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Government of Canada Fixed-Income Market Ecology II: Government of Canada Bond Dealing

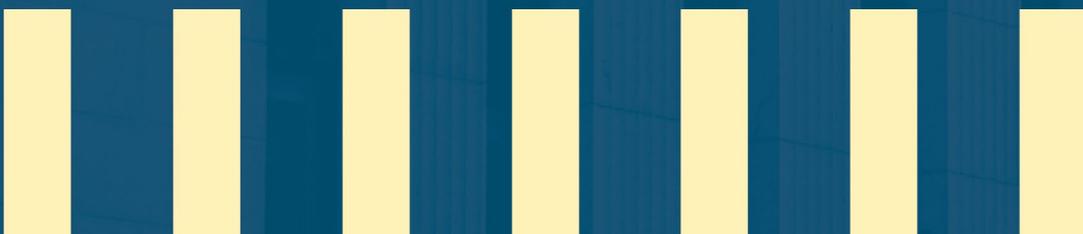
Petr Kocourek
Financial Markets Department
Bank of Canada
pkocourek@bank-banque-canada.ca

Adrian Walton
Financial Markets Department
Bank of Canada
eawalton@bank-banque-canada.ca

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Abstract

This paper describes the organization of the market for trading Government of Canada (GoC) bonds. We outline the role of investment dealers in intermediating trading, distributing GoC securities and providing liquidity across the yield curve. We describe the key features of GoC bond trading and the financial market infrastructures that support it. We also review dealers' risk-management and funding practices, with a focus on interest rate hedging and the use of benchmark bonds and related derivatives. The structure of the GoC bond market reflects both prudential and dealer-specific regulatory frameworks. As well, it reflects dealers' ability to manage inventory, basis risk and short-term volatility—factors that shape trading costs and liquidity conditions in both benchmark and non-benchmark bonds.

Research themes: Financial system – Financial institutions and intermediation; Financial system – Financial stability and systemic risk; Financial markets and funds management – Market functioning; Financial markets and funds management – Market structure

JEL codes: G, G1, G10, G2, G20, H, H6, H63

Résumé

Ce document d'analyse présente l'organisation du marché de négociation des obligations du gouvernement du Canada. Nous décrivons le rôle des courtiers en valeurs mobilières dans l'intermédiation des opérations, la distribution des titres du gouvernement du Canada et l'octroi de liquidités sur toute la courbe de rendement. Nous décrivons aussi ce qui caractérise la négociation d'obligations du gouvernement du Canada ainsi que les infrastructures de marchés financiers sous-jacentes. Nous examinons ensuite les pratiques de gestion des risques et de financement employées par les courtiers, en particulier la couverture des taux d'intérêt et l'utilisation d'obligations de référence et de produits dérivés connexes. La structure du marché des obligations du gouvernement du Canada découle à la fois de cadres prudentiels et de cadres réglementaires propres aux courtiers. De plus, elle repose sur la capacité des courtiers à gérer les stocks, le risque de corrélation et la volatilité à court terme – facteurs influent sur les coûts de négociation et les conditions de liquidité, tant pour les obligations de référence que les autres obligations.

Thèmes de recherche : Système financier; Marchés financiers et gestion financière

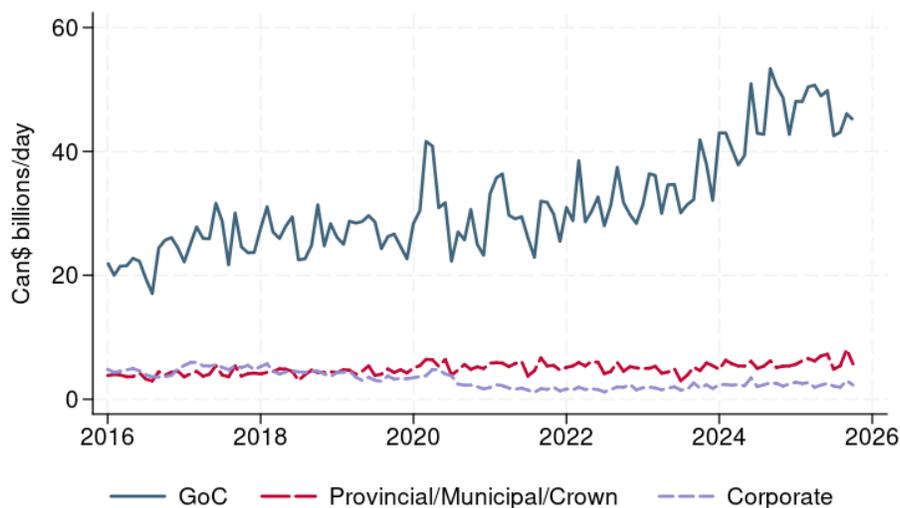
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Introduction

A liquid market for bonds issued by the Government of Canada (GoC) is essential for Canadian capital markets. It enables market participants to trade large volumes quickly at prevailing prices and gives them the flexibility to adjust their portfolios as market conditions and risk preferences evolve. In an episode of market stress, it enables participants to sell securities to meet margin calls or investor redemptions. A liquid GoC market also supports the pricing of other financial instruments: it serves as a key pricing benchmark, and it enhances the pass-through of monetary policy by ensuring that interest rates accurately reflect the information of market participants. In addition, investors value the liquidity of GoC bonds, which raises their prices via a liquidity premium and, in turn, lowers government borrowing costs. The liquidity and importance of GoC bonds are highlighted by the significantly larger trading volume of these bonds than that of the bonds of other types of issuers, namely provinces and corporations (**Chart 1**). This is true even though the total amount outstanding of GoC bonds is roughly similar to that of combined provincial, municipal, and Crown corporation bonds and that of corporate issues.

