CGZ Two-Year Government of Canada Bond Futures

CGF Five-Year Government of Canada Bond Futures

CGB Ten-Year Government of Canada Bond Futures

LGB Thirty-Year Government of Canada Bond Futures

MONTRÉAL EXCHANGE

U23-Z23

Roll Update

August 2023

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QUARTERLY ROLL Summary

First Notice day is August 30th for the September 2023 CGZ (2-year), CGF (5-year), and CGB (10-year) contracts while delivery for the LGB (30-year) will occur on September 20th, the last trading day for all of the aforementioned contracts. Both Canada and the USA have a banking holiday on September 4th, well after the normal roll period for all contracts except LGB. We expect the liquid portion of the roll period to begin this quarter on August 24th, potentially a day earlier than normal due to the ordinary start date falling on a late-summer Friday. The Bank of Canada will make a rate announcement early in the delivery period, potentially impacting the implied repo rate on any remaining contracts, and the Federal Reserve will make a rate announcement late in the delivery period, potentially impacting wildcard option deliveries, if any positions are left so close to the final trading day for September contracts.

Given the current Bank of Canada target rate of 5%, and the lower coupons on deliverable bonds, Canadian fixed income physical delivery contracts will be negative carry during delivery in September so short positions will be eager to deliver early, except in cases where the wildcard option has significant value. This delivery period will resemble the past few quarters with early deliveries, and all new active contracts pricing to the start, rather than the end, of the delivery period.

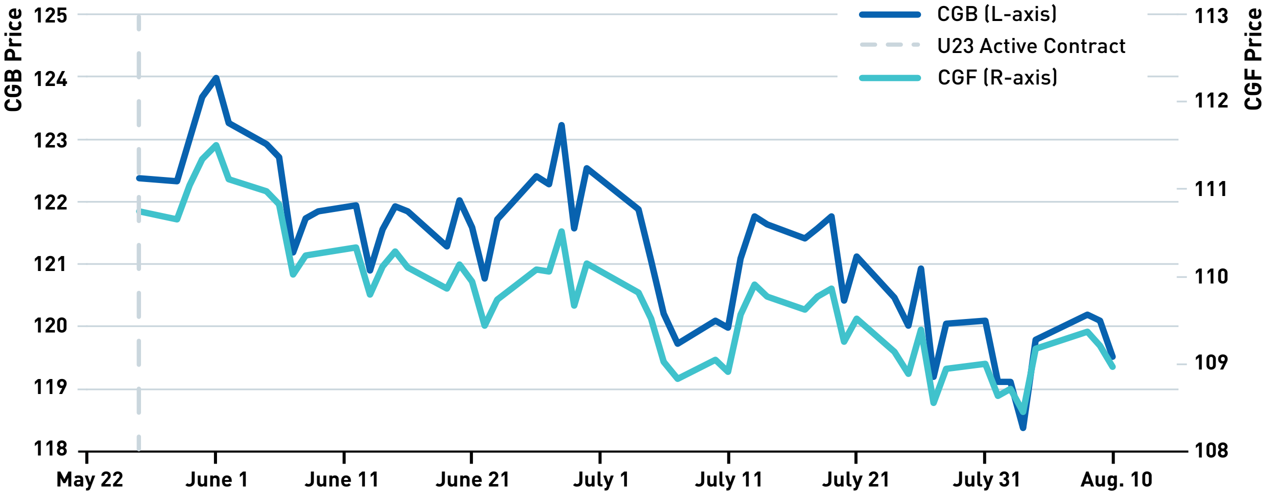
We think model-driven portfolios are short CGF and CGB contracts this quarter as open interest has built steadily while prices declined. We propose that buying demand will probably be exerted on September contracts relative to December; almost certainly for CGF and CGB, and perhaps also for the other contracts. Wildcard options in CGB will continue to be an opportunity for December contracts but may be coming to an end, or at least approaching less profit potential, after this contract. The cheapest-to-deliver change combined with an accumulation of short positions in CGF will probably make for a volatile, opportunity-filled, roll period.

