CGZ Two-Year Government of Canada Bond Futures

CGF Five-Year Government of Canada Bond Futures

CGB Ten-Year Government of Canada Bond Futures

MONTRÉAL EXCHANGE

Z21-H22 Roll Update

November 2021

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QUARTERLY ROLL Summary

For the Z21 contracts, First Notice day is November 29th, so the Z21/H22 roll would ordinarily begin on the 24th of November to give all participants time to exit or roll positions. However, the US holiday on the 25th and a tradition of light staffing in finance roles on the following day will probably result in an early start to the roll of Canadian Bond Futures contracts this quarter, as it has in previous years. We suggest the roll will begin early, perhaps even on the 22nd, and be most liquid on the 23rd and 24th with some opportunity to clean up positions later in the week for patient clients that will be in the office.

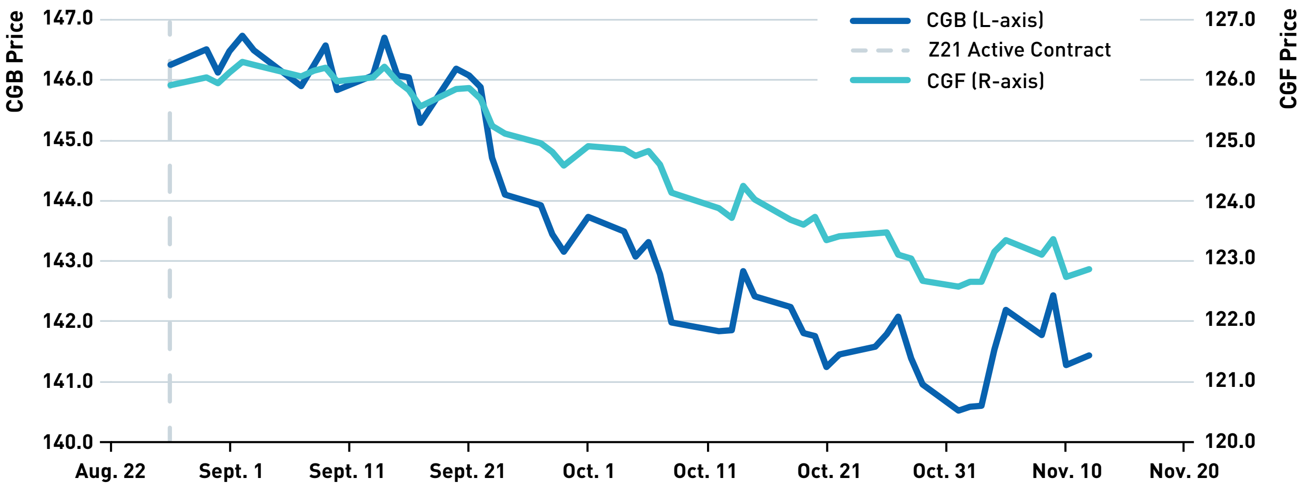
Speculative accounts have probably accumulated short positions in CGZ and CGF contracts this quarter, perhaps to an extreme degree, which will likely cause pricing pressures that push Z21 richer relative to H22 early in the roll. The same direction price pressure may develop for CGB given that contract's recent history of "relatively large" deliveries. Opportunities for relative value managers may exist in CGB due to a very rich CTD versus neighbour bonds.

Speculative Positioning

Although it is unlikely that anyone managing fixed income is not already aware, prices in 2-year, 5-year and 10-year Government of Canada Bond Futures (CGZ, CGF and CGB, respectively) spent almost the entire quarter heading lower as shown in Figure 1 for CGF (5-year) and CGB (10-year). CGF again had more yield volatility and a larger selloff than did CGB[1], although the 5-year contract followed a relatively smooth path to lower prices during the life of the contract while CGB had a significant reversal in early November. Given the price action this quarter, we assume that trend-based models could be short both CGF and CGB contracts, assuming both are included as tradeable securities in their models.

