the draws, BA facilities are now term funded, rather than funded by the sale of BAs. When BAs are sold, it is typically to fund specific short-term assets

Figure 1: Illustrative example of how BAs are created and sold to investors



¹ CDOR is set daily at 10:15(ET).

² This transfer can take place at CDOR set at 10:15(ET).

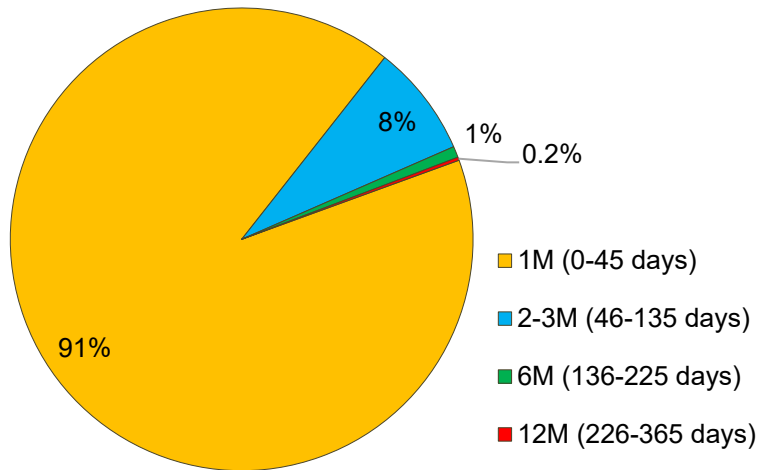
The BA loan structure was originally developed in the 1960s to support the creation of a corporate loan market. Similar types of loan structures were also developed in other jurisdictions

BAs are primarily issued in very short tenors (i.e. 1-month)

Most BA issuance is in the 1-month term to match the 1-month term of the loan drawdowns

Chart 1: 1-month BAs represent the majority of average daily trading volume

Average daily BA trading volume since 2015 by term as a percentage of total daily trading volume



Source: CDS

Last observation: 03/11/2020

- The term of the loan drawdown requested by the corporate borrower depends on their cash flow requirements, interest rate expectations and shape of the CDOR curve
- **Most clients borrow for 1 month**, often owing to the short-term nature of their requirements, the desire to minimize reinvestment risk, and fact that the BA facility is committed (i.e. they have no re-financing risk)
 - ▶ BA draws can be used to meet short-term funding requirements (e.g., accounts payable and payroll), or longer-term obligations like capital investments and mergers or acquisitions.
 - ▶ Most corporates roll their draws at maturity
 - ▶ Most draws are concentrated at the beginning or end of the month
- As such, **issuance volume (and thus stamped BAs) is primarily in the 1M tenor**, with a lesser amount in the 3M

BA issuance and trading volume is primarily concentrated in the 1-month tenor, while 3-month CDOR is the primarily referenced interest-rate benchmark tenor

Regulations have impacted BAs and how BA loans are funded

Historically, draws against BA facilities were funded by the sale of the BA in the secondary market. However, in general this has not been the case since the GFC

- **Banking regulations**, such as the Liquidity Coverage Ratio (LCR), Net Cumulative Cash Flow (NCCF) and Net Stable Funding Ratio (NSFR) **have made BAs more capital- and liquidity-intensive**
- When the BA loan construct was originally introduced in the 60s, and before these regulations were implemented, draws against BA facilities were generally funded by the sale of the BA in the secondary market
- But, in recent years, because of changes in the way that banks manage their funding and especially in light of the new Basel III liquidity regulations, bank treasuries typically fund BA facilities with term funding
 - ▶ This term funding mainly consists of customer deposits and term wholesale funding (i.e. qualifies as stable to achieve the required LCR and NSFR ratios)
- Since 2015/6 banks have been keeping a larger and larger share of the BAs created on their balance sheet due to the limited value assigned to BAs as a funding source from LCR and NSFR
 - ▶ When banks sell BAs, it is to fund other short-term assets, instead of using other types of funding
 - ▶ Based on the CARR survey the six CDOR panel member banks held approximately 50% of the BAs created on their balance at the end of October 2020

Post-crisis regulatory reforms have impacted the effectiveness of BAs as a funding tool and they are no longer used to fund draws against BA facilities

Australian Bank Bill case study*

Australia had a similar BA loan structure to Canada, however, bank acceptances play a very minimal roll in the Australian loan market or bank funding market today. Their role begun to diminish in the 1990s, which was accelerated due to the regulatory changes introduced since the GFC

