FAIR RETURN FOR NEWFOUNDLAND POWER (NP)

EVIDENCE OF

Laurence D. Booth

BEFORE THE

Board of Commissioners of Newfoundland and Labrador.

November 2012

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EXECUTIVE SUMMARY

1) Newfoundland Power's business risk has not increased since 2009. I still regard it as an average business risk Canadian utility with lower than average financial risk.

2) The Canadian economy has now almost fully recovered and is drawing down on the remaining spare capacity which the Bank of Canada expects to see used up by 2013/4. Up until Spring 2011 the Bank of Canada was expected to start increasing interest rates. In June 2011, for example, the Royal Bank of Canada was forecasting long Canada bond yields to be 4.55% by the end of 2012. However despite the fact that the Canadian financial system is "firing on all cylinders," (Bank of Canada), this recovery has been put off for at least two years due to problems in the Eurozone and the US.

3) The actions of the US Federal Reserve in implementing Operation Twist and its commitment to keeping the Federal Funds rate at 0-0.25% until the end of 2014 have brought down global interest rates. This has led to a precipitous drop in long Canada bond yields so corporate spreads over government bond yields remain high at 180 bps. This is mainly due to unusually low government bond yields, since all the standard stress indicators show normal capital market conditions. Furthermore Canadian utilities have started to issue 40 and in some cases 50 year bonds at extremely low interest rates.

4) I have been recommending a credit spread adjustment of 50% of the change in the credit spread from the normal spread of 100bps to my ROE recommendations. This adds 40 bps to simple CAPM estimates, but should even out over the business cycle.

5) However, the corporate credit spread adjustment does not adjust for the overall drop in bond yields since July 2011 and the low forecast long Canada bond yield of 3.00% for 2013 and slightly higher for 2014. This is due to the fact that Canada is one of a very small number of AAA rated countries and is seen as a safe haven. This is indicated by the behaviour of the spread of preferred share yields over Canada bonds, since preferred shares are largely unaffected by foreign demand. As a result, I increase my CAPM estimate for 2013 by 0.80%. This also brings the CAPM estimates into line with DCF estimates, recognising that in a perfect world they should be the same.

6) For 2013 I recommend an ROE of 7.50% for a benchmark utility. This recommendation includes a 0.40% adjustment for credit spreads and 0.80% for Operation Twist. For 2014 and later years I recommend an ROE adjustment mechanism that adjusts for 75% of the change in the forecast long Canada bond yield and 50% of the change in the credit spread, subject to a minimum long Canada bond yield forecast of 3.80%. Alternatively I would recommend a fixed ROE for the indefinite future of 8.25%. This is 0.75% below what the "old" NEB ROE formula would generate for an equilibrium long Canada bond yield forecast of about 5.0%.

7) I regard NP's 45% common equity ratio as anomalous, given its average risk and would recommend that the Board reduce it to 40%. The additional 5% of rate base should be replaced with preferred shares that would continue to support NP's A bond rating.

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I INTRODUCTION AND OVERVIEW

Q. PLEASE DESCRIBE YOUR NAME, QUALIFICATIONS AND EXPERIENCE.

A. Laurence Booth is a professor of finance in the Rotman School of Management at the University of Toronto, where he holds the CIT Chair in Structured Finance. Dr. Booth appeared before the Board in the 2009 Newfoundland Power GRA as well as before most of the major utility regulatory boards in Canada including the CRTC, the Ontario Energy Board (OEB), the Regie De L'Energie, the BC and Alberta Utility Commissions (BCUC and AUC), the Nova Scotia Utilities and Review Board, the New Brunswick Public Utilities Board, the Manitoba Public Utilities Board and the Prince Edward Island Regulatory and Appeals Commission. He has also filed testimony before the Ontario Securities Commission and in a variety of civil suits pertaining to financial matters. A detailed resume is filed as Appendix A. Further information and copies of working papers by Dr. Booth can be can be downloaded from his web site at the University of Toronto at http://www.rotman.utoronto.ca/~booth.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY

A. I was asked by the Consumer Advocate of the Province of Newfoundland and Labrador to review Newfoundland Power's (NP) general rate application (GRA) and associated evidence and to offer an opinion as to the fair rate of return on common equity (ROE) for 2013 and 2014, to review whether the Board should use an ROE adjustment mechanism for future test years and to recommend an appropriate common equity ratio.

In fulfilling this mandate I am mindful that I filed full testimony on May of this year that lead to a settlement ROE of 8.80% for 2012 based on the existing common equity ratio of 45%. Initially I was simply going to file an "update and extension" of my May 2012 evidence. However, on reflection I felt that there was value to having everything in one place, so this evidence represents a complete filing. However, it is obviously repetitive of what I filed in May, since over the last six months markets have essentially moved sideways and there have been no material changes in NP's business risk. In particular, I asked in RFIs whether any of the answers would change from those given earlier this year and the response was no. So this testimony

contains references to RFI answers from this earlier hearing. These earlier RFI answers are labelled A, as in the following answer to CA-NP001A, with current RFI answers marked as B.

Q. DO YOU HAVE SOME OVERALL REMARKS?

A. Yes. In answer to CA NP001A NP referred to its pre-filed testimony (page 5) and the statement:

> "Financial market conditions have changed dramatically in recent years. Newfoundland Power's principal business, regulatory, and financial risks, have not changed materially over this time."

An almost identical statement is on page 3-16 of the current application. I would accept that NP has average business risk, an assessment that NP seems to accept[1] and also that it has lower financial risk, which NP also seems to accept.[2] NP is reluctant to accept that Canadian regulators, such as the AUC, as a matter of policy use financial risk to offset business risk so that all their utilities can be allowed the same ROE[3]. However, this has been the explicit policy of the AUC and the NEB, whereas other boards like the OEB and the BCUC have made risk adjustments through both the common equity ratio and the risk premium over a generic ROE.