FIGURE 1

CGF & CGB Price, Z21s

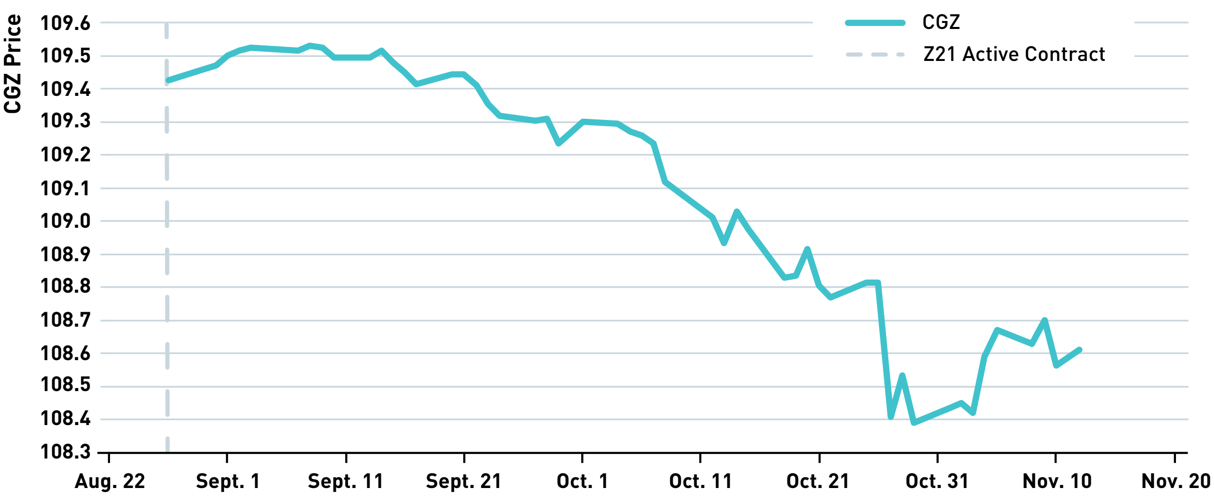


Source: Montréal Exchange

Unlike prior quarters, the active CGZ contract experienced volatile prices and yields this quarter as well with a selloff of over $1 per contract (well over 50 basis points), far more volatility than has been seen in any quarter since summer 2020.

FIGURE 2

CGZ Price, Z21s



Source: Montréal Exchange

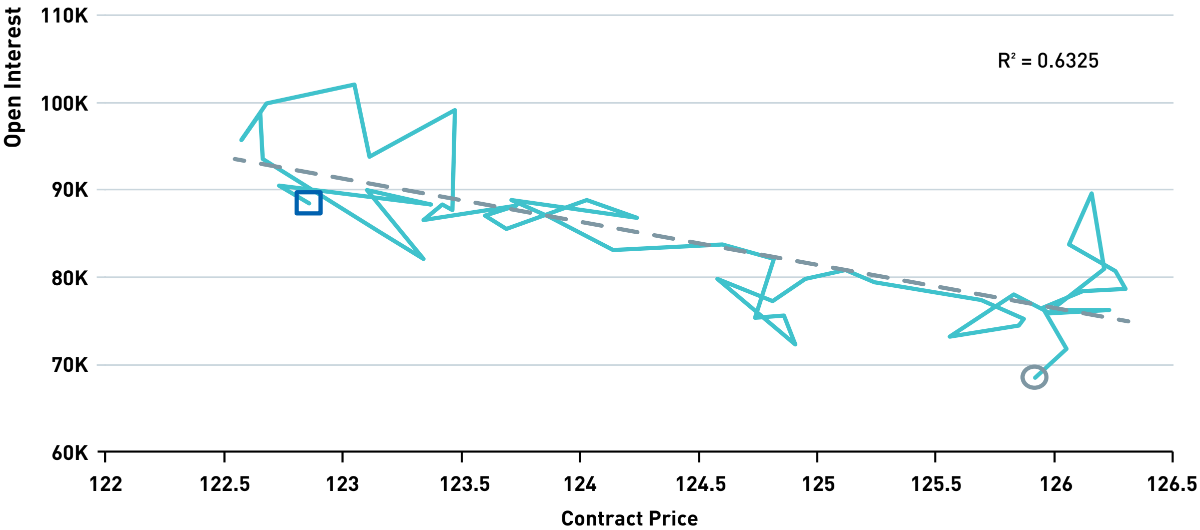
As we do every quarter, we calculated the r-squared for a regression of each contract open interest against price during the life of the contract. For CGZ, this analysis (not shown) resulted in an astonishingly high 0.85 indicating that, as prices fell, new positions were consistently added, probably by speculative investors. Although we're uncertain that a newly liquid contract such as CGZ would attract the attention of pure trend following portfolios, the evidence is strong given the rapid buildup in contracts seen since the launch. Additionally, there are now almost 100,000 contracts open which should be reassuring to investors if they were uncertain the product would be liquid enough to easily exit at expiry. We cautiously note that the buildup of open interest could also be a coincidence that occurred with the selloff.

