APPENDIX 1

FixedResets: Break-Even Rate Shock

The concept of Break-Even Inflation is well known when applied to Real Return Bonds (RRBs), or TIPS as they are called in the States. When analyzing a particular nominal/indexed bond pair, one simply subtracts the real yield on the indexed bond from the nominal yield on the nominal bond to obtain the rate of inflation that must occur in order for the bonds to have an identical realized yield on maturity – this is the Fisher Hypothesis[1], shown in simplified form in equation [1]

$Y = r + i$ [1]

Where: Y: Nominal Yield
r: Real Yield
i: Inflation Expectations

There have been various attempts to improve equation [1] by adding terms for inflation risk (the idea that a nominal holder will require more yield because his expectations might be incorrect) and liquidity (the idea that a RRB holder will require more yield to compensate for the lower liquidity of RRBs) among other things, but by and large these efforts have resulted in unsatisfactory results.

In Canada, Bank of Canada analysts have suggested that the inflation risk premium is zero[2], which goes a long way towards explaining why Canadian issuance is so small relative to the rest of the world[3] – if the issuer is not reducing its interest expense by capturing the inflation-risk premium for itself rather than paying it to nominal-bond buyers, there's not much point in the exercise.

One way or another, the Bank of Canada currently reports than long-term nominal bonds are yielding 4.01%, while long term RRBs yield 1.98% – the break-even inflation rate is therefore 2.03%, very close to the centre of the Bank's 1%–3% operating band, and the point at which it aims when setting monetary policy.

The implication that the inflation risk premium for Canadian RRB is zero has very fundamental repercussions for the market in Fixed-Reset (FR) issues, since the rationale for their purchase is usually that they have better inflation protection than nominals – which is quite true, but how much is that worth?

One characteristic of the market is that the spreads between new FR issues and PerpetualDiscounts (PDs) from the same issuer is very large. Consider, for example, an issuer with PDs yielding 6.5% that issues an FR with an initial rate of 5.7%; the reset spread being assumed to deliver a constant yield in perpetuity, given a constant GOC five-year rate. If we discount the projected cash flows on the FR at the yield of the PDs, we find that fair value of the FR is 12.31% lower; implying that nearly one-eighth of the price of a FR new issue is the premium paid for the inflation protection.

We can check this figure: the modified duration of a perpetual annuity is the inverse of the yield, therefore the FR at 5.7% has a modified duration (assuming constant dividends) of 17.54. Discounting at the PD's yield of 6.5% is equivalent to an increase of 0.80% in yield, hence a decline in price of 17.54 * 0.80 = 14.03% could be expected. This is slightly higher than the precise result of 12.31% due to convexity (see http://www.prefblog.com/?p=1640).

In order to address the question in a quantitative way, I have developed equations calculating the Break Even Rate Shock (BERS) for FRs vs. PDs.

Firstly, a Rate Shock is defined as an increase in nominal rates that hits all markets equally. This could be due to either component of the Fisher equation; inflation or expected real return on bonds of all types. It is important to note that a Rate Shock does not include the concept of a Flight to Quality, in which it is credit spreads that change via a decline in government rates unmatched by corporates, an increase in corporate rates unmatched by Canadas, or a combination of the two.

Secondly, a Break-Even Rate Shock is defined as the Rate Shock that must be experienced immediately in order for the total return of the FR and PD issues examined to be equal.

To determine the BERS for a single FR trading at par:

- The YTW on the issuer's PDs is calculated
- The difference between the initial fixed rate of the FR and the PD YTW is calculated
    - It is assumed that the reset spread has been selected so that, given a constant five-year GOC rate, the dividend on the FR will be constant
- A Rate Shock is applied to the discounting of the cash flows of both the FR and the PD. This is assumed to be
    - Effective immediately
    - Permanent
    - Constant
- The capital loss on the PD due to the rate shock is calculated
- The expected cash flows of the FR are discounted at the post-shock PD yield
    - The dividend will not reset until T years following the rate shock

It will be noted that in this model the effect of calls is ignored; the effect of calls will be examined later in this essay.

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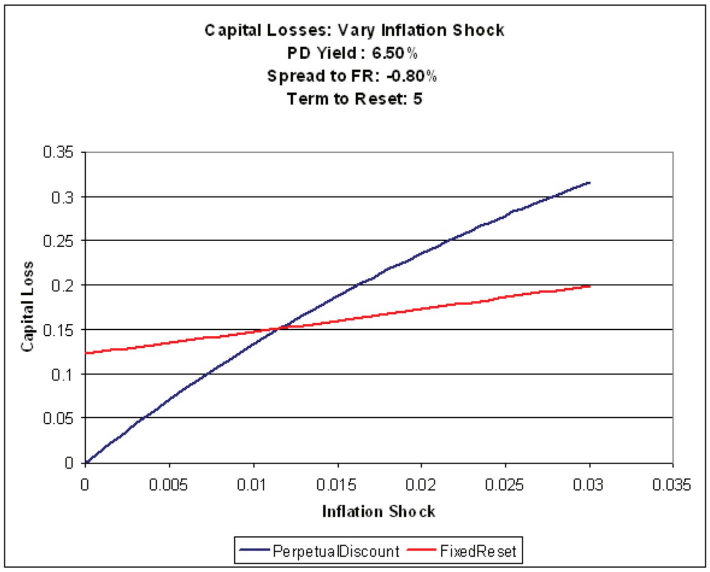
[1] Wensheng Peng, IMF Working Paper No. 95/118, *The Fisher Hypothesis and Inflation Persistence: Evidence from Five Major Industrial Countries,* on-line at http://papers.ssrn.com/sol3/papers.cfm?abstract_id=883264

