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MONTRÉAL EXCHANGE

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Fundamentals of Canadian Fixed Income Futures

Fixed Income Futures Contracts on Montréal Exchange are often used as an efficient and low-cost product to replicate Canadian government bond exposure[1].

Products

Montréal Exchange now lists futures products on a full interest rate curve of maturities from 1-month to 30-years. Similar products exist in other international markets, notably in the United States, Italy, Germany, France, and the United Kingdom, but derivative exposure to Canadian bonds can only be obtained via products traded on Montréal Exchange. The Canadian bond contracts are shown in Figure 1.

FIGURE 1

Futures Contract	Bond Equivalent
CGZ	2-year bonds
CGF	5-year bonds
CGB	10-year bonds
LGB	30-year bonds

Participants

Physical delivery bond futures in Canada are traded by sophisticated international portfolio managers as well as domestic Canadian portfolio managers who want exposure to Canadian government bonds via easily tradeable, standardized, derivative products. These products are often a manager's sensible first step into derivative products as they are often considered a near-perfect substitute for cash bonds in Canada but reduce the expense and effort required to manage bond portfolios.

Benefits of Bond Futures

Canadian bond futures offer exposure to Canadian fixed income markets with less effort expended to manage a traditional portfolio of cash bonds and open possibilities for easy duration management and active strategies along the yield curve.

1 This document provides an overview of Canadian Bond Futures characteristics. For more information, we invite participants to refer to the MX Bond Futures Reference Manual.

For example, an international investor that wants exposure to Canadian interest rates can face significant hurdles and liquidity costs on certain bonds, especially off-the-run securities. Additionally, if the investor doesn't have Canadian dollars on hand, they may need to finance bond purchases in the Canadian securities lending market and/or do costly foreign exchange transactions. Additional trading and management costs will almost always arise if the manager regularly changes portfolio duration or must maintain a target duration over many months by performing maturity extension trades. Finally, firms that have implemented balance sheet constraints and/or fees usually find that futures contracts reduce portfolio costs imposed on their managers.

Bond futures eliminate or reduce costs for the portfolio manager by supplying the same exposure in a safe, easy to understand, derivative form. The standout characteristic of bond futures is that a position will naturally turn into the underlying bond position, even if the position is completely neglected. Additionally, the Canadian dollar cash required to gain the same exposure through futures is a small fraction of the amount needed and the manager can easily sell positions, even positions they don't own, without the need to participate in the repurchase agreement (repo financing) market in Canada.

In recent years, the Ten-Year Government of Canada Bond Futures (CGB™) contract has emerged as the most liquid fixed income instrument in Canada while the Five-Year Government of Canada Bond Futures (CGF™) and the Two-Year Government of Canada Bond Futures (CGZ™) contracts continue to grow in open interest and liquidity at an impressive pace.

