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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

February 2021

H21-M21 Roll Update

Quarterly Roll Summary

First Notice day is February 25th and the liquid days for the contract roll on the 2-year (CGZ), 5-year (CGF) and 10-year (CGB) will probably be February 22nd and 23rd.

The 2-year contract (CGZ) new to this quarterly update, will have a delivery basket change when the active contract switches from H21 to M21, as will the CGF contract. This is the first CGZ roll with the new contract specifications and significant open interest. Since the contract has active liquidity provision from dealer partners, we expect the roll of this contract to trade tightly around fair value.

There is no delivery basket change for the CGB contract this quarter. The Bank of Canada owns considerable amounts of deliverable bonds for this contract but has publicly committed to, and begun already, repo operations with these bonds. CGB has a speculative short base that will likely contribute to price volatility as a preponderance of short positions attempt to roll early to M21, or close positions entirely.

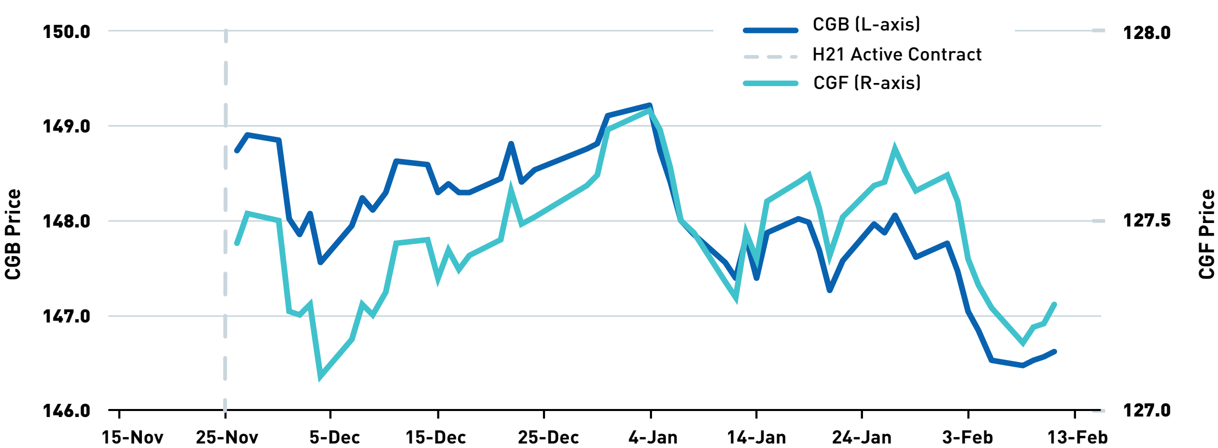
Speculative Positioning

As shown in Figure 1, prices in CGF and CGB followed similar patterns during the life of the H21 contracts. Both the 5-year and 10-year contracts had similar price inflection points during the past three months, with the most severe reversal coming almost exactly on the first trading day of 2021.

After the January 4th reversal point, major trend changes have not been observed and we suspect a substantial short base of speculative investors exists in futures contracts, especially in CGB. In fact, the trend models created by Macro Hive[1] in collaboration with Montréal Exchange show that, taken alone, trend models in CGB with a 1-month or 3-month lookback have had sell signals since mid-December; a sell signal that even predated the trend reversal to lower prices at the start of the year. The CGF model had a similar experience but has recently turned bullish on 5-year contracts.

