Market Spread Risk and FixedResetPremium Preferred Shares

In the previous edition, I noted that *"I consider FixedResets to be absurdly expensive at the present time, although many would be recommended as "Short Term" investments if the alternative of badly beaten-up Split Shares did not exist."*

Never-the-less, there is a strong feeling in the investment community at large that these are, effectively, short term instruments and there is certainly a high demand for them. Accordingly, I have added this class of share to the list of classes from which at least one selection per month will be made; there are no "FixedResetDiscount" issues currently outstanding, but when these issues make their inevitable appearance they will be considered a separate class – and I anticipate little argument as to whether they represent "long term" or "short term" investments! This separation of the class into Premium and Discount components mirrors the separation of the Straight Perpetuals, which has been a valuable taxonomic feature in the past few years.

The FixedResetPremium class presents analytical problems, as I discussed in my May, 2009, seminar on FixedResets.[1] This essay will examine a feature that may often be overlooked in the analysis: the size of the Issue Spread. This attribute may often be overlooked because it is currently irrelevant to traditional Yield-to-Worst (YTW) analysis: since the issue is expected to be called, the dividend is not expected to be reset. However, the size of the Issue Spread has important implications for the degree of confidence we may place in the YTW calculations and – subject to a series of approximations – may be used to adjust the future Exchange Date price so that a risk-adjusted yield may be used in place of YTW.

This essay is split into several sections:

- **Nomenclature:** The jargon used to describe various elements of the analysis is defined.
- **Hockey Sticks:** Any option, or instrument with an embedded option, will have a "hockey stick" payoff diagram when potential returns are plotted against the level of the underlying instrument (in this case, the Market Spread). This section compares the payoff diagram for two FixedResetPremium issues.
- **Estimating the Current Market Spread:** Not as easy as it sounds, given market inefficiency and the high premia on outstanding FixedResets! However, this value is required in order to create a probability distribution for the Future Market Spread.
- **Effects of Future Variance in the Market Spread:** Having reviewed the theory of the scenario analysis and estimated the current Market Spread, we may start a more detailed examination.
- **A Review of Historical Spread Data and its Components:** Spreads have gyrated wildly due to the Credit Crunch, which poses problems to any quantitative analyst.
- **Limitations to the Historical Data:** One must always be cautious when using historical data to estimate the potential for future market changes. This section discusses the limitations of the available historical data.
- **Estimating Market Spread Volatility:** An estimate of the volatility of Market Spread is prepared and the resultant probability distributions used for scenario analysis prepared.
- **Call Probability given the Estimates of Market Spread Mean and Volatility:** The implications of the scenario probability distribution on the probability of a call on the next Exchange Date are discussed.
- **Application of the Scenario Analysis to Future Issue Price:** If the FixedResetPremium issues are not, in fact, called on the next Exchange Date, we must assume that they will trade below par. This section applies the scenario analysis to estimate the Future Issue Price of the issues.
- **Calculation of Risk-Adjusted Yield:** Having estimated the Future Issue Price, we may calculate the yield to the next Exchange Date (or any other date) using this price.
- **The Current Market and Investment Conclusions:** A review of current market conditions in the light of the analysis.
- **Table:** A table of all FixedResetPremium issues tracked by the Hymas Investment Management analytical software, HIMIPref™, showing the relevant terms of each issue and the results of applying the analysis herein.

Nomenclature

Exchange Date: The date on which the issue may be called at par by the issuer, failing which the dividend rate will be reset to GOC5 + Issue Spread. At that point, the holder has the option to exchange to Floating Rate issues.

Future Issue Price: The estimate of a price for a given issue on its next Exchange Date, which may be derived from a single value of the Market Spread on that date, or be the probability-weighted average price from a number of scenarios. This is always less than the call price.

GOC5: The yield on five-year Canadas (possibly calculated using interpolation between active issues) used to determine the dividend rate by adding the Issue Spread. In this essay this is considered to be a constant 2.70%.

Issue Spread: The spread to GOC5 that will define the dividend to be paid on the shares following the Exchange Date

Market Spread: The reset spread at which new FixedReset issues may be sold. Only issues rated Pfd-1(low) are discussed in this essay; credit risk and credit spreads are different kettles of fish entirely!

Risk-Adjusted Yield: The yield of the FixedResetPremium issue to the next Exchange Date, given the actual purchase price, the Future Issue Price on the date examined and the intervening dividends. Note that the calculated value of Risk-Adjusted Yield is over a fixed term; an investor may calculate a yield of X% over the initial holding period, but receive a higher yield over the next holding period. Since Risk-Adjusted Yield considers a wide variety of scenarios, it must not be confused with, or compared to, Yield-to-Worst. My use of the term 'Yield' is something of a misnomer, but it is more mellifluous than 'Risk-Adjusted Expected Total Return'.

[1] To purchase access to the video, visit http://www.prefletter.com/eMailVerification.php?path=vid

Total Spread: The spread between PerpetualDiscount yields (on an interest-equivalent basis) and GOC5. Note that (as discussed) this number has very limited relevancy and this nomenclature is intended for use in this essay only!

Yield-to-Perpetuity: The yield calculated by assuming that the issue is never called, that its price remains constant and that GOC5 remains constant.

Hockey Sticks

In my 2007 essay *Perpetual Hockey Sticks*[2], I pointed out that while Yield-to-Worst (YTW) is a powerful analytical tool, it does not incorporate scenario analysis – that is, it does not examine the effect of overall changes in interest rates over the investment period. The only scenario examined is that of an unchanging environment. To deal with the effects of changing environments, the analyst may calculate the convexity[3] of an issue and draw broad conclusions from the number derived – but it is best to obtain an understanding of the potential scenarios and their effects on projected future returns prior to attempting to force the analysis into a single number, particularly when that number is very sensitive to the type of calculation performed.

