FixedResets
Theory & Practice

May 28, 2009
Toronto

This seminar is being filmed for later distribution

Preferred Shares

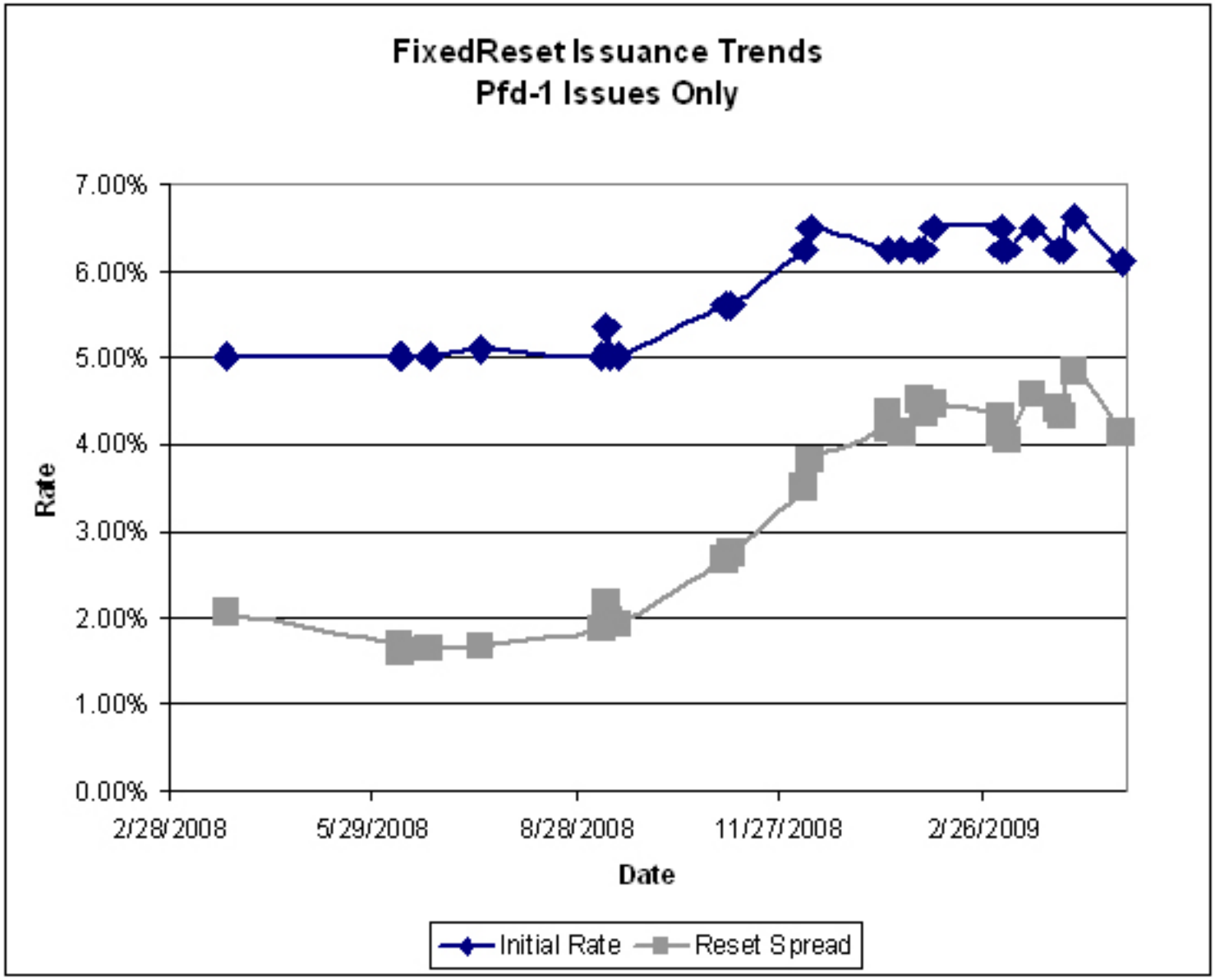
- Fixed rate & Schedule of income
– Holders CAN’T put company into bankruptcy
– Little or no chance for Capital Gain from issue price
– Asymmetric risk / reward
– No dilution of claims (quality may suffer)
– Income is received as dividends
– Have First-Loss Protection

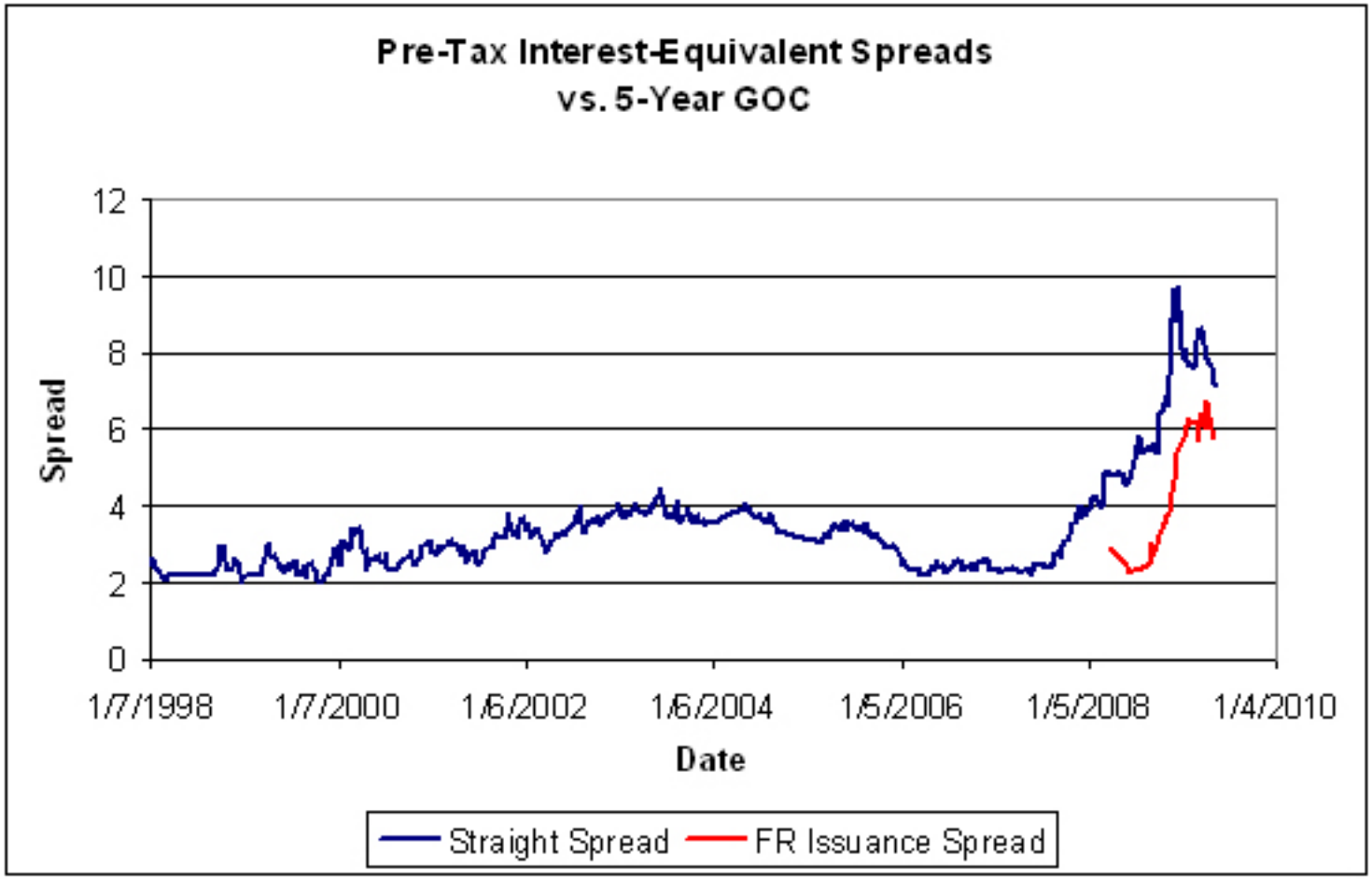
FixedReset Perpetuals

- Long-Term Income dependent upon index
  - 5-Year Canada Bond + Spread
  - 3-Month T-Bills + Spread
- May be redeemed at issuer's option, no retractions
- Most are financial, non-cumulative
- Massive issuance in past year
  - Banks, Insurers, Utilities

Key Differences from Straights

- Redemption Provisions (Standard Terms)
  - FixedResets callable at par in five years
  - Straights callable at premium in 5+ years, par after 9+ years
- Effect of Prolonged Inflation
  - Fixed Resets: some protection
  - Straights: no protection
- Credit Downgrades
  - Similar effects

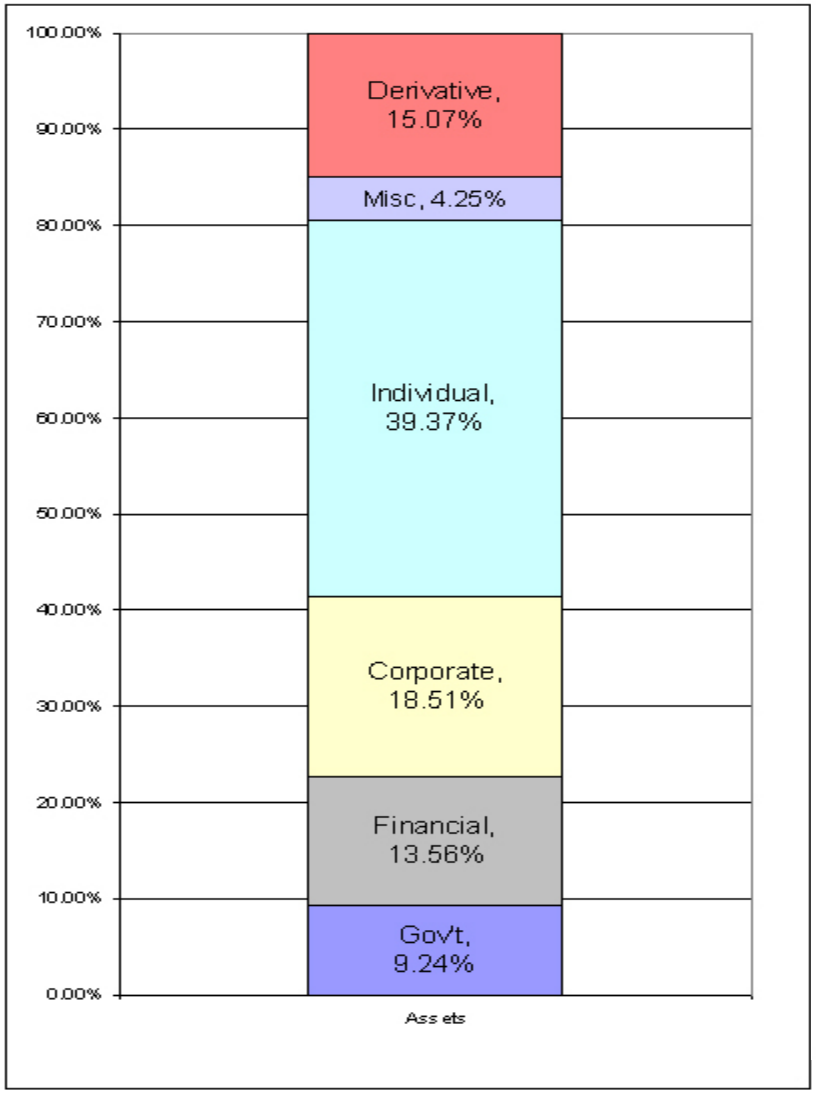

FixedReset Issuance Trends
Pfd-1 Issues Only
7.00%
6.00%
5.00%
4.00%
3.00%
2.00%
1.00%
0.00%
Rate
2/28/2008
5/29/2008
8/28/2008
11/27/2008
2/26/2009
Date
Initial Rate
Reset Spread