FIGURE 1

CGF & CGB Price, H21s



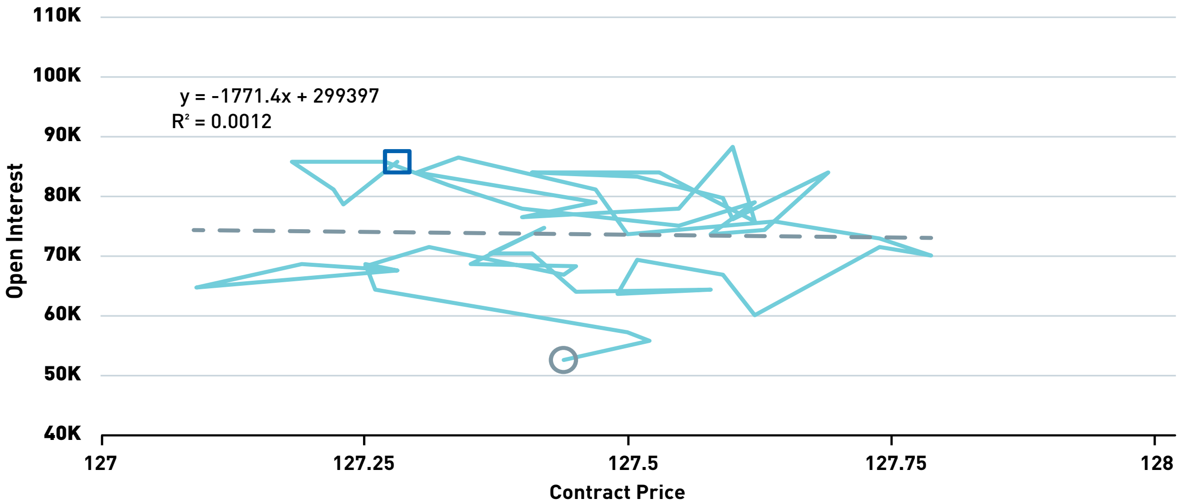
Source: Montréal Exchange

1 For more information, go to m-x.ca/macrohive

Given the reversal halfway through the life of the contract, regressions of open interest against prices initially appear weakly correlated. For example, in Figure 2, where we chart CGF from inception of the H21 contract (circle) to February 11th (square) the overall correlation is almost nothing despite a trend of falling prices and rising open interest in the latter half of the quarter.