- In the early 1990s Australian bank funding was dominated by bank acceptances and similar to Canada these were primarily of 1-month tenor as borrowers were drawing their bank lines for a one-month term
- This began to shift in the mid-90s as banks begun to separate the loan drawdown from its funding, and an active negotiable certificate of deposit (NCD) begun to develop. These NCDs were longer tenor
- By the end-90s the NCD market had grown to be bigger than the bank acceptance market
- While acceptance-based loans kept growing peaking in 2009 at A\$150 billion, banks increasingly sold only a small percentage of their acceptances into the market (by June 2011, 20% or only A\$22 billion of acceptances were sold into the market versus A\$181 billion in NCDs)
- With the changes in bank regulations as a result of the GFC, the amount of bank acceptances sold has further declined and most banks have moved away from the bank acceptance loan structure for traditional loan products
- The Australian credit-sensitive benchmark, the Bank Bill Swap Rate (BBSW), is underpinned by both prime bank-issued bank acceptances (bank bills) and NCDs
 - ▶ Prime bank paper outstanding has ranged between A\$120 - \$150 billion in recent years, primarily only NCDs
 - ▶ It is estimated that about A\$18 trillion (notional) of products reference BBSW, including derivatives, loans and securities

Australia was the last major jurisdiction to move away from the bank acceptance loan structure

CORRA is the main alternative to CDOR

Canadian Dollar Offered Rate (CDOR)

- Credit based measure that incorporates both term and bank credit risk premium
- Measures the rate that Canadian banks are willing to lend to clients with existing credit agreements via banker's acceptances
- Survey-based rate
- Submitted rates lack transparency
- Term rate (1, 2, and 3-month)
- Forward-looking term rate (payment is known in advance)
- Administrator: [Refinitiv](#)
- Publication delay for free usage

Canadian Overnight Repo Rate Average (CORRA)

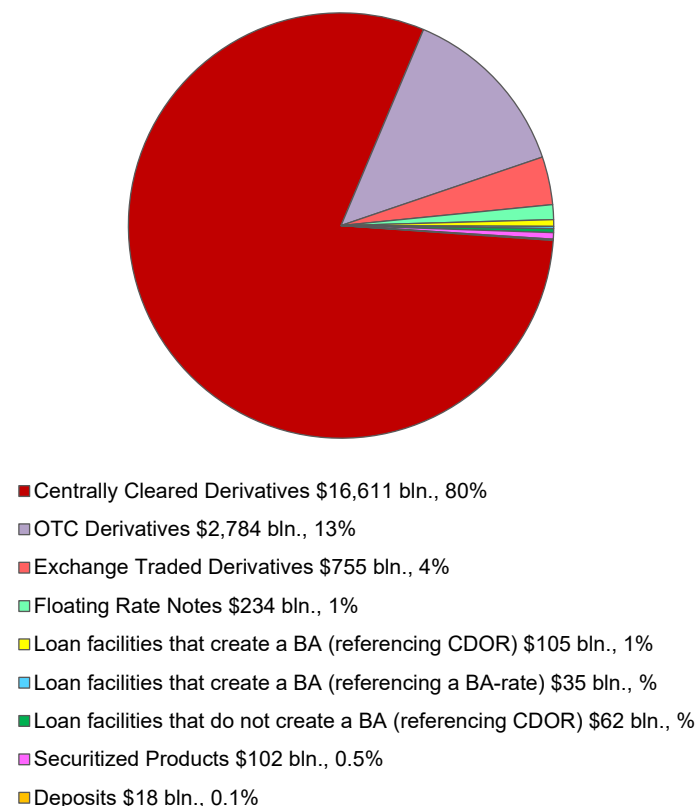
- Risk-free measure that reflects the overnight risk-free rate, closely tracks the Bank of Canada's [Target Rate](#)
- Measures the cost of overnight lending via general collateral repo transactions secured by Government of Canada debt
- Transparent, transaction-based (i.e. reflects actual market transactions)
- Overnight rate
- Needs to be compounded in arrears to calculate a term rate and payment
- Administrator: [Bank of Canada](#)
- No publication delay for free usage

Products referencing CDOR

Products referencing CDOR¹

- 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. See next slide for details of **BA and CDOR based loans**
- **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

