Preferred Share Interconvertibility

In October 2007 I published an article[1] introducing the concept of Preferred Pairs; this idea was further developed in my April, 2009, seminar on Floating Rate Preferred Shares[2]. In this seminar, I showed that the market for interconvertible preferred shares was extremely inefficient, allowing significant opportunity for arbitrage between the issues (subject to taxation and borrowing-risk considerations, which make long-term arbitrage an extremely difficult undertaking for a retail investor) or, at the very least, to allow a buy-and-hold investor to take an informed view on which element of the pair is more attractive given the expected state of interest rates.

In this essay I will examine the topic in more detail and provide a spreadsheet[3] that can be used to gauge the relative attractiveness of the individual elements that comprise a Strong Pair.

"Strong Pairs" of Preferred Shares

A Strong Pair of preferred shares is formed by two preferred share issues that may be converted into each other on certain dates. The prospectus for BCE.PR.S[4] contains the provision:

Holders of Series S Preferred Shares will, subject to the automatic conversion provisions, have the right to convert, on November 1, 2001 and on November 1 every five years thereafter (a "Conversion Date"), their shares into an equal number of Series T Preferred Shares upon giving to BCE Inc. notice thereof not earlier than 45 days prior to, but not later than the close of business on the 14th day preceding, a Conversion Date.
…
Holders of Series T Preferred Shares will, subject to the automatic conversion provisions, have the right to convert, on November 1, 2006 and on November 1 every five years thereafter (a "Conversion Date"), their shares into an equal number of Series S Preferred Shares upon giving to BCE Inc. notice thereof not earlier than 45 days prior to, but not later than the close of business of the 14th day preceding, a Conversion Date.

The Automatic Conversion Provision states that if, after giving effect to shareholder elections for conversion, there will be less than 1-million shares of either series outstanding, then that series will be automatically converted into the other; in other words, BCE will not permit an issue with less than 1-million shares to exist.

When both series of a Strong Pair are trading, there is the opportunity for comparative analysis based on differences between the issues that are much smaller than is usually the case for issue comparisons since any differences between the issues can be forced, at the investor's option, to disappear completely at the next Exchange Date.

Thus the investor usually has the opportunity to make a decision with the knowledge that if he errs, he will have an opportunity to correct his mistake at a certain time in the future – a privilege usually reserved for issuers, who have call options that may be exercised if the dividend rate at the time of their potential call is more than they wish to pay.

The Automatic Conversion Provision is not a cause of concern – or, at the very least, such concern is minimal. Should the choice of all investors be sufficiently overwhelming to trigger the provision, it is reasonable to assume that the choice was well justified (or, at least, that strong demand makes it possible to exit the position at a reasonable price).

Dividends on Strong Pairs

The important difference between the BCE.PR.S and BCE.PR.T reviewed above is their dividend schedule. Again quoting from the prospectus:

From November 1, 2001, floating adjustable cumulative preferred cash dividends payable monthly on the twelfth day of each month commencing with the month of December 2001, with the annual floating dividend rate for the first month equal to 80% of Prime. The dividend rate will float in relation to changes in Prime and will be adjusted upwards or downwards on a monthly basis whenever the Calculated Trading Price of the Series S Preferred Shares is $24.875 or less or $25.125 or more respectively. The maximum monthly adjustment for changes related to the Calculated Trading Price will be ±4.00% of Prime. However, the annual floating dividend rate applicable in a month will in no event be less than 50% of Prime or greater than Prime.

More particularly:

If the Calculated Trading Price for the Preceding Month is	The Adjustment Factor as a Percentage of Prime shall be
$25.50 or more	-4.00%
$25.375 and less than $25.50	-3.00%
$25.25 and less than $25.375	-2.00%
$25.125 and less than $25.25	-1.00%
Greater than $24.875 and less than $25.125	nil
Greater than $24.75 to $24.875	1.00%
Greater than $24.625 to $24.75	2.00%
Greater than $24.50 to $24.625	3.00%
$24.50 or less	4.00%

1 *Preferred Pairs*, Canadian Moneysaver, October 2007, available on-line via http://www.prefblog.com/?p=1378

2 Available on-line (for a small fee) via http://www.prefletter.com/eMailVerification.php?path=vid

3 Available on-line at http://www.prefblog.com/xls/pairEquivalencyCalculator.xls. Note that it must be downloaded to your hard drive if the "Yahoo" tab is to work.

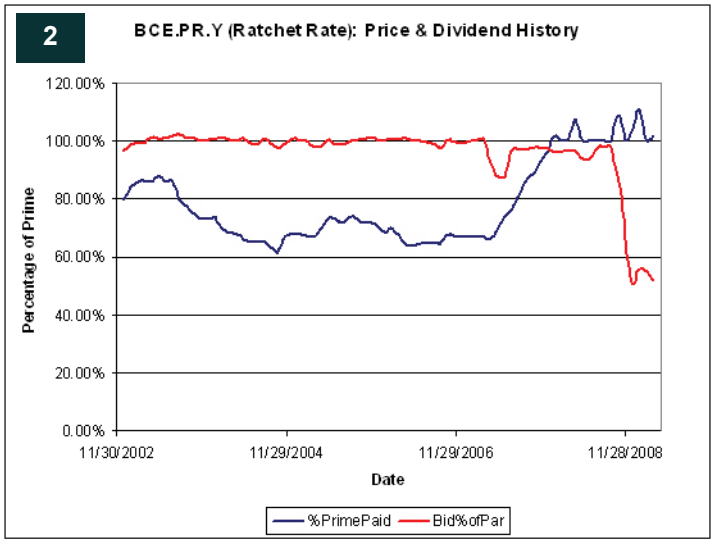
4 Prospectus for *BCE Inc. Cumulative Redeemable First Preferred Shares, Series S*, October 9, 1996, available on-line at http://www.bce.ca/data/documents/ps_s_en.pdf (accessed 2010-2-9)

And for BCE.PR.T:

Fixed cumulative preferred cash dividends payable quarterly on the first day of February, May, August and November in each year. At least 45 days and not more than 60 days prior to the start of the initial dividend period beginning on November 1, 2001, and at least 45 days and not more than 60 days prior to the first day of each subsequent dividend period (the initial five year dividend period and all subsequent five year dividend periods being referred to as a "Fixed Dividend Rate Period"), BCE Inc. shall set, and provide written notice of, a Selected Percentage Rate for the ensuing Fixed Dividend Rate Period. Such Selected Percentage Rate shall not be less than 80% of the Government of Canada Yield determined on the 21st day preceding the first day of the applicable Fixed Dividend Rate Period.

BCE.PR.S is currently referred to in my taxonomy of preferred shares as a "Ratchet Rate" preferred; because the annual dividend ratchets up as the price decreases and ratchets down as the price increases, in an effort to keep the price of the issue near par. Note, however, that for the first period of existence is was a "Fixed Floater", meaning that it paid a fixed rate that would begin to float after a specified date. BCE.PR.T is now the Fixed Floater element of the pair.

Chart 2 is taken from my seminar on Floating Rate Preferreds mentioned earlier and shows that the ratcheting mechanism of BCE.PR.Y was highly successful in maintaining a par trading price until the end of 2006. However, as I have often stressed,[5] the mere fact that an instrument pays a rate based on a money market index does not mean that the instrument may be assigned to the money-market allocation of one's portfolio. While the rate paid is floating (addressing the inflation concerns that retail investors regard with undiluted terror) the credit risk is just as perpetual as with most other preferreds – a nuance often forgotten for as long as the issuing corporation does not attract any unfavourable headlines.



The chart shows isolated instances of the calculated percentage of par being in excess of 100% of prime. This is due to timing differences as the chart was prepared using prime as of the dividend payment date, while the payment amount was calculated by BCE using prime for earlier periods.

As shown, the trading price of BCE.PR.Y dropped significantly below par when it appeared that credit quality would be impaired as BCE attempted to maximize value for common shareholders at the expense of preferred share and debt-holders[6]; it then plunged when the Teachers' amalgamation deal (which included a rather rich offer to purchase the preferreds[7]) collapsed in December 2008.[8] Since the Ratchet Rate structure always includes a maximum rate, there comes a point when the ratcheting mechanism can do no more to support the price of the issue.

