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CGF Five-Year Government of Canada Bond Futures

CGB Ten-Year Government of Canada Bond Futures

May 2020

M20-U20 Roll Update

Quarterly Roll Summary

For M20 contracts, First Notice day is May 28th and the liquid days for the contract roll on both CGF and CGB will probably be May 25th and 26th, with a good chance of an early start on Friday May 22nd, due to the US holiday on the 25th and some potential nervousness about liquidity due to the work-from-home situation of many risk takers and liquidity providers.

Making comments on the expected roll dynamic is challenging this quarter given some of the events that unfolded during the active life of the M20 contracts. However, we believe speculative positioning is currently light due to exceptionally large trend reversals mid-quarter, a general "risk-off" mentality, including by typical arbitrage players, and lower open interest in contracts than previous quarters. There may be less liquidity than usual being provided for the CGB roll in May due to work-from-home conditions imposed on many market participants, lower risk tolerance, and a tendency to avoid placing static orders in order books for CGB rolls.

This quarter is the annual change in cheapest-to-deliver (CTD) for the CGB contract. The incoming CTD is the June 29, which was the 10-year benchmark bond until just recently (April 3rd). There will be no delivery basket change for the CGF contract this quarter as the 1.25% March 2025 is the CTD for both the M20 and U20 contracts[1].

Positioning – Who's Left In?

Although we believe most speculative risk was taken out by extreme reversals in price action during the M20 contract's life, there remains the possibility that the trend, largely unbroken, through April and the first half of May has enticed some trend following models back into CGB contracts.

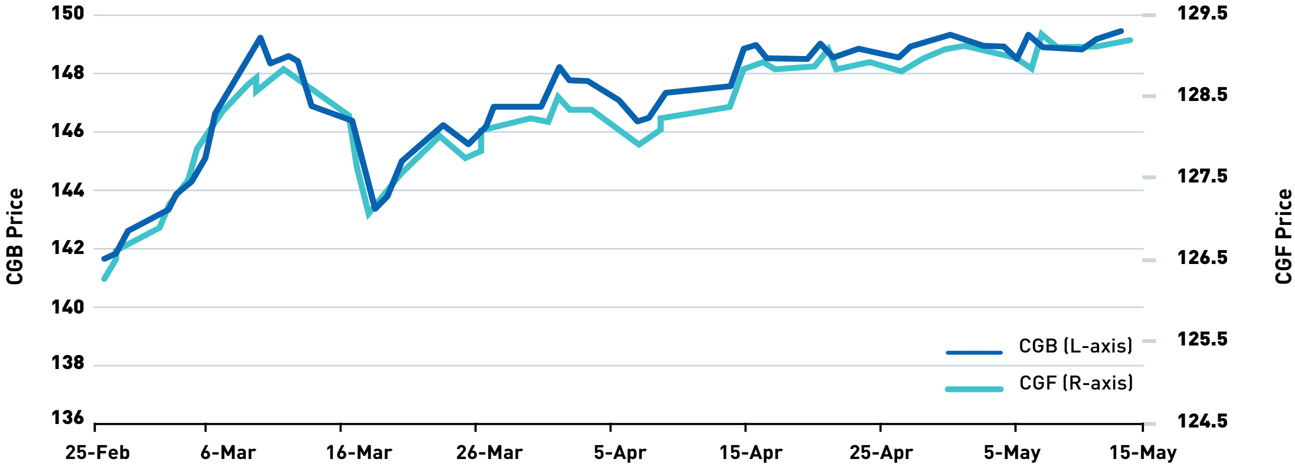
To illustrate, we plot the price of each contract since the end of February in Figure 1. From February 26th through March 10th, the CGB contract price (left axis) rose by more than $7 in a handful of business days. That strength was followed by a painful reversal of almost $6 before rates settled into a strong upward price trend that has been sustained since stocks hit their lows in the third week of March.

Model risk reduction would have occurred at both strong reversals but determining whether trend models have re-entered after paring positions to reduce losses is difficult this quarter.