1 A 65 basis point range for CGFZ21 versus a 54 basis point range for CGBZ21.

Similarly, for CGFZ21, we calculated an r-squared of 0.63 during the life of the contract where, as the contract price fell steadily, positions were added until the open interest exceeded 100,000 contracts, as shown in Figure 3. The majority of positions were still open in mid-November, and this suggests that speculators are heavily short both CGFZ21 and CGZZ21 contracts; probably automated models in the former but perhaps also in the latter. In any case, speculators usually avoid the delivery period and the large shorts will probably lead to early buying pressure in Z21 contracts and selling pressure in H22 as positions are rolled given that there appears no real reason, such as a big price reversal, to de-risk or close short positions.

FIGURE 3

CGFZ21 Price versus Open Interest

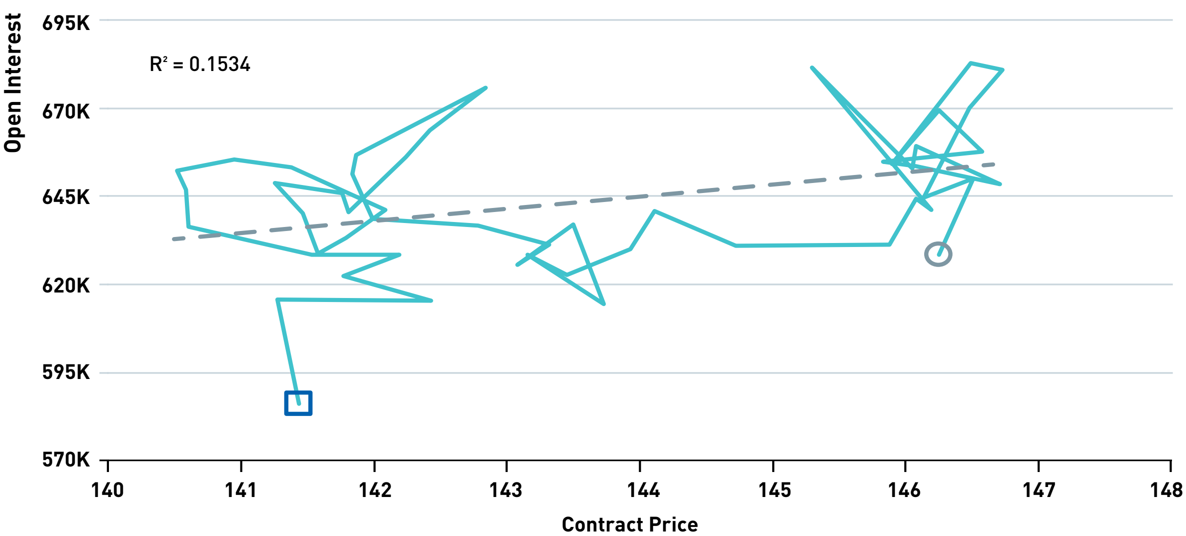


Source: Montréal Exchange

Unfortunately for CGB, the same conclusion is not valid this quarter. CGBZ1 open interest fell as prices fell this quarter and the r-squared was too low to be significant, as shown in Figure 4, despite a sustained selloff of about 50 basis points at the 10-year point in the yield curve. While we observe no obvious reason for this, perhaps models (or managers in general) elected to place short bets at the 5-year and 2-year points in lieu of the normally heavily traded CGB contract. We suggest neutral positioning from speculative clients in the CGBZ21 contract this quarter.

FIGURE 4

CGBZ21 Price versus Open Interest



Source: Montréal Exchange

Cheapest-to-Deliver Switch

Despite some steepening and the large selloff observed in the quarter, contracts will continue to be near-perfect substitutes for the shortest maturity bond in the basket, at least for the foreseeable future. Switch potential is remote for all three of the H22 contracts. To demonstrate, we include Figure 5, an updated depiction of the switch points for CGZH22. Last quarter the yield of the CTD was just 0.45% and now it is almost 55 basis points higher at 0.98%. However, the 6% implied yield used to calculate delivery basket conversion factors is still much higher than current yields and the 0.25% coupon differential for the next-cheapest-to-deliver bond, the 0.75% February 2024, is not nearly enough to make a CTD switch probable. In Figure 5 shown below, it would take a further 250 basis point selloff combined with a steepening between the November 2023 and February 2024 bonds from 7.9 basis points to over 33 basis points to cause the latter bond to be CTD. Similarly, incredibly remote conditions would be needed to cause a switch in CGFH22 or CGBH22.