Importance of Strong Pairs

The Strong Pair structure described above never achieved a lot of traction; apart from two issues from Nortel it was only BCE that issued more than one series as part of the $30-billion in capital raised under the leadership of Len Ruggins, who was for years BCE's top executive for capital funding.[9]

One reason for this is the fact that this structure was not acceptable as Tier 1 Capital for banks. Tier 1 Capital must be free of mandatory fixed charges, which is deemed by OSFI to mean[10]:

*Preferred shares included in tier 1 capital are **not** permitted to offer the following features:*

- *cumulative dividends*
- *dividends influenced by the credit standing of the institution*
- *compensation to preferred shareholders other than a dividend*
- *sinking or purchase funds*

It is the second condition that precludes inclusion in Tier 1 Capital, since the ratcheting mechanism will lead to dividends being influenced by the credit standing of the institution. It would not surprise me at all to learn that the ratcheting mechanism was created with this consideration firmly in mind; the lack of bank competition for investor dollars attracted by this structure made it easier for BCE to issue enormous quantities of these issues.

However, we may see a renaissance of Strong Pairs commencing in a few years, when the myriad FixedReset issues start to reach the end of their initial fixed rate period and those that are not called (currently expected to be a small minority) are partially converted into floating rate issues with dividends paid at a fixed spread over three month bills. It is the 'fixed spread' that addressed the 'credit standing' concern, because the rate will not be affected by the issue's credit quality.

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5 See, for example, *Are Floating Prefs Really Money Market Vehicles?*, Advisor's Edge Report, August 2006, available on-line at http://www.himivest.com/media/advisor_0608.pdf

6 See *BCE Trust Conversion and Preferred Offer Now Dubious?*, on-line at http://www.prefblog.com/?p=235

7 See *Teachers Agrees to Buy BCE: Plans to Acquire Preferreds!*, on-line at http://www.prefblog.com/?p=940

8 See *BCE Deal Dead*, on-line at http://www.prefblog.com/?p=4423

9 Barry Critchley, *Ruggins a master of Tier 1*, Financial Post, 2008-5-20, available on-line at http://www.financialpost.com/opinion/story.html?id=b19351de-28cc-41bf-b04c-663ff4e2ab59 (accessed 2010-2-9)

10 Office of the Superintendent of Financial Institutions, *Capital Adequacy Requirement (CAR) – Simpler Approaches*, Section 2.1.1.3, available on-line at http://www.osfi-bsif.gc.ca/app/DocRepository/1/eng/guidelines/capital/guidelines/CAR_A_e.pdf (accessed 2010-2-9)

Sadly, most of the FixedReset issues that are not called appear likely to be lower quality credits at this point, but there are some investment grade issues with a reset spread of less than 200bp that may well be left outstanding, as shown in Table 1. These issues – if they are not called and if there is a tradable outstanding amount of both the FixedFloater and Floater elements of the pair following the first Exchange Date – will be susceptible to the same analysis as is currently used to examine the FixedFloater/Ratchet pairs. In fact, such analysis should be reliable over a larger range of prices than is currently possible: Ratchet Rate issues are by their nature susceptible to changes in the dividend rate when trading near par, which complicates analysis considerably.

Table 1: Most Likely Precursors of Future Investment Grade Strong Pairs

Issue	Next Exchange Date	Reset Spread
BMO.PR.M	2013-8-25	165bp
BNS.PR.Q	2013-10-25	170bp
BNS.PR.R	2014-1-26	188bp
RY.PR.I	2014-2-24	193bp
TD.PR.A	2014-1-31	196bp
TD.PR.S	2013-7-31	160bp
TD.PR.Y	2013-10-31	168bp
TRP.PR.A	2014-12-31	192bp

The issues listed in this table comprise the entire population of investment-grade FixedReset issues with a ResetSpread of less than 200bp.

Characteristics of Extant Strong Pairs

Table 2 shows the base attributes of the existing Strong Pairs, together with their closing quotation on the TSX as of January 29.

There are some attributes of the shares that are required for analysis but are not listed on the table. They are, however, listed on the "Raw Data" tab of the analytical spreadsheet and express:

- Dividend Pay Dates (fixed, from prospectus)
- Dividend Ex-Dates (these are predictable, but only through tradition – there is no contractual obligation of the issuer to continue past practice)
- Dividend Frequency (currently all FixedFloater issues discussed pay quarterly and all Ratchets pay monthly, but this will not necessarily continue to be the case)
- Dividend Cycle (a code for input to the spreadsheet indicating the months in which the quarterly dividends are paid)
- Quarterly Rate of FixedFloaters (expressed as a dollar figure, for convenience in use of the spreadsheet)
- Website. Trust no one! Verify the information which I have summarized against the issuer's description before taking investment action!

Table 2

Issue	DBRS	S&P	Moody's	Dividend Yield on Par Value (R = Ratchet)	Shares Outstanding (million)	Quote at Close, 2010-1-29	Volume – Average (HIMIPref™) 2010-2-9	Average Volume per TSX 2010-2-10
BCE.PR.A	Pfd-3(high)	P-2(low)	NR	4.80%	10.1	19.98-05	18,419	21,200
BCE.PR.B	Pfd-3(high)	P-2(low)	NR	R	9.9	19.50-40	1,184	2,700
BCE.PR.C	Pfd-3(high)	P-2(low)	NR	4.60%	9.2	20.00-19	11,593	10,300
BCE.PR.D	Pfd-3(high)	P-2(low)	NR	R	10.8	19.50-21.95	169	8,800
BCE.PR.E	Pfd-3(high)	P-2(low)	NR	R	1.4	19.78-94	N/A	4,200
BCE.PR.F	Pfd-3(high)	P-2(low)	NR	4.541%	14.6	19.70-75	5,976	13,000
BCE.PR.G	Pfd-3(high)	P-2(low)	NR	4.35%	10.1	19.18-19	8,269	10,200
BCE.PR.H	Pfd-3(high)	P-2(low)	NR	R	3.9	19.32-77	5,120	12,200
BCE.PR.I	Pfd-3(high)	P-2(low)	NR	4.65%	14.0	19.70-75	12,134	13,800
BCE.PR.R	Pfd-3(high)	P-2(low)	NR	4.54%	8.0	19.02-09	8,808	12,400
BCE.PR.S	Pfd-3(high)	P-2(low)	NR	R	2.3	19.75-94	1,890	4,400
BCE.PR.T	Pfd-3(high)	P-2(low)	NR	4.502%	5.7	19.04-17	6,249	8,600
BCE.PR.Y	Pfd-3(high)	P-2(low)	NR	R	8.1	19.50-00	5,580	6,800
BCE.PR.Z	Pfd-3(high)	P-2(low)	NR	4.331%	1.9	18.60-95	3,534	5,000
BAM.PR.G	Pfd-2(low)	P-2	NR	4.35%	6.2	19.32-58	1,863	2,200
BAM.PR.E	Pfd-2(low)	P-2	NR	R	1.8	17.76-21	1,676	7,400
BBD.PR.B	Pfd-4	P-4	NR	R	9.5	13.50-60	13,188	19,400
BBD.PR.D	Pfd-4	P-4	NR	5.267%	2.5	18.36-60	3,077	4,600

Computation of Average Volume

The two columns reporting average volume in Table 2 reflect different methodologies of calculation, a topic of much more practical importance than might be assumed.

Preferred share trading is "lumpy" since the holdings of many institutional investors (such as mutual funds) dwarf the number of shares that can be traded in any given day. For example, BMO Guardian Monthly Dividend Fund Ltd. held 2.3% of its assets in BCE.PR.Y on September 30, 2009,[11] and its assets were $250-million[12] as of February 9, 2010,[13] implying that the value of this holding was about $5.75-million, or a little under 300,000 shares. If we assess the average daily trading volume of this issue as 6,000 shares, then this implies that this single fund owns about 50 trading days worth of this issue.