Some 'Hockey Sticks' were shown in Chart A9 of the June edition of this newsletter, but to review we'll consider the case of BMO.PR.O, which was announced on 2009-3-11 and has the highest spread (+458bp) to Government of Canada Five Year Yields (GOC5) of any issue currently rated Pfd-1(low) by DBRS.[4] On August 7, this issue was quoted at 27.90-97 to yield 4.12-06% to its presumed call 2014-5-25.

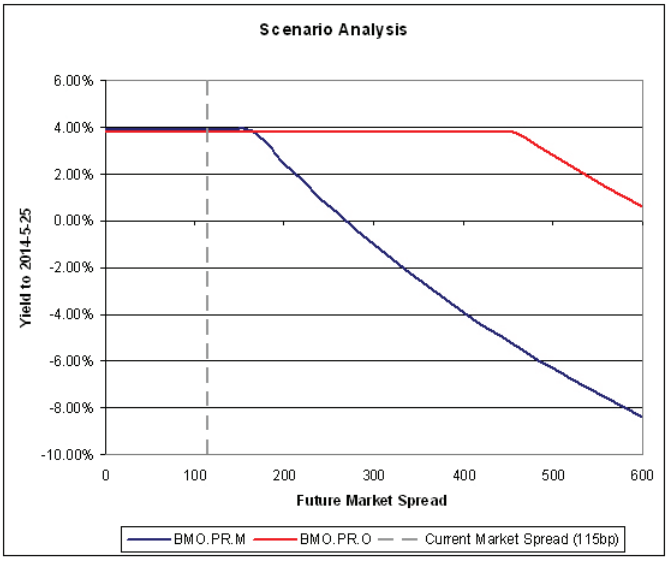
In the scenario analysis, we will consider the effect of differing Market Spreads on the call date, while fixing GOC5 at its current level of about 2.70%. It is certainly possible to consider other values of GOC5 in the scenario analysis – and this is particularly important if we are seeking to compare the investment attractiveness of FixedResets vs. Straights – but in this essay we are seeking to explore relative valuation within the FixedReset class. While the level of GOC5 on the various call dates will affect the calculated prices, this will be a second order effect, affecting the price differential from par only due to its effect on Modified Duration.

If the Market Spread is less than BMO.PR.O's Issue Spread of 458bp, it is prudent to assume that the issue will be called at a price of $25.00. It is possible that the issue will not be called in this event, but if this is the case then it is safe to assume that the it may be sold at a price in excess of $25.00; this potential excess return should be considered a bonus, gratefully accepted but not relied upon.

However, consider the case in which the Market Spread is 500bp, higher than the issue spread. In such a case, it is prudent to assume that the issue will not be called, but will have its dividend reset to 458bp + 2.70% = 7.28% of par value and trade at a price that will make its Yield-to-Perpetuity equal to the market yield of 500bp + 2.70% = 7.70%. In these circumstances, the issue will be trading at a discount and the price may be estimated as:

Price = 25 * (Issue Yield) / (Market Yield)
= 25 * (7.28% / 7.70%)
= 23.64

We may apply the same reasoning and calculations to BMO.PR.M, which has an Issue Spread of only 165bp and was quoted on August 7 at 26.05-22 to yield 4.05-87%. And finally, having made these calculations, the yield-to-call for these two issues may be plotted on the same graph to give a visual demonstration of the performance of the two issues until the call date.



Since the two issues have different call dates, we will calculate yield until the call of BMO.PR.O. The yield to this date of BMO.PR.M may be calculated using the Yield Calculator incorporating a future dividend reset, available on-line via http://www.prefblog.com/?p=6693. When doing so, we should make a note to ourselves: we are implicitly assuming that the Market Spread is the same on both reset dates; not an unreasonable assumption given the purpose of this demonstration, but it is wise to be aware of all implicit assumptions!

In this spirit, it should be noted that the yield calculations of BMO.PR.M in the scenarios in which it iscalled assume that the funds received on call may be reinvested at its reset spread (2.70% + 165bp) until the Exchange Date for BMO.PR.O nine months later; this is not a very supportable premise, but the effect is small. However, this nine month increase in the amortization period of the projected capital loss for BMO.PR.M (from the purchase price of $26.05 to the call price of $25.00) with the effect of changing the yield from being slightly lower than BMO.PR.O to being slightly higher.

[2] Available on-line via http://www.prefblog.com/?p=780

[3] For more information on convexity, see my article of that title via http://www.prefblog.com/?p=1640

[4] Following the DBRS mass downgrade of bank preferreds (see http://www.prefblog.com/?p=7073), there are thirty-four FixedReset issues rated Pfd-1(low) and none rated higher

Estimating the Current Market Spread

Given that all FixedReset issues are trading at a substantial premium to their call price, it is difficult to estimate the current market spread. In the June edition, we estimated that the yield of new-issue FixedResets (YFR) could be approximated by reference to the yield on PerpetualDiscounts (YPD) through the equation:

YFR = 1.44% + 0.67*YPD

Unfortunately, this equation is now not applicable. Given that BMO PerpetualDiscounts were trading on August 7 at a mean yield of approximately 5.65% (= YPD), this would result in a prediction of new issue FixedResets yielding 5.22% with a presumed reset of +252bp.

