

CMB consolidation: How much of a GoC yield back-up? (Taking a guess)

By Warren Lovely

The prospective consolidation of the Canada Mortgage Bond (CMB) program with the regular Government of Canada (GoC) borrowing program—outlined in Canada’s recent budget—has led to much discussion amongst bond market participants. Formal consultations are upcoming with a view to making a final decision as part of Ottawa’s *Fall Economic Statement*. We have used earlier *Market View* notes to explore certain aspects/considerations. For example, we highlighted the disproportionate participation of non-resident investors in the Canadian-dollar CMB program, since it’s far from clear that all foreign bondholders would blindly follow the trail of consolidated supply into lower-yielding Canadas. We also attempted to quantify the notional interest savings the government seems keen to capture, pegging theoretical annual savings at more than \$700 million by year 5, all else equal. But those three little words—‘all else equal’—really are critical.

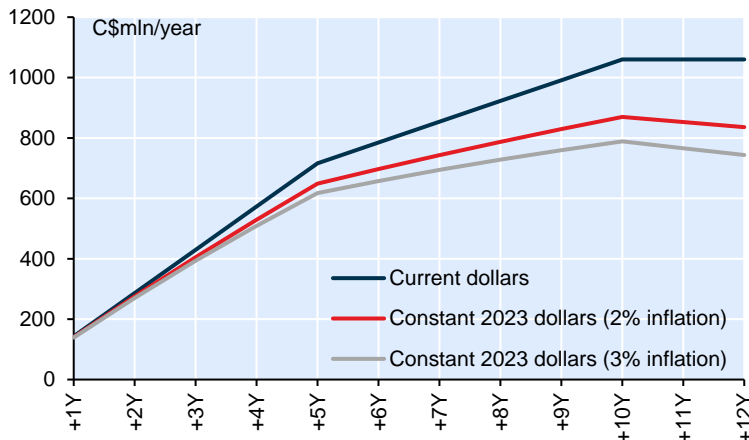
Here we explore what an expanded GoC bond program might mean for Canada’s risk-free curve. As we’ve argued previously, it wouldn’t take much of a back-up in yields to blunt direct consolidation savings in Ottawa. Nor should we lose sight of the potential impact on other issuers, which account for the majority of Canada’s outstanding debt instruments and where any prospective increase in borrowing rates could weigh.

Part A: Where we highlight the rationale & context for the consolidation of Crown borrowing

There’s a precedent for the consolidation of Crown borrowing. Back in 2007, the feds confirmed that direct borrowings by BDC, CMHC and FCC would be folded into the regular GoC program. Then, as now, eliminating the ‘agency spread’ was held up as a (partial) justification for consolidation. But CMB issuance is of greater relative magnitude, with the economic, fiscal and financial context having likewise shifted.

Chart 1: Interest savings stated rationale for consolidation

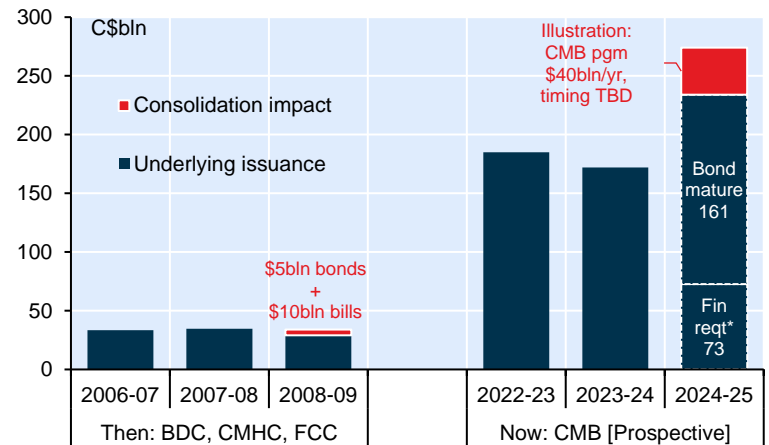
Estimated notional interest savings from CMB consolidation, all else equal



Source: NBF, GoC, CMHC | Note: Based on historical spreads & issuance pattern; assumes full capture of CMB spread, with no impact on GoC yields; excludes commission savings

Chart 2: Crown consolidation context

GoC gross bond issuance in/around Crown borrowing consolidation



Source: NBF, GoC | Note: As per 2008-09 DMS, earlier consolidation split across T-bills & bonds; 2024-25 underlying issuance is illustration & assumes no increase in T-bill stock

Ottawa could theoretically save \$150 million in year 1 of CMB consolidation (+ commission savings). Interest savings could surpass \$700 million by year 5, topping \$1 billion/year in a steady state. Theoretical savings assume no impact on GoC bond yields. But the bond supply in question is hardly trivial, to say nothing of existing net financing needs, sizeable maturities and ongoing BoC QT.

Table 1: How does prospective CMB consolidation compare to the earlier three-name episode?