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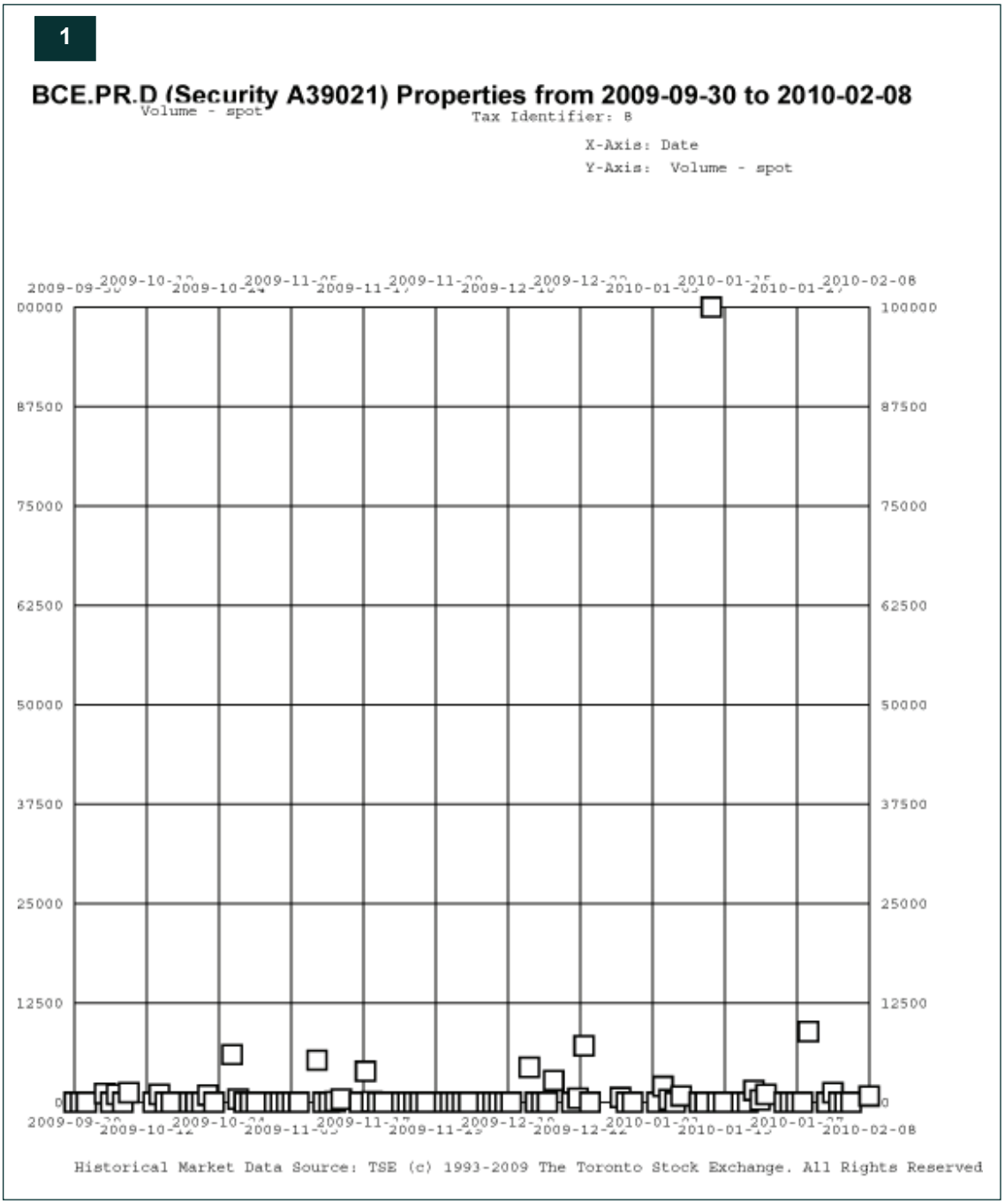

[11] BMO Guardian Monthly Dividend Fund Ltd, *Quarterly Portfolio Disclosure*, September 30, 2009, available on-line at http://www.bmoguardianfunds.com/advisor/marketing/document?documentId=1314 (accessed 2010-2-10)

[12] BMO Guardian Funds, *Mutual Funds*, available on-line at http://www.bmoguardianfunds.com/advisor/controller/fundnavigator/list/overview

[13] BMO Guardian Funds, *BMO Guardian Monthly Dividend Fund Ltd. Mutual*, available on-line at http://www.bmoguardianfunds.com/advisor/controller/funddetails/glance?fundId=22930 (accessed 2010-2-10)

If for any reason the portfolio managers[14] should decide to sell the holding, they will almost certainly contact the preferred desk at a large brokerage which will earn a commission by finding a buyer at a reasonable price[15]; alternatively, they might simply place an iceberg order,[16] to sell the shares and reduce the offering price periodically until it is sufficiently cheap to its peers that the interest of potential buyers is piqued and volume increases dramatically.[17] One way or another, volume would increase (perhaps dramatically, particularly if their trader was able to find a single buyer for the entire block) as the order was executed and decline to normal levels afterwards – but these data would not necessarily convey any information regarding the potential for other blocks to be traded at prices reflecting the quotations during the day examined, just as the "stable" estimate of 6,000 shares per day in normal times did not reflect the speed with which a large order could be executed.

These considerations presented some difficulty in the design of HIMIPref™ and the following procedure was adopted.

- The average volume[18] is calculated as an exponential moving average of the adjusted spot value.
  - The damping factor is normally 0.98[19]; however, if the adjusted spot value is less than one-fifth[20] of the prior day's average volume, this damping factor is squared.
- The adjusted spot value is equal to the actual volume on the day analyzed, subject to a maximum of five times[21] the average volume computed on the prior day
- Portfolio simulations are performed assuming that the simulated portfolio may sell one-half the average volume at the closing bid price, or purchase the same amount at the closing offer price.

This process undoubtedly underestimates the speed and relative price at which positions can be swapped – but in a simulation, this is a desirable feature. Faster and better trading in practice is considered a bonus.

The TSX no longer discloses its computation of average volume in a convenient manner, but I believe it to be a simple moving mean average of daily trading volumes.

The greatest difference between the two calculation methodologies displayed on Table 2 is for BCE.PR.D. I trust that Chart 1 will explain why I will be using average volumes as computed by the HIMIPref™ method when discussing liquidity.

Relative Value Analysis of Strong Pair Elements

As mentioned earlier, comparative analysis of Strong Pair elements is greatly facilitated by the fact that they become interconvertible on a specified future date. Thus, analysis may proceed as follows:

- Estimate a price for the FixedFloater element of the pair on the Exchange Date. The precise value of this price is irrelevant for this purpose.
- Compute the yield-to-Exchange-Date for the FixedFloater using its known current price, its known dividend schedule and the estimated Exchange Date price.
- The Ratchet element of the pair may then be analyzed as follows:
  - The current price is known
  - The Exchange Date price is the same as the FixedFloater Exchange Date Price (the "Interconvertibility Effect")
  - The overall yield to the Exchange Date is set equal to the yield on the FixedFloater
  - The break-even dividend rate can be determined from the above information.

The Interconvertibility Effect in Practice

The Interconvertibility Effect states that we can use the same Exchange Date price for both elements of the Strong Pair when computing expected returns, but does not require any judgement about what that price might be.

Thus, the techniques discussed in this essay are suitable only for the determination of which element of the pair is most attractive; the initial decision to invest in the Strong Pair itself must be made exogenously, with the investor's judgement being informed by other, unrelated analytical techniques.

Let us assume that these other techniques have led the investor to take the view that one of the BCE Ratchet Rate issues is a good long-term investment for his purposes. To a first approximation, he should be indifferent as to whether the actual issue purchased is actually the Ratchet Rate issue or the FixedFloater element because within five years of purchase (the precise date depending on which particular pair is selected) he will be able to convert the FixedFloater into the Ratchet Rate, making it equivalent:

- If the FixedFloater is priced higher than the Ratchet Rate at the time of the exchange, there is the potential to earn extra money by executing trades in the market rather than directly converting
- If the FixedFloater is priced the same as or lower than the Ratchet Rate, instructions may be given to the custodial broker to exchange the issues; there should be no charge for this service.

In practice, the market is an untidy place and precise convergence is unlikely. Charts 3 and 4 provide an indication of two fairly recent examples of relative price behaviour near the Exchange Date.

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[14] John Priestman, Kevin Hall, Michele Robitaille, according to BMO at the above reference.

[15] The desk itself may be the buyer, depending upon their available capital and market conditions.

[16] For a description of Iceberg Orders, see Toronto Stock Exchange, *Trading – Iceberg Orders*, available on-line via http://www.tmx.com/en/trading/products_services/iceberg_orders.html (accessed 2010-2-10)

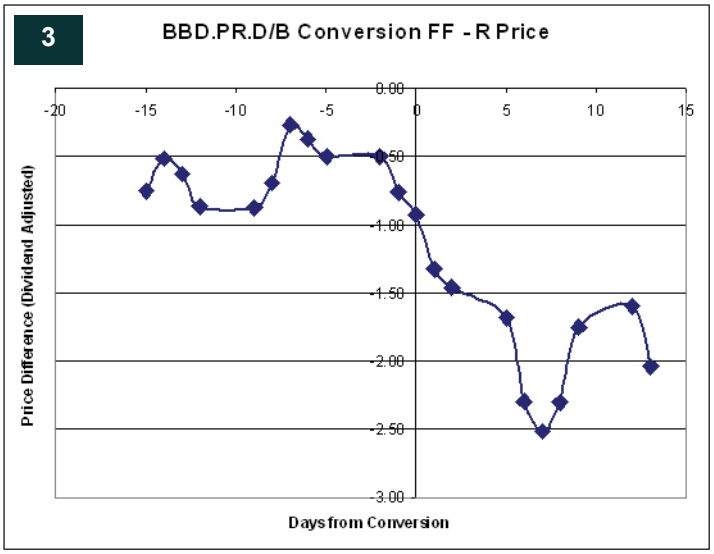
[17] For a discussion of this effect on the market (and how it may be exploited by noise traders!), see *Naïve Hedge Funds in the Canadian Preferred Share Market*, in the December 2009 edition of this newsletter.