1. There was only one possible CTD for the M20 contract but the 0.50% Sep 2025 qualify for (very unlikely) delivery into the CGFU20 contract.

FIGURE 1

CGF and CGB Price, M20s



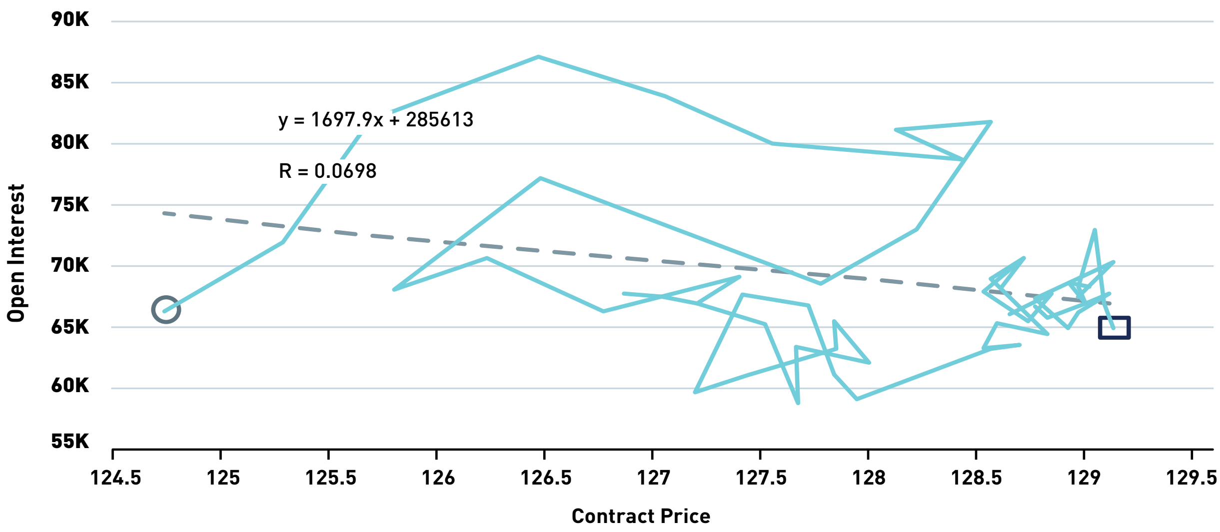
Source: Montréal Exchange

Similarly, correlation, or lack of it, between price and open interest in CGF and CGB this quarter, yields little insight. During the general risk-off panic in March, contract prices both fell and rose precipitously while open interest tended to remain stable, except for CGB during the worst of the reversal. Figure 2 shows the plot for CGF and Figure 3 shows the same relationship for CGB this quarter.

We note that at the time of writing, the open interest for CGF is still about 65,000 contracts – roughly where it started the quarter- while the CGB open interest is well below the level established near the start of the contract. We conclude that CGF seems to have remained a hedging instrument during the volatile COVID-19 market gyrations but that speculative positions in CGB have been pared due to losses or a reduction in risk appetite (or both!).