However, it is a logical conclusion that if NP is an average business risk utility and has lower financial risk, then it should have either a lower allowed ROE than a benchmark Canadian utility or its common equity ratio should be reduced. The most recent benchmark allowed ROE is that by the AUC (Decision 2011-474, December 8, 2011) which allowed an 8.75% ROE for 2012. This was then applied to taxable electric distribution utilities on a 39% common equity ratio. More recently in September 2012 Nova Scotia Power Inc (NSPI) settled on an ROE of 9.0% on 37.5% common equity. In contrast NP is currently on an ROE of 8.80% on 45% common equity. I would regard NP's financial parameters as being overly generous compared to these decisions and I have only refrained from making a capital structure recommendation previously due to the state of the capital markets. However, as time passes, and markets heal, the need for such a high

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[1] See CA NP003A.

[2] See CA NP004A.

[3] See CA NP002A.

common equity ratio also passes. Therefore I think that it is time to consider whether there is any need for NP to have such a strong balance sheet and large common equity ratio, since this clearly comes at a cost to ratepayers.

The upshot of the above is that I have reversed the normal structure of my testimony. In Section II I first consider the current financial and economic outlook, since it has been the state of the markets that has been the main concern since 2008. In Sections III and IV I then consider risk premium and DCF estimates of the fair ROE. Section V then discusses an ROE adjustment model, which is a minor extension of the model I recommended in 2009 that addresses some of the continuing capital market issues. Section VI discusses NP's business risk, an appropriate capital structure and the related credit metrics. Section VII concludes with some comments on the use of US "comparables" since despite the judgment of the Board in 2009, NP has put forward US witnesses whose evidence is very heavily based on US evidence.

I have updated my appendices from the May filing but Appendix B continues with my market risk premium analysis; Appendix C my relative risk assessment for a benchmark utility and Appendix D my DCF estimates. Although these appendices have been updated the conclusions are identical to those I arrived at in May. Similar to my May testimony I have not updated the appendix from 2009 that dealt with comparable earnings testimony, similar to that presented by Ms. McShane for two reasons. First, as she acknowledged no regulator in Canada has placed any significant weight on such evidence for over ten years (CA NP040A), while Dr. Vander Weide does not produce such evidence. Second I have now included a discussion within my testimony of how economic rates of return earned by companies relate to capital market rates of return.

II FINANCIAL AND ECONOMIC OULOOK

Q. WHY DO YOU START BY CONSIDERING CAPITAL MARKET CONDITIONS?

A. Because the legal standard for a fair rate of return stemmed from "altered conditions in the money market" where we would now understand the money market to mean the capital market. The Supreme Court of Canada determined a fair rate of return in *BC Electric Railway Co Ltd., vs. the Public Utilities Commission of BC et al* ([1960] S.C.R. 837), where the Supreme Court of Canada had to interpret the following statute:

> (a) The Commission shall consider all matters which it deems proper as affecting the rate:
>
> (b) The Commission shall have due regard, among other things, to the protection of the public interest from rates that are excessive as being more than a fair and reasonable charge for services of the nature and quality furnished by the public utility; and to giving to the public utility a fair and reasonable return upon the appraised value of the property of the public utility used, or prudently and reasonably acquired, to enable the public utility to furnish the service:

This statute articulated the "fair and reasonable" standard in terms of rates, and that the regulatory body should consider all matters that determine whether or not the resulting charges are "fair and reasonable." To an economist, "fair and reasonable" means minimum long run average cost, since these are the only costs which satisfy the economic imperative for regulation and by definition do not include unreasonable and unfair cost allocations. The statute also articulated the "prudently and reasonably acquired" test in terms of the assets included in the rate base.

Most statutes also allow the regulatory authority to examine all factors that enter into the rates to ensure that the rates are "fair and reasonable." This includes the firm's capital structure decision, since this has a very direct and obvious impact on the overall revenue requirement. To allow the regulated utility to freely determine its capital structure will inevitably lead to rates that are

unfair and unreasonable, otherwise the management of the regulated firm is not fulfilling its fiduciary duties to act in the best interests of its stockholders.

In terms of financial charges, in Northwestern Utilities vs. City of Edmonton (1929), it was stated that a utility's rates should be set to take into account 'altered conditions in the money market.' A fair rate of return was further confirmed in the BC Electric decision when Mr. Justice Lamont's definition of a fair rate of return, put forward in Northwestern utilities, was adopted:"

> "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."

This definition is referred to as an opportunity cost, in that the fair return is what could be earned by investing in similar securities elsewhere; only if the owners of a utility 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.

