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

H23-M23 Roll Update

February 2023

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QUARTERLY ROLL Summary

First Notice day is February 27th for the March 2023 contracts[1] so the roll should begin on February 21st and finish on or before the 23rd, leaving one day for cleaning up positions before any risk of delivery. The President's Day holiday in the USA and Family Day in Canada both occur on the 20th and will not influence the roll this quarter. The Bank of Canada has a rate announcement on March 8th, early in the delivery window.

Due to the tightening cycle by the Bank of Canada and elevated overnight rates, physical delivery fixed income contracts remain negative carry during delivery and, barring exceptional circumstances such as value to the Wildcard option in the Ten-Year Government of Canada Bond Futures (CGB™) contracts, short positions will avoid the negative carry by delivering early. By now, investors are aware that contracts will price assuming delivery will occur (probably, as it is still at the discretion of the owner of the short position) on or near the First Delivery date, not the Last Delivery date.

Speculative positions will probably drive the Five-Year Government of Canada Bond Futures (CGF™) CGFH23 contract to higher prices relative to M23, but the same can't be said with much certainty for the Two-Year Government of Canada Bond Futures (CGZ™) or the CGB contracts this quarter. The 30-Year Government of Canada Bond Futures (LGB™) roll may or may not occur with the rest of the contracts given that the incentive to roll at the end of February has been eliminated. CGB contracts continue to have a valuable embedded Wildcard option which drives the recent cheapness of contracts.

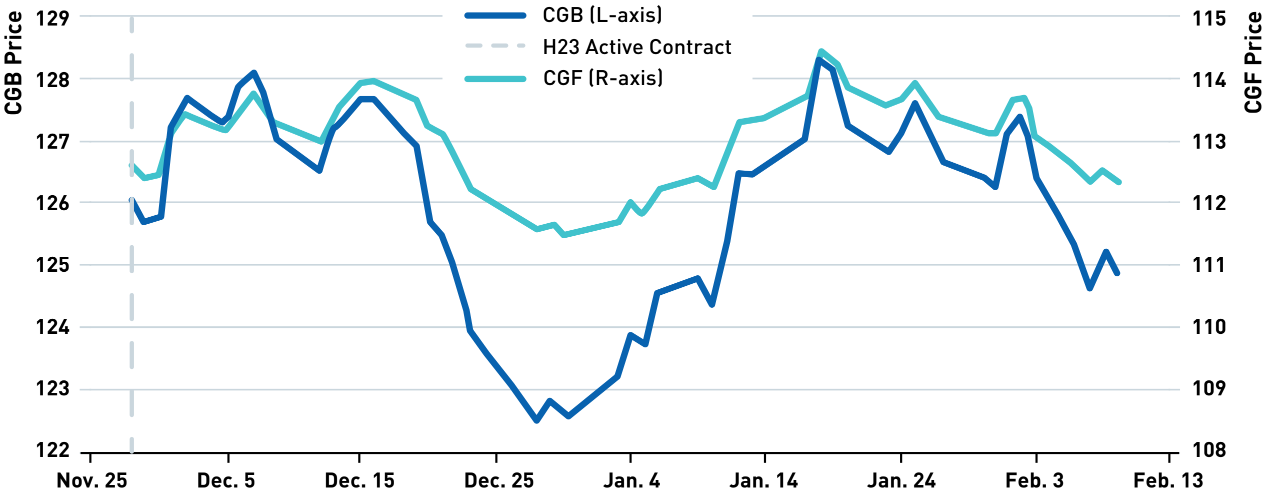
1 Due to recent changes in the contract specifications (Circular 124-22), the LGB contract no longer has a delivery period, unlike the other contracts discussed here. All deliveries occur on the last trading day.

Speculative Positioning

Trend models that quickly adapt to changes in direction, without waiting too long for momentum to be established, probably captured some decent profits in the recent quarter. However, we do not believe a lot of models did, especially at the 10-year point (CGB contracts). Figure 1 shows a pair of painful inflection points in both the 5-year (CGF) and the 10-year (CGB) contract prices on December 28th and January 18th that may have caused some grief for momentum models.