FIGURE 2

MX Bond Futures - Monthly volume

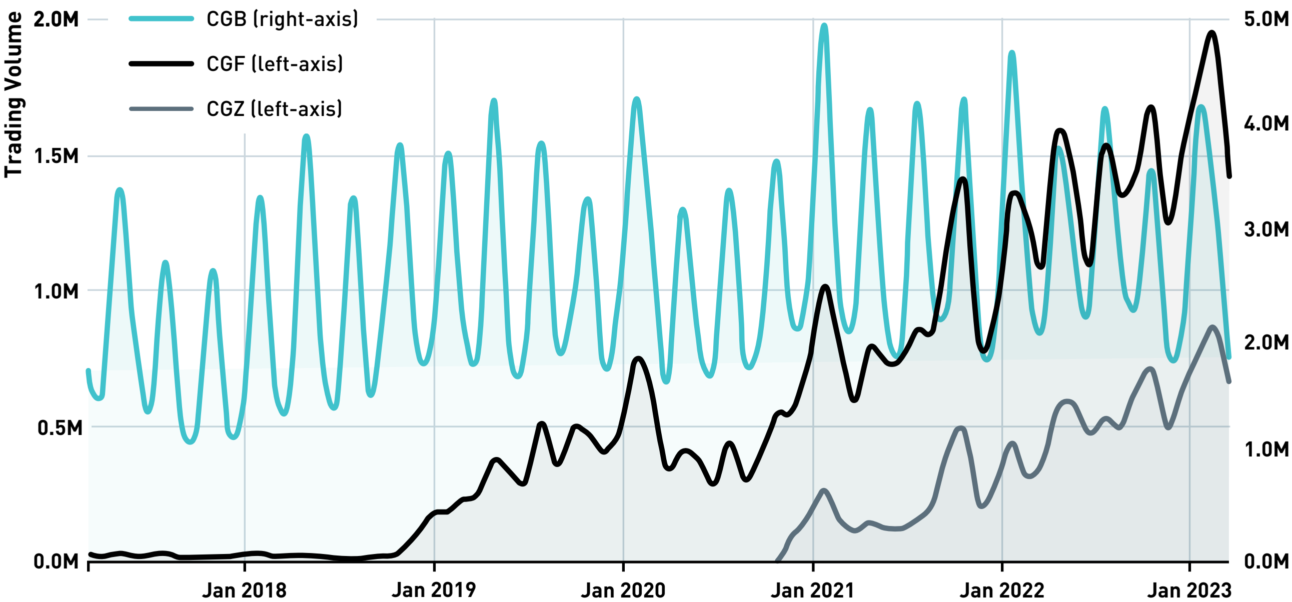
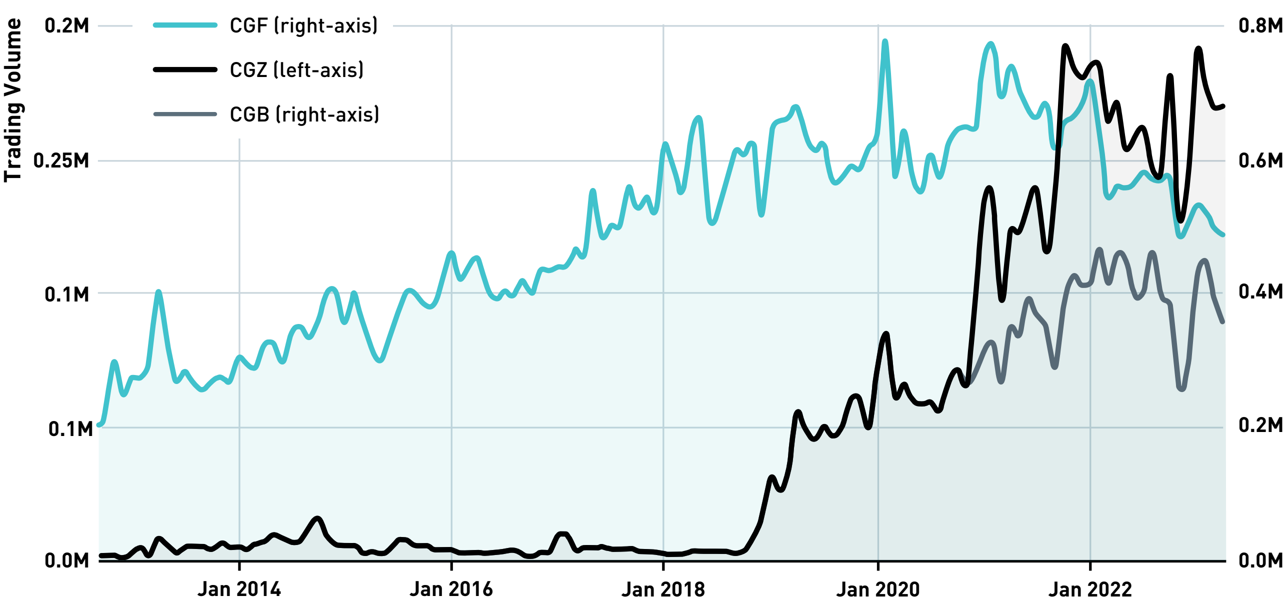


FIGURE 3

MX Bond Futures - Monthly open interest



To illustrate, using a simple example, consider in Figure 4 an international manager that needs $50 million of exposure to 5-year Canadian government bonds due to an allocation decision but doesn't have Canadian dollars on hand to invest. The two possibilities in Figure 4 carry the equivalent risk exposure[2] but the version executed in futures requires far fewer steps to implement and far less currency conversion given that the initial margin for the futures contracts is less than 2% of what the total expenditure in the cash bond market would be.

FIGURE 4

	Cash Bonds	5-year Futures
Position	48,508,000	436
Security DV01	4.55	5.07
Position DV01	22,076	22,098
Price	103.08	114.33
Cost/Initial Margin	50,000,385	929,552

In Figure 5, which shows the steps a typical international manager might take to invest in Canadian government bonds, the actions (in bold) needed to establish and maintain a simple position are shown. The futures contract, which converges to the same price as the underlying Canada bond, is typically a more efficient way to replicate the same investment without expending valuable time and resources on security selection, bond financing operations, foreign exchange, duration management, and other management duties.