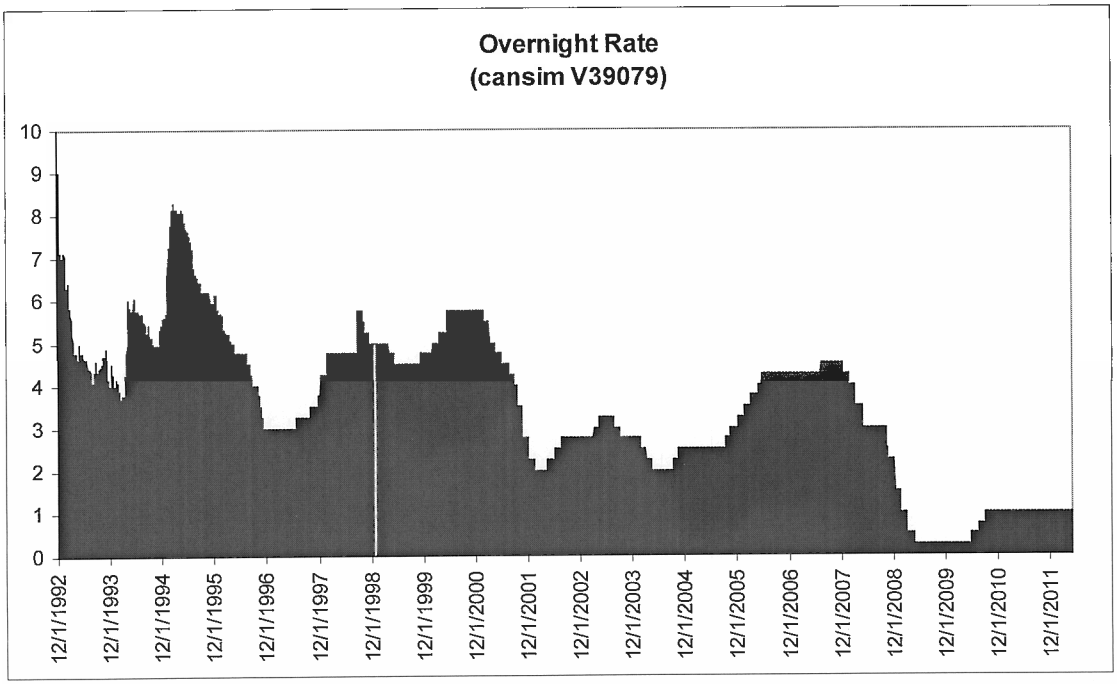
To any modern financial economist Mr. Justice Lamont's definition of a fair rate of return as an opportunity cost means a risk adjusted discount rate or expected rate of return. This is the rate that is determined in the capital market as conditions constantly change.

Q. WHAT ARE CAPITAL MARKET CONDITIONS AT PRESENT?

A. Basic macroeconomic data since 1987 is provided as background in Schedule 1. Into 2008 we had good economic growth 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. 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, resulted in 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.

The following graph shows the impact of this tighter monetary policy, just before the first signs of the financial crisis appeared. Throughout 2006 and up until December 2007, the Bank of Canada set the target rate to try and slow down the economy and reduce inflationary pressures. Of importance is that consistent with a 2% inflation target the overnight rate should be at least 3.0%; so 4.5% up until December 2007 was restrictive. The Bank pays interest on deposits that the chartered banks keep with it at 0.25% less than the overnight rate and the banks can borrow at 0.25% more than the overnight rate; a rate that is called the Bank Rate. Bank Prime is then about 2.0% more than the overnight rate. Consequently up until December 2007 the Bank was actively trying to increase borrowing costs to slow interest sensitive demand. This policy stance was reversed due to the impact of the sub-prime mortgage mess coming out of the United States.



The above graph shows that the Bank conservatively lowered the overnight rate to 3.0% in May 2008 where it kept it throughout the summer. It was then forced to dramatically cut the overnight rate to 0.25% in response to the financial crisis triggered by the failure of Lehman Brothers. 0.25% is defacto the lowest rate that the Bank can set the overnight rate, since otherwise it would mean negative deposit rates for the settlement balances the chartered banks keep with it.

The Bank of Canada started increasing the overnight rate in June 2010 as there were obvious signs of recovery in the Canadian economy. The Bank of Canada increased the overnight rate on three separate occasions each time by 0.25% to bring it to 1.0% and with it Prime to 3.0%. Expectations in 2011 were that the Bank would resume increasing the overnight rate as the economy continued to strengthen, since it was still at least 2.0% below the "equilibrium" rate.

In particular, the Bank of Canada and the Federal Government were increasingly worried that at 1.0% the overnight rate would encourage too much personal borrowing and lead to levels of indebtedness which might have negative implications when rates returned to their normal level. They were, and still are, very worried about a housing bubble in Toronto and Vancouver[4] where house prices increased strongly in response to both lower interest rates and a stronger economy. In response on July 8, 2012 the Federal Government announced a third round of tightening in the mortgage market by restricting amortisation periods to 25 years, reducing the maximum amount that can be borrowed to 80% of appraised value for home equity lines of credit, capping household debt ratios and limiting CMHC insurance to homes with a purchase price less than $1 million. Currently they have also moved responsibility for Canadian Mortgage and Housing Corporation (CMHC) to the Department of Finance, as it will now be subject to OSFI supervision. The problem is that such is the level of mortgage demand in Canada that CMHC is bumping up against its $600 billion insurance limit.

The conundrum faced by the Federal Government is that while it wants to stimulate the economy by maintaining lower interest rates, it does not want a US style debt-fuelled housing bubble, while the levels of personal indebtedness in Canada now exceed those in both the United States and the United Kingdom. The additional problem is that the Canadian economy is not an island and increasingly the Bank of Canada is concerned about the transfer of events from the Eurozone and the US into Canada. On January 26, 2012 the Federal Reserve announced that it would keep the US equivalent of the overnight rate, the Federal Funds rate, at 0.0-0.25% until at least the end of 2014, a promise renewed on August 1, 2012, that is, basically the next three years. The assumption is that in the face of rock bottom US interest rates the Bank of Canada will keep the