Chart 2: 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

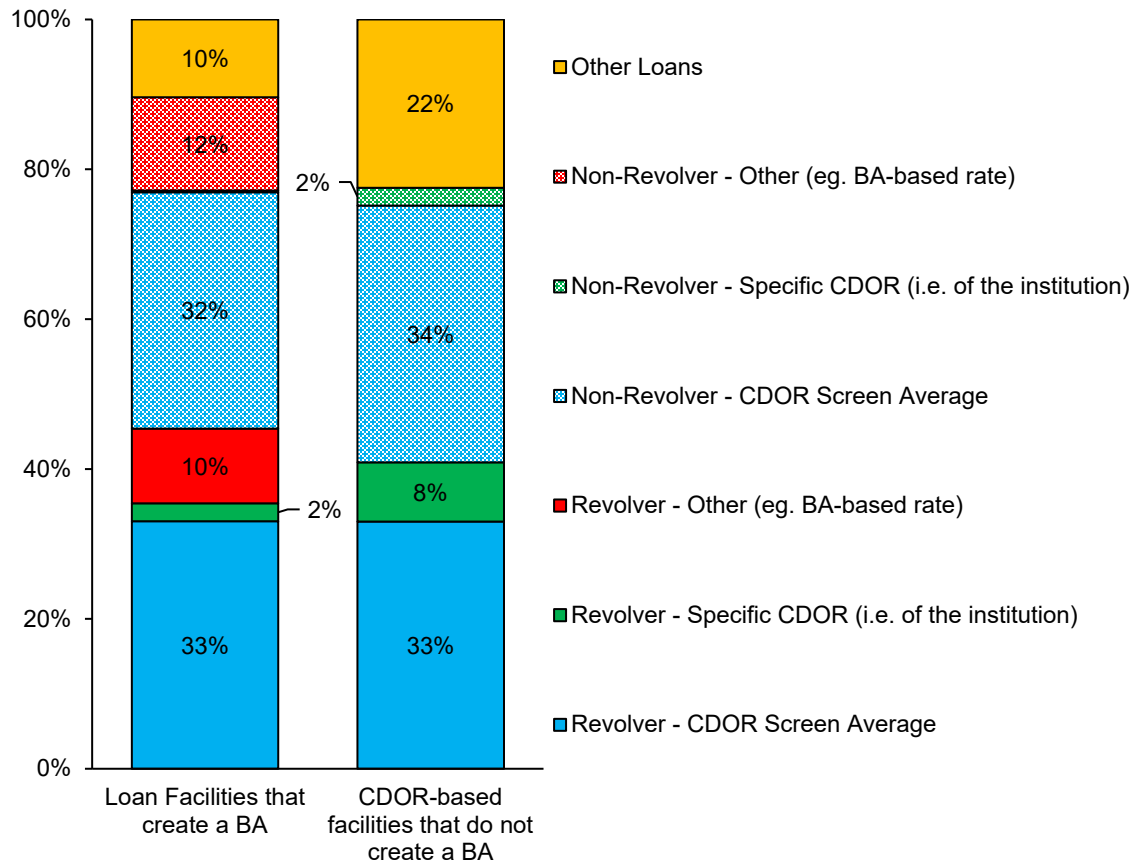
¹: Data reflect exposures as of end-Oct 2021, Source: CARR Survey, LCH, CME, CMHC, Bloomberg.

Breakdown of BA & CDOR loans that reference CDOR

- Loans that reference CDOR are broken down into two types:
 - The original BA loan type created in the 1960s (illustrated in slide 7)
 - Loans that reference CDOR but do not create a BA from the drawdown of funds
- \$218bn in Bankers Acceptance ('BA') and CDOR based loans were reported by survey participants
 - Loan facilities that create a BA represent 71% of all BA and CDOR-based loans
 - CDOR-based loans that do not create a BA have been gaining market share in the last 5 years and now account for about 30% of loans that reference CDOR
- Corporate and commercial borrowers account for almost all BA loan-based facilities
- Revolver and non-revolver type facilities are approximately equal in exposure size
- Loans referencing the CDOR rate, instead of individual bank CDOR submissions, represent the majority of total loans