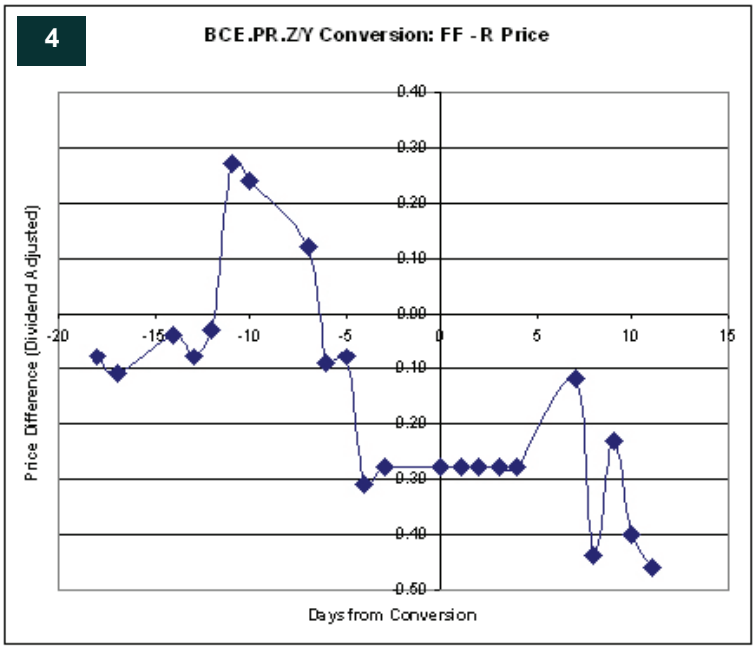
[18] For a more detailed description of the analytical attribute *volume-average*, see *Glossary*, available on-line at http://www.prefshares.com/glossary.html#volume-average

[19] The optimizable parameter *instrumentVolumeInfoDecay* is discussed at http://www.prefshares.com/glossary.html#instrumentVolumeInfoDecay

[20] The analytical constraint *volumeAveragingCap* is discussed at http://www.prefshares.com/glossary.html#volumeAveragingCap

[21] *volumeAveragingCap*, as above.





Quick Method of Relative Value Analysis

At the time of last year's seminar on Floating Rate issues,[22] elements of the pairs were trading on the basis that their current yields were equal; that is, formula (1) gave a very good fit to the observed data.

$R_F * (25/P_F) = R_R * (25/P_R)$ (1) [Incorrect!]

Where

R_F is the dividend yield on the FixedFloater, expressed as a percentage of par

P_F is the price of the FixedFloater

R_R is the dividend yield on the RatchetRate, expressed as a percentage of par

P_R is the price of the RatchetRate

If Equation (1) is correct, we can rearrange the terms and solve for the break-even prime rate, Equation (1a)

$R_R = R_F * (25/P_F) * (P_R/25)$ (1a) [Incorrect!]

$R_R = R_F * (P_R/P_F)$ (1b) [Incorrect!]

To put Equation (1) and its consequences into words, the break-even Ratchet Yield is the yield required to make the Current Yields on the elements of the pair equal.

However, Equation (1) is incorrect, even if we allow the approximation of expected returns to equal current yield, as it makes no allowance for the Interconvertibility Effect.

Such is the inefficiency of the preferred share market, however, that Equation (1a), when solved for each actively trading pair with data from April, 2009, gave a very good fit to the data – at that time, one may conclude, the market was completely oblivious to the issuer's contractual obligation to allow interconvertibility and to the fact that dividends on the FixedFloaters would reset to an unknown rate on the next Exchange Date.

We can account for the Interconvertibility Effect by adding a term to the right-hand-side of Equation (1) to produce the correct Equation (2)

$R_F * (25/P_F) = R_R * (25/P_R) + (P_F - P_R)/(P_R * T)$ (2)

Where T is the time in years until the next Exchange Date.

Those not of an algebraic bent may wish to think of Equation (2) in words as:

Yearly Dollars from FixedFloater Dividends = Yearly Dollars from Ratchet Dividends + Yearly Amortization of Price Difference

Since the unknown factor we are seeking to find is R_R, we can rearrange Equation (2) to isolate the term in Equation (2a):

$R_R = (P_R * R_F)/P_F + (P_R - P_F)/(25*T)$ (2a)

[22] Available for a small charge via http://www.prefletter.com/eMailVerification.php?path=vid

Table 3 shows the results of solving the incorrect Equation (1a) and the corrected Equation (2a) using the January 29 pricing data from Table 2. Several observations may be made, subject to the limitations of the Quick Method.

- The market is still ignoring the Interconvertibility Effect
  - Therefore, a rational investor in these issues may select investments and expect to outperform a random sample
- The pricing of the Bombardier Pair is simply ludicrous. While an investor ignoring interconvertibility may prefer the FixedFloater issue, BBD.PR.D, an investor familiar of the terms of issue will definitely prefer the RatchetRate issue (which is also more liquid, as shown in Table 2).
- There does not appear to be a consistent relationship between average break-even Prime and term to Exchange Date; given the fact that by either method Prime is expected to average approximately double its current value through the next few years, one would expect that expected Prime would increase with term to Exchange Date (see Chart 5)

Table 3: Determination of Break-Even Ratchet Rate with and without Interconvertibility Effect (Quick Method)

Pair (FixedFloater/ RatchetRate)	P_R	R_F	P_F	T	INCORRECT R_R from Equation (1a)	CORRECT R_R from Equation (2a)
BAM.PR.G/E	17.76	4.35%	19.32	1.76	4.00%	0.45%
BBD.PR.D/B	13.50	5.267%	18.36	2.51	3.87%	-3.88%
BCE.PR.T/S	19.75	4.502%	19.04	1.76	4.67%	6.29%
BCE.PR.Z/Y	19.50	4.331%	18.60	2.84	4.54%	5.81%
BCE.PR.A/B	19.50	4.800%	19.98	2.59	4.68%	3.94%
BCE.PR.C/D	19.50	4.600%	20.00	3.09	4.49%	3.84%
BCE.PR.F/E	19.78	4.541%	19.70	5.01	4.56%	4.62%
BCE.PR.G/H	19.32	4.350%	19.18	1.25	4.38%	4.83%

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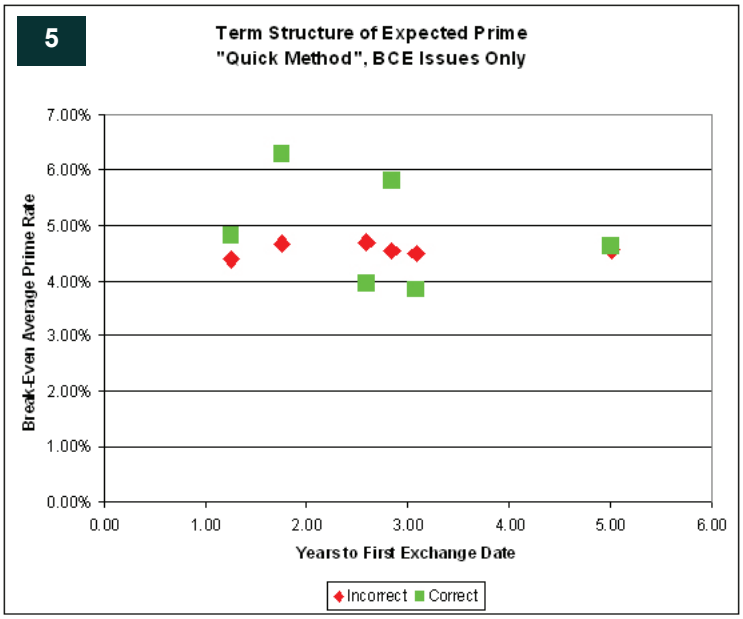

It should be noted that the Quick Method discussed in this section is flawed – the only good thing one can say about it, in fact, is that it appears to be a more accurate indicator of expected returns than are market prices!

