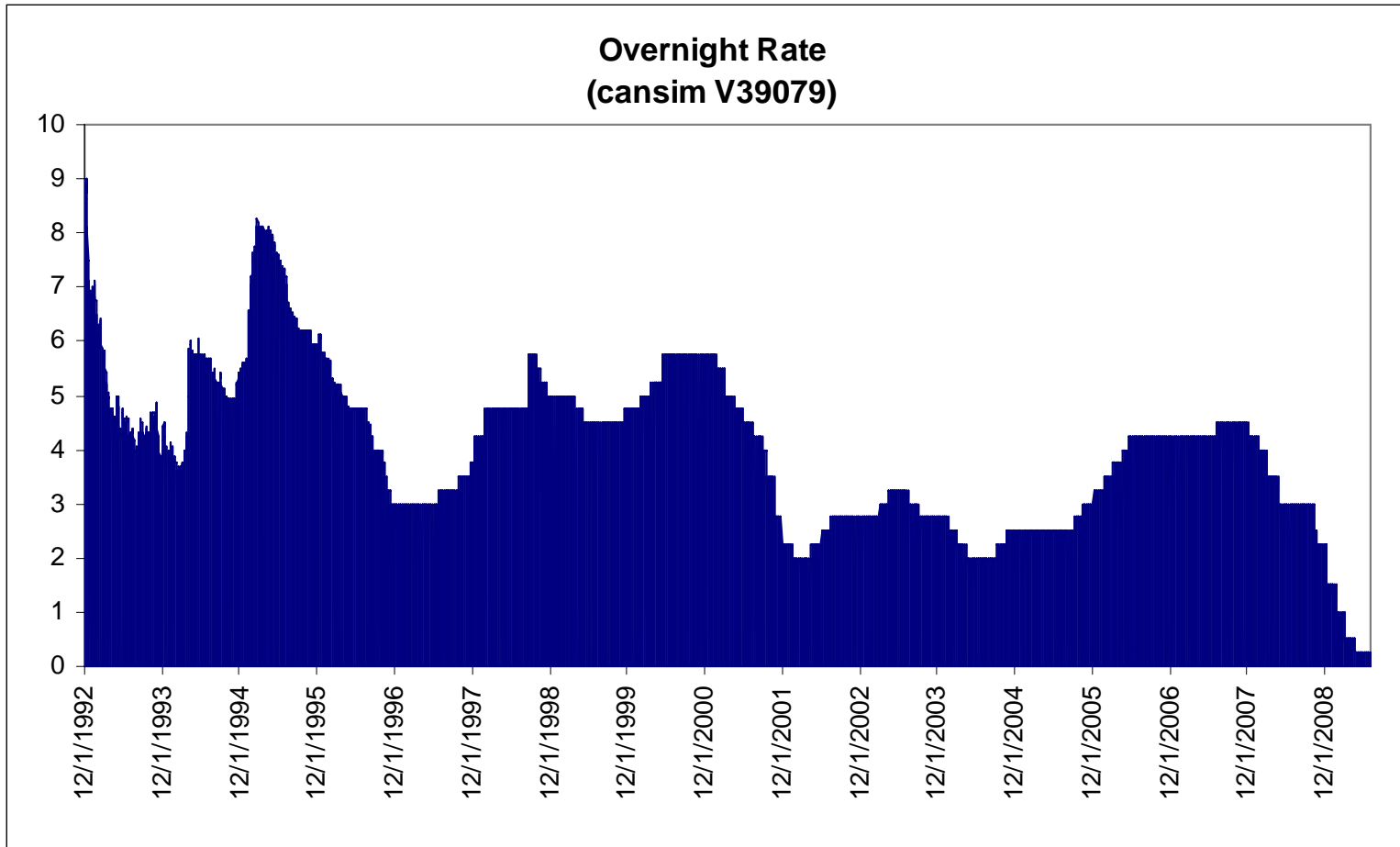


Cost of Capital

**Professor Laurence Booth
CIT Chair in Structured Finance
Rotman School of Management**

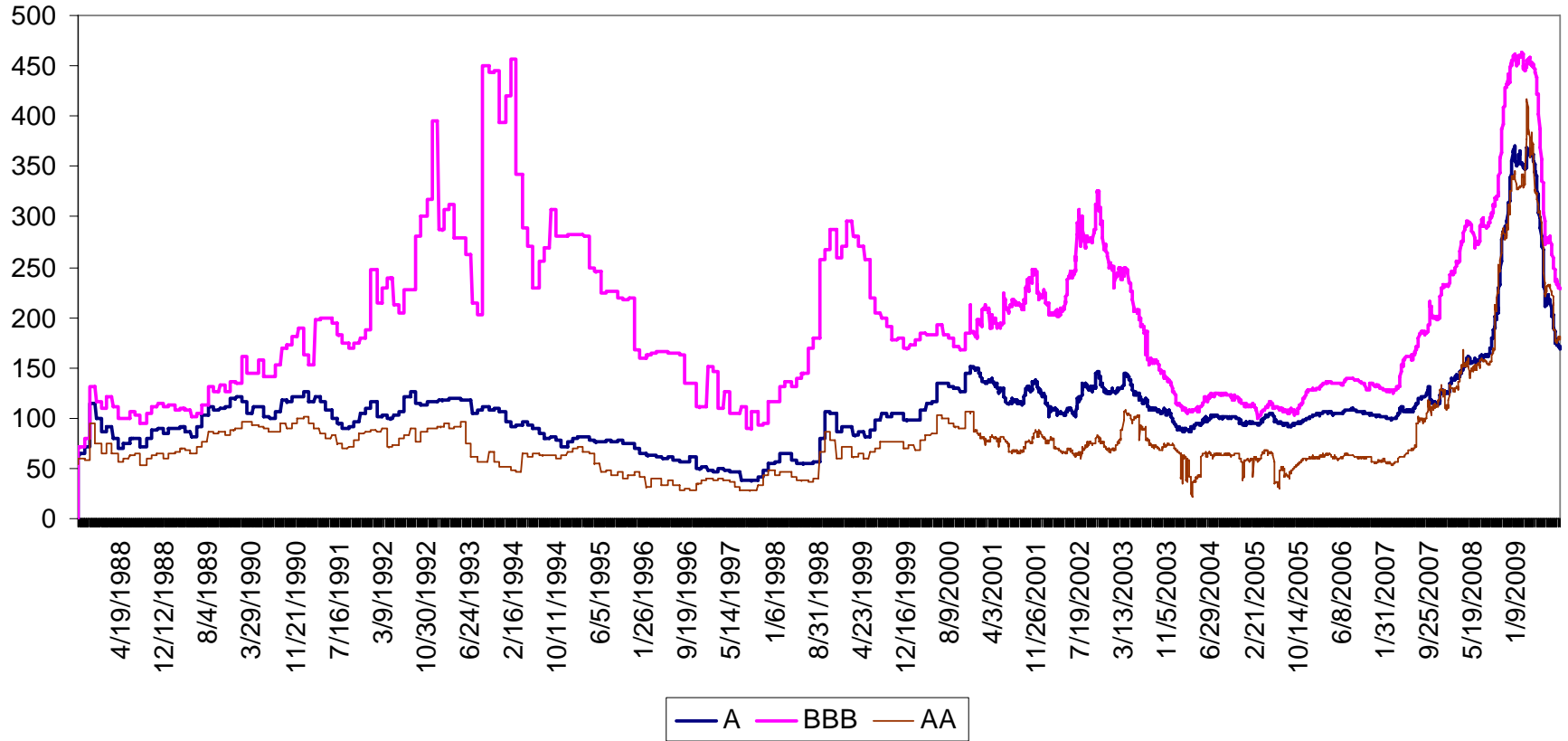


The Business Cycle



Overnight rate indicates Bank of Canada's monetary policy and whether it is stimulating or trying to slow down the economy

Bond Default Spreads



Spreads always increase during a recession and then narrow during the recovery. This is a typical business cycle pattern.

Current Status vs 2003 when Board last reviewed the ROE formula

	2003	2009
Economic growth	1.88%	-2.4%
Current Year Inflation	2.87%	0.5%
Break-even Inflation Rate	2.26%	2.24%
Current T Bill Yield	3.18%	0.26%
Current LTC Yield:	5.36%	4.02%
Long term Canada Bond Yield forecast	6.00%	4.50%
A spreads	1.18%	1.76%
Real Canada Yield	3.1%	1.84%
Market Risk Premium	4.50%	5.00%
Beta estimates	0.45-0.55	0.45-0.55
Benchmark risk premium	275 bp	300 bp
ROE Adjustment coefficient	0.75	0.75

Currently earlier in the business cycle than in 2003, but the financial crisis of 2008/9 has passed.



OEB 2003 ROE Review

- The 2003 Board review was based (paragraph 114) on the assertion by the applicants ***“that there have been significant changes in the capital markets. There is no claim that the utility risk per se has increased.”***
- (Paragraph 141) *We conclude that not only does the equity risk premium formula approach not lead to perverse results, but that the results it currently provides continue to represent fair and reasonable returns. If we had to set a new benchmark rate of return based on the ERP evidence in this proceeding, this rate would not be materially different from that produced by applying the current formula.*
 - Important point: this was after the stock market crash of 2001-2 and recession/ slowdown following the bursting of the Internet Bubble.
 - It seems the ROE formula will always be reviewed at this point in the business cycle!



Forecast Test Year

- **MVX: Volatility of the Canadian equity market has declined precipitously and back to “normal”**
- **TSX is up almost 50% since March lows and recently was well above 11,000**
- **“A” spreads now close to normal cyclical levels**
- **Economy recovering and 2009Q3 will show recession ended**
- **Bank of Canada committed to keeping the overnight rate at 0.25% until 2010Q3**
- **Expectation that inflation will return to 2.0% by 2010Q3 and long Canada yields will pick up to 4.50-4.75% (RBC, Scotia)**
- ***Has this affected the equity cost going forward and should it affect the ROE mechanism?***



Risk Premium Models

- **Explicit Risk premium model**
 - CAPM
 - Primary reliance by NEB (RH-1-2008)
 - Foundation of ROE adjustment mechanisms
 - Constrains the exercise of “judgment” more than any other estimation procedure

