M-26

FAIR RETURN FOR MARITIME ELECTRIC

EVIDENCE OF

Laurence D. Booth

BEFORE THE

Prince Edward Island Regulatory and Appeals Commission

May 2010

EXECUTIVE SUMMARY

The Provincial Government of Prince Edward Island has asked me to provide evidence and testimony to assist in its intervention in Maritime Electric Company's (MEC) tolls application. Specifically I have been asked to recommend a reasonable return on equity (ROE) and capital structure for Maritime Electric and assess its business risk.

My overall assessment is that Maritime Electric is a low risk, predominantly distribution, company (Disco) in a protective regulatory environment. But for its relatively small size MEC would have an A bond rating similar to other such Canadian companies and warrant a common equity ratio of 35-38%. This would also be the case if it were more closely integrated with its parent Fortis. However, I am comfortable with the legislated 40% common equity ratio even though that is marginally high and generally only applicable to publicly owned Discos, like those in Ontario or Alberta.

Despite the extensive evidence often filed in rate of return testimony, the essential facts are that required or fair rates of return are governed by the three basic laws of finance: the time value of money, the risk value of money and the tax value of money. The risk positioning methodology, of which the Capital Asset Pricing Model (CAPM) is one variant, captures two of these three "laws," which is why it is overwhelmingly the most popular way of estimating fair rates of return by private corporations and why Canadian regulators have relied so heavily on it. This methodology anchors the fair rate of return and removes most of the contentious areas of expert testimony.

The starting point of the risk positioning methodology is the risk free rate which measures the time value of money. Here the convention in Canada is to use a forecast of the long Canada bond yield for the test year, which I estimate to be 4.5%. The second step is to estimate the average risk premium for the market as a whole, where the estimates are normally in a range 5.0-6.0% and the final estimate is for the relative risk of a utility which utility regulators normally place in a 0.50-0.60 range, which I regard as marginally high. As a result the fair rate of return would normally be placed at 7.0-8.10%, to which a 0.50% cushion or flotation cost allowance is added to get 7.50-8.60%.

The above values are consistent with the use of automatic ROE adjustment mechanisms that have been in use in Canada since 1994, and which have been confirmed as fair and reasonable by regulators as late as November 3, 2008.[1] However, 2008 was a traumatic year with the US financial system almost bankrupting itself and spreading financial contagion around the world, including Canada, to generate the world's first global recession. During the financial market panic several regulators either suspended or changed their method for setting the allowed ROE. Generally these decisions increased the allowed ROE by 50-75 bps. However, Canada has now emerged from a shallow recession (PEI never went into recession) and Canadian financial markets are now almost back to normal, given where we are in the business cycle. As a result the need to change ROE adjustment mechanisms has now receded and I would judge the results of these formulae to be valuable reference points for the fair ROE.

Overall I would regard Maritime Electric as an average risk Disco and recommend a fair ROE of 8.0% and a common equity ratio of 40%. I would regard the currently allowed ROE of 9.75% to be unreasonably high.

In my formal evidence that follows I will amplify these key points by first discussing recent regulatory decisions in Canada; I then discuss current economic and market conditions, which leads into my ROE estimates. Finally I will discuss where Maritime Electric fits into this risk positioning.

[1] In its Decision on EB 2007-0905, November 3, 2008, the Ontario Energy Board, at the request of the utility, set the fair ROE based on its ROE adjustment mechanism. Like most such mechanisms the ROE is adjusted by 75% of the change in the forecast long Canada bond yield during the test year. Like most regulators in Canada the OEB adjusts for risk differences across utilities by changing the common equity ratio.

I INTRODUCTION

Q. PLEASE DESCRIBE YOUR QUALIFICATIONS AND EXPERIENCE.

A. I am a professor of finance in the Rotman School of Management at the University of Toronto, where I hold the CIT Chair in Structured Finance. A detailed resume is filed as Appendix A. Further information and copies of my working papers can be can be downloaded from my web site at the University of Toronto at http://www.rotman.utoronto.ca/~booth.

I have appeared before most of the provincial utility regulatory boards in Canada as well as the two main national regulators; the National Energy Board and the CRTC. I have also filed testimony before the Ontario Securities Commission and in a variety of civil suits pertaining to financial matters. Along with my late colleague Professor Michael Berkowitz I provided testimony to the BCUC, the Manitoba PUB and the NEB when they introduced the first ROE adjustment mechanisms in Canada.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY

A. The Provincial Government of Prince Edward Island has asked me to provide evidence and testimony to assist in its intervention in Maritime Electric Company's (MEC) tolls application. Specifically I have been asked to recommend a reasonable return on equity (ROE) and capital structure for Maritime Electric and assess its business risk.

Q. HOW IS YOUR TESTIMONY STRUCTURED?

A. I begin my testimony by first discussing recent regulatory decisions in Canada; I then discuss current economic and market conditions and my ROE estimates. Finally I will discuss where Maritime Electric fits into this risk positioning and assess the financial integrity of the company with my recommendations. Appendix B discusses the market risk premium.

II. RECENT CANADIAN REGULATORY DECISIONS

Q. WHAT IS THE BASIS OF REGULATION?

A. The objective of rate of return regulation is that the owners of the firm should not earn excess rates of return from the exercise of monopoly power, nor be penalised by the act of regulation. This economic proposition has been reinforced by legal precedent. In Northwestern Utilities vs. City of Edmonton (1929), it was stated that a utility's rates should be set to take into account "changed conditions in the money market." A fair rate of return was further confirmed in BC Electric (1960) when Mr. Justice Lamont's definition of a fair rate of return, put forward in Northwestern utilities, ie.,

> "that the company will be allowed as large a return on the capital invested in the enterprise as it would receive if it were investing the same amount in other securities possessing an attractiveness, stability and certainty equal to that of the company's enterprise."

was adopted. This definition is what economists refer to as an opportunity cost. Only if the owners of a firm earn their opportunity cost will the returns accruing to them be fair, i.e., they will neither reward the owners with excessive profits, nor ratepayers by charging prices below cost. Hence, the opportunity cost is from basic economic theory, as well as the Northwestern Utilities decision, a fair rate of return.

Of note is that the legal definition in Canada includes three critical components:

> ***(1) The fair return should be on the "capital invested in its enterprise (which will be net to the company)"***

This means that the return should be applied to the capital actually "invested" in the company, which is normally interpreted as the "book value" of the assets, and not their market value. As the Alberta EUB stated (Generic Cost of Capital Decision U-200452, p 24)

> "The Board considers that the application of a market required return (i.e. required earnings on market value) to a book value rate base is appropriate in the context of regulated utilities."

The reason for this is that market values change as a result of the regulatory decision and has little connection with the actual capital invested in the firm.

(2) "other securities"

Mr. Justice Lamont specifically states that the alternative investment should be other securities, and not the book value investment of other companies. This was a natural outgrowth of the Northwestern Utilities Limited decision that was concerned with the authority of the Board to change the allowed rate of return to reflect "changed conditions in the money market." In 1929 the term "money market" had a broader interpretation than its current use; "capital market" would be closer to today's terminology. The motivation for the definition was clearly the desire to change the allowed rate of return to reflect the changes in "market opportunities," which is equivalent to the standard economic definition of a market opportunity cost. Clearly this can only be at market prices, since the investor cannot invest elsewhere at book value!

(3) "attractiveness, stability and certainty"

These words clearly articulate what a financial economist would call a risk-adjusted rate of return. Even in 1929 it was obvious that investors required higher rates of return on riskier investments and awarding a risk free return was inherently unfair.

Further in Federal Power Commission et al v. Hope Natural Gas Co, the United States Supreme Court decided that a fair return

> "should be sufficient to assure confidence in the financial integrity of the enterprise so as to maintain its credit and to attract capital."

Financial integrity is critical for a utility. Since the equity holders have made a "sunk" investment, it is possible for subsequent regulated decisions to deprive the stockholders of a reasonable return and thus make it difficult for the utility to access new capital. Financial integrity is thus equivalent to the ability of the utility to attract capital and fair treatment of its investors.

By basing regulation on the investor's opportunity cost of capital, as defined by Mr. Justice Lamont, not only is the economic objective of regulation attained, but so too is the need for the

return to be fair, since this is the rate at which equity capital can be raised. The obvious need to maintain the credit and financial integrity of the firm is also preserved, since the firm is offering a competitive rate of return and attracting capital. The opportunity cost principle therefore embodies all fairness, capital attraction and financial integrity issues of concern for equitable regulation.

Q. HOW HAS THE RECENT FINANCIAL CRISIS AFFECTED REGULATORY DECISIONS IN CANADA?

A. Until the onset of the financial crisis that started in the Spring of 2008 and gathered speed in the following Autumn, Canadian utility boards seemed to be content that their automatic ROE adjustment formulae were awarding fair and reasonable ROEs. These ROE formulae were all based on the original formulae adopted by the BCUC, Manitoba PUB and NEB, whereby allowed ROE's were determined at a point of time and then adjusted by 75 -100% of the subsequent change in the forecast long Canada bond yield.[2] In many cases these ROE formulae were adopted at the request of the utility. Regardless they had been periodically reviewed and reaffirmed with minor changes multiple times. For example some salient cases are:

- The NEB reaffirmed its ROE formula in a 2001 TransCanada decision and then refused to hear evidence on its formula in 2004;
- The Alberta Energy and Utilities Board adopted its formula in 2004;
- The Ontario Energy Board imposed an ROE formula in 1997, reviewed it in an extensive hearing in 2003, and confirmed it in subsequent decisions as late as November 3, 2008
- The BCUC retooled its formula with minor changes in 2007
- The Regie de L'Energie reaffirmed its ROE formula in a Gaz Metro decision in 2007.

As the Alberta Utilities Commission (AUC) noted (Decision 2009-216, November 12, 2009 page 12)

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[2] The BCUC originally had the ROE adjust by 100% of the long Canada bond yield and then adopted a step function before adopting 75%, while others such as the Manitoba PUB and the Board of Commissioners of Newfoundland and Labrador use 80%.

> 51. Notwithstanding the issues and economic developments discussed above, the Commission observes that since the issuance of Decision 2004-052 in July 2004 and before the onset of the economic crisis, there had been few indications that the adjustment formula was not producing an appropriate annual ROE. Decision 2004-052 and the annual formula had resulted in a range of ROEs with a high of 9.60 percent and a low of 8.51 percent well within the off-ramp triggers set out in the Decision of 7.6 percent and 11.6 percent. Further, until the present Proceeding, no party, other than ATCO Gas with respect to its equity ratio for 2008 and ATCO Pipelines with respect to ROE and capital structure for 2008, had requested a review of the generic formula or a change to the allowed capital structure determined in Decision 2004-052.

Similar statements were made by the Board of Commissioners of Newfoundland and Labrador (Order # PU43 (2009)) when in their decisison (page 13) they stated

> Newfoundland Power bears the burden of showing that it is appropriate to discontinue the use of the automatic adjustment formula, a well-established regulatory tool that was expected to be used to set rates for Newfoundland Power in 2010. The Board is not persuaded by the evidence of Ms. McShane as to the historical underperformance of the formula, especially given the evidence of both Ms. Perry and Mr. Ludlow that the automatic adjustment formula established appropriate rates of return on rate base for almost a decade until the extraordinary financial market conditions which developed late in 2008. (Transcript, Oct. 19, 2009, pgs. 114/21-25; 115/1-25; 116/1-8)

That it was the impact of the financial crisis that caused the OEB to review its ROE formula is also clear from an OEB letter to interveners of August 20, 2009 which stated

> The Board's consultation is prompted by the state of the financial markets. As indicated in the Board's June 18, 2009 letter, the Board is satisfied that further examination of its policy regarding the cost of capital is warranted to ensure that, on a going forward basis, changing economic and financial conditions are accommodated if required. [1]

It is clear from the impact of the multiple ROE formula reviews and the statements of the regulators themselves, that the ROE formulae were generating fair and reasonable ROEs until the extraordinary events of 2008-2009.

Q. HOW DID BOARDS REACT TO THE EXTRAORDINARY EVENTS OF 2008-9?

A. Each board reacted in a slightly different way. However there seems to be two basic reactions:

- Defer the ROE formula for a period of time and award a "bonus" to the formula ROE to reflect the uncertainty generated by the financial crisis after which the ROE formula would either be reviewed or reinstated;

- Make fundamental changes to the formula to try and cope with the extraordianry events.

Q. WHY DO YOU THINK THEY ADOPTED DIFFERENT APPROACHES?

A. It is difficult to impute motives, but there was an evident desire on the part of some boards to retain their ROE formula, since they clearly believed that they were useful. On the other hand the two boards that made changes, the OEB and NEB seemed to want a technically "superior" formula approach. The OEB, for example, was very specific (Decision page 29)

> " As such, it is not sufficient for a formulaic approach for determining ROE to produce a numerical result that satisfies the FRS on average,[3] over time. The Board is of the view that each time a formulaic approach is used to calculate an allowed ROE it must generate a result that meets the FRS, as determined by the Board using its experience and informed judgment.

My reading is that rather than simply suspend the formula, or provide a short term bonus, the OEB sought the "holy grail" of a formula that could even handle the worst financial crisis since 1937. To do this the OEB adopted an ROE formula that varied the allowed ROE with changes in the utility bond yield, as well as changes in the forecast long Canada bond yield. In this way they explicitly adopted an approach previously rejected in Canada.[4] I will return to this later.

In contrast to the OEB decision that was heard after the worst of the financial crisis was passed, the NEB heard TQM's application right in the middle of the worst of the crisis. The hearing started in Montreal on September 23, 2008 when the TSX was at 12,532.63, concluded on October 22, 2008 when the TSX was at 9,236.88, and the decision was circulated March 19, 2009 when the TSX sank to 8,629.1. In total the TSX dropped almost 1/3 over the course of the NEB decision, which may have coloured the NEB's decision to adopt an after tax weighted average cost of capital approach (ATWACC).

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[3] FRS means the fair return standard

[4] For example, the AEUB in its 2004 ROE generic decision rejected the use of corporate bond yields in an ROE formula.

ATWACC had never previously been accepted by a North American regulatory board, and shortly after substantially the same testimony was also heard by the Regie de L'Energie in a Gaz Metro hearing.[5] However, the Regie, like the Alberta Energy and Utilities Board before it, rejected the use of ATWACC and instead used a conventional approach and stated (Gaz Metro Decision page 57).

> 228 Given the numerous difficulties posed by applying the ATWACC based on market values, the Regie concludes that establishing capital structures based on book values and using the traditional approaches based on hearing expert witnesses as to optimal debt/equity proportions to retain is a proven route that is compatible with the establishment of a reasonable return on the basis of the distributor's rate structure.

However, the NEB did explain that its ATWACC award was equivalent to a 9.7% ROE on a 40% common equity ratio, where both represented a significant increase.

The NEB also noted that (RH-1-2008, decision page 26)

> *Conclusion*
>
> The Board concludes that TQM's overall business risk has increased relative to 1994, as a result of increased market, supply and competitive risks.

That is a prime driver in allowing TQM a higher ROE and common equity ratio was increased business risk. Few implications for MEC can be drawn from the NEB's TQM decision since the ATWACC example has not been followed elsewhere, while MEC does not face the increased business risk faced by TQM and the TransCanada Mainline.

Q HOW DID OTHER REGULATORS DETERMINE THE "BONUS" TO THE NORMAL ALLOWED ROE?

A. Not all regulators made the calculation of the bonus clear. However, the Regie stated

> 253 The Regie also accepts the expert's point of view whereby the market risk premium was probably greater during the financial crisis.

[5] Gaz Metro put the same team of experts forward that TQM used before the NEB.

> 263 Consequently, to take account of the financial crisis, the Regie establishes an increase in the market risk premium ranging from 0.50% to 1.0%. This adjustment will be taken into account in establishing Gas Metro's rate of return for 2010 and 2011 rate years.

The Regie continues to believe that the CAPM is the best model to use for estimating the fair rate of return, but that it was under estimating the fair return in 2008/9. The Regie used a beta or relative risk assessment of 0.50-0.55 so the temporary increase in the market risk premium added 0.25-0.55% to the CAPM estimate.[6] The Regie then also increased the estimate by a further 0.25%, but stated

> 303 In view of the Regie's opinion that the automatic adjustment formula under normal financial circumstances, has produced valid results in the past, while permitting a substantial easing of the regulatory process, the Regie renews, effective for the 2011 fiscal year, the automatic rate of return adjustment formula.

Overall the Regie found Gaz Metro to be of "above average" risk and allowed an ROE of 9.20%

The AUC adopted a similar approach when they stated (Decision 2009-216, November 12, 2009)

> 325. Based on the Commission's findings with respect to CAPM, the Commission found a reasonable range of CAPM results of 7.13 percent to 8.62 percent. However, given the Commission's observations with respect to the impacts of the financial crisis on the traditional relationships in the financial market, the Commission considers that these CAPM may be unreasonably low.
>
> 326. The Commission's analysis of the performance of high grade bonds relative to the risk free rate during the financial crisis, as explained in Section 5.7, reveals that the traditional spread between the long Canada bond yield and the yield on high grade bonds had increased to well above the traditional spread of one percent and by the close of the record in the proceeding had moved back to a spread of approximately 1.5 percent. As a result, the Commission concludes that the CAPM results likely underestimate the required market equity return by at least 50 basis points. Accordingly, the Commission has adjusted its CAPM results to arrive at a range of 7.63 percent to 9.12 percent.

In the AUC's case it is clear that they added a 0.50% bonus to the ROE due to changes in yield spreads and in section 310 they quoted me to indicate that these spreads were 50 basis points higher than would be normal at this stage of the business cycle. In arriving at their reasonable CAPM range of 7.13%-8.62% the AUC used similar values to the Regie: a market risk premium

[6] The Regie estimated the "normal" market risk premium at 5.50-5.75%.

range of 5.00-5.75% and a relative risk (beta) coefficient of 0.50-0.63. Overall the AUC set a benchmark allowed ROE of 9.0%, which was the same as that allowed by the Board of Commissioners of Newfoundland and Labrador, which found Newfoundland Power to be of average risk.

Q. WHAT ABOUT THE BCUC'S REVIEW?

A. The BCUC's decision is a bit of an outlier. For their direct risk premium estimate they stated (Decision, Dec 16, 2009 page 60)

> The Commission Panel establishes a CAPM estimate by using the Consensus estimate of 4.30 percent for the risk free rate, establishing an equity market premium in the range of the consensus estimate of Canadian professors of finance of 5 percent to 6 percent, and using an adjusted beta in the range of 0.60 to 0.66. This produces a "bare-bones" CAPM estimate in the range of 7.30 percent to 8.30 percent before an allowance for financing flexibility.

To all intents and purposes this is very similar to that of the AUC, Regie, and the Board of Commissioners of Newfoundland and Labrador except for the very high relative risk assessment (beta) placed on TGI of 0.60-0.66. This higher risk ranking reflected the BCUC's assessment of Terasen Gas Inc's (TGI) increased business risk when it stated,

> The Commission Panel considers that TGI's business risk has increased since 2005. In the Commission Panel's opinion the additional risk suggests an equity ratio for TGI of 40 percent. **Accordingly, the Commission Panel determines that the appropriate equity ratio for TGI is 40 percent effective January 1, 2010.**

The BCUC adjusts for changes in risk in both the common equity ratio and allowed return. In TGI's case this increased risk was a reflection of increasing competition from electricty, increased land claims and the possible implications of the BC government's carbon tax policy.

The result was that unlike other boards the BCUC awarded an allowed ROE for its benchmark utility of 9.50% and requested that Terasen Gas Inc (TGI) file an amended ROE formula by December 31, 2010. In this sense the BCUC is in between the three regulatory bodies that added

a bonus to the ROE and believed in the continuing viability of their ROE formula and the OEB and NEB which changed their basic methodology. However, like the NEB, the BCUC's decision was in part predicated on their increased risk assessment for TGI and no clear cut implications for MEC can be drawn.

Q. WHAT ARE YOUR CONCLUSIONS FROM REVIEWING THESE DECISIONS?

A. Several:

1) There is an evident desire on the part of the AUC, the Regie and the Board of Commissioners of Newfoundland and Labrador to maintain their existing ROE adjustment formula;

2) The BCUC has awarded its benchmark utility a temporary high ROE partly due to its increased risk, but requested that TGI complete a study of an alternative ROE formula by December 2010;

3) The OEB has rebased its formula for a five year period and broken with the decision of other boards by including utility bond yields in its ROE formula;

4) The NEB in its TQM decision has moved to an AWACC approach and dispensed with its ROE formula. A policy unique to the NEB and not followed anywhere else in North America.

For the first time in many years we have the prospect of dramatically different allowed ROEs emanating from different regulatory boards in Canada. In essence the consensus that existed just two years ago that the ROE adjustment formulae gave fair and reasonable ROEs has been broken as different bodies have reacted differently to the traumatic events of the financial crisis of 2008/9. In my judgment as boards realise the temporary impact of these events they will revert to their formula ROEs, but for some it will be difficult to reverse the impact of decisions made so recently.[7] However, it points to the need to discuss recent financial events.

[7] The NEB has emphasised that its decisions relate only to the specific pipeline under examination.

III. FINANCIAL AND ECONOMIC OUTLOOK

Q. WHAT ARE CAPITAL MARKET CONDITIONS AT PRESENT?

A. Basic macroeconomic data since 1987 is provided as background in Schedule 1 to illustrate the rhythm to the economy as shocks gradually work through the system. This is what is generally referred to as the business cycle, where the basic economic variable is the rate of real economic growth. The trend line for economic growth between 2.5-3.0% so that periods with growth significantly below that are periods of economic slowdown, periods above that are expansionary and when growth becomes negative we are in a recession.

