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CGF Five-Year Government of Canada Bond Futures

CGB Ten-Year Government of Canada Bond Futures

MONTRÉAL EXCHANGE

Z20-H21 Roll Update

November 2020

Quarterly Roll Summary

First Notice day is November 27th and the liquid days for the contract roll on both CGF and CGB will probably be November 23rd and 24th, given the Thanksgiving holiday south of the border on November 26th. We expect a roll period that is neither overly volatile nor boring for nimble managers this quarter given the absence of many factors that would normally inject volatility to the roll but quite a few remaining speculative positions.

There will be no delivery basket changes for either the CGF or CGB contract this quarter. There is a potential story in the shortage of deliverable bonds for the CGB contract as the Bank of Canada has now purchased almost 45% of the Jun29s – the CTD (cheapest-to-deliver) bond for both the Z20 and H21 contracts.

A Relatively Quiet Roll

Last quarter, we described the conditions to create a volatile roll period and noted the near absence of all three factors[1]. This quarter will likely have similar dynamics with the added lack of a change in the delivery basket for CGF between the Z20 and H21 contracts. Unless something unusual happens into month end, this roll will likely trade close to fair value most of the time. We summarize the factors below:

- The Bank of Canada is not "in play." Recent comments as well as virtually all economic measures have assured us that no target rate changes are contemplated at this time. The fair value of the roll is easily established by virtually any sophisticated market participant and overnight rate expectations are unlikely to change.
- The embedded options in CGF, and especially in CGB, are near-worthless. Only the Wildcard option in a short CGF position has any real probability of being exercised profitably.
- There is some chance that a supply/demand imbalance may exist between the futures contracts and underlying bonds this quarter. We think speculative trend-followers may have been recently enticed into Canadian interest rate markets from the long side given recent price action.

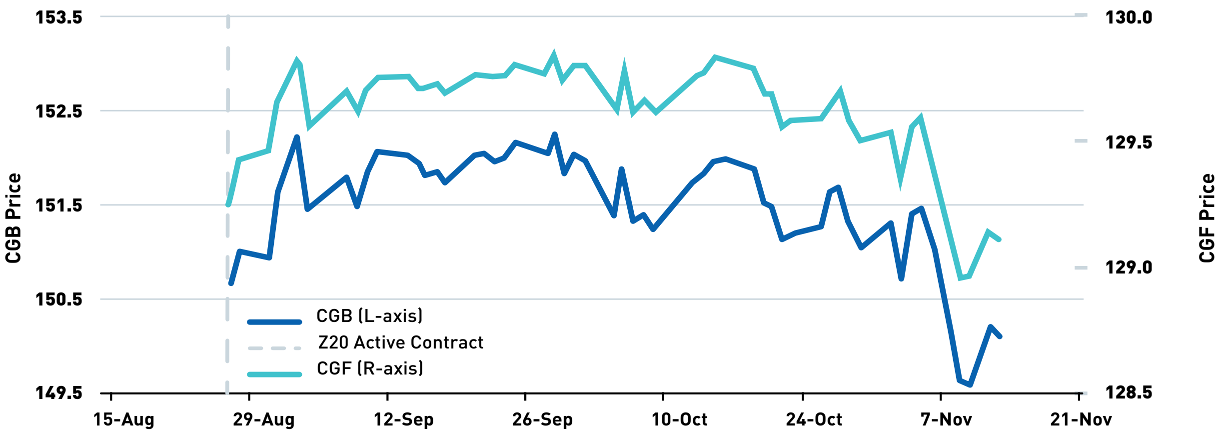
Speculative Positioning

As shown in Figure 1, prices were reasonably stable in both CGF and CGB near the start of the contract life such that trend-following accounts were probably not involved, or at least not much, until around mid-October. After that time, prices in both CGF and CGB began falling and that price action has only accelerated in November, apart from the final two days before November 13th. We believe the recent fall in prices (rise in yields) has caused speculative accounts to build short positions that are still held at the time of writing.