FIGURE 1

CGF & CGB Price, H23s

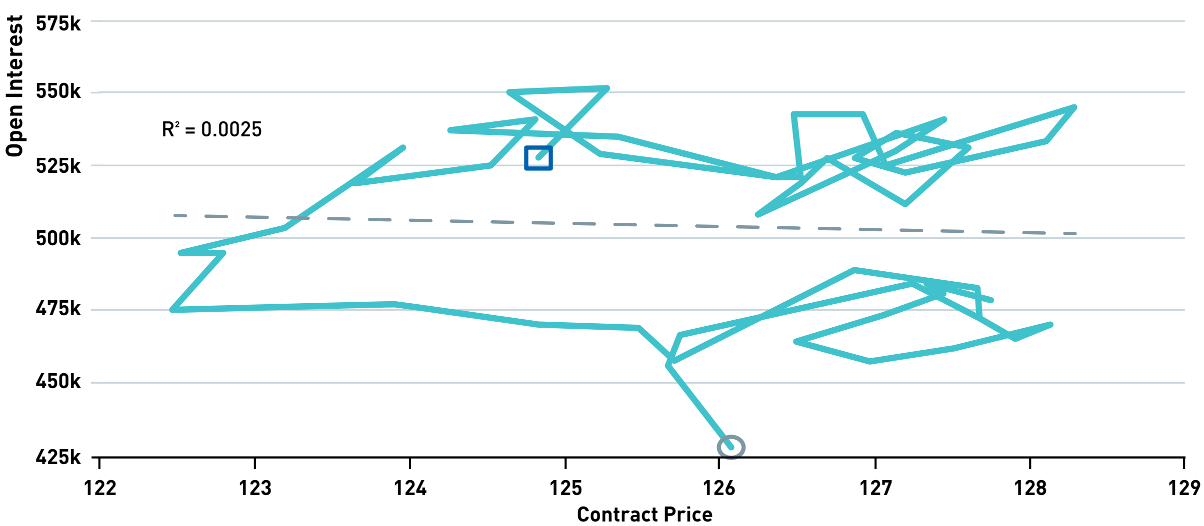


Source: Montréal Exchange

Figure 2 shows that open interest on the CGBH23 (10-year) has not correlated at all with prices this quarter. In fact, in the three periods where prices were trending both upwards and downwards, open interest amounts for the CGB contract remained flat, indicating that speculative momentum models either missed the trend or, more likely, have focused risk in some other area of the curve as central banks potentially approach the end of their tightening cycles.