The first flaw is the assumption embedded in both equations (1) and (2) that Current Yield (annual dividend divided by price) is a reasonable measure of the dividend yield that will be realized until the next Exchange Date.

This is not correct and it is even less correct than is usually the case when comparing issues from the same issuer:

- Equation (2) combines a dividend yield with an expected price change; combining such elements requires the dividend yield to be calculated more precisely.
- All extant RatchetRate issues pay dividends monthly, while all extant FixedFloater issues pay quarterly. This can lead to major differences in 'accrued dividend'
- The RatchetRate yield is presumed to be constant; in fact there will be a certain amount of path-dependency on the yield realized in practice.

The first flaw results from the accounting for the difference in price by adjusting the Current Yield for amortization on a straight-line basis. It is more precise to amortize this difference on a constantly proportional basis; this approximation will have a greater effect on the calculation as the amortized total increases.

Given our knowledge of the flaw in the Quick Method, it behooves us to undertake a more precise calculation of expected returns; this will, at the very least, provide a rough indication of how much error is inherent in the former method. First, however, we will examine the Quick Method calculation in detail.

A Preliminary Example: BBD.PR.B & BBD.PR.D

The most dramatic results for the Quick Method shown in Table 2 are for the Strong Pair formed by the FixedFloater, BBD.PR.D and its RatchetRate counterpart BBD.PR.B. It appears that an investor unaware of the Interconvertibility Effect may well prefer the FixedFloater, since he will mistakenly calculate that Prime must average 3.87% until the end of time if he is to be indifferent between the two issues. Having made this error, it is entirely reasonable in light of current and expected economic conditions to take the view that Prime will in fact average less than this value and that therefore BBD.PR.D is the better investment.

But according to the usually unread prospectus,[23] Exchange Dates are August 1, 2002, and every five years thereafter. Prior to each Exchange Date, the corporation will determine a "Selected Percentage Rate" of not less than 80%, which is multiplied by the yield on five-year Government of Canada bonds to determine the dividend rate on BBD.PR.D. On July 12, 2007, Bombardier announced[24] that the dividend rate on BBD.PR.D would 5.267%, obtained by multiplying the Government of Canada five-year yield of 4.580% by the Selected Percentage Rate of 115%.[25]

Thus, our poorly informed investor might plug values into Equation (1a) as follows:

$$R_F * (25/P_F) = R_R * (25/P_R)$$

R_F = 5.267% [Dividend rate on BBD.PR.D, expressed as a percentage of par]
P_F = 18.36 [Price of BBD.PR.D on 2010-1-29]
P_R = 13.50 [Price of BBD.PR.B on 2010-1-29]

And therefore

$$R_F * (25/P_F) = 5.267\% * (25/18.36) = 7.172\% = \text{Current Yield on BBD.PR.D} \quad [\text{LHS}]$$

And:

$$R_R * (25/P_R) = R_R * (25/13.50) = 1.852 * R_R = \text{Current Yield on BBD.PR.B} \quad [\text{RHS}]$$

This investor now concludes that he may assume that R_R will be 100% of prime (justifiable given the very low price of BBD.PR.B; barring default, any downside surprises in the dividend rate as a percentage of Prime will involve an enormous increase in price to near-par levels) and that therefore, in order for the left-hand side [LHS] to be equal to RHS, prime must average 3.87% until the end of time. He may then make a decision as to which of these two is the better investment based on his view as to the likelihood of the actual average being higher or lower than this figure.[26] – if lower, the FixedFloater will be the better investment.

As noted, however, the BBD.PR.D dividend resets every Exchange Date with the next reset scheduled for August 1, 2012. If the reset were to occur today, with the five-year at about 2.40% and if Bombardier chooses the minimum Selected Percentage Rate of 80%, the dividend on BBD.PR.D could reset at 1.92% of par … a rather dramatic illustration of why Current Yield is not an appropriate measure for long-term valuation of preferred shares with reset features. Any calculations using the contemporary dividend yield must either be strictly limited in scope (e.g., only until the next Exchange Date) or make explicit assumptions regarding future yield resets.

As an aside, I will note that my proprietary analytical software, HIMIPref™, simply assumes that any optional resets by corporations will be so low that conversion to the floating element is effectively forced; anything better that occurs in practice is considered a bonus.

Similarly, a conservative investor will assume the worst, that he will be forced into the floating element at the next Exchange Date and regard the choice between elements as a short term decision that will end up in an identical investment in the short term. Thus, he will calculate the break-even prime rate in accordance with Equation (2) (which is constructed so that it is valid only in the period until the next Exchange Date):

$$R_F * (25/P_F) = R_R * (25/P_R) + (P_F - P_R)/(P_R * T)$$

Where

R_F = 5.267%
P_F = 18.36
P_R = 13.50
T = 2.51

Therefore:

$$R_F * (25/P_F) = 5.267\% * 25/18.36 = 7.172\% = \text{Current Yield on BBD.PR.D} \quad [\text{LHS}]$$

$$R_R * (25/P_R) = R_R * (25/13.50) = 1.852 * R_R = \text{Current Yield on BBD.PR.B} \quad [\text{RHS-1}]$$

These two parts are equal to the incorrect method shown above, but the correction for the amortization of the difference in price is:

$$(P_F - P_R)/(P_R * T) = (18.36 - 13.50)/(13.50 * 2.51) = 14.34\% = \text{Amortization} \quad [\text{RHS-2}]$$

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[23] Bombardier Inc., *Prospectus for Series 2 Cumulative Redeemable Preferred Shares*, May 13, 1997, available on-line at http://www.bombardier.com/files/en/supporting_docs/Prospectus_Series_2.pdf (accessed 2010-2-11)

[24] Bombardier Inc., Press Release, *Bombardier Announces Dividend Rate Applicable to its Series 3 Preferred Shares*, July 12, 2007, available on-line at http://www.bombardier.com/en/corporate/investor-relations/press-releases/details?docID=0901260d8000f8e4 (accessed 2010-2-11)

[25] The Selected Percentage information is contained in Bombardier Inc., Press Release, *Bombardier Announces Share Conversion Privilege of Series 2 and Series 3 Preferred Shares and Dividend Rate Reset of Series 3 Preferred Shares*, June 15, 2007, available on-line at http://www.bombardier.com/en/corporate/investor-relations/press-releases/details?docID=0901260d8000f8e8 (accessed 2010-2-11)

[26] Note that if the approach was valid and the dividend rate on BBD.PR.B was indeed fixed at 5.267% until the end of time, he would also be considering inflation risk over this period. However, given that in actuality this rate resets to a minimum of 80% of the GOC 5-Year yield, this nuance may be ignored.

And solving for the unknown results in:

$R_R = -3.87\%$

This is the value shown in Table 3, with a small rounding error.

Our investor may therefore conclude that, of the BBD.PR.B/BBD.PR.D pair, the RatchetRate issue, BBD.PR.B, will prove to be the better investment provided that the average value of prime until August 1, 2012, exceeds negative 3.87%. This seems like a good bet.