1 Refer to the U20/Z20 Roll Update for additional detail.

FIGURE 1

CGF & CGB Price, Z20s

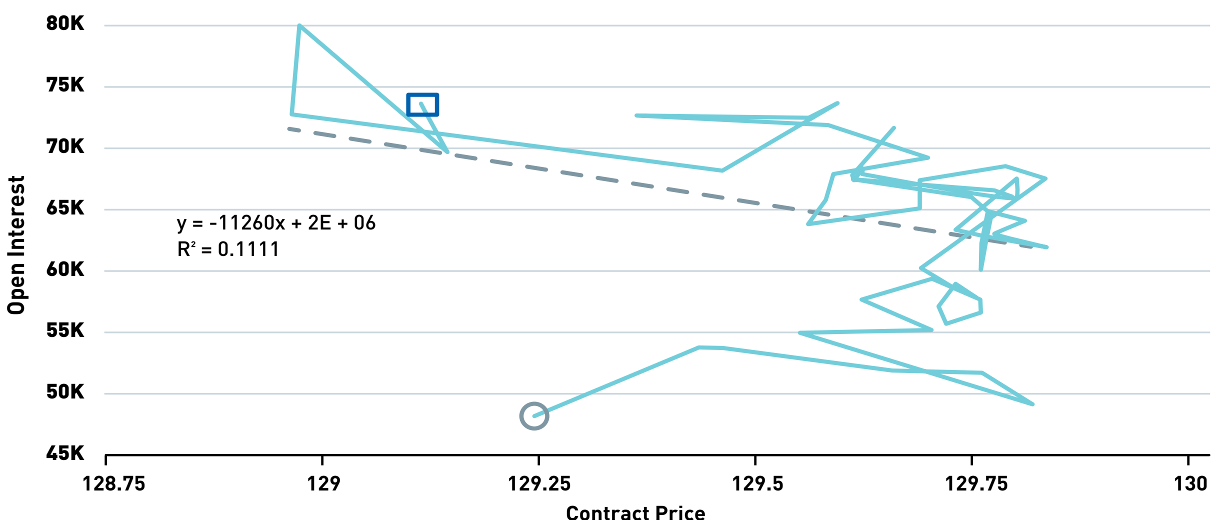


Source: Montréal Exchange

Initially, correlation analysis between open interest and contract prices reveals that little or no correlation existed this quarter between open interest and price for either CGF or CGB. These plots are shown in Figure 2 and Figure 3, respectively, where the date the contract became the active contract is circled in grey and November 13th is in the blue square. However, the analysis is troubled by the falling price trend established mid-quarter where, notably, contract open interest rose and, even more notably, did not fall despite the new trend. We theorize that, given the low volatility of interest rates and absence of painful price reversals this quarter relative to recent quarters, algorithmic models were adding to risk positions throughout the quarter and still hold many of those long positions.