FIGURE 5

	Nov23 Yield															
SLOPE	0.82%	0.86%	0.90%	0.94%	**0.98%**	1.23%	1.48%	1.73%	1.98%	2.23%	2.48%	2.73%	2.98%	3.23%	3.48%	3.73%
0.0	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23
1.6	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23
3.2	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23
4.8	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23
6.3	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23
7.9	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**	**Nov23**
16.3	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23
24.8	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23
33.2	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Feb24	Feb24
41.6	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Nov23	Nov23	Nov23	Feb24	Feb24	Feb24	Feb24	Feb24
50.0	Nov23	Nov23	Nov23	Nov23	**Nov23**	Nov23	Nov23	Nov23	Feb24	Feb24	Feb24	Feb24	Feb24	Feb24	Feb24	Feb24

Relative Value of the CTD Bonds

Unsurprisingly, demand has weakened at Bank of Canada bond auctions versus early 2021 and 2020 with, for example, the 5-year auction coverage declining from a typical 2.6-2.9x covered to just 2-2.2x covered in recent weeks[2]. While this is expected given the elimination of the Bank's acquisition program and significant selloff in bonds during the same period, it has created some interesting relative value opportunities between benchmark, cheapest-to-deliver, and auction bonds.

Auction bonds, which are generally relatively cheap in Canada, are now joined by benchmark bonds, as client selling has demanded liquidity from dealers in these issues. Relatively speaking, cheapest-to-deliver bonds that are not a benchmark bond appear rich, creating opportunities to be long bonds versus short contracts. For Z21 contracts, the CGZ (2-year) CTD was the benchmark until early October and the CGF (5-year) CTD is the current benchmark, so this observation applies to CGBZ21 (10-year) futures in the current active contracts.

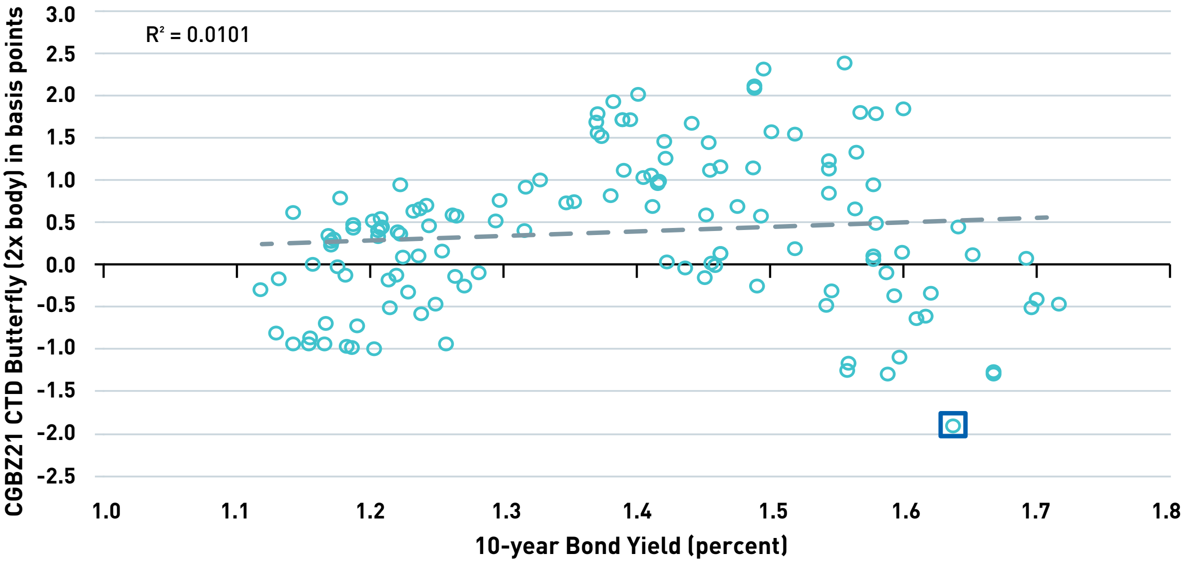
Often, relative value opportunities in CGB and its neighboring bonds are driven by the CGB contract itself as bond managers make liquidity demands via the futures that then go on to influence the relative pricing of the CTD versus neighboring bonds in the cash market. For example, we have often observed the CGB CTD bond becoming rich to neighbor bonds during a rally and vice-versa. However, currently, the CGB contract does not appear to have been the driver of relative value opportunities in the 10-year sector.

2 Source: Bank of Canada

Figure 6 plots the swap spread butterfly[3] of the June 2030 bond versus the 10-year yield recently with the most recent observation highlighted. Although the butterfly indicates the June 2030s are very rich relative to neighbour bonds, it has not been associated with the 10-year interest rate move. In fact, the CTD butterfly has richened as rates have moved higher.