FIGURE 2

CGBH23 Price versus Open Interest

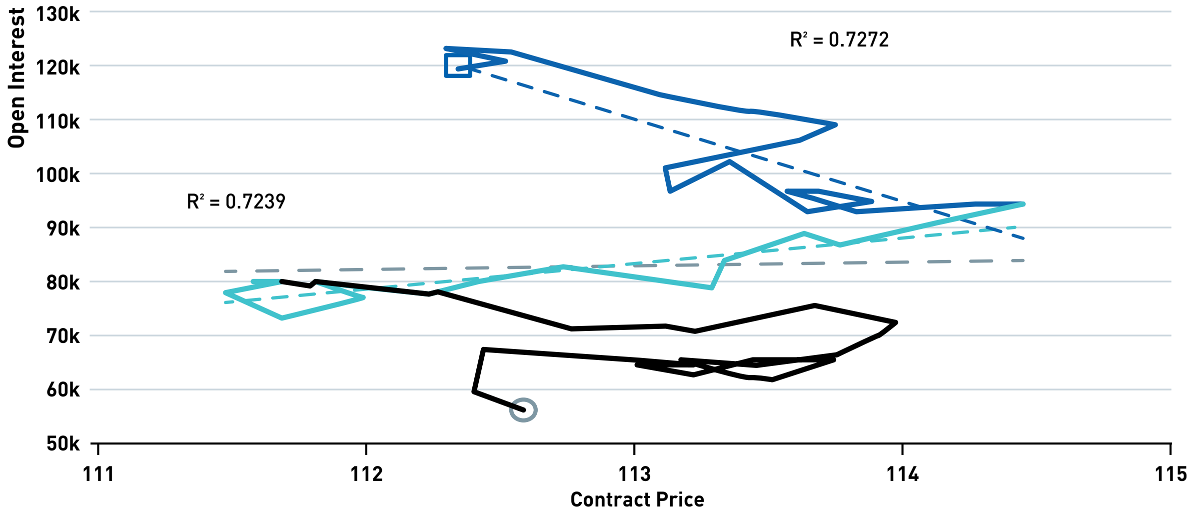


Source: Montréal Exchange

In sharp contrast, a breakdown of the two recent periods of trending prices in the CGF (5-year) contracts shows heavy correlation between prices and open interest. Normally this indicates that, as momentum was established, algorithm models added risk to their positions – in this case, they added risk on both the rally after the end of the year as well as on the selloff after January 18th. These positions are still open and will influence the roll from CGFH23 to CGFM23.

FIGURE 3

CGFH23 Price versus Open Interest



Source: Montréal Exchange

Cheapest-to-Deliver Switch

Higher interest rates, combined with a legacy of very low coupon bonds in the delivery baskets, have made switch risk between bonds in some delivery baskets possible, although still unlikely. Futures contract investors should probably be monitoring the possibility of switch risk, although it remains a distant possibility at this point.

For the new CGF (5-year) contract that will become active during the February roll period, switch risk won't exist as only one bond is deliverable at this time. For the CGB (10-year) contract, a switch would take an implausible steepening of the curve from about zero basis points today to at least 10 basis points, as shown in Figure 4.

FIGURE 4

	Jun31 Yield															
SLOPE	2.46%	2.61%	2.76%	2.91%	**3.06%**	3.26%	3.46%	3.66%	3.86%	4.06%	4.26%	4.46%	4.66%	4.86%	5.06%	5.26%
-5.0	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31
-3.9	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31
-2.8	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31
-1.7	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31
-0.6	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31
0.4	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**	**Jun31**
3.4	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31
6.3	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Dec31	Dec31	Dec31
9.2	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Jun31	Jun31	Jun31	Dec31	Dec31	Dec31	Dec31	Dec31
12.1	Jun31	Jun31	Jun31	Jun31	**Jun31**	Jun31	Jun31	Jun31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31
15.0	Jun31	Jun31	Jun31	Jun31	**Jun31**	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31	Dec31

A similar bear steepening (higher rates, steeper curves) would need to happen for a switch in the CGZM23 contract from the February 2025 bond, the probable cheapest to deliver ("CTD"), to the April 2025 bond, despite the latter bond's very low coupon.

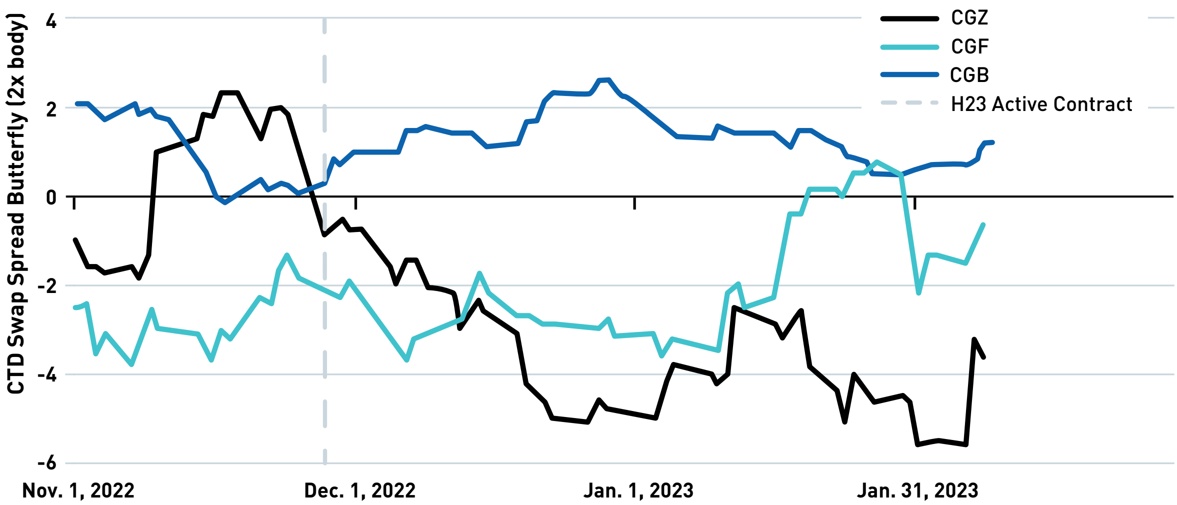
As we wrote in a January[2] article for the LGB (30-year) contract, the announced issuance schedule for a new 2055 Canada bond could have resulted in that bond becoming the CTD in March or April and, due to the higher conversion factor, it would have likely become the CTD for that contract. The bond has been excluded from the basket for June 2023 contracts to avoid the uncertainty associated with the auction size[3].