Chart 3: BA and CDOR Based Assets

Proportion of total assets, by facility type

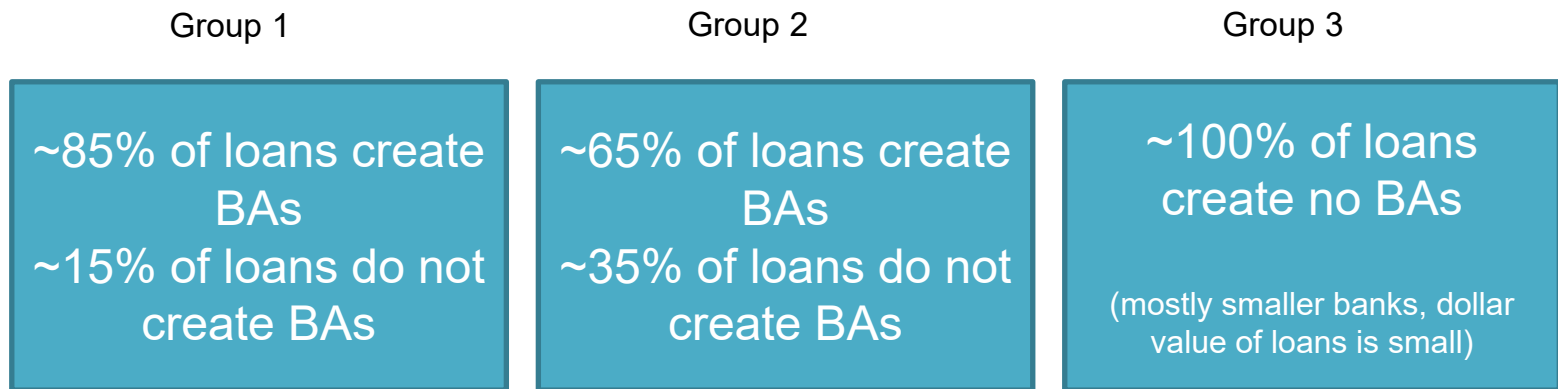


Source: Survey data

Last observation: October 31, 2020

Breakdown of BA versus CDOR-based loans by institution

- The degree to which loans resulted in the creation of BAs varied across banks, with three distinct groupings seen in the data:



- Some banks have indicated that they have moved from Group 1 to Group 2 over time as a result of catering to the needs of smaller corporate clients and infrastructure clients who want hedgeable, CDOR-based loans, but do not want to roll BA draws on a monthly basis. Larger corporates and corporates with syndicated BA loan facilities still primarily use BA-based CDOR loan facilities

There is an emerging trend towards issuing CDOR-based facilities that do not create a BA, which may have implications for the underlying volume in BAs available to the market going forward

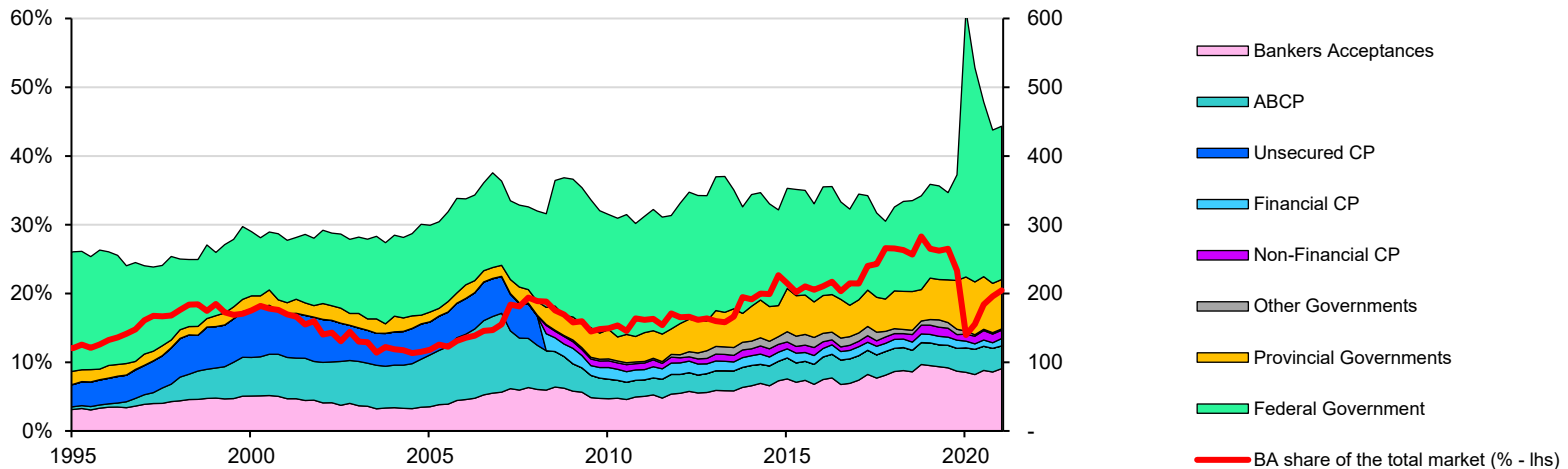
BAs as an investment asset

BAs are an important investment asset for market participants

- As of the end of Q2-21, BAs (sold to market) were the second largest Canadian short-term product outstanding (Chart 4)
- BAs' share of the money market has ranged from 10-26% and currently accounts for about 20%, second only to GoC T-bills
- 94% of Canadian short-term investment assets are accounted for by 4 products (GoC T-bills, BAs, Provincial T-bills, and ABCP)

Chart 4: 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 Balance Sheet Accounts, OSFI consolidated bank balance sheets, DBRS Morningstar