Speculative Positioning

Bond prices have trended downward throughout the time that September contracts have been active with only a few potential hiccups for speculative, momentum driven, models as shown in Figure 1. With only a couple of smaller selloff days to break the downward trend, we suspect that trend models are probably implementing full risk currently.

FIGURE 1

CGF & CGB Price, U23s

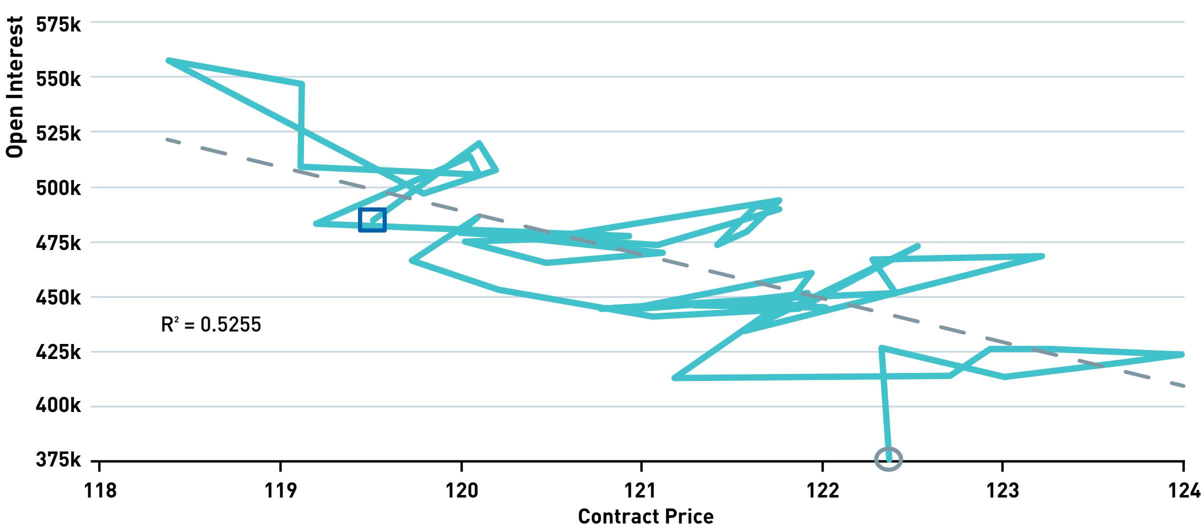


Source: Montréal Exchange

Further, a correlation analysis for both CGB contracts and CGF contracts, often used by trend models to speculate on interest rates in Canada, reveals that open interest has risen consistently as the selloff progressed this quarter. We chart open interest and price level for CGBU23 in Figure 2 where the r-squared of the regression is a relatively high 0.525, very similar to that of CGF this quarter.

