Futures Flash Series ARTICLE 17

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Switch Risk Update: Canada Bond Futures

The bear steepening of the yield curve in August and September coincided with 10-year yields rising to over 4%, a type of market action that hasn't been observed since 2007. Given the number of times we've assured futures market participants that the chance of a cheapest-to-deliver (CTD) switch is minimal in almost all contracts, combined with the fact that a bear steepening move in the yield curve makes CTD switches more likely, we update the switch risk embedded in contracts.

Cheapest-to-Deliver Switch Risk?

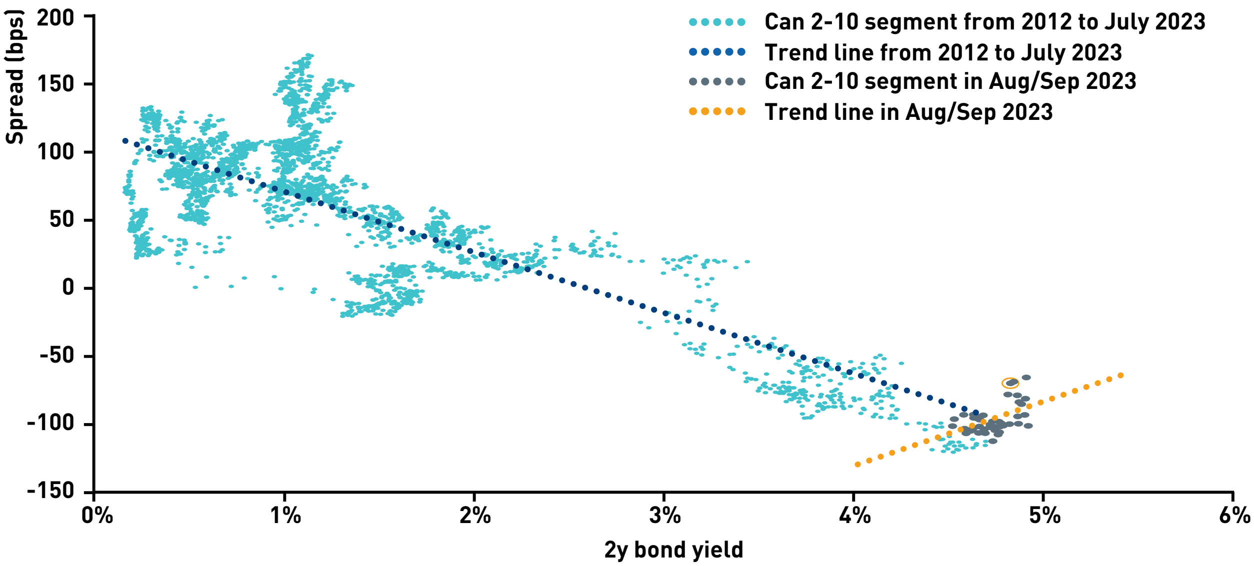
Readers will recall that, due to the 6% implied yield used to calculate futures contract conversion factors for deliverable bonds in Canada, yields approaching 6% give rise to the potential for a bond that is not the shortest maturity to become cheaper to deliver to satisfy delivery requirements for short positions in all physical delivery futures contracts. This optionality, deemed switch risk or the quality option, and possessed by the futures short position, can result in unexpected price changes for the contract. Interested readers may refer to "Switch Risk in Futures: A Refresher" published by Montréal Exchange in February 2022.

Unusual Market Move

Normally, at least in the most recent two decades or so, the yield curve steepens when shorter term rates fall and flattens when shorter term rates move higher, usually as the central bank is implementing tighter monetary policy in the latter case. This makes economic sense since, at higher rates, economic activity in a few months is expected to be dampened and, after a round of tighter monetary policy, central bank responses are to eventually lower rates. However, roughly the opposite occurred in the Canadian (and US) yield curve in late summer, as shown by the opposing slopes of regressing the 2-10 curve segment versus the 2-year yield as shown in Figure 1. The blue markers represent daily observations of the 2-10 segment of the Canadian yield curve between 2012 and July 2023 while the green markers are the most recent observations in August and September 2023. The x-axis in the figure is the 2-year bond yield. For over a decade, the slope of the 2-10 yield curve segment more-or-less reliably steepened when rates moved lower and flattened when rates moved higher. In recent months, as shown in the chart, the opposite has begun to occur with the slope of the 2-10 curve segment moving higher as the 2-year yield moved higher.