Details/context surrounding consolidation of Crown borrowing with regular GoC borrowing program: Then (2007-08) & now (2023)

	Crown consolidation then...	.. and now
Focus of consolidation [BBG ticker]	BDC [BDBCN] CMHC [CANMOR] FCC [FARMCN]	CMB [CANHOU]
When announced/proposed	Budget 2007, for implementation in 2008	Budget 2023, subject to consultation
Government’s stated rationale	Budget 2007 > ‘In an environment of declining federal government borrowing, increased Government of Canada issuance resulting from consolidated borrowing will enhance the liquidity of the Government of Canada bond market.’ Budget 2008 > ‘Consolidating the borrowings of BDC, CMHC and FCC will reduce borrowing costs by eliminating the “agency spread” otherwise paid by Crown-backed entities. It will also enhance the liquidity of the Government of Canada debt market.’	Budget 2023 > ‘CMBs carry the full faith and credit of Canada and constitute a direct, unconditional obligation of Canada. However, despite carrying the same credit rating, CMBs are a more costly form of borrowing compared to regular Government of Canada bonds. In this context, consolidating CMBs into the regular Government of Canada borrowing program represents an opportunity to reduce debt charges and reinvest savings into important affordable housing programs.’
Federal fiscal context	Budget surplus prior to GFC; debt-to-GDP ~30%	Budget deficit of 1½% of GDP; debt-to-GDP 43.5% (2023-24)
Borrowing to be consolidated	\$10-15bln/year	\$40bln/year (\$260bln CMBs currently o/s)
Relative size of consolidation	0.7-0.9% nominal GDP 4.2-6.2% fed revenue 2.1-3.3% fed debt	1.4% nominal GDP 8.8% fed revenue 3.3% fed debt
Borrowing strategy for extra GoC supply	T-bill / bond split; \$10bln T-bills + \$5bln bonds as per 2008-09 DMS	TBD; assume predominantly bonds; \$40bln of CMB issuance split ~\$25bln 5Y & ~\$15bln 10Y in 2022
Bond issuance prior to consolidation & QT	\$35bln gross -\$1bln net (2007-08) (i.e., declining debt stock)	\$172bln gross \$19bln net (2023-24) + QT (see below)
BoC QT (via passive run-off)	N/A	Calendar 2023: \$89bln Calendar 2024: \$55bln
GoC BM target size prior to consolidation	2Y: \$7-10bln 5Y: \$9-12bln 10Y: \$10-14bln 30Y: \$12-15bln	2Y: \$16-22bln (Feb, May, Aug, Nov) 5Y: \$16-22bln (Mar, Sep) 10Y: \$16-22bln (Jun, Dec) 30Y: \$18-28bln (Dec)
GoC bonds o/s prior to consolidation	\$253bln (Mar-2007)	\$1,019bln (Mar-2023)

Source: NBF, GoC, BoC | Note: CMHC direct borrowings included in 2007 consolidation, not to be confused with CMB program; EDC has not been a consolidation target

Part B: Where we explore traditional sovereign bond yield drivers (across countries & over time)

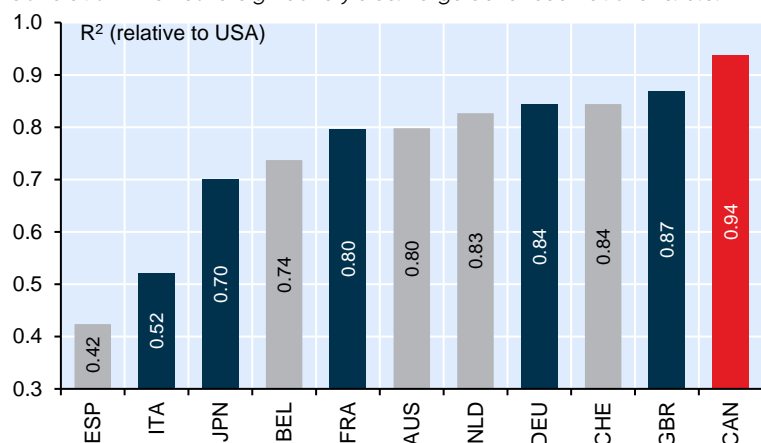
CMB consolidation, were it to proceed, would involve shifting a non-trivial source of primary bond issuance to the sovereign's banner. Note that the prospective consolidation of CMB supply within the regular GoC program would have no impact on Ottawa's accumulated deficit or net debt, since the extra liabilities (in the form of direct GoC securities outstanding) would be canceled out by incremental financial assets (in the form of loans to CMHC). So CMB consolidation need not complicate the government's stated fiscal goals/objectives. Nonetheless, it's worth asking what, if any, impact extra bond supply/gross debt might have on Canada's risk-free curve. Here we enter a discussion of sovereign bond yield determinants. There's a rich literature on the topic and we don't aim to fully replicate existing research. Rather, we seek to offer some high-level and current perspective, while acknowledging a number of important caveats.

Before we go any further, let's state the obvious: Canada's deep and multi-faceted relationship with America means the U.S. Treasury market exerts exceptional influence on our bond yields. No other sovereign bond market is more closely correlated with USTs. We're in the U.S. orbit and destined to stay there, which makes various structural pressure points in the U.S. (e.g., yawning deficits, social security insolvency, defense spending pressures, more rapid aging) potentially problematic for the Canada curve. To us, it hints that North American term premia will grow.

In examining sovereign bond yields, the inflation backdrop and corresponding monetary policy posture are vital considerations. On the face of it, much-cited government finance indicators appear to be of seemingly limited utility... at least when looked at in isolation. In many cases the historical correlation between sovereign yields and government borrowing and/or debt burdens isn't even signed properly (i.e., intuitively). Still, it seems probable to us that higher yields are needed to clear marginal bond supply, particularly in the face of any type of demand leakage (which could arise for a variety of reasons). Intuition likewise suggests that credit quality, liquidity and certain technical/structural considerations might also hold sway. In Part C, we attempt to statistically stitch of a number of these elements together.