FIGURE 2

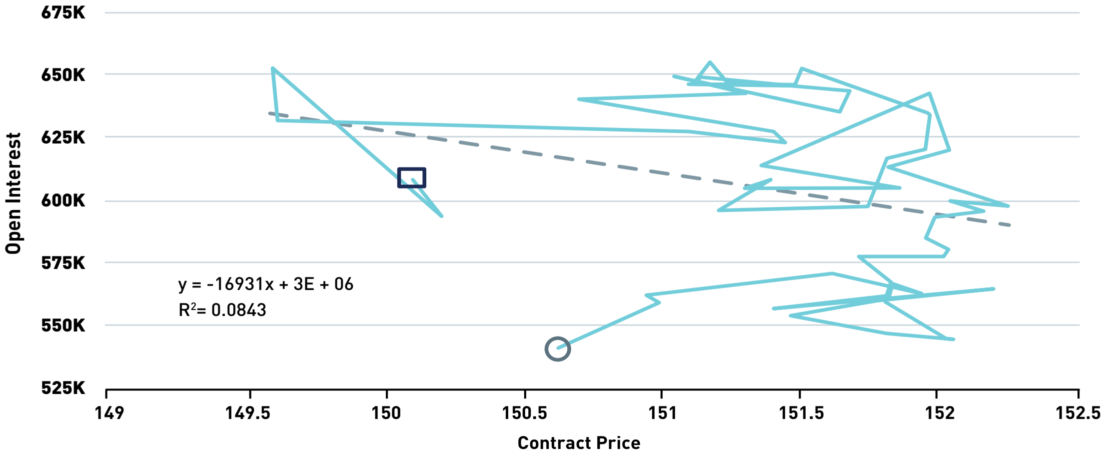
CGFZ20 Price versus Open Interest



Source: Montréal Exchange

FIGURE 3

CGBZ20 Price Versus Open Interest



Source: Montréal Exchange

Cheapest-to-Deliver Switch

To the disappointment of clients that trade basis and to the joy of clients that use futures solely as a hedge or substitute for bonds, low rates and historically flat curves have rendered the potential for a cheapest-to-deliver switch in either CGF or CGB a distant memory. Switch potential is higher for higher rates and steep curves. Switches are still possible, of course, but highly theoretical and completely improbable at current interest rates. In Figure 4, we show that 5-year yields would need to rise by 175 basis points and the 0.25% March 2026 must underperform the current CTD by 35 basis points (5-year sector of the yield curve steepens) for a switch to occur; an incredibly improbable scenario. Similar improbable scenarios exist for CGB.

FIGURE 4

	Sep25 Yield															
SLOPE	0.26%	0.31%	0.36%	0.41%	**0.46%**	0.71%	0.96%	1.21%	1.46%	1.71%	1.96%	2.21%	2.46%	2.71%	2.96%	3.21%
0	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep
1.3	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep
2.6	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep
3.8	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep
5.1	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep
6.4	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**	**25-Sep**
15.1	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep
23.8	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep
32.6	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	26-Mar	26-Mar
41.3	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	25-Sep	26-Mar	26-Mar	26-Mar	26-Mar	26-Mar
50	25-Sep	25-Sep	25-Sep	25-Sep	**25-Sep**	25-Sep	25-Sep	25-Sep	26-Mar	26-Mar	26-Mar	26-Mar	26-Mar	26-Mar	26-Mar	26-Mar

With no reasonable scenario for a switch of deliverable, the embedded quality option and end-of-month options[2] are completely worthless. We discuss the Wildcard potential in a section below.

2 For a full discussion of the embedded options in physical delivery bond futures in Canada, please refer to "Embedded Options in CGF and CGB" published in November 2018.

Relative Value

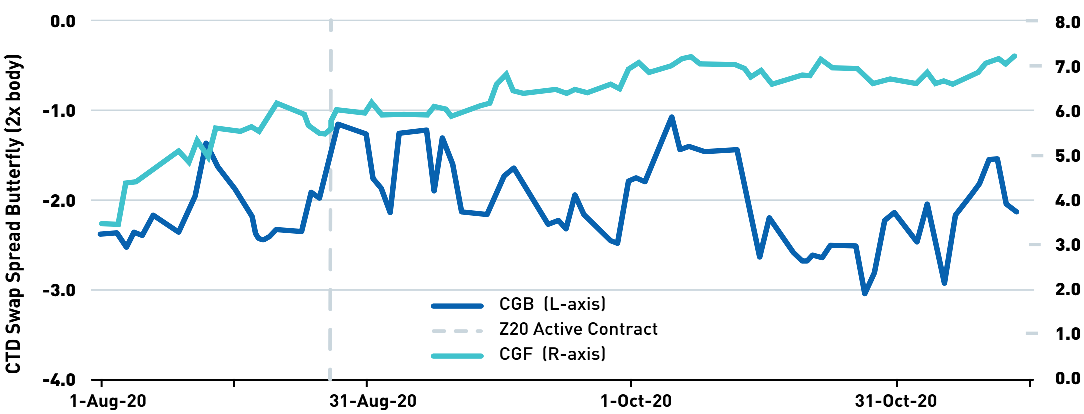
Figure 5 plots the swap spread butterfly[3] for the CTD of both the CGF[4] and CGB contracts this quarter. As usual, a move lower on the chart indicates that the CTD became richer relative to its closest neighbour bonds while a move towards the top of the chart indicates the CTD became cheaper relative to neighbour bonds. The vertical grey line indicates the date on which Z20 became the active contract.