FIGURE 5

5-year Canadian Government Bonds Market

Step 1	**Convert** local currency to $50 million Canadian dollars OR **sign** security financing agreements with a Canadian bank
Step 2	**Select** which bond to purchase
Step 3	**Transact,** possibly electronically, possibly via telephone call
Step 4	**Monitor** the position for rolldown, evolving duration exposure
Step 5	**Re-finance** via repo transactions OR **monitor** foreign exchange exposure associated with coupons
Step 6	Possibly **extend maturity** if the position is held for long periods, **adjust repo financing** or Canadian dollar holdings
Step 7	**Sell** the position, possibly electronically, possibly viat telephone call
Step 8	**Convert** $50 million Canadian dollars plus any profits or losses back to local currency

Montréal Exchange CGF (5-year) Futures

Step 1	**Buy** electronically CGF contracts, convert less than $1 million CAD for initial margin
Step 2	Once per quarter, **roll position** to new active contract, if desired
Step 3	**Sell** the position electronically
Step 4	**Convert** only initial and maintenance (profit & loss) margin amounts to local currency

Other popular trading strategies, including trading yield curve spreads, hedging interest rate exposure or adjusting the duration of a bond portfolio, can also easily be implemented using Canadian bond futures. Detailed examples of these are available on the Montreal Exchange website[3].

2 With a small amount of rounding for whole bonds and contracts. CGF represents a notional of $100,000 per contract but the DV01 of the futures contract is slightly higher than that of the 5-year bond so just 436 contracts are required to obtain the same risk exposure as 48.5 million notional of cash bonds.

3 Refer to Canadian Bond Futures product pages; 2Y (CGZ), 5Y (CGF), 10Y (CGB) and 30Y (LGB™). (ex: https://www.m-x.ca/en/markets/interest-rate-derivatives/cgb)

Notes When Trading Bond Futures

Some concerns and confusion always linger, even among professional investors, when discussing derivatives. We discuss some of these below.

Leverage

While all cash delivery futures contracts have an embedded leverage component, many investors choose to neutralize it by simply purchasing the exposure they would have had in bonds but doing so in futures contracts. The excess cash, either in Canadian dollars or their own local currency, is then invested short-term or in other markets. Since the price of the futures contract converges to the price of the underlying Canadian government bond at delivery, the embedded leverage in a futures contract cannot cause unexpected losses in the way that options, which share the label "derivative" with futures contracts, can and do for other investors.

Delivery

Some investors mistakenly believe that futures contracts carry large delivery risks. While this could be true for some difficult-to-store commodity futures, the same is not true for bond futures. Additionally, most bond futures are never delivered – the investor closes the position before delivery is possible – a characteristic of futures contracts that is entirely under the control of the investor.

Counterparty Risk

The margining system, which protects both the long and short position in futures contracts, has proven to be robust even during periods of incredible market stress associated with high counterparty risk such as the financial crisis following 2008. In fact, this system of daily margining and clearing risk via a third party has become the baseline method for managing counterparty risk in other derivatives markets in the 15 years since the crisis. In Canada, bond futures clearing and margining is managed by the Canadian Derivatives Clearing Corporation (CDCC), an entity deemed systemically important by the Bank of Canada and thus subject to regulatory oversight by various government entities in the country.

Nonlinear Losses

Many investors, especially seasoned professionals, share concerns about derivative positions that can exhibit nonlinear losses, such as short option positions, in periods of very high volatility. This is definitively[4] not an investment characteristic shared by futures contracts. The price of the contract will always converge to the equivalent price of the underlying Government of Canada bond and arbitrage between the futures contract and the underlying bond mitigates temporary divergences in the prices of the two financial instruments. If the futures contract price deviates too much from the underlying, the buyer (or seller) can simply choose to take (make) delivery and convert the position into a government bond.

4 There is some argument that bond convexity – the tendency for a bond price to move in a very slightly nonlinear fashion as interest rates rise or fall – can result in "nonlinearity" for the futures contract but this amount is small in comparison to other types of derivatives and, importantly, is identical to the price relationship between bonds and interest rates. The futures contract doesn't introduce the nonlinearity, it simply reproduces exactly the nonlinearity inherent in government bonds.