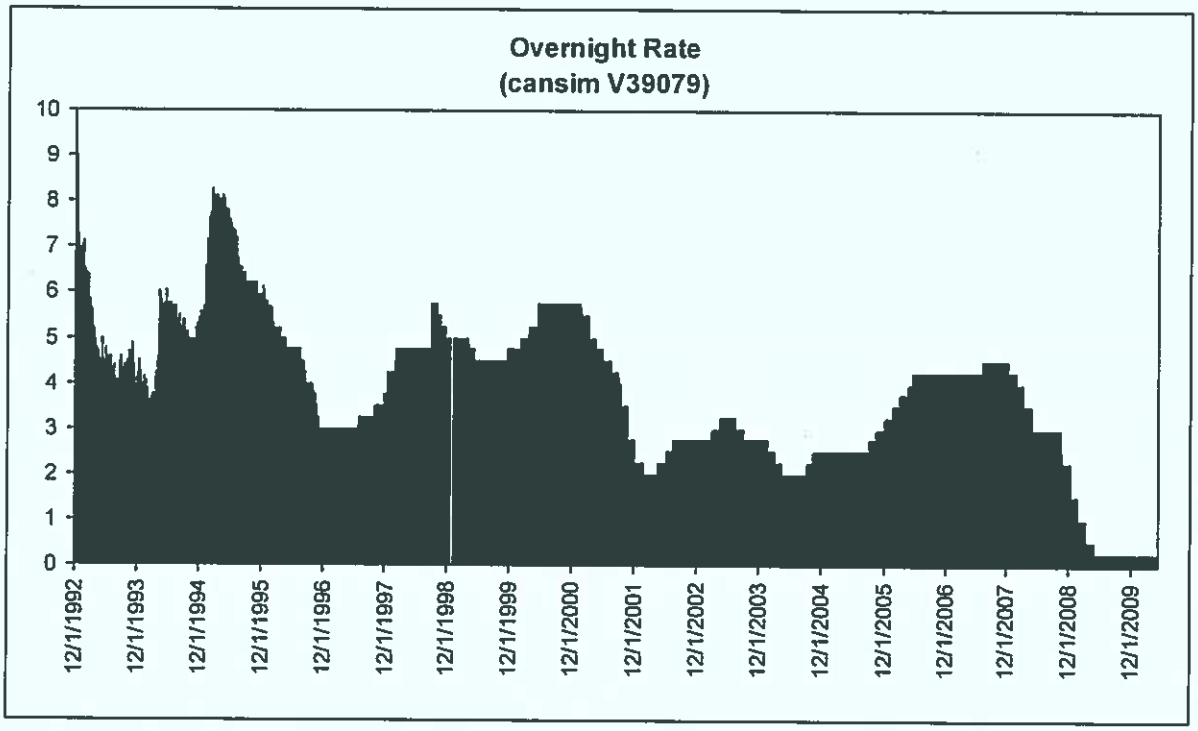
Looking back over the last twenty plus years indicates that from 1989 until 1993 Canada was mired in a deep recession in response to a normal cyclical slowdown as well as restructuring that accompanied the passage of the Free Trade Agreement (FTA). We can also see the strong economy of the late 1980s and again the mid to late 1990s, when real economic growth was over 4.0% as the output gap caused by the recession was soaked up. We can then see the mild slowdown of the early 2000's as recession in the United States spilled over into Canada and our subsequent recovery to trend line growth.

Into 2008 we had good economic growth which soaked up the remaining available labour and for a time the unemployment rate was actually below the natural or non-accelerating inflation rate of unemployment (NAIRU) of 6.0%. Consumer spending was strong as low interest rates supported the purchase of consumer durables and new housing as starts exceeded 200,000 for the sixth year in a row. Further Business investment was strong propelled by an increase in oilsands investment, which grew from $5.3 billion in 2003 to a projected $19.7 billion for 2008, eclipsing the 7% forecasted increase in manufacturing investment of $19.6 billion.

The strong investment position in Canada was partly due to a dramatic improvement in Canada's terms of trade as commodity prices increased. This created a perception that Canada was again a "petro," or at least a "raw materials," based economy as commodity prices reached record highs in summer 2008. This perception allied to the continuing strength of the current account surplus running at 1.0% of GDP, lead to a strengthening Canadian dollar and incipient inflationary

pressures. The result was that starting in September 2005 the Bank of Canada increased its overnight rate from 2.5% to reduce the stimulus being injected into the economy.

As the following graph shows this tighter monetary policy continued throughout 2006 into December 2007, when the target overnight rate was cut from 4.5% to 4.25%.



The reason for the change in monetary policy was the financial problems stemming from the sub-prime mortgage crisis in the United States and its spill-over effects into Canada. The crisis actually started at the end of 2006 as US house prices peaked and started to fall, but it wasn't until July 2007 with the failure of two hedge funds managed by Bear Stearns that investors realised that it was spreading beyond the mortgage markets. Faced with declining house prices, purchasers were increasingly drawn into mortgages by some or all of the following:

- Teaser low interest rates for short periods of time;
- No down payment;
- No verification of income

Many of the second mortgages made in the US were sub-prime *Ninja* mortgages: no income, no job and no assets. Amazingly many of these mortgages were repackaged into special investment

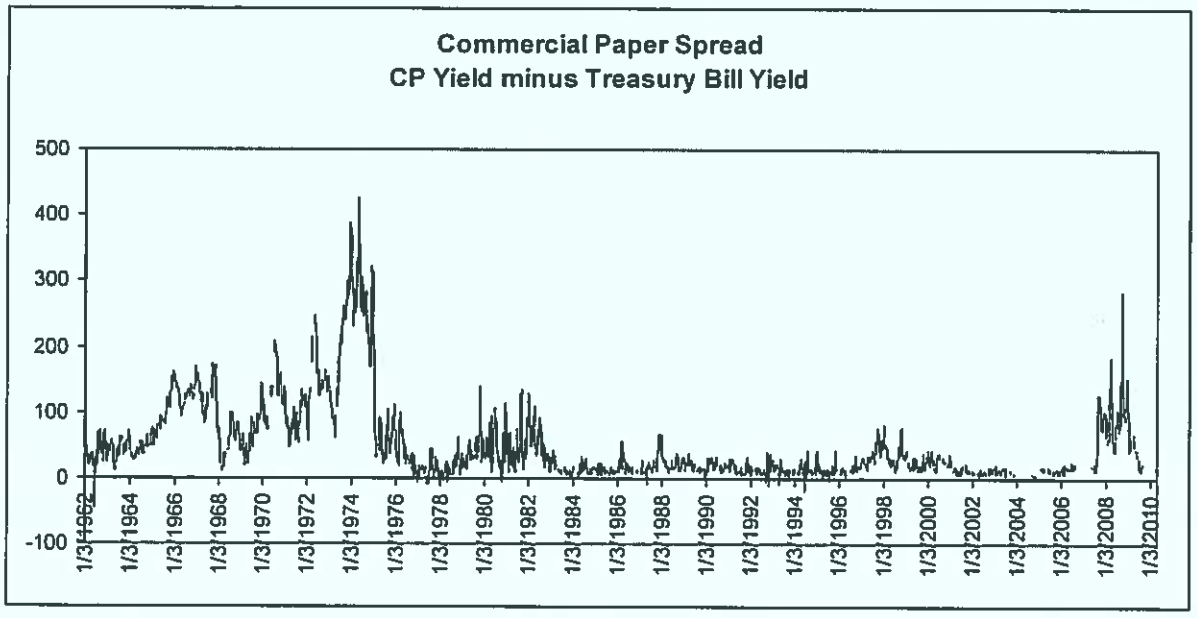
vehicles (SIVs) and financed by issuing mortgaged backed securities with investment grade bond ratings. With these ratings the securities could then be sold to investors and backstopped by major banks like Citibank. In this way these sub prime US mortgages were sold to institutional investors around the world and US problems became global problems.

However, the fact that often the mortgage originator did not keep the mortgage, but sold it off to others, primarily hedge funds and asset backed commercial paper issuers, meant that the normal checks in the lending process broke down and the quality of these "sub-prime" mortgages was far worse than anticipated. When the crisis really broke in August 2007 funds that had issued commercial paper to invest in mortgage related assets could not roll over the commercial paper and investors bolted from anything associated with sub-prime US mortgage debt. In Canada this lead to the Montreal Accord as about $32 billion in asset backed commercial paper was essentially frozen and turned into long term notes. However, in the US the real damage became apparent as Citigroup and Merril Lynch wrote off tens of billions of losses and sought emergency equity infusions from offshore sovereign wealth funds, and the Federal Reserve had to put together a "rescue package" on March 16, 2008 to get JP Morgan to buy Bear Stearns for $2 a share, when Bear Stearns was selling for $155 the previous summer.

The result in the US was fear of any sort of credit risk and a rush to quality as lenders belatedly increased credit standards. Further home owners were believed to be using credit cards and other forms of debt to stay in their houses and lenders braced for a rash of delinquencies on home equity loans and credit card loans as well as on mortgages. In response the Federal Reserve dramatically cut interest rates, bailed out Bear Stearns and made repurchase agreements more widely available in the financial system in an attempt to stop the credit crisis from tipping the US into a full blown recession.

These US problems percolated into Canada directly through losses at CIBC and the National Bank on asset backed commercial paper and indirectly through heightened credit standards and the fear of a US recession. The following graph indicates the impact the credit squeeze had on lenders. It graphs the spread between the 91 day Treasury bill yield and that on 90 day commercial paper (CP). This spread represents what the market demands as a premium for

investing in low risk paper issued by major corporations versus paper issued by the Government of Canada.



What has to be understood is that investors in CP are mainly "parking" their money, rather than investing, so their main concern is security of principal. Consequently with any hint of default the market seizes up. This happens periodically in the CP market as seemingly low risk institutions default and investors panic and refuse to roll over CP for fear of further losses. This is evident in the very large spreads in the early 1970s when investors were "spooked" by the collapse of Penn Central in the US and concerns about whether or not New York City would default. Consequently, the pattern for the commercial paper market is generally for stability punctuated by periods of extreme panic.

For example for the last 20 years, the CP market was very quiet with spreads at 10-20 basis points. This changed in July 2007 with the US sub prime problems spilling over into Canada and got much worse in September 2008 as US banks failed and contagion hit the world's financial markets. The catalyst was the collapse of Lehman Brothers on September 14, 2008, when the US Treasury Secretary Henry Paulson refused to provide short term funding in the face of a classic bank run. Instead Paulson seemed to think that it was good for the markets to make Lehman

"accountable"[8] without fully understanding that through the credit derivatives markets Lehman's collapse would infect banks worldwide.

Paulson's actions in effect turned a US crisis into a global crisis. As the French Finance minister said the decision of the US Treasury Secretary Henry Paulson to let Lehman go bankrupt was "horrendous, for the equilibrium of the world financial system, this was a genuine error." Soon AIG, by market value at one time the world's biggest insurer, was taken over by the US government, and Merrill lynch sold itself to Bank of America. However, the fact that Lehman was allowed to fail had a domino effect on other banks. As the French Finance Minister went on to say "When we let one go, the risk is that others at that moment don't know who their counterparty is anymore and find themselves exposed. Once we let one domino fall, the rest risk collapsing."[9]

Very quickly the Lehman virus went airborne causing investors to withdraw money from banks: precipitating their collapse around the world. Although the US government quickly realised the mistake it had made, it could not be corrected quickly enough. The US Treasury introduced the Troubled Asset Relief Program (TARP) but it initially failed to get through Congress causing the failure of first Washington Mutual and then Wachovia, as both faced classic bank runs. Around the world institutional investors sold off short term money market investments in banks and when US money market funds "broke the buck" and dropped below $1 due to losses on Lehman Brothers' debt, the only safe refuge was US treasury Bills, where for a time yields went negative. In short order the financial markets were frozen as liquidity dried up and securities could not be sold at any reasonable price.

The following graph shows the spreads between Canadian CP and Bankers Acceptances (BAs) and Treasury Bills since the crisis broke in July 2007.

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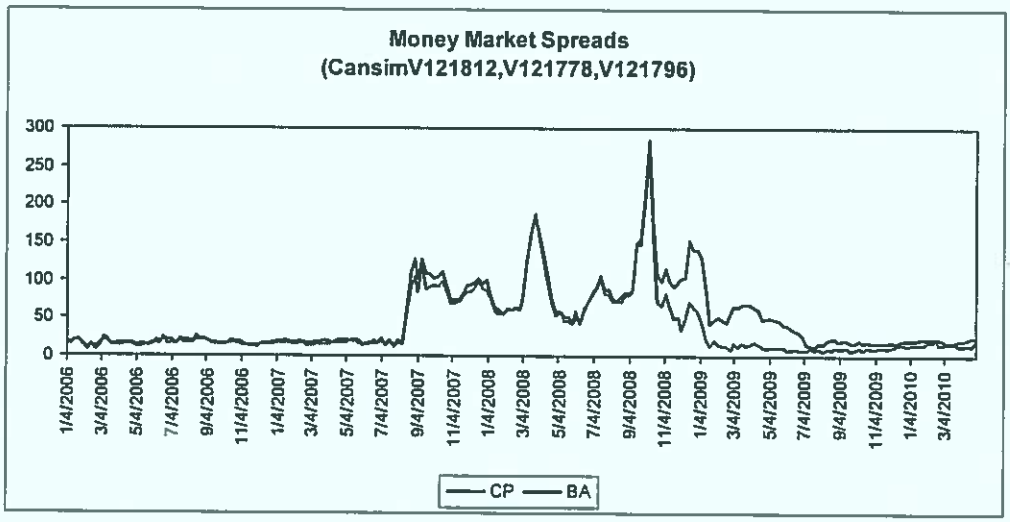
[8] The view was that there was a moral hazard problem in that banks took on more risk since they felt the Fed or US Treasury would bail them out. This was the famous Greenspan Put. Paulson seemed to think that by letting Lehman fail the Greenspan Put would disappear and bankers would be more responsible.
[9] International Herald Tribune, October 10, 2008



BAs are short term paper issued by the Canadian banks similar to Government of Canada Treasury Bills and quite astonishingly after the collapse of Lehman Brothers their spread over T Bills rocketed to peak at almost 300 basis points or 3.0%. By the middle of October banks were reluctant to lend to other banks, let alone corporate borrowers. As interbank lending dried up stock markets collapsed as the real economy can not function if the financial system is broken.

The following table shows the stock market losses as of October 24, 2008 at the peak of the credit crisis.[10] From a US perspective year to date the best performing stock market was Japan's which was only down 35%, the worst among the majors was Hong Kong at 58%, not counting Russia's, which was off 75% before they closed the market. Globally about $14 trillion in wealth had disappeared in a few weeks.[11]

[10] These are from a US perspective and reflect the appreciation of the US$ as US hedge funds repatriated cash to meet possible margin calls.

[11] Taken from L. Booth, "Sub-prime, market meltdown and learning from the past," in The Financial Crisis and Rescue, U of T press, November, 2008.

Table 1: MARKET LOSSES (YEAR-TO-DATE)

Index or Exchange (US Dollars)	Last Trade Date	1 Day Change	1 Day %	1 Month %	6 Month %	YTD %	2006 $b Value
United States Composite	213.40 10/24/2008	-7.52	-3.40%	-27.53%	-37.17%	-40.46%	18,039
Japan Composite	82.39 10/24/2008	-2.74	-3.21%	-22.00%	-32.07%	-35.54%	4,422
United Kingdom Composite	149.79 10/24/2008	-11.63	-7.21%	-35.44%	-48.66%	-52.51%	3,441
Canada Composite	278.25 10/24/2008	-4.74	-1.67%	-40.46%	-48.15%	-49.61%	1,636
Germany Composite	218.89 10/24/2008	-14.62	-6.26%	-39.40%	-51.88%	-56.28%	1,426
Hong Kong Composite	186.44 10/24/2008	-10.10	-5.14%	-31.80%	-51.39%	-57.97%	1,361
Spain Composite	388.93 10/24/2008	-26.01	-6.27%	-34.22%	-50.24%	-51.93%	1,146
Switzerland Composite	374.65 10/24/2008	-10.44	-2.71%	-22.21%	-32.06%	-34.35%	1,111

The combination of heightened credit standards and enormous destruction of wealth lead to the second stage of the crisis as the impact of the credit crunch swept into the real economy: consumers and businesses both took preventive measures to survive the crash by slowing spending and building up reserves. The result was the Keynesian "paradox of thrift:" that as individuals save, demand drops, firms cut production, workers get laid off and those with jobs save even more, which inevitably precipitates a severe recession. In 2009 real growth in Canada dropped to -2.64% similar to the worst of the recession of the early 1990s, but not as bad as in 1981.

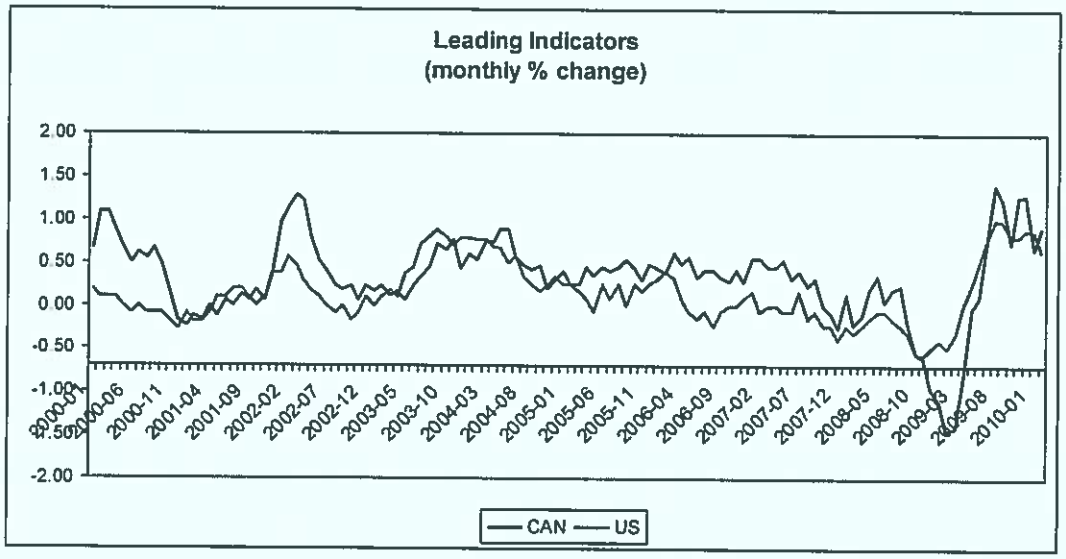
However, of importance is that the enormous measures taken by central banks to stabilise the financial system worked. The BA spread, for example, peaked at almost 300 basis points in October 2008, but is now back to normal levels as confidence in the stability of the Canadian banking system was restored. Canadian banks can now access funds in the paper market on normal terms and as their funding costs have come down, they can pass on these savings to consumers and business. The result has been lower consumer and mortgage rates and a pick up in real estate activity as sales and housing starts have both recovered. Similarly the equivalent "Ted" spread[12] in the United States has fallen from almost 500 basis points in October to more

[12] This is the three month Libor rate minus the US Treasury yield

reasonable levels and triggered significant mortgage refinancing. Both measures indicate that stability and confidence in the banking sector has been restored.

Of more importance is that the Commercial paper spread is back to normal, which means that large stable Canadian companies can access short term financing on similar terms to those prevailing before the crisis. However, since T Bill yields have themselves dropped significantly from 4.57% to just over 0.25%, actual CP funding costs have similarly dropped. This collapse in short term interest costs has rippled through into bank lending costs, where Canadian prime has dropped from 6.25% to 2.25%. As a result all prime and BA based bank lending, such as revolving loan facilities and term loans, have seen a significant drop in their costs.

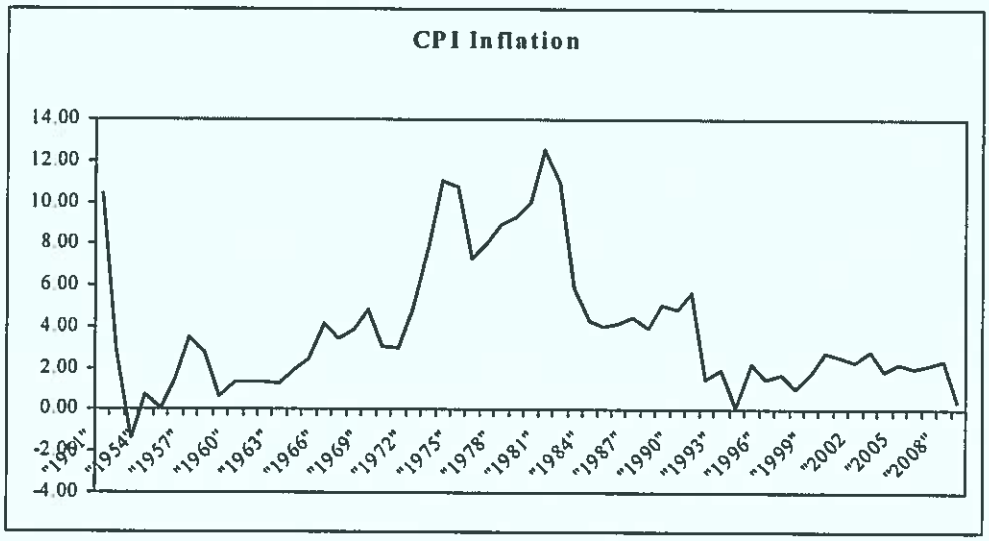
The improvement in the financial sector has impacted the real economy. The following chart is of the monthly % change in the leading indicators in both the US and Canada.



We can clearly see the deterioration starting in the middle of 2007 accelerating into the severe declines in 2008 into 2009. However, we can also see the dramatic recovery starting in April 2009 and the continuing strength into 2010 as the monthly changes plateau above the levels recorded in the recovery after the slowdown in the early 2000's.

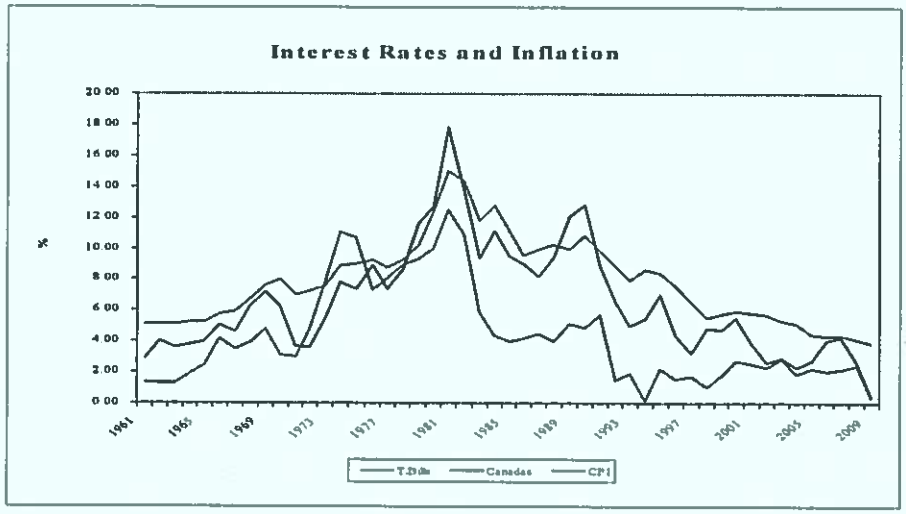
Q. WHAT IS YOUR OUTLOOK FOR INFLATION AND THE ECONOMY?