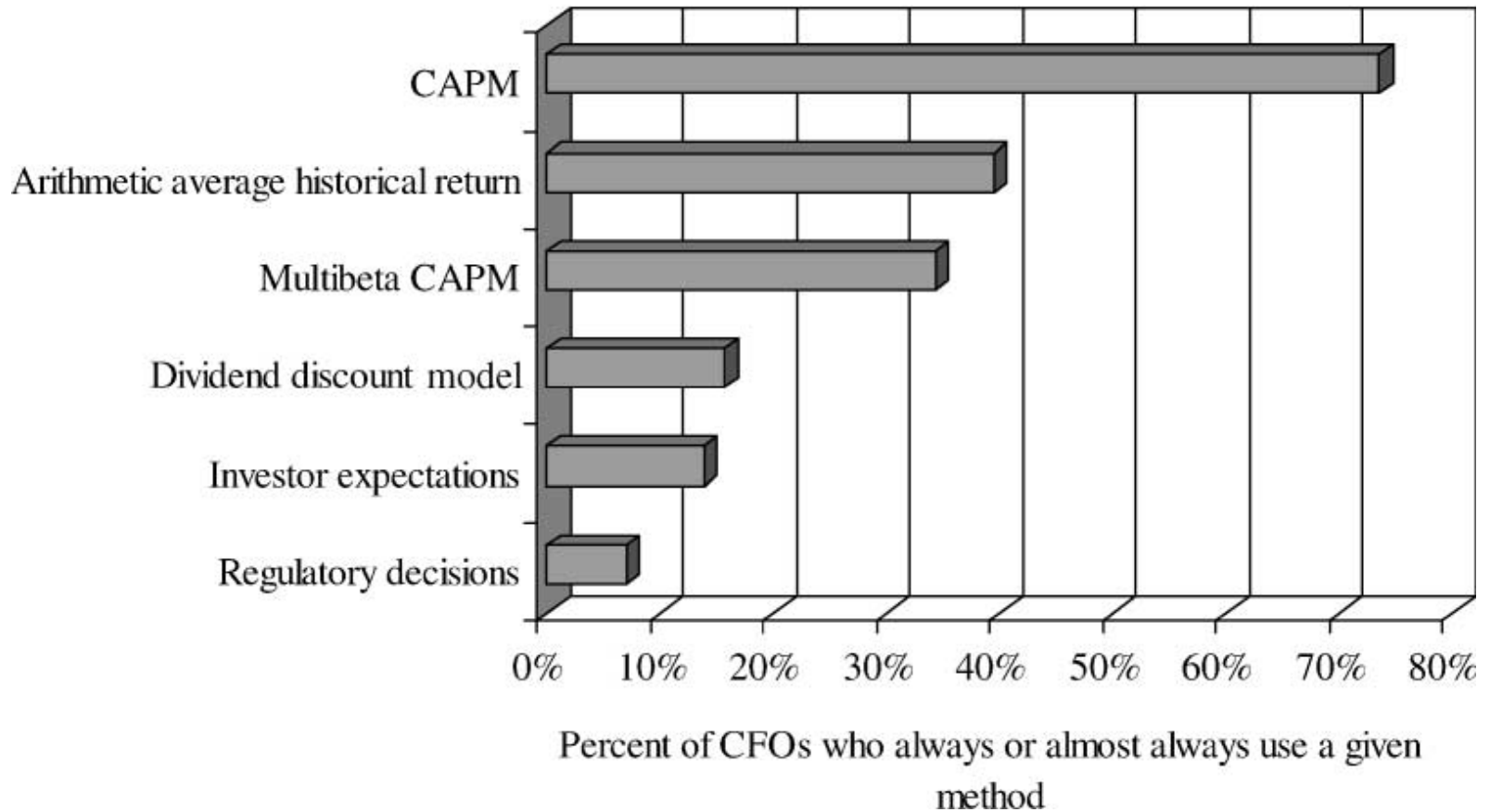
$$K = R_F + MRP * \beta$$

Time Value of
Money

Market Risk
Premium * “beta”



Cost of equity
capital method



Graham and Harvey survey of CFOs (JFE 2001)



Annual Returns 1926-2008

Annual Rate of Return Estimates 1926-2008						
U.S.			CANADA			
	S&P Equities	Long US Treasury	Excess Return	TSE Equities	Long Canadas	Excess Return
AM	11.66	6.05	5.61	11.10	6.56	4.54
GM	9.61	5.67	3.94	9.41	6.21	3.20
OLS	11.13	5.06	6.07	10.44	5.74	4.70
Volatility ¹	20.56	9.19		18.90	8.84	

Arithmetic is simple average; geometric is compound and OLS is the least squares estimate.