FIGURE 2

CGFH21 Price versus Open Interest

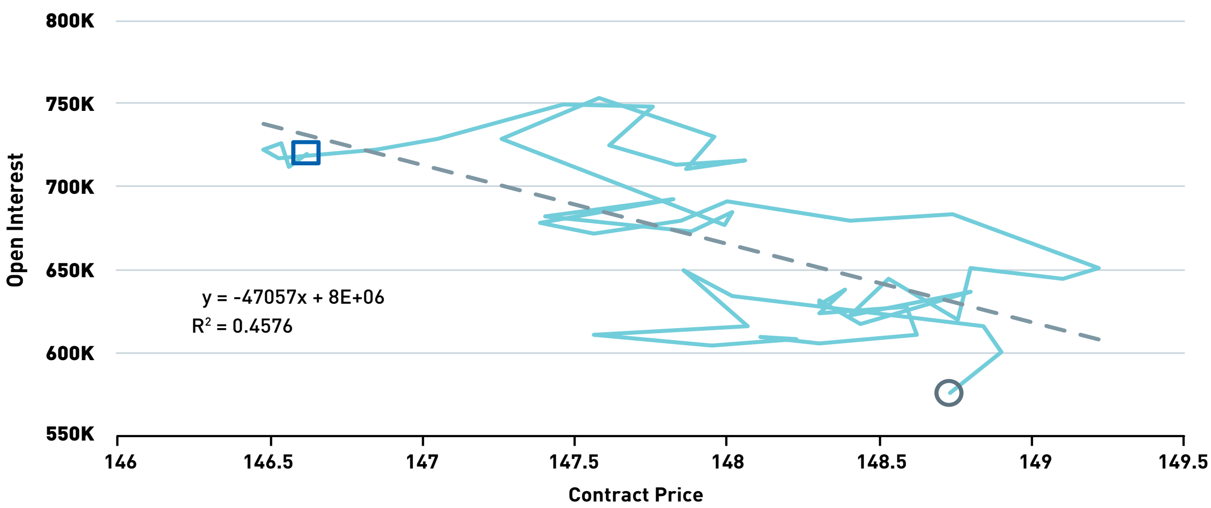


Source: Montréal Exchange

The same pattern is evident in CGB, as shown in Figure 3, but the correlation of open interest to price is stronger in that figure. New positions were increasing the open interest in the contract while prices were going lower. We conclude that the CGB contract has a high likelihood of significant speculative short positions that remained up until at least February 11th when we captured the historical data. As speculative positions are usually held by managers that will not risk entering the delivery period, we expect these short positions to impact the roll pricing as "buy front, sell back" trades should be more prevalent than the reverse early in the roll.

FIGURE 3

CGBH21 Price Versus Open Interest

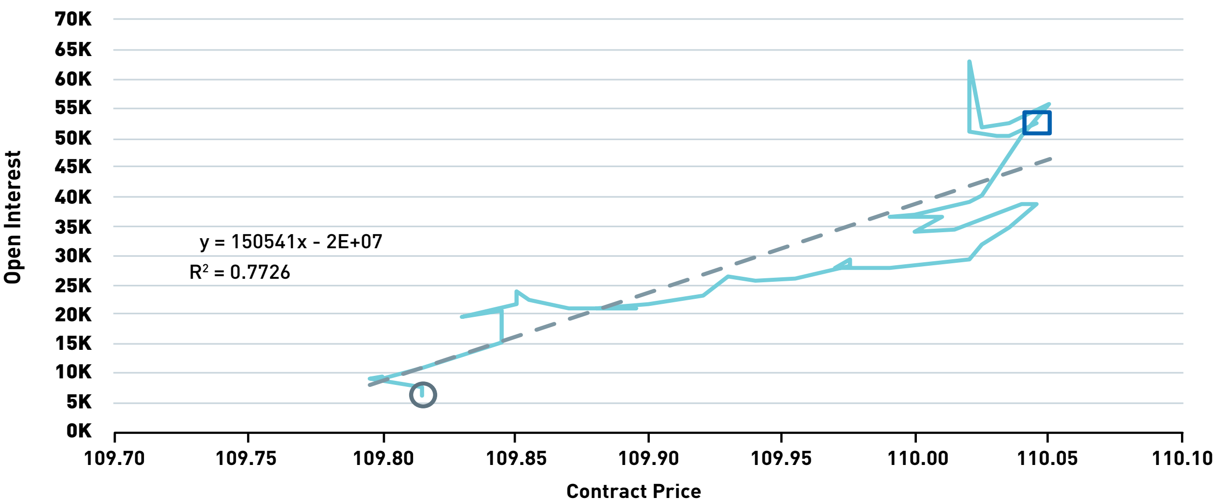


Source: Montréal Exchange

We note that this interpretation of correlation should not be used yet for CGZ contracts. Although Figure 4 shows a highly significant correlation between price and open interest for that contract, prices just happened to be rising during the launch as CGZ open interest slowly increased from almost zero to over 50,000 contracts today. The rising open interest reflects renewed engagement in the contract in general and should not be interpreted as algorithmic models going all-in on CGZ as a rising price trend was established.

FIGURE 4

CGZH21 Price Versus Open Interest



Source: Montréal Exchange

Cheapest-to-Deliver Switch

Switches in the cheapest-to-deliver bond are usually considered a risk by portfolio managers that employ futures contracts as a substitute for bonds, and as an opportunity for those that speculate on relative prices between contracts and bonds. The potential for delivery switches has declined to almost nothing in recent quarters due to the low level (even after the recent selloff) of bond yields and flat curves. Virtually no one should be playing any of the physical delivery fixed income contracts in Canada for switch potential and contracts tend to price as near-perfect substitutes for the shortest maturity bond in the basket.

For CGZ and CGB this quarter, we do not show a yield and slope scenario to quantify the points at which Sep23 would become CTD for CGZM21 or the points at which Jun30 would become CTD for CGBM21. The scenarios are simply too remote to be a worthwhile use of space this quarter.