FIGURE 2

CGBU23 Price versus Open Interest



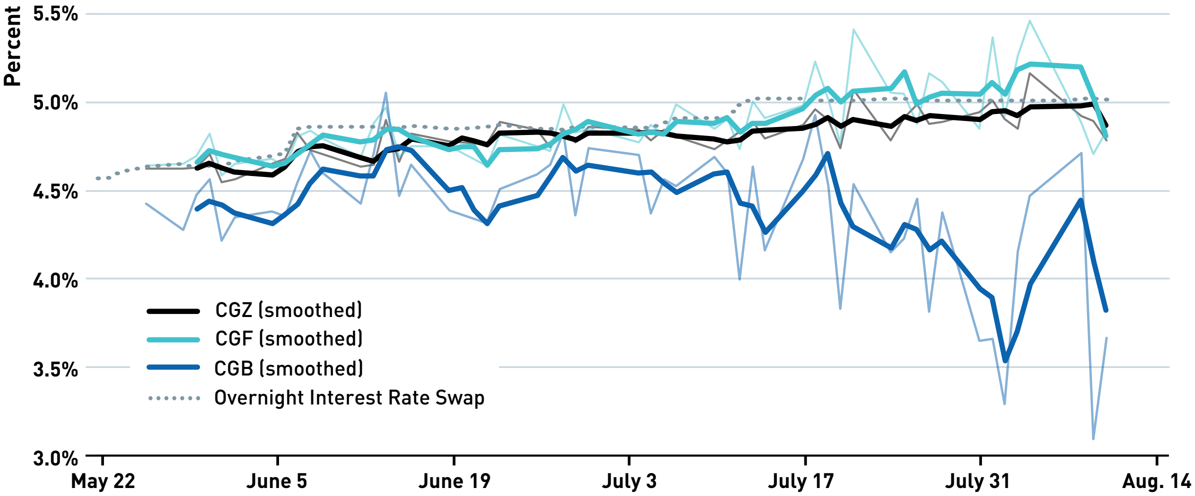
Source: Montréal Exchange

We conclude that speculators are probably short, having built positions continually as the selloff progressed during the quarter, and are at roughly full risk allocation in their algorithmic portfolios.

Often, speculative trends lead to relative price discrepancies between futures contracts and the cheapest-to-deliver bond (CTD) for the contract. Looking at the implied repo for each contract, shown in Figure 3, can reveal that speculative flows, which usually occur with little or no regard for the relative value of futures versus bonds, have altered the relative valuation of the two products. The experience this quarter is mixed as the implied repo for CGF (5-year) contracts was above fair value (contracts were very rich relative to bonds) for much of July and CGB (10-year) contracts, while trading at lower implied repo levels, were quite cheap even after the value of the wildcard option is accounted for.

FIGURE 3

Implied Repo: CGZ, CGF, CGB



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

Cheapest-to-Deliver Switch

Despite the selloff this quarter, there is still very little chance of a switch in the cheapest-to-deliver bond for December (and, of course, September) contracts.

Figure 4 shows the yield/steepness combinations needed for a switch from the December 2031 to the June 2032 as cheapest-to-deliver (CTD) for the CGBZ23 contract which, given the identical CTD as the September contract, looks very similar to the current active contract. A very large selloff of at least a hundred basis points accompanied by an unlikely steepening of the curve by 5-10 basis points would result in a switch to the June 2032 but these are unlikely scenarios, particularly when combined. Similar unlikely conditions would need to occur for any of the other contracts to experience a switch of the cheapest-to-deliver bond.

FIGURE 4

Dec31 Yield

SLOPE	3.03%	3.18%	3.33%	3.48%	**3.63%**	3.83%	4.03%	4.23%	4.43%	4.63%	4.83%	5.03%	5.23%	5.43%	5.63%	5.83%
-5.0	Dec31	Dec31	Dec31	Dec31	**Dec31**	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31
-4.2	Dec31	Dec31	Dec31	Dec31	**Dec31**	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31
-3.5	Dec31	Dec31	Dec31	Dec31	**Dec31**	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31
-2.7	Dec31	Dec31	Dec31	Dec31	**Dec31**	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31
-2.0	Dec31	Dec31	Dec31	Dec31	**Dec31**	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31
-1.2	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**	**Dec31**
2.0	Dec31	Dec31	Dec31	Dec31	**Dec31**	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Jun32	Jun32	Jun32
5.3	Dec31	Dec31	Dec31	Dec31	**Dec31**	Dec31	Dec31	Dec31	Dec31	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32
8.5	Dec31	Dec31	Dec31	Dec31	**Jun32**	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32
11.8	Jun32	Jun32	Jun32	Jun32	**Jun32**	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32
15.0	Jun32	Jun32	Jun32	Jun32	**Jun32**	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32	Jun32