This answer is incongruous: BMO.PR.M was issued at 5.00% + 165 and is now trading at a substantial premium to par.

We may make another attempt: BMO.PR.P was issued in June with terms of 5.40% + 241 at a time when BMO PerpetualDiscounts were yielding 6.125%; the yield on these issues is now 5.65% so we may reduce the terms of a notional new issue by 50bp to estimate a rate of 4.90% + 191. Again, this is inconsistent due to the immediate counterexample of BMO.PR.M.

The Yield-to-Call of the two instruments being examined is approximately 3.90%, so it is tempting to assert that new issues would be possible at 3.90% + 120, but this is almost certainly too low. There should be a new issue concession built into the spreads; additionally, the increased probability of a call for instruments with higher issue yields should be worth something – perhaps not much, but something!

For purposes of this discussion, we will assume that new issues are possible with an initial yield of 4.15%. To determine the Market Spread we will assume that the issuers extend term until the first reset in order to provide a Reset Spread that is initially benchmarked against a Canada with a term slightly in excess of five years, in order to take advantage of the slope of the yield curve. Assuming that this longer-term Canada (or interpolation) yields 3.00% as opposed to the GOC5 level of 2.70%, we may assign a value of 115bp to the Market Spread, thus assuming that FixedResets may currently be issued with terms of 4.15% + 115bp.

Effects of Future Variance in the Market Spread

Whatever the precise relationship of the yields given the current Market Spread of 115bp, it should be apparent that there is not much difference between the projected investment returns of the two issues given a constant Market Spread. There is, however, a very different level of exposure to increasing Market Spread.

Should the current Market Spread spread increase from its estimated level of 115bp to exceed the BMO.PR.M reset spread level of 165 bp, this issue will be exposed to the full downside risk that the perpetual nature of these instruments implies. BMO.PR.O, however, can withstand a much greater increase, to its reset level of +458bp, before it becomes prudent to assume that it will not be called and that the trading price will be below the call price of $25.00. Investors may have much higher confidence that BMO.PR.O will be called – but, as the yield until the call date indicates, they do not appear to be willing to pay too much for that certainty!

Some investors may look at economic conditions and conclude that there is no chance whatsoever of Market Spreads exceeding the 165bp reset rate on BMO.PR.M; if this view is applied to this situation then there is indeed no major difference in the expected returns from the two issues and thus the market pricing is appropriate.

Other investors, such as myself, might profess to having no well defined views on the future Market Spread, but reason that the larger buffer capacity of BMO.PR.O makes it the better choice; it is more likely to behave as expected (with a call at the first opportunity) and accordingly has far less downside risk in the event of Market Spreads creeping up again.

And still other investors will insist on quantitative estimates of the downside risk before making any decision at all. While this is an admirable trait in general, one must be very careful of stretching the applicability of quantitative estimates beyond their prudent bounds. I suggest that when it comes to such a thing as forecasting future market levels, or even attempting to describe the probability distribution of potential future market levels, distortion is a very easy thing to do. All assumptions, both implicit and explicit, made in the course of the analysis should be understood, with final answers being subject to a check of the robustness of the model to changes in those assumptions.

A Review of Historical Spread Data and its Components

First, we must remember just exactly what is meant by the Total Spread: it is the difference in yield between a Government of Canada bond with a guaranteed maturity at par in five years and a preferred share, which is an obligation of a corporation that is subject to business risks, can possibly go bankrupt, has the option of suspending dividends without explicit repercussions (although the implicit repercussions are sufficiently severe to make this the penultimate step prior to bankruptcy) and is not obliged to return the principal at any time.

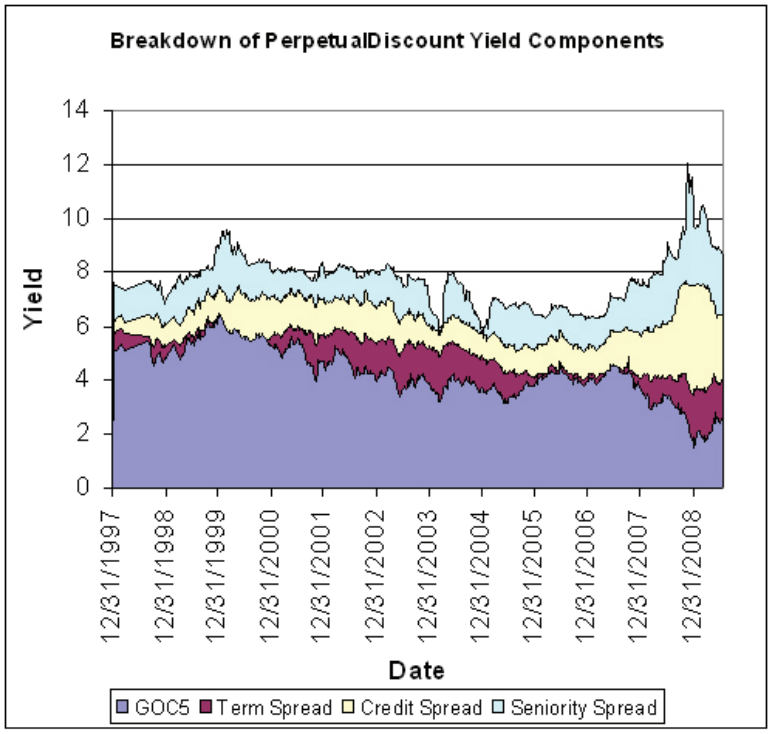
These are two very different numbers we are examining when we blithely prattle on about Total Spread!