A. The Canadian economy has experienced low and stable inflation for almost twenty years as the following graph shows.



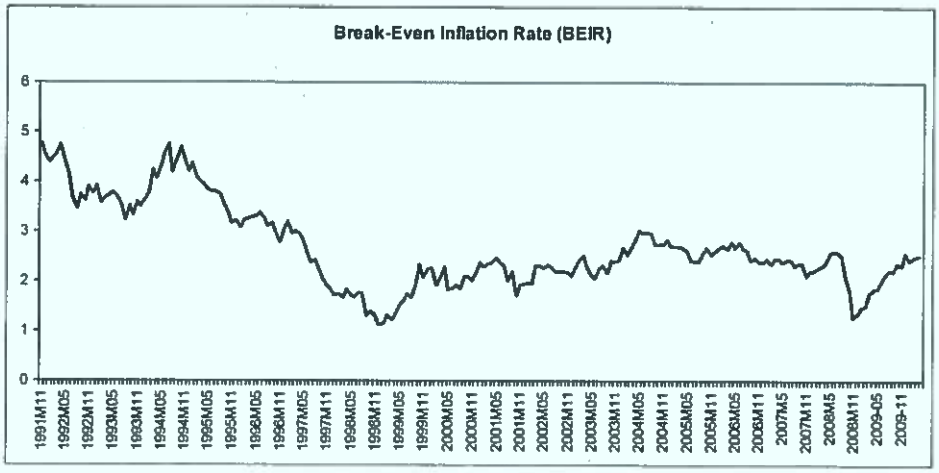
There was an enormous run up in inflation from the early 1950's through to its peak in the early 1980s after which inflation plateaued at the 4.0% level before the effects of the recession in the early 1990s caused it to drop to its cyclical low in 1994/5. Since that time changes in the consumer price index have fluctuated around the middle of the Governor of the Bank of Canada's 1-3% range.

This change in inflation has affected the level of nominal interest rates as the following graph shows. Prior to 1981 inflation was increasing steadily until the 1981-2 recession which brought inflation under control. Similarly, in the late 1980's there was a gradual increase in inflation that peaked about 1991 as the Bank of Canada engineered a slowdown to bring down the rate of inflation. Although the absolute rate of inflation differed during these periods the same pattern of increasing inflation is evident and in both cases interest rate increases slowed down the economy and with it the rate of inflation. We can also see the effects of the Bank of Canada's tightening through the end of 2007 as the 91 day Treasury Bill yield increased to almost match that on the long Canada bond indicating a slowdown.



1

2 The Bank of Canada's policy stance moderated in December 2007 as the target overnight rate
3 was cut, but throughout 2008 there were fears of incipient inflation caused by high commodity
4 prices. The start of the recession in 2008Q4 caused a quick reversal of these fears as concerns
5 switched from inflation to deflation and investors fretted about a Great Depression II caused by
6 the US financial crisis. Schedule 2 shows that on May 5, 2010 the long Canada real bond yielded
7 3.93% or 2.46% below the equivalent nominal bond yield of 1.47%. The real bond guarantees
8 the investor protection from inflation, whereas the nominal bond has built into the yield
9 compensation for both the expected rate of inflation and a real yield. As a result, the spread
10 between the nominal and real bond yields, which is called the break-even inflation rate (BEIR),
11 is often taken as a measure of the market's inflationary expectations. The following graph
12 indicates the BEIR since 1991.



13

We can clearly see the collapse in inflationary expectations in the late 1990's and that since then the BEIR has been slightly above the middle of the Bank of Canada's operating range for inflation of 2.0%. Further we can see the traumatic events of the Fall of 2008 when the BEIR dropped from its "normal" level of 2.50% to 1.26% in November 2008. During this period the fears of a deep recession and deflation were so strong that the BEIR essentially halved in the space of a few months. Since these deflationary fears have subsided the BEIR has moved back to its normal level.

In its Monetary Policy Report (April 2010) the Bank of Canada predicts that the Canadian economy will be back to full capacity in 2011Q2 as a result of more rapid economic growth of 3.7% in 2010 as the economy moves through a "V" shaped recovery. The Bank also expects that the year over year inflation rate will move closer to its 2.0% target rate by 2011. The following is the Bank of Canada's base case projection for 2011 and 2012.

Summary of the base-case projection for Canada[a]

	2009	2010				2011				2012			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP (quarter-over-quarter percentage change)	5.0 *(3.3)*	5.8 *(3.5)*	3.8 *(4.3)*	3.5 *(4.0)*	3.5 *(3.8)*	3.3 *(3.8)*	2.8 *(3.3)*	1.9 *(2.6)*	1.9 *(2.2)*	1.9	1.9	1.9	1.9
Real GDP (year-over-year percentage change)	-1.2 *(-1.5)*	2.0 *(1.0)*	3.9 *(2.9)*	4.5 *(3.8)*	4.2 *(3.9)*	3.6 *(4.0)*	3.3 *(3.7)*	2.9 *(3.4)*	2.5 *(3.0)*	2.1	1.9	1.9	1.9
Core inflation (year-over-year percentage change)	1.6 *(1.6)*	2.0 *(1.6)*	1.9 *(1.7)*	1.8 *(1.7)*	1.8 *(1.8)*	1.7 *(1.5)*	1.7 *(1.9)*	1.9 *(2.0)*	2.0 *(2.0)*	2.0	2.0	2.0	2.0
Total CPI[b] (year-over-year percentage change)	0.8	1.7	1.7	2.4	2.4	2.4	2.3	1.9	2.0	2.0	2.0	2.0	2.0
Total CPI excluding the effect of the HST (year-over-year percentage change)	0.8 *(0.9)*	1.7 *(1.6)*	1.7 *(1.5)*	2.0 *(1.8)*	2.1 *(1.9)*	2.1 *(1.9)*	2.0 *(1.9)*	2.0 *(2.0)*	2.0 *(2.0)*	2.0	2.0	2.0	2.0
WTI[c] (level)	76 *(76)*	79 *(81)*	86 *(83)*	88 *(84)*	89 *(86)*	89 *(87)*	90 *(88)*	90 *(88)*	90 *(89)*	91	91	91	91

The Bank of Canada was criticised in the Spring of 2009 for being overly optimistic as was I before the Alberta Utilities Commission in June 2009. However, the fact is that Canada has gone through a relatively mild recession, as compared to the 1981 recession and what has happened elsewhere, and is recovering rapidly. As a result inflation will rebound quite quickly moderated mainly by the strength of the Canadian dollar.

Q. WHAT ABOUT PEI?

A. The Island is not large enough to affect either Canadian economic conditions or the financial markets so it is a price taker in terms of economic conditions. However, in 2009 it was the only province not to experience an economic contraction. In this it was closer to Manitoba and Nova Scotia, that experienced only negligible contractions, than the more resource dependent provinces; Newfoundland for example, saw a contraction of 9.5%. However, there was a small drop off in provincial employment which pushed the unemployment rate to 12.0%, which apart from Newfoundland was the highest in Canada. For 2010 and 2011 PEI is expected to show economic growth of 2.0-3.0% driving the unemployment rate down to 11.0%.

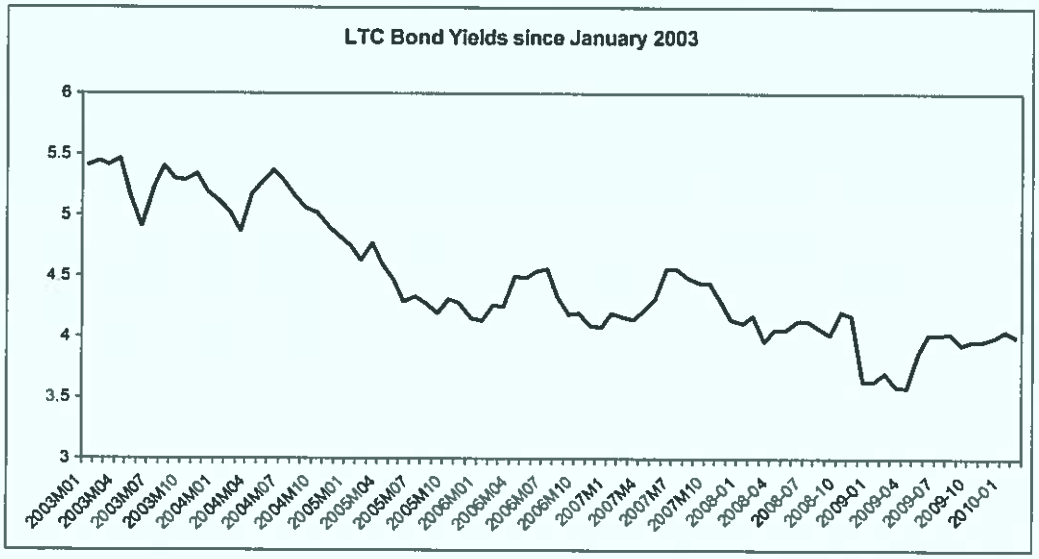
Q. WHAT IS YOUR INTEREST RATE FORECAST?

A. Schedule 2 provides data on the full range of interest rates across the broad maturity spectrum as of May 5, 2010. What is evident is that interest rates for long maturity instruments are much higher than for short dated bonds. This is referred to as a 'normal' or positively sloped yield curve. If we look at the graph on page 24 it is clear that short term Treasury bill yields have continued their long decline from their peaks in 1981 as inflation has receded. This long run decline has been punctuated by periods when Treasury bill yields have increased to support the dollar (1996) or fight a too vigorous economy (late 1980's, late 1990's and mid 2000's). In contrast, long-term rates have continued their gradual year over year decline without these peaks as inflation has gradually receded as a problem and the Bank of Canada's credibility has increased.

The Bank of Canada is committed to keeping the over night rate at 0.25% until 2010Q3, but whether or not it starts to increase rates at that point depends on how the Euro problems in the PIGS develop.[13] Despite the huge bailout announced on May 10, 2010, if these sovereign debt problems cascade the Bank may be forced to keep the overnight rate at 0.25% longer than was expected just a few months ago.

[13] PIGS: Portugal, Ireland (Italy), Greece and Spain.

In contrast to the Treasury Bill yield, the yields on long term Canada (LTC) bonds are not as affected by current monetary policy. The graph on the next page shows that the LTC yield stayed at about 4.5% from 2005 until December 2007 when the Bank of Canada started to cut interest rates after which it stayed at around 4.0% until November 2008 when it dropped by 0.50%, as the market began to understand the severity of the recession and its implication for inflation. However, as these fears receded the LTC yield recovered to the 4.0% level it was at prior to the financial crisis.

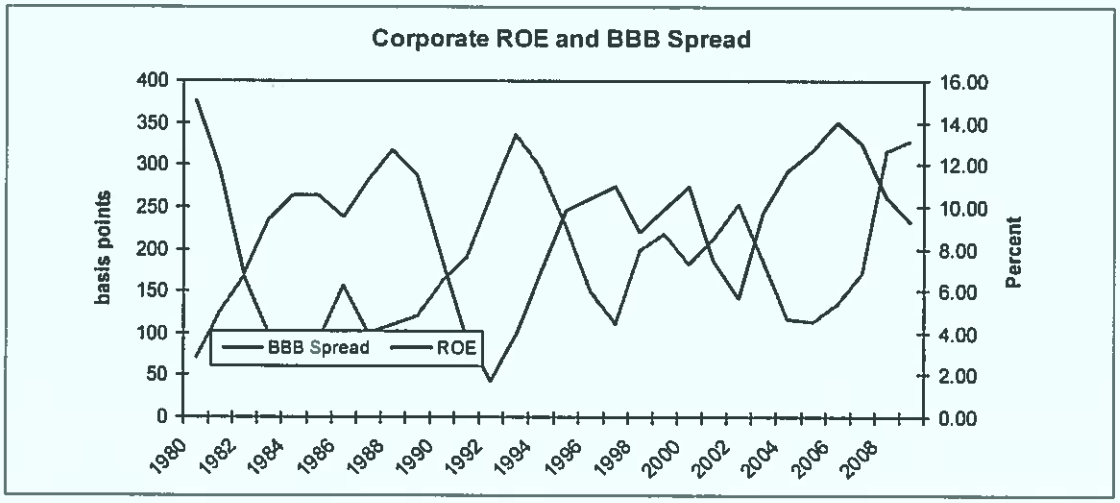


As inflation returns to the Bank of Canada's 2.0% target level in 2011 and the economy returns to normal growth I see the yield on the long Canada bond returning to the 4.50% level of 2007. Consequently I base my ROE recommendations on a 4.50% LTC bond yield. This is consistent with the recent behaviour of the LTC yield and the current Royal Bank of Canada's forecast that sees the LTC yield increasing to 4.50% by 2011Q1 and finishing the year at 4.60%.

Q. HOW DOES THE STATE OF THE ECONOMY AFFECT PROFITS AND THE CAPITAL MARKET?

A. Schedule 1 provides the Return on Equity (ROE) for "Corporate Canada" as a whole from the aggregate data maintained by Statistics Canada (*Quarterly Financial Statistics for Enterprises*). In the following graph I graph this average annual ROE against the average spread between the yield on BBB debt and LTC bonds using data from Scotia Capital. The BBB bond is

the lowest investment grade bond rating and the yield spread between the BBB and the LTC bond reflects the credit risk involved in investing in the BBB bond, as well as its relative lack of liquidity.

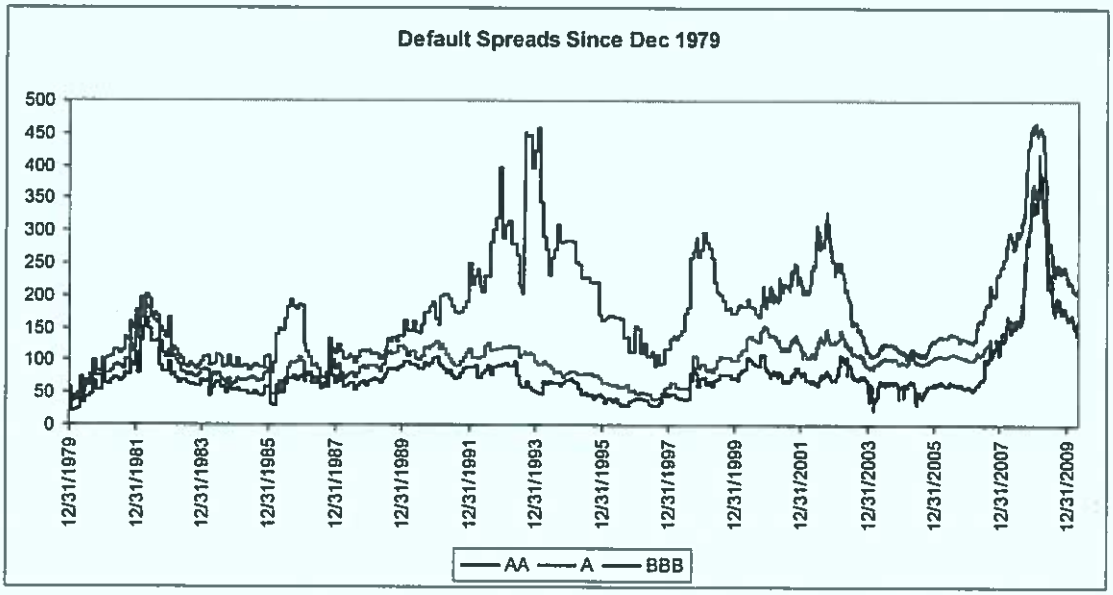


The graph shows the clear impact of the business cycle on corporate profits as indicated by the ROE and the spread between the yield on BBB rated bonds and the risk free LTC bond. For example, in 1980 the average ROE was 15.05% and the BBB spread was very low at just over 50 basis points. "Corporate Canada's ROE" then declined during the 1982 recession and investor fears over the recovery of their bond investments caused the BBB spread to widen. The ROE then hovered around the 10% level during the growth oriented 1980's with a stable yield spread. As ROEs fell from 1989 onwards and the economy went into recession, investors again grew concerned about credit risk and the yield spread increased dramatically to almost 350 basis points in 1993. The profit recovery during the mid 1990s then caused the yield spread to contract only to widen in the early 2000s as ROEs weakened. Finally we can see the high ROEs of the last few years reflected in low credit spreads until the recent recession, when the drop in profitability caused the BBB spread to widen again.

The graph indicates the way in which the business cycle affects firms. During expansions, profitability and the aggregate ROE increase and credit risk drops. This causes investors to buy corporate bonds on narrower spreads over similar Canada bonds. During recessions the reverse happens: as profitability drops credit risk increases and investors sell corporate bonds causing

wider spreads as investors flee credit risky bonds and buy government bonds. This "flight to quality" is a regular part of the business cycle.

The following graph provides the spread information in more detail with AA, A as well as BBB spreads.



The cyclical behaviour of spreads is again clearly visible. The BBB in particular widened and reached very large spreads of 450 basis points in the serious recession of the early 1990s. Similarly during the recession/slowdowns in the early 2000s the BBB spread again reached very high levels of 300 basis points, although the fact that the recession was not as serious meant that it did not reach the highs of the early 1990s. Since then we can clearly see the impact of the financial crisis of 2008/9 as the BBB spread again reached the levels of the 1990's recession. However, once the crisis passed spreads have retreated as they did in previous recoveries as the economy worked its way out of recession.

However, two factors are important. Sometimes the spread is affected by financial factors independent of economic activity. We can see this in the spike in spreads in 1998 as the "Asian crisis" that began in 1997 introduced a flight to quality independent of the state of the North American economies. Second is that what was unique about the 2008/9 financial crisis was the dramatic increase in spreads experienced by A and AA rated companies. During previous crises

Canadian A spreads rarely went much above 160 basis points, whereas in this crisis they reached 370 basis points before their recent precipitous decline.

Q. HOW DID THESE RECENT SPREADS AFFECT UTILITY ROE DECISIONS?

A. It is quite clear that the increased spreads for A rated credits had a major impact in increasing the allowed ROEs for 2009, since most Canadian's utilities are rated A.[14] Both the AUC and OEB specifically referenced corporate credit spreads, while it was a factor in most hearings. The belief was that there was something wrong with the ROE adjustment formulae since in the period November 2008-March 2009 LTC yields fell to just above 3.50%, and as a result allowed ROEs fell, while A spreads increased to over 450 bps, well above their normal recession level highs. As a result utility allowed ROEs were falling at the same time as their borrowing costs over LTC bonds were increasing, which seemed to indicate problems with the ROE formulae.

Q. DOESN'T THE INCREASE IN SPREADS MEAN INCREASES IN EQUITY COSTS?

A. There are many factors that affect corporate spreads as a result it is impossible to determine how much the expected return on a bond changes due to any increased risk premium embedded in the yield. However, it is reasonable to assume that the spread does include a risk premium which may be related to that on equities. This would be particularly true as the spreads widened so dramatically as the stock market crashed in 2008/9. For this reason, I will discuss the impact of spreads after discussing the equity market risk premium and whether it changes over time.

However, what has to be emphasised is that current A spreads are now under 160 bps while utility A spreads at 130 bps are below corporate A spreads and back to where they were at this stage in the last slowdown and recovery in 2002. This was before several ROE adjustment

[14] S&P will not rate an operating subsidiary higher than its parent unless it is ring fenced, which is usually not the case for Canadian utilities. Large companies are also rated more highly simply because size generally affects market access and alternative sources of funds. As a result the BBB Canadian utilities are really A credits.

formulae were reviewed (or implemented by the AEUB) and found to give fair and reasonable allowed ROEs. As a result there is nothing unusual about current financial market conditions that would invalidate the fairness of ROEs generated by conventional formulae.[15]

For reference purposes the NEB formula is

ROE = 12.25% +0.75 *(LTC yield -9.25%)

So with my 4.50% forecast LTC yield the fair ROE would be ***8.68%.***

The AEUB (now AUC) ROE formula is

ROE = 9.60% + 0.75*(LTC yield – 5.68%)

So with my 4.50% forecast LTC yield the fair ROE would be ***8.72%.***

The OEB ROE formula was

ROE = 9.35 +0.75* (LTC yield -5.50)

So with my 4.50% forecast LTC yield the fair ROE would be ***8.60%.***

It is clear that with current LTC forecast yields and utility borrowing costs, the ROE adjustment formulae imply a fair ROE of 8.60-8.72% and that these formulae were found to generate fair and reasonable ROEs in capital market conditions not too dissimilar to those currently existing. What is more utility assets that were subject to these formula ROEs have consistently been resold at market prices significantly above their book values indicating that these allowed ROEs were excessive and above a fair and reasonable ROE. My own estimate of a fair and reasonable ROE for a benchmark follows.

[15] Utility spreads are generally lower than regular corporate spreads for the same rating classification during poor economic times, that is, the rating agencies are conservative in their rating of utility debt.

III FAIR ROE ESTIMATES

Q. WHAT IS THE MOST COMMON WAY OF ESTIMATING A FAIR RETURN?

A. In finance there are three iron laws: the time value of money; the risk value of money and the tax value of money. A fair rate of return has to satisfy these three iron laws so that the investor is compensated for delay in using their money (time value), bearing risk and investing in tax disadvantaged securities. These three principles are all well accepted and understanding the three iron laws is critical for understanding how financial markets behave. It is why ***risk positioning*** models are the most well accepted method for determining fair rates of return.