Approximately Geometric Mean = Arithmetic Mean - .5*variance

For example, US variance is about 4%, so AM and GM diverge by about 2%



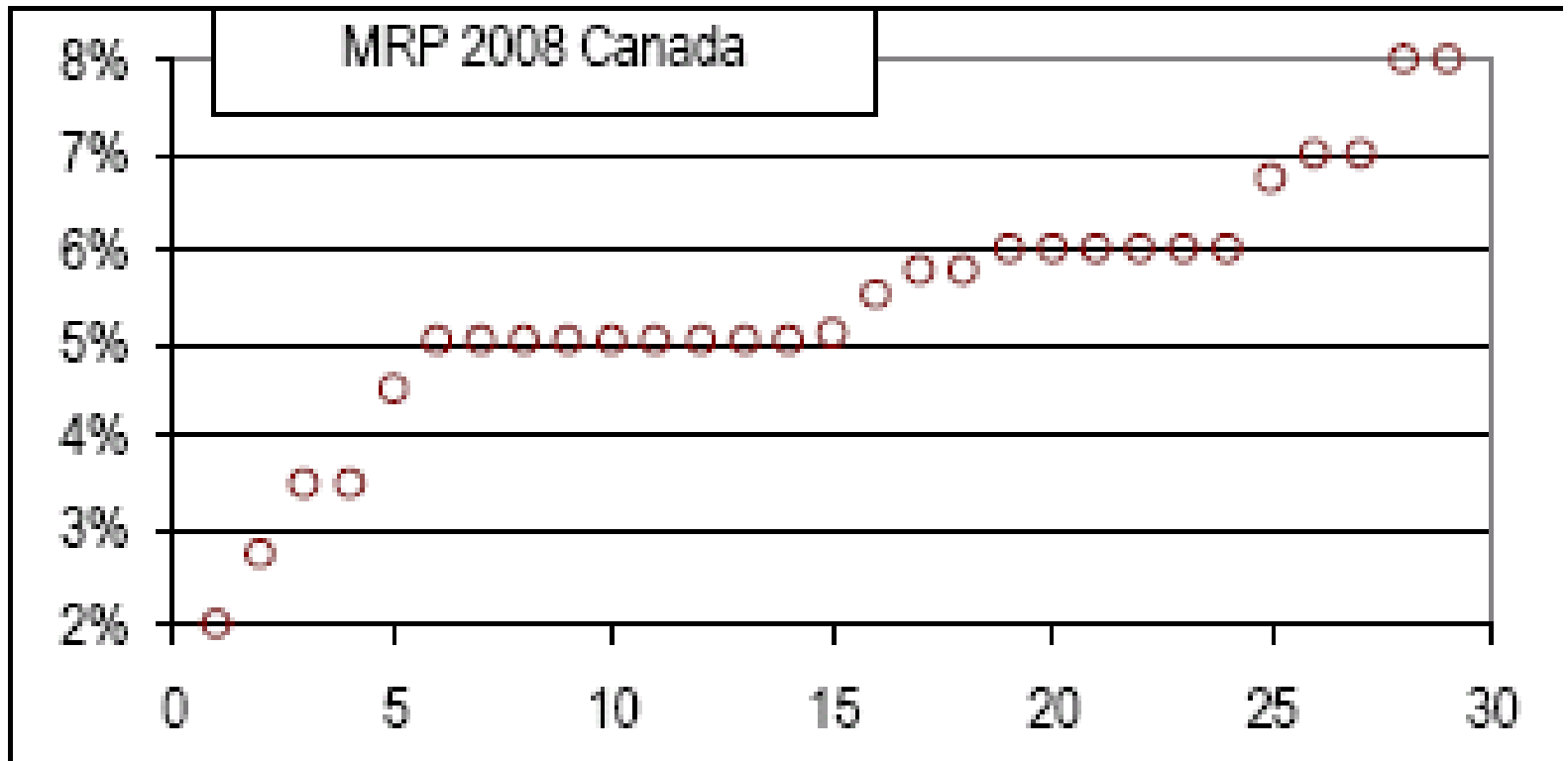
Fernandez Survey May 2009

Table 2. Market Risk Premium used in 2008 by 884 finance professors

		USA	Euro	UK	Canada	Australia	Other	Sum
MRP used in 2008	Average	6.3%	5.3%	5.5%	5.4%	5.9%	7.9%	
	St. dev.	2.2%	1.5%	1.9%	1.3%	1.4%	3.9%	
	MAX	19.0%	10.0%	10.0%	8.0%	7.5%	27.0%	
	Q3	7.2%	6.0%	7.0%	6.0%	7.0%	10.0%	
	Median	6.0%	5.0%	5.0%	5.1%	6.0%	7.0%	
	Q1	5.0%	4.1%	4.0%	5.0%	6.0%	5.5%	
	min	0.8%	1.0%	3.0%	2.0%	2.0%	2.0%	
	Number	487	224	54	29	23	67	884

- 1) US MRP is higher than in Canada*
- 2) Median Canadian MRP is 5.1%*

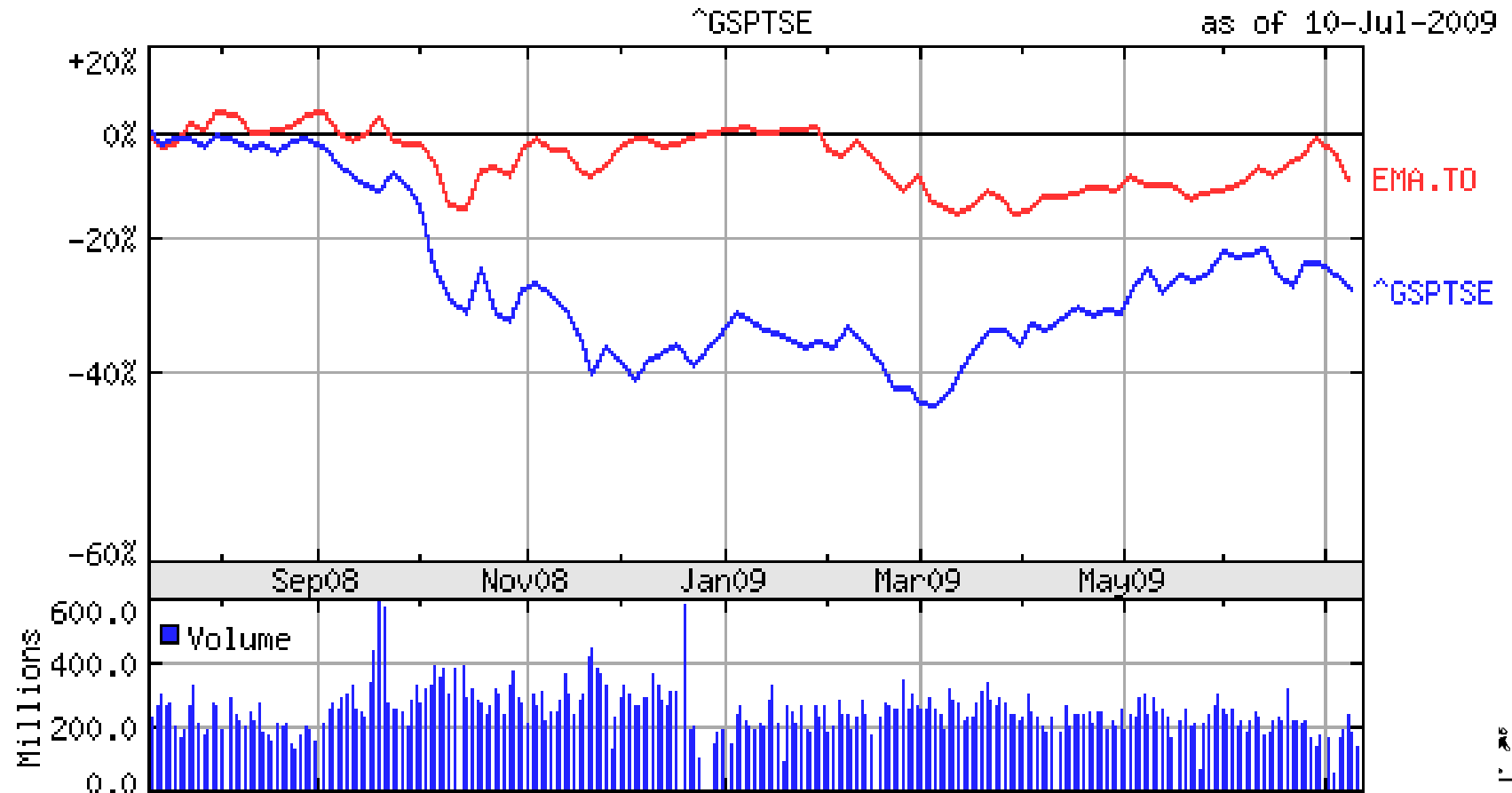




If the OEB randomly asked a Canadian finance professor what the MRP is, the answer would almost certainly be 5.0% or 6.0%