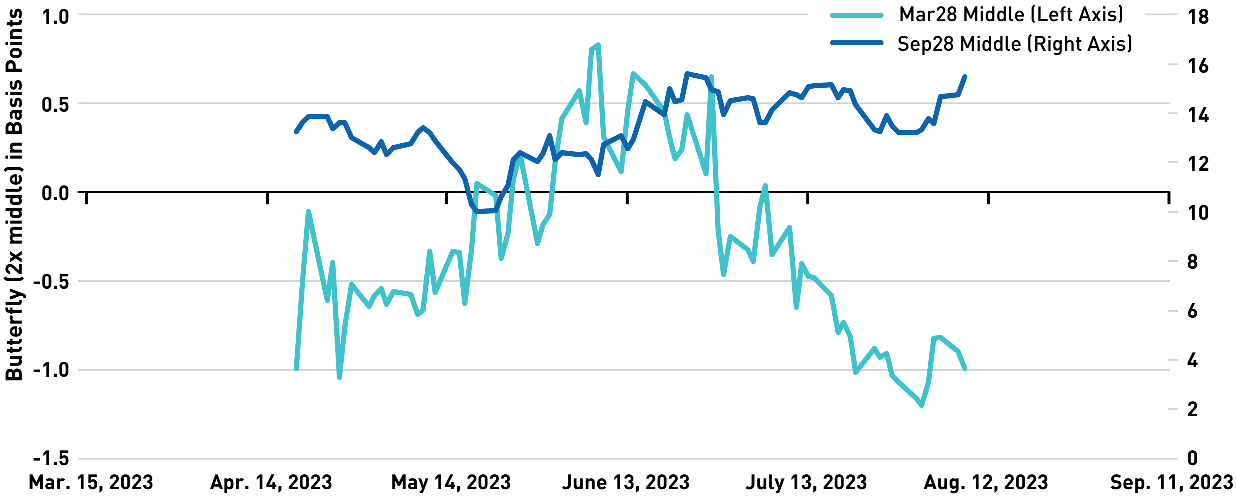
Relative Value of the CTD Bonds

There is no CTD change between the September and December contracts for both CGB and LGB. As is normal every quarter, there is a change of CTD for CGZ (2-year) and, as usual twice a year, a change for CGF as well.

The roll will usher in a new cheapest-to-deliver bond for the CGF contract with the September 2028 taking over from the March 2028, both original 5-year bonds, of course. Figure 5 shows the swap spread butterfly, a measure of the relative value of specific bond issues, for the cheapest-to-deliver bond of both the CGFU23 and the CGFZ23. Since mid-July, the September contract CTD, the March 2028 bond, has richened dramatically (moved lower in the figure) versus neighbouring bonds while the September 2028, CTD for the December futures contract, has been steady. Given that the March 2028 is the current 5-year benchmark bond, this may be due to some incremental cheapening of off-the-run bonds rather than any direct impact from futures trading, but investors should be aware that the CTD for CGFU23 contracts is near its richest point this cycle when compared to other similar maturity bonds.

FIGURE 5

Mar28 v. Sep28 Swap Spread Butterflies



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

Key Metrics & Expectations

We show some Key Metrics of importance to managers with September 2023 positions in Figure 7, Figure 8, Figure 10, and Figure 11. We used closing prices on August 10th and have reduced the number of CTD bonds outstanding on the CGB contract by the holdings of the Bank of Canada[1]. As always, December contracts have not yet traded so we use the official settlement price which may or may not be a tradeable price at this time.

CGBU23 to CGBZ23

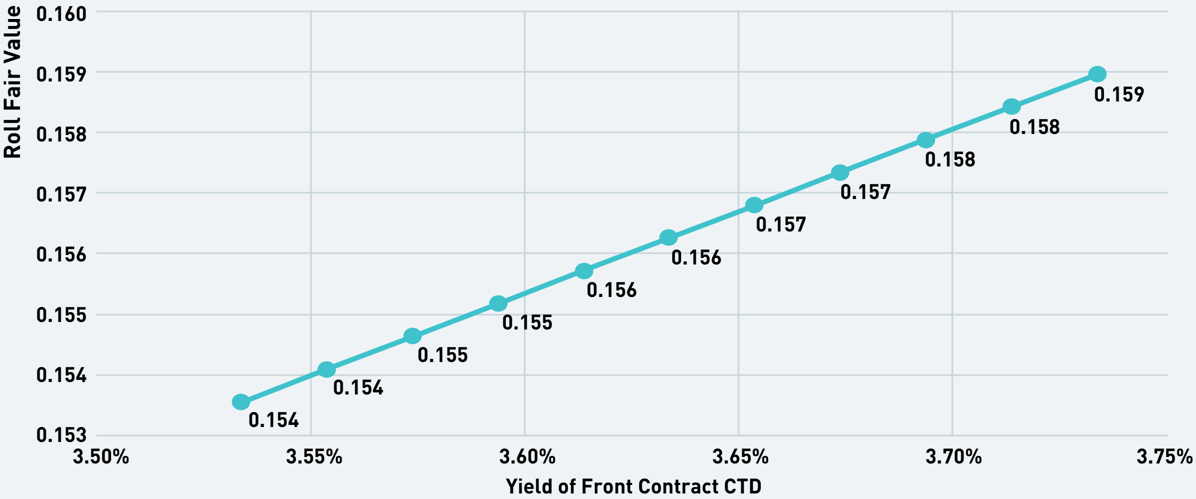
There is no change to the CTD for the CGB contract this quarter and, therefore, practically no change to the DV01 of the contract. Roll pricing will almost certainly be very stable intra-day, even if interest rates are volatile, as shown below in Figure 6 where a theoretical 10-basis point intraday move in interest rates causes a mere 0.3 cents change to the fair value[2] of the roll.