Chart 1: Government of Canada bonds have a large trading volume relative to other types of bonds

Bond trading volume, monthly data



Source: MTRS

Bank-owned investment dealers (dealers) play a key role in providing liquidity in the GoC bond market. Unlike equity markets, where trading is often conducted through electronic exchanges that allow investors to trade with all other types of market participants (e.g., NYSE and TSX), investors in GoC bonds do not trade with each other directly. Instead, they trade with dealers—specialized firms that serve investors and whose intermediation decisions are shaped by market conditions and clients’ needs. Many large dealers benefit from being owned by large banks, which bring economies of scale; these dealers can leverage their parent bank’s large balance sheet to manage risk and can capture synergies with other business lines. However, bank-affiliated dealers must comply with two distinct regulatory regimes: The Canadian Investment Regulatory Organization (CIRO)¹ has dealer-specific requirements (minimum capital, position margins, operational rules) that apply to securities dealers, while the Office of the Superintendent of Financial Institutions (OSFI) has a consolidated banking framework (capital ratios, leverage ratio, liquidity requirements) that applies to the entire parent bank, including the dealer as an integrated component. Therefore, unlike non-bank-affiliated CIRO-only dealers, bank dealers navigate both dealer-focused and banking system-wide prudential standards simultaneously.

Dealers serve various clients, including banks, pension funds, hedge funds, insurance companies and wealth managers, and they execute GoC bond trades on behalf of other internal business units (or trading desks) within the dealer or their parent bank.² Many large dealers also perform the role of a primary dealer, distributing newly issued GoC bonds to clients.³

Understanding dealers’ costs, risks, business practices and the clients they trade with is important for understanding the liquidity of GoC bonds. For example, when dealers trade with clients, they raise or lower their own risk exposure to changes in interest rates. Dealers often face challenges in quickly finding directly offsetting counterparties

¹ The Canadian Investment Regulatory Organization (formerly the Investment Industry Regulatory Organization of Canada) is the self-regulatory organization that oversees securities dealers and investment firms in Canada.

² These works complement other research on end-investors in the GoC bond market and provide a more comprehensive understanding of the market: Bédard-Pagé et al. (2021) on pension funds; Aldridge et al. (2024) on insurance companies; Sandhu and Vala (2023) on hedge funds; Aldridge, Sandhu and Tchamova (2024) on foreign central banks.

³ The primary dealer system is part of a well-defined debt distribution framework established by the Department of Finance Canada, while the Bank of Canada provides ongoing advice on its execution. This framework is a central element of the government’s debt management function; it ensures the efficient and reliable financing of the federal debt and the well-functioning of Government of Canada securities markets. Under this framework, the role of primary dealers includes meeting minimum bidding requirements in primary auctions of GoC bonds and bills at competitive prices, distributing these securities in the secondary market, and maintaining two-sided markets by providing both bids and offers. For details, see the Bank of Canada’s [“Overview of Terms of Participation in Auctions for Government Securities Distributors and Customers.”](#)

for a specific GoC bond because buyers and sellers may not always wish to trade the same bond issue, that is, bonds with the same CUSIP (Committee on Uniform Security Identification Procedures) numbers. At any time, there may be as many as 50 to 60 distinct GoC bonds that can be traded across the yield curve. This means dealers may be required to hold positions, especially in non-benchmark bonds.⁴ Dealers must therefore manage the risk inherent in taking on the opposing side of client trades for some period of time. During these periods, dealers must also fund their bond positions, which is costly. These factors contribute to dealers' costs, which, in turn, affect the cost of trading for clients and the overall liquidity of the market. These trading costs are often expressed as a bid-offer spread and a size of quotes; these are common measures of overall market liquidity. The bid-offer spread measures the immediate trading costs, and the size of quotes determines how much can be traded before moving to less favourable prices. Smaller quote sizes mean that investors must execute large orders across multiple price levels or in smaller tranches, which increases their overall trading costs through greater price impact. This quantity dimension of liquidity becomes particularly important in the GoC bond market, where dealers may be less willing to commit large amounts of capital to non-benchmark issues. Through numerous conversations with market participants, we have gained valuable insights into dealers' practices and decision-making processes as well as the liquidity dynamics in the GoC bond market.

In brief, liquidity in GoC bonds is determined largely by dealers' ability to hedge their interest rate risk, with short-term volatility being a primary factor contributing to liquidity conditions. This suggests that liquidity measures, like the bid-offer spread, can be combined with volatility measures and interpreted on a risk-adjusted basis. Dealers widen bid-offer spreads to compensate for heightened hedging costs and basis risk during periods of elevated short-term volatility. Raw spread measures thus conflate true liquidity conditions with volatility-driven risk premiums. Dealers typically rely on a combination of four markets to hedge their position in a given GoC bond: other GoC bonds, GoC bond futures, US Treasury bonds and US Treasury bond futures. Of these hedging instruments, GoC bond futures are playing an increasingly significant role in dealers' hedging practices. Furthermore, bank-owned dealers' ability to fund GoC bond positions is supported by a liquid GoC repo market and those dealers' affiliation with their parent bank's repo desk.

⁴ For example, Sandhu and Vala (2024) find that, on average, around half of daily buying and selling volume in a given GoC bond is offset by client trading.