Of the risk positioning models the most popular is the capital asset pricing model (CAPM), which algebraically states:

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

Where the investor's required or fair rate of return (K) is equal to the risk free rate (R_F) plus a risk premium, which is the market risk premium (MRP) times the security's beta coefficient (β). Why the CAPM is so widely used is because it is intuitively correct: the time value of money is captured in the long Canada bond yield as the risk free rate, while the risk value of money is captured in the market risk premium, which anchors an individual firm's risk. As long as the market risk premium is approximately correct the estimate will be in the right "ball-park."[16]

Currently the CAPM is ***overwhelmingly*** the most important model used for estimating the cost of equity capital or fair rate of return to the equity holders. The following table comes from a survey of 392 US Chief Financial Officers (CFOs) by Graham and Harvey in the Journal of Financial Economics 2001:

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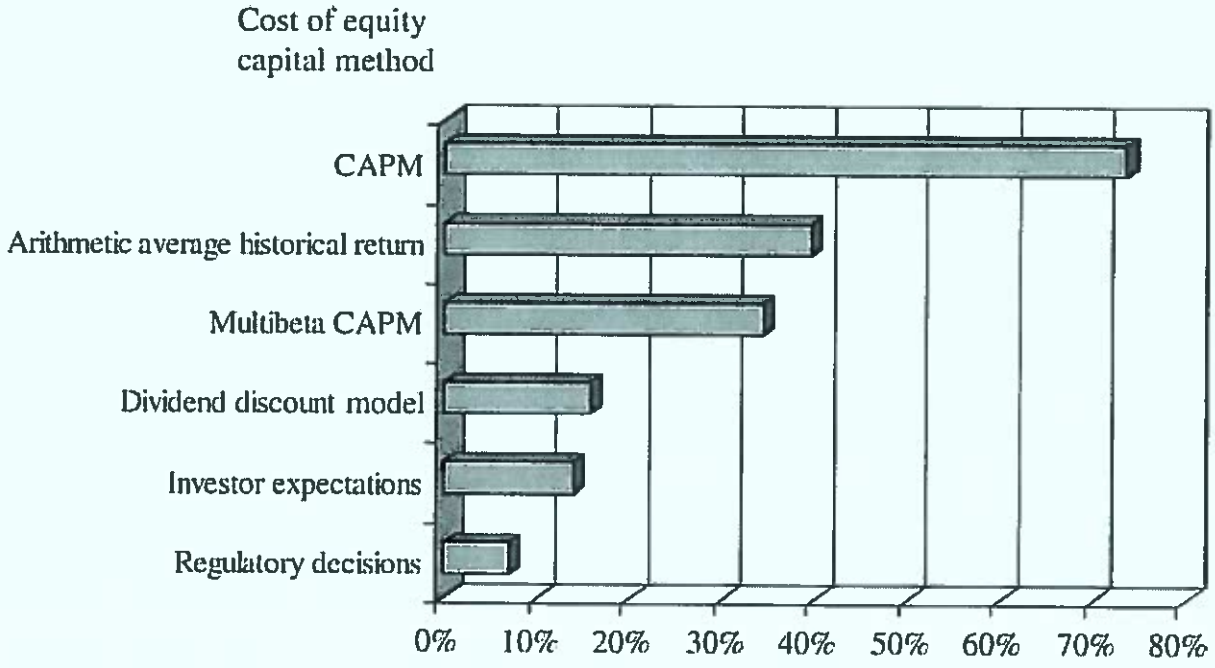
[16] The tax value of money is important since interest is fully taxed whereas dividend income for stocks is not. As a result the risk premium estimated using the LTC bond yield *under-estimates* the true risk premium. For many years I used preferred stock yields as the basis for a risk premium model, since the tax treatment of preferred shares is the same as for common shares.



70% of US CFOs use the CAPM and about a further 30% use simple arithmetic historical returns, which I will discuss shortly, and "multi-beta" models similar to one that I often use. Of more importance is that the CAPM is the overwhelming choice of Canadian utility regulators for setting the allowed ROE. For example, the NEB in its TQM decision stated (Page 6)

> *Cost of Equity Methods*
>
> The Board is of the view that CAPM is widely accepted as a cost of equity model. This model has been relied upon by the Board in previous proceedings and was not contested in this proceeding as a method to estimate the cost of equity. In the Board's view, CAPM captures the risk equity holders have to bear when holding a common stock.

In Appendix B I provide my own estimates of the market risk premium in both Canada and the US. Since 1922 the experienced excess return of equities over LTC bonds has been 4.96% while the excess return of US equities over long US Treasuries has been 6.03%. This 5.0-6.0% range has been reinforced by survey work by Professor Fernandez [17] who surveyed finance professors

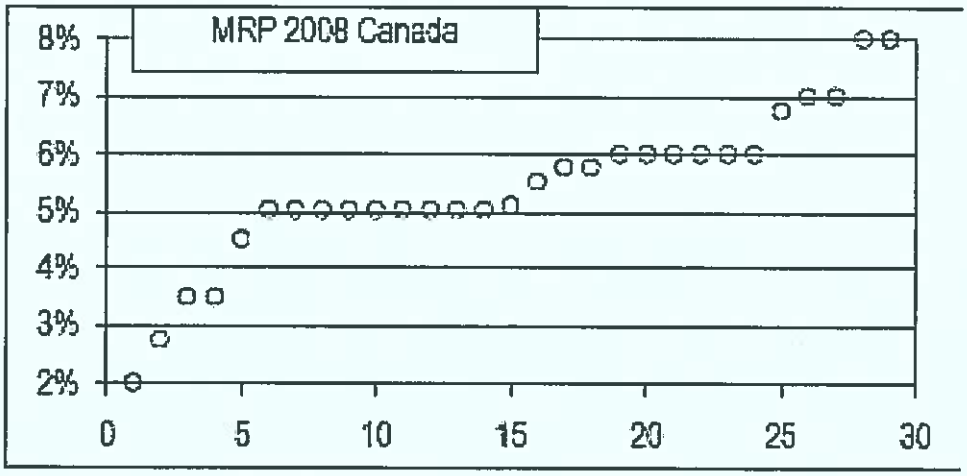
[17] Market risk premium used in 2008 by professors: a survey with 1,400 answers," April 2009.

around the world as to their estimates of the market risk premium. A key result is his Table 2 reproduced below.

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

This table confirms the results in my Appendix: the US market risk premium has averaged about 1.0% more than in Canada. Interestingly the median or middle guy in the US thinks the market risk premium is 6.0%, in Europe 5.0% and in Canada 5.1%. The following graph gives the distribution of the MRP estimates for all 29 Canadian respondents.



As is clear most finance faculty in Canada think the market risk premium is either 5.0% or 6.0%. There are a few down at 2% or 3% and even two people up at 8.0%. However what is absolutely clear is that the typical market risk premium estimate is 5.0-6.0%, which implies an overall market expected return of 9.50-10.50% based on my 4.50% LTC bond yield forecast, or a real

return of about 7.50-8.50% given a 2.0% inflation forecast. Both of these are marginally generous compared to the historical record in my Appendix B where the real rate of return on equities has been about 6.50%.

These types of estimates are also common to industry professionals. A report by TD Economics (January 2006) "rates of return for the long haul" estimated long run rates of return at cash (T. Bills) 4.40%, long bonds 5.60% and common equities 7.30-7.80%. The 7.30% lower end to the range came from looking at long run earnings and dividend growth in Canada and the top end from the US. This TD report confirms the observation that Canadian risk premiums are lower than in the US. It would also confirm the 9.50-10.50% expected return on the market, since the TD returns are more likely to be long run compound returns, rather than short run arithmetic returns.[18]

A second estimate is a report by Rajiv Silgardo, the chief investment officer of Barclays Global Investors Canada Ltd, who in a summary published in the Canadian Investment Review (Summer 2003) reported the following equity market risk premiums:

Canada	US	UK	Japan	Aus	Europe
3.75%	4.50	5.75	2.50	4.50	5.00

Mr. Silgado estimated the equity risk premiums by using a modified growth model, but the critical points again are a lower equity market risk premium in Canada than the US.

The above types of analyses are not specific to Canada. Arnott and Ryan,[19] two finance "professionals," that is, non-academics, estimated the real growth rate in US dividends at 1.0% from 1926-1999. This is well below the real growth rate in US GDP, implying that US aggregate dividends grow at a slower rate than the corresponding values for Canada. They also produced the following table for international growth rates from 1969-1999:

Arnot and Ryan DPS and EPS Growth Rates

[18] As I explain in Appendix B, compound returns tend to be about 2.0% less than arithmetic returns.
[19] R. Arnott and R. Ryan, "The Death of the Risk Premium," *Journal of Portfolio Management* (Spring 2000).

	US	Canada	UK	Japan
Real GDP	2.3%	2.9%	2.1%	1.6%
Real EPS	1.4%	-2.2%	1.3%	-3.4%
Real DPS	1.3%	-0.9%	2.2%	-1.6%
Average	1.3%	-1.5%	1.7%	-2.5%

This data shows more pessimistic growth rates than the earlier Canadian data alone, since the time horizon is shorter. It is possible to make dividends grow faster than earnings by companies increasing their dividend payout, which is what happened in the UK. However, across all these major economies, the Arnott and Ryan data indicates that corporate profits and dividends have not kept up with the average GDP growth rate.

Finally in a recent Investment Strategy report (October 22, 2008), just as the market was crashing the Royal Bank of Canada stated

> **"The US equity market is now priced to deliver total annualized returns of about 7.4% per annum over the next ten years."**

RBC went on to track ten year future returns based on the trailing price to normalised earnings ratio (PE).

Price-Normalized Earnings	Expected Price Return	95% Confidence Interval Low	High
5	8.1	(2.4)	18.5
10	4.0	(6.5)	14.5
15	1.6	(8.8)	12.1
20	(0.1)	(10.5)	10.4
25	(1.4)	(11.8)	9.1
30	(2.4)	(12.9)	8.0
35	(3.3)	(13.8)	7.1
40	(4.1)	(14.6)	6.3
45	(4.8)	(15.3)	5.6
50	(5.4)	(15.9)	5.0
55	(6.0)	(16.5)	4.5

What the chart indicates is that investing at a time when the PE ratio is low gives higher future returns, and the highest ten year average price return for the US market is 8.1%. This would marginally under state the total return since it excludes dividend income and is again more likely to be a compound return. However, there is broad consensus among academics and professionals

that overall equity market return is unlikely to be higher than 10.50% and the market risk premium is at most 6.0%

Again these types of estimates have been accepted by Canadian regulatory boards. The Regie accepted a market risk premium estimate of 5.50-5.75% before the current crisis (Section 252 of Gaz Metro 2009 Decision); the BCUC accepted the 5.0-6.0% range from the finance professors referenced above (Decision page 60), and the AUC a range of 5.0-5.75% (Decision section 240). Overall there is little that is controversial about the general range of the market risk premium estimates or the implication that the expected return on the stock market as a whole is about 9.50-10.50%. The final step is how much *lower* the fair return for a benchmark utility should be given that I am not aware of any witness testifying that any Canadian utility is riskier than the average stock in the Canadian market.

Q HOW DO YOU ASSESS THE RISK OF A BENCHMARK UTILITY?

A. In Schedule 3 are the actual ROEs for the major utility holding companies (UHCs) in Canada plus those for the TransCanada mainline as a forward test year company and Foothills which is full cost of service. These actual ROEs are to be compared with those in final column for Corporate Canada as a whole as estimated by Statistics Canada. Before discussing "risk" I should note two things. First, the average ROE for Corporate Canada was 9.72% whereas for the two regulated pipelines it was 10.07% for Foothills and 10.49% for the TransCanada Mainline indicating its persistent over-earning its allowed ROE. Second for the UHCs the average ROE ranged from a low of 9.81% for TransAlta, which is no longer heavily regulated, to a high of 14.93% for Enbridge and 17.96% for GMI which is a limited partnership.

In terms of risk, below the 2008 ROE is the standard deviation of their annual ROEs, which is one measure of the earnings risk of these companies. As we would expect these range from 1.12 and 1.10 for Foothills and TransCanada as "pure" utilities to 4.72 for TransAlta which is the least regulated of these UHCs.[20] The next row divides this standard deviation by that for Corporate

[20] TransAlta sold its Alberta distribution and transmission assets and is now mostly a generation company.

Canada as a whole, which indicates these UHCs are about 40% as risky as the Statistics Canada average ROE. However, this overstates their risk since the Statistics Canada ROE reflects diversification across all the firms in the economy. It also misses a very important fact. This is that the performance of the utility holding companies (UHCs) tends to occur at different stages of the business cycle than that of Corporate Canada as a whole.

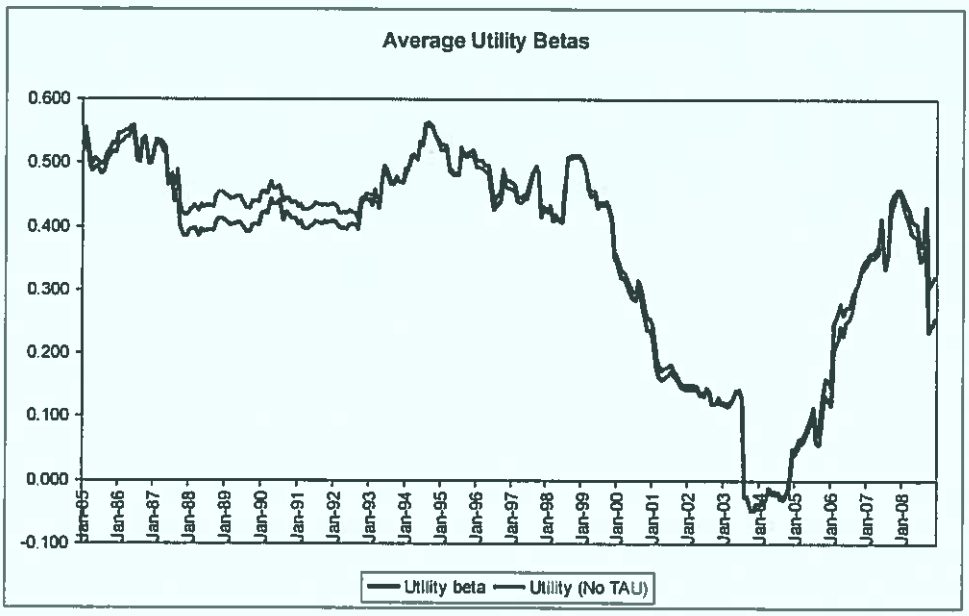
Note that from the Statistics Canada data there were serious recessions/slowdowns in the early 1990s and 2000s when Corporate Canada earned sub par ROEs. However, the earnings of UHCs scarcely skipped a beat and some like CUL and GMI had record high ROEs. What this indicates is that we need to take into account when the high and low ROEs occur. This is because UHCs are widely regarded as defensive stocks that do just as well in a recession and thus act as a "safe harbour." This is what the ROE beta measures, which is the sensitivity of the UHC ROE's to that of Corporate Canada. This is the last row in Schedule 3, which indicates that for the purest regulated utilities their ROE betas are negative, whereas for the more diversified utility holding companies they are positive!

The weakness of these risk assessments is that they are based on the firm's accounting earnings, or total income risk, that is their ROE. What investors are interested in is the risk involved in the stock market value of the securities they hold. This risk includes investment risk, independent of income risk, as what is important is how the stock market reacts to changed economic circumstances in re-pricing a firm's securities. Moreover, since investors rarely hold single investments, they are interested in how the risk of their overall portfolio changes as a result of holding a particular security. This measure of risk is called the security's ***beta*** coefficient.

Schedule 4 has the stock market betas for the major Canadian UHCs as well as the average (utility beta) for each of the 5-year periods ending 1985 through 2008. For the market as a whole the beta is 1.0, so these beta estimates indicate that these utilities and utility holding companies (UHCs) are lower risk than the typical stock, which is what we would expect given their ability to earn their allowed ROE and the associated income certainty. However, these are simply statistical estimates of past relationships and are highly sensitive to unique events affecting a firm. To partially circumvent these problems we can also group firms into industries and

examine their betas over time. In this way the random behaviour of one firm is reduced in importance.

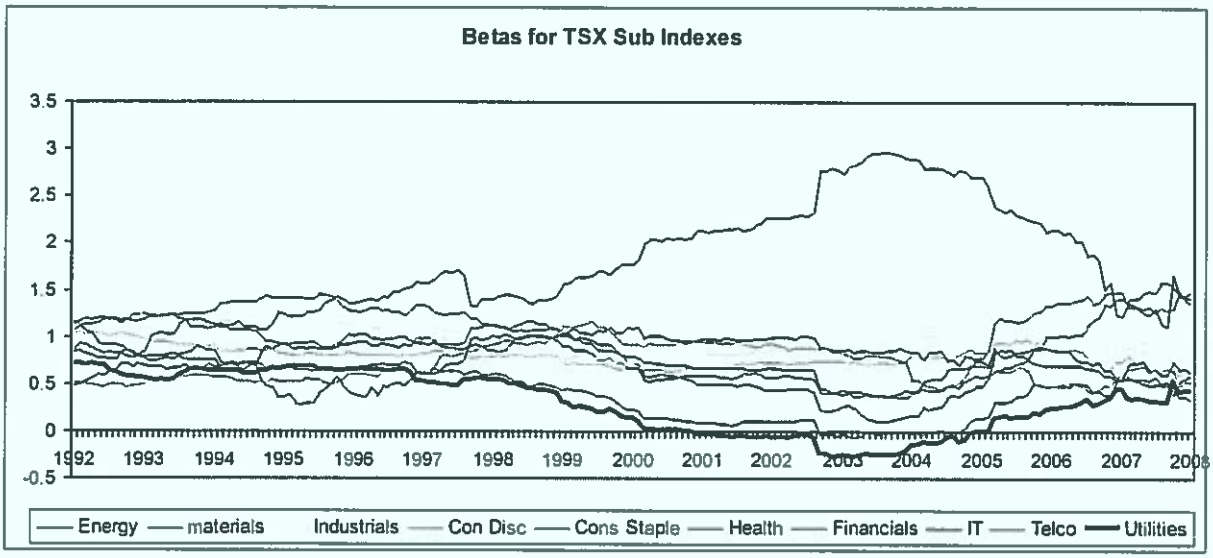
The last column in Schedule 4 gives the average for these UHCs, which can be regarded as an "industry" beta. This average beta is graphed below. The average is both with and without TransAlta, since TAU is becoming less and less a regulated utility even though many still regard it as such.



The data shows that for the five-year period ending in 1985 the average beta was 0.53[21]. The average then drops through to 1992 before increasing back to the same level for the period 1990-1994. The average beta then drops from the 0.50 level in the late 1990s to negative for 2003 before increasing back to average 0.24 for the most recent five year period ending in 2008. Over this long period the average beta for these utilities has been 0.36 in a range from a negative number to 0.55.

Another way of looking at the data is to look at the betas of the relevant TSX/S&P Composite sub-indexes as graphed below.

[21] Betas are estimated over five year periods of monthly data so the 1985 estimate covers the period 1980-1985.



1

2 This is a "busy" graph that tracks the betas of all the sub indexes, but it is the bolded line that is
3 most important since this is the utility sub index. Here it is important to remember that betas are
4 simply a statistical estimate of the extent to which a stock moves with the general market over a
5 particular period of time. As a result looking at them is like driving using only a rear view
6 mirror. For example, by convention, betas are estimated over a five-year period. This means that
7 if a critical event happens during the estimation period, then the beta estimate will pick it up.
8 However, once the event "passes out" of the five-year estimation window, the impact of the
9 event will disappear from the beta estimate.

10 For example, note the dramatic impact of the information and technology (think Nortel and JDS
11 Uniphase) sub index beta, which increased dramatically from about 1.5 to over 3 before dropping
12 in 2006. Those two companies were so important to the Canadian market they effectively
13 became the market. As the IT beta increased, the other sub-index betas ***had*** to decrease, since in
14 aggregate they have to sum to 1.0. The important point is that the low utility betas in the early-
15 mid 2000's are not an anomaly; they simply reflect the fact that during this period the market
16 was IT driven and utilities and other low risk sectors of the market were not affected by the
17 "internet bubble."

18 In Schedule 5 is a table of the most recent betas graphed above. This highlights the most recent
19 version of the "Nortel phenomenon," which is the impact of the recent high commodity prices on

the TSX. Note for example, that the energy and materials sub index betas were low until the period 2002-2006, since commodity prices were also quite low. Starting in 2002 commodity prices started to increase propelling the prices of commodity stocks up and with them the value of the TSX Composite. As a result the betas of the energy and materials sub index increased, as this time resource stocks drove the market. For the period 2004-2008 the beta of the energy sub index was 1.42, not quite a repeat of the "Nortel phenomenon" but the same effect regardless.

The recent story of the impact of resource stocks, like the earlier story of Nortel, simply indicates that statistics like betas tell the truth: to understand them you have to understand the financial and economic environment that generated them. This is that periodically the market is driven by particular sub sectors and when this happens, defensive stocks like utilities get "left behind." However, this is what we mean by low risk, that they do not go up and down to the same extent as riskier sectors.[22] It is my judgement that betas tend to revert to their long run average levels: for the market as a whole this is 1.0, but for regulated firms this is about 0.45-0.55.[23]

Q. HOW DID CANADIAN UTILITIES BEHAVE DURING THE RECENT STOCK MARKET CRASH?

A. Much as we would expect: they behaved like low risk stocks. On December 9, 2008 a story in the Calgary Herald[24] discussed the implications of the price of oil dropping from US$144 to US$50 and what it meant for oil and gas companies and pipelines. Hal Kvisle, CEO of TransCanada, noted that although it was more difficult to raise money TransCanada had just raised $1.16 billion in an issue that was over subscribed. Kvisle indicated that it underscored the attractiveness of infrastructure investments in troubled times. The article also noted that Enbridge had increased its dividend by 12 per cent and upped its 2009 earnings guidance by about 20 per cent. Enbridge's CEO Pat Daniel said he's confident "the company can maintain 10

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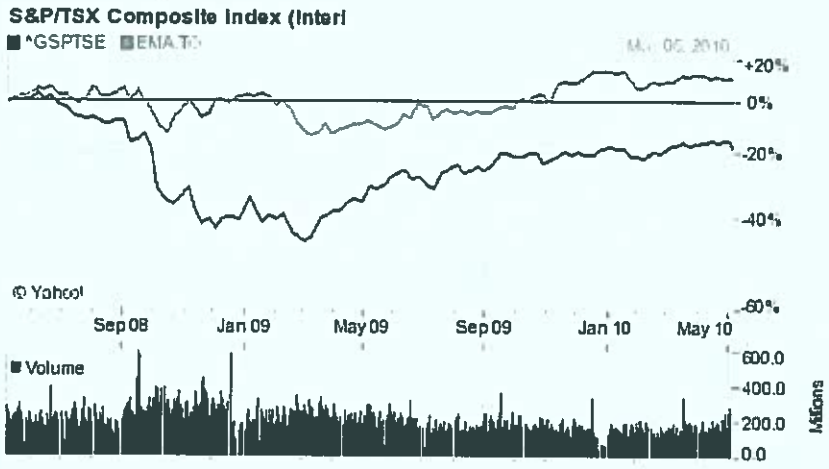
[22] Note that if we estimate the betas of Canadian UHCs using a US index, either with or without exchange rate adjustments, the betas are even lower since the Canadian market is not perfectly correlated with the US market and utilities are typically locally owned stocks.