Relative Value of the CTD Bonds

There is no relative value story to the CTD bond for the CGB contract this quarter, nor should we expect one, given that there is no change in CTD for the March to June contracts. In very broad terms, Figure 5 shows that, compared to neighbouring bonds, the CGFH23 contract CTD has generally cheapened while the CTD for the CGZH23 contract has generally been richening when measured via the swap spread butterfly.

FIGURE 5

H23 CTD Swap Spread Butterflies



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

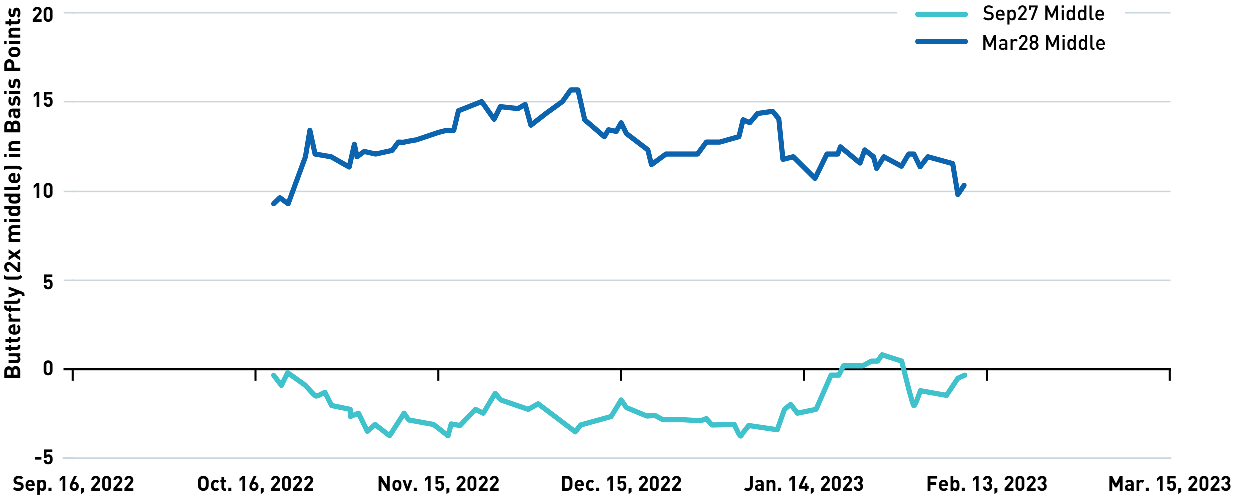
Probably the most compelling story in relative value this quarter is the difference in valuation between the September 2027 bond, considered CTD for the CGFH23 contract, and the March 2028 bond, deemed CTD for the CGFM23 contract. The latter bond is quite a lot cheaper versus neighbours which is probably due to the auction supply as depicted in Figure 6. Investors taking a short position in the CGFM23 contract should be aware that the sole CTD for this contract is currently a lot cheaper than other bonds.

2 "2023 The Future of Futures", published by Montréal Exchange.