FIGURE 2

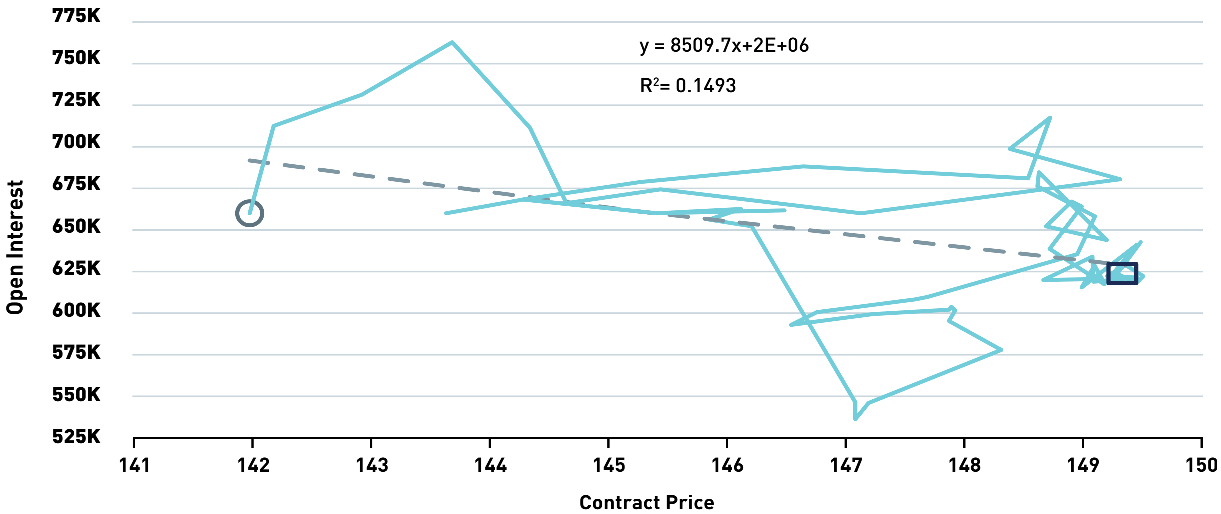
CGFM20 Price Versus Open Interest



Source: Montréal Exchange

FIGURE 3

CGBM20 Price Versus Open Interest

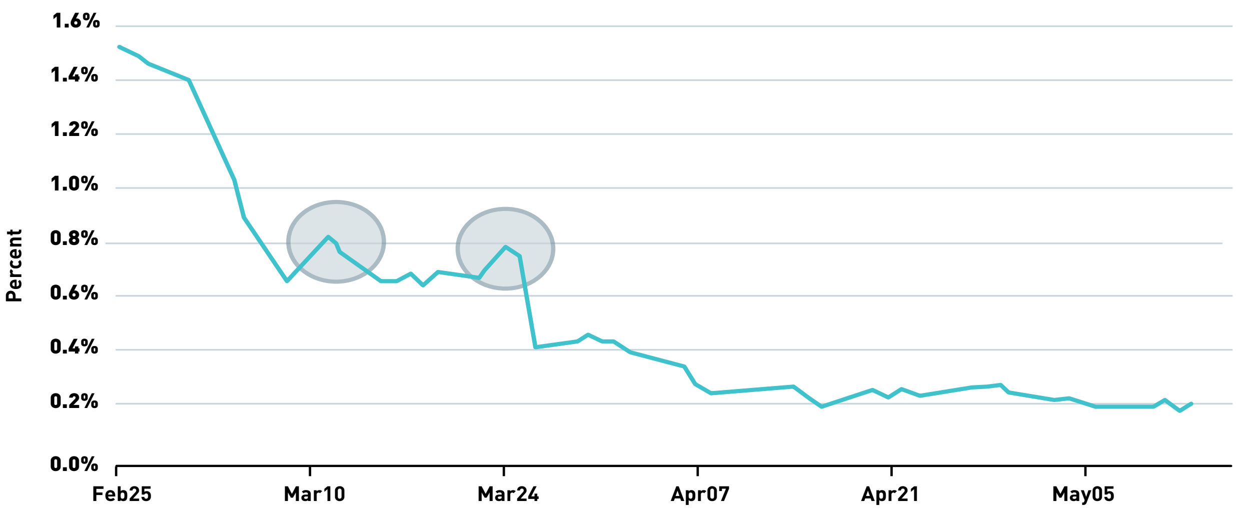


Source: Montréal Exchange

Finally, even arbitrage and quasi-arbitrage strategies had reason to push pause on risk taking this quarter as futures basis (and its relation, Implied Repo) had moments of turmoil during the market meltdown in March. Figure 4 shows the closing level for Implied Repo during the life of the CGBM20 contract. While the absolute decline is no surprise – the Bank of Canada was aggressively cutting rates and telegraphing its intent to do so, along with almost all other central banks – the highlighted areas became a cause for concern in basis and "dirty basis"[2] trades.