Although still remote, we depict the yield and slope scenarios for CGFM21 in Figure 5 where we can see that a rise in yields to 1.04% (unlikely) accompanied by about 30 basis points of steepening (even more unlikely) between the March and September maturity dates would cause a switch from the March 26 bond to September 26, thus rewarding short CGFM21 positions with unexpected profits and inflicting unexpected losses on long positions. These scenarios are unlikely and the embedded options that the short position owns in CGF should price at very close to zero, as are those in CGZ and CGB.

FIGURE 5

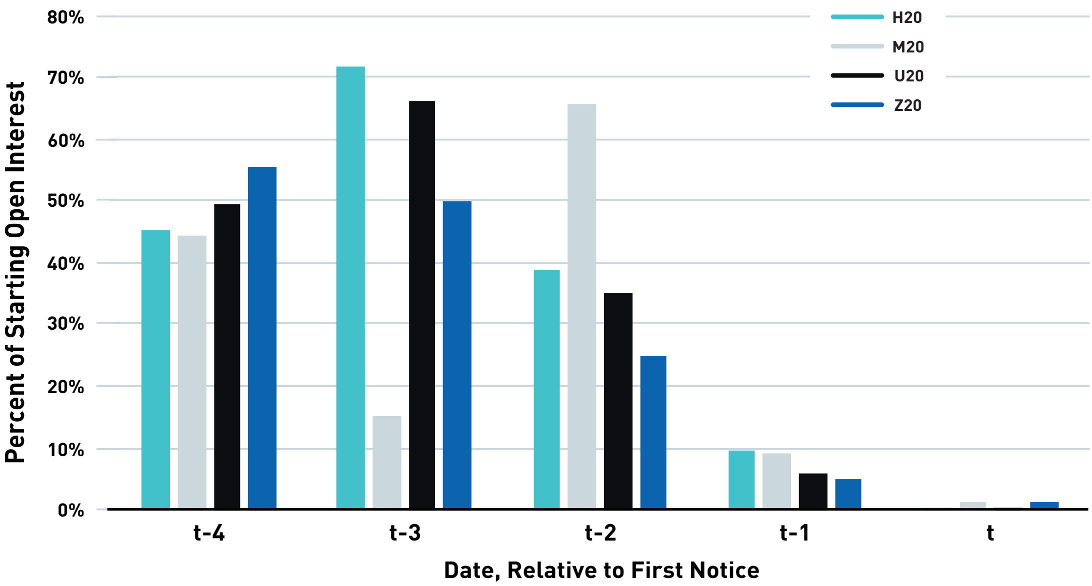
	Mar26 Yield															
SLOPE	0.34%	0.39%	0.44%	0.49%	**0.54%**	0.79%	1.04%	1.29%	1.54%	1.79%	2.04%	2.29%	2.54%	2.79%	3.04%	3.29%
0.0	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26
1.9	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26
3.8	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26
5.7	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26
7.6	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26
9.5	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**	**Mar26**
17.6	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26
25.7	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Mar26	Sep26	Sep26
33.8	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Mar26	Mar26	Mar26	Mar26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26
41.9	Mar26	Mar26	Mar26	Mar26	**Mar26**	Mar26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26
50.0	Sep26	Sep26	Sep26	Sep26	**Sep26**	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26	Sep26

Roll Activity Forecast

Trading volumes in futures rolls follow quite predictable paths and we forecast that about 930,000 contracts of CGBH21 will trade from February 19th to February 25th. We derive this forecast via a simple observation of the activity in the contract during roll periods in 2020. For example, Figure 6 shows the volume of CGB traded on each day for the five days ending on the First Notice date for each of the H20 to Z20 contracts. Instead of plotting total volume, we express each day's contract volume as a percentage of the open interest on t-5.