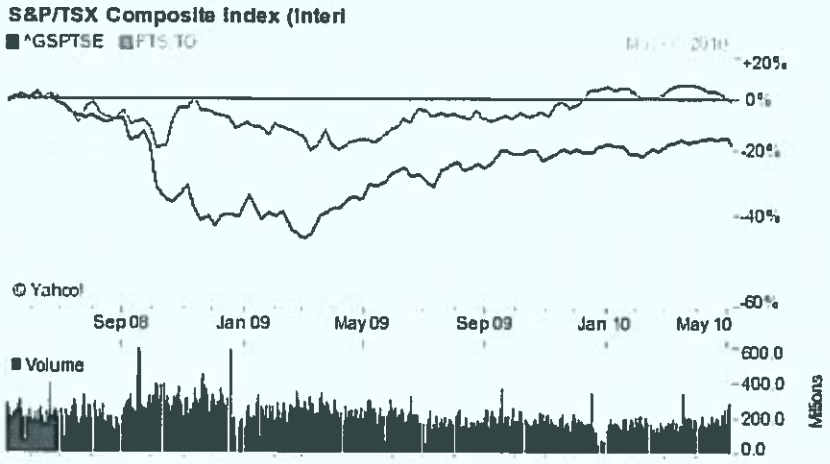
[23] This is also accepted in the literature. Gombola and Kahl, "Time series properties of utility Betas," Financial Management, 1990, come to the same conclusion.

[24] Shaun Polczer, "Pipeline companies weather darkest hour; Executives say crisis worst in oil patch history" Calgary Herald, December 9, 2008.

per cent earnings per share growth for at least the next five years, a testament to the ***low-risk business model*** (emphasis added) of pipelines in general." The article went on to state that "Enbridge has been one of the top performers on the TSX, losing only 1.7 per cent year-over-year compared to more than 41 per cent for the TSX main board and a whopping 56 per cent for the TSX's capped energy index since June." It further quoted Daniel as saying "I think that speaks to the low risk, steady predictable nature of our business, ...***People don't really realize it until you get into tough times like this.***" (emphasis added) The article went on to note that "Enbridge shares gained $1.32, or three per cent, on the Toronto Stock Exchange on Monday to finish at $39.50 while Trans-Canada added 60 cents to close at $33.90."

To see how Canadian utilities have performed during the last two years I tracked their stock price performance against that of the TSX/S&P index using data from Yahoo.ca, since similar data is not available yet in standard data bases. The following two graphs are for Emera (EMA.TO) and Fortis (FTS.TO). Both of these companies are close to being pure regulated utilities.





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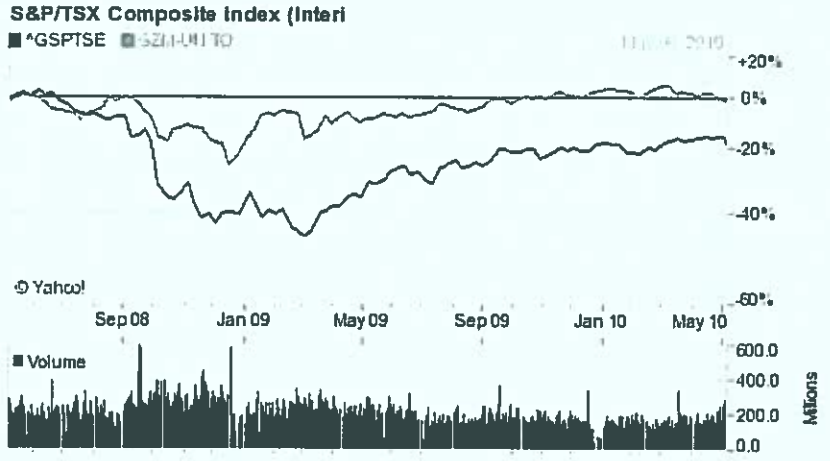
2 The important point is that over the last two years the TSX has dropped about 20% and at times
3 was off well over 40%. However, an investor in Emera is now up and at worst lost barely 10%,
4 whereas an investor in Fortis has about broken even and had a maximum loss of about 20%. The
5 following is a graph of Gaz Metropolitain which is almost a pure utility



6

7 Again the implication is the same: overall Gaz Metro has broken even and at most suffered a loss
8 of 20%, less than half that of the Canadian market as a whole.

9 **Q. OVERALL WHAT IS YOUR RISK ASSESSMENT OF A BENCHMARK**
10 **UTILITY?**

11 **A.** My assessment can be summarised as follows:

12

Relative standard deviations of ROEs:	40% of the risk of Corporate Canada
Relative ROE betas:	negative risk premia!
Recent beta estimates from UHCs:	0.30-0.40
Recent price performance during the crisis:	half as risky

Overall I rely on my judgment and the tendency of risk to revert to long run averages and use a normal range for a benchmark utility's risk as 45%-55% as risky as the market or typical stock. I see nothing in the recent risk measures to indicate that this risk ranking has changed in any material way.

Q. HAVE CANADIAN REGULATORS ACCEPTED THIS RISK RANKING?

A. Yes. The AUC placed a benchmark utility at 50%-63% as risky as the average stock (Decision section 254); the Regie at 50-55% (Decision Section 253) and the BCUC (Decision page 60) at 60%-66%. Of these only that of the BCUC appears to be outside of a reasonable range and probably reflected their view that the business risk of Terasen Gas Inc had increased.

Q. WHAT DOES THIS MEAN FOR THE FAIR ROE?

A. With a market risk premium estimate of 5.0%-6.0% and a relative risk assessment of 45-55%, I place the utility risk premium at 225- 330 bps or a mid point of about 275 bps. When added to a 4.5% LTC yield this means a fair return of 7.25%. This is reasonable compared to an overall expected return on the market of 9.50-10.50% and an average Corporate Canada ROE of 9.72%.

Q. IS THIS YOUR ROE RECOMMENDATION?

A. No. This estimate of a fair return is applied to the market value of the stock consistent with the way that Mr. Justice Lamont and economists define the fair return. However, there are costs attached to raising capital, which are not reflected in this estimate. For this reason it is conventional to add 0.50% for flotation costs, when applying the fair return to the book value of equity of a utility. In doing this I would recommend a fair ROE of 7.75%.

Q. DOES THIS RECOMMENDATION REFLECT MARKET CONDITIONS?

A. Yes. It is my judgment that markets have reverted pretty much to normal considering where we are in the business cycle. While there are still concerns about a Euro debt cascade, they are not of the same order of magnitude as those which upset markets from September 2008-April 2009. However, the above estimation procedure uses a long run market risk premium and relative risk coefficient, so the fair return estimate is relatively insensitive to current market conditions. This is why many regulators added a premium in 2009. The main way of doing this was by examining corporate bond yields. I looked at this and the main evidence that I am aware of is a paper by Professor Aswath Damadoran at New York University.

Professor Damadoran has written a series of textbooks concerned with valuation as well as a recent paper on the equity risk premium.[25] The following is his Table 15 from this recent paper where he estimates the equity risk premium (Market Risk Premium) for the US.

Table 15: Equity Risk Premium (ERP) for the United States

Approach Used	*ERP*	*Additional information*
Survey: CFOs	3.80%	Campbell and Harvey survey of CFOs (2008)
Survey: Global Fund Managers	3.80%	Merrill Lynch (July 2008) survey of global managers
Historical - US	4.79%	Geometric average - Stocks over T.Bonds: 1928-2007
Historical – Multiple Equity Markets	4.04%	Average premium across 17 markets: Dimson, Marsh and Staunton (2008)
Current Implied premium	4.54%	From S&P 500 – 9/14/08
Average Implied premium	3.98%	Average of implied equity risk premium: 1960-2007
Implied premium adjusted for T.Bond rate and term structure	3.12%	Using regression of implied premium on T.Bond rate
Default spread based premium	3.80%	Default Spread * (ERP/ Default Spread average)

Professor Damodoran cites several sources for his market risk premium estimates; including survey data of CFOs and Fund managers, historic estimates similar to mine in Appendix B,

[25] A. Damodaran, "Equity Risk Premium (ERP), Determination, Estimation and Implication," Stern School, NYU, October 2008.

implied estimates using cash flow models both with and without adjustments for bond market spreads and an estimate based on default spreads.

There are two important insights from his table. First, the range of his estimates for the US market risk premium is from 3.12%-4.54% which are all lower than my estimate of 5.0%-6.0%. However, more importantly he has a model that estimates the market risk premium which incorporates corporate spreads. Damodaran estimates the market risk premium by looking at the relationship between implied market risk premium estimates and the default spread on BBB bonds from 1960-2007. He estimates the market risk premium as the median 2.02 times the default spread on BBB bonds. Applying this to the recent spike in spreads in Canada would indicate that the market risk premium at its peak during the financial crisis was over 9.0%, since the BBB spread in Canada reached over 450 bps; well above its long run average. Conversely with the latest BBB spread in Canada (May 5, 2010) at 2.11% this would put the current market risk premium at 4.22%, which is less than my 5.0%-6.0% market risk premium estimate. Further we can expect it to decline as the economy and markets recover since these spreads are clearly cyclical.

Damadoran's model is an interesting way of incorporating spreads on corporate bonds into a time varying utility or market risk premium. However, if a model like this is used it introduces a large amount of volatility into the allowed ROE for little gain, since over the course of the business cycle the spreads average out. For example, since 1980 the BBB spread has averaged 176 bps in a range of 38-464 bps. If the market risk premium varies by about 2X the BBB spread and the average utility has a relative risk assessment of 0.50 this would indicate that the average utility risk premium has been 352 bps in a range from 38-464 bps with the median or typical utility risk premium lower. In my judgment it is better to ignore this volatility and simply use a long run average market risk premium.

IV. US ESTIMATES

Q. WHAT IS YOUR JUDGMENT ON THE USE OF US ESTIMATES IN CANADA?

A. Ms. McShane's recommendations are almost entirely based on US utility holding companies and I regard them as biased high estimates for Canadian utilities for two reasons. First, the US financial markets exhibit more risk than the Canadian markets and have generate higher risk premia in the past. Second although the principles of regulation are the same between the US and Canada, as is widely recognised the implementation is different. As a result estimates from US regulated utilities can only be used in Canada if significant adjustments are made and as far as I can see Ms. McShane has not made any.

Q. WHY DO YOU REGARD THE US AS RISKIER THAN CANADA?

A. Apart from the statistical evidence in Appendix B Schedule 10 that the S&P500 index has exhibited more volatility than the TSX Composite in Canada, we have the fact that experts consistently estimate the US market risk premium as higher than in Canada. Further the recent financial crisis highlights the on-going differences between the US and Canada. For example the US decision to let Lehman Brothers go into bankruptcy on September 14, 2008 triggered the financial melt down and was a huge mistake. The result was frozen credit markets and a stock market collapse pushing the world into its first ever global crisis.

In all of this Canada was largely a bystander wondering how such disastrous and elementary mistakes could be made in the US. As Prime Minister Stephen Harper said at the G-20 summit

> *"Unregulated financial markets do not work. Canada has known that for a long time. I thought frankly, we all knew that from events of many decades ago – but obviously the United States went on a different path."*

With stronger regulation of its financial system Canada avoided the problems in the US. The Office for Superintendent of Financial Institutions (OSFI), for example requires 7% common equity and 10% total capital for the Canadian banks, whereas the Bank for International Settlements requirements are for a minimum of 4% and 8% respectively. Further, the Canadian

banks significantly exceed these minimums with the Royal Bank of Canada, for example, recently at just under 10% for common equity and 13% for total capital.[26] OSFI has also enforced the latest Basel 2 standards that use more refined risk weights for different banking assets. In contrast, the US has yet to adopt Basel 2 for all its banks and generally its banks operated with far less capital, which is partly why they experienced such disastrous results, These differences are symptomatic of basic cultural differences between the US and Canada.

These differences are now compounded by significant differences in macroeconomic financial conditions. Whereas the size of the Canadian deficit and the strength of the Canadian economy are much better than anticipated just a short while ago, the US continues to have problems and the size of its deficit raises significant long run inflationary concerns. This is reflected in higher long term US Treasury bond yields than their equivalents in Canada (4.5% versus 4.0%), higher borrowing costs (US Prime is 1.0% higher than in Canada) and a strong C$. Taking estimates from a jurisdiction with different economic problems and higher interest rates and costs of capital and applying them to Canada without adjustments simply does not make any economic or financial sense.

Q. IS IT COMMONLY ACCEPTED THAT US UTILITIES ARE RISKIER THAN CANADIAN ONES?

A. Yes. Moody's is one of the two major US bond rating agencies and in a major review of its rating methodology[27] it cited three major factors that determined how it rated the supportiveness of regulation. These were (paraphrasing)

- Protecting the system to ensure reliable supply
- Protecting the consumer from monopoly over charging or sudden large rate increases;
- Attempting to achieve a balance between satisfying shareholders versus efficiency to hold down prices.

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[26] I refer to tier 1 capital as common equity but it also included non-cumulative perpetual preferred shares.
[27] Rating methodology: global regulated electric utilities, Moody's March 2005.

It then had a rating scale from 1-4 with 1 being the most supportive regulatory environment (SRE). Canada was rated 1 whereas the different US states were rated either 2 or 3. SRE1 was defined as "Regulatory framework is fully developed, has shown a long track record of being highly predictable and stable and there is a very high expectation of timely recovery of costs and investments." SRE2 and SRE3 indicate less assurance of cost recovery and greater unpredictability or inconsistency in regulation.

Moody's reviewed this report and issued a new one in August 2009.[28] The new Moody's report refines their assessment into four major areas where in the following table the % indicates the weights applied by Moody's,

- Regulatory framework: 25%
- Ability to recover costs and earn profits: 25%
- Diversification: 10%
- Financial strength and liquidity: 40%

Moody's states very clearly "for a regulated utility the predictability and supportiveness of the regulatory framework in which it operates is a key credit consideration and the one that differentiates the industry from most other corporate sectors." A quick glance at Moody's weights indicates that fully 50% of the weighting is based on the first two criteria which both reflect the supportiveness of the regulatory environment.

Further in discussing the US and Canada Moody's states,

> "Moody's views the regulatory risk of US utilities as being higher in most cases than that of utilities located in some other developed countries, including Japan, Australia and Canada. The difference in risk reflects our view that individual state regulation is less predictable than national regulation; a highly fragmented market in the US results in stronger competition in wholesale power markets; US fuel and power markets are more volatile; there is a low likelihood of extraordinary political action to support a failing company in the US; holding company structures limit regulatory oversight; and overlapping and unclear regulatory jurisdictions characterize the US market. As a result no US utilities, except for transmission companies subject to federal regulation, score higher than a single A in this factor."

[28] Infrastructure Finance; Regulated Electric and Gas Utilities, August 2009.

Moody's goes on to discuss how 4 of the 6 investor owned bankruptcies in the US resulted from regulatory disputes culminating in insufficient or delayed rate relief for the recovery of costs and/or capital investment in utility plant. Moody's further states "as is characteristic of the US, the ability to recover costs and earn returns is less certain and subject to public and sometimes political scrutiny." I would emphasise here Moody's phrase "as is characteristic of the US" since this reflects a less protective regulatory environment than we have in Canada.

It is well recognized that the typical US utility has both a higher allowed ROE and more common equity than their Canadian counterpart. This is shown, for example, in Table 3 of Ms. McShane's evidence where the US utilities have approximately 8-9% more common equity and 0.70-1.00% higher allowed ROEs. All else constant with these better financial parameters, if they have the same business risk they would have better bond ratings. However, this is not the case, as the median bond rating for Ms. McShane's US electric companies (McShane Schedule 5) is BBB, whereas in Canada (McShane Schedule 1) it is A.

It is important to recognise that US utilities have higher allowed ROEs and more common equity since they are riskier than their Canadian counterparts. As a result, their financial ratios are bound to be higher indicating "stronger" financial parameters. This simply reflects the different regulatory approaches adopted in the US versus Canada. Adopting these financial parameters as "targets" for a Canadian utility then makes no sense, since as the Moody's weights make clear the most important factor is the regulatory environment.

Q. HAVE CANADIAN REGULATORS CONFIRMED THIS?

A. Yes. The Board of Commissioners of Newfoundland and Labrador commented on Ms. McShane use of US "comparables" and stated (decision page 17)

The Board believes that, in this type of analysis, it is not enough that the chosen comparables are the best available. If this data is to be relied on it must be shown to be a reasonable proxy or that reasonable adjustments can be made to account for differences. The evidence showed significant differences in virtually all of the comparables including significant levels of non-regulated and non-utility business as well as riskier generation projects, earnings volatility, more competition and less regulatory support. While it was argued that, on balance, the U.S. comparables are reasonable proxies the Board notes the overwhelming evidence of a lack of balance as it was clear that on almost every measure Newfoundland Power would have to be considered less risky than the U.S. comparables. The Board heard evidence that the rating agencies consider U.S. companies to be peers for Newfoundland Power but the Board does not conclude from this that they are the same. Moody's comments acknowledge the differences in operations in the U.S. and Canada:

> *"NPI's Baaa1 issuer rating reflects the fact that the company's operations are exclusively based in Canada, a jurisdiction where regulatory and business environments in general are relatively more supportive than those of other international jurisdictions such as the United States, in Moody's view."* (Application, 1st Revision, Exhibit 4 - Moody's Credit Opinion, August 3, 2009)

As the Newfoundland decision clearly states, it is not enough that US utilities be used simply because there are not enough Canadian ones available: comparables have to be the same to be used without any adjustment. And here the Board found "overwhelming" evidence that Ms. McShane's sample of US utilities were riskier on almost every measure than Newfoundland Power, which it regarded as an average risk Canadian utility.

Also the BCUC (decision page 52) commented on Ms. McShane's use of US comparables and while they felt they were useful, where no Canadian data was available, they also stated

> The Commission Panel agrees with Dr Booth that "significant risk adjustments" to US utility data are required in this instance to recognize the fact that TGI possesses a full array of deferral mechanisms which give it more certainty that it will, in the short-term, earn its allowed return than the *Value Line* US natural gas LDCs enjoy. The Commission Panel notes Dr. Booth's suggestion that the risk premium required by US utilities is between 90 and 100 basis points more than utilities in Canada require may set an upper limit on the necessary adjustment. Accordingly, the Commission Panel will reduce its DCF estimate by between 50 and 100 basis points to a range of 9.0 percent to 10.0 percent, before any allowance for financing flexibility.

The decisions of both the BCUC and the Board of Commissioners of Newfoundland and Labrador indciate that Ms. McShane's sample of US "comparables" can not be used as a benchmark for a Canadian utility's fair ROE without making significant adjustments.

Q. WHY WOULD YOU JUDGE US UTILITIES TO WARRANT 90-100 BPS HIGHER ROE?

A. If the US market risk premium is 1.0% higher than in Canada, and US and Canadian utilities had equal relative risk coefficients of 0.50 then that would warrant a 0.50% difference in their ROEs. When this is added to the 0.50% higher long Treasury yield (compared to LTC Canada yield) then you have a 1.0% difference in the fair rate of return. If in addition the relative risk coefficient of US utilities is higher than the 0.50 I am using for Canada, then the difference in the fair ROE between Canadian and US utilities would be significantly greater than 1.0%. Hence I would regard 90-100 bps as a lower bound as the true difference could be much greater.

In addition I should point out that Ms. McShane's estimation procedures over-estimate the fair rate of return for US utilities. Note that in her Schedules 6-8 she estimates the fair rate of return using a discounted cash flow (DCF) model. This model takes the current dividend yield, increases it for growth and then adds a growth forecast as she explains on page 26 of her testimony. The only problem is that she relies on IBES or analyst growth forecasts which are known to be biased high. For example, in Schedule 6 she uses an average growth forecast of 5.80%, which exceeds the long run nominal growth rate for the US economy. Extrapolating this growth forecast to infinity, as is assumed in her model, would result in all economic activity in the US ultimately being electric utilities. Although she modifies this model in the subsequent tables the high growth forecast still affects her estimates.

It is well accepted that analyst growth forecasts tend to be biased high. For example, recently Easton and Sommers[29] have documented the size of the analyst bias at 2.84% and in their conclusions (page 1012) state:

> We show that, on average, the difference between the estimate of the expected rate of return based on analysts' earnings forecasts and the estimate based on current earnings realizations is 2.84%. When estimates of the expected rate of return in the extant literature are adjusted to remove the effect of optimistic bias in analysts' forecasts, the equally weighted estimate of the equity risk premium appears to be close to zero. We show, however, when estimates are based on value-weighted analyses, the bias in the estimate of the expected rate of return is lower and the estimate of the expected equity premium is more reasonable, 4.43%.

Easton and Sommers also state (page 986)

> Our estimate of the implied expected rate of return on the market from the value-weighted regression, after removing the effect of bias in analysts' forecasts, is 9.67% with an implied equity risk premium of 4.43%. Of course, this estimate of the equity risk premium is more reasonable than that obtained when all observations have equal weight.[8]

Of importance is that their estimate of the US market risk premium of 4.43% is marginally below my own estimate.

This optimism in analyst forecasts has been accepted by other regulatory bodies such as the Alberta EUB when it stated (Decision U99113, page 49)

> "Both the IAT and ATCO used forward-looking estimates of investor expectations. ATCO utilized IBES investor surveys, which the Board considers overly optimistic."

The well documented optimism bias of analyst forecasts clearly biases Ms. McShane's DCF estimates if growth is estimated using these optimistic analyst forecasts without any adjustments.

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[29] "Effect of analyst's optimism on estimates of the expected rate of return implied by earnings forecasts, Journal of Accounting Research, 45-5, December 2007.

As a result estimates which I would expect to be higher than those for Canadian utilities are even higher given Ms. McShane's estimation technique.