The difficulties inherent in comparing two numbers that will not necessarily respond in the same manner to any given set of economic conditions are collectively referred to as “basis risk”. In fact, this particular computation is subject to three sets of basis risk:

- Term Spread: This is the spread between instruments of different term, which for analytical purposes I will consider to be the difference between five-year and long-term Canadas.
- Credit Spread: This is the spread between the default-free Canadas and Corporate bonds, which are subject to default in various degrees of severity. The credit spread is measured for long-term bonds, to be consistent with the other defined spreads.
- Seniority Spread: This is the spread between Corporate bonds, which only default in the event of bankruptcy, and Preferred Shares, which can default without the company necessarily entering the bankruptcy process.

Alert readers will point out further basis risks that are not being considered in this analysis:

- The five-to-thirty year spread is being used to measure the term spread, whereas the instruments in question are perpetual.
  - Quite true, and this is yet another source of basis risk. However, the five-to-thirty year basis risk will be much larger than the thirty-year-to-perpetuity basis risk, so we are at least defining the bulk of the risk; additionally, there is no significant population of perpetual instruments that could provide data for estimation of the latter risk.
- Using the five-to-thirty year spread ignores the rate reset feature of FixedResets
  - Again, quite true; but I have argued previously[5] that the rate reset feature is without value when presumed to provide the same degree of inflation protection as is afforded by Real Return Bonds. Finding a market price (as opposed to value) for this feature will have to await the receipt of data over a much longer term and variety of market conditions than is currently available.
- The seniority spread is not always calculable in a rational manner, since there have been periods over the last ten years in which there have been no Perpetual Discounts trading at all – all the Straights have been PerpetualPremiums.
  - True for the third time, but what can we do? There are no data, so during these periods, the yield-to-worst of the PerpetualPremium index will be used as an alternative.



For all these quibbles (and I'm sure there are many more!), an examination of the spread and its decomposition into the three components is highly illuminating. It is quite clear that the effect of the Credit Crunch was – quite reasonably – to increase the Credit Spread; inflation and rates on government issues had nothing to do with the exceptionally poor performance of PerpetualDiscounts in the period from, say March 2007 to November 2008. It is not quite so clear as to why the Credit Crunch brought forth the FixedReset structure – but that's a more philosophical question!

Further, it clear that predictions of the future Market Spread will be have to be made very cautiously, since there are three components which do not appear to interact in any meaningful manner.

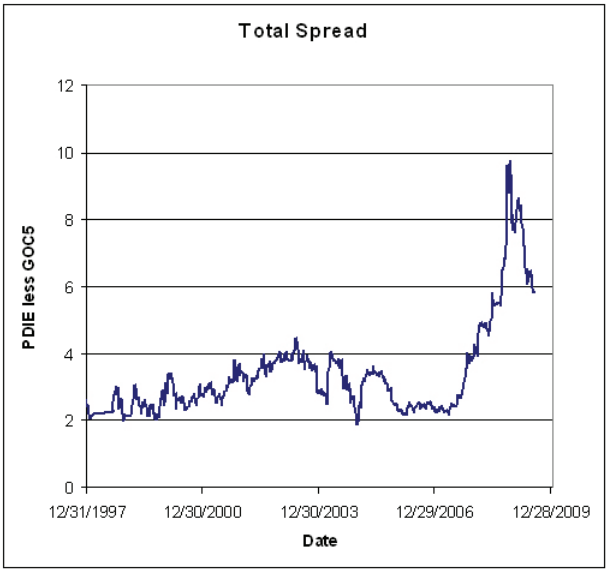
Limitations to the Historical Data

Given that the option of the issuer to call the issue is the crux of the relative pricing question, it makes sense that we seek to quantify the relative chances of a call of BMO.PR.M and BMO.PR.O using option theory which means – as usual! – the need for a measure of the volatility of the underlying

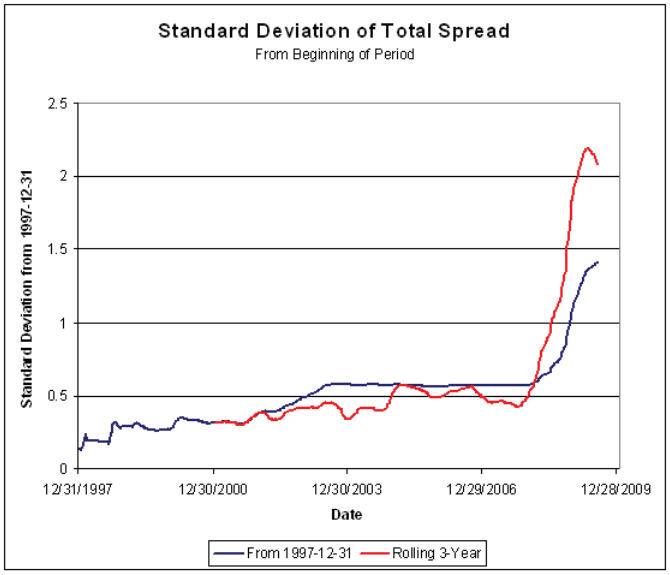
Prior to preparing estimates for the value that investors should place upon excess buffer in the reset spread, we should examine the limitations of the data more carefully.

First, it is apparent that the total spread has been quite volatile over time, trading in a range of about 200-400 bp between the end of 1997 and the onset of the Credit Crunch in the second quarter of 2007; the credit crunch has exploded the spread and, while on the mend, its current value of about 600bp is well above historical norms.