FIGURE 6

10-year Bond Yield versus CTD Butterfly

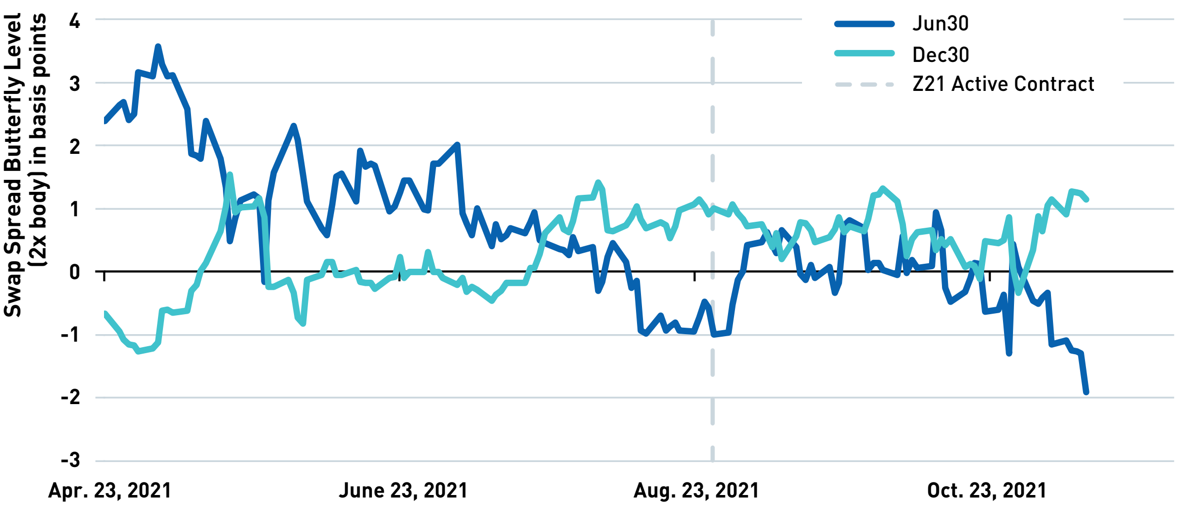


Source: BMO Capital Markets[i] Fixed Income Sapphire database

The real relative value action has occurred near or in the benchmark bonds and can be observed by plotting the June 2030 swap spread butterfly versus the same measure for the December 2030 bond, as shown in Figure 7. In that figure, we see that the June 2030 butterfly is historically rich to neighbours, one of which is the December 2030, but the December 2030 butterfly, which is a less off-the-run bond closer in maturity to the benchmark, is historically cheap to neighbour bond maturities.

FIGURE 7

Jun30 versus Dec30 Swap Spread Butterfly



Source: BMO Capital Markets[i] Fixed Income Sapphire database

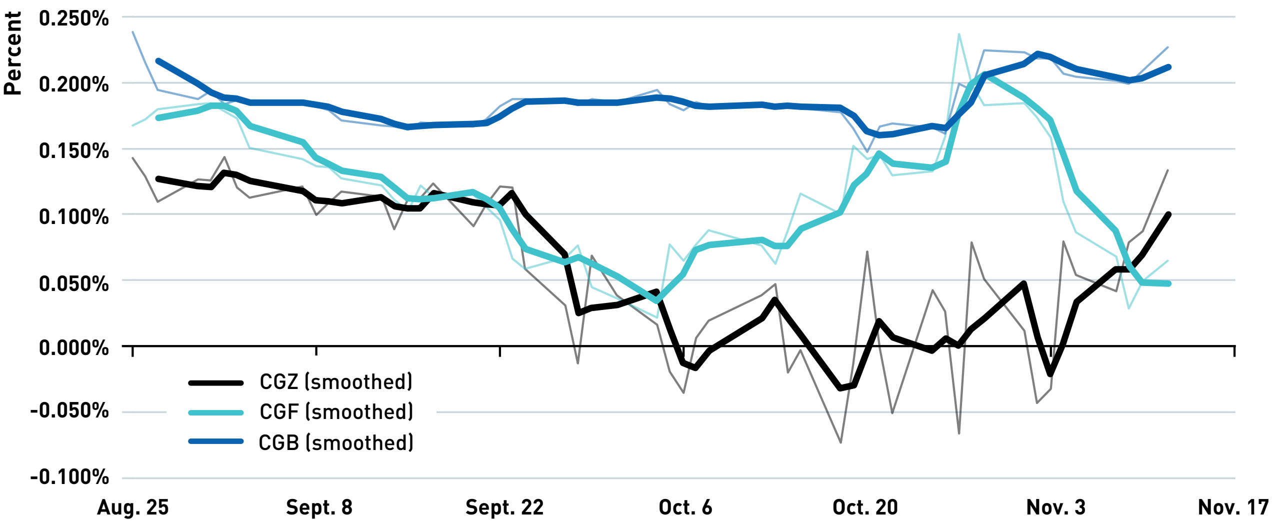
Since the CGB cheapest-to-deliver bond tends to lose some liquidity premium after it drops from the delivery basket, as the June 2030 will do after the roll to U22 contracts occurs in late May, seeing it rich relative to neighbours is unusual at this juncture.