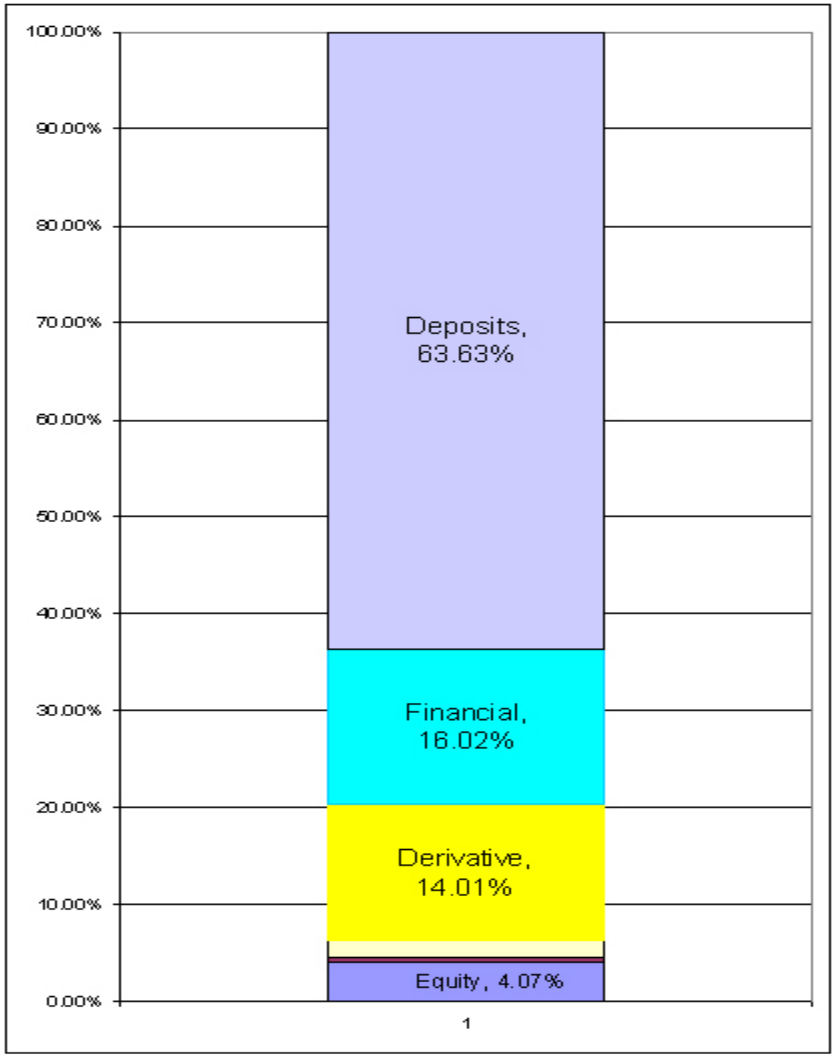

Pre-Tax Interest-Equivalent Spreads
vs. 5-Year GOC
Spread
12
10
8
6
4
2
0
1/7/1998
1/7/2000
1/6/2002
1/6/2004
1/5/2006
1/5/2008
1/4/2010
Date
Straight Spread
FR Issuance Spread

Credit Quality

Banks & Insurers

Bank Balance Sheets





Bank Credit: Asset Quality

- Leverage in Canada is constrained to 20x
  - Total Capital / (Assets + Some Exposures)
  - Banks may apply for relaxation to 23x
- Some assets are riskier than others
  - T-Bill has same balance sheet effect as credit-card receivable
- Regulatory focus is to protect depositors
- Need a buffer against unexpected losses

Banks: Risk Weighted Assets

- A “Risk-Weight” is determined for all balance-sheet and off-balance-sheet items
- Treasuries & Canadas have credit risk 0%
- Claims on banks (according to sovereign rating) and corporations
  - AAA to AA- : 20%
  - A+ to A- : 50%
- Retail (RBC average is 22%)
  - Mortages 35% (less if insured; RBC average is 8%)
  - Unsecured 75%
- Other factors based on term, unused credit lines, etc.
- Market Risk, Operational Risk

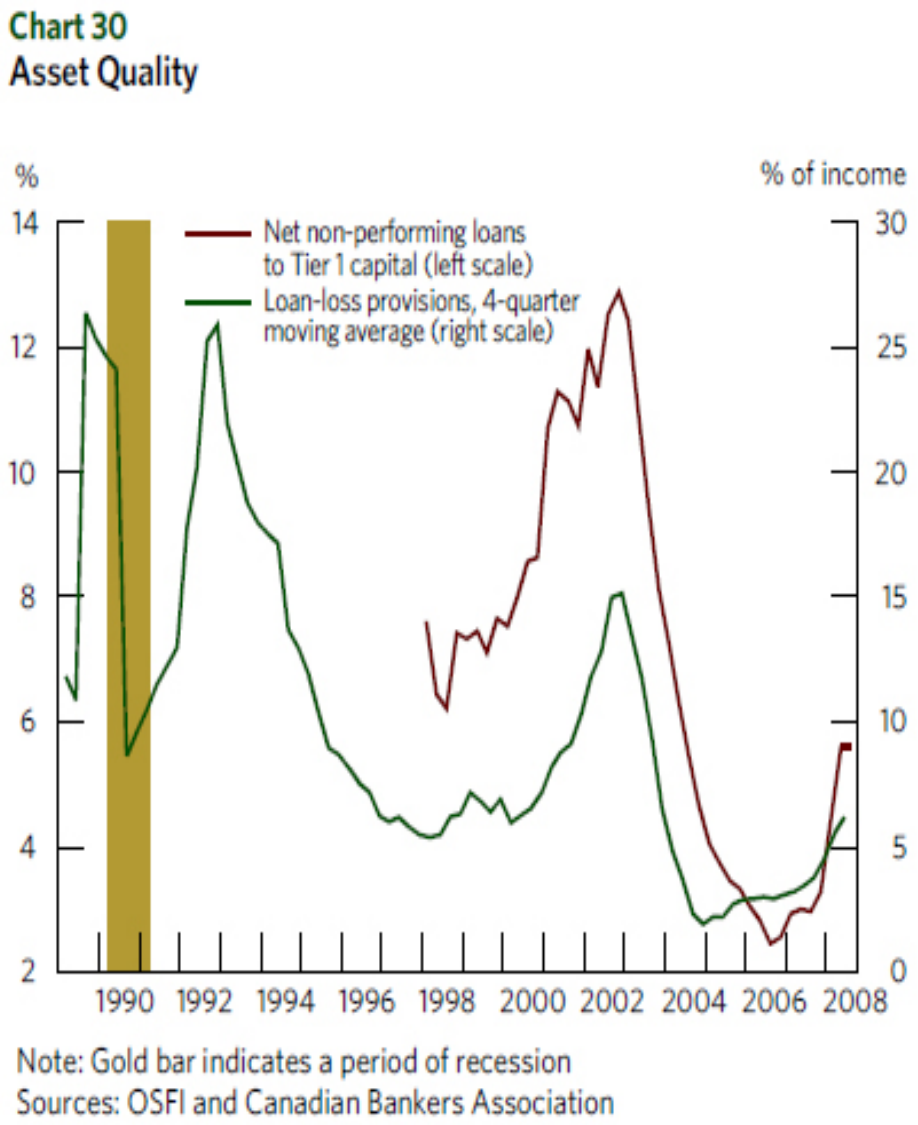
Banks: Capital Ratios 1Q09

Ticker	ACM	Equity/RWA	Tier 1 Ratio
NA	17.0	6.53%	10.00%
TD	16.9	6.70%	10.10%
BNS	18.6	6.83%	9.50%
CM	17.7	7.18%	9.80%
RY	17.5	7.66%	10.60%
BMO	15.8	7.71%	10.21%

Banks: Credit Ratings

Ticker	DBRS*	S&P	Moody's
NA	Pfd-1(low)	P-2(high)	A1
TD	Pfd-1	P-1(low)	Aa2 [Outlook Negative]
BNS	Pfd-1	P-1(low)	Aa3
CM	Pfd-1	P-1(low)	A1 [Outlook Negative]
RY	Pfd-1	P-1(low)	Aa2 [Outlook Negative]
BMO	Pfd-1	P-1(low)	Aa3

* All DBRS Tier 1 Ratings are under Review-Negative



Bank of Canada

Financial System Review

… an excellent resource

- They aren't trying to sell you anything!
- Warnings of ABCP vulnerability in 2003 were spot-on
- www.bankofcanada.ca

Bank of England has very good research.

Credit Quality: Insurers

- Capital Requirements set by OSFI (MCCSR: Minimum Continuing Capital and Surplus Requirements)
  - Apply only to operating insurers, not holding companies … be careful!
- Capital Requirement set by exposure to risks, including
  - Segregated Funds
  - Annuities
- Ratio of 150%+ Total Capital Required at Operating Level
  - 190-200% Normal
  - … but preferreds are generally at the Holding Company level

Insurers: Gross Leverage Measures

Ticker	Equity*	Other Tier 1	Bond Effect**	Stock Effect***
IAG	1,195	18.70%	1.30%	1.40%
ELF	2,276	8.80%	0.90%	1.60%
GWO	3,474	81.50%	15.20%	16.60%
SLF	7,725	34.20%	3.70%	3.70%
MFC	15,480	30.80%	8.60%	12.30%

*Common Equity + Minority Interest – Intangibles
**Effect of 100bp change in interest rates (All insurers are short duration)
***Effect of 10% equity market decline

Insurers: Credit Ratings

Ticker	DBRS	S&P	Moodys	AMBest
IAG	Pfd-2(high)	P-1(low)	NR	bbb+
ELF	Pfd-2(low)	P-2(high)	NR	NR
GWO	Pfd-1(low)	P-1(low)	NR	a-
SLF	Pfd-1(low)	P-1(low)	Baa2	NR
MFC	Pfd-1(low)	P-1(low)	NR	a

Credit Quality Notching

Relationship: Tier 1 & Senior Debt

S&P, 2009-3-31

… our view that European governments and the European Commission (EC) over the medium term may be more willing than previously to encourage or force banks to suspend payments on hybrid securities to preserve cash and build capital …

60 financial institutions downgraded

DBRS, 2009-4-20

… changes in methodologies reflect the revision of our views on external support as it relates to preferred shares and the elevated risk of non-payment of preferred dividends relative to the risk of default indicated by senior debt ratings based on the more severe business environment being faced by global banks…