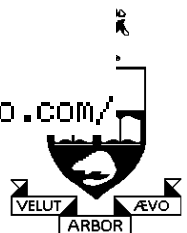


Stock Performance over Last Year

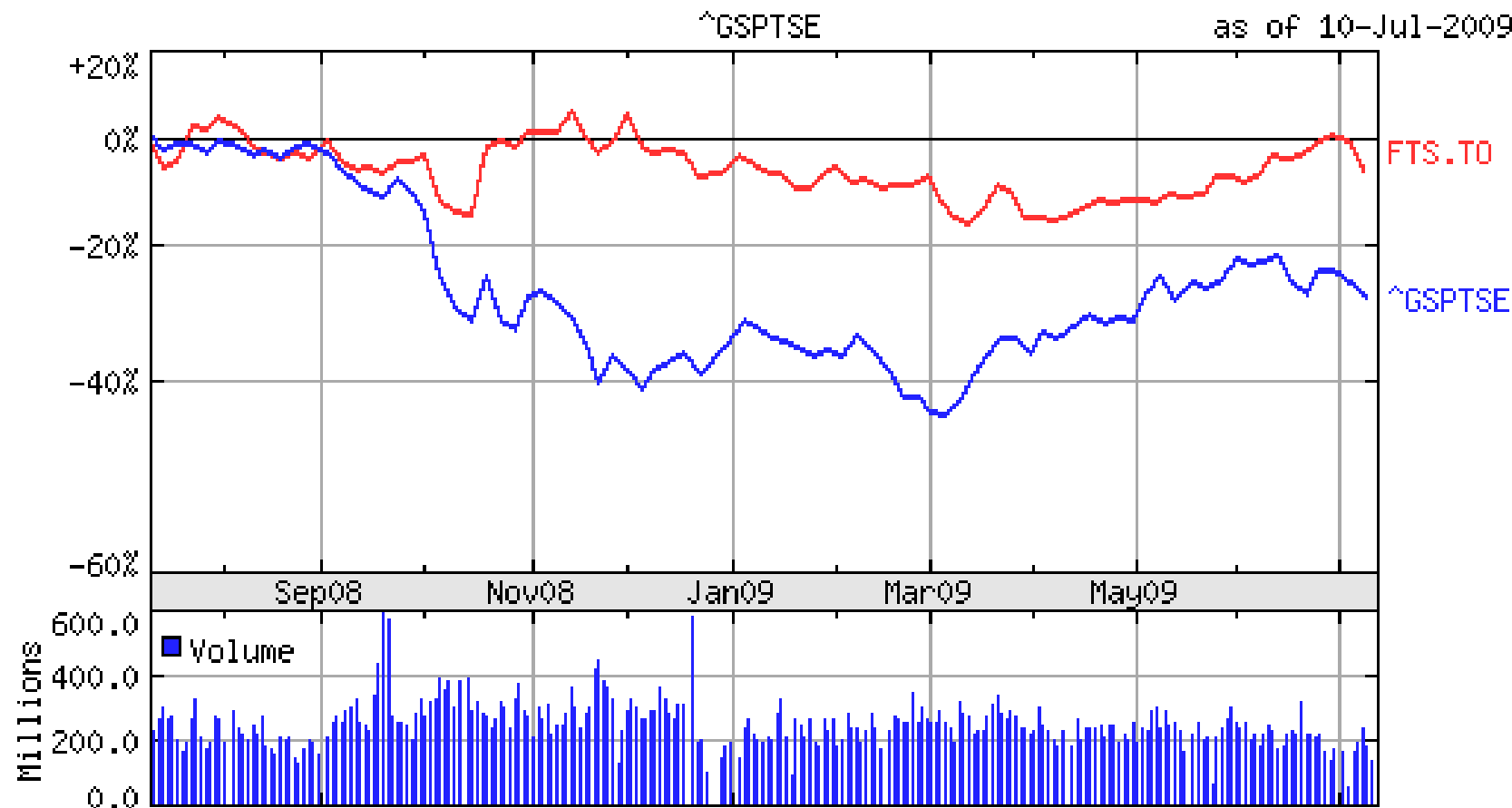


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Stock Performance over Last Year