[2] http://www.bankofcanada.ca/en/review/autumn04/reid.pdf Christopher Reid, Frédéric Dion and Ian Christensen, *Real Return Bonds: Monetary Policy Credibility and Short-Term Inflation,* Bank of Canada Review, Autumn 2004

[3] Pu Shen, Kansas City Fed Economic Review, 1Q09, *Developing a Liquid Market for Inflation-Indexed Government Securities: Lessons from Earlier Experiences,* available on-line at http://www.kansascityfed.org/PUBLICAT/ECONREV/PDF/09q1Shen.pdf

In Chart A1, I show the loss of present value that will be experienced by a PD (initially yielding 6.5%) and a FR (initially yielding 5.7%, with the rate reset in five years) when a rate shock of varying severity is applied. It will be noted that if there is no rate shock, the loss on the FR is the 12.31% calculated earlier, while no loss is experienced by the PD. It is only when the rate shock reaches 116bp – when the PD yield becomes 7.66% and the five year Canada rate increases by the same amount to reset the dividend on the FR to 6.86% from the initial rate of 5.70% – that the losses are equivalent and the FR structure has achieved its purpose for the investor.

A1



Many investors will emphasize that should a rate shock in excess of 116bp be experienced then the FR will outperform – by losing less money – and this is an entirely valid point. In order to come up with a fully general solution for an investor it is necessary to take a view on:

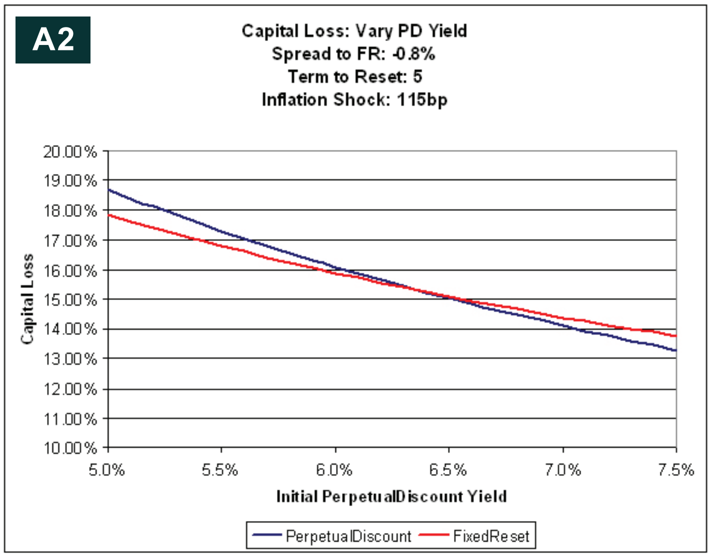
- The probability distribution of potential rate shocks
- The loss-aversion function of the individual investor

The probability of each possible loss multiplied by the severity of that particular loss multiplied by the value reflecting the investor's aversion to that loss should, in theory, be integrated together with the more cheerful prospects of potential gain and the desirability of ownership of each issue determined by the score calculated through this process.

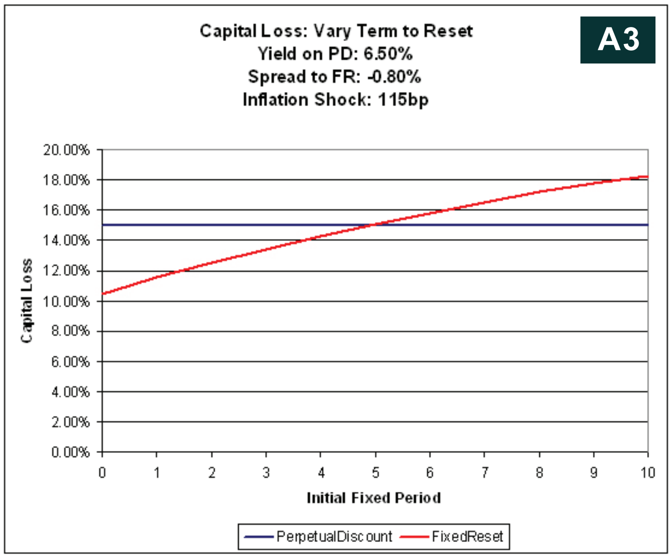
It is the loss-aversion function, and retail's difficulties with the concept, that probably explains the difference between the BERS values found in the FR/PD market and that of zero found in the nominal Canadas/RRBs market. In the first place, the loss experienced through an investment in FRs without subsequent rate shock will be invisible to many investors, since it is not experienced as actual loss of capital but as reduced yield, which can be rationalized as being due to a desire for safety – without quantitative analysis being considered necessary. Additionally, investment advisors counselling clients may, consciously or otherwise, apply their own loss aversion function to the projected returns: 'A loss of 5% … I can explain it. A loss of 15% … I'll lose the client'. Naturally, this will be particularly true if the 5% loss is invisible!