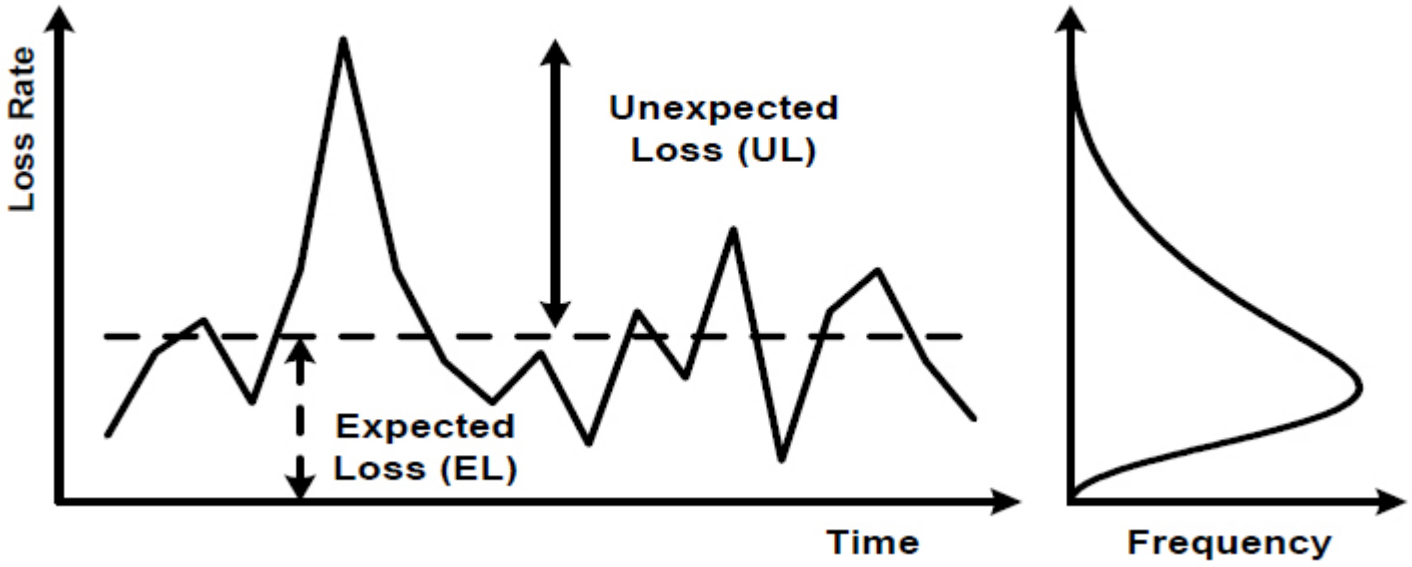
All Canadian bank Tier 1 on Review-Negative

Notching Provides Framework

- Components of Capital
  - Equity
  - Preferred Shares
  - Innovative Tier 1 Capital
  - Tier 2 Capital
- Non-Equity Elements typically notched against senior debt
  - e.g., CIBC / S&P:
    - Senior Debt & Deposit Notes: A+
    - Sub-Debt: A
    - Preferred shares: A-

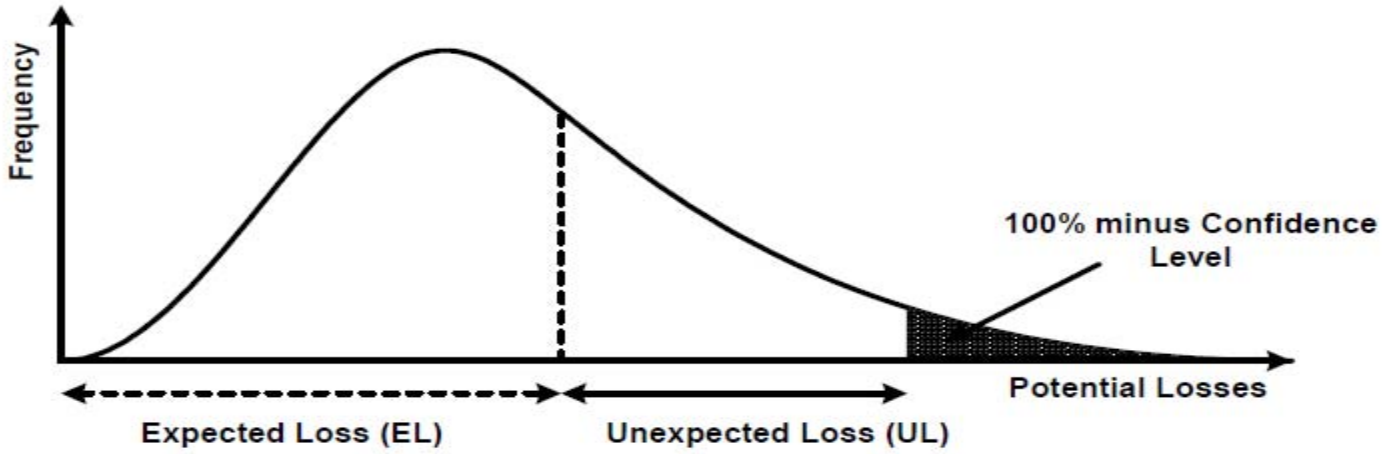
BIS Capital Rules (Basel 2)

- Expected Losses are deducted from capital
  - e.g., 2% of Credit Card debt
- Remaining Capital is to absorb Unexpected Losses



Capital Requirements

- 8% Total Capital / Risk-Weighted Assets is required



The confidence level is fixed at 99.9%, i.e. an institution is expected to suffer losses that exceed its level of tier 1 and tier 2 capital on average once in a thousand years.

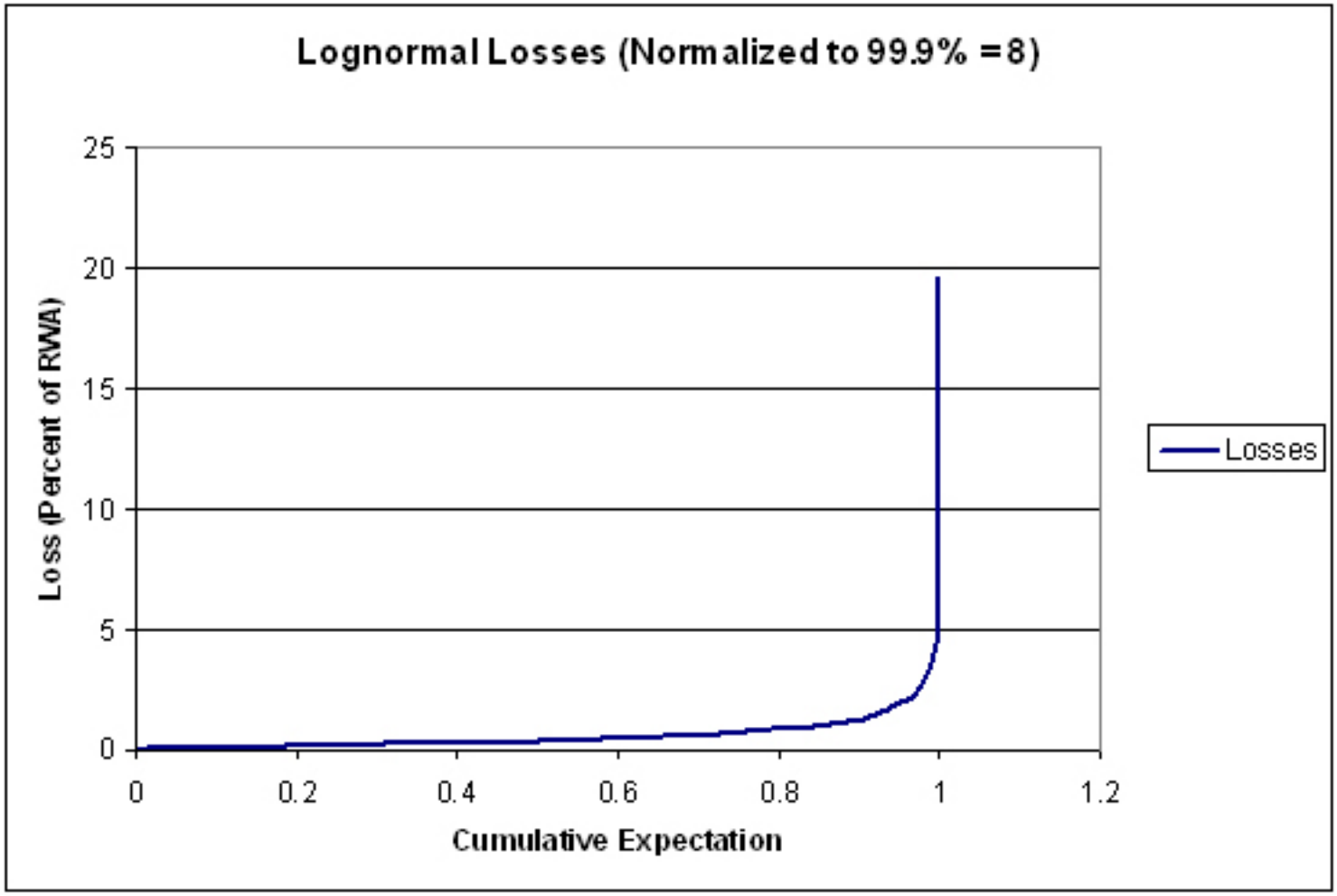
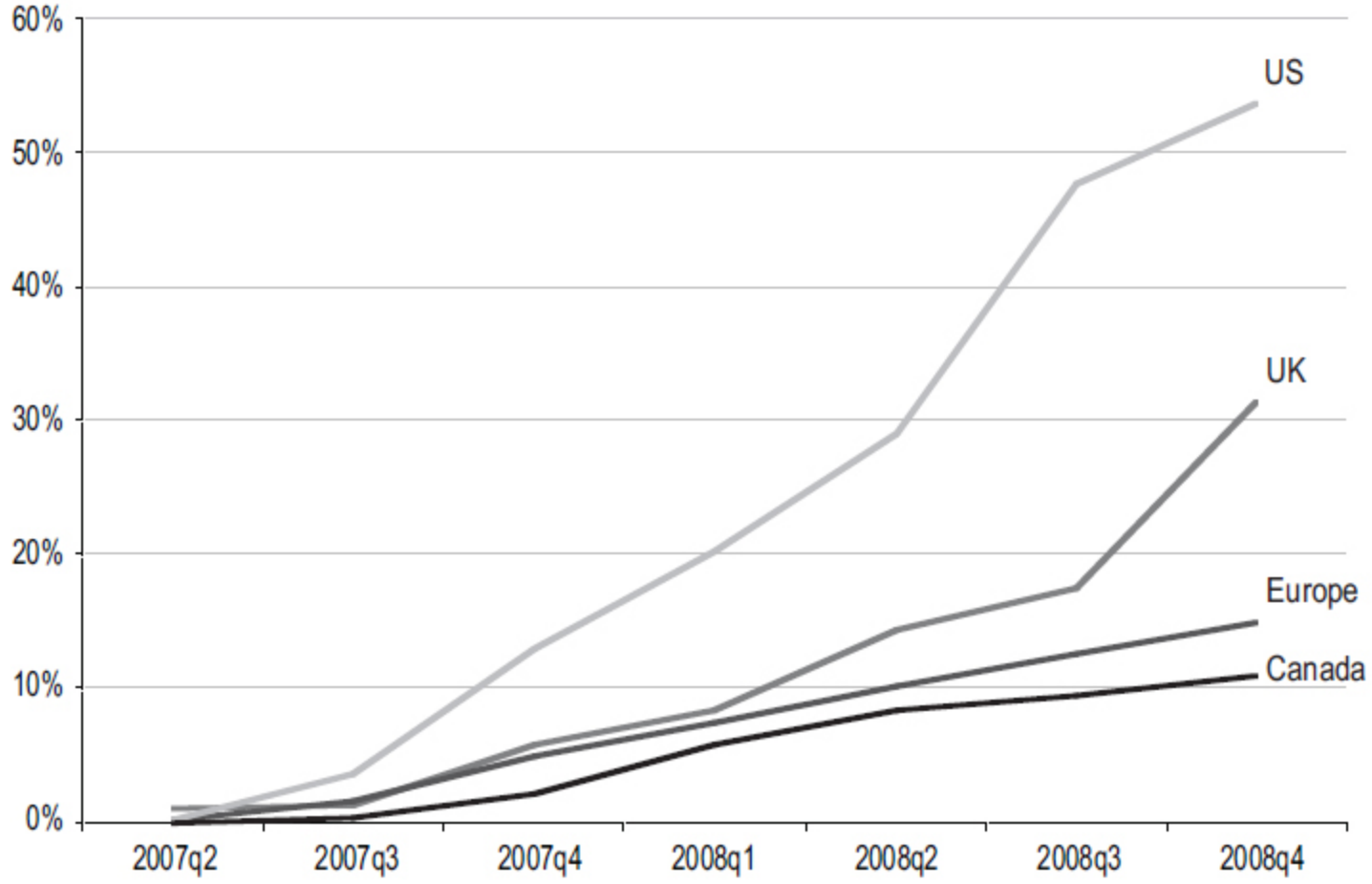