FIGURE 6

Daily Volume During Roll, 2020



Source: Montréal Exchange

Discarding the unusual M20 contract, where t-3 fell on the Memorial Day holiday in the United States, we simply average the percentage volume of the remaining three contracts to obtain the Percent of Starting Open Interest that is traded during each day immediately prior to First Notice, shown in the appropriate row of Figure 7. In the final row of the same figure, we calculate the expected daily volume from the existing open interest on the CGBH21 contract. Since option plays are not viable this quarter, we are reasonably confident that trading volumes will approximate the results shown in Figure 7, which are about 3-4 times the normal volume levels for CGB on a non-roll date. Experienced market participants will recognize that this elevated trading activity is completely normal during quarterly rolls.

FIGURE 7

DATE	19-FEB-21	22-FEB-21	23-FEB-21	24-FEB-21	25-FEB-21
Percent of Starting OI	50%	63%	33%	7%	1%
Forecast Daily Volume	304,598	380,397	199,426	41,200	3,783

Key Metrics & Expectations

Key Metrics that may interest a Portfolio Manager with a position in H21 contracts who is contemplating his/her roll strategy this week are shown in Figure 8, Figure 9 and Figure 10. We used closing prices on February 11th and have reduced the number of CTD bonds outstanding by the holdings of the Bank of Canada. Only the CGBM21 contract had any open interest on our capture date so the indicated prices for the June contracts, and any analysis driven by the price, is not based on a tradeable market level at this time.

CGFH21 and CGBH21 will both carry positively during the March delivery period as coupons are above the overnight rate. CGZ, which now has over 50,000 contracts of open interest, has a coupon of 0.25% and the implied repo is currently below that level so short positions do not yet have an incentive to deliver early. Use the Final Delivery date to calculate implied repo or net basis for CGF and CGB but be prepared for a possible change to First Delivery date to calculate implied repo for CGZ (only if the current cheapness in the contract disappears, which is not expected).

CGZH21 to CGZM21

The 2-year contract, which launched recently under new contract terms, has grown steadily in open interest to over 50,000 contracts. The contract carries almost perfectly flat in the delivery period so shorts may (or may not) deliver early if any contracts remain open after the First Notice date. The CTD will change from the Nov22 to Feb23 bond for the next contract, a relatively negligible maturity extension. The contract currently prices quite fair at an implied repo of about 0.19%.

At just over $950,000 of DV01 for all the outstanding contracts combined, there is unlikely to be much jockeying for position among shorts and longs in this contract, although the roll period will certainly be a good test of the new liquidity provisions put in place for the launch. If both contracts trade at fair value, we would expect a mid-price of about 5.4 cents for the roll on February 22nd.

FIGURE 8

CGZ Key Metrics

11-FEB-2021	FRONT (MAR21)	BACK (JUN21)	DIFFERENCE
Closing Price	110.045	110.000	0.045
Cheapest-to-Deliver (CTD)	CAN 0.250% Nov 2022	CAN 0.250% Feb 2023	Change!
Delivery Years (Last delivery)	1.6	1.6	0.0
CTD Conversion Factor	0.9101	0.9101	
CTD Clean Price	100.1595	100.1200	
CTD Yield	0.157%	0.189%	0.032%
Gross Basis (cents)	0.7	0.9	
Net Basis (Final Delivery, cents)	0.8	0.9	0.2
Implied Repo (Final Delivery)	0.19%	0.23%	0.03%
DV01/100 of CTD	1.7	2.0	0.3
Open Interest	51,215	0	
CTD Outstanding (millions)	29,847	15,914	-13,933
Bond Equivalent Notional	5,122	5,122	
Multiple of Outstanding	0.2x	0.3x	0.2x

Source: TD, Royal Bank, Montréal Exchange

CGFH21 to CGFM21

The CGFM21 contract will have a different CTD than the H21 contract with the change to an ultra-low coupon 0.25% Mar26 bringing the possibility of negative basis to this contract since the current target rate of the Bank of Canada is the same as the coupon rate. If CGFM21 ever prices to an implied repo of above 0.25%, pricing will switch to reflect early delivery.