Chart 3: No country in U.S. orbit more than Canada

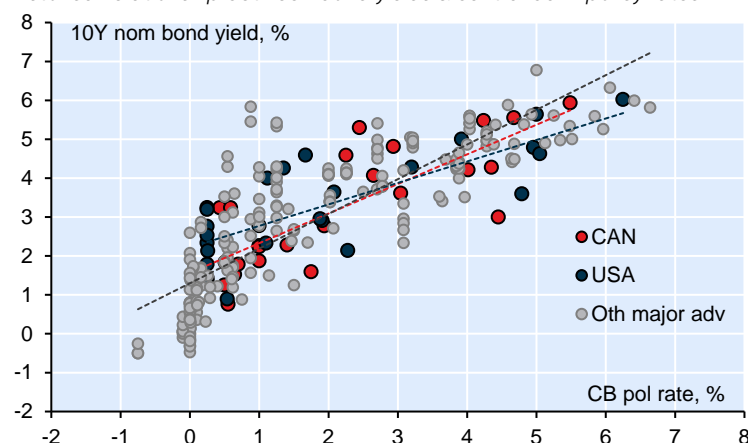
Correlation in 10Y sovereign bond yields: Large advanced nations vs. U.S.



Source: NBF, BBG | Note: Correlation between a sovereign's average annual 10Y bond yield with USA; 25Y period up to 2023(YTD); CAN=red, other G7 nations=blue

Chart 4: Can't lose sight of monetary policy backdrop

Historical relationship between bond yields & central bank policy rates

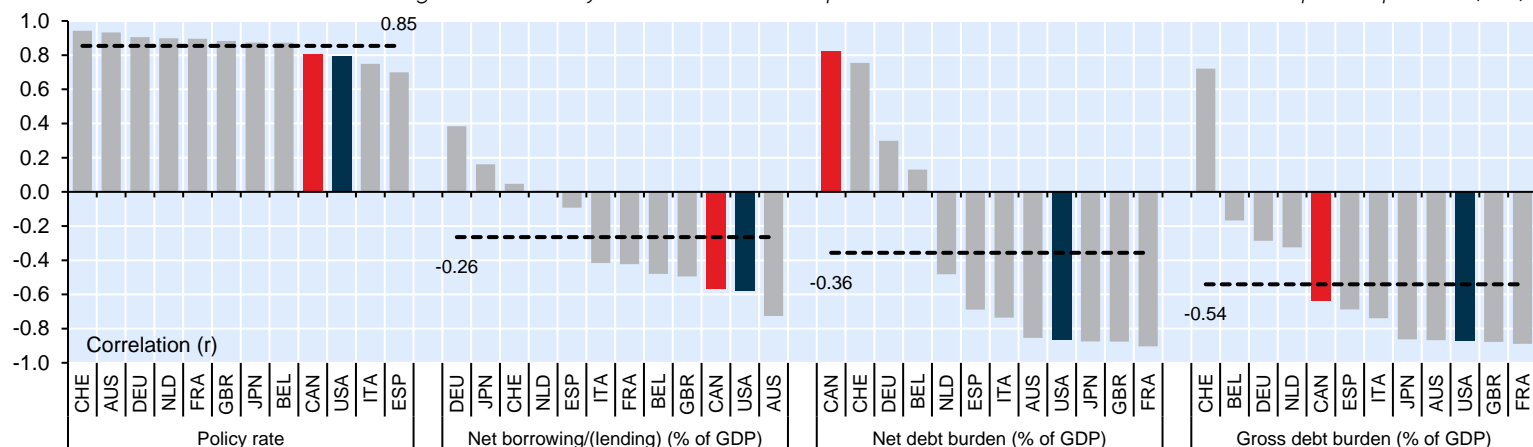


Source: NBF, BBG | Note: Annual averages for 25Y period up to 2023(YTD) for subset of 12 large advanced countries

Canada is in America's orbit, which means purely domestic considerations could hold relatively less sway here. Saying that, structural pressures in the U.S. are hardly reassuring for bond markets. Meanwhile, it's of little surprise that central bank policy rates go a long way towards explaining where bonds trade. Many key government finance metrics appear comparatively less important.

Chart 5: Tenuous (and seemingly less-than-intuitive) connection between bond yields and key fiscal measures over time?

Historical correlation between 10Y sovereign nominal bond yields & select variables | Results for advanced economies based on 25Y period up to 2023(YTD)



Source: NBF, BBG, IMF | Note: Bars represent individual country correlations over time; dotted lines refer to average correlation for subset of 12 large advanced countries (as at 9-May)

As per the above comment, in many cases the historical correlation between borrowing and debt burdens doesn't jibe with intuition. Clearly, simple, single-variable relationships omit much. But the relative extent of borrowing undertaken by a central government might just wield some influence on yields after all, along with a host of other potential considerations. Read on...