The sensitivities of the calculation to changes in the other parameters describing the relationship between the notional FR and PD issues are shown graphically in charts A2–A4.

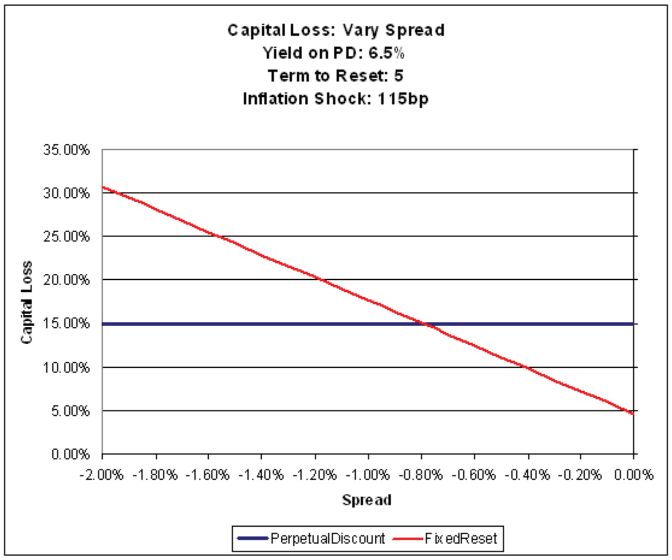
A2



A3

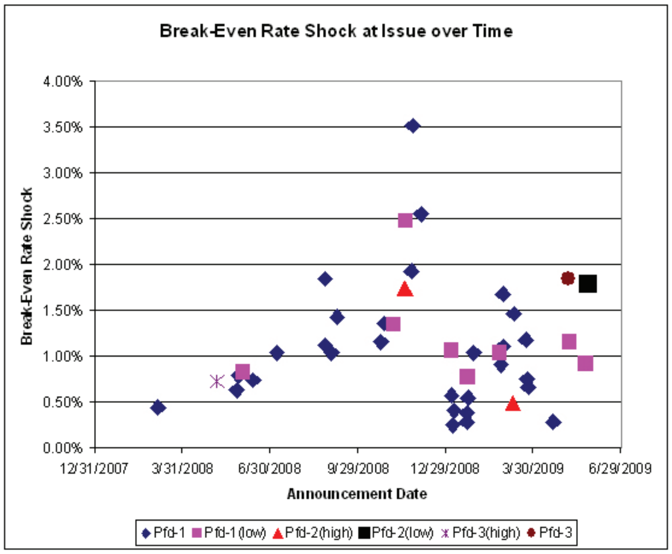


A4



In investigating BERS, I have examined each FR issue currently listed on the Toronto Stock Exchange (including BNS.PR.S, which does not trade: see http://www.prefblog.com/?p=5879) and determined the mean average yield of that issuer's PD issues on the announcement date. I have then calculated the BERS using a term to reset of five years for each issue (an approximation, but the calculation is not particularly sensitive to this variable, as shown in Chart A3). The BERS and supporting data is provided in Table 1 and shown graphically in chart A5.