Lognormal Losses (Normalized to 99.9% =8)
Loss (Percent of RWA)
25
20
15
10
5
0
0
0.2
0.4
0.6
0.8
1
1.2
Cumulative Expectation
Losses

Figure 3: The cumulative writedowns of Canadian banks (% of shareholder equity)



Central Banking, Volume 19, Number 4

Subordination Implies Notching

Instrument	Subordination	Std Devs	Normsdist	Annual Default	Moody's Equivalent
Deposit Note	11.5%	3.46	0.9997	0.0267%	A
Sub-Debt	9.76%	3.30	0.9995	0.0486%	A-
IT1C & Preferreds	7.09%	2.98	0.9986	0.1446%	Baa
Equity	0	0	0	N/A	N/A

Credit Quality: Summary

- Rating Agencies have access to material non-public information
  - Opinions are relatively reliable
  - Read the Ratings Announcements
  - Adjust if you're uncomfortable
- OSFI doesn't care about you!
  - Focus is on the operating subsidiaries; no authority over holding companies (unlike banks, due to Bank Act restrictions)
- Companies will cherry-pick data

Market Sensitivity

Interest Rate Sensitivity

- Modified Duration describes the change in price for a given change in yield
  - Accurate for small changes only … say one or two percent
  - Calculation does not take account of calls
- Modified Duration of Straight: $D_{MOD} = 1/y$
- Price Change for given change in yield
  - $\Delta P / P = - D_{MOD} \Delta y$ (for all fixed income)
  - $\Delta P / P = - \Delta y / y$ (for PerpetualDiscounts)

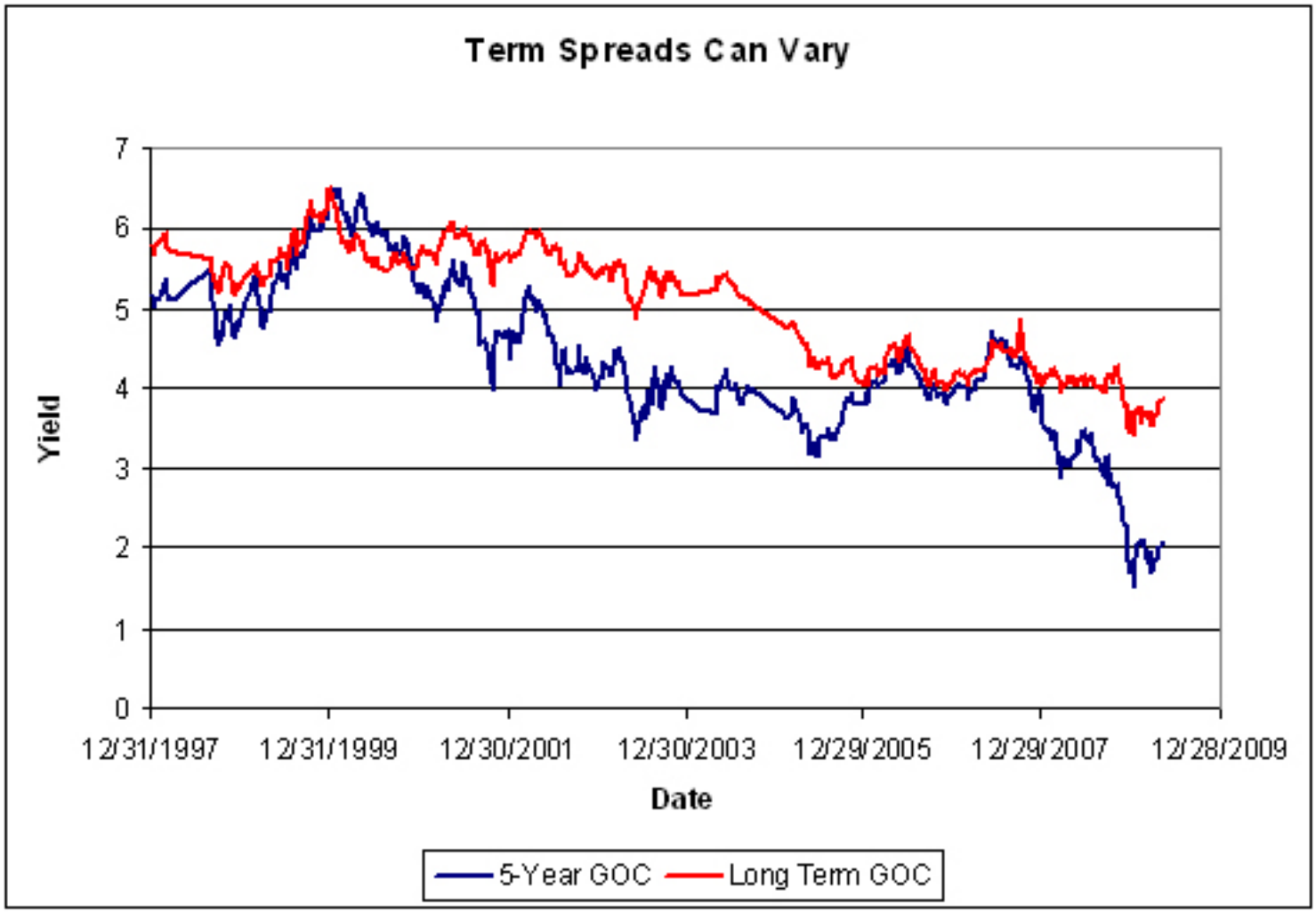
FixedResets: Analysis ex-Calls

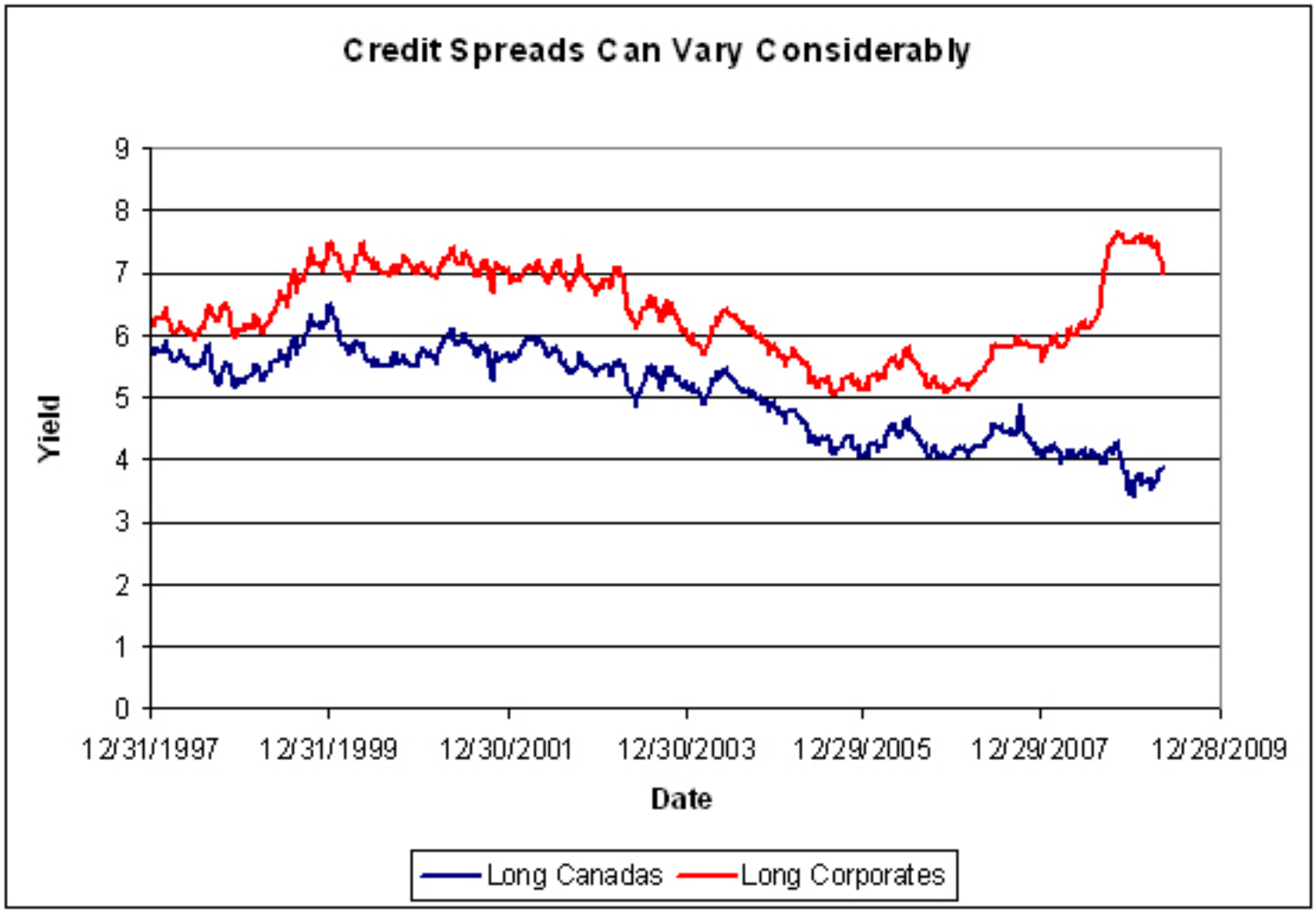
- Yield = GOC5 + Spread
- If Spread constant:
  - Yield will reset to GOC5 + Spread on Reset Date
  - Price will be par on Reset Date
  - Therefore, duration on each reset date will be the same as a five-Year retractible.