Part C: Where we guess at the impact of marginal supply on sovereign bond yields

We ran a series of OLS regressions to better isolate the impact of marginal bond supply on sovereign bond yields, all else being equal. We played with a broad collection of explanatory variables and lag structures, generally seeking to control not only for supply and all-important policy rates, but the associated economic outlook, underlying credit quality, debt structure, relative liquidity, foreign investor engagement, etc. This work yielded some interesting findings, notwithstanding plenty of nuance and no shortage of 'fine print'. We caution that bond issuance is not necessarily the most significant determinant of borrowing rates. Nor are statistical results perfectly stable. Again, the gravitation pull of the U.S. is a more material consideration for Canada than anywhere else. In other words, we urge caution when interpreting statistical results.

Not for nothing, our earlier work identified a somewhat tenuous relationship between gross/net supply and spreads in Canada's public sector credit markets. For example, higher frequency analysis of provincial bond markets showed an inclination for issuers to push supply into 'risk-on' markets, leading to the somewhat ironic finding that the biggest months of primary market activity often coincided with tighter (not wider) spreads. A clear case of correlation not implying causation. CMB issuance, it should be noted, is much less opportunistic. In truth, CMBs are the most predictable source of primary market supply in Canada's domestic bond market. For the time being, we'll leave aside a detailed study of the CMB spread-supply relationship and return to the issue at hand: what a larger sovereign bond program might mean for GoC bond yields.

The following Box outlines one aspect of our statistical testing: a cross-sectional study. We attempted to control for variety of notional yield drivers. The specific model outlined below proved capable of explaining 96% of the prevailing variation in 10-year sovereign bond yields. Coefficients on all independent variables were signed properly, although not all were significant at the 90% confidence level.

Separate time-series analysis had some difficulty identifying a consistent/significant relationship between gross/net supply and GoC yields. Saying that, *where* bonds are placed can influence the shape of the yield curve, with examples of past supply shocks/announcements leading to noted re-pricing of the Canada curve. Going one step further, we found cross-sectional evidence that a government's preferred funding strategy (proxied by average term) can help to explain the relative steepness (or lack thereof) in sovereign yield curves.

Box: A simplified econometric approach to estimating advanced economy sovereign bond yields (at a given point in time)

Example of OLS regression specification/approach > Cross-sectional sample of up to 25 advanced economies (data capture as at 9-May)

$$GT10Y = \beta_0 + \beta_1 CBPol_i + \beta_2 GrsFin_i + \beta_3 FinAss_i + \beta_4 ATM_i + \beta_5 GDPSh_i + \beta_6 NonRes_i + \beta_7 CR_i + u$$

Where: GT10Y = generic 10-year sovereign government nominal bond yield (% , current) [dependent variable]

CBPol = central bank policy target interest rate (% , current)

GrsFin = central government gross financing need (% of GDP, 2023)

FinAss = general government financial assets (% of GDP, 2023)

ATM = central government average term-to-maturity of outstanding debt securities (years, 2023)

GDPSh = national share of global GDP (% of PPP-adjusted worldwide GDP, 2023)

NonRes = non-resident share of general government debt outstanding (% of total, 2022)

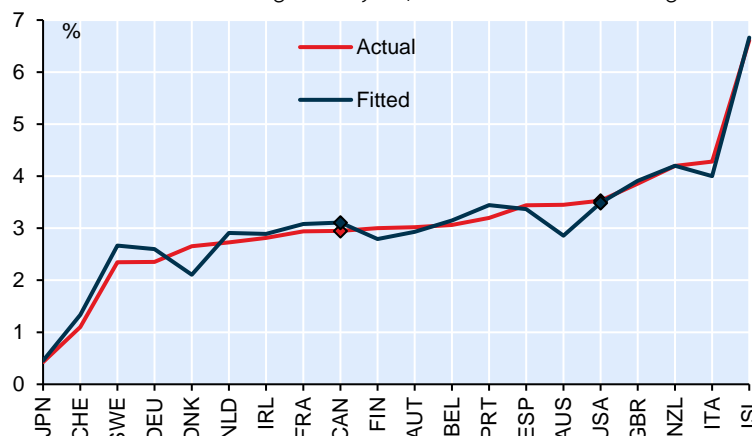
CR = sovereign long-term credit rating, controlling for outlook (linear translation of S&P rating, current)

Source: NBF | Note: The above is a cross-sectional model for estimating current nominal bond yields in advanced economies; various specifications were tested, utilizing a range of explanatory variables, terms & lag structures; time-series analysis was conducted to study the impact of government borrowing over time; refer to Annex (page 6) for details

We've not subjected our statistical work to extensive peer review; nor do we pretend our analysis belongs in the *Journal of Econometrics*. What we present here can be thought of exploratory and/or illustrative. Ultimately, we ran a variety of regressions (cross-section, time-series and panel) in an attempt to isolate for the impact of gross financing on bond yields, all else equal. Notwithstanding often lofty adjusted R-squared values, there are limitations aplenty. More to the point, bond supply is not necessarily the most significant variable at play, often taking a back seat to other considerations. Finally, as should be apparent, cross-sectional results are sensitive to the prevailing yield environment, with the perceived 'cost' of marginal government issuance likely to change as yields evolve.