Hedging interest rate risk is a key factor in Government of Canada bond market intermediation

Dealers organize their bond trading businesses into *desks*—specialized teams that serve clients and actively manage the firm’s inventory and risk exposure for a specific product line, including GoC bonds. Depending on the institution, GoC bond trading may be organized within a single desk or split into multiple desks specializing in different sectors of the yield curve, such as a 2-year desk, 5-year desk, 10-year desk or other maturities. These desks typically consist of operational staff and traders focusing on trade execution and risk management. They are supported by a handful of salespeople who engage directly with clients, facilitating customer orders and providing market insights.⁵ Traders often use electronic chat systems and trading platforms to negotiate and execute trades. Increasingly, they also use automatic quoting and trade execution tools, typically to manage relatively small trades, which can be numerous and cumbersome for traders to manage manually.⁶

Adverse changes in interest rates (i.e., bond yields) represent the most significant potential risk to the dealers’ GoC portfolios. This risk is commonly quantified by the change in portfolio value due to a one-basis point change in interest rates, known as the *dollar value of a basis point* (DV01). DV01 is typically managed at the level of a trader’s *book*—the portfolio of positions they are responsible for—although desks may also manage risk wholistically across the books of various traders.

Dealers actively hedge their interest rate risk rather than bearing it outright. While dealers may have a directional bias in their exposure to interest rates, most client trades are hedged quickly, and this practice has become more common over time. This is, in part, because since the 2008–09 global financial crisis, banking regulations, namely Basel III and in the US, the Volcker Rule, have imposed more stringent risk limits on bank-owned dealers.

Hedging allows dealers to facilitate their clients’ needs while operating within these risk limits. For example, regulatory data on value at risk (VaR) from OSFI indicate that the 10-day, 99% confidence VaR limit for a Canadian GoC bond desk at a bank-owned dealer is around \$10 million on average. In terms of bond positions, this implies a notional limit on unhedged positions of around \$600 million in equivalent terms for a five-year bond (see **Appendix B** for details). With six major banks, the total position limit for dealers is

⁵ Sales staff generally do not belong to a single desk. They report through a separate reporting line and often cover multiple products, which may include other fixed-income instruments or even other financial products. Their coverage is often segmented by client type (for example, hedge funds, central banks or real-money investors) rather than by product.

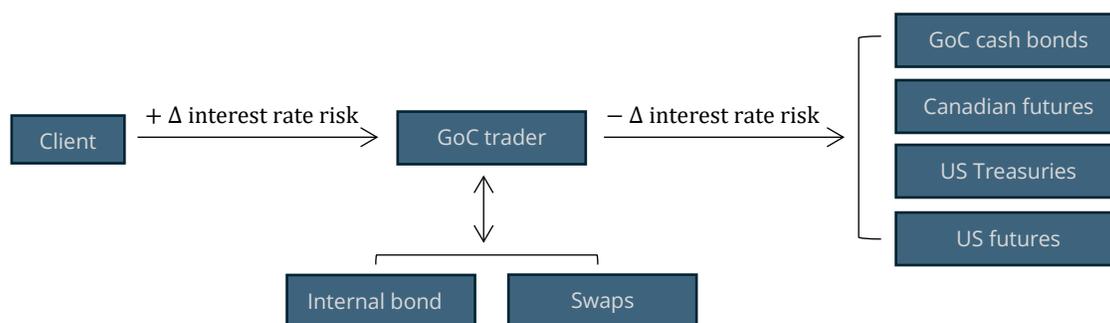
⁶ These automated trading practices in Canadian bonds are often conducted through CanDeal Markets or Bloomberg FIT, electronic dealer-to-client platforms.

therefore around \$3.6 billion of market value, which is less than 1% of the GoC total debt outstanding. Given that the GoC market tends to have over \$40 billion in daily trading volume (**Chart 1**), hedging is critical for dealers to be able to serve their clients.

The importance of hedging is similar in Canada and the United States. Recent research on the US Treasury bond market shows that dealers have a small DV01 relative to the size of their inventory and that these dealers' profits are generally uncorrelated with changes to the overall level of interest rates (Lu and Wallen 2024). Another recent paper demonstrates that US Treasury dealers breach internal risk limits only rarely (Li, Petrasek and Tian 2024).

Dealers use a variety of financial instruments to hedge interest rate risk: GoC bonds, GoC bond futures, US Treasury bonds and US Treasury bond futures. Hedging is typically done within a short window of taking on a new bond position, for example, within an hour, and the choice of hedging instrument depends on market conditions and the relative price of each instrument. This is illustrated in the schematic in **Figure 1**. We note that while the market for interest rate swaps is highly liquid and used by other market participants for interest rate hedging, GoC bond dealers typically do not use swaps for their own hedging. However, interest rate swap desks need to hedge their own exposure by trading GoC bonds, making them frequent natural counterparties for GoC bond dealers and providing an indirect connection between GoC bond dealers and the swap market.

Figure 1: Stylized overview of trading practices in the Government of Canada bond market