1 The Bank lends their holdings, so the bonds are still available to deliver. The Bank holds a small amount of the current CTD for CGB but none of the bonds that are CTD for the other contracts.

2 For fair value of the roll in this test, we assume the wildcard option in the September and December contracts have equal value which is, in our view and experience, a mostly safe assumption before either of the delivery periods begin.

FIGURE 6

CGBU23/CGBZ23 Roll Fair Value v. Rate Level, Aug 25/23



When the 5 cents of value from the Wildcard option is included, the CGBU23 trades about 3 cents cheaper than fair market value making this contract rather attractive for buyers, and unattractive to sellers. Existing shorts that are in the contract for the wildcard play may (should?[3]) choose to close their position before delivery if the levels we observed on August 10th are still available as the cheapness of the contract relative to bonds exceeds the fair value of the wildcard option.

We believe algorithmic models, and other speculative managers, are short contracts this quarter, as discussed above, and probably at full or nearly full risk allocations. The result will be early pressure to buy September contracts from speculative clients, who need to roll before first notice day, accompanied by relative value players (at existing prices) to close or roll their shorts early. If this dynamic plays out, September contracts should appreciate relative to December contracts at busy times during the roll period as dealers struggle to meet liquidity demands.

FIGURE 7

CGB Key Metrics

10-AUG-2023	FRONT (SEP23)	BACK (DEC23)	DIFFERENCE
Closing Price	119.510	119.240	0.270
Cheapest-to-Deliver (CTD)	CAN 1.500% Dec 2031	CAN 1.500% Dec 2031	No change
Delivery Years (Last delivery)	8.2	7.9	-0.2
CTD Conversion Factor	0.7105	0.7174	
CTD Clean Price	84.8320	84.8320	
CTD Yield	3.634%	3.634%	0.000%
Gross Basis (cents)	-8.0	-71.1	
Probable Delivery Date	01-Sep-23	01-Dec-23	
Net Basis (cents)	5.6	11.2	5.6
Implied Repo (to Prob. Delivery)	3.66%	4.55%	0.89%
DV01/100 of CTD	6.5	6.5	0.0
Open Interest	485,015	0	
CTD Outstanding (millions)	28,352	28,352	0
CTD Notional of Front OI	48,502	48,502	
Front OI Multiple of CTD	1.7x	1.7x	0.0x

*As values may have been rounded to the nearest cent, "difference" values may vary.

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

3 The value of the wildcard option is difficult to value and often very difficult to monetize optimally. For more, see "Wildcard Options: The Option of Maximum Regret" published by MX in August 2022.

CGZU23 to CGZZ23

CGZU23 was trading about one cent cheap relative to the CTD bond on August 10^{th}, which is close enough to fair value that basis traders probably aren't attracted but far enough that anyone looking to get long 2-year bond exposure should probably choose futures rather than cash bonds to express their view. As usual, the wildcard option is not a factor here and almost all contracts will be delivered early.

The cheapest-to-deliver bond (CTD) will change this quarter from the May 2025 bond to the August 2025; a normal quarterly change for this contract. The DV01 extension of 14% is also normal for this contract but will cause the fair value of the roll to vary with the level of interest rates. With the Bank "in play" again, we suspect there are not many investors that will be willing to leave roll orders for extended periods as the fair value of the roll may change by up to a couple cents during the day even without new information being priced into the 3-month rate.