Appendix - Government of Canada bond futures specifications

	CGZ (Two-Year)	CGF (Five-Year)
Underlying	C$100,000 nominal value of a Government of Canada bond with a 6% notional coupon.	C$100,000 nominal value of a Government of Canada bond with a 6% notional coupon.
Expiry cycle	March, June, September and December	
Price quotation	Per C$100 nominal value	
Minimum price fluctuation	0.005 = C$5 per contract	0.01 = C$10 per contract
Contract type	Physically-delivered: delivery of eligible Government of Canada bonds	
Last trading day	Trading ceases at 1:00 p.m. on the seventh business day preceding the last business day of the delivery month.	
Expiration day	Expiration occurs on the last trading day	
Delivery notices	Delivery notices must be submitted before 5:30 p.m. or before such time set by the clearing corporation on any business day, between the second business day preceding the first business day of the delivery month, and the second business day preceding the last business day of the delivery month inclusively.	
Delivery day	Delivery shall be made on the second business day following the submission of the delivery notice by the member holding a seller's position or on any other day as determined by the clearing corporation. Delivery shall be completed no later than the last business day of the delivery month.	
Delivery standards	Government of Canada Bonds which: • have a remaining time to maturity of between 1½ year and 2½ years; • as of the first day of the delivery month, calculated by rounding down to the nearest whole month period; • have an outstanding amount of at least C$2.4 billion nominal value; • are originally issued at two-year Government of Canada bond auctions; • are issued and delivered on or before the fifteenth day preceding the first delivery notice day of the contract. More information on delivery standards is available in Article 12.112 of the Rules of the Bourse.	Government of Canada Bonds which: • have a remaining time to maturity of between 4½ years and 5½ years; • as of the first day of the delivery month, calculated by rounding down to the nearest whole month period; • have an outstanding amount of at least C$3 billion nominal value; • are originally issued at five-year Government of Canada bond auctions; • are issued and delivered on or before the fifteenth day preceding the first delivery notice day of the contract. More information on delivery standards is available in Article 12.212 of the Rules of the Bourse.
Position limit	Information on position limits can be obtained from the Bourse as they are subject to periodic changes. See Circulars. For position limit for the first contract month, please see the First contract month position limit page on the Regulatory Division website.	
Price limit	None	
Minimum margin requirements	Information on minimum margin requirements can be obtained from the Bourse as they are subject to periodic changes. See the Futures contracts margin rates page on the Regulatory Division website.	
Trading hours	Regular session: 8:00* p.m. (t-1) to 4:30 p.m. Note: During early closing days, the regular session closes at 1:30 p.m. *± 15 seconds.	
Clearing corporation	Canadian Derivatives Clearing Corporation (CDCC)	
MX Symbols	CGZ	CGF

	CGB (Ten-Year)	LGB (30-Year)
Underlying	C$100,000 nominal value of a Government of Canada bond with a 6% notional coupon.	C$100,000 nominal value of a Government of Canada bond with a 6% notional coupon.
Expiry cycle	March, June, September and December	
Price quotation	Per C$100 nominal value	
Minimum price fluctuation	0.01 = C$10 per contract	0.05 = C$50 per contract
Contract type	Physically-delivered: delivery of eligible Government of Canada bonds	
Last trading day	Trading ceases at 1:00 p.m. on the seventh business day preceding the last business day of the delivery month.	
Expiration day	Expiration occurs on the last trading day	
Delivery notices	Delivery notices must be submitted before 5:30 p.m. or before such time set by the clearing corporation on any business day, between the second business day preceding the first business day of the delivery month, and the second business day preceding the last business day of the delivery month inclusively.	Delivery notices must be submitted before 5:30 p.m. or before such time set by the clearing corporation on the last Trading Day of the delivery month.
Delivery day	Delivery shall be made on the second business day following the submission of the delivery notice by the member holding a seller's position or on any other day as determined by the clearing corporation. Delivery shall be completed no later than the last business day of the delivery month.	Delivery shall be made on the second business day following the submission of the delivery notice by the member holding a seller's position or on any other day as determined by the clearing corporation. Delivery shall be completed no later than two business days following the last trading day of the delivery month.
Delivery standards	Government of Canada Bonds which: • have a remaining time to maturity of between 8 years and 10½ years; • as of the first day of the delivery month, calculated by rounding down to the nearest entire three-month period; • have an outstanding amount of at least C$3.5 billion nominal value; • are originally issued at ten-year Government of Canada bond auctions; • are issued and delivered on or before the fifteenth day preceding the first delivery notice day of the contract. More information on delivery standards is available in Article 12.312 of the Rules of the Bourse.	Government of Canada Bonds which: • have a remaining time to maturity of not less than 28½ years; • as of the first day of the delivery month, calculated by rounding down to the nearest entire three-month period; • have an outstanding amount of at least C$3.5 billion nominal value; • are originally issued at thirty-year Government of Canada bond auctions; • are issued and delivered on or before the fifteenth day preceding the delivery month of the contract. More information on delivery standards is available in Article 12.412 of the Rules of the Bourse.
Position limit	Information on position limits can be obtained from the Bourse as they are subject to periodic changes. See Circulars. For position limit for the first contract month, please see the First contract month position limit page on the Regulatory Division website.	
Price limit	None	
Minimum margin requirements	Information on minimum margin requirements can be obtained from the Bourse as they are subject to periodic changes. See the Futures contracts margin rates page on the Regulatory Division website.	
Trading hours	Regular session: 8:00* p.m. (t-1) to 4:30 p.m. Note: During early closing days, the regular session closes at 1:30 p.m. *± 15 seconds.	Regular session: 7:00* a.m. to 4:30 p.m. Note: During early closing days, the regular session closes at 1:30 p.m. *± 15 seconds.
Clearing corporation	Canadian Derivatives Clearing Corporation (CDCC)	
MX Symbols	CGB	LGB

For more information

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