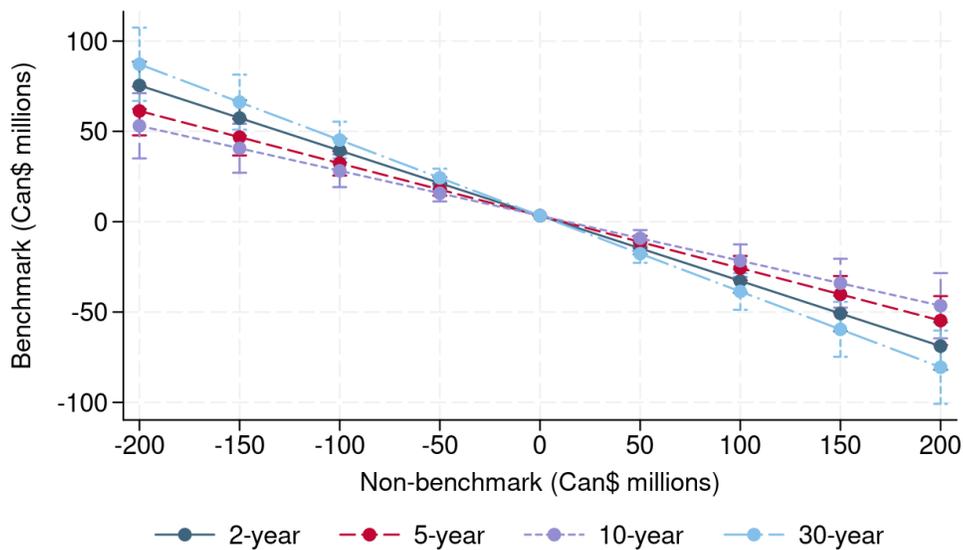


Among GoC bonds, there are four main benchmark bonds. These are the most liquid bonds in the specific maturity segment and therefore the most effective for hedging. They are, by convention, recently issued bonds in the 2-, 5-, 10- and 30-year maturity sectors where bond and derivatives traders coordinate their trading, making them the

most liquid.⁷ Using data on dealers’ trading, **Chart 2** shows the importance of benchmark bonds. The analysis compares Canadian dealers’ daily net bond purchases in benchmark and non-benchmark bonds using a linear regression to estimate the average relationship (for details, see **Appendix A**). The figure shows the model fit for realistic, hypothetical quantities of dealers’ daily net trading volume. Benchmark and non-benchmark flows tend to be offsetting to a high degree; for every dollar of new non-benchmark flow observed, there tends to be 25 cents to 50 cents of offsetting benchmark flow, depending on the maturity sector. The residual flow is likely offset by other products such as derivatives and other bonds, as mentioned above, but these are outside the scope of the data used. While these results are just correlations, they are consistent with the use of benchmark bonds as a hedge to non-benchmark bonds.

Chart 2: Benchmark and non-benchmark flows suggest a hedging relationship

Daily net trading volumes (dealers), 2016–2025 (fitted values)



Source: MTRS, Bank of Canada calculations

Hedging reduces exposure to outright interest rate movements, but it does not eliminate the basis risk that dealers are exposed to—specifically, the basis risk arising from the possibility of adverse price movements between the bond position and the offsetting hedging instrument (e.g., between a benchmark bond and a non-benchmark

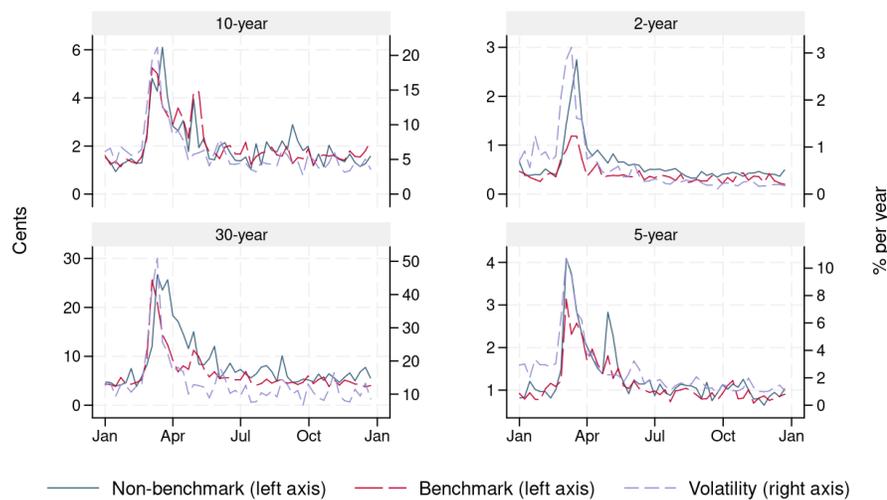
⁷ For a deeper investigation of benchmark bonds, see Bulusu and Gungor (2017) and Berger-Soucy, Garriott and Usche (2018).

bond). Basis risk can significantly challenge dealers' hedging and, therefore, their ability to intermediate the market effectively. Short-term volatility is a critical factor influencing the risk of adverse price movements. It increases uncertainty in the relative pricing of the two bonds, thereby increasing the basis risk between them. Such volatility thus amplifies dealers' hedging costs, leading to wider bid-ask spreads and a general deterioration in GoC liquidity, particularly during periods of elevated short-term interest rate volatility.

Chart 3 and **Chart 4** illustrate how increases in short-term volatility coincide with rising benchmark and non-benchmark illiquidity. Our conversations with dealers suggest that dealers gauge volatility in real time by observing price changes and mitigate the associated risks through the bid-ask spread they quote to clients. We therefore show daily observations of realized volatility using price changes in 10-minute increments. The relationship between liquidity and volatility has an important implication: while the bid-offer spread is commonly used as an indicator of market liquidity, much of its variation reflects short-term volatility, and it should thus be interpreted on a risk-adjusted basis. In principle, the residual would reflect competition among dealers and the pass-through of their costs. These observations are consistent with Fleming (2023), who finds that short-term volatility and liquidity in the US Treasury market are highly and consistently correlated over time.