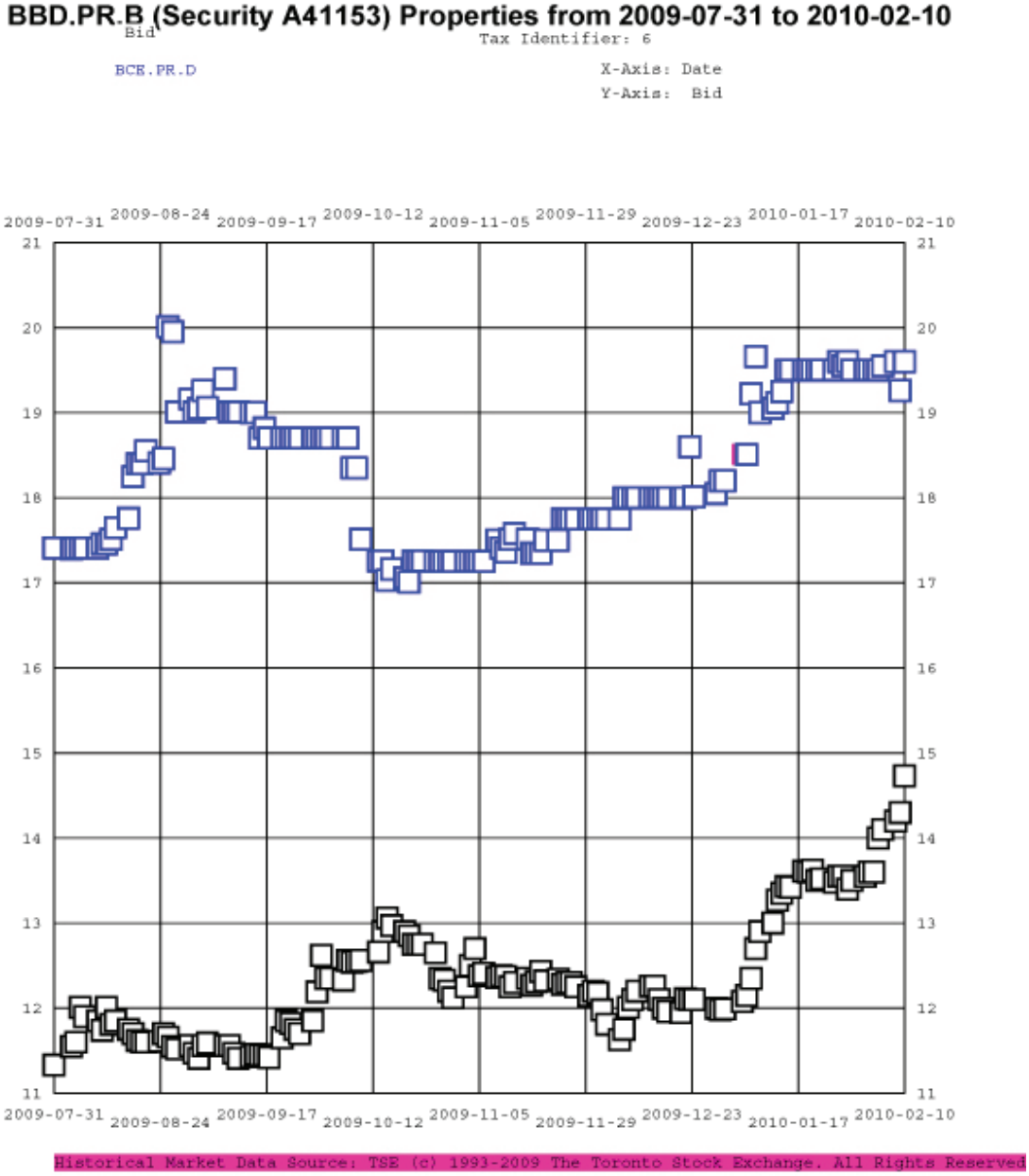
Let us assume, for instance, that the value of each instrument on the next Exchange Date is best estimated by the current price of the Ratchet Rate issue, 13.50. We can invest at that price and accumulate dividends, whatever they happen to be, and find ourselves on August 1, 2012, with an investment valued at 13.50.

If we invest in BBD.PR.D at 18.36 instead, we will receive our dividends at a fixed rate of 5.267% * par value, or $0.3291875 quarterly. There are 10 dividend payments between now and then, so the total dividend received will be $3.29; but our investment will only be worth 13.50, the same as the RatchetRate, so we will have lost $1.57 on the deal as opposed to the gain (via dividends) we have made on BBD.PR.B.

But, you might say, what if it's not worth 13.50 on that date? What if it retains its value and is worth 18.36 on the Exchange Date? To which I respond:in that case, either the RatchetRate issue will also be worth 18.36 or, at a minimum, the RatchetRate issue may be exchanged for the higher priced FixedFloater – so any such improvements on the end price will also improve the rate of return on the RatchetRate.

It is quite beyond me to discern any rationale for the enormous price differential between these two issues.

6



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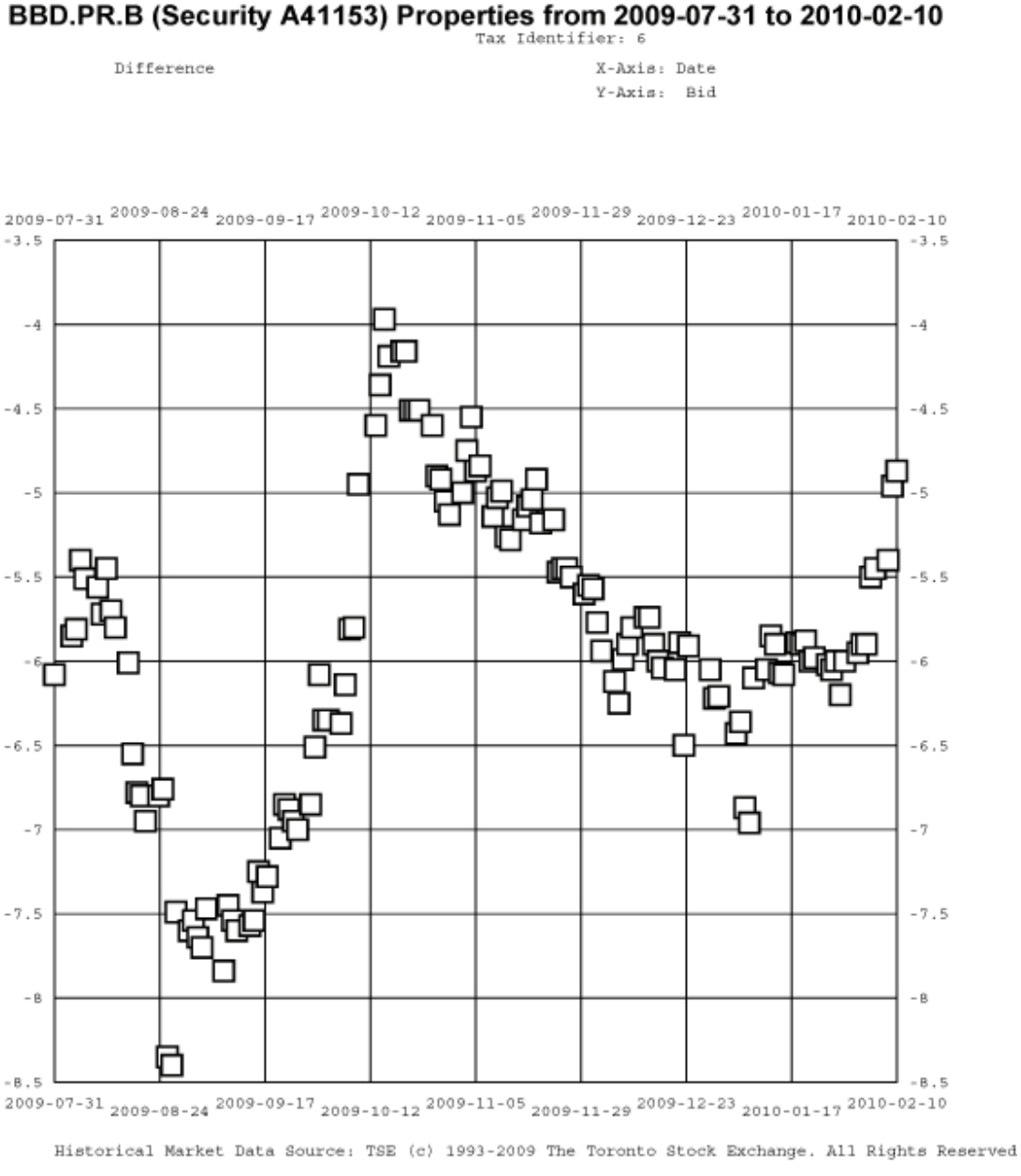


Precise Method of Relative Yield Analysis

The most obvious shortcoming of the Quick Method was its use of Current Yield (as adjusted for amortization of the price difference) in determining relative valuation of the elements of a Strong Pair. Fortunately, we have spreadsheets available for precise yield calculation, originally developed by Keith Betty[27] and which I have extended[28] to allow for the computation of long-term FixedReset yields given a single change in dividend rate on a specified date. It will be noted that the latter version will also be useful when estimating long-term yields on FixedFloaters and that bond calculators are not suitable for preferred share yield calculations as they invariably include accrued interest in the purchase price.