Last observation: Q2-21

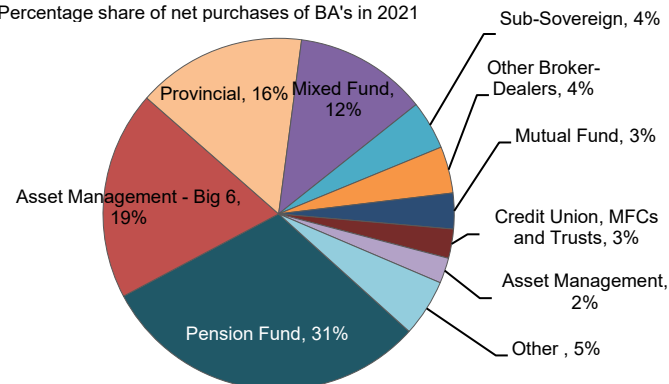
BAs as an investment product

Pension funds are the largest net purchasers of BAs in secondary market

- 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%)
- Since BAs incorporate bank credit risk, they offer a yield pickup in the secondary market relative to GoC and provincial treasury bills
- For example, since 2019, the average pickup of 1M BAs has been around 16 bps to GoC treasury bills ('CTB') and 8 bps to provincial bills ('PTB')
- As BAs receive the same short-term credit rating as the accepting bank, most receive the highest DBRS credit rating of R-1 (high)

Chart 5: Net purchasers of BAs from dealers

Percentage share of net purchases of BA's in 2021

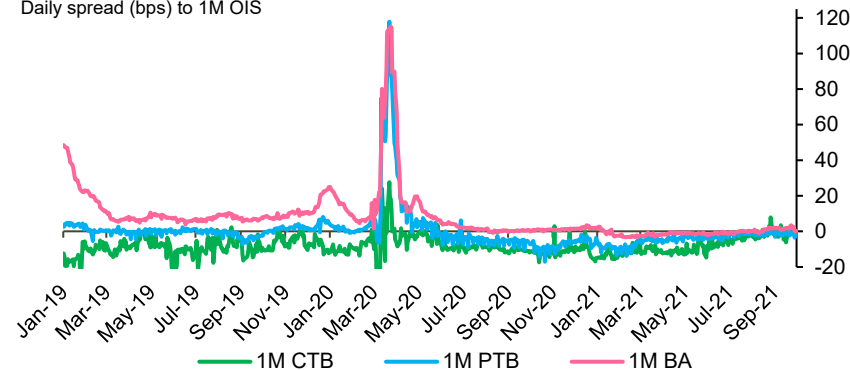


Source: MTRS, Bank of Canada calculations

Last observation: 23/09/2021

Chart 6: BAs provide yield pickup compared to other MM products

Daily spread (bps) to 1M OIS



Source: Bloomberg, IIROC, CDS.

Last observation: 29/09/2021

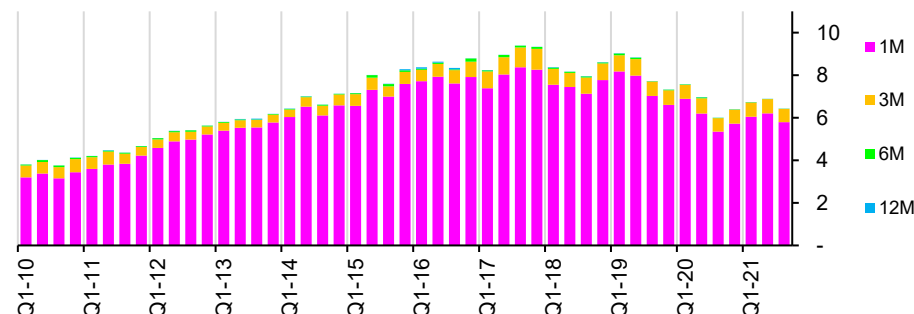
BA trading volume is high given their relatively short tenor

- Trading volumes are high given the relatively short tenor of BAs, with 1-month BA trading volume having accounted for ~90% of total volume over the last 10 years (3-month: ~9%)
- Total average daily BA trading volume has declined just over 25% since 2017
- As of Q3-21, average daily volume across all BA tenors was \$6.4bn
 - ▶ 1M: \$5.7bn, 3M: \$627mn, 6M: \$19mn, 12M: \$1.1mn
- The distribution of daily traded volumes has shifted left (i.e., to a greater relative frequency of lower trade volumes) post-Covid for 1-month BAs