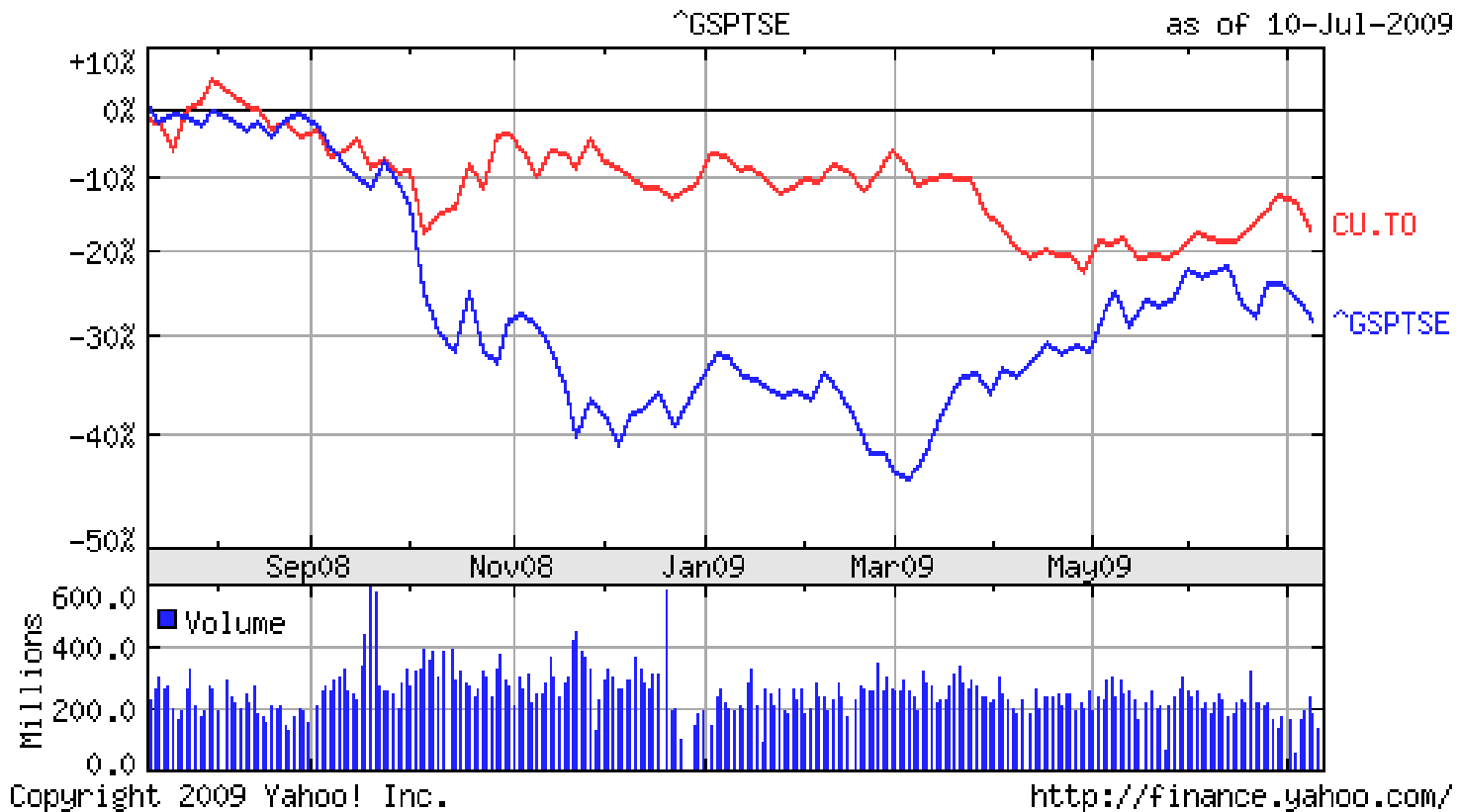


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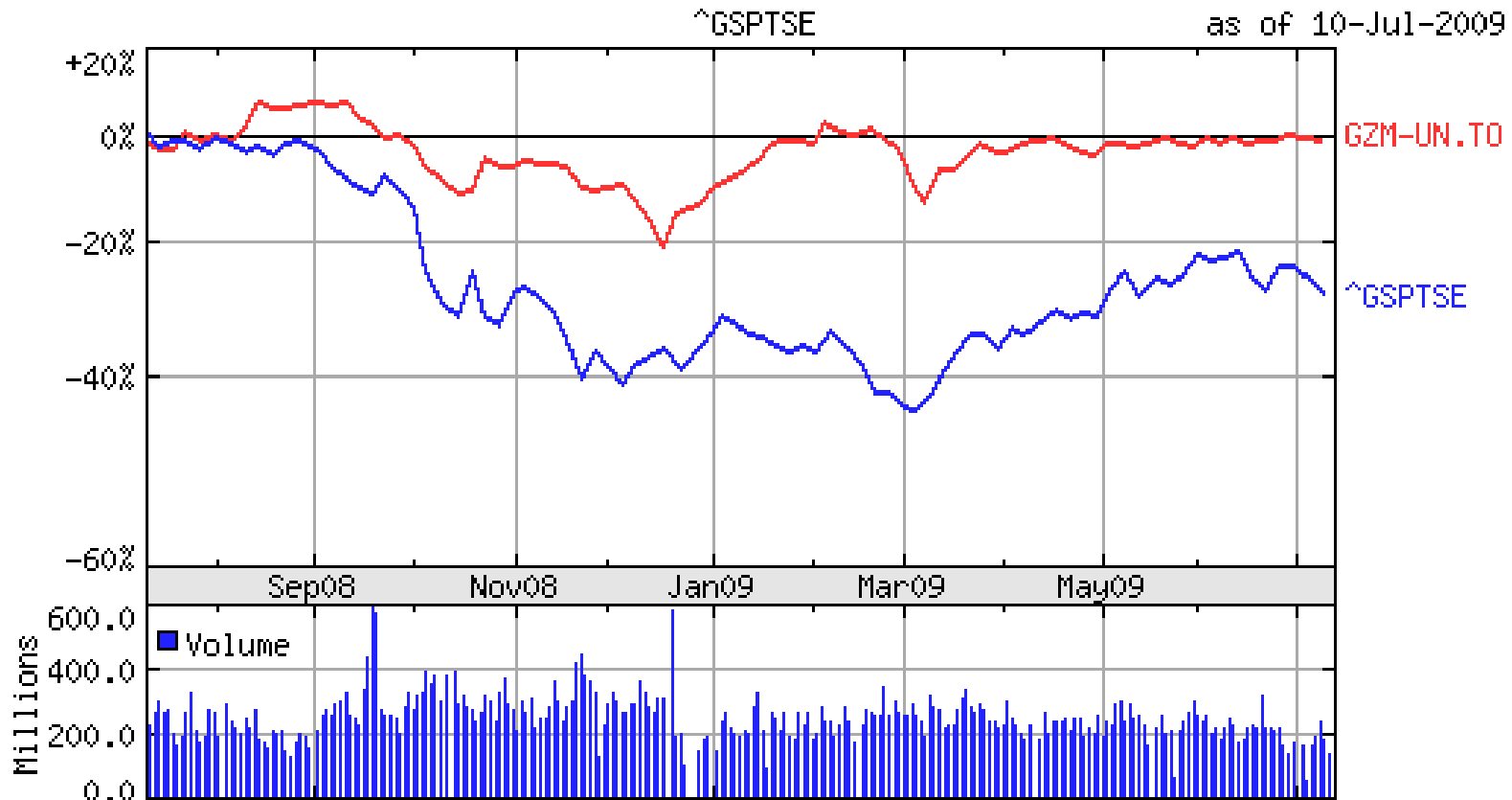