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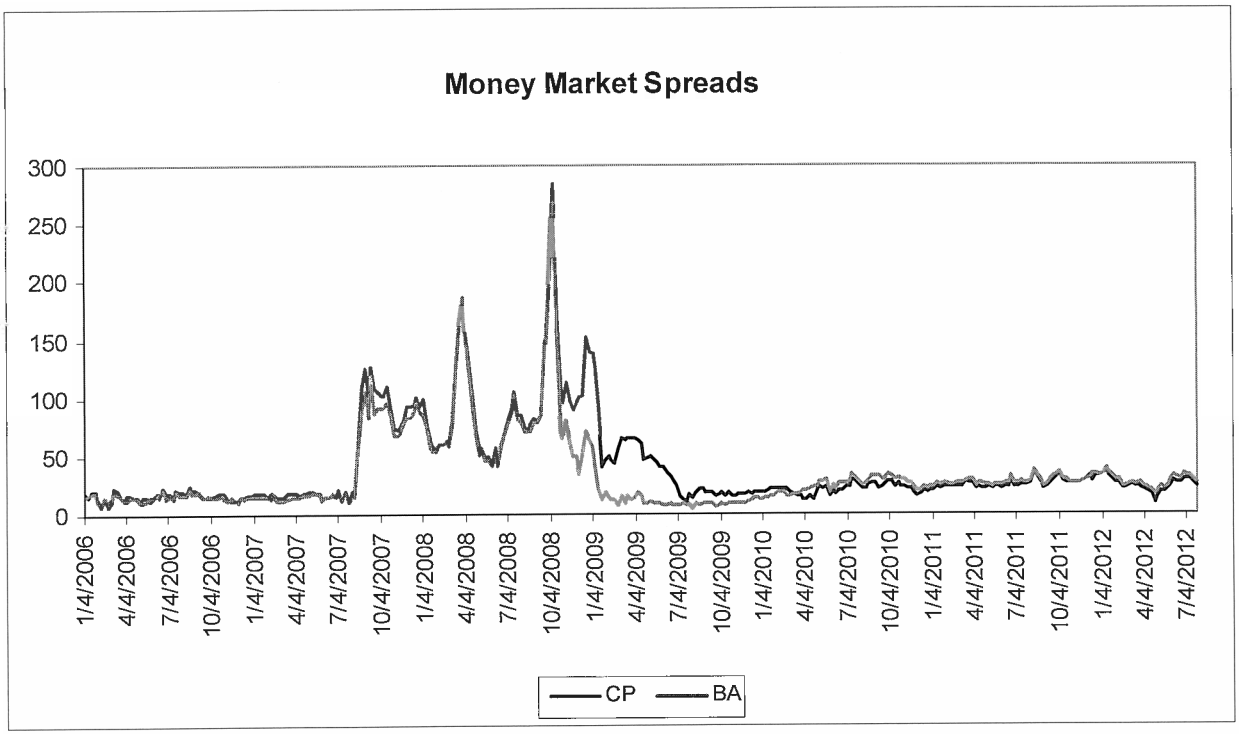
[4] In April 2012 housing starts increased by 14.0% to an annualized pace of 244,900 indicating a very strong housing market in Canada.

overnight rate at 1.0%, otherwise the Canadian dollar will appreciate hurting manufacturing in central Canada. That it is external events triggering monetary policy in Canada is clear from the following graph of the spread between the yield on 91 day Treasury Bills (TB) and those on Bankers Acceptances (BA) and Commercial paper (CP).

Treasury Bill yields are close to the rate that the chartered banks get from their deposits at the Bank of Canada when they have excess cash. In contrast, the Bankers' Acceptance rate is the rate the market requires on short term investments in the main chartered banks, whereas the Commercial Paper rate is the rate that large Canadian companies with the best credit rating can get by issuing notes in the money market. As a result the spreads between these two private rates and that on Treasury Bills is indicative of the state of the short term lending market[5] and the willingness of large investors to lend to the banks and very low risk, stable, Canadian companies



Before discussing these spreads, it is important to note that investors in the money market are mainly "parking" their money, rather than investing, since their main concern is security of

[5] The main banks are generally rated R-1 (Mid) equivalent to an AA bond rating while CP is a mixture of R-1 (Mid) and R-1 (low), which means down to A.

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 and an inability to distinguish between good and bad risks. For example, for the last 20 years the money market has been very quiet with spreads at 10-20 basis points. This changed in July 2007 with the US sub-prime problems spilling over into Canada, where we can see the large spike and again with the Bear Stearns bailout in March 2008. This got much worse in September 2008 as Lehman Brothers failed and contagion hit the world's financial markets and spreads in the Canadian money market went close to 3.0%.

However, of importance is that the measures taken by central banks to stabilise the financial system worked. The BA and CP spreads had dropped to normal by 2009 and have remained at close to normal levels for the past two years. Currently these spreads are about 20 bps as Treasury Bill yields have dropped over the last few months as expectations that the overnight rate will increase have dimmed. However, since T Bill yields are still exceptionally low at 0.92% actual CP funding costs for prime borrowers are still at very low levels at 1.16%. Overall the money market reflects the direct impact of the policy stance of the Bank of Canada and the spill over from the Federal Reserve, which currently indicates exceptionally low short term borrowing costs, probably continuing until the end of 2014.

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 since 2000.[6]