An implied repo of just 0.11% at time of writing means the CGFH21 contract prices cheap relative to bonds by almost 1.5 cents. If CGFM21 prices closer to fair value when liquidity begins to build, short positions in H21 may choose to roll earlier rather than later to capture the cheapness in that contract.

Open interest in this contract remains manageable for all participants and we expect a calm and stable roll to occur with no viable reason for volatility to enter the relative pricing of the two contracts.

FIGURE 9

CGF Key Metrics

11-FEB-2021	FRONT (MAR21)	BACK (JUN21)	DIFFERENCE
Closing Price	127.280	128.760	-1.480
Cheapest-to-Deliver (CTD)	CAN 0.500% Sep 2025	CAN 0.250% Mar 2026	Change!
Delivery Years (Last delivery)	4.4	4.7	0.2
CTD Conversion Factor	0.7859	0.7654	
CTD Clean Price	100.0769	98.5375	
CTD Yield	0.483%	0.545%	0.062%
Gross Basis (cents)	4.7	-1.5	
Net Basis (Final Delivery, cents)	1.8	-1.7	-3.5
Implied Repo (Final Delivery)	0.11%	0.30%	0.19%
DV01/100 of CTD	4.5	4.9	0.4
Open Interest	85,850	0	
CTD Outstanding (millions)	26,820	14,229	-12,591
CTD Notional of Front OI	8,585	8,585	
Front OI Multiple of CTD	0.3x	0.6x	0.3x

Source: TD, Royal Bank, Montréal Exchange

CGBH21 to CGBM21

A lot of speculative short positions appear to have been accumulated this quarter and we have no reason to believe they have been closed.

The current cheap pricing of the H21 contract (relative to the CTD), with an implied repo of 0.13%, has persisted, in varying magnitude, for the life of this contract. Given the ongoing cheapness in H21 and fair value of the contract about 1.5 cents higher, short positions will probably try to roll early while long positions in H21 will try to wait for better prices later in the roll period, if they can.

Large speculative short positions may result in early buying pressure on H21. This could be exacerbated by the low implied repo rate, if positions are being closed, as shorts take an extra cent of profit from the cheapness in contracts relative to bonds at this time. Watch for early upward pressure on the roll price to confirm this theory (buying of front contracts, selling of back contracts).

FIGURE 10

CGB Key Metrics

11-FEB-2021	FRONT (MAR21)	BACK (JUN21)	DIFFERENCE
Closing Price	146.620	144.820	1.800
Cheapest-to-Deliver (CTD)	CAN 2.250% Jun 2029	CAN 2.250% Jun 2029	No change
Delivery Years (Last delivery)	8.2	7.9	-0.2
CTD Conversion Factor	0.7587	0.7645	
CTD Clean Price	111.4881	111.4910	
CTD Yield	0.814%	0.814%	0.000%
Gross Basis (cents)	24.8	77.6	
Net Basis (Final Delivery, cents)	1.5	5.3	3.7
Implied Repo (Final Delivery)	0.13%	0.13%	0.00%
DV01/100 of CTD	8.5	8.5	0.0
Open Interest	608,669	3	
CTD Outstanding (millions)	6,219	6,219	0
Bond Equivalent Notional	60,867	60,867	
Multiple of Outstanding	9.8x	9.8x	0.0x

Source: TD, Royal Bank, Montréal Exchange

Wildcard Potential

Both CGF and CGB are positive carry during the delivery period this quarter and, although CGZ is basically flat carry, we suspect there is not enough profit potential[2] there to attract anyone playing wildcard options in that contract. Further, we anticipate that after-hours market moving information is going to be less common going forward as the new administration in the United States could be expected to be less likely to make important policy announcements via social media channels.