3 For more details, please refer to Advisory Notice A23-002.

FIGURE 6

Sep27 v. Mar28 Bond Yield Butterflies

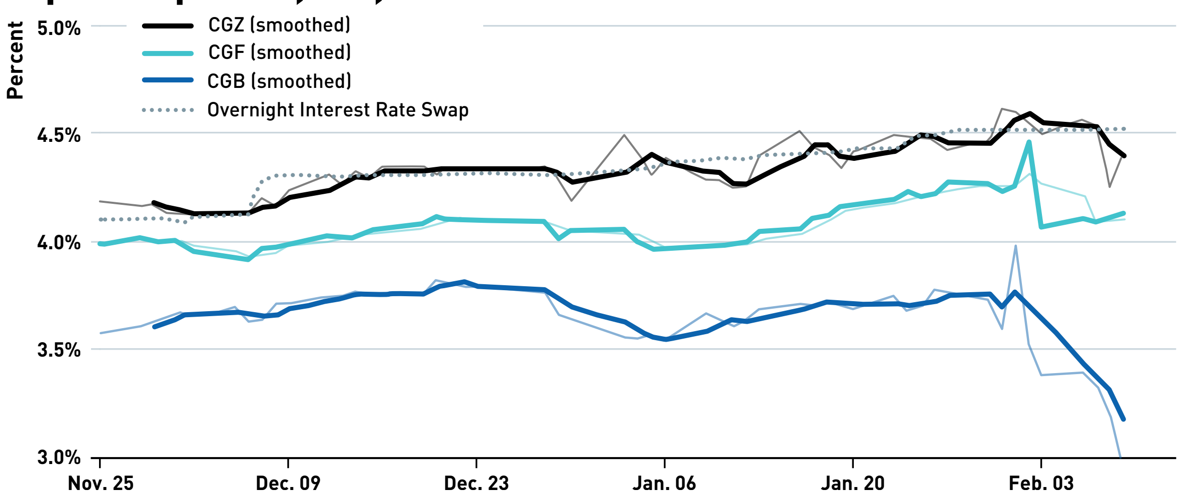


Source: BMO Capital Markets[i] Fixed Income Sapphire database

In fact, much like last quarter, several Canadian fixed income contracts this quarter have been cheap relative to their CTD bond when measured by gross basis or implied repo although the CGZH23 (2-year) contract has traded reliably close to fair value and the LGBH23 (30-year) contract, now stripped of its value-distorting Wildcard option, trades almost exactly at fair value. Figure 7 shows the implied repo level of the CGZ, CGF, and CGB contracts during the quarter along with the daily level of the overnight interest rate swap to delivery. The CGZH23 (the March 2-year contract) has been quite well-behaved in terms of keeping to fair value while the CGFH23 contract has traded, and remains, quite cheap relative to bonds; the implied repo level is too low.

FIGURE 7

Implied Repo: CGZ, CGF, CGB



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

At first glance, the CGBH23 (10-year) contract appears to be even cheaper relative to bonds but the contract must reflect the value of the Wildcard option. In fact, the low price for the contract mostly reflects the value of the embedded Wildcard option for which investors must be compensated for taking on a short basis position in that contract. For more on the value of the Wildcard options this quarter, see the appropriate section below.

Key Metrics & Expectations

We show some Key Metrics of importance to managers with March 2023 positions in Figure 8, Figure 9, Figure 10, and Figure 12. We used closing prices on February 9th and have reduced the number of CTD bonds outstanding by the holdings of the Bank of Canada, where applicable[4]. As is usual with the back contracts, none of the June contracts had traded on our price capture date so the indicated prices for the M23 contracts, and any analysis driven by the price of those contracts, are not based on a tradeable market level at this time.

CGBH23 to CGBM23

There is no change of CTD for the CGB contract this quarter so the roll should be somewhat more stable and orderly than usual given that managers can safely place standing orders.

When the 7.5 cents of value from the Wildcard option is included, the CGBH23 trades about 2.5 cents cheaper than fair value. Thousands of contracts are almost certain to be taken into delivery as shorts angle for a Wildcard option payoff, albeit a payoff that is unlikely to exceed what was extracted last quarter.