A5

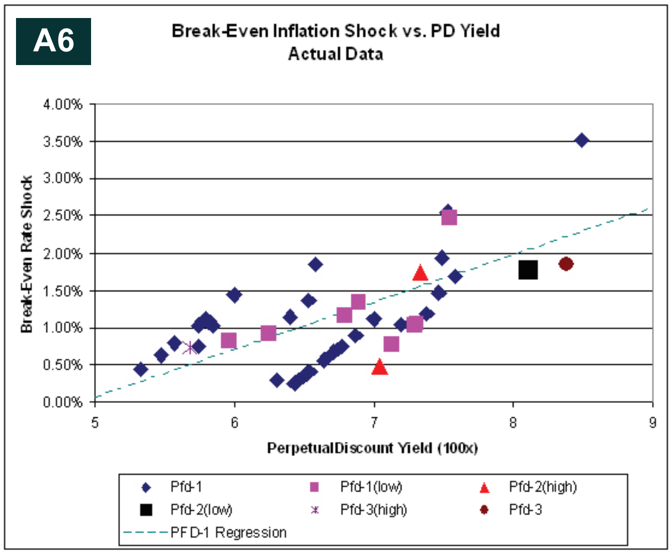


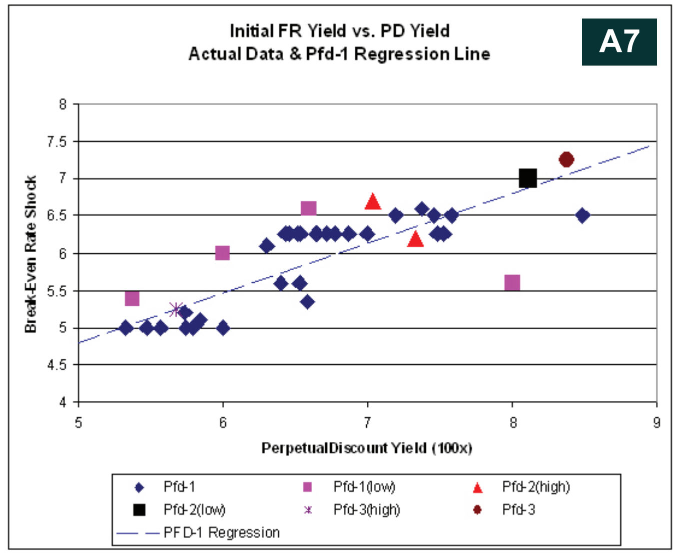
The peak BERS was experienced with the issue of BMO.PR.N, announced on November 25, 2008, a day on which the HIMIPref™ PerpetualDiscount subindex dropped 2.16%, one day before what was to prove the bottom of the market. Amidst all the gloom of that day, BMO's PD issues closed with a pre-tax bid-YTW of 8.49%, but BMO was able to sell a FR issue with an initial fixed rate of only 6.50%. The BERS for this issue was a staggering 351bp … in other words, as long as the PDs maintained a yield of under 12.00% after suffering the heartbreak and thousand natural shocks that fixed income is heir to, then (subject to the assumptions of the calculation) they will turn out to have been the better investment. Despite this astonishing yield give-up, the FR issue closed about two weeks later without incident (see http://www.prefblog.com/?p=4448).

The coincidence of the peak in BERS with the peak in PD yields is worthy of investigation; we can hypothesize that investors, frightened by the decline in PerpetualDiscount prices due to the increase in credit spreads, stampeded into FR issues in a search for price stability, unaware that the sensitivity of the FR class to changes in credit spreads at new issue time is equal to that of PD issues (it is only Rate Shocks, as defined above, that the FR adjustment mechanism can accommodate).

This hypothesis may be examined by plotting the BERS and the initial rate paid on FR issues against the announcement-date PD yield; these data are presented in Charts A6 and A7, respectively.

Chart A6 indicates that there is some kind of relationship between the BERS and the yield on PDs, which doesn't make a lot of sense … fortunately, the relationship is not too strong! However the r-squared of the Pfd-1 data is about 42% (the amount of dispersion of the raw data that is explained by the regression line), which is significant enough. Will the regression retain its validity outside the range of the data examined? Will the BERS be close to zero once the banks can issue FR paper with a 5% initial yield? We will see!





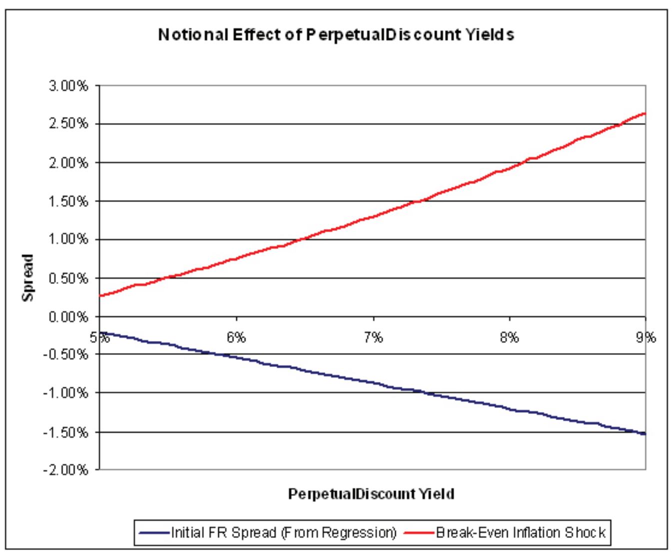
The relationship between the initial FR yield and the PD yield on announcement date is stronger, with r-squared of 70%; this is only to be expected. As it turns out, the equation derived for the initial FR Rate (YFR) relative to the announcement date PD yield (YPD) is:

YFR = 1.44% + 0.67*YPD [2]

Clearly, the validity of equation [2] will decline at more extreme values of YPD (I would certainly not expect an initial yield on FRs of 1.44% when PDs yield zero!) but within the current boundaries the relationship is strong; and more interestingly, the sensitivity of YFR to YPD is significantly less than unity.(the regression results in a standard error of the 0.67 slope of only 0.08).

This relationship can be used to determine the BERS for a notional FR that obeys this relationship within the bounds of 5% < YPD < 9%; the results of the calculation are shown in Chart A8.

A8



It is Chart A8, more than any other, which demonstrates that the new issue market in FRs does not have a proper backing in logic. While arguments can be constructed to show that, despite the fact that the reset feature has no value to risk-neutral investors, there is a value – and hence a non-zero BERS – for retail investors with risk-aversion functions defined within certain bounds, there is no excuse for the idea that the BERS should increase when credit spreads increase. The sensitivity of FRs at new issue time is equal to that of PDs, if we ignore the effect of any new-issue concession that may be inherent in the issue; it does not make sense that investors should expect a larger rate shock when credit spreads are higher.