If trend models are using CGZ, which we don't have much evidence of, they are likely to be short and at full risk. Like the other contracts, this positioning will probably lead to buying pressure on the September contract accompanied by selling pressure on the December, unless price action or new economic information before the roll becomes a catalyst to exit rather than retain current exposure.

FIGURE 8

CGZ Key Metrics

10-AUG-2023	FRONT (SEP23)	BACK (DEC23)	DIFFERENCE
Closing Price	102.045	102.415	-0.370
Cheapest-to-Deliver (CTD)	CAN 3.750% May 2025	CAN 3.500% Aug 2025	Change!
Delivery Years (Last delivery)	1.6	1.6	0.0
CTD Conversion Factor	0.9648	0.9608	
CTD Clean Price	98.3950	97.9200	
CTD Yield	4.729%	4.615%	-0.114%
Gross Basis (cents)	-5.8	-48.0	
Probable Delivery Date	01-Sep-23	01-Dec-23	
Net Basis (cents)	1.2	-5.0	-6.3
Implied Repo (to Prob. Delivery)	4.79%	5.17%	0.38%
DV01/100 of CTD	1.6	1.8	0.2
Open Interest	99,434	0	
CTD Outstanding (millions)	15,200	19,000	3,800
CTD Notional of Front OI	9,943	9,943	
Front OI Multiple of CTD	0.7x	0.5x	-0.1x

*As values may have been rounded to the nearest cent, "difference" values may vary.

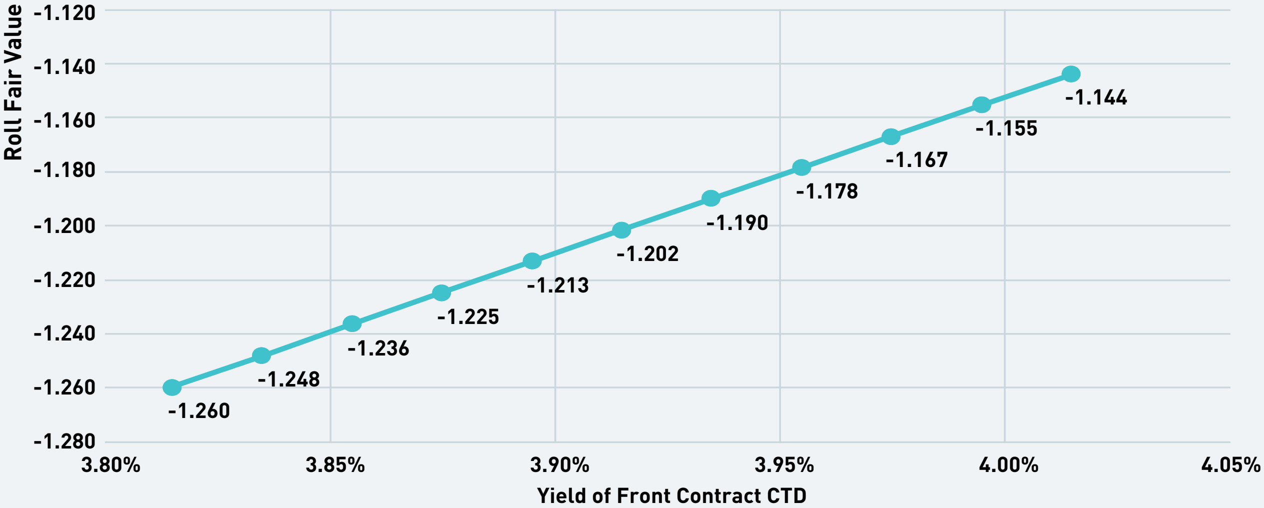
Source: BMO Capital Markets[i] Fixed Income Sapphire database, Montréal Exchange

CGFU23 to CGFZ23

The 5-year contract (CGF) on the roll to CGFZ23 will see a 6-month extension of the cheapest-to-deliver bond but coupons about 150 basis points below current overnight rates means both contracts will be priced for early delivery and should trade at a negative basis. Due to the DV01 difference between contracts, the theoretical fair value of the roll will be volatile when interest rates fluctuate intraday, as depicted in Figure 9, so many investors should be reluctant to leave standing roll orders with brokers.