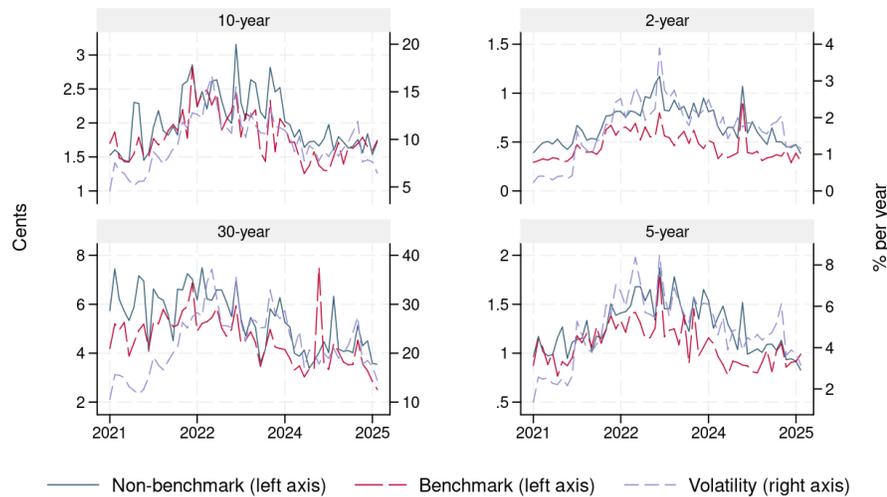
Chart 3: Short-term volatility influences liquidity in the Government of Canada bond market

Liquidity in the Government of Canada bond market liquidity in 2020



Source: CanDeal, Bank of Canada calculations

Chart 4: Liquidity in the GoC bond market after 2020

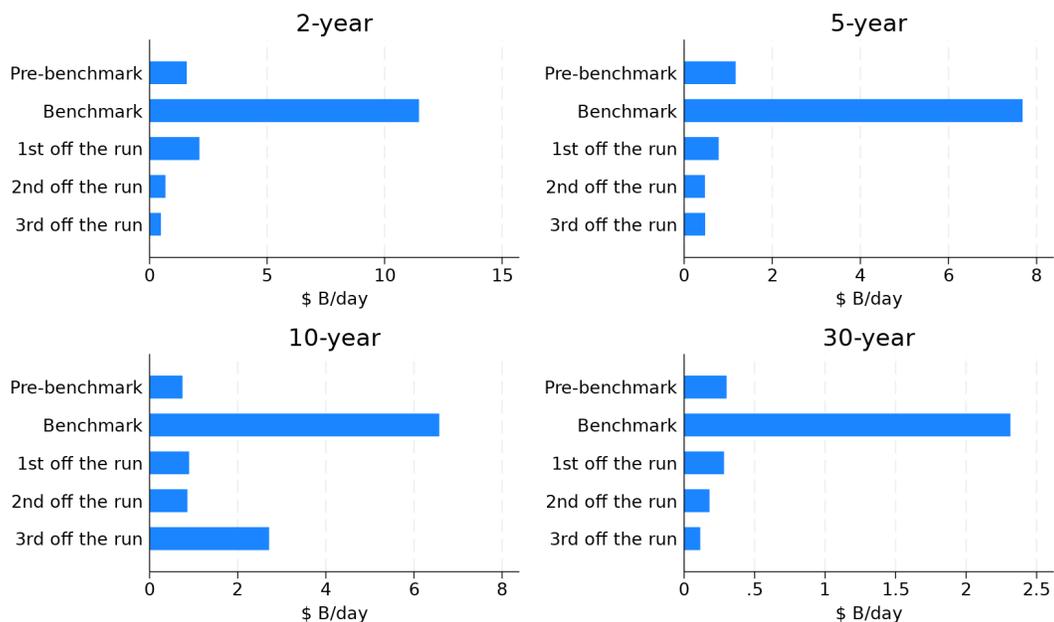


Source: CanDeal, Bank of Canada calculations

The basis risk between benchmark and non-benchmark bonds is especially relevant to positions in aged, non-benchmark bonds. Over time, these bonds tend to have less trading volume and less price correlation with benchmark bonds. This means that the basis risk grows, increasing the chance that dealers cannot find a counterparty without exiting a position at a potential loss. **Chart 5** illustrates the gap in trading activity between benchmark and non-benchmark bonds across maturities, emphasizing the structural illiquidity of off-the-run bonds that makes them more susceptible to basis risk over time. In addition, banks impose inventory aging limits that penalize positions held for periods of weeks or months.

Chart 5: Non-benchmark bonds trade significantly less than benchmark bonds across all maturity sectors

Trading volume over the benchmark cycle (2024–2025)



These vulnerabilities become particularly pronounced during periods of market stress, when the divergence in liquidity between benchmark and non-benchmark bonds tends to widen. **Chart 3** shows that in March 2020, non-benchmark illiquidity increased more than benchmark illiquidity as volatility spiked. This is consistent with work on the US Treasury market in the same period (Fleming and Ruela 2020). **Chart 4** shows that the relationship between liquidity and volatility has continued to hold since 2020.