3 A common measure of relative value, a swap spread butterfly is constructed by calculating the spread to swaps for the closest similar bonds with maturities before and after the CTD. One then multiplies the spread of the CTD by two and subtracts the spread of the nearest comparator bonds to construct the butterfly. A lower value indicates the CTD (or body of the butterfly) is rich relative to its nearest neighbour (or wing) bonds.

Additionally, CGBZ21 has also traded closer to fair value to its CTD than have the other contracts this quarter. Both CGF and CGZ have been trading relatively cheap (low implied repo, high gross basis) to bonds, perhaps related to the observations we made above where the open interest was driven higher during the selloff in these contracts. Given that the overnight index swap (OIS) level to December 31st has been stable at 20 basis points, both CGZ and CGF contracts have traded at implied repo levels 15-20 basis points cheap (below the OIS rate) while CGB has fluctuated between just 3 basis points cheap and 2 basis points rich to overnight index swap levels during the quarter, as shown in Figure 8.

FIGURE 8

Implied Repo: CGZ, CGF, CGB



Source: BMO Capital Markets[i] Fixed Income Sapphire database, Montréal Exchange

There's a possibility that active relative value managers will exploit this opportunity in CGB versus benchmark bonds this quarter, driving June 2030 bond prices back towards fair value.

Key Metrics & Expectations

We show some Key Metrics that may interest a Portfolio Manager with a position in Z21 contracts who is contemplating his/her roll strategy this week in Figure 9, Figure 10, and Figure 11. We used closing prices on November 12th and have reduced the number of CTD bonds outstanding by the holdings of the Bank of Canada. None of the H22 contracts had traded on this price capture date so the indicated prices for the March contracts, and any analysis driven by the price of those contracts, are not based on a tradeable market level at this time.

CGBZ21 to CGBH22

Although there is no change to the delivery basket and the June 2030 bond will be the cheapest-to-deliver for both the Z21 and H22 10-year contracts, the CGB roll will likely attract the most interest due to the higher open interest in the contract and its popularity as a trading product. The Z21 was recently observed at about 27 basis points of implied repo[4], about 1.2 cents rich to fair value for the contract given the observed 0.20% overnight index swap rate to the delivery date.

We believe trend following models in portfolios that must avoid the delivery period are not a predictable factor this quarter for CGB. However, with two quarters of large contract deliveries recently, long positions should be wary of a patient short investor base that takes contracts into delivery either to purposely deliver bonds, wait for a Wildcard exercise opportunity, or for some other unknown motive.

Long positions may choose to roll early to avoid a richening in the roll given the (possibly) abbreviated roll period due to the American holiday. Price pressure early in the roll may therefore come from impatient or delivery-wary long positions seeking to sell Z21 and buy H22 to maintain positions or even to sell Z21 outright if using the roll liquidity to close existing positions. Outside of the Wildcard exercise possibility, there is little chance of early delivery for CGBZ21 and no chance of a delivery squeeze given the large amount of outstanding June 2030 bond.

4 Closely related to gross basis, implied repo is our preferred measure of relative value between futures contracts and the bonds in the delivery basket. In the absence of valuable embedded options in the futures contract, the futures contract fair value, as measured by implied repo, should match the overnight index swap market rate to the delivery date of the futures contracts.

FIGURE 9

CGB Key Metrics

12-NOV-2021	FRONT (DEC21)	BACK (MAR22)	DIFFERENCE
Closing Price	141.430	139.550	1.880
Cheapest-to-Deliver (CTD)	CAN 1.250% Jun 2030	CAN 1.250% Jun 2030	No change
Delivery Years (Last delivery)	8.4	8.2	-0.2
CTD Conversion Factor	0.6873	0.6944	
CTD Clean Price	97.3248	97.3248	
CTD Yield	1.586%	1.586%	0.000%
Gross Basis (cents)	12.0	42.1	
Net Basis (Final Delivery, cents)	-0.4	5.0	5.3
Implied Repo (Final Delivery)	0.27%	0.11%	-0.16%
DV01/100 of CTD	7.8	7.8	0.0
Open Interest	586,224	0	
CTD Outstanding (millions)	27,160	27,160	0
CTD Notional of Front OI	58,622	58,622	
Front OI Multiple of CTD	2.2x	2.2x	0.0x