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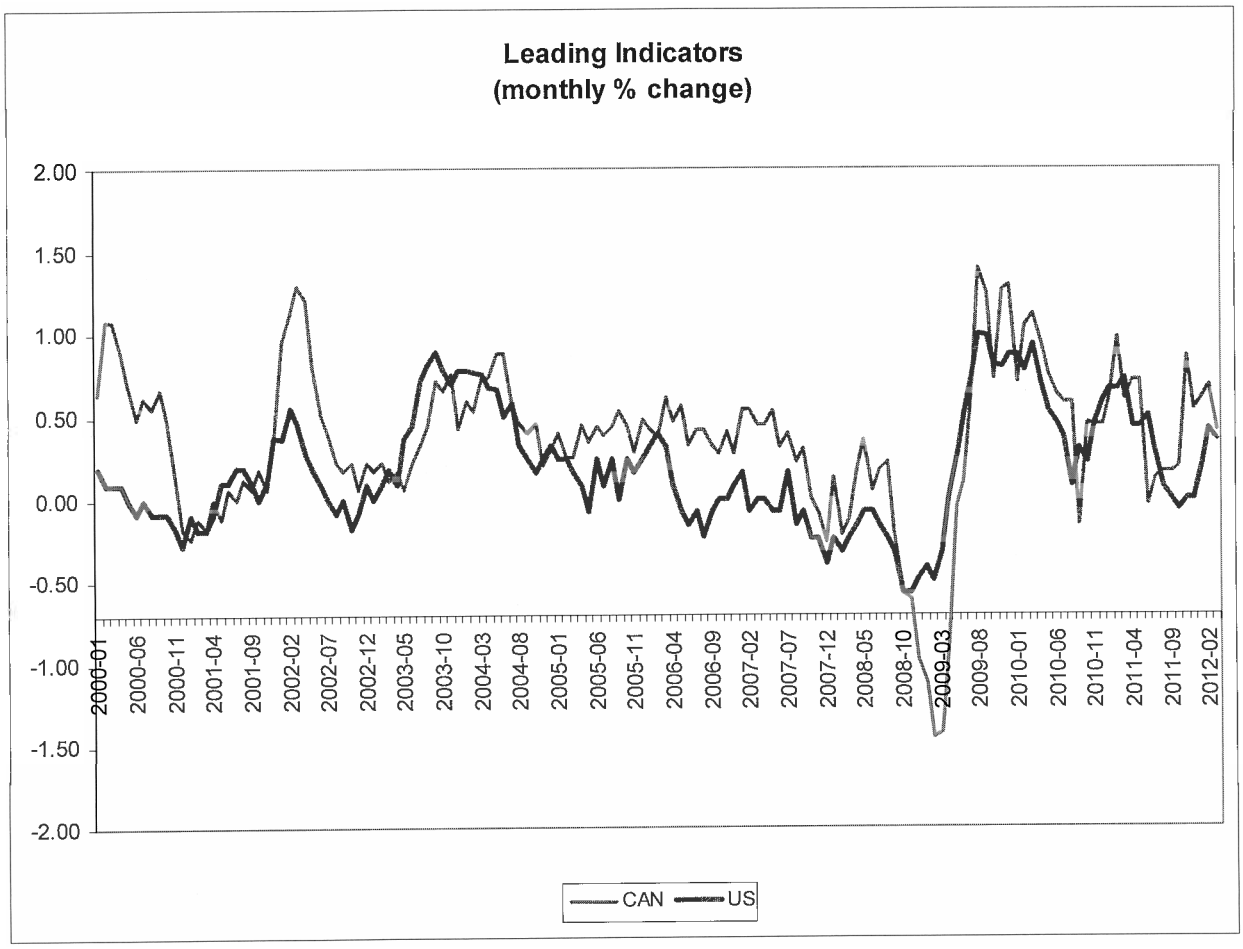
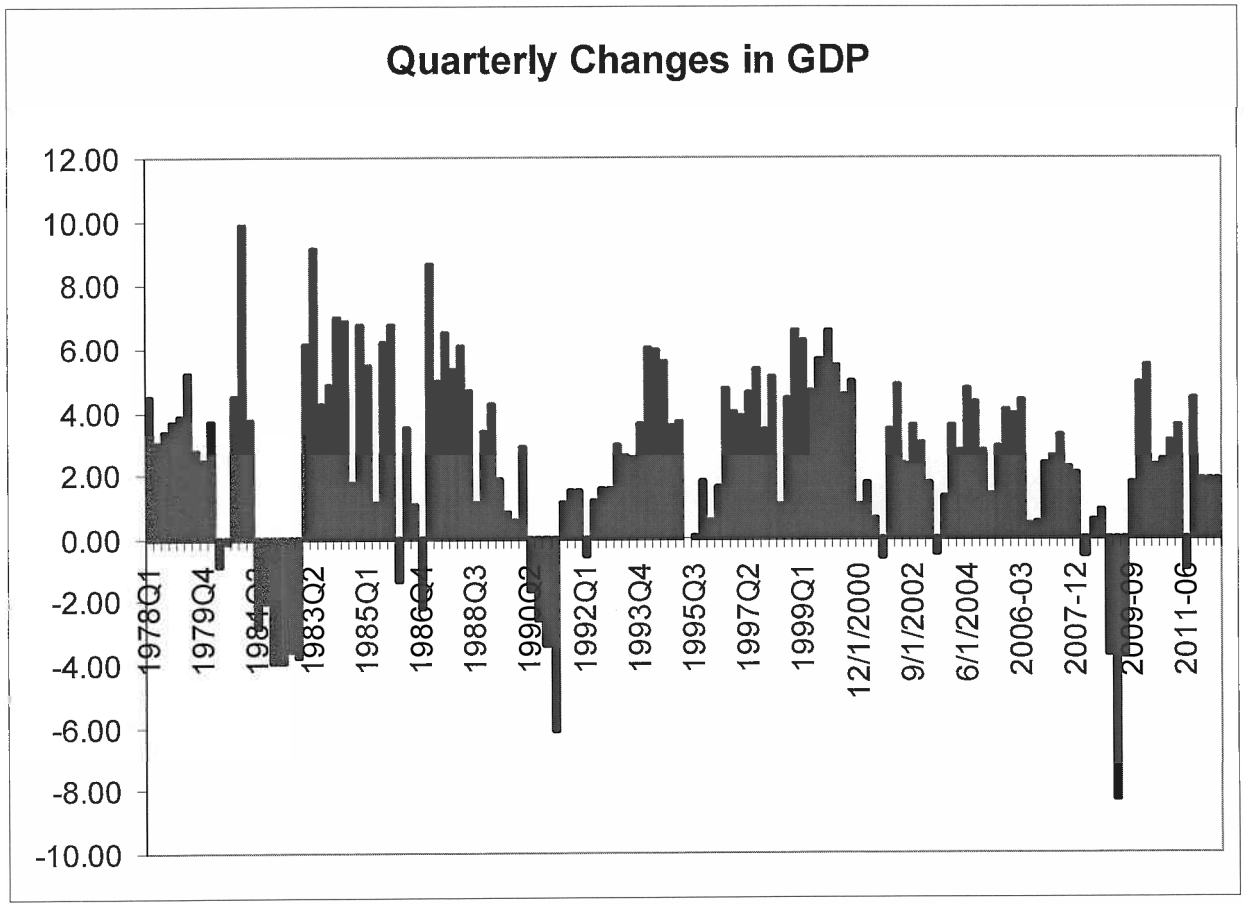
[6] Statistics Canada has now stopped producing these indicators.