The repurchase market is critical in supporting liquidity in Government of Canada bonds

Repurchase (repo) is critical to GoC liquidity because dealers rely on it to fund their bond positions. When dealers buy a GoC bond, taking a long position, they must deliver cash to the seller, by convention on the following business day (called T+1 settlement). Conversely, when dealers sell a bond not in inventory, they enter into a short position and must borrow the bonds for delivery to cover their short.⁸ Repo therefore functions effectively as a low-cost, collateralized loan for funding and covering GoC bond positions because the bonds themselves are used as collateral.⁹ In addition, the repo market also

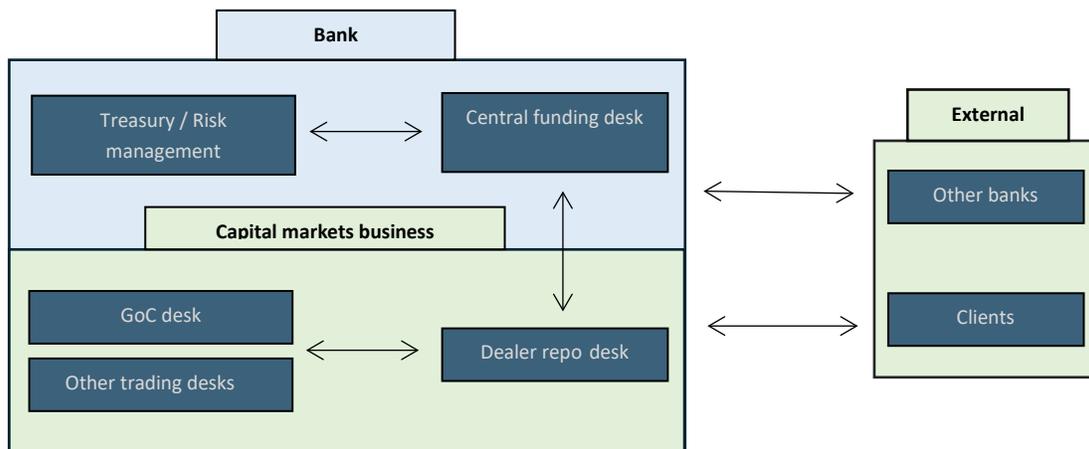
⁸ See Garriott and Gray (2016) and Huh and Infante (2021) for details on the repo market.

⁹ Alternatively, to cover short positions, dealers can borrow securities through securities lending agreements which are like repos but typically involve the temporary exchange of securities rather than securities and cash.

has the advantage of being short-term, with the most popular term to maturity being just one business day. This gives dealers the flexibility to exit and enter repos quickly to match rapidly changing GoC bond positions.

Bank-owned dealers derive stability from their banks' affiliated repo desks also being key intermediaries in the Canadian repo market. A bond dealer's funding and short-cover needs are executed by a repo desk affiliated with the dealer's parent bank on its behalf.¹⁰ **Figure 2** illustrates a stylized version of this institutional set-up. Repo desks are typically subject to limits on gross quantities of repo and reverse repo since repo is effectively a cash loan to the bank that expands the bank's balance sheet by creating new assets and liabilities. These limits are present, in part, because the Basel III leverage ratio penalizes a bank's gross assets relative to capital, and repo is a high-volume, capital-intensive activity. Since the dealer's repo desk can prioritize the internal needs of its bank affiliates, GoC bond dealers are insulated from the possibility of losing access to repo when these constraints could otherwise reduce the amount of repo being extended to clients during times of extreme market stress. Another source of stability is scale: a bond dealer's funding needs typically represent only a small share of its parent bank's overall repo activity, which helps ensure those needs are met reliably.

Figure 2: Affiliated repo desks support Government of Canada bond dealers



¹⁰ In practice, many banks operate two distinct repo desks. The *dealer repo desk* is part of the bank's capital markets business line and focuses on serving external clients as well as providing funding and sourcing securities for internal trading desks at relatively low cost, including the GoC desk(s). In parallel, the *central funding desk* is part of the bank's treasury and is active in the repo market to support the bank's overall cash and liquidity management, rather than contributing to the repo market-making function like the typically much larger dealer repo desk. The central funding desk also supports the dealer repo desk's operations when the latter places excess cash with, or borrows securities from, the central funding desk. In some institutions, there are no distinct dealer and central funding repo desks. Instead, a single dealer repo desk performs both functions separately, executing transactions for market making and for the bank's treasury needs.

To mitigate capital constraints, repo dealers may use securities lending as a substitute for repo to borrow the bond that they have shorted. Securities lending is a market that involves a distinct class of intermediaries called custodians who borrow and lend securities, for a fee, from a pool of client inventories.¹¹ Securities lending is particularly useful when a GoC dealer has offsetting long and short positions in GoC bonds. The bond acquired in the long position can be directly used as collateral with a securities lending custodian to borrow the bond needed for short cover with no exchange of cash and no corresponding expansion of the balance sheet. In this case, the proceeds from the short position are used to fund the purchase of the bond from the client. Data and anecdotes suggest that securities lending accounts for roughly one-third of total funding and short cover, with repo accounting for the remainder.¹²

The regulatory capital impact of hedged positions in Government of Canada bond dealing primarily comes from the leverage ratio and the net stable funding ratio

Since the global financial crisis, the effect of Basel III regulation has increased the amount of hedging done by dealers. Market risk regulation, like the VaR limits discussed above and, in the United States, the Volcker Rule, have limited outright risk taking by bank-owned dealers. We therefore examine the impact of bank capital and liquidity regulations, assuming dealers hedge their market risk using the strategies discussed above.

In general, the impact of bank capital regulations on fully hedged GoC dealing varies by scenario and by regulatory component. While hedging typically offsets risk and cash flows, muting the effects on the liquidity coverage ratio (LCR), market-risk capital, and risk-weighted assets (RWA), the net stable funding ratio (NSFR) or leverage ratio (LR) can still be materially affected in certain cases. In Canada, unlike in the United States or the United Kingdom, (un-netted) reverse repos attract a 5% required stable funding (RSF) charge, which leads to an increase in the NSFR. Furthermore, the leverage ratio penalizes gross positions regardless of hedging.