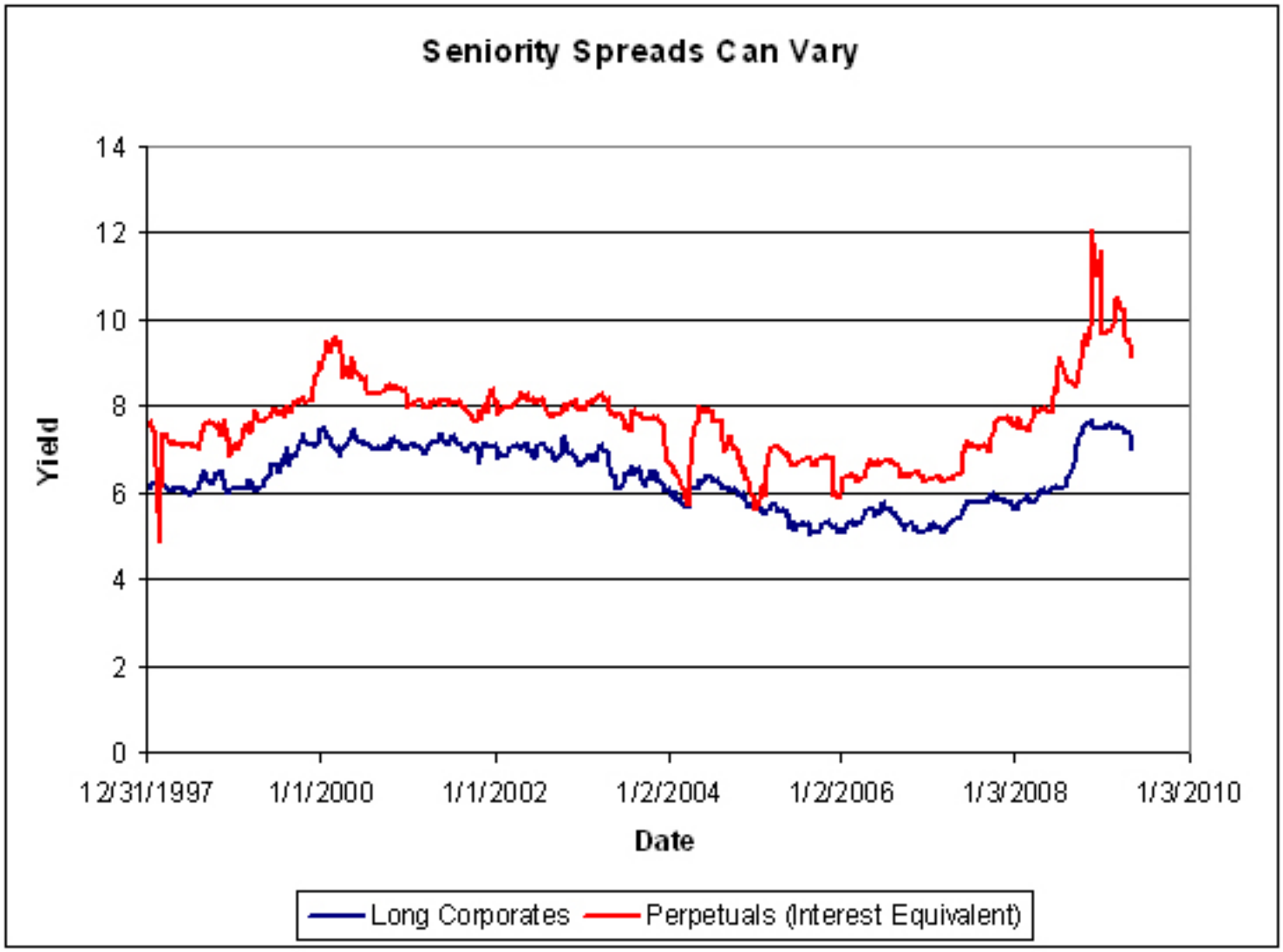
… if market spread varies …

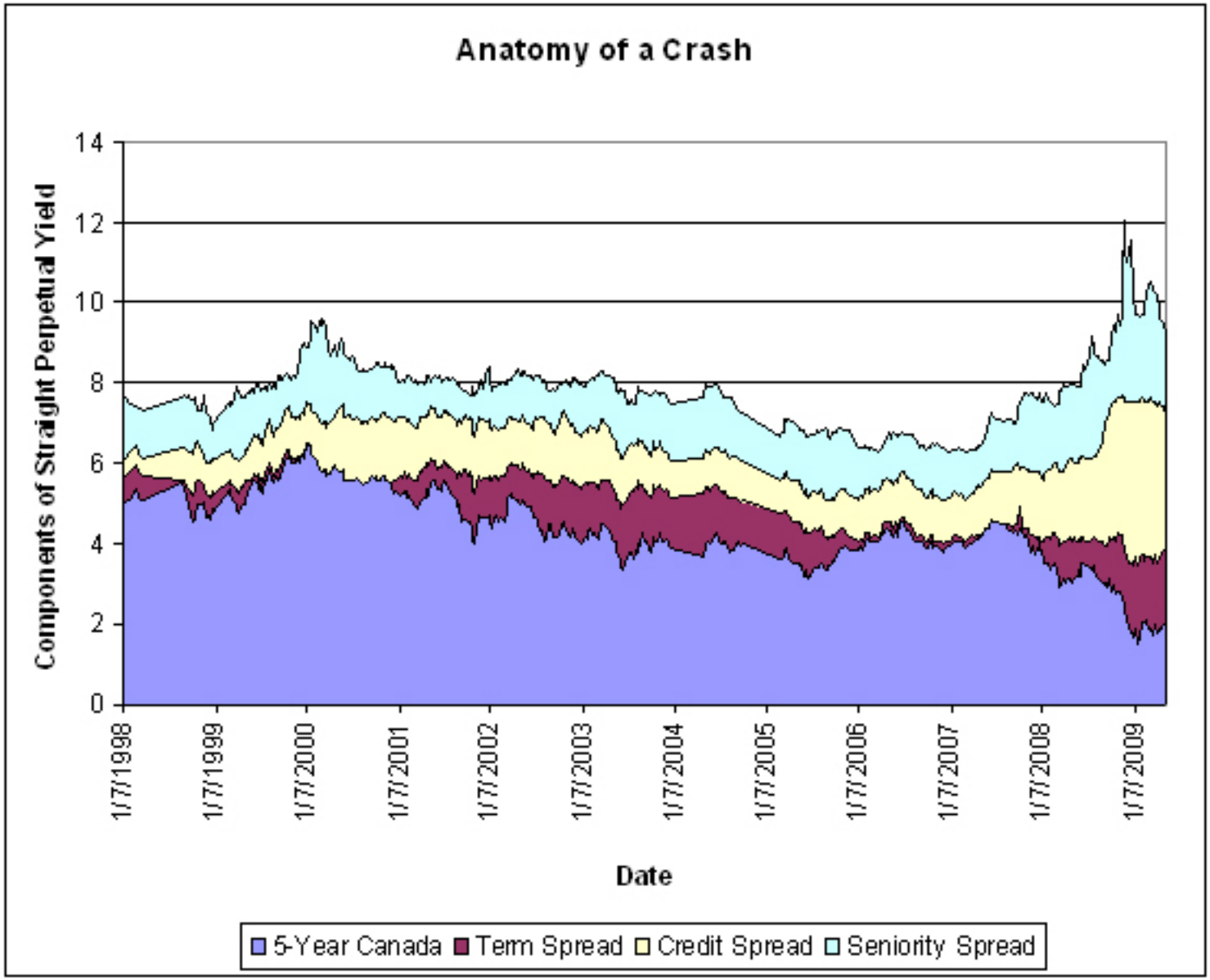
- Yield resets to previously agreed spread
- There will be a difference in perpetuity for this yield
- Therefore:
  - $Y = GOC5 + S$
  - $\Delta Y = \Delta GOC5 + \Delta S$
  - $\Delta P / P = (\Delta GOC5 / 0.2) + (\Delta S / Y)$ … (nearly)

What Caused the Crash?


Term Spreads Can Vary
Yield
7
6
5
4
3
2
1
0
12/31/1997
12/31/1999
12/30/2001
12/30/2003
12/29/2005
12/29/2007
12/28/2009
Date
5-Year GOC
Long Term GOC


Credit Spreads Can Vary Considerably
Yield
9
8
7
6
5
4
3
2
1
0
12/31/1997
12/31/1999
12/30/2001
12/30/2003
12/29/2005
12/29/2007
12/28/2009
Date
Long Canadas
Long Corporates


Seniority Spreads Can Vary
14
12
10
8
6
4
2
0
Yield
12/31/1997
1/1/2000
1/1/2002
1/2/2004
1/2/2006
1/3/2008
1/3/2010
Date
Long Corporates
Perpetuals (Interest Equivalent)


Anatomy of a Crash
Components of Straight Perpetual Yield
14
12
10
8
6
4
2
0
1/7/1998
1/7/1999
1/7/2000
1/7/2001
1/7/2002
1/7/2003
1/7/2004
1/7/2005
1/7/2006
1/7/2007
1/7/2008
1/7/2009
Date
5-Year Canada
Term Spread
Credit Spread
Seniority Spread

Implications

- Crash in PerpetualDiscount prices was caused by Credit Spreads
- Not Term Spreads, not Inflation
- Recall, for non-callable FixedResets
  - $\Delta P / P = (\Delta GOC5 / 0.2) + (\Delta S / Y)$ (very nearly)
- Consider historical data:

FixedResets in 2004 … maybe!

	5/8/2009	4/30/2004
5-Year Cda	2.05%	3.54%
Straight Yield	6.56%	5.50%
FixedReset Initial Rate	6.00%	5.00% ?
Reset Spread	379	150 ?

A FixedReset issued five years ago would be resetting today at about 3.50%

Current lowest reset spread is TD.PR.S

- 5% Initial Rate
- resets 2013-7-31 at +160
- Current quote 24.06-30 (looks very expensive; Yield-to-Perpetuity < 4%)

What Influences Credit Spreads?

Influences on Credit Spreads

- Default Risk
  - Merton Model
- Uncertainty regarding Default Risk
  - e.g., volatility in financial statement elements
  - Discounting rate of expected cash flows
- Liquidity
  - Unexplained residual
  - Can be captured by buy-and-hold investors

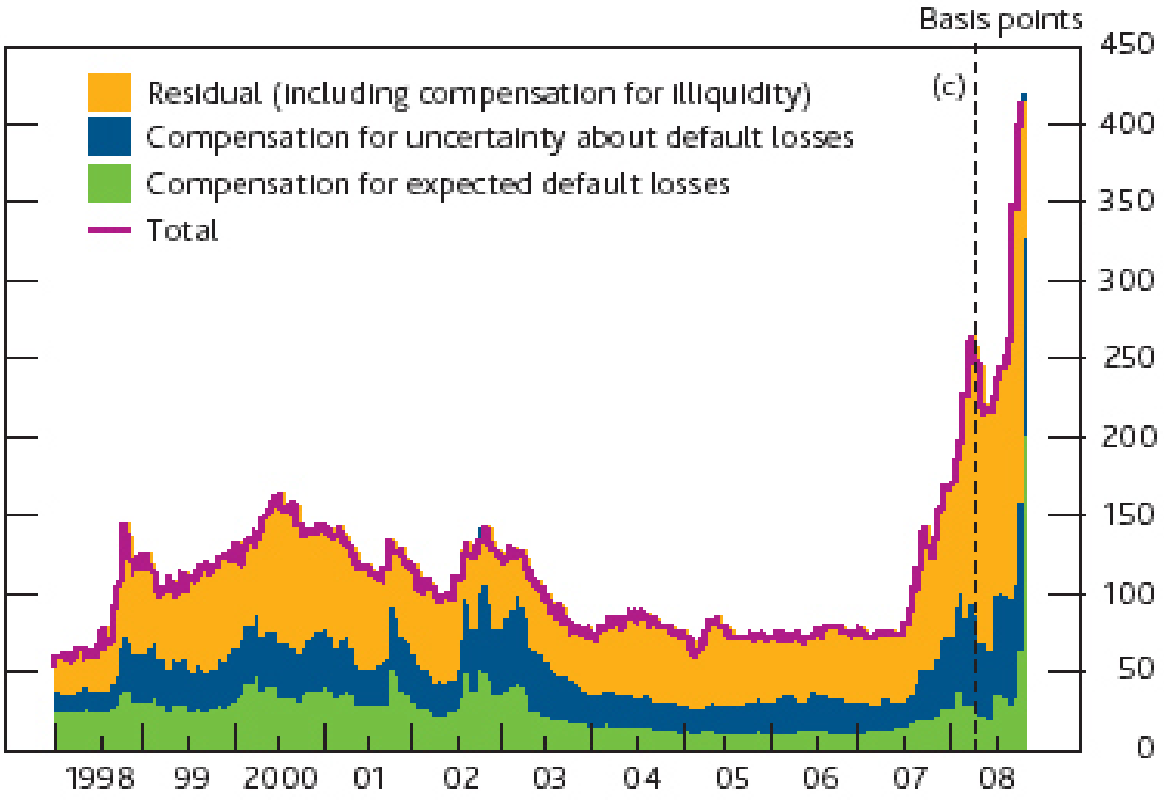
Estimating Default Risk

- “Merton Model” estimates chance of decline in asset value wiping out common equity.
- Similar to bank capital requirements, but uses market capitalization rather than book assets.
- Always results in calculated spreads less than market spreads

Liquidity Effects in the Market

- “Benchmark” vs. “Off-the-Run” Government Yields
- TIPS vs. Nominal Treasuries
- Central Bank Collateral Premium
- “Market Impact” costs for funds
  - real cost of fund trading, not commissions

Chart 2.6 Decomposition of sterling-denominated investment-grade corporate bond spreads(a)(b)



Sources: Bloomberg, Merrill Lynch, Thomson Datastream and Bank calculations.