FIGURE 4

CGBM20 Implied Repo



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

On the highlighted dates in Figure 4, the Implied Repo on the CGB contract was high relative to overnight index swaps by a considerable amount. As other markets and established relative value relationships broke down, futures basis did the same and futures contracts became abnormally expensive relative to cash bonds.

Normally, this would entice arbitrage players to enter the market and profit from the difference but we find that open interest in CGB was falling during this time, not rising, indicating that, as with other markets, good profit opportunities were ignored during the risk-off mayhem in March. Additionally, unusual spikes in relative value differences between similar assets drives up the Value-at-Risk (VaR) cost of what are normally low-risk trades, resulting in a natural risk reduction tendency for participants that use VaR for risk management. Perhaps some bold managers used the highlighted dates in Figure 4 to enter trades, but we think they are the exception, not the majority.

2. A long basis trade is a simultaneous sale of futures contracts accompanied by a purchase of the risk-weighted equivalent of the cheapest-to-deliver bond. In a pure basis trade, the bond purchase is financed by a repo market transaction to the delivery date of the futures contract. A dirty basis trade is a riskier but common variation where the bond purchase financing is arranged for a shorter term than the pure basis trade.

Cheapest-to-Deliver Switch

A recurring theme for physical delivery futures contracts in Canadian fixed income markets is the complete lack of a plausible scenario for a CTD switch to occur. Much like all recent quarters, we struggle to express how remote the possibility is without using the word "impossible" since, under some extremely odd combinations of rate and slope changes, a switch does retain some possibility. Delivery basket math favors high rates and steep curves to increase the probability of a CTD switch and rates are now at the bottom of historical ranges. Despite some recent steepening, curves are still way too flat for a CTD switch to be plausible.

With no reasonable scenario for a switch of deliverable, the embedded quality option and end-of-month options[3] are completely worthless. Wildcard options in CGB (but not CGF), which do not require a CTD switch to be profitably exercised, may retain some value to active participants[4].

We omit the usual grids this quarter that plot the switch points for the delivery baskets since it appears completely irrelevant at this time.

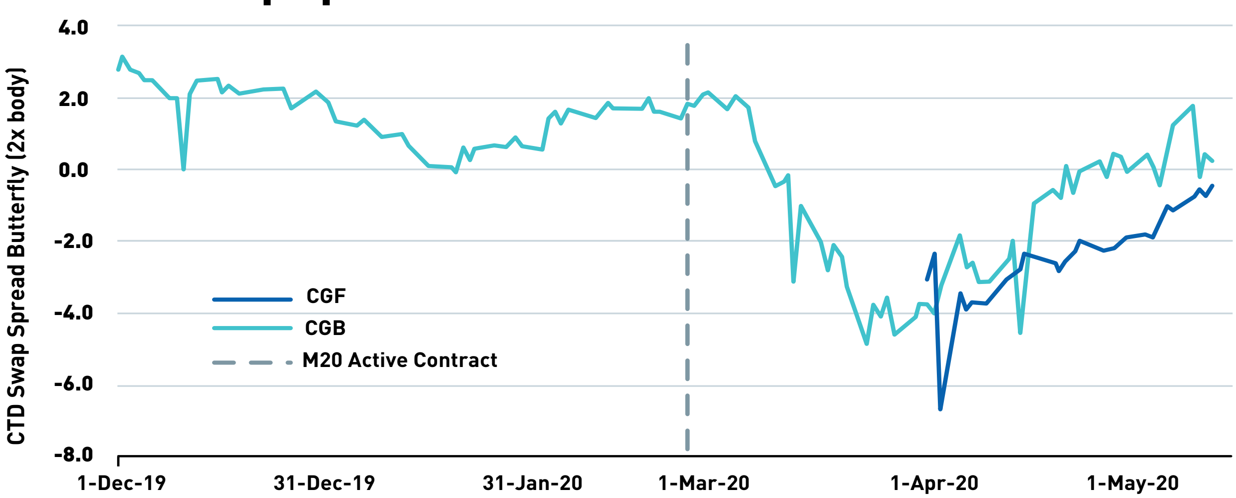
Relative Value

Figure 5 plots the swap spread butterfly[5] for the CTD of both the CGF 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 M20 became the active contract.