V. MARITIME ELECTRIC'S RISK

Q. WHERE WOULD YOU PLACE MEC RELATIVE TO YOUR BENCHMARK UTILITY?

A. MEC is largely an electricity distribution company with very limited generation capacity. Most of MEC's power comes from long term contracts with NB Power and the Point Lepreu nuclear plant with limited on-Island generation. It is the refurbishment of the Point Lepreu plant that has caused the most short term problems for MEC, since the replacement power has increased MEC's costs and the balance in the deferral account for future recovery from customers. Currently of the amounts in the energy cost adjustment account (ECAM), fully $23.5 million relates to these replacement energy costs with $20.7 million being due to normal operation. And these amounts are expected to increase before MEC can obtain its share of Point Lepreu's generation when that facility comes back online in 2011.

For a relatively small utility the amounts built up in the ECAM are the greatest short term risk since they affect the company's short term cash flow and are relatively large amounts to recover from rate payers. However, two factors mitigate this risk. The first is that the province is very aware of the build up and is supportive in resolving the issue. Second the company's proposal to add them to the cost of the refurbishment of Point Lepreu makes sense since it will spread the costs over the 25 year expected life of the refurbishment so that all future users of electricity on the Island pay the full cost of the refurbishment. Even though this stretches the "matching" principle, the extraordinary nature of the costs justifies this action. My only concern is that the cost of financing these deferrals will be the cost of capital, rather than the short term borrowing cost. Regardless I do not see these costs as a risk factor.

What makes MEC a low risk utility is that it is the monopoly provider on PEI and the Island is itself relatively low risk without significant exposure to a single resource, unlike Newfoundland. As S&P notes MEC has a "strong business risk profile,.... a mature, but stable economy with relatively low growth rates." The only weakness for MEC is its relatively small size which restricts market access, but it has structured its finances to enhance its liquidity position. Overall I see MEC as a typical low risk Canadian utility, while its issuer cost rating is BBB+ the fact it

issues secured debt makes this rating meaningless; what matters most is the A rating on its secured debt since this is its main source of financing.

Q. WHAT IS YOUR OVERALL RECOMMENDATION?

A. Given that MEC is a relatively small utility I would recommend 25 bps over my benchmark ROE recommendation or 8.0%, while in the short run I would recommend it maintain its 40% legislated common equity ratio. As the amounts in the ECAM are disposed of and the financial markets are clearly settled, the legislated common equity ratio can be revisited.

Q. DOES THAT CONCLUDE YOUR TESTIMONY?

A. Yes.

SCHEDULE 1

	Unemployment Rate	Real Growth	CPI Inflation	T Bill Yield	Canada Yield	FX Rate US$	Average ROE
1987	8.81	4.25	4.42	8.17	9.93	0.75	11.19
1988	7.77	4.97	3.94	9.42	10.23	0.81	12.69
1989	7.58	2.62	5.06	12.02	9.92	0.84	11.47
1990	8.16	0.19	4.81	12.81	10.81	0.86	7.57
1991	10.32	-2.09	5.61	8.83	9.81	0.87	3.87
1992	11.24	0.88	1.45	6.51	8.77	0.83	1.69
1993	11.42	2.34	1.90	4.93	7.88	0.78	3.81
1994	10.43	4.80	0.12	5.42	8.58	0.73	6.7
1995	9.54	2.81	2.22	6.98	8.35	0.73	9.77
1996	9.73	1.62	1.48	4.31	7.54	0.73	10.35
1997	9.16	4.23	1.69	3.21	6.47	0.72	10.93
1998	8.35	4.10	1.00	4.74	5.45	0.67	8.78
1999	7.58	5.53	1.75	4.70	5.68	0.67	9.88
2000	6.85	5.23	2.69	5.48	5.92	0.67	10.93
2001	7.23	1.78	2.52	3.85	5.79	0.67	7.42
2002	7.66	2.92	2.25	2.57	5.67	0.65	5.67
2003	7.61	1.88	2.80	2.87	5.29	0.72	9.64
2004	7.18	3.12	1.85	2.27	5.08	0.77	11.63
2005	6.77	2.85	2.21	2.71	4.41	0.83	12.7
2006	6.32	2.53	2.00	4.02	4.29	0.88	13.95
2007	6.03	2.50	2.14	4.17	4.32	0.94	12.94
2008	6.15	0.41	2.37	2.62	4.06	0.94	10.39
2009	8.23	-2.64	0.30	0.40	3.85	0.88	9.17
Cansim	V13682111	v1992067	v41690973	V122484	V122501	V37426	V634672/V634628

SCHEDULE 2

CANADA BOND YIELDS

Overnight money market rates		0.25
Benchmark bonds		
Canada	91 day Treasury Bill yield	0.39
Canada	Six month Treasury Bills	0.72
Canada	One year Treasury Bills	1.29
Canada	Two year	1.72
Canada	Three year	2.24
Canada	Five year	2.83
Canada	Seven year	3.05
Canada	Ten year	3.54
Canada	Long term (30 year)	3.93
Canada	Real return bonds	1.47
Marketable Bond Average yields		
Canada	1-3 year	1.65
Canada	3-5 year	2.55
Canada	5-10	3.15
Canada	Over tens	3.85

Source: Bank of Canada's web site at http://bankofcanada.ca/en/securities.htm, for April 28-May 4, 2010.

SCHEDULE 3

Earned UHC ROEs

	CU Ltd	Emera	Enbridge	Fortis	GMI	PNG	Terasen	TransAlta	TCPL	Mainline	Foothills	Canada
1993	13.37	12.02	17.53	11.84	19.29	12.92	10.82	16.00	14.01	12.31	11.73	3.81
1994	13.71	11.90	9.59	10.71	19.73	13.44	7.24	15.10	12.86	11.16	11.5	6.70
1995	14.12	11.55	16.91	10.74	19.50	11.77	8.51	14.00	13.20	12.56	12.25	9.77
1996	14.86	10.59	14.47	9.61	19.91	13.32	17.59	13.24	12.33	11.83	11.25	10.35
1997	14.87	10.56	14.04	9.43	18.91	13.32	8.34	12.84	11.25	11.15	10.67	10.93
1998	14.75	9.47	13.25	7.16	19.11	10.14	12.09	16.41	7.04	10.63	10.21	8.78
1999	14.54	10.83	13.35	8.56	17.66	10.79	13.35	4.88	7.42	9.64	9.58	9.88
2000	15.44	10.88	15.65	9.71	17.93	9.75	15.16	8.14	8.44	9.99	9.9	10.93
2001	14.96	10.58	14.90	12.25	17.45	7.50	10.26	7.23	10.89	10.01	9.61	7.42
2002	17.56	6.65	10.11	12.24	18.91	5.94	9.59	2.31	11.93	9.95	9.53	5.67
2003	13.71	9.77	17.31	12.28	18.05	7.59		8.67	12.80	10.18	9.79	9.64
2004	15.19	9.80	16.43	11.25	18.21	6.97		5.97	15.49	10.18	9.56	11.63
2005	12.24	9.03	13.90	12.39	16.94	8.34		7.45	17.56	9.66	9.46	12.70
2006	14.24	9.07	14.26	11.83	15.80	5.86		1.81	14.10	8.92	8.88	13.95
2007	15.96	10.93	14.53	9.96	13.31	5.00		13.07	13.99	9.13	8.46	12.94
2008	15.67	9.92	22.69	8.68	16.57	6.79		9.77	12.70		8.71	10.39
STDEV	1.21	1.32	3.04	1.59	1.71	2.97	3.28	4.72	2.80	1.10	1.12	2.72
Ratio	0.44	0.48	1.12	0.59	0.63	1.09	1.20	1.73	1.03	0.40	0.41	
Beta	-0.03	-0.06	0.20	-0.09	-0.38	-0.41	0.41	-0.51	0.24	-0.22	-0.21	

Ratio is the simple ratio of the standard deviation of the utility holding company (UHC) ROE to that of Corporate Canada
Beta is the regression coefficient of the Utility ROE against that of Corporate Canada.

SCHEDULE 4

Stock Market Betas

	CUL	EMERA	Enbridge	Fortis	GMI	PNG	Terasen	TRP	Ft Chicago	TransAlta	Utility beta
12/31/1985	0.60			0.66	0.29	0.55	0.21	0.79		0.62	0.51
12/31/1986	0.61			0.52		0.38	0.14	0.85		0.53	0.50
12/31/1987	0.32			0.25		0.46	0.47	0.59		0.22	0.42
12/30/1988	0.36			0.30		0.45	0.52	0.63		0.20	0.45
12/29/1989	0.36			0.25		0.42	0.56	0.60		0.22	0.44
12/31/1990	0.37			0.21		0.47	0.56	0.59		0.27	0.44
12/31/1991	0.38			0.25		0.46	0.54	0.54		0.28	0.43
12/31/1992	0.50			0.38		0.35	0.47	0.55		0.40	0.45
12/31/1993	0.58		0.39	0.37		0.56	0.47	0.45		0.47	0.47
12/30/1994	0.61	0.54	0.54	0.45		0.45	0.60	0.58		0.56	0.54
12/29/1995	0.49	0.54	0.48	0.51	0.47	0.45	0.63	0.53		0.58	0.51
12/31/1996	0.49	0.51	0.50	0.38	0.48	0.29	0.57	0.48		0.57	0.46
12/31/1997	0.61	0.40	0.44	0.31	0.38	0.44	0.48	0.34		0.46	0.43
12/31/1998	0.57	0.56	0.47	0.49	0.37	0.59	0.46	0.56		0.53	0.51
12/31/1999	0.54	0.43	0.25	0.34	0.20	0.52	0.33	0.25		0.27	0.36
12/29/2000	0.38	0.29	0.07	0.24	0.18	0.49	0.23	0.18	0.24	0.07	0.26
12/31/2001	0.28	0.22	-0.10	0.16	0.11	0.45	0.16	-0.05	0.14	0.08	0.15
12/31/2002	0.24	0.17	-0.18	0.15	0.08	0.47	0.10	-0.07	0.12	0.10	0.12
12/31/2003	0.14	-0.05	-0.40	-0.04	0.01	0.36	0.01	-0.42	-0.04	-0.06	-0.05
12/31/2004	0.13	-0.01	-0.31	0.03	0.15	0.46		-0.21	0.05	0.14	0.04
12/30/2005	0.23	0.06	-0.18	0.22	0.19	0.48		-0.18	0.16	0.41	0.12
12/29/2006	0.34	0.08	0.21	0.48	0.43	0.51		0.29	0.34	0.41	0.33
12/31/2007	0.45	0.21	0.53	0.62	0.78	0.24		0.47	0.34	0.48	0.45
12/31/2008	0.06	0.11	0.30	0.17	0.45	0.20		0.34	0.42	0.86	0.26

SCHEDULE 5

	Energy	materials	Industrials	Con Disc	Cons Staple	Health	Financials	IT	Telco	Utilities
1992	0.47	1.17	1.29	1.04	0.88	1.07	1.14	0.83	0.51	0.72
1993	0.70	1.24	1.22	0.98	0.78	0.78	1.18	0.84	0.50	0.55
1994	0.68	1.27	1.15	0.92	0.76	0.85	1.14	1.11	0.58	0.63
1995	0.93	1.41	1.19	0.82	0.68	0.36	0.92	1.25	0.53	0.67
1996	0.93	1.28	1.10	0.83	0.66	0.39	1.02	1.36	0.61	0.65
1997	0.98	1.33	0.97	0.82	0.62	0.60	0.93	1.56	0.62	0.53
1998	0.85	1.12	0.94	0.80	0.60	1.02	1.11	1.40	0.92	0.55
1999	0.91	1.04	0.78	0.73	0.43	1.00	1.00	1.55	1.11	0.30
2000	0.67	0.74	0.73	0.69	0.23	1.10	0.79	1.78	0.92	0.14
2001	0.50	0.60	0.82	0.68	0.10	0.98	0.67	2.12	0.94	-0.03
2002	0.43	0.57	0.86	0.73	0.11	0.99	0.67	2.27	0.92	-0.06
2003	0.27	0.43	0.91	0.74	-0.04	0.85	0.39	2.75	0.82	-0.26
2004	0.17	0.42	1.04	0.81	-0.02	0.84	0.41	2.89	0.55	-0.14
2005	0.48	0.78	1.12	0.84	0.14	0.74	0.58	2.71	0.71	-0.01
2006	1.01	1.34	1.05	0.87	0.48	0.88	0.70	2.14	0.49	0.24
2007	1.41	1.47	0.95	0.74	0.54	0.56	0.55	1.22	0.59	0.44
2008	1.42	1.36	0.79	0.59	0.32	0.64	0.58	1.49	0.53	0.43

APPENDIX B

ESTIMATION OF THE MARKET RISK PREMIUM

Introduction

In this appendix I estimate the market risk premium by examining realised rates of return on different broad classes of securities over long periods of time.[1] The reason for doing this is that if the underlying relationship generating these returns has remained reasonably constant then these realised returns can be used as a forecast of the market's future requirements. The difference between these returns is then commonly used as an estimate of the market risk premium. In analysing the actual data, however, we first need to be aware of some estimation problems and the impact of changes that have occurred in the markets.

Different Risk Premium Estimation Procedures

Suppose an investor puts $1,000 into an investment. If the investment doubles, i.e., a 100% return, to $2,000 and then halves, i.e., a -50% return, to $1,000, we can calculate two rates of return. The ***arithmetic*** rate of return would be 25% i.e., the average of +100% and -50%. The arithmetic rate of return is the average of the two per period rates of return. However, it would be difficult to convince an investor, who after two years only has the same $1,000 that he started with, that he has earned an average rate of return of 25%. Quite obviously, the investor is no better off at the end of the two periods than he was at the start! To counterbalance this potentially misleading statistic, most mutual funds advertise geometric or ***compound*** rates of return. This compound rate of return is often called the true rate of return. It is calculated as the nth root of the terminal value divided by the initial value, minus one. In our case, there are two periods, so that n=2 and the compound rate of return is calculated as $(1/1)^{1/2}$ which is 1, indicating a zero rate of return. This gives the common sense

[1] This appendix covers similar material to that covered in Laurence Booth "Equities Over Bonds: But By How Much?" Canadian Investment Review, Spring 1995 and "Equity Risk Premiums in the US and Canada," *Canadian Investment Review* (Spring 2001). The latter paper is available for download from Professor Booth's web site http://www.rotman.utoronto.ca/~booth

solution that if you started and finished with $1,000, then your rate of return is zero.

Both the arithmetic and compound rates of return are normally calculated when evaluating investments. If we need the best estimate of *next* period's rate of return, this is the arithmetic return. If we need the best estimate of the return over several periods, the arithmetic return becomes less useful and more emphasis is placed on the compound return. If we want the best estimate of the annual rate of return earned over a long period of time, this is the compound rate of return, since this indicates the long run expected change in wealth. Moreover, if we ignore intervening periods, then the arithmetic return over a very long period is the compound rate of return, that is, the difference between the arithmetic and compound returns is essentially the definition of the period over which the investment is held.

What causes the two rates of return to differ is the uncertainty in the per period arithmetic rates of return. If the arithmetic rate of return is constant, then both rates of return are identical. However, the more uncertain the arithmetic rate of return, the larger the discrepancy between the two estimates. For instantaneous rates of return the following equation approximately describes their relationship:

$$\textit{Compound rate of return} = \textit{Arithmetic return} - (var/2)$$

In the previous example, there is a large amount of uncertainty, that is, high variance (var), so that the difference between the arithmetic return and the geometric return is very large. Moreover, as we estimate over a longer and longer period, the estimated compound rate of return earned on an investment approaches that of the compound return. In estimating the market risk premium, I believe that the correct time period for calculating arithmetic rates of return is a **one**-year holding period. The reason for this is primarily because most regulated firms are regulated on the basis of annual rates of return and rates are almost always expressed as annual percentages.

In addition to the arithmetic and compound rates of return I also estimate the arithmetic rate of return by means of an ***ordinary least squares*** regression model. This is a statistical technique that estimates

the annual rate of return by minimising the deviations of the annual values around the estimate. Ordinary least squares (OLS) is the standard technique for estimating economic models and is commonly used for estimating other annual growth rates, such as the growth rate in dividend growth models.

Relevant Time Period

There is a problem in estimating the market risk premium over a short period of time, since the stage in the business cycle will bias the results. For example, if the period is restricted to end in a bull market, the recent realised returns will be high, raising the overall realised risk premium. This 'business cycle' problem is well known in comparable earnings tests, but it is also evident in realised risk premium tests. In particular, it makes the use of the compound rate of return estimated over short periods suspect. This timing problem is also evident in analysing bond returns, since bond returns vary inversely with interest rates. This means that estimating a bond return over a period when interest rates have been increasing tends to understate the bond investor's expected rate of return. This is because the realised rate of return will be lower than expected, because of the losses caused by increasing interest rates. This in turn will overstate any estimate of the market risk premium. Conversely, estimating bond returns over a period of declining interest rates will have the reverse effect, as capital gains will cause the realised rate of return to exceed that expected. It is important therefore, to capture a full interest rate cycle; otherwise realised rates of return may not be valid predictors of the market risk premium

In Schedule 1 are the results of a study of realised Canadian risk premiums over the longest time period for which there is data available. The data is taken from an annual "Report on Canadian Economic Statistics, 1924-2009," March 2010, compiled on behalf of the Canadian Institute of Actuaries. Over the entire period an investment in equities would have earned an average total rate of return of ***10.37%*** using the OLS estimate, ***9.91%*** using the geometric mean estimate, and ***11.59%*** using the arithmetic return estimate. The corresponding return estimates for the long Canada bond are **5.73%**, ***6.09%*** and **6.43%**, producing corresponding **market risk premium estimates of 4.*63*%,**

3.83% and 5.*16*%.

The standard deviations for the equity and Canada bond returns were 18.7% and 8.7% respectively, indicating the higher average risk of equities than bonds. Consequently, there is a larger difference between the arithmetic and geometric returns for equities than bonds. For example half the equity return variance (of 0.187^2 or 3.49%) is 1.75%, which is approximately the 1.68% difference between the arithmetic and geometric return estimates. For bonds half the variance is 0.38%, which is again approximately the difference between the arithmetic and geometric bond returns.

To determine whether or not these realised risk premium estimates are **unbiased**, we can graph the yields on 91 day Treasury Bills, long Canadas and the CPI inflation rate. From the graph in Schedule 2 we can see that the yields on T. Bills and long Canadas were very stable from 1936, despite an extremely volatile inflation rate. During this period fixed income investors were not able to adjust their yields since interest rates were effectively controlled. Then about 1950, yields started to trend upwards with the rate of inflation, as well as becoming more volatile, as the bond market was decontrolled. Interest rates then peaked in the early 1980s before beginning a long period of declining rates that ended in the mid 1990s.

What the graph vividly shows is that the behaviour of interest rates has not been constant over the full period 1924-2009. For this reason, Schedule 1 also includes rate of return estimates for two sub-periods from 1924-1956 and for 1957-2009. For the earlier period the market risk premium estimate is 4.66%, 6.82% and 8.85% for the OLS, geometric and arithmetic returns respectively. For 1957-2009 the corresponding estimates are 1.64%, 1.94% and 2.87%, indicating a significant difference over the two periods. Also note that the standard deviation of the equity series declined from 21.25% for the earlier period to 16.74% for the latter period, indicating a slight decrease in equity market risk. In contrast, the standard deviation of the long Canada bond returns increased from 5.20% to 10.08%, indicating the dramatic post war increase in volatility in the long-term bond market as the tools of Canadian monetary policy changed.

Evolution of Canadian Monetary Policy

Prior to the early 1950's interest rates were controlled to stimulate the economy and did not vary very much, partly because the Canadian markets were very illiquid. It was not until the 1953-4 reforms introduced by the Bank of Canada, that an active secondary market in shorter-term Canada bonds even developed. Prior to that period the tools of Canadian monetary policy were primitive. It is quite obvious from the graph in Schedule 2 that the long Canada yield pattern changed in the early 1950's, as these changes in the Canadian markets were introduced. After being stable at around 3% from 1936-1955, long yields, in particular, started edging upwards.

Note also that since the reforms of 1953-4, the volatility of yields has increased. Part of the reason for this is that in the earlier period the realised rate of inflation was between around 2.0%, whereas in the latter period it has been twice that at around 4.0%.. Fixed income securities are more sensitive to inflation, since their coupons by definition are fixed. As a result their real return varies with the level of inflation. The volatility of inflation and the changed nature of monetary policy is most evident in the behaviour of Treasury bill yields. The yield on 91 day T. Bills became increasingly volatile after the 1953-4 reforms, reaching record highs of over 20% for a short period in 1981. This increase in Treasury Bill return volatility from 0.57% in the earlier period to 3.91% in the latter period mirrors that of long Canadas. Essentially, between these two periods the risk of investing in long Canadas effectively doubled.

From 1950 until 1981 the trend in long Canada yields was upwards. This means that investors in long Canada bonds suffered losses as the prices of their existing bonds (with low interest rates) dropped in comparison to the newer bonds being issued at ever increasing yields. As a result, the returns from holding long Canada bonds **understated** what investors expected to earn, causing biased high estimates of the market risk premium. This overestimation peaked in 1981 as losses from holding long Canada bonds peaked. After that point, long Canada yields decreased causing huge capital gains. As a result, the investor's expected return for long Canada bonds is **overstated** by looking at realised returns, which causes a downward bias to the estimated market risk premium.

These changes have clearly affected the relative riskiness of debt versus equity securities. One way of estimating this is to look at the variability of the equity return divided by that on long Canadas. This is shown in the graph in Schedule 3, where variability is the standard deviation of returns over the prior ten-year period. In the earlier periods, equities were four or five times as risky as bonds, since from the earlier interest rate graph we know that bond yields and thus bond prices were quite stable. However, this relationship changed during the period of interest rate volatility in the 1970s and 1980s when equities were only slightly more risky than the bond market. As a result the equity risk premium was squeezed. More recently as the yields on long Canada bonds have stabalised, the risk in the bond market has declined and the riskiness of equities relative to bonds has increased. By the end of the period equity risk had increased to triple that of the bond market, significantly more than for the period of the 1980s and 1990s, when equity market risk barely exceeded that in the bond market.