FIGURE 1

2-10 Since 2012 Versus 2y Yield



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

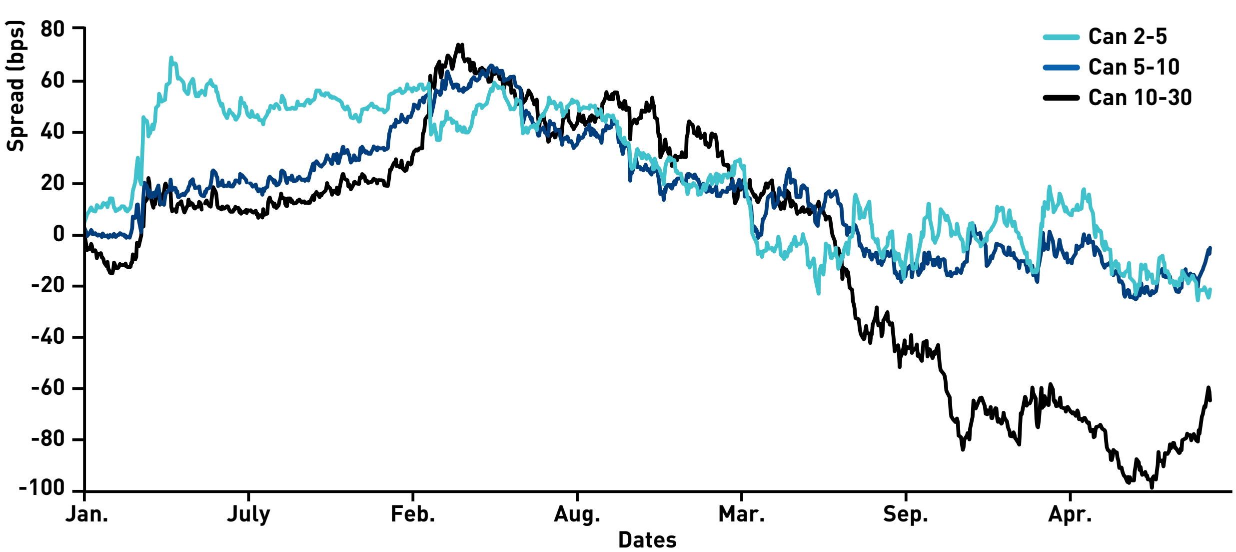
Several factors affect the calculation of the cheapest-to-deliver bond[1] but higher rates and steeper curves are, especially in Canada, usually the most significant factors that can increase switch potential. Steeper curves mean bonds of longer maturity are, usually only slightly, cheaper than bonds that have fewer years to maturity so steeper curves exacerbate the potential for a CTD switch. With a steep curve, a switch can occur at rates lower than 6% because longer maturity bonds in the basket are slightly cheaper than shorter maturity bonds.

Current State

As readers may have guessed from Figure 1, most segments of the Canadian yield curve, even after the bear steepening of the past two months, remain inverted. We can observe this in Figure 2 which shows the 2-5, 5-10, and 10-30 segments of the yield curve separately. In the figure, the 2-5 segment remains extremely inverted, even after a steepening of over 40 basis points recently, and the 10-30 segment is as inverted as it has been since the beginning of the COVID-19 pandemic. Only the 5-10 portion of the curve is approaching the zero point (from below, of course), although it remains inverted by a few basis points.

FIGURE 2

Canada Slope Segments, October 5/23



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

1 In addition to outright yield levels and the slope of the curve, overnight yields and the relative coupons on the bonds in the delivery basket can also have important effects.

CGZZ23: Very inverted segment of the curve, little switch risk still

The 2-5 inversion is important for the CGZ futures contract (2-year) since the bonds in the delivery basket fall into this segment of the curve. With a deep inversion, there is little chance that a longer maturity bond will become cheaper to satisfy delivery requirements in the CGZZ23 contracts, even though more steepening could, and probably will, occur. As can be seen in Figure 3 which depicts the combination of yield and curve steepness (the CTD switch points) between the August 2025 bond and the November 2025 bond. Despite a much higher coupon, the 4.5% November 2025 bond wouldn't be CTD without a rather large steepening of about 15 basis points or a combination of another rise in rates of about 50 basis points, plus 5 or so points of steepening. The probability of a switch is certainly higher now than it was at any point since the launch of this contract, but it is still unlikely.

FIGURE 3

Aug25 Yield

SLOPE	4,66%	4,71%	4,76%	4,81%	**4,86%**	5,01%	5,16%	5,31%	5,46%	5,61%	5,76%	5,91%	6,06%	6,21%	6,36%	6,51%
-50	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25
-40,2	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25
-30,5	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25
-20,7	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25
-10,9	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25
-1,1	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Aug. 25**	**Nov. 25**	**Nov. 25**	**Nov. 25**	**Nov. 25**
3,1	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Aug. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25
7,3	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Aug. 25	Aug. 25	Aug. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25
11,5	Aug. 25	Aug. 25	Aug. 25	Aug. 25	**Aug. 25**	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25
15,8	Nov. 25	Nov. 25	Nov. 25	Nov. 25	**Nov. 25**	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25
20	Nov. 25	Nov. 25	Nov. 25	Nov. 25	**Nov. 25**	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25	Nov. 25

CGFZ23: Just one deliverable bond so far

For CGFZ23, the December delivery month of the CGF (5-year) futures contract, there is currently only a single bond in the delivery basket, although that will change shortly when the Bank of Canada creates a new March 2029 bond[2]. We model a new bond in Figure 4 but find that it would be very unlikely to take CTD status from the September 2028. It could occur with 5-year yield higher by 50 basis points and a LOT of positive slope to that segment of the yield curve, but this scenario remains unlikely despite being more probable than at most periods in the past.