We can clearly see the drop in the leading indicators during the slow-down in 2001 and the rapid recovery in 2002 after which they stabilised throughout the period 2002-2007. However, starting in 2007 they start to weaken, particularly in the US and then there were severe declines in the last quarter of 2008 into 2009. Then, as normal, there is a rapid recovery out of recession and a movement towards stabilisation. Recently for both the US and Canada the absolute values of the leading indicators have been trending down slightly from their previous lofty levels, but they are still showing economic recovery.

Q. HOW DOES THIS COMPARE TO GDP?

A. The following graph has the quarterly change in real GDP since the start of 1978.

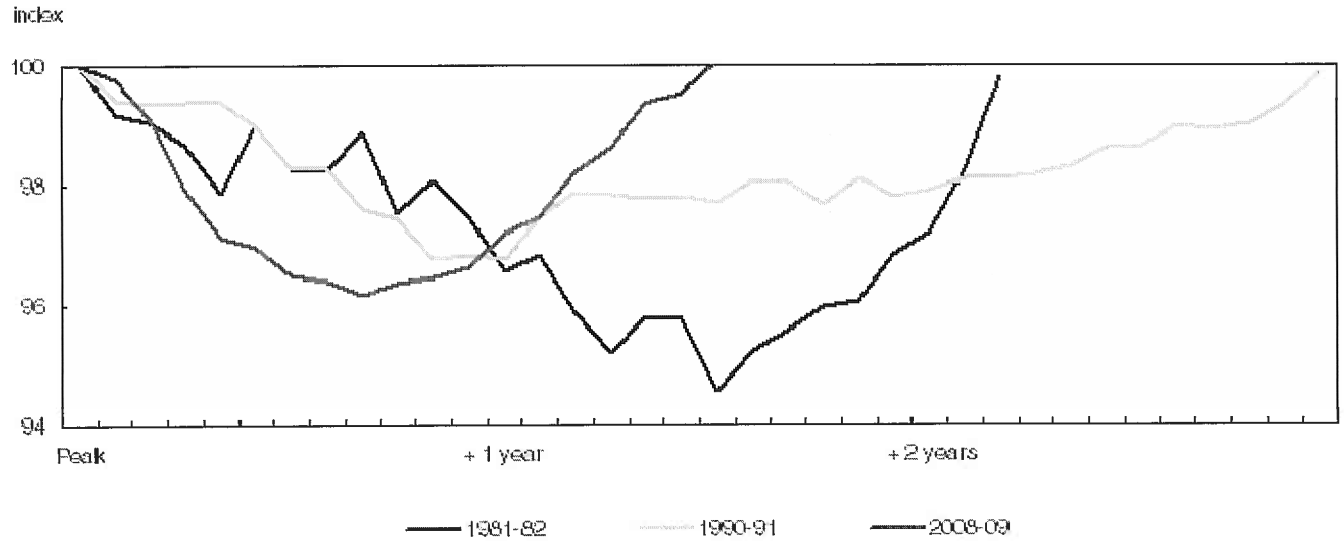


The start date reflects the need to capture the previous recessions to gauge the impact of the severity of the recent recession. These annualised quarterly changes are quite volatile ranging from a minimum of -7.3% to a maximum of 9.9% with a median change of about 3.00%. During the 1981 recession GDP dropped by 3.92%, whereas in the severe restructuring recession of the early 1990s the drop was over several quarters with a maximum of 6.08%. Note that in the early 2000's after the internet bubble burst, Canada did not have a recession, unlike the United States. In contrast, while quarterly growth was basically flat into late 2008, it declined precipitously in 2008Q4; 2009Q1 was then very bad with the largest decline since 1961 of 7.29%,[7] before moderating in 2009Q2 with a sharp snap back 2009Q3 into 2010Q1. 2010Q2 saw some weakness in economic growth as the quick gains dropped off, but then quarterly growth continued throughout 2010 and into 2011, despite weakness in 2011Q2 caused by supply disruptions from Japan. Real growth averaged 2.46% in 2011 and this growth has now continued

[7] The current version of the GDP accounts start in 1961.

into 2012, although 2012Q2 indicated a drop off in the real quarterly growth rate to 1.8%, which continued into 2012 Q3.

Given the volatility of quarterly changes in GDP, it is useful to look at the changes from the start of a recession, indexed at 100, to see how severe and how long the recession lasted. Statistics Canada did this in the following chart.[8]



Notably the recession of the early 1990s was the longest, since Canada was adjusting to the Free Trade Agreement, as well as a normal cyclical downturn, but not as severe. In contrast the recession of 1981-2 was more severe, but ended more quickly than that in the early 1990s. By any comparison the recession of 2008-9 was both shorter and milder. The Statistics Canada analyst concluded

> "By most conventional measures – real GDP, employment or hours worked – the 2008-2009 recession was less severe than those starting in 1981 and 1990. This holds true whether one is comparing the drop from peak to trough or the time needed to recoup the losses experienced during a recession."