We summarize this in a simplified table that lists the main Basel III capital requirements and the treatment of relevant hedged and funded GoC positions involving combinations of GoC bonds, futures, repo and securities lending as exemplified by four typical GoC trades with a hypothetical notional of \$10 million (**Table 1**; see **Appendix B** for details). These scenarios might arise naturally from a purchase or sale of a \$10 million position in

¹¹ For more information on Canadian securities lending, see Johal, Roberts and Sim (2019).

¹² This is consistent with data from OSFI on bank-level GoC collateral holding and pledging in repo and secondary lending markets.

a non-benchmark bond that is then hedged via a benchmark bond or futures. Each scenario assumes that a dealer starts with some existing assets and liabilities and calculates the net effect of the package of trades.

All scenarios involve expanding both assets and liabilities, therefore worsening the leverage ratio.¹³ One key differentiator is whether the funding legs can be netted. Netting can occur either through collateral versus collateral securities lending, or through repo when the cash lender and borrower are the same counterparty and other standard criteria are met: a legal agreement to settle on a net basis within the same settlement system, same maturity date and same currency.

Scenario 1 (long GoC and short GoC positions funded via overnight unnetted repo and reverse repo) has the highest impact, around double the others, since no netting is involved. By contrast, Scenario 2 (long GoC and short GoC positions funded via securities lending or netted repos) shows strategies where the two funding legs can be offset through netted repo or securities lending. This avoids balance sheet expansion from the funding legs, and the leverage ratio impact is therefore much smaller than in the unnetted repo case. In these first two scenarios, NSFR effects also differ: unnetted reverse repos in Scenario 1 attract a 5% RSF charge (intermediate impact), whereas matched cash flows or securities-lending funding in Scenario 2 reduces the NSFR to a small impact. This is one reason why central clearing has received attention lately as a potentially important way to help mitigate the overall capital cost of government bond trading (for example, Duffie et al. 2023), although it does not eliminate the cost entirely.

Scenario 3 (long GoC and short futures positions with repo for funding for the long position) and Scenario 4 (long future and short GoC positions, using reverse repo for short cover) pair GoC and futures positions and generate balance sheet exposures similar to those in Scenario 2. Although Scenario 4 does not use repo funding, it still generates balance sheet impact via the short sale, which generates new assets and liabilities.

¹³ There are two complementary ways to analyze the balance sheet consequences of trades. The accounting view approaches it from the perspective of how transactions are recorded on the balance sheet. The regulatory view for the leverage ratio, by contrast, assesses the impact in terms of the gross exposure on the asset side of the balance sheet that results from the trading steps when calculating the ratio. In practice, both perspectives matter for understanding capital costs.

Table 1: Net effect of Basel III capital regulation on common Government of Canada dealer positions

Scenario	Liquidity coverage ratio	Risk-weighted assets	Market risk	Net stable funding ratio	Leverage ratio
Long \$10M GoC (funded in repo), short \$10M GoC (covered in reverse repo, unnetted)	Minimal High-quality liquid assets (HQLA) in/out closely matched	Small Credit risk charge for repo, reverse repo	Small Interest rate risk hedged, basis risk left	Intermediate: \$0.5M tier 1 Reverse repo attracts a 5% required stable funding (RSF) charge	Large: \$0.6M tier 1 <i>Leverage ratio (LR) asset:</i> bond \$10M + reverse repo \$10M <i>Balance sheet (BS) mechanics:</i> repo and short both expand BS
Long \$10M GoC, short \$10m GoC (funding and cover with netted repo or via securities lending)	Minimal HQLA in/out closely matched	Small Credit risk charge for secondary lending or repo, reverse repo	Small Interest rate risk hedged, basis risk left	Small Cash flows closely matched, netting removes 5% RSF charge	Intermediate: \$0.3M tier 1 <i>LR asset:</i> bond \$10M only <i>BS mechanics:</i> cash legs net; short expands BS
Long \$10M GoC (funded in repo), short \$10M future	Small Decline in HQLA from futures margin	Small Credit risk charge for futures and repo	Small Interest rate risk hedged, basis risk left	Small Decline in HQLA from futures margin	Intermediate: \$0.3M tier 1 <i>LR asset:</i> bond \$10M only <i>BS mechanics:</i> repo expands BS; future off-BS
Long \$10M future, short \$10M GoC (covered in reverse repo)	Small Decline in HQLA from futures margin	Small Credit risk charge for futures and reverse repo	Small Interest rate risk hedged, basis risk left	Intermediate: \$0.5M tier 1 Reverse repo attracts 5% RSF charge	Intermediate: \$0.3M tier 1 <i>LR asset:</i> reverse repo \$10M only <i>BS mechanics:</i> short expands BS; future off-BS

Dealers are hedging less with Government of Canada bonds and more with Government of Canada bond futures

GoC bond dealers are increasingly using bond futures to hedge their interest rate risk. Futures offer attractive characteristics for market participants, including transparency, simplicity and the ability to trade electronically, making them a convenient product for a broad and diverse set of participants. A catalyst for this shift toward GoC bond futures has been the improved liquidity in the 2- and 5-year bond futures, after the Montréal Exchange initiated market-making programs to increase trading volume and liquidity. This was done for the 2-year Government of Canada Bond Futures contract in 2018, followed by the 5-year Government of Canada Bond Futures contract in 2021.¹⁴ Before that, the only highly liquid bond futures market was in the 10-year sector. Shortly after their reinitiation, both the 2-year and 5-year futures markets became substantially more liquid as measured by trading volume. Consequently, this growth in the use of bond futures has likely also improved liquidity in GoC bond markets by attracting new participants and new liquidity providers to the broader Canadian interest rate market. Related analysis indicates that even in March 2020, market makers in Canadian futures