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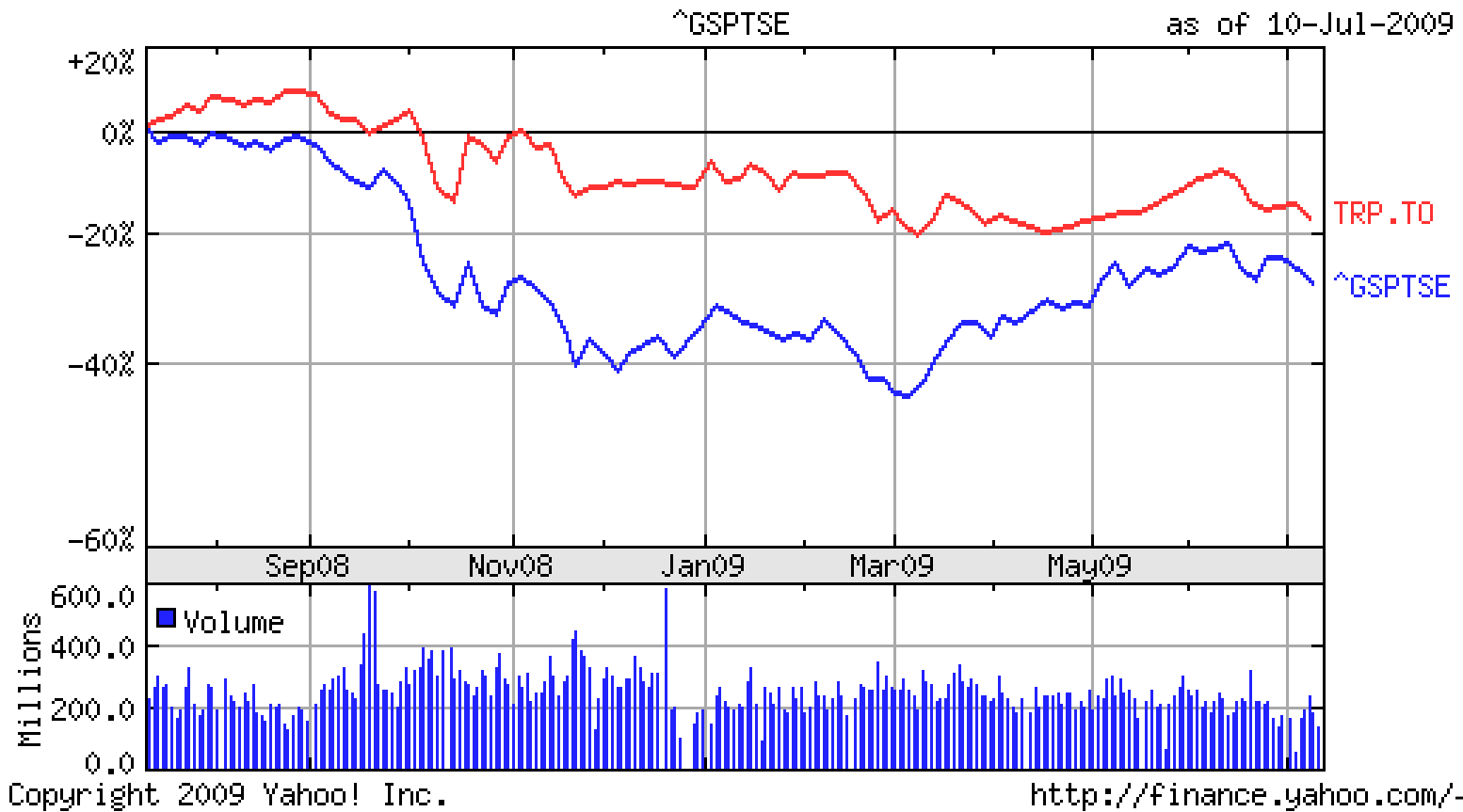
Stock Performance over Last Year