The figure is one of our standard analyses used to determine if the CTD has come under unusual buying or selling pressure during the quarter. However, during the emergency monetary policy measures undertaken by the Bank of Canada for the current pandemic, we note that nearly all bonds are under unusual buying pressure as Bank holdings of Canada bonds alone is now $271 billion, up from $77 billion on April 1, 2020. That the Bank has managed to buy nearly 45% of the outstanding Jun29 bond, which is the CTD for all CGB contracts until the roll from M21 to U21 in late May, without drastically moving the relative value of that bond relative to its neighbours is quite remarkable.

The CTD for CGF this quarter, on the other hand, has suffered a steady but slight cheapening from about 5.5 to 7 basis points relative to neighbour bonds; not enough to stand out as anything but a gradual cheapening of the current 5-year benchmark bond or, similarly, a gradual richening of the next 5-year benchmark bond.

FIGURE 5

Z20 CTD Swap Spread Butterflies



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

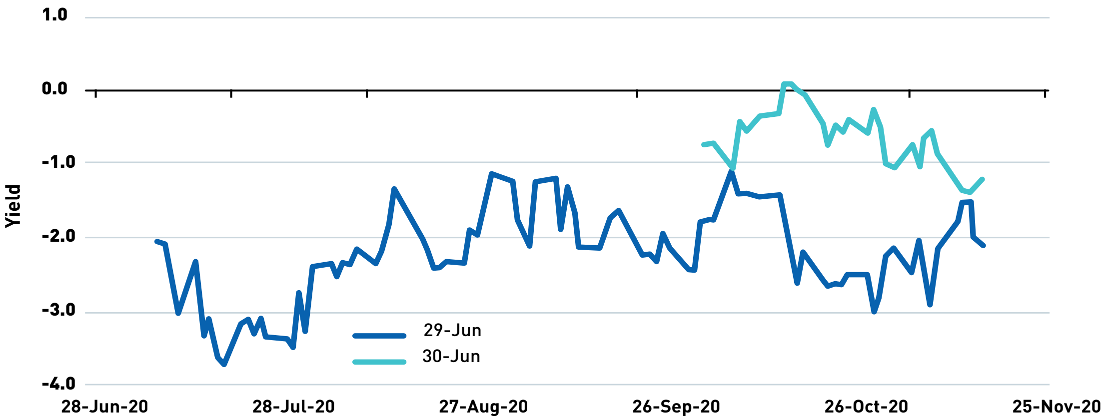
Last quarter, we identified a potential opportunity when we observed that auction bonds in both CGF and CGB were cheap relative to off-the-runs (due to Bank of Canada buying). Much of that trade has now run its course for the Jun30 bond as the swap spread butterfly has collapsed to roughly the same level as that of the Jun29, as shown in Figure 6. For those participating in this trade, it is time to move on to the new 10-year auction bond, the Dec30.

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.