Source: BMO Capital Markets[i] Fixed Income Sapphire database, Montréal Exchange

CGZZ21 to CGZH22

The 2-year contract came into its own this quarter and again surged to a high open interest, especially as 2-year rates began to rise in earnest. The current open interest represents only 0.8x the available DV01 of cheapest-to-deliver but the roll may be a test of the contract given the new highs of open interest achieved. The CTD will change from the August 2023 bond to the November 2023 bond for the next contract, a relatively negligible maturity extension. The DV01 extension of 14% is unlikely to cause anyone any distress and the fair value of the roll, assuming no drastic changes in expectations for Bank of Canada policy changes during the roll period, will probably be about 31 cents plus or minus one cent on the roll date. Investors wary of delivery should note that this contract is almost exactly neutral carry during delivery and short positions will be almost completely indifferent between delivering early or waiting to the end of December. Clients that cannot deliver or take delivery should close their CGZZ21 positions early as delivery could occur anytime on or after First Notice.

CGZZ21 currently prices very cheap to bonds with an implied repo level of just 0.07% to delivery, or almost one cent cheap relative to the overnight index swap market to the same date. Although we have no evidence of algorithmic traders involved in CGZ so far, we suspect the strong correlation to open interest during the quarter is indicative that many speculative clients are short contracts. Significant buying pressure in CGZZ21 contracts to capture some of the cheapness of the contract accompanied by selling in H22 should be expected early, especially if new clients wish to test the roll market due to the newly high open interest.

FIGURE 10

CGZ Key Metrics

12-NOV-2021	FRONT (DEC21)	BACK (MAR22)	DIFFERENCE
Closing Price	108.610	108.420	0.190
Cheapest-to-Deliver (CTD)	CAN 0.250% Aug 2023	CAN 0.500% Nov 2023	Change!
Delivery Years (Last delivery)	1.6	1.6	0.0
CTD Conversion Factor	0.9101	0.9140	
CTD Clean Price	98.8685	99.0700	
CTD Yield	0.919%	0.980%	0.061%
Gross Basis (cents)	2.2	-2.6	
Net Basis (Final Delivery, cents)	2.2	-12.0	-14.2
Implied Repo (Final Delivery)	0.07%	0.57%	0.50%
DV01/100 of CTD	1.7	1.9	0.2
Open Interest	95,069	0	
CTD Outstanding (millions)	11,392	12,492	1,100
CTD Notional of Front OI	9,507	9,507	
Front OI Multiple of CTD	0.8x	0.8x	-0.1x

Source: BMO Capital Markets[i] Fixed Income Sapphire database, Montréal Exchange

CGFZ21 to CGFH22

The CTD for CGF will not change from the September 2026 bond, the current 5-year cash benchmark, when the active contract rolls from CGFZ21 to CGFH22. There is so much of this CTD available that we can foresee no possibility of delivery squeeze at this time. Given no change in the CTD, the DV01 of the two contracts will be quite similar and the roll fair value will be stable even if interest rates rise or fall during the roll period.

An implied repo of just 0.07% at time of writing means CGFZ21 also prices cheap relative to bonds. There is little risk of early delivery, but we suspect speculators are quite heavily short the contract and will wish to buy and/or roll early to new H22 positions to capture some of the 2 cents that Z21 contracts are cheap relative to the overnight index swap market at this time. Managers with long positions in CGFZ21 may find it profitable to be patient as pricing pressures develop during the roll.

FIGURE 11

CGF Key Metrics

12-NOV-2021	FRONT (DEC21)	BACK (MAR22)	DIFFERENCE
Closing Price	122.860	121.150	1.710
Cheapest-to-Deliver (CTD)	CAN 1.000% Sep 2026	CAN 1.000% Sep 2026	No change
Delivery Years (Last delivery)	4.7	4.4	-0.2
CTD Conversion Factor	0.7960	0.8053	
CTD Clean Price	97.9116	97.9116	
CTD Yield	1.453%	1.453%	0.000%
Gross Basis (cents)	11.5	34.9	
Net Basis (Final Delivery, cents)	2.2	7.0	4.8
Implied Repo (Final Delivery)	0.07%	0.07%	0.00%
DV01/100 of CTD	4.6	4.6	0.0
Open Interest	88,472	0	
CTD Outstanding (millions)	15,706	15,706	0
CTD Notional of Front OI	8,847	8,847	
Front OI Multiple of CTD	0.6x	0.6x	0.0x

Source: BMO Capital Markets[i] Fixed Income Sapphire database, Montréal Exchange

Wildcard Potential

As in previous quarters, Wildcard options have limited potential[5] in CGZ contracts due to the high conversion factors; delivery tails are less than 9% of a long basis trader's position versus over 20% in CGFZ21 and 31% in CGBZ21[6].