Average daily trading volumes have declined since 2017

Chart 7: Average daily BA volumes peaked in late 2017

Average daily BA trading volume (\$bn.) by term, per calendar quarter



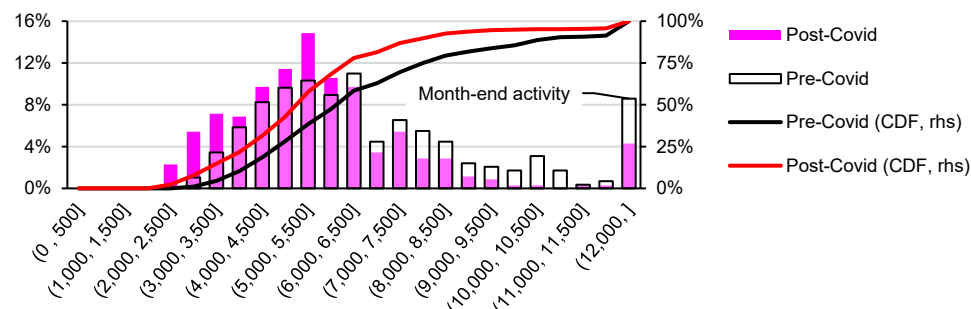
Note: CDS data was used for dates before 2016. Trades are classified by remaining days until maturity as follows: 1M (0-45), 3M (46-125), 6M (126-240), 12M (241-365).

Source: CDS, MTRS

Last observation: Q3-21

Chart 8: There distribution of total daily volumes of 1-month BAs has shifted left post-Covid

Relative frequency of daily trading volume (\$mn.) pre- and post-Covid



Note: 'Pre-Covid' period ranges from Jan 2019 to Feb 2020, 'Post-Covid' is from May 2020 to Sep 2021.

Source: MTRS, Bank of Canada calculations

Last observation: 29/09/2021

CDOR and BAs are subject to externalities

- These externalities include:
 - ▶ Regulatory changes
 - ▶ Changes in the short-term funding market dynamics, including from domestic and international extraordinary monetary policy actions
 - ▶ Periods of financial market stress
- CDOR and BAs are susceptible to increased volatility and widening spreads (relative to OIS) especially during extreme periods of financial stress
 - ▶ IIROC publishes daily (on a T+1 basis), for informational basis only, the weighted average rate for 1- and 3-month BAs transacted, using MTRS data
 - ▶ As a result of the illiquid conditions in longer dated BAs during the peak of the Covid-19 crisis they had to revert to publishing the prior day's 3-month transaction-based BA rate on 7 consecutive days in March 2020 due to limited trading volume in 3-month BAs
- The Bank of Canada introduced the Bankers Acceptance Purchase Facility in mid-2020 to support the continuous functioning of financial markets by conducting purchases of BAs

Chart 9: CDOR-OIS spread experiences substantial widening during periods of stress

Average weekly 1-month CDOR-OIS spread (bps)



Source: Refinitiv, Bloomberg

Last observation: 12/10/2021

CDOR-OIS can experience substantial widening during periods of financial market stress

The interplay between BA credit facilities, BA securities and CDOR

- Canadian BA credit facilities are uniquely structured:
 - ▶ If a corporate client chooses to draw on a BA credit facility, it automatically creates a security that is both an asset and a liability for the bank
 - ▶ Banks then decide whether to hold the created BA on its balance sheet or sell it into the market
 - ▶ The sale of the BA is not used to fund the BA-based loan, but rather other short-term assets
- When a bank sells a BA security into the money market, the price of this trade reflects what an investor will pay to own a short-term bank credit instrument
- This is not, however, the price at which a bank will offer out its balance sheet under a BA credit facility (i.e. CDOR)
- The difference between the level where BA securities trade and CDOR sets is called the BA/CDOR basis
- The magnitude of the 'basis' is impacted by many factors including, but not limited to: supply and demand for money market instruments (i.e. BAs), the cost of term funding for banks (bank credit spreads), extraordinary monetary policy (i.e. QE or purchase programs), bank regulation, demand for funding through BA credit facilities by corporates, and market stress
- CDOR's definition cannot be directly tied to transactions and it therefore relies on expert judgement
- Expert judgement takes into account where BA and other securities transact in the market as well as the factors that drive the basis

Benchmark regulation

Global benchmark regulation

Globally, benchmark regulations are largely designation-based, and favour benchmarks rooted in transactions from a liquid underlying market