We expect there to be excess liquidity demands on CGBH23 from the selling side as the roll period approaches since most long CGB positions will want to exit before facing the uncertainty of the Wildcard. We suspect the contract has cheapened already for this reason as shown above in Figure 7.

FIGURE 8

CGB Key Metrics

9-FEB-2023	FRONT (MAR23)	BACK (JUN23)	DIFFERENCE
Closing Price	124.840	124.490	0.350
Cheapest-to-Deliver (CTD)	CAN 1.500% Jun 2031	CAN 1.500% Jun 2031	No change
Delivery Years (Last delivery)	8.2	7.9	-0.2
CTD Conversion Factor	0.7105	0.7174	
CTD Clean Price	88.6660	88.6660	
CTD Yield	3.057%	3.057%	0.000%
Gross Basis (cents)	-3.3	-64.3	
Probable Delivery Date	01-Mar-23	01-Jun-23	
Net Basis (cents)	7.7	9.8	2.1
Implied Repo (to Prob. Delivery)	2.53%	4.14%	1.61%
DV01/100 of CTD	6.8	6.8	0.0
Open Interest	528,096	0	
CTD Outstanding (millions)	31,144	31,144	0
CTD Notional of Front OI	52,810	52,810	
Front OI Multiple of CTD	1.7x	1.7x	0.0x

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

CGZH23 to CGZM23

The CGZH23 contract is currently trading about 2 cents cheap to fair value with a 4.1% implied repo to First Delivery; overnight interest rate swaps are at 4.51% to that date.

The CGZH23 contracts will be delivered early as overnight interest rates now exceed the CTD coupon by 150 basis points and no one expects to make anything on any of the embedded options. The CTD will change this quarter, as is usual with the 2-year contract, from the November 2024 bond to the February 2025 bond. The DV01 extension of 14% is slightly higher than normal for the contract which will cause the fair value of the roll to vary with the level of interest rates. Managers should be wary of leaving standing orders in today's volatile rate environment as the price difference on the roll could be more than five cents on a volatile day.

The 3.75% coupon on the November 2024 bond means long basis positions in the CGZM23 contract will carry negatively and the contract will initially be priced to First Delivery with a negative basis level. Although unlikely, a large reduction of the target rate by the Bank of Canada could change that. Long positions should try to roll early given the completely unjustified cheapness of the March contract and near certain early delivery.

4 The Bank lends their holdings, so the bonds are still available to deliver. The Bank does not hold most of the newer bonds that are now cheapest-to-deliver into some of the March and June contracts.

FIGURE 9

CGZ Key Metrics

9-FEB-2023	FRONT (MAR23)	BACK (JUN23)	DIFFERENCE
Closing Price	103.080	102.850	0.230
Cheapest-to-Deliver (CTD)	CAN 3.000% Nov 2024	CAN 3.750% Feb 2025	Change!
Delivery Years (Last delivery)	1.6	1.6	0.0
CTD Conversion Factor	0.9530	0.9648	
CTD Clean Price	98.1800	99.5670	
CTD Yield	4.102%	3.980%	-0.123%
Gross Basis (cents)	-5.5	33.7	
Probable Delivery Date	01-Mar-23	01-Jun-23	
Net Basis (cents)	2.1	56.1	54.0
Implied Repo (to Prob. Delivery)	4.10%	2.65%	-1.45%
DV01/100 of CTD	1.6	1.9	0.2
Open Interest	98,065	0	
CTD Outstanding (millions)	16,500	15,000	-1,500
CTD Notional of Front OI	9,807	9,807	
Front OI Multiple of CTD	0.6x	0.7x	0.1x

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

CGFH23 to CGFM23

The CTD for the 5-year contract (CGF) change from the September 2027 bond to the 3.5% March 2028 on the roll to the CGFM23 contract. The Bank of Canada target rate far exceeds the coupon on the CTD for both contracts so both will price to early delivery (again, a negative basis to the CTD bond) given existing market expectations.