(a) Webber, L and Churm, R (2007), 'Decomposing corporate bond spreads', *Bank of England Quarterly Bulletin*, Vol. 47, No. 4, pages 533–41.
(b) Option-adjusted spreads over government bond yields.
(c) April 2008 *Report*.

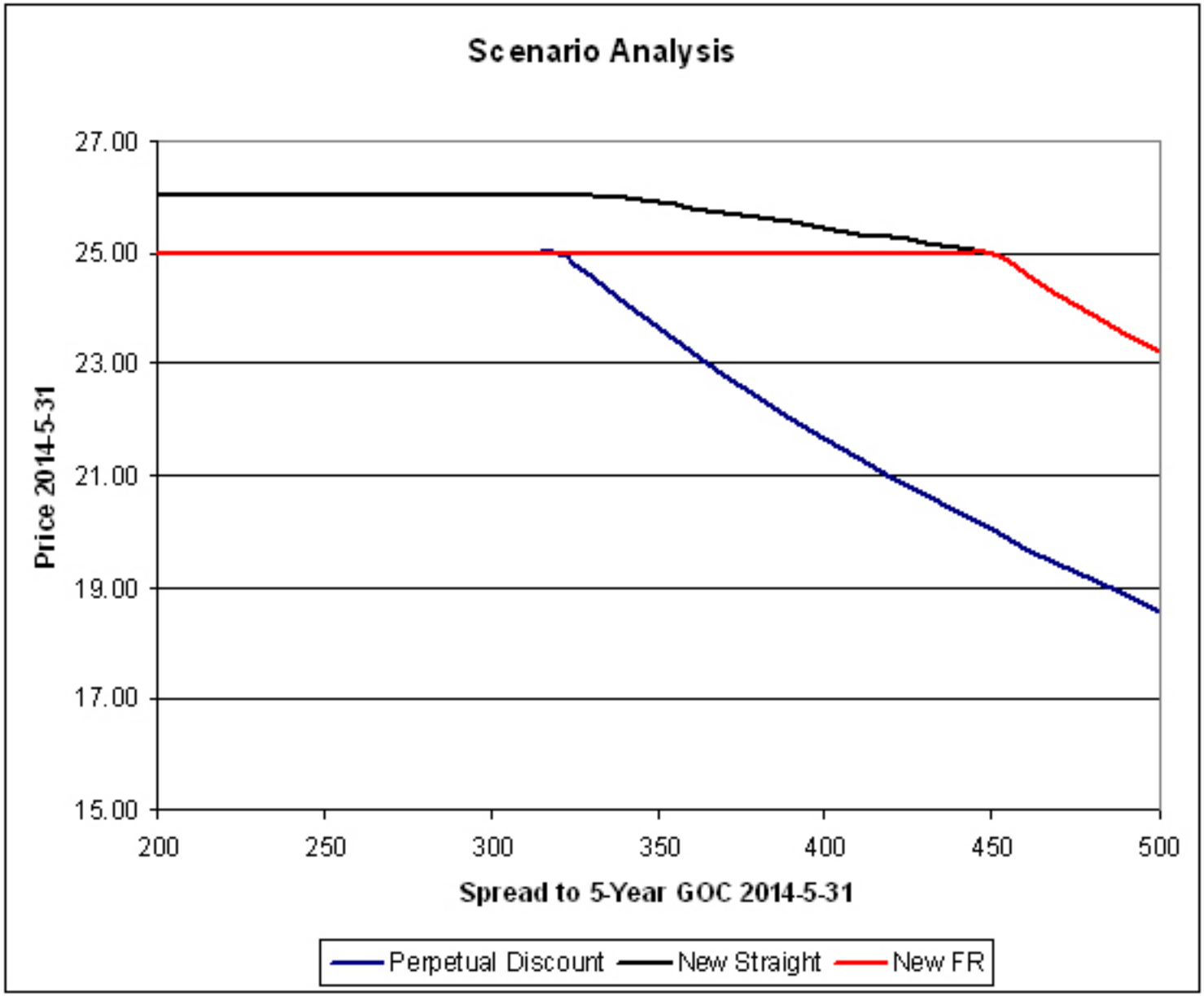
Call Provisions

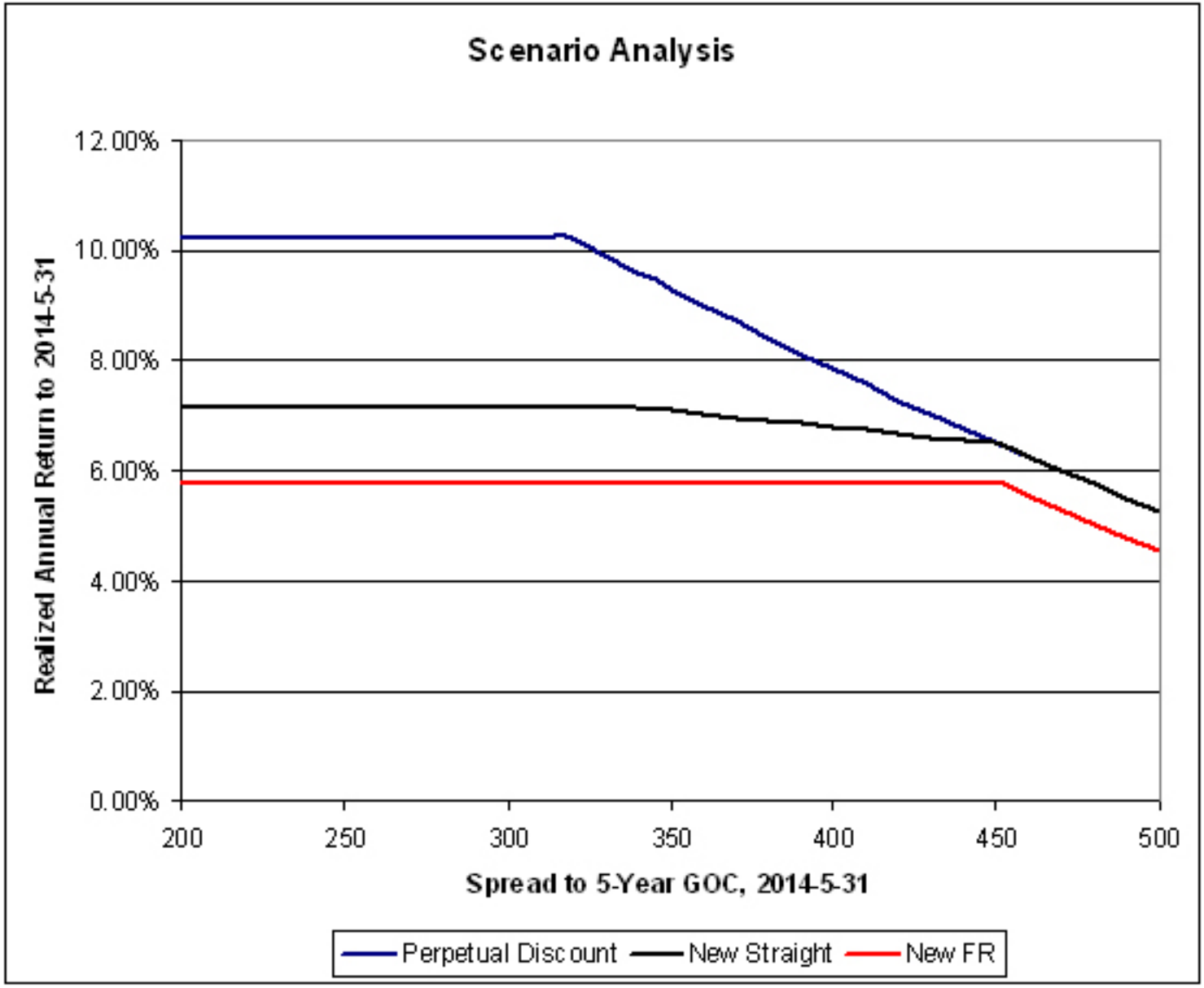
Fixed-Resets Have Early Call

- All are callable at par on the first Reset Date (about five years)
- Compare with standard terms for straights
  - Callable at $26 after five years
  - Callable at $25 after nine years

Effects of Calls

- Compare:
  - New issue FixedReset, spread 5.8%+380
  - New issue Straight Perpetual, 6.50%
    - Pays 1.625, callable 5-years @ 26, 9-years @ 25
  - Old PerpetualDiscount
    - Price $20, pays $1.30, currently callable @ 25
- Examine effects of spread changes
- Hold 5-Year GOC Rate constant at 2%


Scenario Analysis
27.00
25.00
23.00
21.00
19.00
17.00
15.00
Price 2014-5-31
200
250
300
350
400
450
500
Spread to 5-Year GOC 2014-5-31
Perpetual Discount
New Straight
New FR


Scenario Analysis
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
Realized Annual Return to 2014-5-31
200
250
300
350
400
450
500
Spread to 5-Year GOC, 2014-5-31
Perpetual Discount
New Straight
New FR

Historical Credit Spreads

	To 2007-3-31	All Data
<2%	1	1
2%-3%	214	240
3%-4%	177	193
4%-5%	11	34
5%-6%	0	14
6%-7%	0	5
7%-8%	0	13
8%-9%	0	10
>9%	0	4

Data since 1997-12-31, Interest Equivalent Straight Perpetual less GOC 5-Year

Inflation Risk

Yield on a PerpetualDiscount

- Yield is the sum of:
  - Expected average inflation
  - Real Return
  - Default Premium
  - Default Uncertainty Premium
  - Liquidity Premium
  - Inflation Risk Premium
  - Symmetry Premium
  - Et cetera
- All factors apply to FixedResets except for Inflation Risk Premium

How Much is the Inflation Risk Premium Worth?