The explanation must lie in investor psychology; since the inception of the FR structure a little over a year ago, markets have experienced jarring declines which will have terrified those who made the mistake of assuming that fixed-income was equivalent to fixed-price. Such investors will grasp at any straw for greater price stability, regardless of the cost of such stability and the fact that stability in the face of the increased credit spreads that caused the recent declines will simple not exist.

Calls

The calculation of the BERS and the above discussion has assumed that both PDs and FRs are true perpetuals, by which I mean non-callable.

At new issue time, the presence of calls favours PDs: the fact that by definition they are treading below their call price (well below, in many cases) increases the symmetry of their potential returns, while the 5-year call at issue price on FRs creates maximum asymmetry since capital gains are capped at zero over the long term, while the influence of spreads and potential default provide a downside equivalent to that of PDs – it is only negative rate shocks as defined in this essay that provide any advantage to FRs.

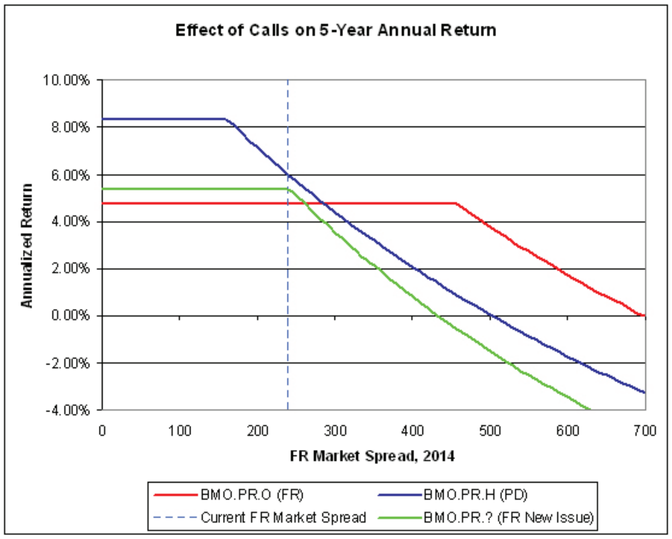
In the secondary market, however, things are more complex. It is clear that higher reset spreads imply a greater chance of a call and, as is the case with PerpetualPremiums, the high probability of call will contain genuine value for investors seeking an investment with a five year term (see my essay *Perpetual Hockey Sticks*, via http://www.prefblog.com/?p=780).

There is, unfortunately, no clear way to assess the attractiveness of a high-reset FR vs. a PD, but it is possible to draw a pay-off diagram that provides the first step in such an assessment. Let us consider as an example BMO.PR.O, announced on March 11 with an initial rate of 6.50% and a reset spread of 458bp. Since BMO has just announced an FR with a reset spread of 213bp, it is clear that there is currently a good chance that BMO.PR.O will be called when the first opportunity arises, May 25, 2014.

Chart A9 shows the annual returns that will be realized by three BMO issues given a number of assumptions. The issues are:

- BMO.PR.O, FR, 6.50%+458bp, now trading at $27.00
- BMO.PR.H, PD, pays $1.33, yields 6.08%
- BMO.PR.?, FR New Issue, 5.40%+241, priced at $25.00

A9



The assumptions are that the Five-Year GOC rate doesn't change, that there is no Rate Shock and that the yield relationship between PD issues and new FR issues doesn't change. Some simplification has been performed in the computation of the annual returns under varying market spread scenarios; these simplifications will have minor effect and do not affect the conclusions.

First, we observe that the PD issue performs better than the new FR issue under all market-spread scenarios – this is a consequence of the assumption made for purposes of this chart that there is no Rate Shock. Since the BERS for the BMO new issue is 1.02%, the underperformance of the new issue given the assumption should not come as a surprise.

The critical point, however, is the effect of the high reset spread on the older BMO.PR.O FR issue. This is trading to yield approximately 5.00% until its projected call in 2014, much less than the 5.40% BMO is attaching for its new issue; but with that lower expected yield comes the higher certainty of achieving that yield. As is so often the case, there is no clearly and universally better choice between the two issues; that choice will be determined by the individual investor's view of the probability distribution of the market spreads five years hence and his individual objective function that defines his desire for and aversion to each possible return.