- As a result of the “Wheatley Review of LIBOR”, the UK introduced a regulatory regime for benchmarks in 2012. LIBOR was initially the only benchmark specified under the rule after they were [finalized](#) in 2013
- The International Organization of Securities Commissions (IOSCO) published a set of [principles for financial benchmarks](#) in 2013, establishing an overarching framework for financial benchmarks and their providers
 - ▶ The principles are proportional: their application depends on the size/risks of the benchmark. This proportionality was highlighted in IOSCO’s September 2021 [statement](#) on credit-sensitive rates
 - ▶ The principles establish a hierarchy of data inputs for benchmarks, ranging from arms-length transactions in active markets (best) to expert judgement (worst)
- EU soon followed suit with its 2016 Benchmark Regulation ([BMR](#)), which into effect in January 2018
 - ▶ In line with the proportionality of IOSCO’s principles for financial benchmarks, benchmarks can be designated under the BMR as “critical” benchmarks, significantly increasing the regulatory oversight accompanying them
 - ▶ Where benchmarks are based on expert judgement, rather than arms-length transactions, additional controls were required of benchmark administrators
- Numerous other jurisdictions have also introduced benchmark regulation that is closely aligned with IOSCO’s Principles for Financial Benchmarks with primary focus on creating transaction-based rates
- Since 2013, global work on benchmark reform has been led by the FSB’s [Official Sector Steering Group](#)
 - ▶ The 2014 key message on IBORs was for jurisdictions to reform their IBORs to make them more transaction based

Global reform efforts have focused on moving from survey-based to transaction-based benchmarks

Domestic benchmark regulation

In April 2021, the securities authorities of seven Canadian provinces adopted a [multilateral instrument](#) for designated benchmarks and benchmark administrators, improving the legal basis on which Canadian securities regulators can take enforcement or other regulatory action against benchmark administrators, contributors or users

- With this multilateral instrument, Canada now has a robust regulatory regime for financial benchmarks, similar to the EU Benchmark Regulation
- In September 2021, the OSC and AMF [decided](#) to designate CDOR as both a “designated interest rate benchmark” and a “designated critical benchmark” and RBSL as a “designated benchmark administrator” for CDOR, scoping them into key parts of the new rules
- In recent months, CDOR submitters and CDOR’s administrator have been reviewing their policies and procedures to ensure they adhere to the new rules
 - ▶ Refinitiv published a [revised](#) CDOR Contributor Code of Conduct on 16 September 2021
- As a result of the introduction of domestic benchmark regulatory framework the CDOR submitters are potentially considering making changes to their submission processes, including where the actual submission is made and the governance around the inherent conflicts arising from the CDOR definition

There are potential implications from recent CSA benchmark rules for CDOR and its submission process

International IBOR comparison

International IBOR comparison

➤ LIBOR

- ▶ Among the [recommendations](#) of the 2012 Wheatley Review of LIBOR was that LIBOR be transferred to a new administrator and provided a hierarchy (or waterfall) of inputs for LIBOR settings, aimed at prioritizing transactions and executable quotes over expert judgement
- ▶ ICE Benchmark Administration took over as administrator of LIBOR in 2014 and in 2016 published a [Roadmap for ICE LIBOR](#) explicitly adopting a transaction waterfall for LIBOR
- ▶ In December 2017, LIBOR was [designated](#) under the BMR as a critical benchmark, subjecting it to more stringent requirements. A three-level waterfall structure was fully implemented in 2019
- ▶ Despite changes to the survey process, many panel banks wanted to leave the LIBOR panel due to the lack of underlying transactions and therefore LIBOR will cease to be published in two stages with the remaining key USD tenors being discontinued after June 2023

➤ EURIBOR

- ▶ EURIBOR was designated under the BMR as a critical benchmark in 2016
- ▶ EURIBOR's administrator, EMMI, developed a “hybrid methodology” for EURIBOR submissions tied to a transaction waterfall. After two consultations, EMMI phased in the new [methodology](#) in during 2019

All major global credit-sensitive benchmarks have moved to either a strict waterfall structure or fully transaction-based methodology

International IBOR comparison

➤ **Australian Bank Bill Swap Rate (BBSW)**

- ▶ BBSW has always represented the rate at which Prime Bank Bills trade (this included both bank acceptances and negotiable certificates of deposit) and was originally a survey-based rate
- ▶ After four banks withdrew from the BBSW panel in 2013, its survey methodology was replaced with a National Best Bid and Offer (NBBO) methodology (executable bids / offers for prime bank paper in the interbank market)
- ▶ To address a decline in liquidity around the rate setting time, since 2018, BBSW's administrator ASX has calculated BBSW directly as the volume-weighted average price (VWAP) of all eligible primary and secondary market transactions in prime bank paper during the rate set window (8:30-10:00 am) with a direct waterfall process
- ▶ Definition of underlying market was also broadened beyond interbank trading to include a wider range of counterparties (e.g., private sector and government investment funds)

All major global credit sensitive interest-rate benchmarks have moved to either a strict waterfall structure or fully transaction-based methodology