FIGURE 9

CGFU23/CGFZ23 Roll Fair Value v. Rate Level, Aug 25/23



CGFU23 was trading at almost exactly fair value on our capture date this quarter – about 1 cent cheap to bonds when ignoring the value of the embedded wildcard option – which almost perfectly matches the 1.1 cent fair value that we calculate for the wildcard option. This fair value was not, we should note, reflected in the price of the contract for much of this quarter. In fact, any investor paying attention could have obtained the CGF wildcard embedded in the September 5-year contract for less than a zero price on multiple days in July, similar to what happened in CGB for a short period of time last quarter[4].

As discussed above, we believe that algorithmic speculative models and other speculators remain short this contract, probably in good size. Given the high probability of early delivery and the accumulated positions, speculator short positions in CGFU23 will probably try to roll early, or be liquidity seekers rather than providers, putting similar pressure on the roll. The resulting roll price volatility may be amplified by the fact that non-speculators, usually a more careful and conservative investor, will not want to leave a deep book of limit orders on the roll given the potential for fair value to fluctuate. Good opportunities will probably arise for nimble investors during the roll and are more likely in the CGF contract than the CGB.

FIGURE 10

CGF Key Metrics

10-AUG-2023	FRONT (SEP23)	BACK (DEC23)	DIFFERENCE
Closing Price	108.970	110.180	-1.210
Cheapest-to-Deliver (CTD)	CAN 3.500% Mar 2028	CAN 3.250% Sep 2028	Change!
Delivery Years (Last delivery)	4.4	4.7	0.3
CTD Conversion Factor	0.9027	0.8877	
CTD Clean Price	98.2870	97.2860	
CTD Yield	3.915%	3.847%	-0.068%
Gross Basis (cents)	-8.0	-52.1	
Probable Delivery Date	01-Sep-23	01-Dec-23	
Net Basis (cents)	-0.7	-1.7	-1.0
Implied Repo (to Prob. Delivery)	4.84%	5.08%	0.24%
DV01/100 of CTD	4.1	4.5	0.4
Open Interest	113,217	0	
CTD Outstanding (millions)	15,000	15,000	0
CTD Notional of Front OI	11,322	11,322	
Front OI Multiple of CTD	0.8x	0.8x	0.0x

*As values may have been rounded to the nearest cent, “difference” values may vary.

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

4 Those interested can refer to “Free Money Trade” published by Montréal Exchange in June.

LGBU23 to LGBZ23

With no delivery period or first/last notice dates on the LGB (30-year) contract, there is no threat of early delivery to compel investors to roll to the new contract before the end of August. In prior quarters, some investors have recognized this lack of urgency and kept positions open several days or weeks past the first delivery date for the other contracts. In practice, many investors seem to prefer to close or roll LGB contracts on roughly the same schedule as CGB, but we note that half of the open interest in LGBM23 remained open until just prior to delivery[5].

Since there is no change to the CTD for this contract versus the September, and no wildcard option to contend with, roll pricing will probably be quite stable even though it can fluctuate by a cent or two in either direction as rates fluctuate. Like all the rolls this quarter, the implied repo differential between September and December will be important as markets digest new economic releases ahead of and during the roll period.

FIGURE 11

LGB Key Metrics

10-AUG-2023	FRONT (SEP23)	BACK (DEC23)	DIFFERENCE
Closing Price	159.900	160.250	-0.350
Cheapest-to-Deliver (CTD)	CAN 2.750% Dec 2055	CAN 2.750% Dec 2055	No change
Delivery Years (Last Trading Day)	32.2	31.9	-0.2
CTD Conversion Factor	0.5388	0.5400	
CTD Clean Price	85.9900	85.9900	
CTD Yield	3.475%	3.475%	0.000%
Gross Basis (cents)	-16.4	-54.5	
Delivery Date	20-Sep-23	18-Dec-23	
Net Basis (cents)	-0.4	0.0	0.4
Implied Repo (to Delivery)	5.05%	5.00%	-0.05%
DV01/100 of CTD	17.5	17.5	0.0
Open Interest	1,619	0	
CTD Outstanding (millions)	6,750	6,750	0
CTD Notional of Front OI	162	0	
Front OI Multiple of CTD	0.02x	0.00x	-0.02x

*As values may have been rounded to the nearest cent, "difference" values may vary.
Source: BMO Capital Markets[i] Fixed Income Sapphire database, Montréal Exchange

Wildcard Option Value

The LGB (30-year) contract has no embedded Wildcard option and the Wildcard option embedded in the CGZ (2-year) contract, has almost no value every quarter due to the very large conversion factors for the CTD every quarter.