Historical Components of PerpetualDiscount Yield

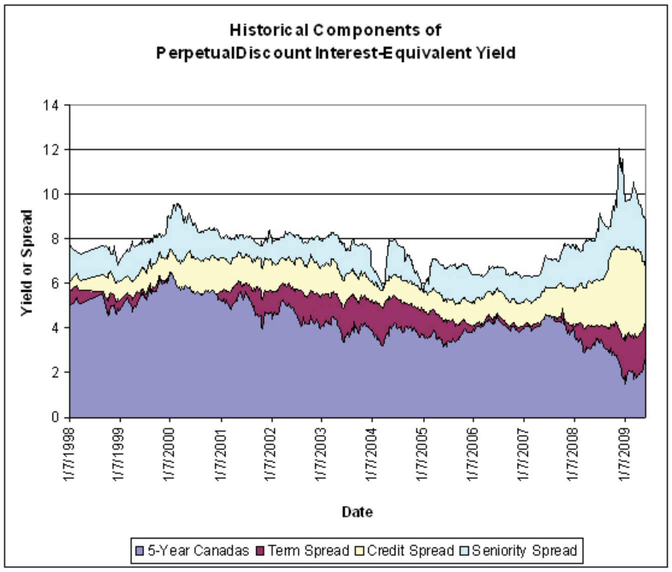
It is, of course, completely ludicrous to compare the yields on PerpetualDiscounts with Five-Year Canadas: the basis risk is incredible. However, the tradition of 5-Year mortgages has ingrained the idea into the Canadian market view; and it may well be that taking advantage of this nonsense was a consideration when the FR structure was defined.

Be that as it may, I present Chart A10, which shows the PerpetualDiscount Interest-Equivalent yield as a sum of its four components when defined in this manner. In order to prepare this graph:

- The PerpetualPremium yield was used when there were no members of the PerpetualDiscount index
- The Perpetual yield was multiplied by a constant 1.4x tax factor
- The Five-Year Canada Rate has been supplied by the Bank of Canada

- The Term Spread is the Long Canada Rate (Bank of Canada) less the Five-Year Canada Rate
- The Credit Spread is the Long Corporate Rate (ScotiaMcLeod / TSX via the Bank of Canada, and http://www.canadianbondindices.com) less the Long Canada Rate
- The Seniority Spread is the tax-adjusted Perpetual Yield less the Long Corporate Rate

A10



Spreadsheet

A Microsoft Excel™ spreadsheet has been used to calculated the BERS reported in this essay. I am unable to supply this spreadsheet with the delivery of this publication, but will eMail it on request to subscribers. It will eventually be published – but not just yet!

The calculations are derived from the Supporting Algebra reported below and are as follows:

Cell	Title	Formula	Example	Text
B2	Yield on Perpetual Discount	Data	6.13%	Yield as a Percentage
B3	Yield Spread to Fixed Reset	Data	-0.73%	Yield Discount for FR
B4	Term To Reset	Data	5	Term to reset, years, integer
B5	BERS	Data	1.02%	BERS, parallel shift to all markets, percentage
B8	Pre-Shock PD Duration	=1/B2	16.33	Modified Duration = 1/y
B9	Post-Shock PD Yield	=B2+B5	7.15%	Yield increases by shock
B10	Capital Loss on PD	=1-B2/(B2+B5)	14.28%	Capital loss resulting from shock (note convexity effect)
B11	Pre-Shock Dividend Rate, FR	=B2+B3	5.40%	
B12	Pre-Shock FR Fair Value	=25*(B2+B3)/B2	22.04	Discounted at Pre-Shock PD Yield
B13	Post-Reset Dividend Rate, FR	=B2+B3+B5	6.42%	
B14	Fair Value FR on Reset Date	=25*(B2+B3+B5)/(B2+B5)	22.46	Discounted at Post-Shock PD Yield
B15	PV of Reset Date FR Value	=B14/(1+B2+B5)^B4	15.91	
B16	Total FV of Interim FR Div	=B4*25*(B2+B3)	6.75	Number of years to reset time annual dividend
B17	PV of Interim FR Dividends	=25*(B2+B3)*((1 - (1+B2+B5)^B4))/(((1+B2+B5)^B4)*(-B2-B5))	5.51	Discounted at Post-Shock PD Yield
B18	Post-Shock PV FR	=B15+B17	21.42	PV Interim Dividends + PV Reset Date value
B19	FR Capital Loss due to Shock	=1-(B18/B12)	2.81%	Pre-Shock Fair Value vs. Post-Shock Fair Value
B20	Post Shock Loss from $25	=1-(B18/25)	14.31%	$25 issue price vs. Post-Shock Fair Value

In order to determine the BERS, the value in cell B5 is varied manually until the value in B10 is equal to the value in cell B20.

SUPPORTING ALGEBRA

In order to calculate the Break Even Inflation Shock, we need to be able to calculate the price of a Fixed Reset issue immediately after this shock is experienced.

These calculations will be based on valuing the issues assuming at all times that the dividend is paid annually exactly one year hence; this allows us to use the current yield to price the instruments.