The figure paints an extreme scenario during the early days of the CGBM20 contract as the CTD richened by an astonishing 6 basis points relative to its nearest neighbour bonds during the extreme fixed income rally in March. It took a reversal to outsized selling and some additional time afterwards for all the risk to be cleared but it seems evident that making markets in CGB blocks and warehousing the risk against neighbour bonds was a tough business in March.

FIGURE 5

M20 CTD Swap Spread Butterflies



Source: BMO Capital Markets[6] Fixed Income Sapphire database

The CTD bonds for both the CGFM20 and CGBM20 contracts have now returned to roughly normal levels versus neighbour bonds. However, a stark gap still exists between the CGBM20 CTD and the CGBU20 CTD, as shown in Figure 6. In that figure, we observe that the swap spread butterfly for M20, with June 28s as the body of the butterfly, has returned to normal while the same measure for the U20 CTD, with June 29s as the body of the butterfly, is still very rich. As the panic ebbed, the June 28s have given up some of their extreme richness while the 29s have remained rich, probably in anticipation of the CGB roll. Buyers of CGBU20 should be aware that they are buying a derivative of an underlying bond that is extremely rich versus its neighbours.

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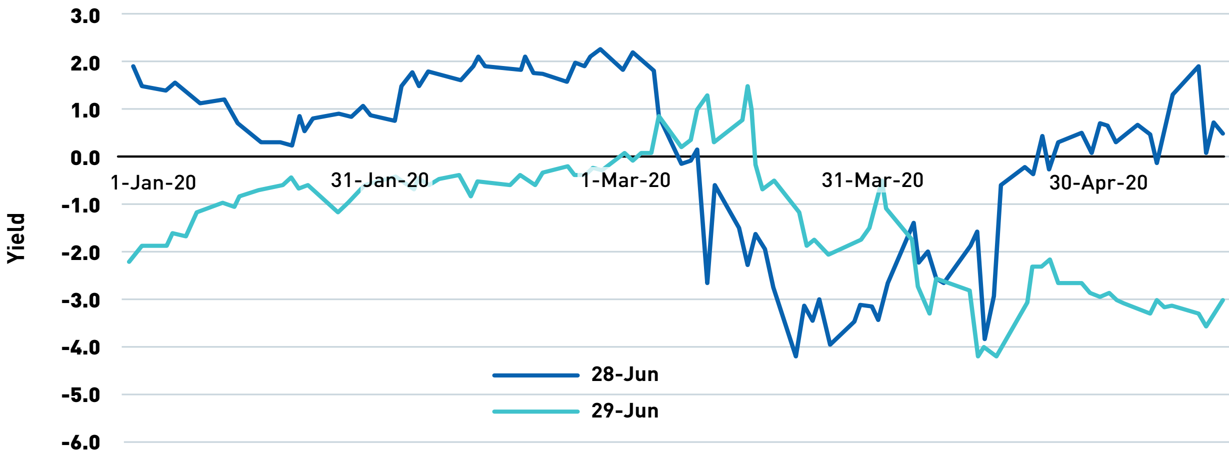
3. For a full discussion of the embedded options in physical delivery bond futures in Canada, please refer to "Embedded Options in CGF and CGB" published in November 2018.
4. For an examination of a successful Wildcard option play and notes on Wildcard potential in the Z19 contracts, refer to "CGB Case Study: Wildcard Option Exercise" published in July 2019.
5. 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.