Market Risk Premium Estimates Going Forward and Backwards

In Schedule 1 market risk premium is estimated as the difference between the estimated return on equities and on long Canada bonds over a particular period. An alternative is to estimate it each year, which is what is done in Schedule 4. Starting in 1924-1928 the realised market risk premium is estimated using each of the three techniques and then updated each year with the new data. In this way it captures the "learning" that goes on form 1924. The instability in the 1920s is evident: as the estimates are very high, due to the strong equity markets in the 1920's, and then in the 1930s it declines precipitously as a result of the great stock market crash. However, the market risk premium stabilises by the late 1950s, and then begins its long gradual decrease as a result of the structural changes referred to above. Note that with almost ninety years of data, the impact of any one-year is now very small and the market risk premium is "stuck" around 5.0%. However, it is apparent that the realised market risk premium has been **declining** almost continuously since the mid 1960's as the importance of the prewar period gets smaller and smaller.

An alternative is to work backwards, that is, start in the five-year period 2003-2009 and then go back in time, which is the grapph in Schedule 5. In this way we capture what current market participants have experienced. Note that whereas the previous graph always includes the period 1924-1928, this graph always includes the most recent five year period. In this case the last five years includes the recent stock market crash and recovery. However, as we work back through time and add in progressively older data the influence of the recent market volatility recedes and once we get back to the 1950's we finally get a market risk premium above 4.0%. However, this graph illustrates why current market participants generally assess the risk premium of equities over bonds as lower than 5.0%, since this is what they have experienced.

In Schedule 6 is the earned risk premium (using arithmetic returns) for various holding periods. If we look at the last row we have the earned risk premium for various start dates finishing in 2009, this is essentially a subset of the data graphed in Schedule 5. Note for example, that the most recent ten-year period has an earned risk premium of 0.16%, as this period goes back successively by adding an extra ten years of data the earned risk premium drops and then increases until for the sixty year period 1950-2009 it reaches 5.0%.

Changes in the Market Risk Premium

The fact that estimates of the market risk premium change over time indicates that some adjustments are in order. In my judgement the riskiness of the equity market is relatively stable. In fact, going back as far as 1871, there is substantial evidence that the real return on US equities has been constant at just under 9.0%.[2] However, there is ***no*** support for the assumption that either bond market risk or average bond market returns have been constant. As Schedule 1 shows, from 1924-1956, there was very little movement in nominal interest rates, as monetary policy was subordinate to fiscal policy. As a result, the standard deviation of annual bond market returns was only 5.20%. In contrast from 1956-2007, monetary policy became progressively more important and interest rates much more volatile. As a result, the standard deviation of the returns from holding the long Canada bond

[2] See Laurence Booth, "Estimating the Equity Risk Premium and Equity Costs: New Ways of Looking at Old Data", *Journal of Applied Corporate Finance*, Spring 1999.

increased substantially. ***Effectively bond market risk doubled, while equity market risk was much the same.***

However, what is crucial for the investor is whether this risk is diversifiable, that is, is the bond market beta or risk positive? In Schedule 7 I show that the Canadian bond market beta was very large during the period since 1991 until the early 2000's. This was the period when governments had severe financing problems and flooded the market with government debt. This caused both the bond and equity markets to partly be moved by a common factor: interest rates. This is why adding long Canada bonds to an equity portfolio during the 1990's did not reduce portfolio risk to the extent that it did in the 1950's and more recently.

Schedule 7 shows that the beta on the long Canada bond was close to zero until the late 1980s; then increased dramatically peaking at almost 0.60 before receding to normal. It was this increase in bond market risk that caused risk premiums to shrink throughout the 1990's. In fact it is quite clear that with a Canada bond beta of say 0.50, a low risk utility in the mid 1990s did not require a significant risk premium. This conclusion was reinforced by the observation that the Canada bond income (interest) is fully taxed, whereas the utility income would predominantly come as dividend income, which is preferred by every taxable investor in Canada.

In Schedule 8 are the results of a regression analysis of the real Canada bond yield against various independent variables. The real Canada yield is defined as the nominal yield reported by the Canadian Institute of Actuaries minus the average CPI rate of inflation, calculated as the average of the current, past and forward year rates of inflation. The regression model explains a large amount of the variation in real Canada yields, and four variables are highly significant. The two "dummy" variables represent unique periods of intervention in the financial markets. Dum1 is for the years from 1940-1951, which were the "war" years, when interest rates were controlled. The coefficient indicates that government controls reduced real Canada yields by about 5.4% below what they would otherwise have been. This of course was the objective of the war-time controls. Similarly, Dum2 is for the years 1972-1980, which were the oil crisis years, when huge amounts of "petrodollars" were

recycled from the suddenly rich OPEC countries back to western capital markets, where they essentially depressed real yields. The sign on Dum2 indicates that, but for this recycling, real yields would have been about 3.6% higher. These dummy variables are included because during these two periods real yields were depressed by special "international" factors.

The remaining two independent variables capture the risk and endemic problem of financing government expenditures. Risk is the standard deviation of the return on the long Canada bond over the preceding ten years. In earlier periods when monetary policy was not used, interest rates barely moved and the returns on long Canada bonds were very stable. As a result the risk of investing in them was very low. The coefficient on the bond risk variable indicates that for every 1% increase in volatility, real Canada yields increased by about 23 basis points. That is, the effective 5% increase in the standard deviation of bond market returns between the two periods 1924-1956 and 1957-2009 has been associated with about a 115 basis point increase in real Canada yields between these two periods. This is the extra risk premium required by investors to compensate for the higher risk attached to investing in long Canada bonds. Absent any increase in equity market risk, the result is a 115 basis point reduction in the market risk premium between the two periods.

The deficit variable is the total amount of government lending (from all levels of government) as a percentage of the gross domestic product. As governments increasingly ran deficits, this figure became a very large negative number, indicating increased government borrowing. For 1992, the number was about -9.1%, a record peacetime high, indicating that government net borrowing was 9.1% of GDP and was flooding the markets with Canada bonds. For 1997, this deficit turned into a surplus, which increased every year until 2000 when the surplus hit almost 3.0% of GDP. The coefficient in the model indicates that for every 1% increase in the aggregate government deficit, real Canada yields have increased by about 27 basis points. That is, increased government borrowing by competing for funds has driven up real interest rates. At the peak of the government's financing problems in 1992 a 9% deficit was adding almost 2.5% to the real Canada yield relative to what would be produced with a balanced budget. When these two effects are added together it is easy to see why there was very little "extra" risk for low risk equities over bonds in the early 1990s.

The effect of increased interest rate risk and government "over borrowing" are clearly two sides of the same coin. Their effect was to crowd the bond market with risky long Canada bonds that could only be sold at premium interest rates, frequently to non-residents. This driving up of Canada bond yields reduced the spread between Canada bond yields and equity required rates of return and the market risk premium. It is this deficit and risk phenomenon in the government bond market that created the narrowing market risk premium, and the large Canada bond betas in the mid 1990's.

In Schedule 8 is a graph of the real yield produced directly from the real return bond. Unfortunately this data is not available for earlier periods since these bonds did not exist. However, we can see directly the huge decline in the real yield over the last ten years as governments have got their budgets under control and uncertainty in the bond market has declined. For the period 1991-2000 the real yield was 4.0-4.5%, whereas more recently it has been 1.50-2.0% or a decline of 2.50% consistent with bond betas of 0.50 and a 5.0% true market risk premium.

In 1994 the National Energy Board introduced its formula ROE with a forecast long Canada yield of 9.25% and a utility risk premium of 3.0%. This allowed ROE then adjusted by 75% of the change in the forecast long Canada bond yield or conversely the utility risk premium changed by 25% of the change in the forecast long Canada bond yield. If the forecast long Canada bond yield is 4.25%, for arithmetic simplicity, then this 5.0% drop in the long Canada bond yield has increased the utility risk premium by 1.25%. With a utility beta of 0.50 this implies a 2.50% increase in the market risk premium since the early 1990s consistent with the low market risk premium during this period of fiscal deficits.

US Estimates

The Canadian data is one time series of equity and bond returns and reflects unique events that have happened in the Canadian capital markets, looking at US data we can assess whether these estimates are reasonable. The main source of this US data comes from the work of Ibbotson and Sinqufield, who calculated holding period return data from December 1925 for common equities,

long term US government bonds, treasury bills, and the consumer price index. Schedule 10 provides US estimates of the market risk premium along with the comparable Canadian estimates for the period 1926-2009.

Based on annual holding periods the US realised equity risk premium is slightly higher than the Canadian equivalent. Given the "higher" quality of the US data as well as the volatility of the estimates, many put greater faith in the US estimates, even for the Canadian market. This is also frequently justified by the doubt expressed at the "higher risk"[3] Canadian market having a lower realized market risk premium, as well as the increasing integration between the two capital markets, which "presumably" moves Canada closer to the US experience.

However, the difference between the US and Canadian AM market risk premium estimates of 1.07% (6.03%-4.96%) is split between a difference in the average equity return of 0.41% and a difference in the average government bond return of 0.66%, that is approximately a 60:40 bond market-equity market split. In explaining this note that:

- The difference between the equity market returns can partly be explained by the historic efforts of Canadian governments to deliberately segment the Canadian equity market from that in the US[4] as well as by the historically lower risk of the Canadian market.

- The difference in the returns on Canadian and US government bonds reflects the pivotal role of the US government bond market in the world capital market as the US $ has became the world's reserve currency. This importance was amplified yet again when the US government intervened in the Fall of 2008 to support the bonds issued by two US government mortgage agencies Fannie Mae and Freddie Mac, where a principal bond holder was the Government of China.

If we take the US equity market return as a better estimate of the "true" Canadian equity market return, now that most of the protectionist policies in Canada have receded, this would increase

[3] Note, however, that the standard deviation or variability of the S&P500 equity returns was 20.48% or 1.52% higher than that for the Canadian market. Over this whole period US equities were marginally ***more*** risky than Canadian equities.

[4] The dividend tax credit only applies to dividends from Canadian corporations; foreign withholding taxes apply to foreign source income, while portfolio restrictions have existed in tax-preferred plans.

the market risk premium estimate from 4.96% to 5.37%.

Finally we have to bear in mind that currently Canada is in a very favourable position and has been since the late 1990s when "government" moved into fiscal surplus. The favourable finances have resulted in low inflation and interest rates, and allowed the removal of the foreign property restriction on tax preferred investments that previously restricted foreign holdings to a maximum of 30%. We can see this in the graph of real interest rates in Canada and the US in Schedule 11. The US only recently introduced a real return bond (Treasury Inflation Indexed Securities or TIPs), so the series does not go back as far as that for the real return bond in Canada. However, it is clear that the yield on the Canada real return bond has consistently been 0.50% lower than the US TIPs yield. This is consistent with the emergence of Canada as a capital exporter and lower required returns in Canada. It also reinforces the obvious that there is no reason for the required returns on the same instrument to be the same in two different capital markets even if the markets are integrated.

Reasonableness of the Estimates

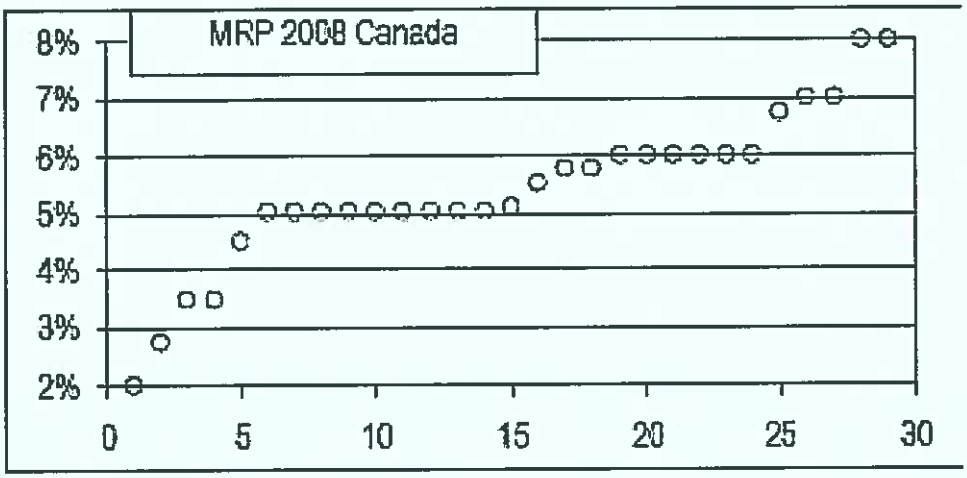
The prior statistical work indicates that the Canadian market risk premium was 5.16% for the period 1924-2009, 4.96% for the period 1926-2009, while that for the US was 6.03%. These estimates are consistent with the judgment of professionals in the area of capital markets. At the height of the financial crisis Professor Fernandez[5] surveyed finance professors around the world to find out what they used for the market risk premium. A key result is his table 2 reproduced below.

[5] Market risk premium used in 2008 by professors: a survey with 1,400 answers," April 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

This table confirms the results in Schedule 10 that the US market risk premium has averaged about 1.0% more than in Canada. Interestingly the median or middle person in the US (and Australia) thinks the market risk premium is 6.0%, in Europe 5.0%, in the UK 5.0% and in Canada 5.1%. The following table indicates the range of estimates for Canada.



As is clear most finance faculty in Canada think the market risk premium is either 5.0% or 6.0%. There are a few down at 2% or 3% and even two people up at 8.0%. However, what is absolutely clear is that my AM estimates are typical of estimates of Canadian faculty who work in the area and are not "low," quite the opposite they are consistent with professional judgement in Canada and the US.

Despite the fact that most recent estimates of the market risk premium in Canada since 1956, place the market risk premium at under 3.0%, I judge most of this to be the result of deficit financing induced problems in the bond market that caused very high bond yields in the 1970's and 1980's. I discount the current deficit problems in Canada since we will return to a balanced budget as the economy recovers. As a result my own estimate of the market risk premium is 5.00-5.25%. I increase this to 5.50% to reflect the survey results of Fernandez and to give weight to the evidence from the US. With a forecast long Canada bond yield of 4.5%, this means an overall market required return of 10%, or with 2.0% long run inflation, a real return of 8.0%[6] broadly consistent with long run experience.

[6] Note that from Schedule 1 since 1956 the real return on equities has been under 7.0%.

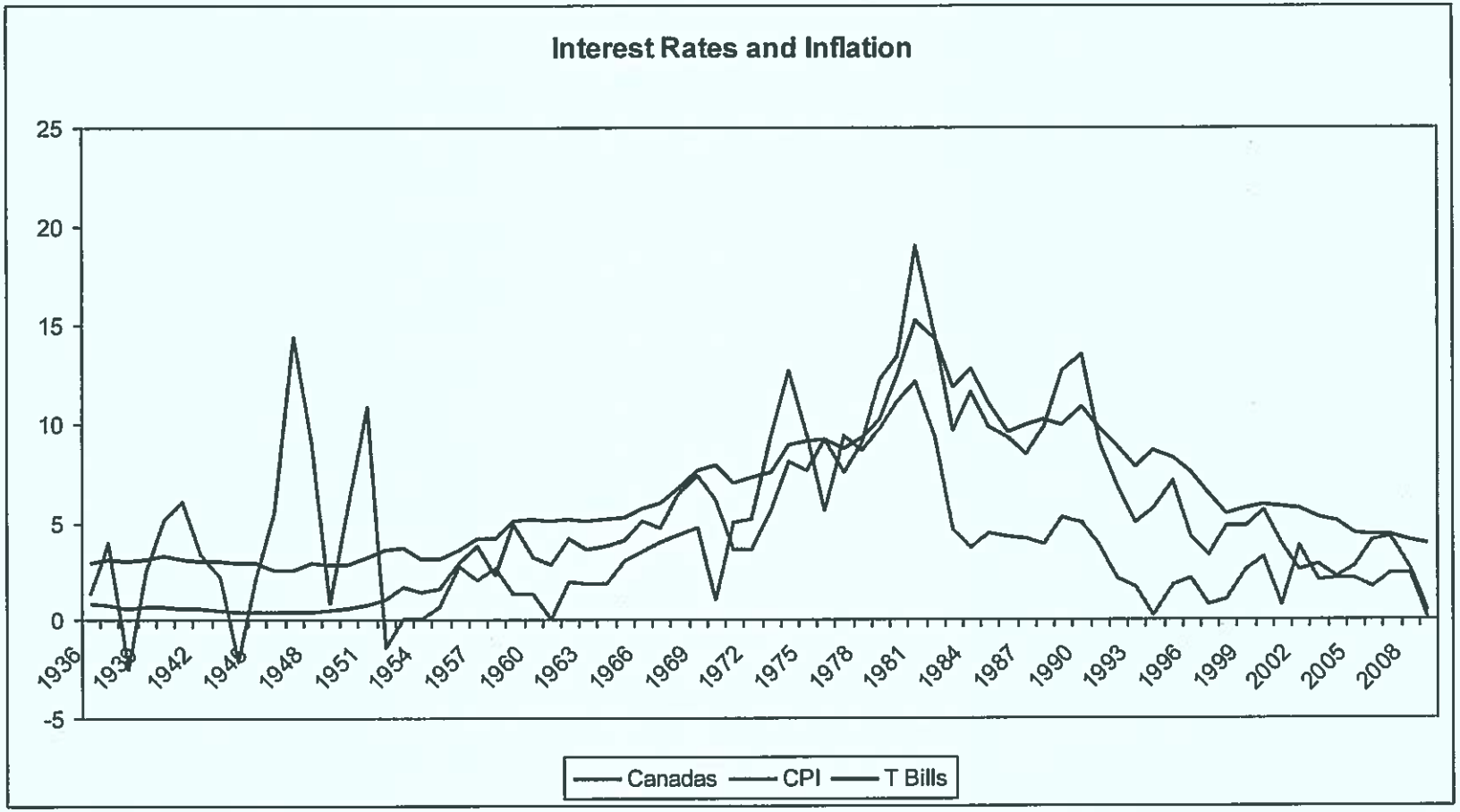
SCHEDULE 1

ESTIMATED ANNUAL RETURNS[1]

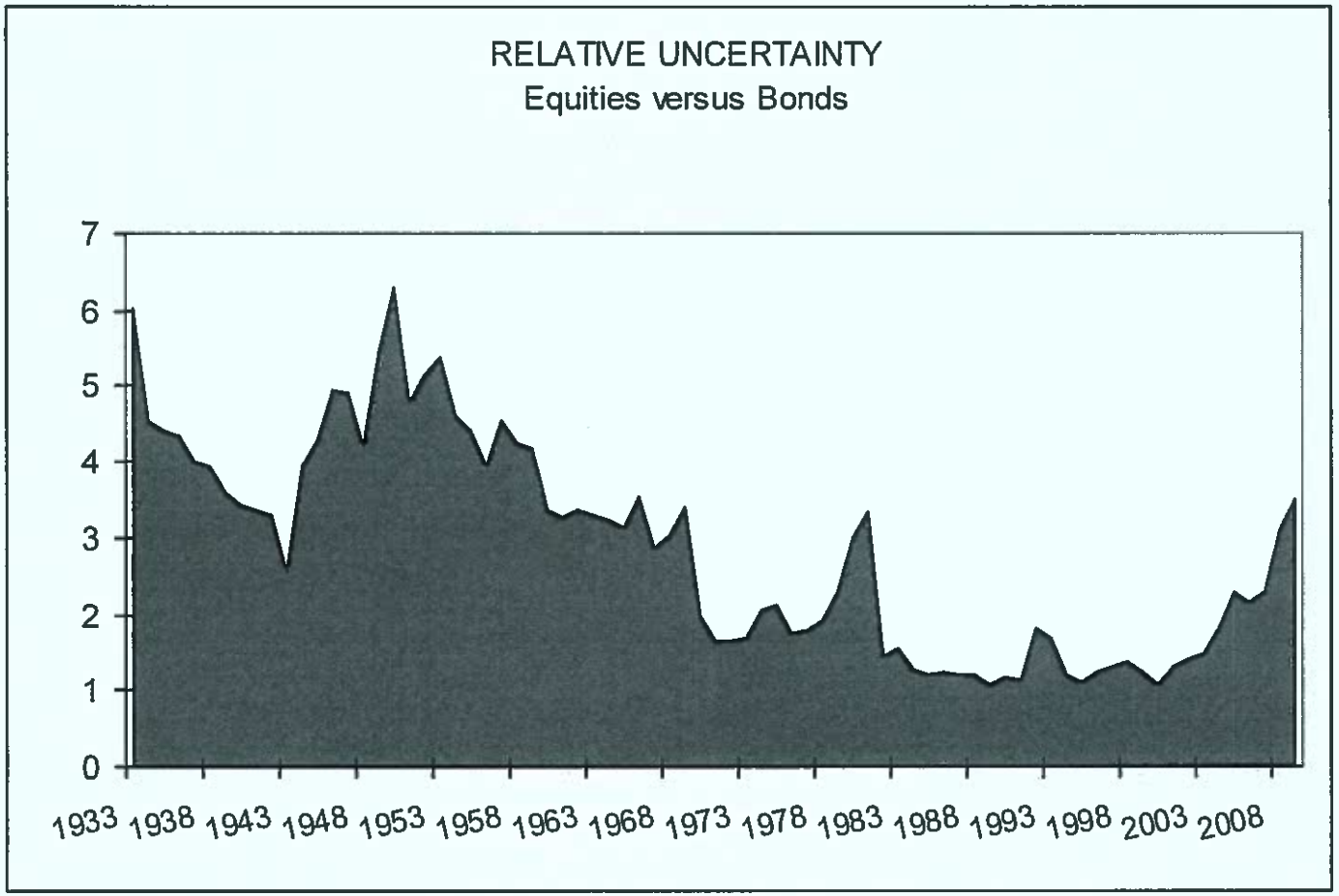
	OLS Estimate[2]	Arithmetic Mean	Geometric Mean	Standard Deviation
1924-2009				
CPI	3.83	3.06	2.98	4.05
Long Canadas	5.73	6.43	6.09	8.71
Equities	10.37	11.59	9.91	18.7
Treasury Bills	5.81	4.85	4.77	4.21
Excess Return over Bonds	***4.63***	***5.16***	***3.83***	
1924-1956				
CPI	1.85	2.18	1.41	4.80
Long Canadas	4.13	4.15	4.02	5.20
Equities	8.80	13.00	10.84	21.25
Treasury Bills	0.68	0.84	0.84	0.57
Excess Return over Bonds	***4.66***	***8.85***	***6.82***	
1957-2009				
CPI	4.78	4.01	3.97	3.13
Long Canada	8.63	7.84	7.39	10.08
Equities	10.27	10.71	9.34	16.74
Treasury Bills	7.81	6.59	6.59	3.91
Excess Return over bonds	***1.64***	***2.87***	***1.94***	