The CGFH23 contract is trading at about one cent cheap to bonds with an implied repo of just 3.95% to First Delivery at time of writing: that's after accounting for the 1.8 cent value of the embedded Wildcard option. Further, as discussed above, algorithmic speculative models appear to be very short this contract and their aversion to approaching the delivery period will probably put upward price pressure on front contracts relative to the back contracts. Short positions should try to roll early to avoid the rush to buy H23. Note however that the March 2028, CTD for the M23 contract but not the H23 is much cheaper relative to neighbouring bonds as we discussed in the relative value section above.

FIGURE 10

CGF Key Metrics

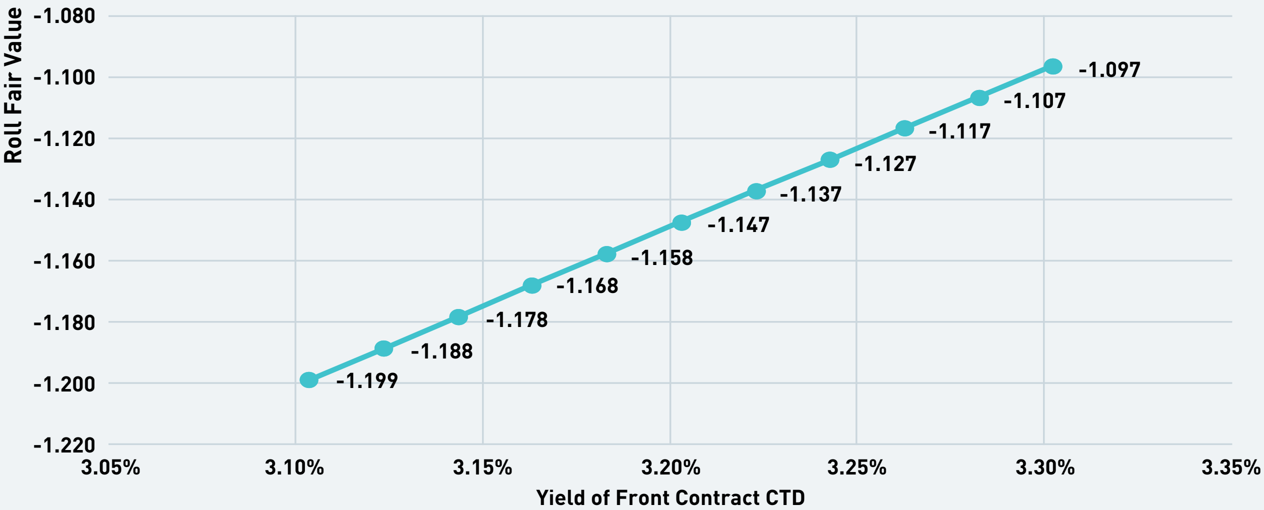
9-FEB-2023	FRONT (MAR23)	BACK (JUN23)	DIFFERENCE
Closing Price	112.350	113.310	-0.960
Cheapest-to-Deliver (CTD)	CAN 2.750% Sep 2027	CAN 3.500% Mar 2028	Change!
Delivery Years (Last delivery)	4.4	4.7	0.2
CTD Conversion Factor	0.8735	0.8979	
CTD Clean Price	98.0980	101.6024	
CTD Yield	3.203%	3.154%	-0.049%
Gross Basis (cents)	-4.0	-13.9	
Probable Delivery Date	01-Mar-23	01-Jun-23	
Net Basis (cents)	3.6	20.0	16.4
Implied Repo (to Prob. Delivery)	3.94%	3.95%	0.01%
DV01/100 of CTD	4.2	4.7	0.5
Open Interest	119,466	0	
CTD Outstanding (millions)	16,000	11,500	-4,500
CTD Notional of Front OI	11,947	11,947	
Front OI Multiple of CTD	0.7x	1.0x	0.3x

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

The DV01 extension is about 10% and the fair value of the roll will be unstable intraday so managers will need to monitor their orders closely. As we show in Figure 11, a 10 basis points wide intraday move in the 5-year yield would result in a change of almost 5 cents on the roll: beware of leaving standing orders this quarter.