This immediately tells us that any results we are able to derive using historical data should be considered tentative: we shouldn't be too enamored of significant figures in any calculations we perform since historical relationships do not apply.

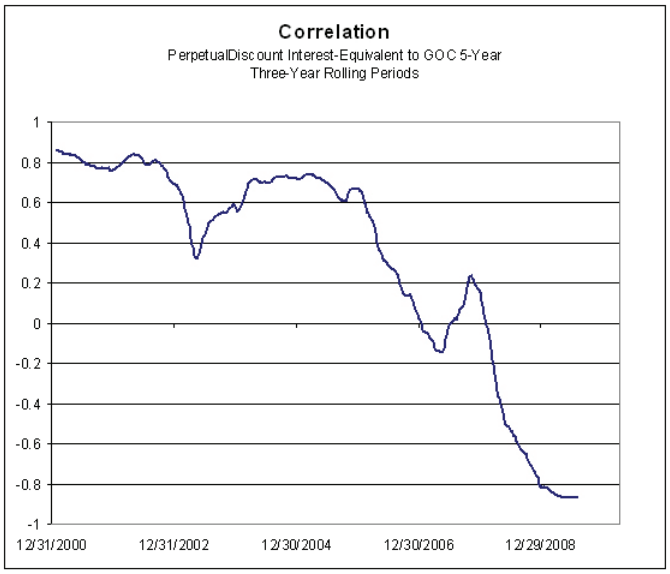


[5] See the June edition of this publication



And, when we calculate the standard deviation of the total spread, the limitations of the data become even more apparent: it will come as no surprise to market participants to learn that the preferred share market has been unusually volatile through the course of the Credit Crunch, but the quadrupling of the standard deviation when computed as a three year rolling average will give even the most earnest pseudo-quant pause. This value is required for option value computations: which one do we use?

And finally, we will calculate the correlation between GOC5 and the PerpetualDiscount Interest Equivalent (PDIE) – not because its really needed, but just as a mischievous dig at those who have great faith in correlation analysis as a quantitative investment tool:



At the beginning of the period for which we have data, the correlation between PDIE and GOC5 was large and positive – not much could be gained by way of diversification by investing in these two asset classes. By the end of the period, however, the situation has reversed almost precisely and the correlation is large and negative: an almost ideal pair for a diversified portfolio. So which value for the correlation should be used? I will have to leave that to readers to decide – I have never placed much faith in precise correlation calculations between asset classes, although the concept is very useful as a qualitative conceptual tool.

At this point, some readers will wonder why I proudly declare myself to be a quant, and credit the application of HIMIPref™ quantitative software for the returns on Malachite Aggressive Preferred Fund.[6] I've taken such pains to point out the weaknesses and difficulties inherent in a quantitative approach to the valuation of the embedded option in FixedReset preferreds – and the problems are only tractable with a lot of hand-waving – that a fully quantitative approach may seem futile.

The difference is the risk distance (as I refer to it) between the two elements being compared; there will be basis risk in any comparison and the question is whether we have any reason to believe that the basis risk we assume when we take a position on relative valuation is adequately compensated for by the extra return we hope to gain from the position.

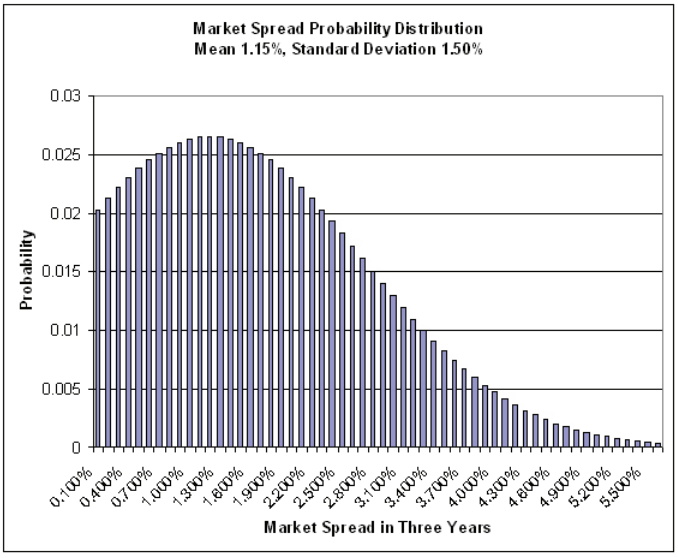
[6] See http://www.himivest.com/malachite/MAPFMain.php for details. Past performance is no guarantee of future results; you can lose money through an investment in Malalchite Aggressive Preferred Fund or any other fund.

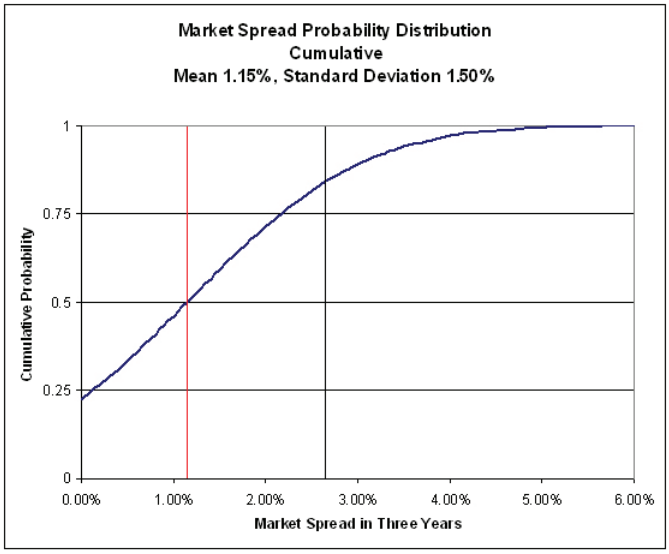
Comparing one FixedReset to another FixedReset is a difficult, but not impossible process; the analysis can be performed with sufficient likelihood of success that it is worth doing. Comparing a FixedReset issue with five-year Government of Canada bonds is another matter entirely and comparing FixedReset issues with cash – as is necessary for market timing[7] – is a futile endeavour; and telling prospective clients that I cannot do it and will not make the attempt has cost me many a prospect (my only solace is that nobody else can do it either; these clients searching for the advisor with access to the Philosopher's Stone have in general suffered the fate of all such naifs through history).