Wildcard exercise is also unlikely in CGFZ21 contracts as the carry during delivery is relatively high due to the 1% coupon on the CTD bond. It would take more than a 6 basis point move in the 5-year after 3pm but before 5:30pm in order to make this option exercise profitable at the start of the delivery period, declining to about 4 basis points by December 10th. While not impossible, we think most clients can find better opportunities than this in the current environment.

Although the CGBZ21 contract will be highly positive carry during delivery, some potential may exist for Wildcard exercise, and unexpected early delivery, in the contract this quarter. The price change needed after settlement of the futures contract but before the delivery deadline on each day during the delivery period is shown in Figure 12. At the start of the period, it would take a 26.5 cent price rise (3.4 basis point) after 3pm to offset the positive carry a long basis position would earn holding until the end of the month. As the positive carry accrues, this falls to under two basis points, or just 0.15 cents by December 10th. We believe a profitable Wildcard exercise is possible in CGBZ21, although abundant fixed income opportunities elsewhere may limit the number of clients positioning for it.

5 For a fuller description of how a Wildcard option exercise works, refer to "CGB Case Study: Wildcard Option Exercise" published by Montréal Exchange in July 2019.

6 The delivery tail is equal to (1/conversion factor) – 1.

FIGURE 12

CGBZ21 Wildcard Treshold

DATE	REMAINING CARRY ($ PER CONTRACT)	MINIMUM ΔCTD PRICE TO EXERCISE WILDCARD
29-Nov-2021	120.37	0.265
30-Nov-2021	116.35	0.256
1-Dec-2021	112.34	0.247
2-Dec-2021	100.31	0.220
3-Dec-2021	96.29	0.212
6-Dec-2021	92.28	0.203
7-Dec-2021	88.27	0.194
8-Dec-2021	84.26	0.185
9-Dec-2021	72.22	0.159
10-Dec-2021	68.21	0.150
13-Dec-2021	64.20	0.141
14-Dec-2021	60.18	0.132
15-Dec-2021	56.17	0.123
16-Dec-2021	44.13	0.097
17-Dec-2021	40.12	0.088

CDCC Delivery Reports[7] for September contracts show a few thousand CGZU21 and CGFU21 contracts were delivered during the delivery period, but none appear to be related to Wildcard option exercises. Oddly, nearly 13,000 CGBU21 contracts were taken into the delivery period and were delivered on or near the final day. We speculate that a client either wanted to deliver bonds to establish (or eliminate) a cash market position, or tried a Wildcard play unsuccessfully. Although 13,000 is a large quantity of contracts and somewhat unusual, the large delivery represents just 2% of open interest in that contract.

7 CDCC Delivery Reports available on the CDCC website (Delivery Reports page).

LOOKING FORWARD & Opportunities

- Is switch risk coming back to CGB? The 0.5% coupon on the December 2030 bond but 1.5% coupon on the June 2031 bond combined with a reduction to just 6 months between 10-year bond maturities may introduce switch risk to the CGBU22 and Z22 contracts, especially if yields continue to rise and curves continue to steepen. Informed managers should plan to calculate switch potential and value for their positions.
- Versus recent contracts, CGB is both rich to its cheapest-to-deliver bond and its CTD is rich to neighbouring bonds, which may create good opportunities for relative value portfolio managers.
- Relative Value opportunities almost always exist as auction bonds purchased against hedges of CGB and CGF contracts are almost always attractive. In addition, owning futures contracts in lieu of benchmark bonds appears attractive in CGB given the cheapness of the 10-year benchmark bond versus neighbours.
- The new LGB contract may attract a lot of attention from clients interested in Wildcard option value. We anticipate these options to have more value than any of the other contracts given the very low conversion factors and thus large delivery tails; just one interesting aspect of the new LGB contract that we will be writing about soon.

Kevin Dribnenki writes about fixed income derivatives and opportunities in Canadian markets. He spent over 10 years managing fixed income relative value portfolios as a Portfolio Manager first at Ontario Teachers' Pension Plan and then BlueCrest Capital Management. During that time he managed domestic cash bond portfolios as well as international leveraged alpha portfolios and has presented at several fixed income and derivatives conferences. He received a BA in Economics from the University of Victoria, an MBA from the Richard Ivey School of Business, and holds the Chartered Financial Analyst designation.

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