FIGURE 6

CBG M20 and U20 CTD Swap Spread Butterflies



Source: BMO Capital Markets Fixed Income Sapphire database

Key Metrics & Expectations

The Key Metrics that may interest a Portfolio Manager with a position in M20 contracts who is contemplating his/her roll strategy this week are shown in Figure 7 and Figure 8. We used closing prices on May 14th to avoid any anomalies with the early close on the Friday preceding Victoria/Patriot's Day. Note that neither CGFU20 nor CGBU20 has any open interest so pricing, and any analysis driven by the pricing, is not based on market driven price discovery at this time.

With coupons on both the CTD of the CGF and CGB contracts currently way above the overnight rate, the M20 contracts will both carry extremely positively during delivery. The same will probably be true for U20 unless, through some unanticipated event not yet imagined by market participants, the Bank of Canada increases overnight rates by an enormous 100 (for CGFU20) or 200 (for CGBU20) basis points.

CGFM20 to CGFU20

With no change in the CTD and an absence of speculative positions, the roll from CGFM20 to CGFU20 should be uneventful. The current implied repo of 0.18% makes the contract almost exactly fair value relative to overnight index swaps. There are Bank of Canada fixed announcement dates on June 3rd, July 15th and September 9th, all within the life of U20 contracts, and a quick recovery (or anticipation of one) from the pandemic economic conditions would warrant a higher implied repo for U20 contracts. That belief won't develop before the roll though, so we expect both M20 and U20 CGF contracts to trade at about fair value of 0.20% implied repo implying a roll price (not shown) of about 1.725 on May 25th.

FIGURE 7

CGF Key Metrics

14-MAY-2020	FRONT (JUN20)	BACK (SEP20)	CHANGE
Closing Price	129.140	127.620	1.520
Cheapest-to-Deliver (CTD)	CAN 1.250% Mar 2025	CAN 1.250% Mar 2025	
Delivery Years (Last delivery)	4.7	4.4	-0.3
CTD Conversion Factor	0.8062	0.8151	
CTD Clean Price	104.2350	104.2350	
CTD Yield	0.356%	0.356%	0.000%
Gross Basis (cents)	12.2	21.2	
Net Basis (Final Delivery, cents)	0.9	-15.1	-16.0
Implied Repo (Final Delivery)	0.18%	0.63%	0.45%
DV01/100 of CTD	4.9	4.9	0.0
Open Interest	64,405	0	
CTD Outstanding (millions)	17,300	17,300	0
CTD Notional of Front OI	6,441	6,441	
Front OI Multiple of CTD	0.4x	0.4x	0.0x

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

CGBM20 to CGBU20

The roll period for CGB will be eventful, almost without question, this quarter. M20 is the last contract with Jun28s as the CTD and the contracts from U20 to M21 will all have the Canada 2.25% June 2029 as the likely CTD bond. Normal delivery (i.e. to the last delivery date or near it) is almost inevitable due to the positive carry of a long basis position in M20 and long positions can afford to be patient if they can risk (unlikely) delivery.

The current pricing of the M20 contract, exactly fair value at an implied repo of 0.21%, is somewhat surprising to us given recent market events, although roll participants are reminded that the CTD for M20 appears fair value to neighbour bonds while the U20 CTD remains rich to neighbour bonds (Figure 6).

The DV01 extension due to the CTD change is significant at about 14% per contract, as usual when the CGB CTD changes, and may hamper liquidity during the roll. We think few managers will leave long-term 1:1 roll orders with their broker as volatile rates recently means they may be giving away an arbitrage opportunity if prices move significantly while their order is open. Lesser liquidity than normal may occur due to the current COVID-19 work-from-home arrangements in place for liquidity providers. While technology solutions are probably adequate, we think working conditions may result in liquidity providers (both banks and speculators) taking less risk this quarter than usual. Those able, and willing, to take new risk may find good opportunities in the CGB roll that otherwise would not exist.