Be that as it may, having reviewed the weaknesses of our proposed analysis, we may commence the analysis itself.

Estimating Market Spread Volatility

One pleasant effect of our admitted inability to derive an acceptable estimate of the standard deviation of the probability distribution of the future Total Spread is that we may select any number we please for the base case scenario of Market Spread volatility. A full analysis would include several such choices in order to allow comparisons and an assessment of the robustness of our estimates (a process that many investors did not perform when investing in sub-prime mortgage paper!), but a full analysis will not be performed in this essay.





In the July edition of this newsletter, we estimated option values using a three-year standard deviation of 0.96 (percent, absolute) for the absolute yield of PerpetualDiscounts; for the estimates here we will estimate that the standard deviation of the Market Spread from now until the call date of any given issue of 1.5 (percent, absolute). We will not adjust this figure to account for the differing times to call date.

Plots are shown of the probability distribution of future Market Spread using our estimates of a mean of 1.15% and a standard deviation of 1.50%. These plots are cut off at a market spread of zero. Note that it doesn't really matter what the shape of the probability distribution below the mean of 115bp, since all such values will result in all issues currently analyzed being called.

Call Probability given the Estimates of Market Spread Mean and Volatility

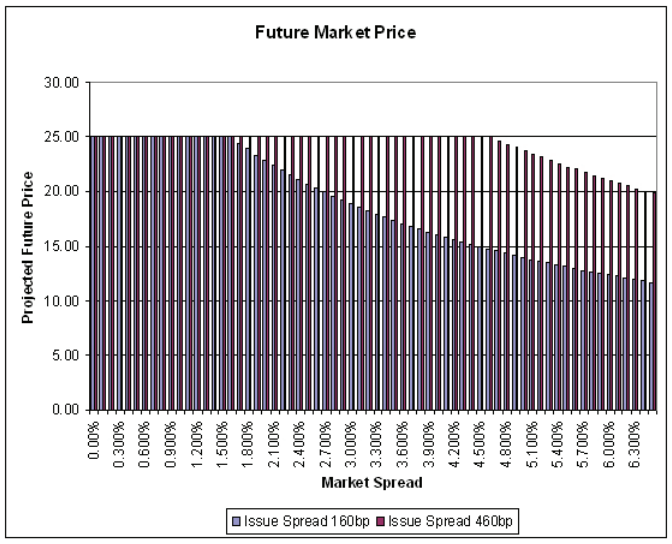
This computation gives us an immediate estimate of the probability that the two instruments examined will be called. BMO.PR.M, with an issue spread of +165bp, is (165-115)/150 = 0.33 standard deviations above the mean, implying a cumulative probability of 63% that the actual Market Spread at the end of the period will be below the Issue Spread and therefore that the issue will be called.

Similarly, BMO.PR.O's Issue Spread of +458bp implies a call probability of 99%.

Application of the Scenario Analysis to Future Issue Price

It is very gratifying to have derived our first result after all the preparatory work, but the ultimate objective is to estimate the yield differential that the Iron Law of Finance (Risk = Return) implies must be the case. If an issue is not called, it is understood that its issue Spread will be less than the Market Spread and that the issue should therefore trade below its par value. Further, as the 'Hockey Stick' charts earlier in this essay implied, losses can grow very quickly with increases in the Market Spread, since the sensitivity of price to Market Spread under these conditions is calculated to perpetuity.

[7] For a short discussion of market timing, see http://www.prefblog.com/?p=2294



These projections for Market Spread probability distribution may be converted into prices using the formula:

- If the Market Spread is less than the issue spread, the price is 25.00
- If the Market Spread is more than the issue spread, the price is equal to 25*(IS + GOC5)/(MS + GOC5), where
  - IS = issue spread
  - MS = market spread

The probability distribution of Future Price for Issue Spreads of 160bp and 460bp (approximately equal to the spreads of BMO.PR.M and BMO.PR.O) have been plotted.

Each projected future price can be probability weighted to arrive at an average projected future price, using the probability distributions previously derived. This results in projected future prices of $23.21 for the Issue Spread of +160bp, and $24.97 for the Issue Spread of +460bp.

Calculation of Risk-Adjusted Yield

We will convert these numbers into projected yields, using the same assumptions that were made to prepare the "Scenario Analysis" graph; the projected Future Price calculated is assumed to be the price on the next Exchange Date for each issue. Plugging in the prices derived above, we find that the yield for BMO.PR.M is 2.04% until its 2013-8-25 Exchange Date and the yield for BMO.PR.O is 3.75% to 2014-5-25.