4 We have used the 1.5% Jun26 bond for the second wing of the CGF butterfly to generate a longer history.

FIGURE 6

Jun30 versus Jun29 Swap Spread Butterfly



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

Key Metrics & Expectations

Key Metrics that may interest a Portfolio Manager with a position in Z20 contracts who is contemplating his/her roll strategy this week are shown in Figure 7 and Figure 8. We used closing prices on November 13th and have reduced the number of CTD bonds outstanding by the now significant holdings of the Bank of Canada. Both the CGFH21 and CGBH21 contracts had no open interest on November 13th so the indicated prices, and any analysis driven by the price, is not based on a tradeable market level at this time.

With coupons on both the CTD of the CGF and CGB contracts currently above the overnight rate, the Z20 and H21 contracts will both carry positively during delivery, barring an unanticipated change in target rate[5]. Use the Final Delivery date to calculate implied repo or net basis unless the Bank of Canada very unexpectedly raises the overnight rate.

CGFZ20 to CGFH21

With no change in the delivery basket or CTD, the contract DV01 will change only slightly when CGFH21 becomes the active contract.

An implied repo of just 0.15% at time of writing means the Z20 CGF contract prices cheap relative to bonds by just over one cent. If CGFH21 prices closer to fair value when liquidity begins to build, short positions in Z20 may choose to roll earlier rather than later to capture the cheapness in that contract.

Despite relatively high open interest, we expect a calm and stable roll to occur with no viable reason for volatility to enter the relative pricing of the two contracts. Fair value for the Z20/H21 roll on November 24th will be around 1.78 given the extremely flat overnight interest rate swap curve.

FIGURE 7

CGF Key Metrics

13-NOV-2020	FRONT (DEC20)	BACK (MAR21)	DIFFERENCE
Closing Price	129.11	127.32	1.79
Cheapest-to-Deliver (CTD)	CAN 0.500% Sep 2025	CAN 0.500% Sep 2025	No change
Delivery Years (Last Delivery)	4.7	4.4	-0.2
CTD Conversion Factor	0.7756	0.7859	
CTD Clean Price	100.18	100.18	
CTD Yield	0.462%	0.462%	0.00%
Gross Basis (cents)	4.2	11.9	
Net Basis (Final Delivery, cents)	1.2	2.8	1.5
Implied Repo (Final Delivery)	0.15%	0.18%	0.03%
DV01/100 of CTD	4.7	4.7	0

5 CGFH21 could conceivably carry negatively since the CTD, the 0.5% Sep25, has a low coupon. A mere 25-50 basis points rise in the overnight rate would cause this contract to “flip” to negative carry in delivery and cause a rapid repricing of basis to reflect early delivery. With a 2.25% coupon on the CTD bond, the CGBZ20 and CGBH21 contracts will carry positively with near certainty.

Open Interest	73,444	0	
CTD Outstanding (millions)	29,847	29,847	0
CTD Notional of Front OI	7,344	7,344	
Front OI Multiple of CTD	0.2x	0.2x	0.0x

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

CGBZ20 to CGBH21

We believe that a lot of speculative long positions were accumulated this quarter and that they are still open at this time. In addition, the Bank of Canada has continued to aggressively buy the CTD bond with a net result that the notional equivalent of the CGBZ20 is almost nine times the notional available of the 2.25% Jun 2029 that all existing short positions would need to make delivery[6]. This could impart some nervousness to short positions who have no desire to bid against each other to obtain bonds if they choose to deliver.

The current cheap pricing of the Z20 contract (relative to the CTD), with an implied repo of 0.17%, was absent before the 10 basis points bond selloff began in November. Given the cheapness in Z20 and fair value of the contract about one cent higher, short positions should probably try to roll early while long positions in Z20 will try to wait for better prices later in the roll period, if they can.

Large speculative long positions may result in early selling pressure on Z20 but cheap contracts and some potential nervousness about a lack of bonds to deliver, if it comes to that, should result in buying pressure for Z20 contracts. Since the expected buying and selling pressure can only be expressed via incremental price changes, we suspect that this roll period will offer many intraday opportunities for roll or contract liquidity providers on both the sell and buy sides of the street.