FIGURE 8

CGB Key Metrics

14-MAY-2020	FRONT (Jun20)	BACK (Sep20)	Change
Closing Price	149.560	153.690	-4.130
Cheapest-to-Deliver (CTD)	CAN 2.000% Jun 2028	CAN 2.250% Jun 2029	
Delivery Years (Last delivery)	7.9	8.7	0.7
CTD Conversion Factor	0.7488	0.7475	
CTD Clean Price	112.1910	115.7441	
CTD Yield	0.453%	0.468%	0.015%
Gross Basis (cents)	20.0	86.1	
Net Basis (Final Delivery, cents)	0.3	14.2	13.9
Implied Repo (Final Delivery)	0.21%	-0.09%	-0.30%
DV01/100 of CTD	8.4	9.6	1.2
Open Interest	635,189	0	
CTD Outstanding (millions)	13,500	12,300	-1,200
CTD Notional of Front OI	63,519	63,519	
Front OI Multiple of CTD	4.7x	5.2x	0.5x

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

Wildcard Potential

In terms of the potential for a Wildcard option exercise, we calculate and show the price move threshold for CGBM20 during each day of the delivery period in Figure 9, although we expect the conditions for a Wildcard exercise to be absent this quarter. Both CGF and CGB long basis positions are now significantly positive carry, making a Wildcard option exercise far less likely but still possible near the end of the month. For reference, the threshold price movement to exercise a Wildcard option on CGB is more than 11 times higher than it was for the H20 contract. We speculate that any Wildcard delivery would take place near to the final trading day if market conditions justify one at all.

FIGURE 9

CGBM20 Wildcard Threshold

DATE	Remaining Carry ($ per contract)	Minimum ΔPrice to Exercise Wildcard
28-May-2020	182.46	0.544
29-May-2020	176.17	0.525
1-Jun-2020	169.88	0.506
2-Jun-2020	163.59	0.488
3-Jun-2020	157.30	0.469
4-Jun-2020	138.42	0.413
5-Jun-2020	132.13	0.394
8-Jun-2020	125.84	0.375
9-Jun-2020	119.54	0.356
10-Jun-2020	113.25	0.338
11-Jun-2020	94.38	0.281
12-Jun-2020	88.09	0.263
15-Jun-2020	81.79	0.244
16-Jun-2020	75.50	0.225
17-Jun-2020	69.21	0.206
18-Jun-2020	50.33	0.150

A wildcard exercise in CGFM20 (table not shown) is highly unlikely as it would require more than an 8 basis point rise in yields between 3pm and 5pm at the start of the delivery period and more than 3 basis points at the end.

CDCC Delivery Reports for the H20 contract show just over 3,000 CGBH20 contracts were delivered on March 20th; a date when 10-year bond prices were very volatile and rose more than 25 cents after the futures settlement price was established that day. Although we can never be certain from published reports, it would appear someone successfully exercised their H20 Wildcard option on the 20th of March.

Looking Forward & Opportunities

- The CTD for CGBU20 is still very rich versus neighbour bonds, probably in anticipation of forced rolling of contracts. Long positions in CGBM20 may consider a temporary move to Jun30 cash bonds in lieu of contracts until the richness subsides if they are able. Speculative accounts could short the CGBU20 versus long positions in Jun28 and Jun30 to capture this dynamic in a bond butterfly.

- CGFZ20 will have an ultra-low coupon CTD in the 0.5% September 2025 and there is a good chance, assuming the Bank of Canada has moved from the emergency COVID-19 overnight rate of 0.25%, that the contract will carry negatively during the delivery period in late November. That would make Gross Basis negative for the contract and one should thus assess the implied repo rate and Net Basis to First Delivery, not Last Delivery, if that comes to pass.

- Unfortunately for speculators, the CGBU20 to M21 contracts will have essentially no chance of a CTD switch since high coupons and shorter maturities are favored by CTD math. For U20 to M21, the CTD 2.25% June 2029 will be 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 until at least the U21[6].

6. And probably longer given that a new 10-year bond would have an even lower 0.75% coupon at time of writing.

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.

For more information:

T +1 514 871-3501
irderivatives@tmx.com

m-x.ca/futures

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