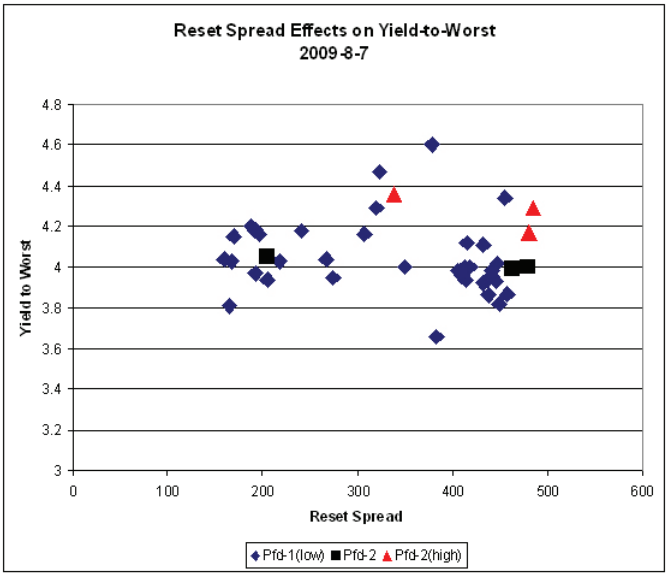
This is a far cry from normal calculations, which only consider the single scenario of constant Market Spread. It is clear that – whatever inaccuracies we have made in the various estimates and approximations leading to this result – we have now quantified the risk intrinsic to BMO.PR.M due to its relatively low issue spread.

We may go further. There is no reason for these two issues to be trading at significantly different risk-adjusted yields – the issuer is identical and the term to the next Exchange Date is relatively close (within a year). At what price should BMO.PR.M trade so that its risk-adjusted yield is equal to that of BMO.PR.O? The answer is $24.47; which is $1.58 lower than its current price – so much lower that it would be prudent to assume that the issue will not, in fact, be called.

Such analysis may be too kind to issues with skimpy Issue Spreads. While analysis such as that in this section uses the weighted mean average of the derived market prices to determine yields and assumes that the investment is made for a five year term only, the actual prices received could vary quite significantly from the mean and a rational investor will seek additional yield to compensate for the uncertainty in expected total return.

The Current Market and Investment Conclusions

It is a tribute to the continued inefficiency of the Canadian preferred share market that there is no allowance for future Market Spread risk in the current pricing of the various FixedResets that have been issued to date. Perhaps the market needs an object lesson: if a call gets skipped and an extant issue has its dividend reset to half that of comparables, we may see Portfolio Managers, advisors and investors paying more attention to risk. We will then also have the pleasure of seeing the blame-game play out; perhaps there's some manner in which Credit Rating Agencies can get left holding the hot potato again!



Until that happy day, it should be apparent from even a glance at the chart plotting Yield-to-Worst against the Reset Spread that there is no effect in the market at present.

There are two possible explanations for this phenomenon:

- Market participants have thoroughly investigated the issue and determined that their projection of future Market Spreads shows a 100% chance of these spreads being less than 150bp; in other words, that there is no chance at all of an extant issue having its dividend reset to a rate that is below the market at the time
- The market is simply inefficient

I'll let you make your own minds up regarding which explanation is most likely!

In general, though, it appears that risk protection is free. Prudent investors who seek to invest in these perpetual instruments for a five year term (accepting the chance of an unfavourable term extension) will take advantage of the market pricing and concentrate their holdings of FixedResets in issues with high Issue Spreads; there is no loss of yield in this exercise and considerably greater assurance that the calculated yield to call will be realized. While there may well be greatly different views in the marketplace regarding the probability distribution of the Future Market Spread (which will determine how much yield an investor should be prepared to give up for greater call probability), it should be apparent that there is a value to the buffer capacity that is currently being given away.

I should note explicitly that the calculations in this paper show the effects of a single probability distribution. A distribution with a smaller standard deviation will have a smaller effect on Future Issue Price.

In the section "Estimating the Current Market Spread", I suggested that a notional new issue could carry terms of 4.15% + 115bp. Those who may consider purchasing such an issue may wish to bear in mind that, according to the analysis presented in this essay, this notional new issue will have a call probability of 50%, Future Issue Price of $22.20, and Risk-Adjusted Yield of 2.23%.