We define:

i : yield on Perpetual Discount
GOC5 : yield on five-year Canadas
r : reset spread for fixed reset
Δ : yield differential, the Fixed Reset initial yield less the Perpetual Discount initial yield
Δi : rate shock
T : Term to Reset

and note that prior to the shock

$$\text{GOC5} + \text{r} - \Delta = i \quad [1]$$

On the Reset Date following the shock, the dividend rate will be reset to

$$25 \bullet (\text{r} + \text{GOC5} + \Delta i) \quad [2]$$

and when this rate is discounted at the post shock Perpetual Discount rate, the fair value on the Reset Date is

$$\frac{25 \bullet (\text{r} + \text{GOC5} + \Delta i)}{i + \Delta i} \quad [3]$$

We substitute values using equation [1] so that the fair value on the Reset Date is

$$\frac{25 \bullet (i + \Delta + \Delta i)}{(i + \Delta i)} \quad [4]$$

and then discount this price to the Shock Date:

$$\frac{25 \bullet (i + \Delta + \Delta i)}{(i + \Delta i)} \bullet \frac{1}{(1 + i + \Delta i)^{\text{T}}} \quad [5]$$

The Shock Date value of the Fixed Reset dividends received up to and including the Reset Date is

$$\sum_{t=1}^{\text{T}} \frac{25\,(i + \Delta)}{(1 + i + \Delta i)^{t}} \quad [6]$$

$$= 25\,(i + \Delta) \bullet \sum_{t=1}^{\text{T}} \frac{1}{(1 + i + \Delta i)^{t}} \quad [7]$$

Using the Lemma, we find

$$\sum_{t=1}^{\text{T}} \frac{1}{(1 + i + \Delta i)^{t}} = \frac{1 - (i + \Delta i)^{\text{T}}}{(1 + i + \Delta i)^{\text{T}}\ (-i - \Delta i)} \quad [8]$$

and therefore we substitute equation [8] into equation [7] to get the Present Value of the pre-reset FR dividends on the Shock Date

$$25\,(i + \Delta) \bullet \frac{1 - (i + \Delta i)^{\text{T}}}{(1 + i + \Delta i)^{\text{T}}\ (-i - \Delta i)} \quad [9]$$

and therefore the fair value of the Fixed Reset on the Shock Date is found by addition of equations [5] and [9]

$$\frac{25\,(i + \Delta + \Delta i)}{(i + \Delta i)\ (1 + i + \Delta i)^{\text{T}}} + 25\,(i + \Delta) \bullet \frac{1 - (i + \Delta i)^{\text{T}}}{(1 + i + \Delta i)^{\text{T}}\ (-i - \Delta i)} \quad [10]$$

The value of the Perpetual Discount after the shock is found by dividing its constant dividend rate of

$$\text{D} = 25i \quad [11]$$

by the post-shock yield, $i + \Delta i$, so that the post-shock price is

$$\frac{\text{D}}{i + \Delta i} = \frac{25i}{i + \Delta i} \quad [12]$$

and thus the new price divided by its old price is

$$\frac{i}{i + \Delta i} \quad [13]$$

LEMMA

Let $\sum^{T} = \frac{1}{r} + \frac{1}{r^2} + \ldots + \frac{1}{r^T}$ [L1]

$\therefore\ r\sum^{T} = 1 + \frac{1}{r} + \ldots + \frac{1}{r^{T-1}}$ [L2]

$\therefore\ (1-r)\sum^{T} = \frac{1}{r^T} - 1$ [L3]

$\therefore\ \sum^{T} = \left(\frac{1-r^T}{r^T}\right) \Big/ (1-r)$ [L4]

$\therefore\ \sum^{T} = \frac{1-r^T}{r^T\,(1-r)}$ [L5]