Chart 6: Fitting a model of sovereign bond yields

Actual vs. fitted 10Y sovereign bond yield, based on 'best fit' OLS regression

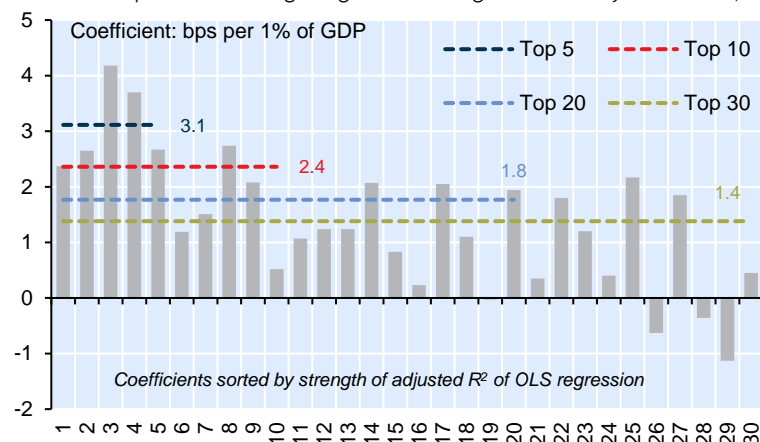


Source: NBF, BBG, IMF, S&P | Note: Fitted levels based on OLS specification explaining 96% of prevailing 10Y bond yields across 20 advanced economies (as at 9-May)

A number of models did a respectable job explaining sovereign bond yields. Based on a collection of 30 or more individual specifications, central government gross financing needs (scaled to GDP) were generally of moderate significance... in some cases not significant at all. We're always wary of false precision, but based on prevailing levels, it's possible that each 1% of GDP increase in a central government's gross financing needs could add 1½-3 bps to a 10-year sovereign bond yield, all else equal. (The estimated impact on current 5-year bond yields was found to be broadly similar.)

Chart 7: Isolating the impact of extra government financing

Estimated impact of central gov't gross financing on 10Y bond yield (all else equal)



Source: NBF, BBG, IMF, S&P | Note: Coefficients on gross financing from 30 regressions of prevailing 10Y bond yields across 20-25 advanced economies (as at 9-May)

Table 2: What simplified models might hint at for GoC bond yields in CMB consolidation world

Illustration: Notional impact on GoC bond yields due to increase in gross financing linked to prospective CMB consolidation (all else equal)

Coefficient on gov't gross financing need: Estimated impact on 10Y bond yield	CMB consolidation multiplier: Size of CMB bond program scaled to economy	CMB consolidation impact: Notional impact on GoC bond yields
1.4–3.1 bps for each 1%-pt of nominal GDP (based on cross-section analysis of current nominal bond yields in 20-25 advanced economies)	~1.4% of Canadian nominal GDP (\$40bln/year CMB supply scaled to Canada's \$2.8tn nominal GDP)	~2-4 bps on GoC 10Y bond yield (based on prevailing yields & current assumptions for select explanatory variables, all else equal)

Source: NBF | Note: The above impacts are meant to be illustrative and are based on advanced economy sovereign bond yields prevailing on 9-May

It would no doubt be the federal government's hope that any potential consolidation of CMB bond supply would see existing investors in the product pivot their demand to the sovereign, to be expressed in primary and secondary markets. Things might not be that simple, however. No question, the relative magnitude of CMB issuance and outstandings is non-trivial in the context of the current GoC market. Meanwhile, ongoing BoC QT will work to drain excess liquidity from Canada's financial system. This unconventional tightening is already requiring end investors to take down a record amount of net GoC bond supply, which could be expected to contribute to higher term yields all else being equal. Any post-consolidation demand leakage, from domestic or international investors (or both), could necessitate a modest increase in yields to clear a relatively larger GoC program. At \$40 billion, the current level of CMB supply is equivalent to 1.4% of national GDP. At present, simplified regression analysis suggests that might initially require a 2-4 bp back-up in GoC yields to clear. We'd note that various consolidation strategies could be contemplated, some of which could presumably limit the impact on term yields. For instance, some CMB-related issuance could be financed via an expanded T-bill stock (although such a strategy would add to interest rate reset risk).

Looking back on the prior Crown consolidation episode—announced in 2007 for implementation in 2008—you'd be hard-pressed to identify a meaningful 'consolidation impact' on GoC bond yields. After all, the world fell headlong into a global financial crisis shortly after the consolidation of BDC, CMHC and FCC direct borrowing was announced, muddying bond market waters. Canada's clearly underperformed U.S. Treasuries at the onset of consolidation in 2008, but that was likely more a function of the less-acute financial system stain in Canada and thus a less-pronounced degree of monetary policy easing north of the border. Given extreme policy noise in 2008-09, this prior (and more minor) Crown consolidation episode is less-than-informative from our vantage point.

Part D: Where we estimate the cost to all issuers for a given change in borrowing rates