Analysis of the issues relating to CDOR

CDOR in the international context

- All LIBOR jurisdictions are transitioning to RFRs for derivatives and cash securities except those products referencing EURIBOR, and are also increasingly doing so in lending and mortgage markets
- Where credit sensitive benchmarks like CDOR still exist, they have been reformed to rely primarily on transactions, with a prescribed waterfall of objective data to make the benchmarks as robust as possible (e.g. Australia's BBSW)
 - ▶ Expert judgement, in some cases pre-prescribed, is the last step in these waterfalls
- In contrast, CDOR's current definition is not directly linked to specific BA transactions. CDOR therefore relies solely on the expert judgement of the submitting panel banks
 - ▶ The volume of BA transactions is important to the submission process, however, as they provide market intelligence that help inform expert judgement
- CDOR is now regulated domestically and has been recently designated a 'critical benchmark'. This means that submission standards and codes of conduct will be made more robust for both the administrator and the panel bank members
- Similar to LIBOR, there are risks that should some existing CDOR panel members wish to no longer to submit to the CDOR setting, the rate becomes no longer viable given the small number of panel banks

Sustainability of BAs as a funding tool for banks

- As a result of Basel III (LCR and NSFR), BAs are no longer an effective short term funding tool for bank treasuries from a regulatory perspective
- Banks would prefer to eliminate, similarly to what happened in Australia and other major jurisdictions, the connection between the generation of an BA asset (i.e. the provision of a loan) and its related funding
- Evidence of this is the growth of both CDOR-based facilities (that do not create a BA) on the asset side and an increased holding of BAs on the balance sheet
- There is a risk that banks will continue to reduce the use of BA facilities and/or reduce the issuance of BA securities in the market
 - ▶ While there is no direct connection between the volume of BA securities and CDOR, a decline of BA volumes will erode the robustness of CDOR and have implications for its sustainability
- Notwithstanding, BA credit facilities are still an important facet of a bank's lending relationship with its corporate client base, and BA securities are a material segment of the Canadian money market investment universe

Robustness in the context of IOSCO principles

- Refinitiv, as CDOR's designated benchmark administrator, has produced a new and enhanced code of conduct to govern CDOR submission
- Domestic benchmark regulation and the revised code will add rigor to the submission process and enhances the current framework that supports CDOR
- CARR has noted, however, that there are characteristics associated with CDOR common to other global credit-sensitive benchmarks, that bear consideration in the context of ensuring Canada has a robust benchmark regime in the future
- A statement issued by the International Organization of Securities Commissions (IOSCO) in September 2021 specifically highlighted that greater attention be paid to parts of Principles 6 and 7* in relation to credit sensitive rates:

1. Principle 6 - Proportionality

- the 'relative size of the underlying market referencing the benchmark in relation to the volume of trading' (inverted pyramid)
- less than 8% of BA volume is 3-month (\$6-8bn), while 90% derivatives (\$18tr) reference CDOR's 3-month setting

2. Principle 7 - Data Sufficiency

- 'data sufficiency in a benchmark's design to accurately and reliably represent the underlying market' and more specifically the reliability during stress periods
- 3-month BA issuance curtailed in conditions of financial stress (e.g. in March 2020 IIROC was unable to publish a 3-month BA rate for 7 consecutive days due to insufficient volumes)

*: See IOSCO's [Principles for Financial Benchmarks](#) (2013)

BAs and CDOR in the Canadian financial system

- CDOR is currently the preeminent interest rate benchmark in Canada
- BAs also play an important role in the Canadian financial system:
 - ▶ BAs are a key short-term investment asset for investors in the Canadian money market
 - ▶ BA borrowing facilities are a common tool for most corporate treasurers to manage funding needs
- If Canada follows the global trend towards relying primarily on RFRs, there would likely be a significant impact on the use of BAs as both a lending and as a borrowing instrument
- Given the reliance of both investors and corporates on BAs, alternate or complementary short-term products would be required
- This would require significant system changes across the Canadian financial system, including to risk measurement, technological infrastructure, processes and legal documentation. These changes would impact not only the banks, but borrowers and investors as well
 - ▶ Similar changes have already been instituted in other jurisdictions as a result of the end-of LIBOR
 - ▶ With the increased usage of RFR globally, it is also expected that CORRA will gain prominence in Canadian financial products and that these types of changes will be inevitable over time

Next Steps

Next steps and timelines

CARR intends to publish a document in late 2021 that provides an overview of its analysis of CDOR and the BA market and forward-looking recommendations for the benchmark

- The overview of analysis will reflect the same findings detailed in this presentation, the implications of which will provide the basis for CARR's forward-looking recommendations
- If any material changes are recommended for CDOR, a public consultation is expected to take place to ensure all Canadian stakeholders have a chance to provide input