Fixed Reset Characteristics

Issue	Announcement	Average Issuer PD Yield on Announcement Date	Initial FR Rate	Reset Spread	BERS on Announcement Date	DBRS	Reset Date	June 12 Closing Quote	June 12 Bid Yield-to-Call	June 12 Bid Yield-to-Perpetuity
BNS.PR.P	06/03/2008	5.332	5	205	0.44%	Pfd-1	25/04/2013	25.11-22	5.06%	4.85%
FTS.PR.G	06/05/2008	5.68	5.25	213	0.73%	Pfd-3(high)	01/09/2013	24.90-19	5.41%	4.99%
BNS.PR.Q	27/05/2008	5.474	5	170	0.63%	Pfd-1	25/10/2013	24.72-94	5.44%	4.66%
TD.PR.S	29/05/2008	5.575	5	160	0.79%	Pfd-1	31/07/2013	24.91-99	5.29%	4.54%
NA.PR.N	02/06/2008	5.965	5.375	205	0.82%	Pfd1(low)	15/08/2013	25.51-59	4.94%	4.85%
BMO.PR.M	12/06/2008	5.7433	5.2	165	0.74%	Pfd-1	25/08/2013	24.91-04	5.16%	4.55%
TD.PR.Y	07/07/2008	5.845	5.1	168	1.03%	Pfd-1	31/10/2013	24.81-00	5.48%	4.66%
BNS.PR.R	26/08/2008	5.795	5	188	1.12%	Pfd-1	26/01/2014	24.95-99	5.20%	4.76%
CM.PR.K	27/08/2008	6.5814	5.35	218	1.84%	Pfd-1	31/07/2014	25.26-40	5.30%	5.04%
TD.PR.A	02/09/2008	5.745	5	196	1.03%	Pfd-1	31/01/2014	24.84-99	5.33%	4.85%
RY.PR.I	08/09/2008	6.0012	5	193	1.43%	Pfd-1	24/02/2014	24.91-96	5.18%	4.80%
RY.PR.L	23/10/2008	6.40	5.6	267	1.15%	Pfd-1	24/02/2014	25.89-90	4.86%	5.17%
TD.PR.C	27/10/2008	6.5325	5.6	274	1.36%	Pfd-1	31/01/2014	26.10-20	4.74%	5.19%
GWO.PR.J	06/11/2008	6.8975	6	307	1.34%	Pfd-1(low)	31/12/2013	25.91-50	5.07%	5.53%
IAG.PR.C	17/11/2008	7.33	6.2	338	1.74%	Pfd-2(high)	31/12/2013	25.61-90	5.56%	6.00%
PWF.PR.M	18/11/2008	7.5442	6	320	2.48%	Pfd-1(low)	31/01/2014	26.15-50	5.10%	5.63%
RY.PR.N	24/11/2008	7.4862	6.25	350	1.93%	Pfd-1	24/02/2014	26.60-70	4.85%	5.77%
BMO.PR.N	25/11/2008	8.49	6.5	383	3.51%	Pfd-1	25/02/2014	27.01-19	4.71%	5.96%
BNS.PR.S	04/12/2008	7.5283	6.25	384	2.55%	Pfd-1	26/01/2014			
TD.PR.E	05/01/2009	6.65	6.25	437	0.57%	Pfd-1	30/04/2014	27.01-18	4.66%	6.28%
NA.PR.O	05/01/2009	7.3066	6.6	463	1.06%	Pfd-1(low)	15/02/2014	26.91-09	4.97%	6.58%
RY.PR.P	06/01/2009	6.4337	6.25	419	0.25%	Pfd-1	14/02/2014	26.92-07	4.59%	6.17%
BNS.PR.T	07/01/2009	6.5383	6.25	414	0.41%	Pfd-1	25/04/2014	27.03-08	4.64%	6.12%
RY.PR.R	21/01/2009	6.4625	6.25	450	0.29%	Pfd-1	24/02/2014	27.00-09	4.49%	6.34%
BNS.PR.X	21/01/2009	6.515	6.25	446	0.38%	Pfd-1	25/04/2014	27.02-18	4.66%	6.34%
TD.PR.G	22/01/2009	6.6425	6.25	438	0.55%	Pfd-1	30/04/2014	27.07-15	4.61%	6.27%
NA.PR.P	22/01/2009	7.13	6.6	479	0.77%	Pfd-1(low)	15/02/2014	27.07-23	4.83%	6.64%
CM.PR.L	28/01/2009	7.1957	6.5	447	1.04%	Pfd-1	30/04/2014	27.11-25	4.81%	6.39%
MFC.PR.D	24/02/2009	7.29	6.6	456	1.03%	Pfd-1(low)	19/06/2014	26.91-99	4.93%	6.47%
TD.PR.I	25/02/2009	6.8725	6.25	415	0.90%	Pfd-1	31/07/2014	26.91-05	4.78%	6.14%
RY.PR.T	27/02/2009	7.0012	6.25	406	1.11%	Pfd-1	24/08/2014	26.96-16	4.96%	6.14%
CM.PR.M	27/02/2009	7.5828	6.5	433	1.68%	Pfd-1	31/07/2014	27.19-27	5.01%	6.34%

CIU.PR.B	10/03/2009	7.04	6.7	481	0.49%	Pfd-2(high)	01/06/2014	27.55-65	4.54%	6.51%
BMO.PR.O	11/03/2009	7.4625	6.5	458	1.47%	Pfd-1	25/05/2014	27.05-15	5.05%	6.53%
HSB.PR.E	23/03/2009	7.38	6.6	485	1.18%	Pfd-1	30/06/2014	26.80-95	5.00%	6.67%
RY.PR.X	24/03/2009	6.7712	6.25	442	0.75%	Pfd-1	24/08/2014	26.95-00	4.90%	6.35%
TD.PR.K	25/03/2009	6.7175	6.25	433	0.67%	Pfd-1	31/07/2014	26.95-00	4.87%	6.29%
RY.PR.Y	21/04/2009	6.3062	6.1	413	0.29%	Pfd-1	24/11/2014	26.85-92	4.78%	6.24%
CCS.PR.D	06/05/2009	8.38	7.25	521	1.84%	Pfd-3	30/06/2014	26.02-15	6.49%	7.40%
SLF.PR.F	08/05/2009	6.794	6	379	1.16%	Pfd-1(low)	30/06/2014	26.00-09	5.25%	6.06%
MFC.PR.E	25/05/2009	6.25	5.6	323	0.92%	Pfd-1(low)	19/09/2014	25.23-29	5.48%	5.83%
BAM.PR.P	27/05/2009	8.11	7	445	1.78%	Pfd-2(low)	30/09/2014	25.59-65	6.57%	7.01%
BMO.PR.?	10/06/2009	6.125	5.4	241	1.02%	Pfd-1	25/02/2015	25.00	5.40%	5.12%