- Subject of much academic analysis
  - 11-22bp, time varying? *Grishchenko & Huang*
  - Small, time-varying? *Hördahl*
  - Canada maybe zero? *Reid, Dion & Christensen*
    - Canadian data no good, since market illiquid
- Doesn't matter much: Investor's risk function is much more important

If Inflation Risk Premium = 0 …

- PerpetualDiscounts will embed long-term inflation expectations
- FixedResets will embed 5-Year inflation expectations
- Probably equal
  - I have grave doubts that any significant difference could be extracted from term and liquidity premia

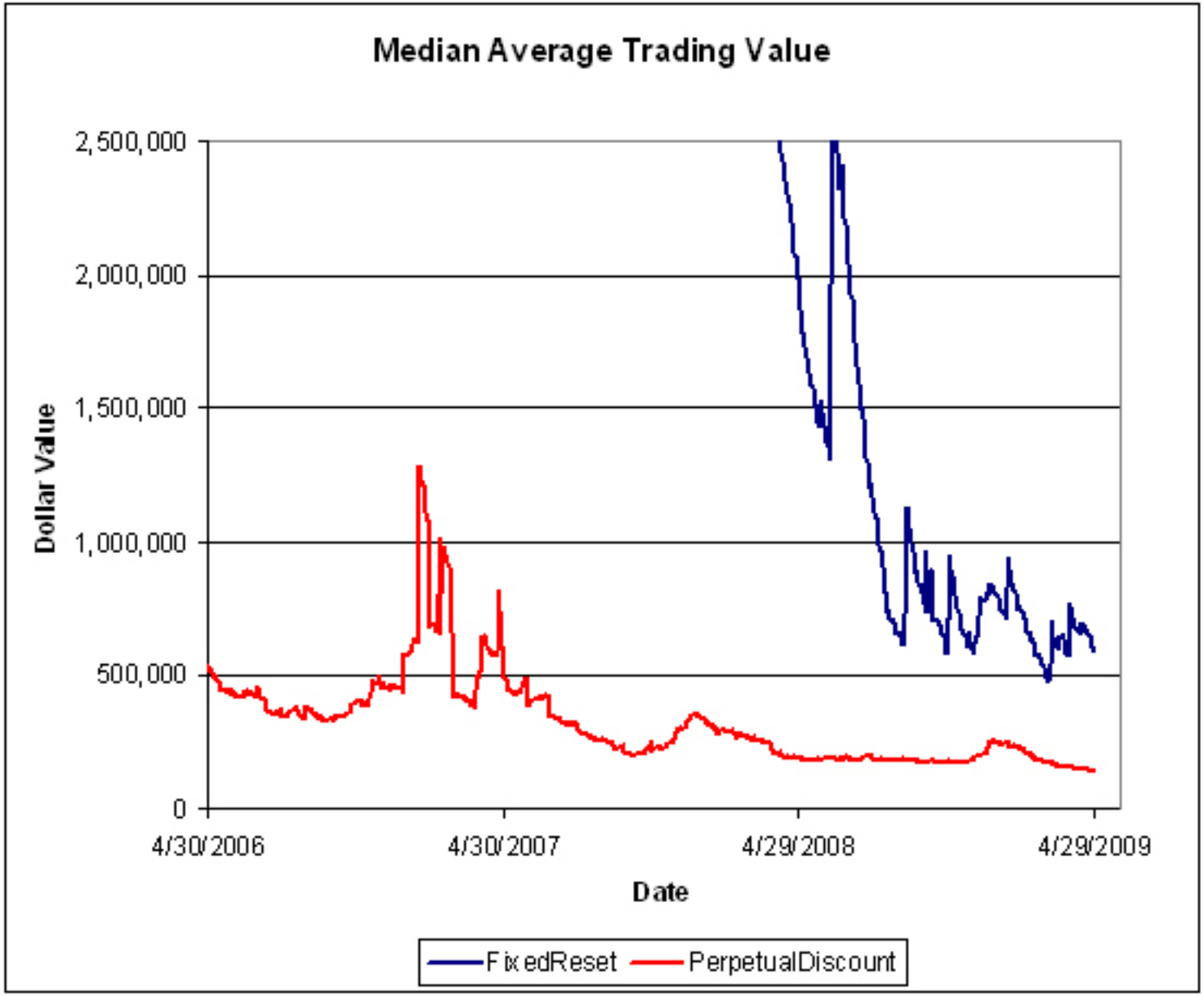
Implications

- Asymmetrical market:
  - Cost for issuers = Zero
    - Inflation effects zero
    - Five year call for perpetual money is very attractive
  - Value perceived as positive for buyers
- Value can legitimately be positive for inflation-sensitive investors
  - Same principal as insurance, but costs are high and avoidable (e.g., common stock, real-estate)

Spreads to Straights

Factors in Straight/FR Spread

- Credit
  - Credit quality is equal
- Potential for call
  - Attractiveness is often reversed by investors
- Liquidity
  - Plausible, but no evidence from issue yields
- Price Stability
  - This is how they are sold …


Median Average Trading Value
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
Dollar Value
4/30/2006
4/30/2007
4/29/2008
4/29/2009
Date
FixedReset
PerpetualDiscount

Price Stability: Really?

- $\Delta P / P = (\Delta GOC5 / 0.2) + (\Delta S / Y)$…(nearly)
- Ignoring calls, Exposure of Straights & FixedResets to
  - ΔS is the same
  - $\Delta GOC5$: Straights have 3-4 times the exposure
- But: leverage does not have an intrinsic value
- Internal pricing of FixedResets inconsistent with desire for price stability.

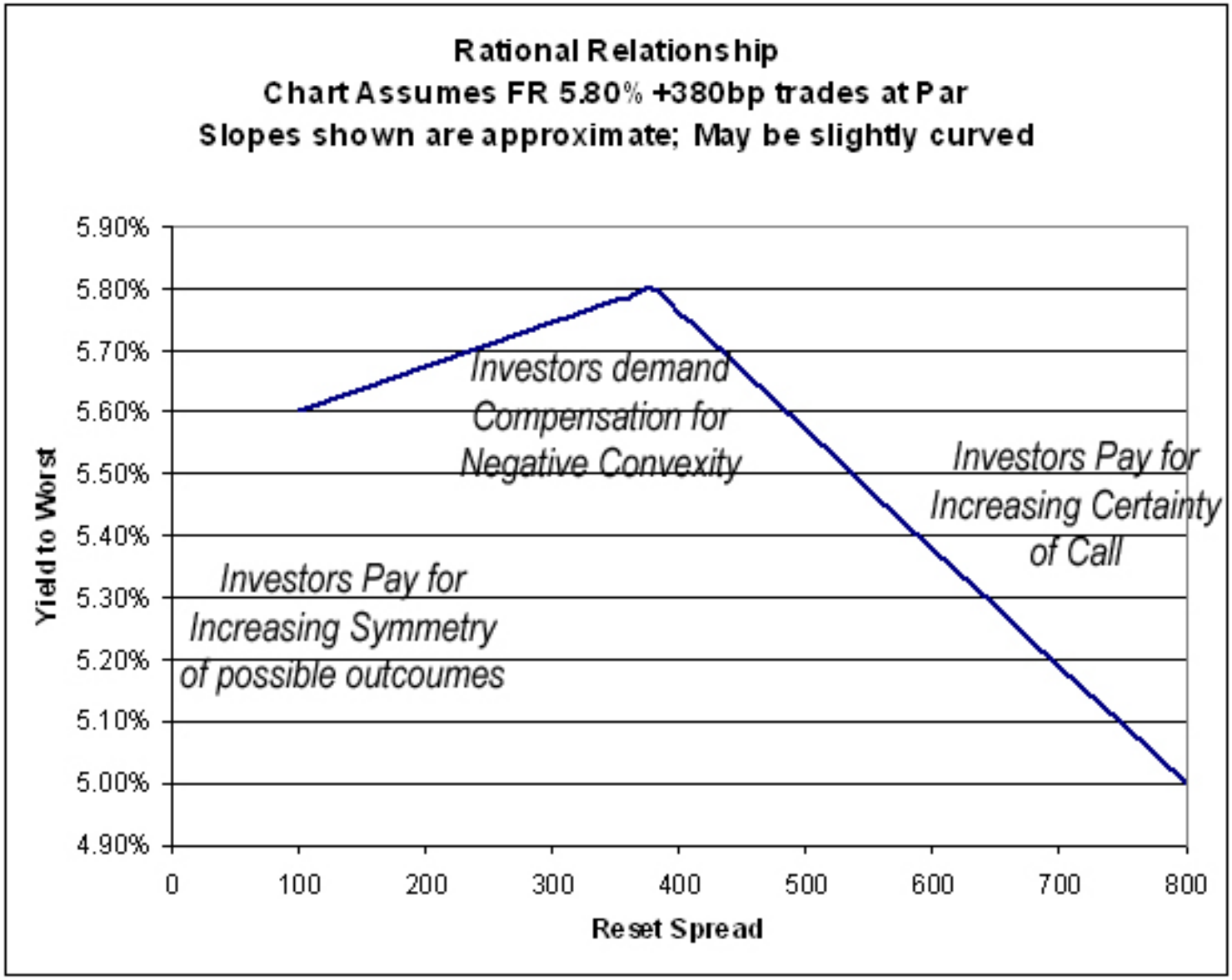
Conclusion

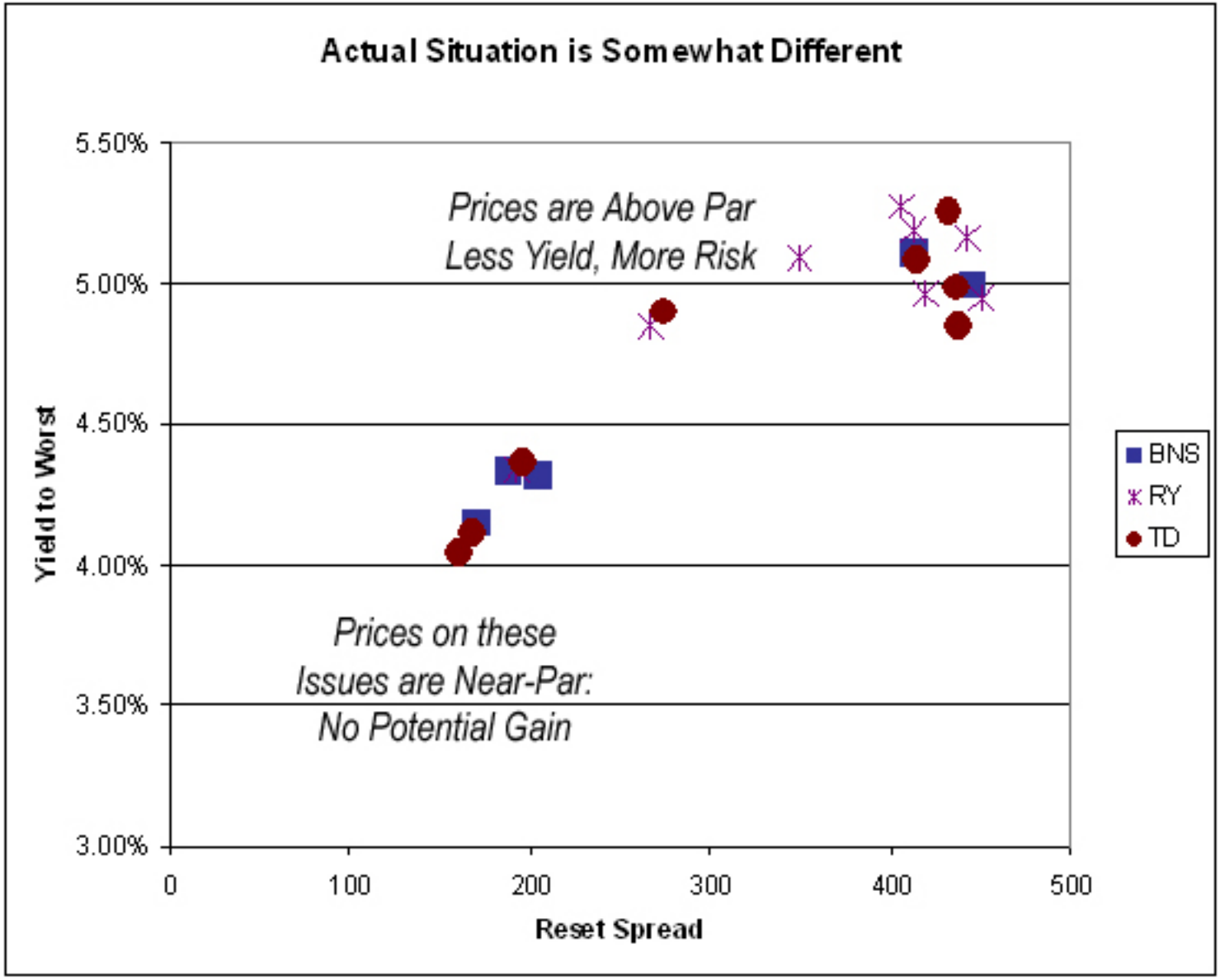
- FixedResets should trade at roughly even-yield with Straight Perpetuals
  - Perhaps slightly less due to reduced GOC5 sensitivity … but not much less!
- Should yield more than PerpetualDiscounts due to negative convexity (asymmetric risk/reward) due to calls
- HIMIPref™ doesn't care; Floaters are set equal value to Non-Floaters by fudge factor