FIGURE 8

CGB Key Metrics

13-NOV-2020	FRONT (DEC20)	BACK (MAR21)	DIFFERENCE
Closing Price	150.09	148.32	1.77
Cheapest-to-Deliver (CTD)	CAN 2.250% Jun 2029	CAN 2.250% Jun 2029	No change
Delivery Years (Last delivery)	8.4	8.2	-0.2
CTD Conversion Factor	0.7531	0.7587	
CTD Clean Price	113.278	113.283	
CTD Yield	0.649%	0.648%	0.001%
Gross Basis (cents)	24.5	75.3	
Net Basis (Final Delivery, cents)	0.8	3.2	2.3
Implied Repo (Final Delivery)	0.17%	0.17%	0.00%
DV01/100 of CTD	8.9	8.9	0
Open Interest	608,669	0	
CTD Outstanding (millions)	6,802	6,802	0
Bond Equivalent Notional	60,867	60,867	
Multiple of Outstanding	8.9x	8.9x	0.0x

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

Wildcard Potential

We calculate and show the price move threshold for CGBZ20 during each day of the delivery period in Figure 9. The hurdle is quite high as it starts at about a 6 basis points rally in bonds needed at the start of the delivery period and declines to about 2 basis points by the day before the final trading day. Positive carry makes the conditions for a successful exercise somewhat unlikely but geopolitical conditions are seemingly always "in play" in 2020 so we would not rule it out. In addition, there is a Bank of Canada fixed announcement date on December 9th, halfway through the delivery period, as well as a December 16th Federal Reserve announcement.

6 Of course, >95% of all short positions will be closed prior to the delivery period.

FIGURE 9

CGBZ20 Wildcard Threshold

DATE	Remaining Carry ($ per contract)	Minimum Δ CTD Price to Exercise Wildcard
27-Nov-20	214.65	0.655
30-Nov-20	207.5	0.633
1-Dec-2020	200.34	0.611
2-Dec-2020	193.19	0.589
3-Dec-2020	171.72	0.524
4-Dec-2020	164.57	0.502
7-Dec-2020	157.41	0.48
8-Dec-2020	150.26	0.458
9-Dec-2020	143.1	0.436
10-Dec-2020	121.64	0.371
11-Dec-2020	114.48	0.349
14-Dec-2020	107.33	0.327
15-Dec-2020	100.17	0.306
16-Dec-2020	93.02	0.284
17-Dec-2020	71.55	0.218

A wildcard exercise in CGFZ20 is more likely than in CGB this quarter, although we remain unconvinced that a lot of relative value basis trading is occurring in this contract. A mere 1.5 basis points fall in yields between 3pm and 5pm ET at the start of the delivery period and less than a half basis point fall on December 17th would result in a profitable Wildcard option exercise in CGFZ20 long basis positions.

FIGURE 10

CGFZ20 Wildcard Threshold

DATE	Remaining Carry ($ per contract)	Minimum Δ CTD Price to Exercise Wildcard
27-Nov-20	26.41	0.091
30-Nov-20	25.53	0.088
1-Dec-2020	24.65	0.085
2-Dec-2020	23.77	0.082
3-Dec-2020	21.13	0.073
4-Dec-2020	20.25	0.07
7-Dec-2020	19.37	0.067
8-Dec-2020	18.49	0.064
9-Dec-2020	17.61	0.061
10-Dec-2020	14.97	0.052
11-Dec-2020	14.09	0.049
14-Dec-2020	13.21	0.046
15-Dec-2020	12.33	0.043
16-Dec-2020	11.45	0.04
17-Dec-2020	8.8	0.03

CDCC Delivery Reports[7] for both CGFU20 and CGBU20 contracts show that no Wildcard option exercises occurred in the September delivery period.