[27] See my article *Yield Ahead*, Canadian Moneysaver, July/August 2006, available on-line at http://www.himivest.com/media/moneysaver_0607.pdf

[28] See *Yield Calculator for Resets*, PrefBlog, available on-line at http://www.prefblog.com/?p=6693

I have developed a spreadsheet that some may find useful in the examination of Preferred Pairs and made it available on-line[29]. I will admit that this is a complete hack in the programmer's sense of the word – elements of other spreadsheets[30] have been used with only minimal necessary changes made to provide the new functionality. It may be a character flaw, but I simply cannot take spreadsheets seriously enough to spend a lot of time on their development – if I intend to provide a professional-looking product I'll work with real programming tools! So the spreadsheet is a little rough around the edges; as always, interested parties are welcome to submit improvements to me which, if used, will be fully credited to them.

As always, before examining the results of any analytical technique, it is necessary to consider its flaws: there are three that I have uncovered to date:

- **Maturity date dividend cut-off:** The yield calculator requires a price as of the end-date of the calculation, which is logically the next Exchange Date. It then adds a final dividend to this price, based on the dividend rate and the length of time elapsed since the last pay-date. This is not correct: most RatchetRate preferreds earn their dividend over a calendar month, but these dividends are paid midway through the following month. Thus, for instance, a monthly-pay RatchetRate preferred paying $0.05 at mid-month and a month-end Exchange Date will have its yield calculated as if $0.025 is received as an accrued dividend on the Exchange Date; in fact, no dividends will be received then but the full $0.05 will be received two weeks or so following the Exchange Date.
- **Constant Dividends:** As has been noted above, most RatchetRate elements of Pairs are trading as if their dividend stream will be based on a Prime Rate which can be considerably different from current Prime. The calculations assume that the break-even Prime rate takes effect immediately and remains constant until the Exchange Date; a more precise approach would increase Prime gradually through the period of the calculation, even if a simple straight-line interpolation of current and ending values was used to estimate intermediate rates.
- **Constant Proportion of Prime:** All extant RatchetRate preferreds are trading substantially below par and have been doing so for some time; hence, the percentage of Prime that they pay has ratcheted up to 100%. Should prices on these issues move closer to par, then there is the potential for this percentage to start ratcheting down again, which will largely invalidate this analytical method or, at the very least, make further assumptions necessary. Fortunately, this nuance will not apply to the Floating component of Strong Pairs formed from FixedReset issues should such issues appear in the future.

The effect of these errors will almost certainly be negligible compared to the inefficiency of the market, but should be understood.

Table 4 shows the results of the analysis using the more precise yield calculation.

Error Checking

As noted, the mathematical differences between the "Quick Method" and the more laborious precise method imply that there will almost always be differences in the results of the calculations.

Table 5 shows these differences for each Strong Pair together with data that might be expected to be relevant to the size of the error.

Table 4: Results of "Precise" Calculation of Break-Even Prime Rate

Pair (FixedFloater/ RatchetRate)	P_F (assumed constant)	Exchange Date	FixedFloater Yield to Exchange Date	P_R (Price Increases to P_F on Exchange Date)	Break-even Prime Rate
BAM.PR.G/E	19.32	2011-11-1	5.48%	17.76	0.49%
BBD.PR.D/B	18.36	2012-8-1	7.30%	13.50	-3.24%
BCE.PR.T/S	19.04	2011-11-1	5.89%	19.75	6.30%
BCE.PR.Z/Y	18.60	2012-12-1	5.62%	19.50	5.61%
BCE.PR.A/B	19.98	2012-9-1	5.78%	19.50	3.86%
BCE.PR.C/D	20.00	2013-3-1	5.57%	19.50	3.78%
BCE.PR.F/E	19.70	2015-2-1	5.75%	19.78	4.62%
BCE.PR.G/H	19.18	2011-5-1	5.66%	19.32	4.92%

Table 5: Differences between "Quick" and "Precise" Calculations

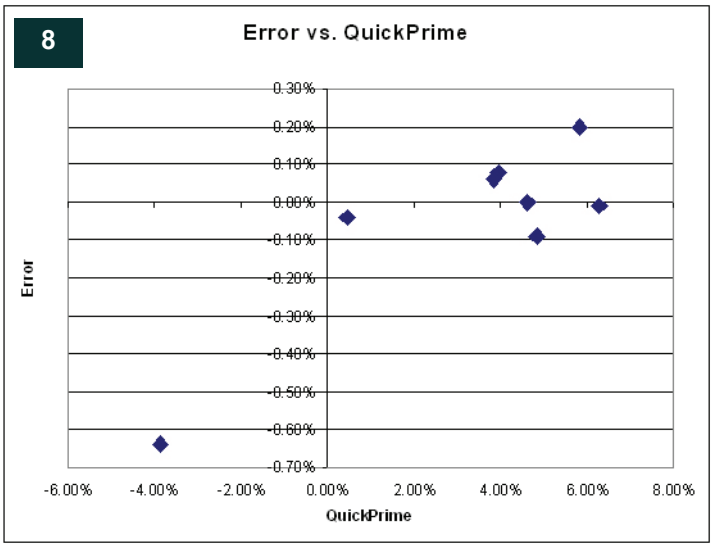
Pair (FixedFloater/ RatchetRate)	Break-Even Prime from Quick Method	Break-Even Prime from Precise Method	Difference in Calculated Break-Even Prime Rates	Current Difference in Price of Issues
BAM.PR.G/E	0.45%	0.49%	-0.04%	1.56
BBD.PR.D/B	-3.88%	-3.24%	-0.64%	4.86
BCE.PR.T/S	6.29%	6.30%	-0.01%	1.07
BCE.PR.Z/Y	5.81%	5.61%	0.20%	-0.90
BCE.PR.A/B	3.94%	3.86%	0.08%	0.48
BCE.PR.C/D	3.84%	3.78%	0.06%	0.5
BCE.PR.F/E	4.62%	4.62%	0.00%	-0.08
BCE.PR.G/H	4.83%	4.92%	-0.09%	-0.14

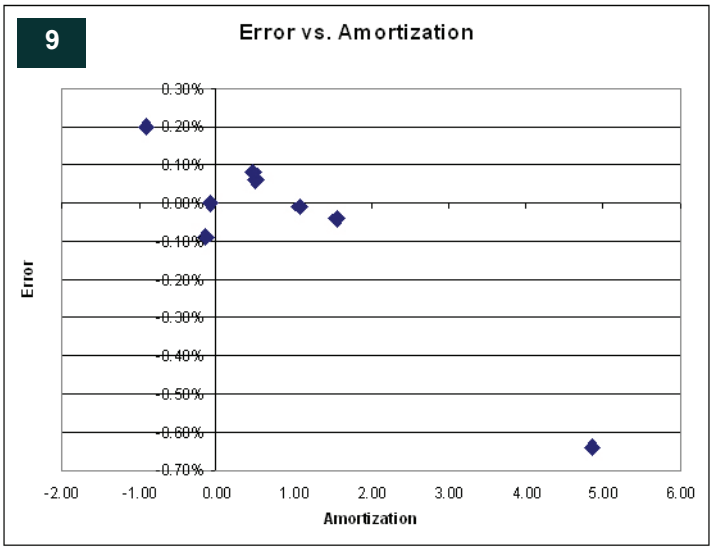
[29] http://www.prefblog.com/xls/pairEquivalencyCalculator.xls

[30] Including the Yahoo Price Downloader originally developed by Peter Ponzo, aka "gummy". See http://www.financialwebring.org/gummystuff/Yahoo-data.htm

The large error for the BBD.PR.D/B pair was expected, since the amortization amount is so high. The error for the BCE.PR.Z/BCE.PR.Y pair looks out of place at first glance, but is consistent when placed in context, as shown in charts 8 and 9.

Use the Quick Method by all means – but understand when the inherent assumptions are likely to break down and the approximate size of such errors. Conduct periodic checks against the Precise Method!





BCE: A More Practical Example

Let us suppose that an investor has decided that his portfolio would be improved with some exposure to BCE Ratchet Rate issues. One approach towards gaining such exposure would simply be to examine a list of the various issues of this type and attempt to purchase the cheapest one at best price possible.

However, the Interconvertibility Effect makes it possible to gain such exposure – on a long term basis – through the purchase of one of the FixedFloaters, with the intent of converting it (or, at least, examining the attractiveness of such a conversion at the proper time) on the next Exchange Date.

An examination of Table 4 shows that the cheapest BCE RatchetRate preferred on 2010-1-29 was BCE.PR.H, bid at the relatively low price of 19.32. However, Table 4 also informs us that the next Exchange Date for this issue is 2011-5-1 and the Break-Even Prime Rate, R_R, is 4.92%.