Internal Analysis

Compare YTW with Reset Spread

- In current environment, most issues are trading above par
- YTW scenario is call on first reset date
- Call Probability depends solely on S
  - GOC5 is irrelevant
- Therefore, an investor seeking certainty will pay more for higher S and give up yield for greater call certainty


Rational Relationship
Chart Assumes FR 5.80% +380bp trades at Par
Slopes shown are approximate; May be slightly curved
Yield to Worst
5.90%
5.80%
5.70%
5.60%
5.50%
5.40%
5.30%
5.20%
5.10%
5.00%
4.90%
0
100
200
300
400
500
600
700
800
Reset Spread
Investors demand Compensation for Negative Convexity
Investors Pay for Increasing Certainty of Call
Investors Pay for Increasing Symmetry of possible outcoumes


Actual Situation is Somewhat Different
Prices are Above Par
Less Yield, More Risk
Prices on these
Issues are Near-Par:
No Potential Gain
Yield to Worst
5.50%
5.00%
4.50%
4.00%
3.50%
3.00%
0
100
200
300
400
500
Reset Spread
BNS
RY
TD

FixedReset Term Inversion

- Yields are higher as probability of call increases
- Roughly equivalent to term inversion in bond markets
  - Indicator of expectation of decline on yields
  - Investors want to lock-in higher yields, get capital gains
- Makes no sense in FixedReset market

Current Yield Analysis

- Current Yield = Current Dividend / Price
- Inappropriate
  - If called, will be capital gain or loss
  - If not called, dividend will reset
    - Ordering of rates will be different
  - Does not account for proximity of ex-Date
- Popular because it's easy
- Occasionally has high explanatory power
  - Remember! Predictive power is lousy!

Yield-to-Worst (YTW) Analysis

- Determine Yields-to-Maturity (YTM)
  - Each Call Date (first one will usually suffice)
  - Perpetuity (using current GOC5 + Spread after first call date
- Lowest YTM is YTW
  - Conservative estimate of worst-case scenario (barring default!) under constant conditions
- Fits to the data are poor
  - Expected due to effect of calls
- Problem: 100% chance of worst-case scenario

Blended Yield Analysis

- Determine YTMs to Call Date (YT5) and Perpetuity (YTP)
- Blended Yield: BY = x·YT5 + (1-x)·YTP
- Calculate BY for Pfd-1 issues for 0 <= x <= 1
- Select value of x that gives lowest Standard Deviation (SD)
- Fits are OK, with x = 0.7
- Problems
  - x is the same for all issues
  - YT5 will have different end-dates unless data restricted

Forecast Yield Analysis

- YTW Analysis assumes constant conditions
- What if GOC5 is forecast to change?
- Calculate YT5 & YTP for issues as before
- Increment all YTPs by x, 0 <= x <= 300
  - Not strictly kosher, but more accurate than data!
- Calculate YTWs for each x, select minimum SD
- Good fit found with x = 100bp

Dynamic Blend (Price) Analysis

- Same as Blended Yield, but “x” varies according to Price “P” of issue
- X = Base + (P-23)·Slope
- Vary Base & Slope, minimize SD
- Best fit currently Base=25%, Slope=30%
  - $23 issue has 25% chance of Call
  - $25 issue has 85% chance of Call
- Fit is good, but there’s an extra parameter

Dynamic Blend (Spread) Analysis

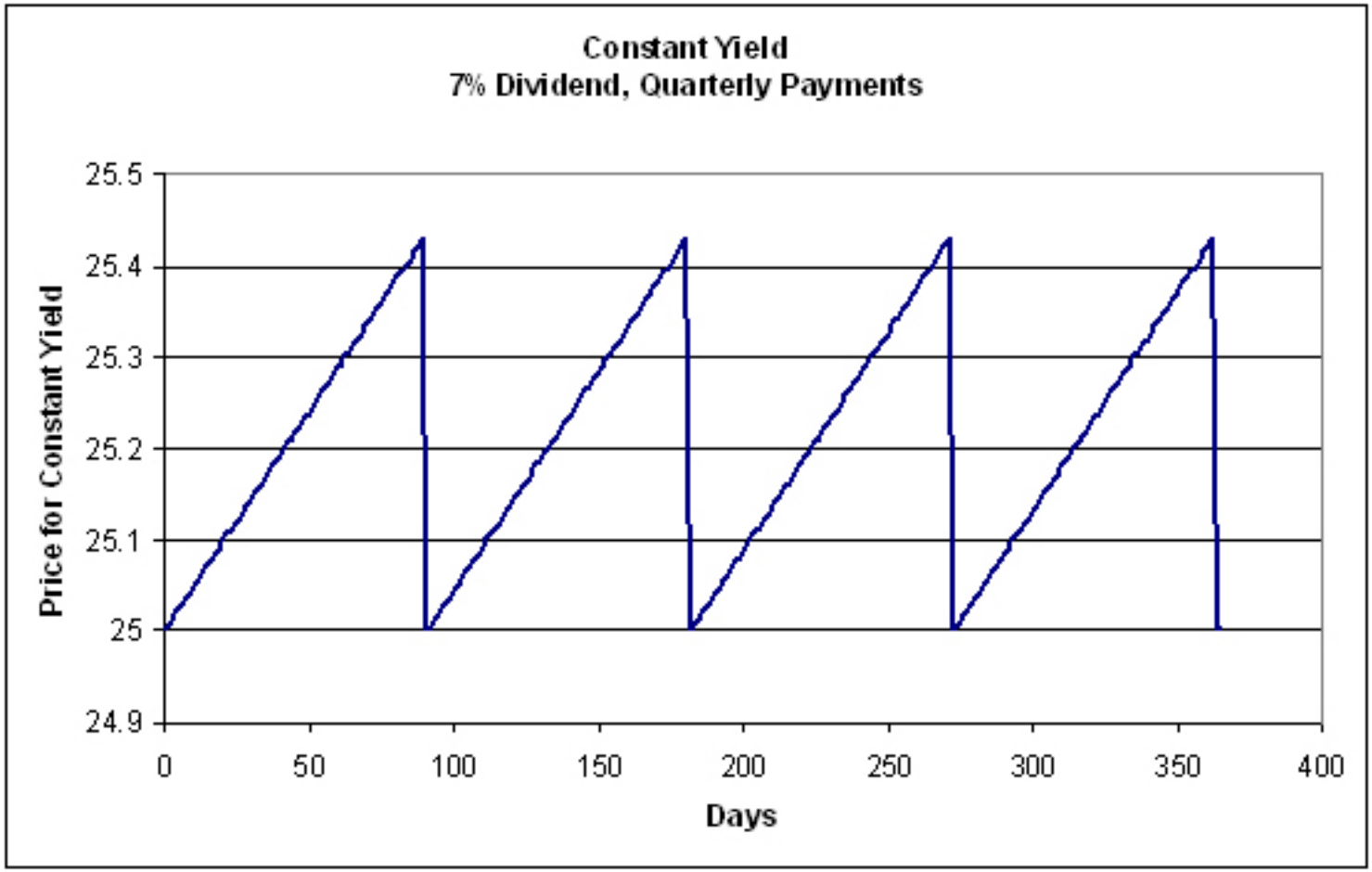
- Same as Dynamic Blend (Price) but use Spread
- X = Base + (S-100)·Slope / 100
- Best Fit: Base=33%, Slope=27%
  - TD.PR.S: Spread = 160, X=49%
  - 100% chance of call if S > 348
- Fit about the same as with Price

HIMIPref™ Analysis

- Calculate self-consistent yield curve
  - Use all issues
  - Estimate option values, future rates
  - Spreads: credit, cumulativity, floating rate, etc.
  - Minimize square of error
- Calculate Valuation
  - Migration to yield curve
  - Dynamic factors
  - Yields calculated in various ways
- High-Spread FixedResets currently cheap, low-spread issues expensive
- Hard to exploit since Durations are low

Dividend Effects

Dividend Effects



7% Dividend on $25 stock = $1.75 p.a. = $0.4375 Quarterly

Dividend Effects: Terminology

- **Pay Date** : The date the holder gets paid
- **Record Date** : The date the company determines who gets paid
- **Ex-Dividend Date** : The first date on which a trade with regular settlement will not settle on or prior to the Record Date
- "**Stripped Price**" = "**Flat Bid Price**" : Market Price adjusted for dividend

Accounting for Dividend Effects

- Must calculate yield precisely
  - Cannot use a bond calculator: these account for accrued interest
  - Cannot use current yield
- Check dividend ex-Date
- There are often opportunities for trading in the week around ex-Date
- New issues often have long first coupons
  - Dividend capture strategies can be very profitable

Cumulative Dividends

- Bank issues must be non-cumulative if they are to be included in Tier 1 Capital
- Insurance Company
  - Operating Company: Same as banks
  - Holding Company: Various rules under various Acts
- Other Companies (utilities, etc.)
  - Generally cumulative

Cumulativity Over-Emphasized

- Nortel & Quebecor World paid preferred dividends until the last minute
- When a company is tempted to suspend preferred dividends, only financing available is via preferred stock
- Cumulativity is largely a proxy for Non-Financial
- Worth something, certainly, but not a lot

Market Efficiency

Why is the Market Inefficient?

- Not enough “hot money”
- Not enough dealer capital
- Not enough people watching
- Arbitrary Investment Manager policies
- Tax Effects
- Loss Recognition

Sell Liquidity – Don’t Buy It

- Place Limit Orders, not Market Orders
- Let the market come to you
- Not a very tradeable market
  - Spreads are wide, but duration is short
  - May be opportunities around dividend ex-dates


Hymas
Investment Management Inc.