Issuer	Initial Rate	Reset Date	Reset Spread	DBRS	Standard Deviations Above	Call Probability	Bid 090807	Next Dividend	YTW 090807	Risk-Adjusted Price	Risk-Adjusted Yield
BAM.PR.P	7.00	30/09/2014	445	Pfd-2(low)	*	*	26.97	30-Sep	5.39	*	*
BMO.PR.M	5.20	25/08/2013	165	Pfd-1(low)	0.33	63.06%	26.05	25-Nov	3.71	23.21	2.04
BMO.PR.N	6.50	25/02/2014	383	Pfd-1(low)	1.79	96.30%	27.95	25-Nov	3.59	24.91	3.53
BMO.PR.O	6.50	25/05/2014	458	Pfd-1(low)	2.29	98.89%	27.90	25-Nov	3.77	24.97	3.75
BMO.PR.P	5.40	25/02/2015	241	Pfd-1(low)	0.84	79.95%	26.72	25-Nov	3.95	24.29	3.51
BNS.PR.P	5.00	25/04/2013	205	Pfd-1(low)	0.60	72.57%	25.96	29-Oct	3.92	23.85	2.76
BNS.PR.Q	5.00	25/10/2013	170	Pfd-1(low)	0.37	64.31%	25.85	29-Oct	3.89	23.39	2.45
BNS.PR.R	5.00	26/01/2014	188	Pfd-1(low)	0.49	68.68%	25.85	29-Oct	3.94	23.56	2.74
BNS.PR.T	6.25	25/04/2014	414	Pfd-1(low)	1.99	97.69%	27.60	29-Oct	3.86	24.95	3.82
BNS.PR.X	6.25	25/04/2014	446	Pfd-1(low)	2.21	98.63%	27.63	29-Oct	3.83	24.97	3.81
CCS.PR.D	7.25	30/06/2014	521	Pfd-3	2.71	99.66%	27.77	30-Sep	4.86	*	*
CIU.PR.B	6.70	01/06/2014	481	Pfd-2(high)	*	*	27.75	1-Sep	4.43	*	*
CM.PR.K	5.35	31/07/2014	218	Pfd-1(low)	0.69	75.39%	26.53	31-Oct	4.01	23.98	3.28
CM.PR.L	6.50	30/04/2014	447	Pfd-1(low)	2.21	98.66%	27.79	31-Oct	3.93	24.97	3.91
CM.PR.M	6.50	31/07/2014	433	Pfd-1(low)	2.12	98.30%	27.80	31-Oct	4.03	24.96	4
FTS.PR.G	5.25	01/09/2013	213	Pfd-3(high)	*	*	25.61	1-Sep	4.20	*	*
GWO.PR.J	6.00	31/12/2013	307	Pfd-1(low)	1.28	89.97%	27.05	30-Sep	4.10	24.69	3.86
HSB.PR.E	6.60	30/06/2014	485	Pfd-2(high)	*	*	27.82	30-Sep	4.18	*	*
IAG.PR.C	6.20	31/12/2013	338	Pfd-2(high)	*	*	27.05	30-Sep	4.30	*	*
MFC.PR.D	6.60	19/06/2014	456	Pfd-1(low)	2.27	98.85%	27.79	19-Sep	4.25	24.97	4.23
MFC.PR.E	5.60	19/09/2014	323	Pfd-1(low)	1.39	91.72%	26.60	19-Sep	4.36	24.77	4.2
NA.PR.N	5.375	15/08/2013	205	Pfd-2	*	*	26.20	10-Oct	4.06	*	*
NA.PR.O	6.60	15/02/2014	463	Pfd-2	*	*	27.75	10-Oct	4.04	*	*
NA.PR.P	6.60	15/02/2014	479	Pfd-2	*	*	27.75	10-Oct	4.04	*	*
PWF.PR.M	6.00	31/01/2014	320	Pfd-1(low)	1.37	91.41%	26.80	31-Oct	3.95	24.77	3.77
RY.PR.I	5.00	24/02/2014	193	Pfd-1(low)	0.52	69.85%	26.05	27-Oct	4.02	23.71	2.98
RY.PR.L	5.60	24/02/2014	267	Pfd-1(low)	1.01	84.45%	26.60	27-Oct	4.09	24.46	3.66

Issuer	Initial Rate	Reset Date	Reset Spread	DBRS	Standard Deviations Above	Call Probability	Bid 090807	Next Dividend	YTW 090807	Risk-Adjusted Price	Risk-Adjusted Yield
RY.PR.N	6.25	24/02/2014	350	Pfd-1(low)	1.57	94.14%	27.32	27-Oct	4.05	24.86	3.94
RY.PR.P	6.25	24/02/2014	419	Pfd-1(low)	2.03	98.87%	27.35	27-Oct	4.02	24.95	3.98
RY.PR.R	6.25	24/02/2014	450	Pfd-1(low)	2.23	98.72%	27.51	27-Oct	3.87	24.97	3.85
RY.PR.T	6.25	24/08/2014	406	Pfd-1(low)	1.94	97.38%	27.60	27-Oct	4.00	24.94	3.96
RY.PR.X	6.25	24/08/2014	442	Pfd-1(low)	2.18	98.54%	27.62	27-Oct	3.99	24.97	3.96
RY.PR.Y	6.10	24/11/2014	413	Pfd-1(low)	1.99	97.65%	27.52	27-Oct	4.01	24.95	3.98
SLF.PR.F	6.00	30/06/2014	379	Pfd-1(low)	1.76	96.08%	26.93	30-Sep	4.38	24.90	4.31
TD.PR.A	5.00	31/01/2014	196	Pfd-1(low)	0.54	70.54%	25.89	31-Oct	3.89	23.71	2.82
TD.PR.C	5.60	31/01/2014	274	Pfd-1(low)	1.06	85.54%	26.75	31-Oct	3.63	24.53	3.25
TD.PR.E	6.25	30/04/2014	437	Pfd-1(low)	2.15	98.41%	27.61	31-Oct	3.85	24.96	3.82
TD.PR.G	6.25	30/04/2014	438	Pfd-1(low)	2.15	98.44%	27.71	31-Oct	3.76	24.96	3.73
TD.PR.I	6.25	31/07/2014	415	Pfd-1(low)	2.00	97.72%	27.50	31-Oct	4.05	24.95	4.01
TD.PR.K	6.25	31/07/2014	433	Pfd-1(low)	2.12	98.30%	27.75	31-Oct	3.84	24.96	3.81
TD.PR.S	5.00	31/07/2013	160	Pfd-1(low)	0.30	61.79%	25.90	31-Oct	4.04	23.21	2.35
TD.PR.Y	5.10	31/10/2013	168	Pfd-1(low)	0.35	63.81%	26.06	31-Oct	3.75	23.21	2.16

* Calculations for “Standard Deviations Above”, “Call Probability”, “Risk-Adjusted Price” and “Risk-Adjusted Yield” have not been performed for issues not rated Pfd-1(low) by DBRS. The addition of heterogenous credits would add another layer of complexity – and source of basis risk – to the analysis.