Since Prime is now 2.25%, it is highly unlikely – although not, of course, impossible – that Prime will average 4.92% over the next fifteen months. If such a change were to be applied linearly, then the Prime Rate on the Exchange Date would have to be 7.59%, implying an increase in Prime of about 35bp each and every month for the next 15 months. As I say, not impossible. But on a balance of probabilities, I suggest that an investor seeking exposure to BCE.PR.H would be well advised to invest instead in its Strong Pair complement, BCE.PR.G (assuming that prices at decision-time are consistent with the table, of course!) with the intent of exploiting the lamentably unexploited option to convert at the first opportunity.

Note that this analysis need not be restricted to the extant Strong Pairs that have been examined in Table 4: there are two FixedFloater issues listed on Table 2, BCE.PR.I and BCE.PR.R, which do not currently have complementary RatchetRate issues outstanding, although the potential for later conversion is just as great as it is for any of the extant issues. Investors may quite rationally deem there to be complementary RatchetRates, at a reasonable price compared to other such issues, and compare the results with those for which such issues actually do exist.

Liquidity

Those who are familiar with my work will know how much I stress liquidity as a drive of yield differences in the fixed income world. It behooves us to ask: given that the break-even Prime yields are so different from both the current rate and from each other, can it be that these differences are driven by liquidity? In other words, are the excess gains that appear to be possible from a detailed analysis of strong pairs a symptom of an inefficient market (as indicated by the good fit to the data provided by the incorrect equation (1A)) or are they driven by liquidity differences between the FixedFloater and the RatchetRate components of the Strong Pairs?

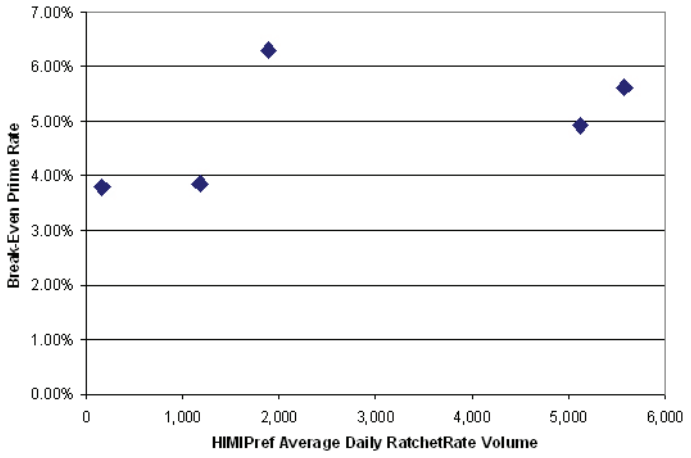
Table 6 summarizes the data regarding the Break-Even Prime Rate and the liquidity measures provided by the TSX and by HIMIPref™.

Table 6: Liquidity Data for Strong Pairs

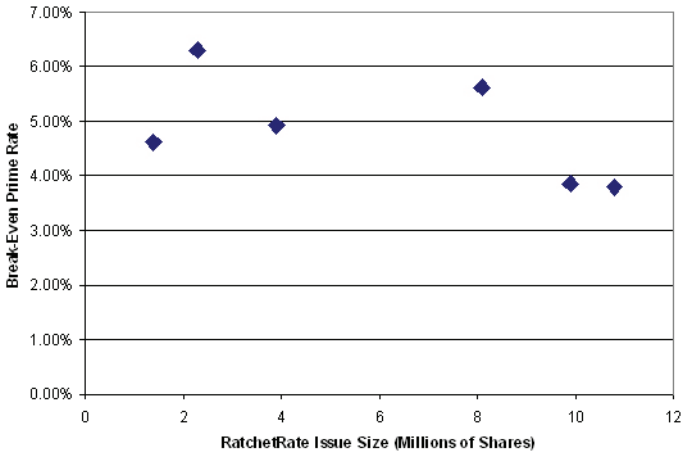
Pair (FixedFloater/ RatchetRate)	Break-Even Prime from Precise Method	volume-average (HIMIPref™) for FixedFloater	volume-average (HIMIPref™) for RatchetRate	Average Daily Volume (TSX) For FixedFloater	Average Daily Volume (TSX) for RatchetRate	Shares Outstanding for FixedFloater (million)	Shares Outstanding for RatchetRate (million)
BAM.PR.G/E	0.49%	1,863	1,676	2,200	7,400	6.2	1.8
BBD.PR.D/B	-3.24%	3,077	13,188	4,600	19,400	2.5	9.5
BCE.PR.T/S	6.30%	6,249	1,890	8,600	4,400	5.7	2.3
BCE.PR.Z/Y	5.61%	3,534	5,580	5,000	6,800	1.9	8.1
BCE.PR.A/B	3.86%	18,419	1,184	21,200	2,700	10.1	9.9
BCE.PR.C/D	3.78%	11,593	169	10.300	8,800	9.2	10.8
BCE.PR.F/E	4.62%	5,976	N/A	13,000	4,200	14.6	1.4
BCE.PR.G/H	4.92%	8,269	5,120	10,200	12,200	10.1	3.9

Charts 10, 11 and 12 show my attempts to make sense of the data (restricting the issues to BCE Strong Pairs in an attempt to ensure sample homogeneity) but … I can only express the opinion that it looks like the market is simply inefficient and trading on Current Yield in accordance with the incorrect Equation (1)!

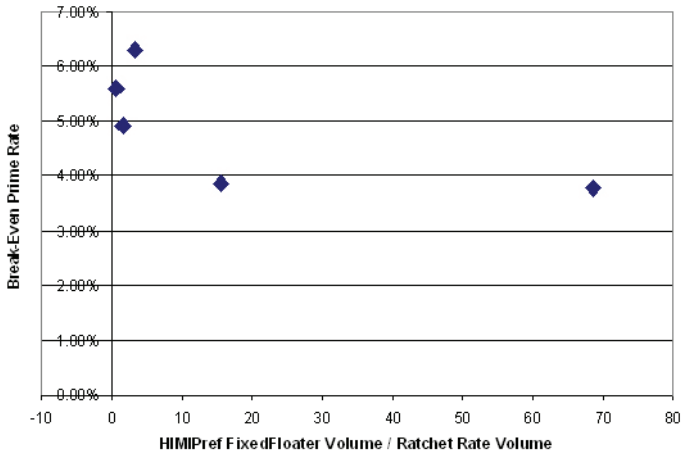
10 Break-Even Prime vs. HIMIPref RatchetRate Volume



11 Break-Even Prime vs. RatchetRate Issue Size



12 Break-Even Prime vs. HIMIPref Volume Ratio



Credit Quality

With only three names in the entire sample, it would be imprudent to draw firm conclusions from any pattern that might be found in their comparison. However, it is consistent with theory that the Break-Even Prime Rate for Bombardier is so much different from the other two names: as it is rated only Pfd-4, compared with Pfd-2(low) for BAM and the popular-with-retail BCE at Pfd-3(high).

The low rating on Bombardier may mean that there are fewer investors who have the slightest interest in investing in either one of the issues; and therefore prices may drift further and further apart, one way or the other, without anybody ever noticing or caring.

Conclusion

Strong Pairs form a unique segment of Canadian preferred share in that they offer investors a meaningful option on a regular basis (the investor's option to retract with respect to Operating Retractible shares is not considered meaningful, given overwhelming expectations that the issuer will call such shares immediately before the option becomes exercisable. In practice, the retraction option is hardly ever exercised or even considered, since the issue ceases to exist prior to decision time).

The analysis presented in this essay indicates that investors ignore both this option and the fact that dividends on the FixedFloater element of each Strong Pair will be reset on every exchange date to a value that cannot be known in advance. This creates an inefficient market which may be exploited by investors willing to perform the fairly simple calculations required to quantify the differences between Strong Pair elements; although straightforward arbitrage may not be possible due to stock borrowing and taxation constraints, it is certainly possible for those entering and exiting positions in these issues to select from the possibilities available to them with a very good chance of achieving excess returns.

These techniques may become more important in the future should there be significant numbers of new Strong Pairs formed from FixedResets.

On a related note, it should be remembered that the universe of RatchetRate issues from the same issuer form a complex of Weak Pairs – issues that should be identically priced due to their characteristics, but which have no mechanism whereby the investor can force convergence. Together with the characteristic that issuers generally have the right to reset the FixedFloater rate sufficiently low that investors will be forced into RatchetRate issues on the Exchange Date, this observation may be useful in comparing different FixedFloaters from the same issuer, given that it may be assumed for analytical purposes that all such issues will become RatchetRate issues within a five year period.

[31] An exception was IQW.PR.C shortly before its bankruptcy. See http://www.prefblog.com/?p=1638