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

Looking Forward & Opportunities

- CGF investors should note that timing options will be in play for M21 contracts (but probably not H21) given the extremely low coupon on the 0.25% Mar26, which will be that contract's CTD. Investors should be aware of the repercussions such as potential early delivery and gross basis that prices negative for that contract, although they do still have three months to prepare.
- Larger bond issuance for fiscal spending associated with COVID-19 has resulted in a change to the issuance cycle for 10-year bonds. December maturities, in addition to the usual June, will be the norm, at least for the time being, and a new December 1, 2030 bond has been created since the last quarterly roll. This will change the existing CGB dynamic as the previous norm of a single annual change in the delivery basket when the active contract moves from June to September will become a twice annual event. While important, this change is essentially a medium-term waiting game for CGB relative value clients as the Dec30 bond will not become the likely CTD until M22 contracts roll to U22 in late May 2022, or about 18 months from now.
- Opportunities remain to play auction bonds against hedges of CGB and CGF contracts as auction bonds often become relatively cheap relative to off-the-runs. The Bank of Canada exhibits a pattern of buying less of the auction bond versus nearby maturities, which is shown in Figure 11 where CTD bonds and auction bonds are highlighted. Relative value investors may be able to buy auction bonds, hedge with CGB or CGF – where the CTD is an off-the-run bond – and capture the auction discount.
- We reiterate, again, that the potential for a switch of CTD for any CGB contract until the CGBU22 is basically zero. High coupons and shorter maturities are favored by CTD math. For U20 to M21, the 2.25% June 2029 CTD is a year shorter in maturity and a full percentage point higher in coupon than the next-in-line bond in the delivery basket making switch potential almost nonexistent. Further, the new Dec30 has an even lower 0.5% coupon, although the difference in term-to-maturity between this bond and the Jun30 will be only 6 months. We confidently predict that no switch potential exists for CGB contracts for at least another year and a half.

FIGURE 11

Coupon	Maturity Date	Bank Holdings	Total Outstanding	Percent	Note
1.50%	01-Sep-24	8,361 million	16,065 million	52%	
1.25%	01-Mar-25	10,729 million	17,300 million	62%	
9.00%	01-Jun-25	522 million	2,134 million	24%	
2.25%	01-Jun-25	3,376 million	13,100 million	26%	
0.50%	01-Sep-25	17,653 million	47,500 million	37%	CGF CTD
0.25%	01-Mar-26	1,820 million	10,000 million	18%	5yr Auction
1.50%	01-Jun-26	4,828 million	13,472 million	36%	
4.25%	01-Dec-26	200 million	5,250 million	4%	
1.00%	01-Jun-27	5,727 million	14,740 million	39%	
8.00%	01-Jun-27	2,190 million	3,621 million	60%	
2.00%	01-Jun-28	4,908 million	13,500 million	36%	
5.75%	01-Jun-29	3,618 million	10,599 million	34%	
2.25%	01-Jun-29	5,498 million	12,300 million	45%	CGB CTD
1.25%	01-Jun-30	10,384 million	44,200 million	23%	10yr Benchmark
0.50%	01-Dec-30	1,300 million	10,000 million	13%	10yr Auction
4.00%	01-Dec-31	200 million	5,800 million	3%	
5.75%	01-Jun-33	2,830 million	11,989 million	24%	
3.00%	01-Dec-36	200 million	5,850 million	3%	
5.00%	01-Jun-37	4,286 million	11,731 million	37%	
4.00%	01-Jun-41	4,904 million	13,838 million	35%	
2.00%	01-Dec-41	200 million	6,550 million	3%	
1.50%	01-Dec-44	200 million	7,700 million	3%	
3.50%	01-Dec-45	5,928 million	16,300 million	36%	
1.25%	01-Dec-47	200 million	7,700 million	3%	
2.75%	01-Dec-48	5,243 million	14,900 million	35%	
2.00%	01-Dec-51	7,460 million	27,817 million	27%	30yr Auction
2.75%	01-Dec-64	24 million	4,750 million	1%	

Source: Bank of Canada

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