FIGURE 4

Sep28 Yield

SLOPE	3,69%	3,84%	3,99%	4,14%	**4,29%**	4,44%	4,59%	4,74%	4,89%	5,04%	5,19%	5,34%	5,49%	5,64%	5,79%	5,94%
-5	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28
-4,8	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28
-4,5	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28
-4,3	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28
-4	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28
-3,8	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**	**Sep. 28**
-1	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Mar. 29
1,7	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Mar. 29	Mar. 29	Mar. 29
4,5	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Sep. 28	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29
7,2	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Sep. 28	Sep. 28	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29
10	Sep. 28	Sep. 28	Sep. 28	Sep. 28	**Sep. 28**	Sep. 28	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29	Mar. 29

2 The coupon is still to be determined at time of writing, but we modeled 4.25% for this exercise.

CGBZ23: Much more probable

As we discussed above, the 5-10 portion of the curve is approaching flat from a position of over 20 basis points inverted just a few months ago. That dis-inversion could continue and become a positive slope in the crucial off-the-run 10-year bond area of the curve if the current trend continues. With just 6 months between their maturities, the December 2031 is in a reasonably tight competition with the June 2032 since the latter bears a higher coupon which gives it an additional push towards CTD status. Figure 5 shows the current state of the struggle but, if we had to guess, we'd say that yields are unlikely to rise high enough, and curves will not steepen to levels that will result in the 2032 becoming CTD, despite the current trend in that direction. Nevertheless, investors should be aware that switch risk is higher today in CGB contracts than it has been for a very long time.

FIGURE 5

Dec31 Yield

SLOPE	3,57%	3,72%	3,87%	4,02%	**4,17%**	4,37%	4,57%	4,77%	4,97%	5,17%	5,37%	5,57%	5,77%	5,97%	6,17%	6,37%
-5	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31
-4,1	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31
-3,2	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31
-2,2	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31
-1,3	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31
-0,4	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**Dec. 31**	**June 32**	**June 32**
1,7	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	Dec. 31	June 32	June 32	June 32	June 32	June 32
3,8	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	Dec. 31	Dec. 31	Dec. 31	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32
5,8	Dec. 31	Dec. 31	Dec. 31	Dec. 31	**Dec. 31**	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32
7,9	Dec. 31	June 32	June 32	June 32	**June 32**	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32
10	June 32	June 32	June 32	June 32	**June 32**	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32	June 32

LGB: No switch

A defining characteristic of the Canadian yield curve for decades, especially prior to the ultra-low rates of the pandemic years, has been a very flat or even inverted 10-30 segment of the yield curve which often stands in stark contrast to our US neighbour. Despite the 10-30 segment of the bond yield curve still inverted to levels matching the maximum inversion in the post-pandemic years, switch risk is almost zero for LGBZ23, the 30-year contract for December delivery. We show the potential for December 2053 to become CTD in Figure 6[3] and note that it would still take an extremely large selloff accompanied by a historic flattening, to accomplish a switch from 2055 to 2053 for the December contracts.

3 Figure 6 has an important difference to the figures for other contracts. Since the current CTD for the LGB contract has a longer maturity than the other bond in the delivery basket that is not the CTD, the slope of the yield curve acts in the opposite direction. A very inverted long-end yield curve (more negative slope) would make the December 2053 cheaper than the December 2055 rather than the opposite which is true of all the other delivery baskets. We choose here, for consistency, to retain the term slope rather than utilize the term "yield difference" since the latter would flip the CTD zones and vertical axis labels top to bottom, which we believe would be very confusing for readers.

FIGURE 6

Dec55 Yield

SLOPE	3,33%	3,48%	3,63%	3,78%	**3,93%**	4,13%	4,33%	4,53%	4,73%	4,93%	5,13%	5,33%	5,53%	5,73%	5,93%	6,13%
-20	Dec. 53	Dec. 53	Dec. 53	Dec. 53	**Dec. 53**	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53
-16,5	Dec. 55	Dec. 55	Dec. 53	Dec. 53	**Dec. 53**	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53
-12,9	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53
-9,4	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53
-5,8	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 53	Dec. 53	Dec. 53	Dec. 53	Dec. 53
-2,3	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 55**	**Dec. 53**	**Dec. 53**	**Dec. 53**
1,2	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 53
4,6	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55
8,1	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55
11,5	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55
15	Dec. 55	Dec. 55	Dec. 55	Dec. 55	**Dec. 55**	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55	Dec. 55

Summary

To summarize, the yield curve in Canada remains inverted, although recent price action has resulted in steeper curves than the historic inversion of 2022 and 2023. Switch risk may be approaching but is unlikely to play a part in the December contracts unless rates continue to rise rapidly with an associated steepening more severe than has been observed so far. The exception is the LGB (30-year) contract where a more inverted curve (bigger negative slope), would, but is unlikely to, result in a CTD switch.

Investors should remain aware of the consequences of cheapest-to-deliver switches and, perhaps, begin to develop models to value this risk if they have not done so already.

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

irderivatives@tmx.com

m-x.ca/futures

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