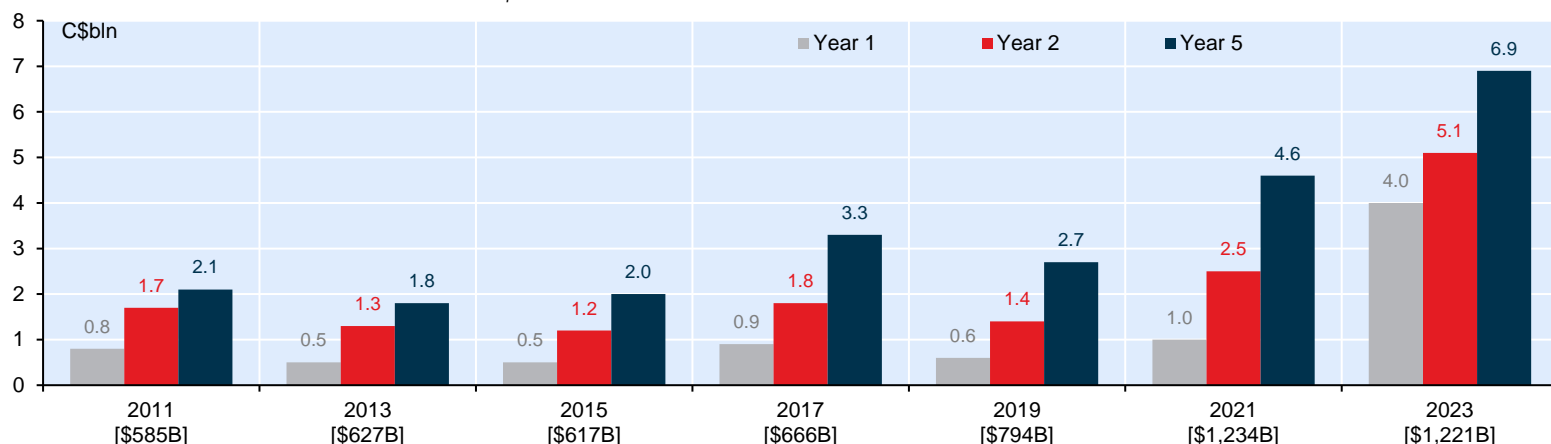
We're not interested in being deliberately alarmist. Indeed, we've cautioned on the limitations of various statistical approaches to estimating the impact of supply on sovereign bond yields (be it across nations or over time). But if prospective CMB consolidation were to be predominantly financed via incremental GoC bonds (as seems likely), it's plausible that a modest back-up in Canada's risk-free bond yields could follow. As previously noted, the ultimate impact might be expected to vary across the yield curve, depending on the precise funding strategy the government employed for the marginal product.

All this brings us to the next logical question? If GoC yields were to edge a bit higher, how much might that cost the federal government? Put another way, is there a risk that some of the notional interest savings (i.e., 'agency spread' capture) could be washed away? It's quite possible. Barring an basis point-for-basis point compression in all credit spreads vs. the GoC curve, any potential increase in underlying Canada yields could also add to borrowing costs for other debt issuers. This is a non-trivial consideration for Canada's decentralized public sector, where provincial governments carry relatively heavy debt loads and where local governments are being asked to accommodate future growth (via partially debt-financed capital spending). Look beyond the public sector and you'll find that Canadian corporate issuers have just as much debt outstanding in the domestic market as our governments do. Moreover, the existing crop of index-eligible corporate bonds is of a shorter average term than in the broader public sector, suggesting higher rates could be captured quicker. Note that much outstanding financial debt is a reflection of leverage taken on by Canadian households, where an adjustment to higher borrowing rates is already weighing.

In this section, we aim to estimate the relative sensitivity to a sustained increase in borrowing rates. Simply put, for a heavily leveraged country like Canada, this is a non-trivial consideration. It is, however, one aspect among many that should be contemplated during CMB consultations. A host of market-functioning issues need to be better understood, ditto for some complex mortgage market dynamics. As such, you can expect much more to be said on this, as Ottawa contemplates one of the most significant changes ever to Canada's bond market.

Chart 8: Ottawa's sensitivity to a given change in borrowing rates has stepped up

Evolution in Government of Canada's estimated impact of a sustained 1% increase in all interest rates

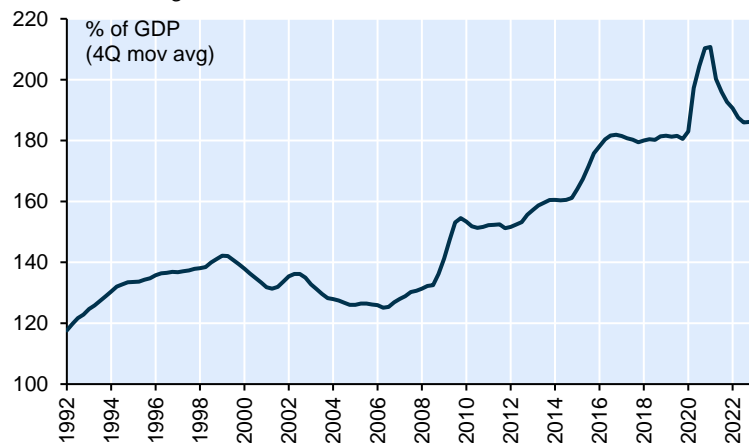


Source: NBF, GoC (Budget) | Note: Figures in [] refer to the projected level of federal debt at time of budget

When contemplating the impact of a GoC-led increase in borrowing rates, it's natural to start with... well the Government of Canada. The federal government's official analysis shows ever-greater sensitivity to higher interest rates. The impact would accumulate over time as more debt is rolled. As always, we treat sensitivities with caution. But taking an admittedly simplistic view, each 1 bp sustained increase in all GoC yields might cost Ottawa ~\$40 million in year 1 and roughly \$70 million by year 5. In other words, it shouldn't take too many basis points to get one's attention.

Chart 9: A broader perspective on debt surely needed...