It is also useful to contrast this with the experience in the US, where the following graph from DBRS provides a "jobs" analysis for the US and Canada.[9] Similar to the Statistics Canada graph,

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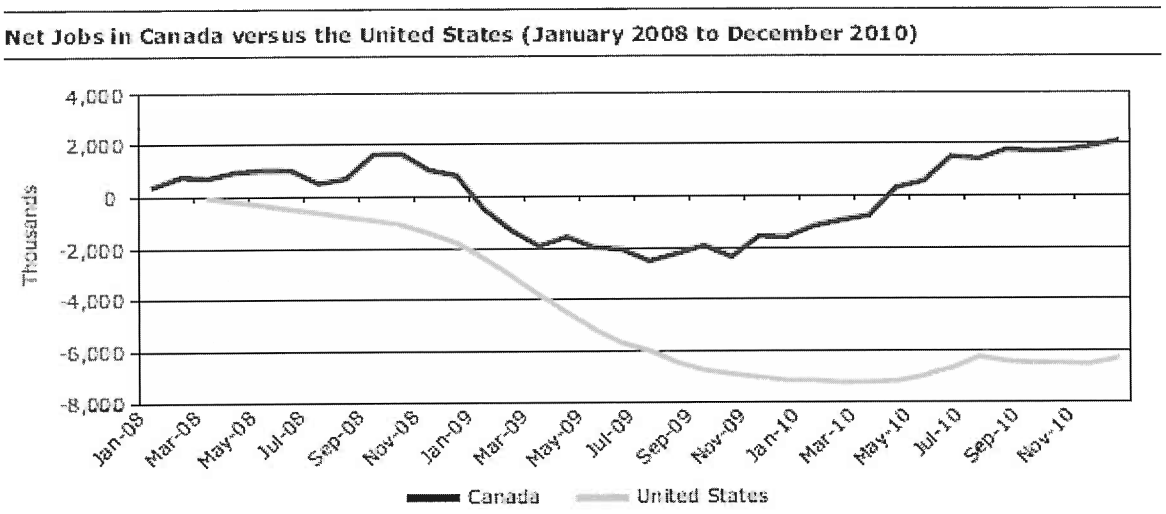
[8] Philip Cross "How did the 2008-2010 recession and recovery compare with previous cycles?" http://www.statcan.gc.ca/pub/11-010-x/2011001/part-partie3-eng.htm, chart 3.2

[9] DBRS, Corporate 2010 Year in Review and 2011 Outlook, January 2011.

it shows that the Canadian economy had recovered and returned to creating employment. In stark contrast, the US economy was still "sputtering" and failing to replace the jobs lost during the recession, let alone creating the new jobs required for an expanding labour market. As DBRS notes the US unemployment rate will probably remain above the "normal" rate for the "foreseeable future."

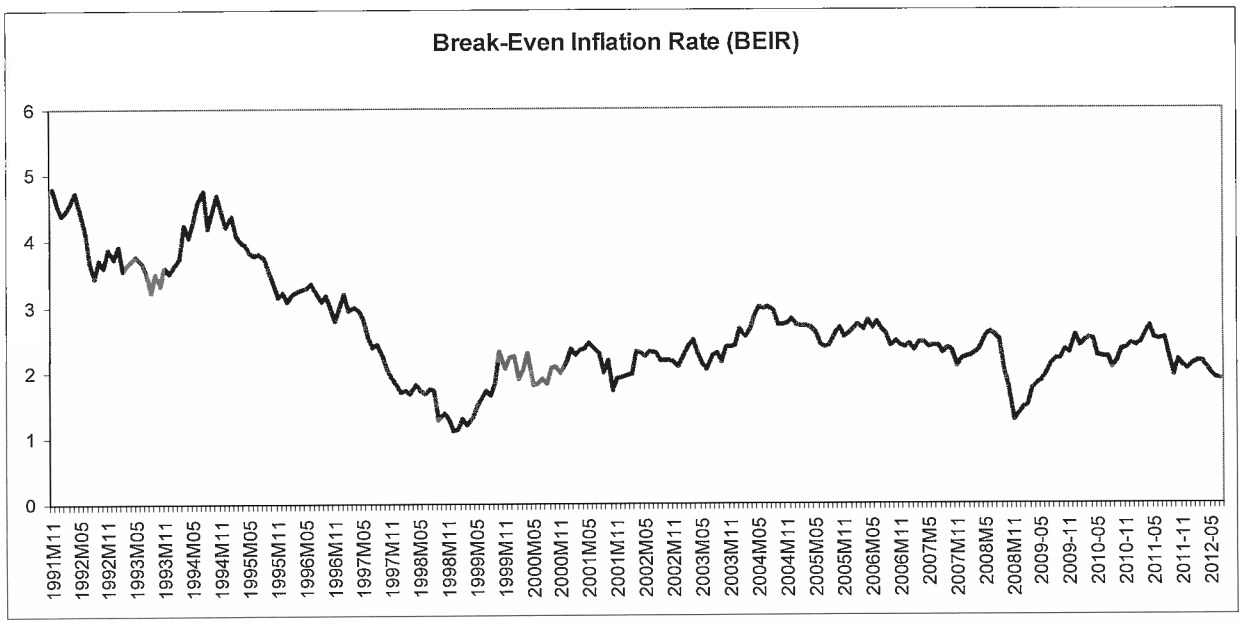


The above two graphs make it clear that what characterised the 2008-9 recession in Canada was not its severity, or length, but simply the speed with which events unfolded. Further the experience of the Canadian economy is in marked contrast to the serious problems in the United States.