We calculate the value of the CGFU23 wildcard option at just over 1 cent per CGF contract this quarter, again lower than that of the 5-year contract last quarter due to slightly lower afternoon volatility and a slightly higher conversion factor. This option value was not reflected in the price of the contract during much of July as the implied repo of the contract was greater than the equivalent short-term rate in other markets. In other words, the embedded wildcard in CGFU23 was available at a negative price for multiple days in July, like how the CGBM23 wildcard traded briefly at negative prices last quarter. We suspect some sophisticated traders have accumulated long basis positions as a wildcard play and more contracts may be taken into delivery than normal.

Wildcard exercise is again possible and likely in CGBU23 (10-year) contracts but the CGBZ23 contract may be one of the last good opportunities for the wildcard trade for some time. Hedge tails of consistently over 40% will be replaced after the December contract with hedge tails of less than 35% making the potential profits for wildcard exercise decline by about 13%; significant given the difficulty short positions have had exercising optimally in the highly negative carry environment of past quarters. We value the option for CGBU23 at just 5 cents per contract this quarter, down from about 7 cents last quarter due to lower historical afternoon volatility recently combined with slightly higher conversion factors (and thus smaller hedge tails).

Long CGBU23 positions going into delivery could easily experience a Wildcard exercise against their position as there seems to be an (yet unexplained) trend for late afternoon price spikes early in the delivery month. Late afternoon price action has allowed CGB (and sometimes CGF) short positions to profitably exercise the embedded option conveniently early in most delivery periods, thus avoiding almost all the negative carry but profitably harvesting the option value. This phenomenon is perplexing as the mere existence of Wildcard options should drive late-afternoon volatility lower during delivery[6], not higher. However, we see no catalyst for change in the market during this delivery cycle.

5 It was eventually closed in the market rather than being delivered.

6 As the CTD price rises after 3pm, holders of the option should be selling their hedge tail into the strength if they intend to deliver early, thus dampening any late afternoon price rallies. While this is sound market theory, it doesn't seem to work in practice.

LOOKING FORWARD & Opportunities

- As recent months have taught everyone in the Canadian bond market, the Bank of Canada is "in play" constantly at this juncture. A surprise 25 basis point rate hike today, or pricing of an expected rate hike, would increase the price of CGFU23 by 2.5 cents and CGBU23 by 1.5 cents, all else equal. A full rate hike priced in or out in a short period of time is unusual but not impossible given rampant speculation of when the Bank will pause (or not) again to continue its recent inflation fight[7].
- There is a Bank of Canada rate decision on September 6th and a Federal Reserve announcement on the 20th, both during the delivery period. Ironically, the Bank of Canada announcement usually has no effect on the wildcard option in Canadian bond futures since it is made long before the daily settlement price is established while the Federal Reserve announcement, made in the afternoon, can sometimes trigger wildcard exercise/delivery. The Federal Reserve won't be a factor this quarter as the announcement comes after the wildcard option disappears on the day before the last trading day.
- Hedge tails will be smaller for CGBH24 contracts than they have been for at least the past year. Wildcard activity should decrease somewhat as the opportunity becomes less profitable, assuming no large change in afternoon CTD price volatility.
- There were opportunities to acquire free or negatively priced wildcard options again this quarter, although the opportunity shifted to CGF contracts from CGB contracts, which are inherently more difficult to monetize. These opportunities to obtain embedded options for no cost, or even a negative price, continue to present themselves from time to time, especially during interest rate volatility and when momentum (price insensitive) players get involved. Sophisticated relative value investors may want to monitor more closely for them.

7 For more on Canada inflation, refer to "Economic Pessimism Grips Canada Inflation Market" published by Montréal Exchange earlier this month.

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