Stock Performance over Last Year



Stock Performance over Last Year



Stock Performance over Last Year

^GSPTSE

as of 10-Jul-2009



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Dr. Booth's Recommended Fair ROE

- **LTC Yield:** **4.50%**
- **Market Risk Premium:** **5.0%**
- **Beta:** **0.5**
- ***Raw Estimate:*** **7.0%**

- **Issue costs:** **0.50%**
- **Margin of Error**
- **(6% MRP & beta of 0.50 = 0.50%):** **0.25%**

- ***Recommended ROE:*** **7.75%**




Financing

- **No utility downgrades during crisis**
- **Utilities raised significant amounts of capital**
- **Absolute financing costs are low and most utilities are lowering their embedded debt cost even as spreads are higher than normal**
- **Utilities increased their dividend payments**
- **No indication of any financing problems for Canadian utilities**
 - **Some utilities are funding shorter term but this is typical of this stage in the business cycle**
 - **Prime is at 2.25% and new bank facilities are at increased spreads over Prime and the BA rate but absolute costs are at record lows due the low 0.25% overnight rate**



Matt Akman: MacQuarie CAMPUT 2008



MACQUARIE

Macquarie Research Equities

Conclusion

- The ROE formula appears to be working
- *But evidence may be masked by:*
 - Fund flows away from other yield product
 - Modest increase in allowed equity
 - Loosening of regulatory framework
- So a reduction in allowed returns could be detrimental
- The whole framework and its effectiveness is contingent on its stability and reliability

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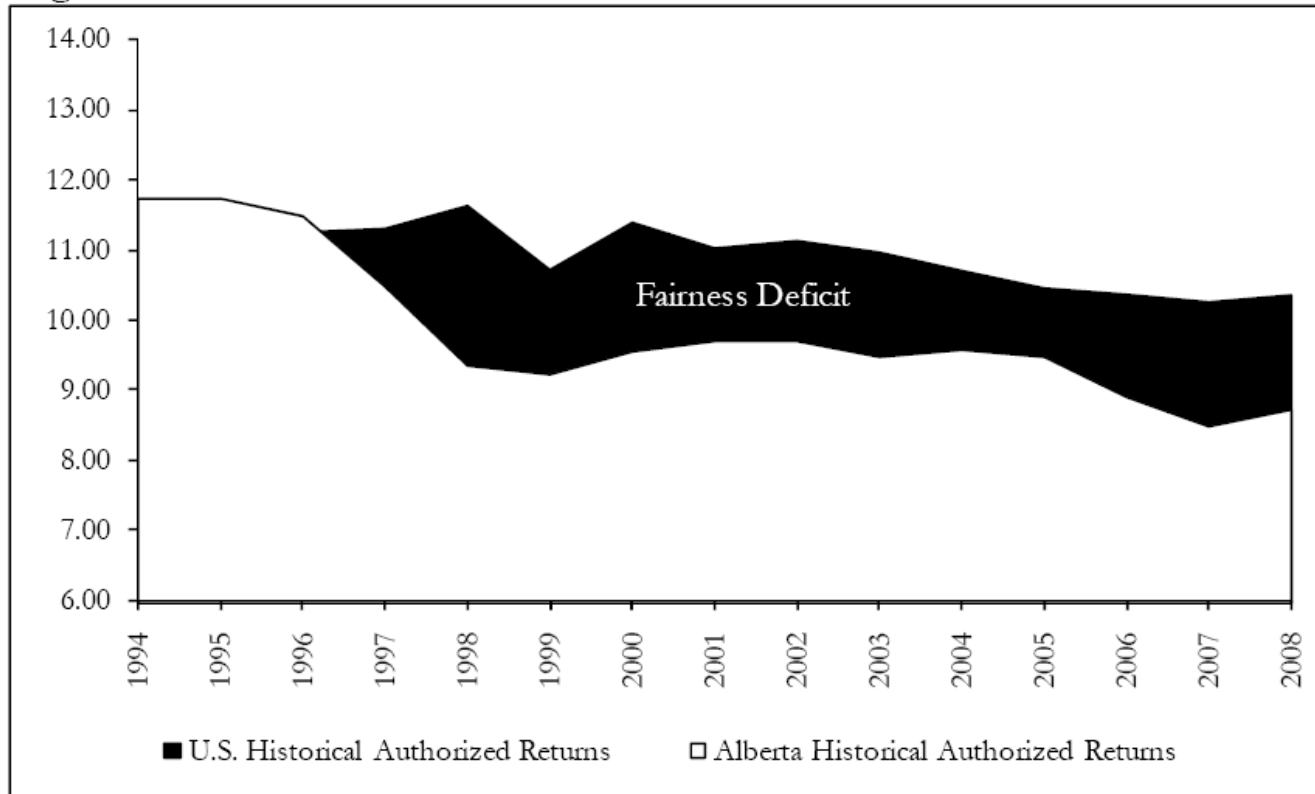
Akman's changed view seems to be prompted by the financial market crisis which has now passed