FIGURE 11

CGFH23/CGFM23 Roll Fair Value v. Rate Level, Feb 22/23



LGBH23 to LGBM23

The LGB contract is a little different from the rest of the contracts now and we are uncertain how this roll period will play out. There is no "delivery period" or first/last notice dates as all notices to deliver will take place on the last trading day, without exception. This change eliminates any opportunity to deliver early for those with short positions, and thus eliminates a lot of optionality, but also mitigates any threat of early delivery. One could argue that there is no longer any compelling reason to start rolling the contract when all the other contracts are rolling to a new active contract. The roll may begin and end with the others… or it might not. We suspect many contracts will roll at the normal time and drag the rest with them as open interest and liquidity falls but we will be observing this roll in LGB contracts carefully to see if a new convention emerges. There is no change to the CTD as the new 2055 bond has been excluded[5] from the delivery basket for June contracts. The contract was trading exactly at fair value on February 9th.

FIGURE 12

LGB Key Metrics

26-JAN-2023	FRONT (MAR23)	BACK (JUN23)	DIFFERENCE
Closing Price	173.600	173.650	-0.050
Cheapest-to-Deliver (CTD)	CAN 2.000% Dec 2051	CAN 2.000% Dec 2051	No change
Delivery Years (Last Trading Day)	28.7	28.4	-0.2
CTD Conversion Factor	0.4551	0.4570	
CTD Clean Price	78.8454	78.8454	
CTD Yield	3.118%	3.118%	0.000%
Gross Basis (cents)	-16.0	-51.3	
Probable Delivery Date	22-Mar-23	21-Jun-23	
Net Basis (cents)	-0.1	3.7	3.8
Implied Repo (to Prob. Delivery)	4.52%	4.39%	-0.13%
DV01/100 of CTD	16.3	16.3	0.0
Open Interest	681	0	
CTD Outstanding (millions)	33,810	33,810	0
CTD Notional of Front OI	68	0	
Front OI Multiple of CTD	0.0x	0.0x	0.0x

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

5 For more details, please refer to Advisory Notice A23-002.

Wildcard Option Value

The LGB contract no longer has an embedded Wildcard option due to the recent change of contract specifications. Further, the Wildcard option embedded in the CGZ (2-year) contract, where conversion factors are always very high at around 0.95, has a negligible value of around 0.2 cents per CGZ contract this quarter.

The CGFH23 (5-year) contract Wildcard option value is also low due to relatively high conversion factors; we calculate its value at approximately 1.8 cents per CGF contract this quarter, a value which explains most of the relative cheapness observed in the contract recently, although we suspect few managers utilize this particular contract for Wildcard trades.

Wildcard exercise is possible in CGBH23 (10-year) contracts since the conversion factor of 0.7105, due to the low coupon on the CTD bond, makes the option reasonably valuable, although the value has declined relative to the December 2022 contracts as a result of lower late-afternoon volatility (Figure 13) and a somewhat higher conversion factor on the CTD. We value the option at 7.5 cents per contract this quarter, down from about 8.5 cents last quarter.

FIGURE 13

CGB CTD bond, 3pm-5pm Price Change Standard Deviation

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

Long positions going into delivery could experience a Wildcard exercise against their position. We note that, highlighted in Figure 13, price volatility in the afternoon has spiked upward on the first or second day of the delivery month in each of September and December 2022 allowing CGB short positions to profitably exercise the embedded option. This is perplexing as the mere existence of Wildcard options should drive late-afternoon volatility lower during delivery rather than higher.

LOOKING FORWARD & Opportunities

- Roll prices should be less volatile given that timing options are fully priced. In addition, with front end rates out of play for now, large changes in the implied repo rate for either the front or back contracts are not expected.
- Investors may look to buy the CGFM23 contract versus neighbouring bonds in a butterfly trade to capture some of the cheapness in the CTD. Alternatively, an invoice spread could be entered in the hopes of capturing some richening of the CTD relative to the swap market.

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