Total outstanding Canadian debt securities relative to GDP (all issuers)

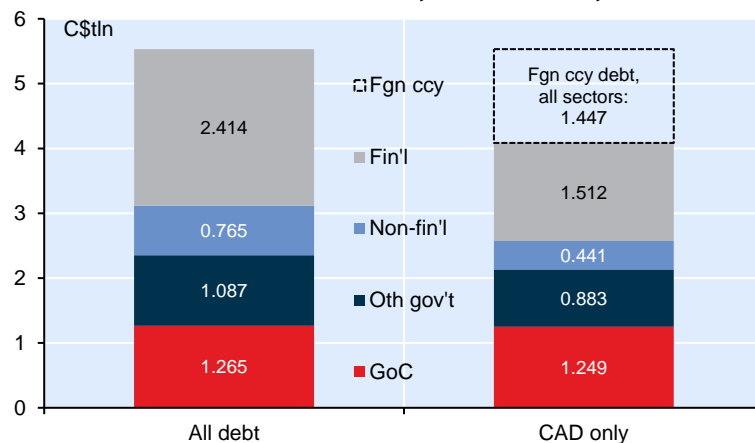


Source: NBF, StatCan | Note: Book value; last observation 2022:Q4

Canadian issuers, across all sectors, have \$5½ trillion of outstanding debt instruments. The corresponding ratio to GDP may be off its pandemic peak but is nonetheless quite elevated (near 200%). There's simply far more relative leverage now than when the feds last consolidated a portion of Crown borrowing (in 2008). When it comes to the impact of higher borrowing rates, we shouldn't limit our focus to the Government of Canada, since the majority of outstanding Canadian debt originates elsewhere. Ottawa's share of CAD-denominated debt, at ~30%, is a touch higher than the all-currency tally. That's because provinces and Canadian corporates have long opted to steer a portion of their supply to foreign currency markets. This option remains should domestic market conditions sour and/or CAD borrowing rates prove less-than-attractive—not that we're particularly fearful of an abrupt collapse in domestic demand for Canadian credit at present. As we've argued, the most likely catalyst for any adjustment in borrowing rates after prospective CMB consolidation would be via modestly higher GoC bond yields, particularly if some existing CMB investors looked elsewhere for yieldy, high-quality liquid assets. It's possible that a hunt for yield in a post-consolidation world could pull some select credit spreads in, limiting the net impact of higher borrowing rates for these issuers. But given the larger share of debt traced to non-GoC sectors, even a modest/partial back-up in borrowing rates could really add up.

Chart 10: ... since other gov'ts & corps are big borrowers too

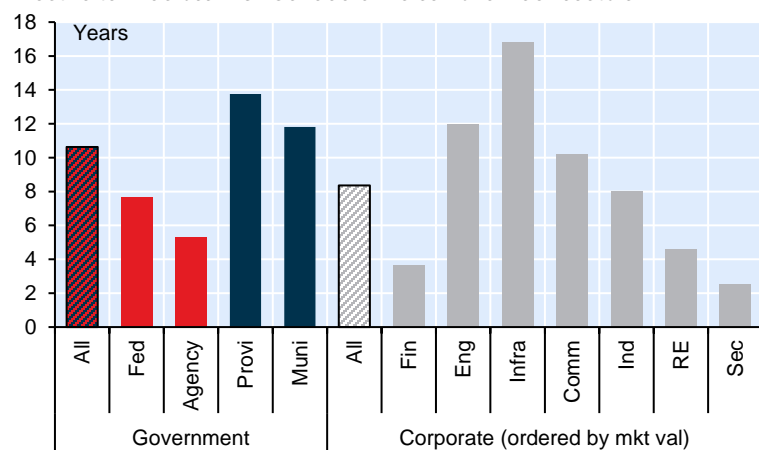
Distribution of Canadian debt securities by sector & currency of issue



Source: NBF, StatCan | Note: Book value as at 2022:Q4

Chart 11: How quickly do your bonds roll?

Effective term across FTSE Canada Universe Bond Index sectors

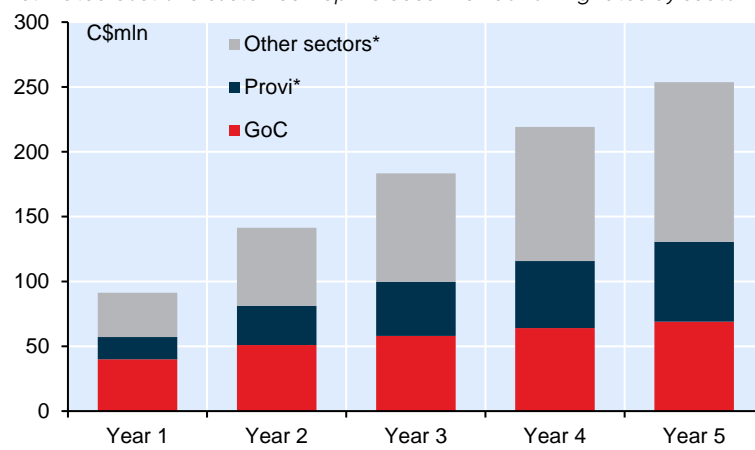


Source: NBF, FTSE Russell | Note: Based on closing prices & constituents as at 9-May

Large provinces provide official sensitivity analysis, putting a dollar value on a given parallel shift in borrowing rates. The relative fiscal sensitivity to higher interest rates is initially much lower at the provincial level than for the feds, given that (a) provinces have less short-term debt outstanding (which obviously rolls the fastest); and (b) outstanding provincial bonds are of a longer average term, as these issuers generally prefer to place a larger share of their debt out the curve. Still, the impact of sustained higher borrowing rates would build over time. Canada's corporate sector (including financials) has just as much domestic debt outstanding as in the public sector. Some of this is short-term, some of it floating, where the impact of higher borrowing rates would be felt quickly. As for outstanding fixed-rate corporate bonds, index analysis reveals an effective term that's somewhat shorter than the overall government sector. After a number of simplifying assumptions, we estimate the annual cost to all Canadian debt issues from a 2-4 sustained basis point increase in all borrowing rates could reach \$500 million to \$1 billion by year five. Which finally brings us to...