1. Using data from the Canadian Institute of Actuaries, "Report on Canadian Economic Statistics" March 2010.
2 OLS stands for the ordinary least squares regression estimate

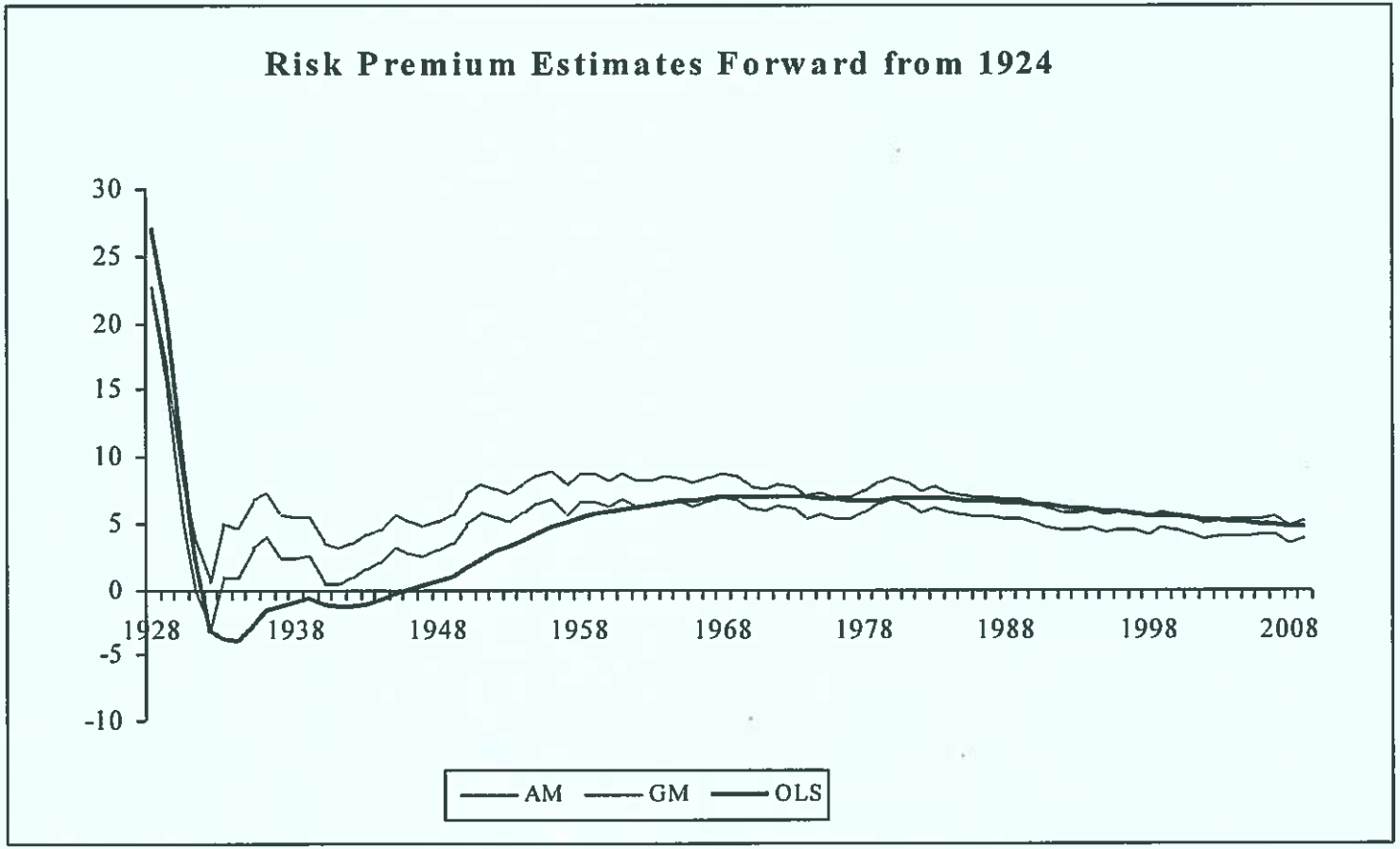
SCHEDULE 2


Interest Rates and Inflation
25
20
15
10
5
0
-5
1936
1939
1942
1945
1948
1951
1954
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
Canadas
CPI
T Bills

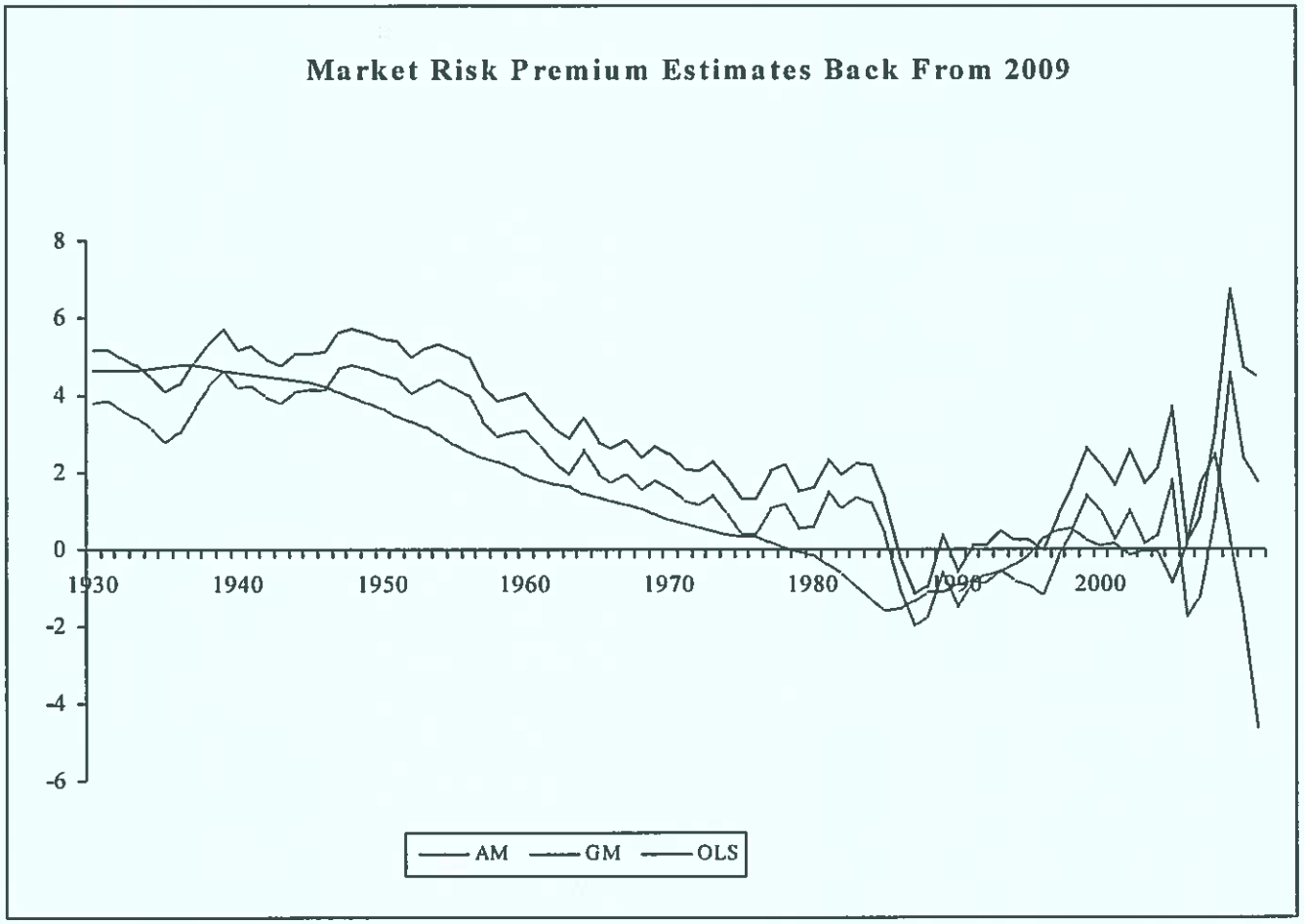
SCHEDULE 3


RELATIVE UNCERTAINTY
Equities versus Bonds
7
6
5
4
3
2
1
0
1933 1938 1943 1948 1953 1958 1963 1968 1973 1978 1983 1988 1993 1998 2003 2008

SCHEDULE 4


Risk Premium Estimates Forward from 1924
30
25
20
15
10
5
0
-5
-10
1928
1938
1948
1958
1968
1978
1988
1998
2008
AM
GM
OLS

SCHEDULE 5


Market Risk Premium Estimates Back From 2009
8
6
4
2
0
-2
-4
-6
1930
1940
1950
1960
1970
1980
1990
2000
AM
GM
OLS

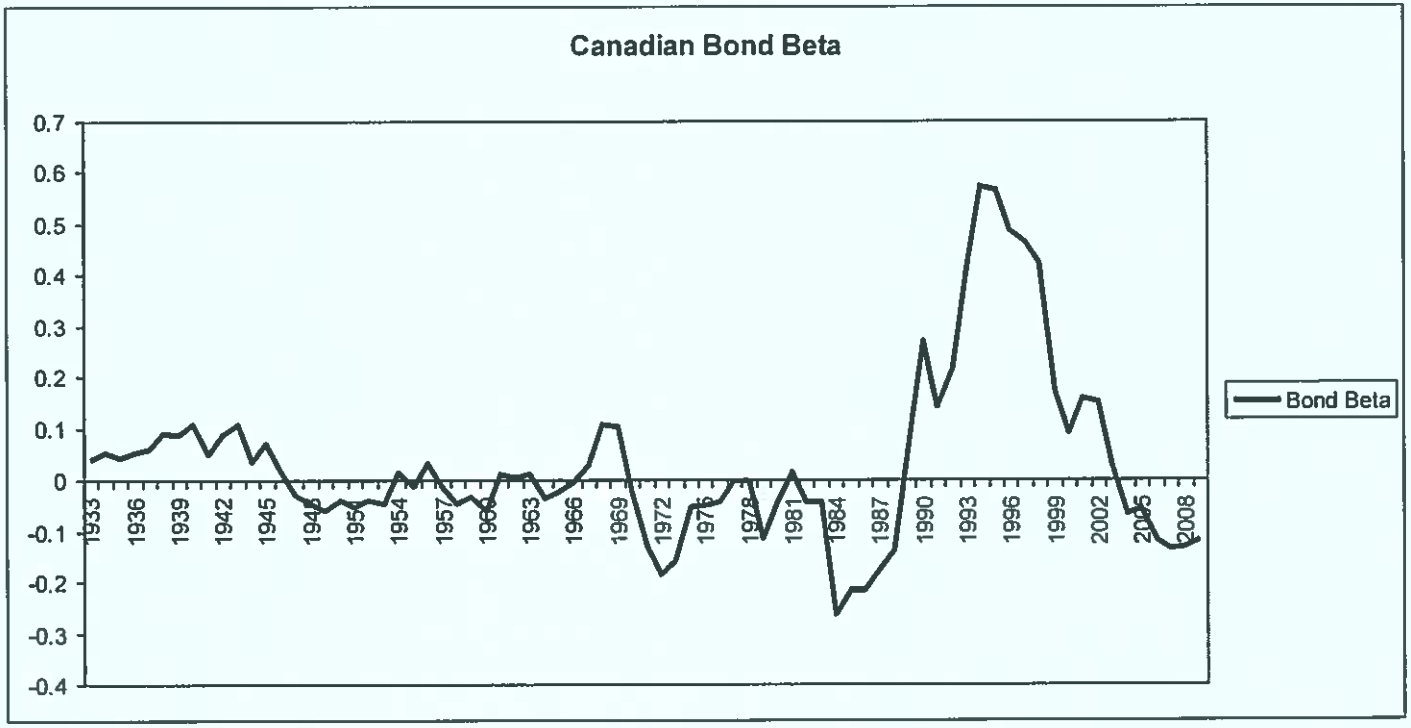
SCHEDULE 6

Earned Risk Premiums for Different Holding Periods

Start dates on the horizontal and ending dates on the vertical. For example, an investor would have earned a 2.65% arithmetic risk premium investing from 1960-1999.

	1930	1940	1950	1960	1970	1980	1990	2000
1939	-1.31							
1949	2.35	6.01						
1959	6.37	11.27	16.53					
1969	7.29	10.15	12.22	7.91				
1979	7.02	9.11	10.14	6.94	5.97			
1989	5.76	7.17	7.46	4.44	2.70	-0.58		
1999	4.90	5.94	5.93	3.27	1.73	-0.40	-0.21	
2009	4.31	5.11	4.96	2.65	1.33	-0.21	-0.03	0.16

SCHEDULE 7


Canadian Bond Beta
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
-0.1
-0.2
-0.3
-0.4
1933
1936
1939
1942
1945
1948
1951
1954
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
Bond Beta

SCHEDULE 8

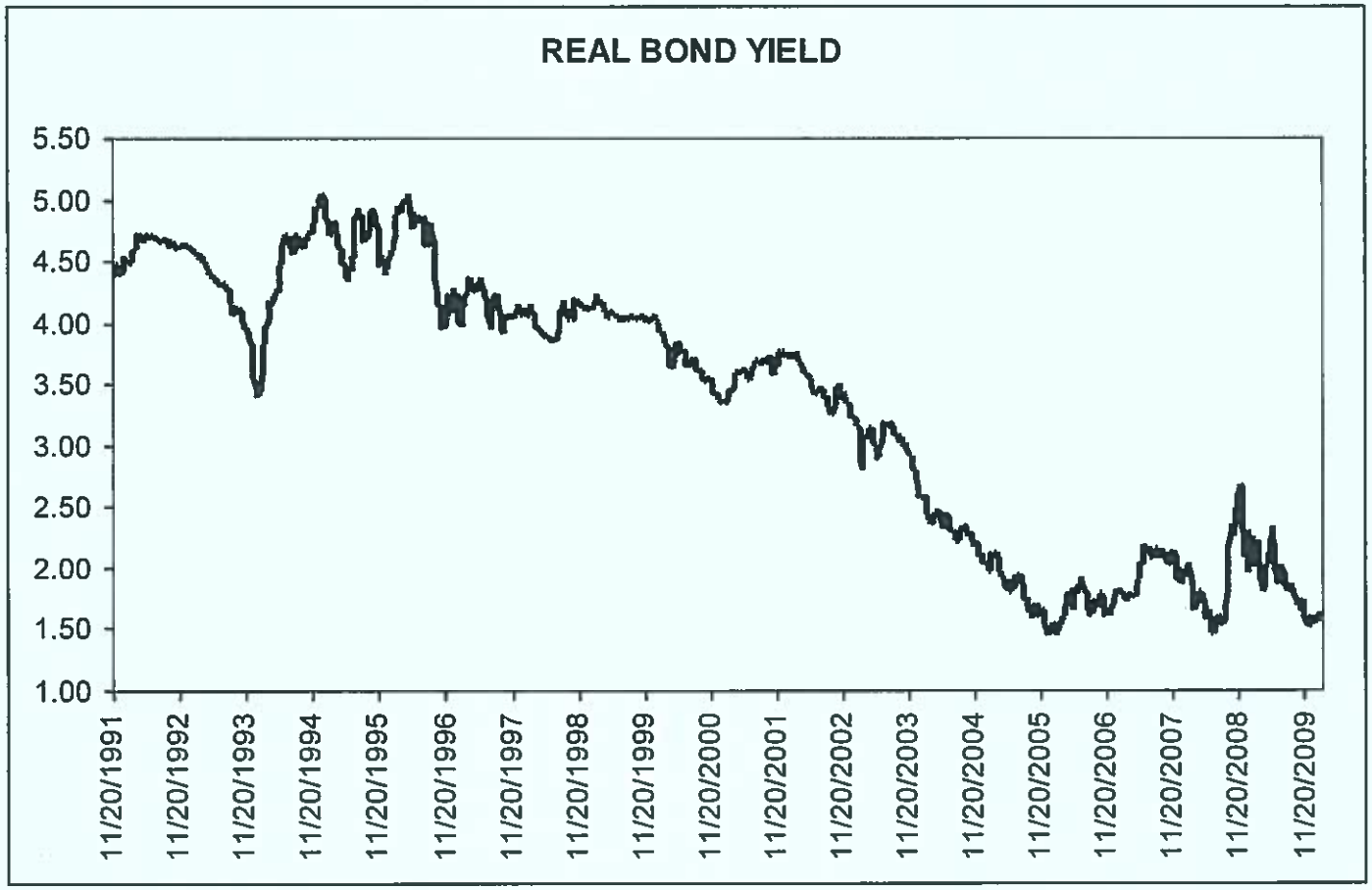
FACTORS INFLUENCING THE REAL CANADA YIELD

Dependent variable: Long Canada yield minus the average CPI inflation rate for the past, current and forward year.

Independent variables:	Coefficient	T-Statistic
Constant:	1.30	
Risk: standard deviation of return on long bond index for prior ten years.	0.24	5.06
Deficit: aggregate government lending as a % of GDP.	-0.26	-8.36
Dum1: dummy variable for years 1940-51	-5.28	-12.54
Dum2: dummy variable for years 1972-80	-3.61	- 8.73

Adjusted R^2 of the regression 85.4%
Seventy two years of data 1936-2009

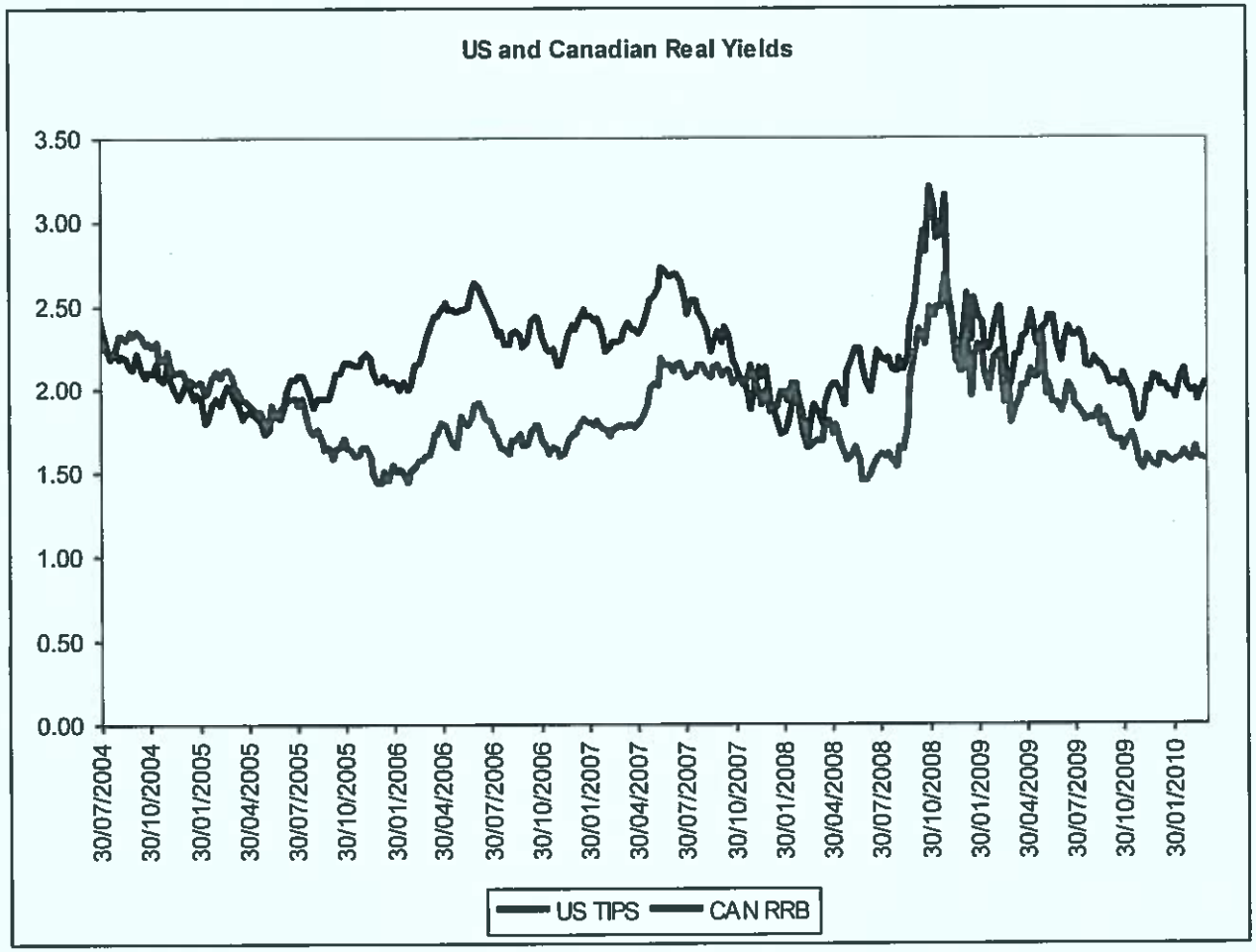
SCHEDULE 9


REAL BOND YIELD
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
11/20/1991
11/20/1992
11/20/1993
11/20/1994
11/20/1995
11/20/1996
11/20/1997
11/20/1998
11/20/1999
11/20/2000
11/20/2001
11/20/2002
11/20/2003
11/20/2004
11/20/2005
11/20/2006
11/20/2007
11/20/2008
11/20/2009

SCHEDULE 10

Annual Rate of Return Estimates 1926-2009						
	U.S.			CANADA		
	S&P Equities	Long US Treasury	Excess Return	TSE Equities	Long Canadas	Excess Return
AM	11.80	5.77	6.03	11.39	6.43	4.96
GM	9.77	5.40	4.37	9.69	6.08	3.61
OLS	11.09	5.11	5.98	10.42	5.80	4.62
Volatility[1]	20.48	9.15		18.96	8.87	

SCHEDULE 11


US and Canadian Real Yields
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
30/07/2004
30/10/2004
30/01/2005
30/04/2005
30/07/2005
30/10/2005
30/01/2006
30/04/2006
30/07/2006
30/10/2006
30/01/2007
30/04/2007
30/07/2007
30/10/2007
30/01/2008
30/04/2008
30/07/2008
30/10/2008
30/01/2009
30/04/2009
30/07/2009
30/10/2009
30/01/2010
US TIPS
CAN RRB