BOOTH OEB 2009



US ROE Comparisons: Concentric Report

Figure 1: Fairness Deficit, U.S. vs. Alberta Historical Authorized Returns



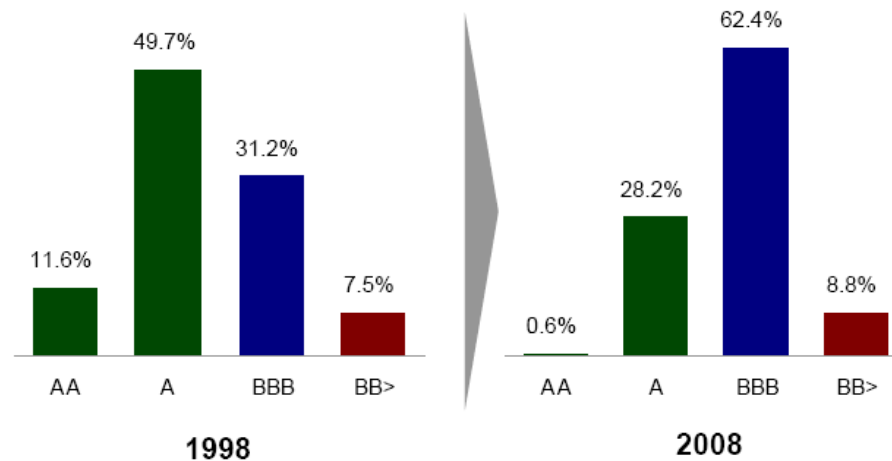
Source: Concentric Energy's testimony on behalf of various utilities in the 2009 Generic AUC ROE hearing, but fairness deficit precedes AUC ROE formula (2003)



US vs Canada

- US utility allowed ROEs are higher and they typically have more common equity
- Canadian bond ratings are typically higher

POWER & UTILITIES INDUSTRY: RELATIVE CREDIT PROFILE 1998 - 2008



- Merrill Lynch presentation to NARUC January 2009
- Similar data filed by Ms. McShane in 2007 OPG hearing

US utilities are higher risk: 1

- **Utility Risk**
 - **Regulatory lag: infrequent rate hearings**
 - **Less use of deferral accounts**
 - **More use of historic test year rather than forward test year**
 - **Expenditures not pre-approved as they are in Canada**
 - **More short term variability in returns and often a persistent inability to earn allowed ROE**

- **Safire 5 factors (Transcript Day 21 AUC hearing)**
 - **Review frequency**
 - **Historic vs Forward test years**
 - **Greater reliance on market forces (Light handed regulation)**
 - **Experimental rate making**
 - **Black Swan events (PG&E & Dequesne)**



US utilities have more “event” Risk

- **Holding Company Risk (Booth Union Gas testimony 2004)**
 - **US regulators did not protect bond holders from parent companies or takeovers**
 - Enron raided its pipeline subs for \$1 billion: no action from FERC
 - Many telecom takeovers during the internet bubble period caused bond holder losses
 - Frontier Telephone was rated AA- and was purchased by Global Crossing and the rating subsequently lowered to BB+. The New York Public Service Commission did not prevent the acquisition.
 - Cincinnati Bell was rated AA- when its parent acquired IXC Communications, which had a B- rating, and subsequently Cincinnati Bell’s rating was dropped to BBB-. The Public Utilities Commission of Ohio did not create any roadblocks or impose any penalties on Cincinnati Bell.
 - Qwest acquired US West Communications, which was rated A+ and S&P warned its rating would be cut to BBB- but regulatory concern was on service quality not protection of bond holders.
 - **Absence of “ring fencing”: affects US bond ratings**
 - **S&P Ratings Criteria**

“the bar has been raised with respect to factoring in expectations that regulators would interfere with transactions that would impair credit quality. To achieve a rating differential for the subsidiary requires a higher standard of evidence that such intervention would be forthcoming.”



US markets are riskier

- **Consistent evidence that US market risk premium is higher than in Canada**
 - Financial market meltdown confirms US market risk is higher than in Canada
 - Note US banks have same technology, economics and regulations as Canadian banks, but are much riskier due to *implementation of regulation*
- **Allowed ROEs in Canada dropped below those in US in late 1990's**
 - Government of Canada went from a fiscal deficit to surplus causing inflation and opportunity costs to fall
 - 2005 Foreign Property Restriction (30%) was removed as surplus funds in Canada
 - Canada has moved into a net creditor position
 - The US in contrast has severe financial problems:
 - US Prime is 1.0% higher than in Canada
 - Long Term US interest rates are higher
 - USG deficit is 13% of GDP
- **Can not take Rates from one country and apply to another without adjustment (IRP)**



ROE formula working fine

- *Any problems that may have existed in Fall 2008-Spring 2009 are now history and reflect the worst financial crisis for 70 years and are not reflective of future capital market conditions*
- *ROE formula has given the correct indicator for the ROE for the last 15 years*
 - *As long as inflation stays at 1-3% and LTC yields at 4-5% the ROE will be approximately correct*
 - *No ROE formula can be exactly correct at all stages of the business cycle*
 - *Fortis paid 1.7X book to buy Terasen Gas in 2007: \$900 million premium earns zero. Clearly the BCUC allowed ROE is fair and reasonable otherwise why would Fortis throw \$900 million away to get the \$1.2 billion book equity earning the BCUC ROE?*