The CGBH21 contract would require a 6 basis point after-market move in yields at the start of the delivery period to make a Wildcard option exercise viable; a scenario we deem rather remote at the moment. Of course, the threshold for a profitable exercise declines steadily to the day prior to the last trading day and only a 1.5 basis point after market surprise (yields lower) would be required at the end of the delivery period.

For CGF, there is a better chance, although we have rarely observed Wildcard exercises in this contract. Figure 11 shows the price threshold for a profitable Wildcard exercise in CGFH21, which begins at around 2 basis points and declines to a half basis point change by the end of the delivery period. It is not impossible to imagine an after-hours bond price rally of this magnitude during the delivery period in March, especially given that the Federal Reserve will make an interest rate announcement on the 17th. Bank of Canada rate announcements do not normally affect the Wildcard option since they do not occur after futures have closed for the day.

FIGURE 11

CGFH21 Wildcard Threshold

DATE	REMAINING CARRY (PER CONTRACT)	MINIMUM ΔCTD PRICE TO EXERCISE WILDCARD
25-Feb-2021	26.13	0.096
26-Feb-2021	25.25	0.093
1-Mar-2021	24.38	0.090
2-Mar-2021	23.51	0.086
3-Mar-2021	22.64	0.083
4-Mar-2021	20.03	0.074
5-Mar-2021	19.16	0.070
8-Mar-2021	18.29	0.067
9-Mar-2021	17.42	0.064
10-Mar-2021	16.55	0.061
11-Mar-2021	13.93	0.051
12-Mar-2021	13.06	0.048
15-Mar-2021	12.19	0.045
16-Mar-2021	11.32	0.042
17-Mar-2021	10.45	0.038
18-Mar-2021	7.84	0.029
19-Mar-2021	6.97	0.026

CDCC Delivery Reports[3] for both CGFZ20 and CGBZ20 contracts show that no Wildcard option exercises occurred in the December delivery period.

Looking Forward & Opportunities

- Recent interest in using CGF and CGB contracts to express curve trades continued this quarter and over 70,000 units of strategy trades were executed in the 2CGFH21-1CGBH21 strategy on MX. That already equals the total amount observed in the Z20 contracts and both totals are an increase of 80% or so from U20 contracts. Futures remain a popular way to execute 5-10 curve trades quickly and cheaply in Canada.
- M21 contracts bring the return of potential "negative basis" and the potential for early delivery in CGF and CGZ due to the extremely low coupons of 0.25% on the CTD bonds. If the implied repo inches above the 0.25% level, short positions in CGFM21 will have an incentive to deliver early and the pricing of CGFM21 will immediately reflect that likelihood. The price change of half a cent (a fall in the price of the futures contract) will not be large if we see only a few basis points above the 0.25% level. A similar dynamic exists in CGZM21 but the price change in the contract would be even less.

2 Profit potential in embedded Wildcard options is greater when conversion factors are farther from 1. In the CGZH21 case, the conversion factor for the CTD is 0.9101, much higher than that of the CTD for CGF or CGB contracts, making the potential profit low, even if a scenario arose to exercise the option.

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

- Relative value opportunities appear abundant as auction bonds purchased against hedges of CGB and CGF contracts are almost always cheap. Relative value investors may be able to buy auction bonds, hedge with CGB or CGF[4] – where the CTD is an off-the-run bond – and capture the auction discount.
- 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, are now the norm, at least for the time being. 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 15 months from now.
- Our previous concerns about the lack of free-floating Canada 2029 bonds to ensure "tame" roll periods proved unfounded as:
  - Almost no contracts have remained open into the delivery period recently and,
  - The Bank of Canada has shown a willingness to conduct extensive repo operations to ensure smooth functioning markets in off-the-run bonds. For instance, as of this writing, there are $814 million Canada 2029s loaned by the Bank in the funding markets. We suspect they would not hesitate to lend the remaining $5 billion of that issue that they own, which negates any possibility of a delivery squeeze.
- 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 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.

4 Or even CGZ now that the contract has become more liquid.

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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