Chart 12: It might surprise you what a single bp is worth

Estimated cost of a sustained 1 bp increase in all borrowing rates by sector



Source: NBF, Cdn gov'ts, StatCan | Note: Non-GoC impacts incorporate NBF estimates

The bottom line... where theoretical interest savings intersect with potentially higher borrowing costs

CMB consolidation, which will be the subject of forthcoming consultations, is predicated on capturing the 'agency spread' on explicitly guaranteed bonds. Based on historic CMB spreads, some non-trivial savings are theoretically available—reduced interest charges meant to be steered into unnamed affordable housing initiatives. Setting aside bond and mortgage market functioning issues (of which there are many), it's possible that the enlarged GoC debt program needed to accommodate consolidation could result in higher borrowing rates. We estimate that adding \$40 billion in annual supply to the GoC bond market might initially require a 2-4 bp back-up in GoC bond yields, dulling direct interest savings for Ottawa. But other governments and corporates account for a much larger share of debt outstanding. Given the heightened sensitivity to higher interest rates in today's economy, even a seemingly modest increase in borrowing rates (if fully passed through and sustained) could cost all Canadian debt issuers roughly \$500 million to \$1 billion a year by year 5. Ironically, that might fully offset the notional interest savings that motivated the proposed CMB consolidation in the first place. Whether intended or not, the prospective cost to other governments, corporations and ultimately households is nothing to sneeze at and should be examined during consultations.



Annex: Sample OLS regression results from cross-sectional analysis of sovereign bond yields

As per Part C (page 3), we specified a number of statistical relationships, via OLS regression analysis, to identify and isolate the potential impact of a central government's gross financing need on resulting bond yields. Detailed results from a sample regression are presented below.

$$GT10Y = \beta_0 + \beta_1 CBPol_i + \beta_2 GrsFin_i + \beta_3 FinAss_i + \beta_4 ATM_i + \beta_5 GDPSH_i + \beta_6 NonRes_i + \beta_7 CR_i + u$$

Dependent variable: GT10Y | Method: Least Squares

Sample: 1-25 advanced sovereigns (jointly comprising 91% of total advanced economy GDP in 2023)

Included observations: 20 of 25 (jointly comprising 85% of total advanced economy GDP in 2023)

Variable	Coefficient	Std. Error	t-Statistic	Prob.	Coefficient interpretation
C	-0.315	0.577	-0.55	0.59	
CBPol	0.837	0.067	12.49	0.00	+1%-pt equiv. to +83.7 bps
GrsFin	0.024	0.015	1.57	0.14	+1%-pt of GDP equiv. to +2.4 bps
FinAss	-0.007	0.005	-1.36	0.20	+1%-pt of GDP equiv. to -0.7 bps
ATM	0.048	0.037	1.29	0.22	+1 year equiv. to +4.8 bps
GDPSH	-0.085	0.038	-2.26	0.04	+1%-pt of world GDP equiv. to -8.5 bps
NonRes	-0.013	0.006	-2.25	0.04	+1%-pt of holdings equiv. to -1.3 bps
CR	0.009	0.004	2.13	0.05	1 notch weaker rating (+10 pts) equiv. to +9.4 bps
R-squared		0.959			
Adjusted R-squared		0.935			
S.E. of regression		0.312			
F-statistic		40.4			
Prob. (F-stat)		0.000			

Where: GT10Y = generic 10-year sovereign government nominal bond yield (% , current) [dependent variable]

CBPol = central bank policy target interest rate (% , current)

GrsFin = central government gross financing need (% of GDP, 2023)

FinAss = general government financial assets (% of GDP, 2023)

ATM = central government average term-to-maturity of outstanding debt securities (years, 2023)

GDPSH = national share of global GDP (% of PPP-adjusted worldwide GDP, 2023)

NonRes = non-resident share of general government debt outstanding (% of total, 2022)

CR = sovereign long-term credit rating, controlling for outlook (linear translation of S&P rating, current)

Source: NBF | Note: The above is a cross-sectional model for estimating current nominal bond yields in advanced economies; various specifications were tested, utilizing a range of explanatory variables, terms & lag structures; time-series analysis was conducted to study the impact of government borrowing over time

Note on select other explanatory variables tested, which can include historical values, current readings & available forecasts: CPI inflation, real GDP growth, unemployment rate, general government net lending/(borrowing), general government budget balance trend prior to pandemic, general government structural budget balance, general government net debt burden, general government gross debt burden, gross national savings, GDP per capita, Moody's long-term sovereign credit rating, proxy for non-investment grade sovereign credit rating, proxy for triple-A sovereign credit rating, proxy for JPN (owing to extreme nature of some readings), etc.



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