¹⁴ For more details on the 2-year and 5-year futures relaunches, see Montréal Exchange (2020).

markets continued to provide liquidity, which supported hedging and price discovery in GoC bonds.¹⁵

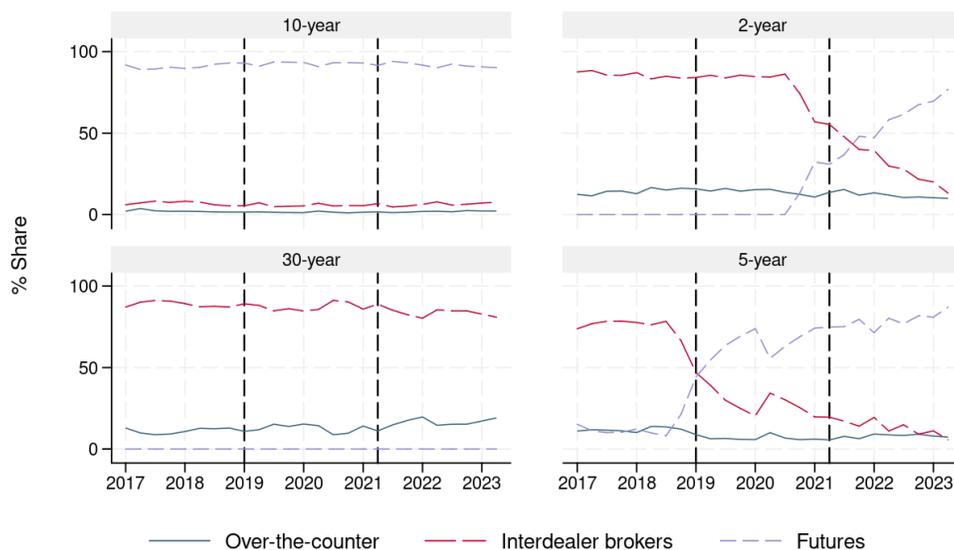
The growing depth and diversity of participants in the futures markets is reinforcing dealers' ongoing substitution of hedging outright interest rate risk using GoC bonds through interdealer brokers (IDBs) with bond futures (**Chart 6**).¹⁶ Like futures markets, IDBs are anonymous, electronic platforms that provide a centralized and low-cost way to trade. But the broader participant base in futures markets, including many international participants, further reduces transaction costs, making futures markets a more attractive option for dealers. This substitution appears not to have extended to the over-the-counter (OTC) interdealer market, where dealers and banks trade among themselves bilaterally and non-anonymously. This may be because dealers use the OTC market to execute large transactions. Therefore, while futures seem to have absorbed much of the outright risk transfer once conducted through IDBs, they have not entirely replaced the role of OTC trading in dealers' inventory management.

¹⁵ See Canadian Fixed Income Forum (2021).

¹⁶ This is consistent with other analysis presented at the Canadian Fixed Income Forum (2023).

Chart 6: The volume of futures has grown rapidly in most maturity sectors

Interdealer bond and futures trading volume (% share)



Source: MTRS, Montreal Exchange

However, futures markets may also bring new risks because they allow investors to easily obtain leverage. The growth in bond futures has also been supported by hedge funds that use strategies that integrate futures and bond markets.¹⁷ While these strategies contribute to market liquidity, their high leverage makes them relatively susceptible to risks that might cause hedge funds to quickly liquidate their futures and bond-market positions, and this can add further stress on GoC bond markets during periods of market stress. Similar discussions are ongoing about the US Treasury market, for example, Kruttli et al. (2021).

New risks merit further investigation

The GoC bond market stands out for its exceptional liquidity compared with other Canadian fixed-income securities. This liquidity is supported by dealers having access to repo markets for funding, provided by affiliated repo dealers, and to a wide range of hedging instruments to mitigate interest rate risk. As the use of bond futures grows, and as new types of participants enter the Canadian interest rate risk market, further investigation into the associated risks and benefits is warranted.

¹⁷ One example is the cash-futures basis trade; see Uthemann and Vala (2024) for details.

Appendix A: Estimating the relationship between benchmark and non-benchmark flows

To estimate the relationship between benchmark and non-benchmark flows, we use the Market Trade Reporting System (MTRS), a trade-level dataset on fixed income trading in Canada collected by the Canadian Investment Regulatory Organization (CIRO, formerly IIROC) from securities dealers, including the Big Six banks and other Canadian dealers, and transmitted daily. We organize the data into observations and the dealer-date-maturity sector level and compute net benchmark and total non-benchmark flows by summing trading volume, indicated by buy or sell. We then estimate the linear model with an ordinary least square regression:

$$\text{Benchmark net flow } (i, j, t) = \text{Non-benchmark net flow } (i, j, t)$$

for maturity sector i , dealer j , and date t .

Appendix B: Value at risk and position limits

We convert VaR to a position limit using the formula:

$$\text{position limit} = \frac{\text{VaR limit}}{z * \sigma * \sqrt{T} * \text{duration}},$$

where

- z is a z-score from a standard normal distribution, which we take to be 2.33 corresponding to the 99th percentile.
- σ is the daily five-year yield volatility, which we take to be 5 bps; we calculate from 2025 data. terms for a five-year bond (see Appendix X for details)
- T is the VaR time horizon, which is 10 days.
- Duration is the sensitivity to interest rates, which we take to be 4.5 years corresponding to a five-year bond.
- VaR limit, which is observed from regulatory data, we take to be \$10 million.
- Position limit is the market value of a position limit, which we solve for.

Based on these inputs, the calculated implied position limit is \$603.20 million.

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