Q. WHAT IS YOUR OUTLOOK FOR INFLATION?

A. The Bank of Canada has had a 2.0% target rate of inflation since 1991 and this was recently renewed with the Government of Canada (Fall 2011). It increases the overnight rate when it judges the forecast core inflation rate to be above this target and likely to go to the top of its 1.0-3.0% operating band. Conversely, it drops the overnight rate when it fears that inflation will drop to the bottom of its range and as a result it needs to stimulate the economy. The inflation rate data in Schedule 1 clearly shows the inflationary pressures in 2008 prior to the recession as well as the dramatic drop in 2009 and recovery in 2010.

Since 1991, the Federal Government has been issuing two types of bonds: a nominal bond where the interest rate is fixed and a real return bond, which guarantees the investor protection from inflation. The difference between the nominal yield and the yield on the real-return bond is called the break-even inflation rate (BEIR), since if actual inflation is higher than this after the fact you would have been better off in the real bond and vice versa. Consequently the BEIR is often taken as one measure of the market's inflationary expectations. The following graphs the BEIR (as a %) since 1991.



We can clearly see the collapse in inflationary expectations in the late 1990's as the market finally believed the Federal Government's intentions not to inflate its way out of its deficit problems. Since then the BEIR has been slightly above the middle of the Bank of Canada's operating range for inflation of 2.0%, but never above the 3.0% upper limit set by the Bank. We can also see the impact of the traumatic events of 2008Q3 when the BEIR dropped from its "normal" level of just above 2.0% to 1.26% in November 2008.[10] 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 and economic growth has got back on track the BEIR has moved back to its normal level hovering around 2.0%, but currently sits just

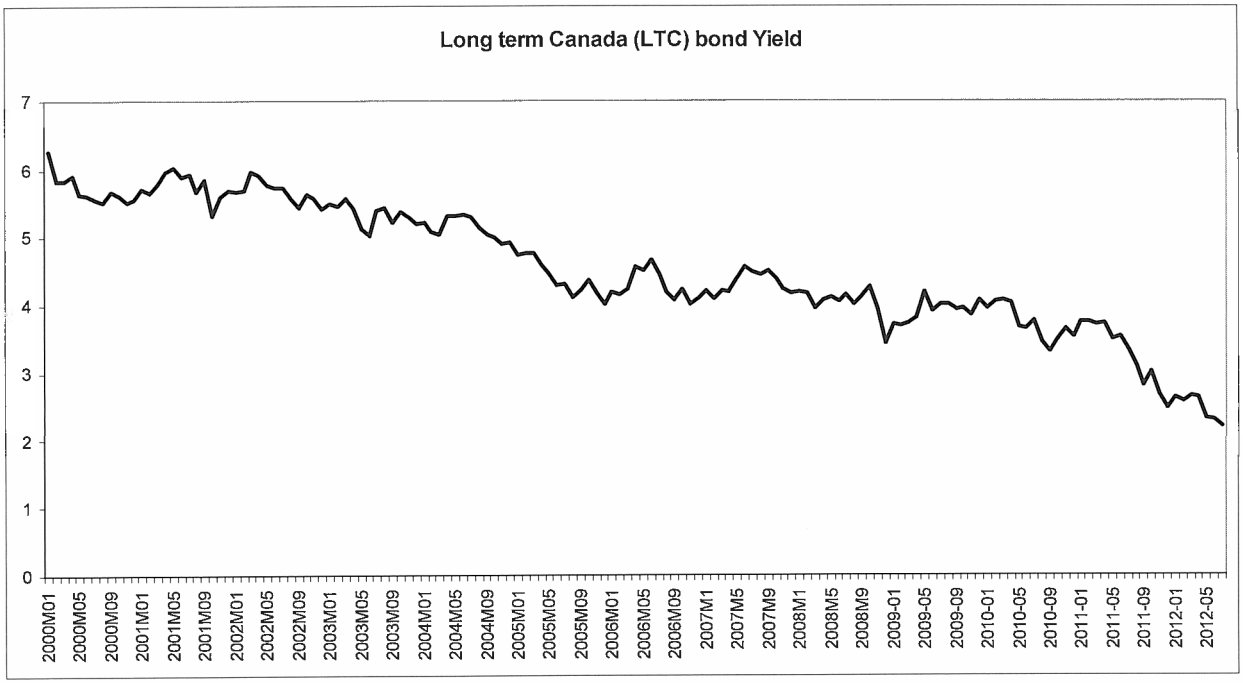
[10] The average BEIR since Canada returned to a budgetary surplus is 2.23%.

below that at 1.89% as the economy's real growth rate has marginally dropped off. So consistent with the BEI I would expect long run inflation at the Bank of Canada's target rate of 2.0%

Q. WHAT HAS BEEN THE RECENT HISTORY OF THE LONG CANADA BOND YIELD?

Schedule 2 provides data on the full range of interest rates across the broad maturity spectrum as of the end of October 2012. What is evident is that interest rates for long maturity instruments are higher than for short dated bonds. This is referred to as a 'normal' or positively sloped yield curve. Typically the maturity spread, or the yield difference between the long Canada bond and 91 day Treasury Bills, is about 1.25%, but currently it is slightly higher. This spread has decreased recently since although the Bank of Canada is still keeping short term interest rates low to enhance the recovery, long term rates have also come down due to the actions of the Federal Reserve in the US, which I will discuss later.

Normally yields on long term Canada (LTC) bonds are not as affected by current monetary policy, since monetary policy works on the overnight rate and its influence weakens as the maturity of the bond increases. However, the current experience is not normal. The following graph 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 immediately prior to the financial crisis and the expectation in 2009/10 was that long Canada bond yields would increase as the economy recovered. However, in 2010 Q3 long term interest rates started to fall and this fall accelerated into Q4 2011 and has continued into 2012. Currently LTC yields are at 2.41% and barely compensate an investor for the purchasing power loss caused by 2% inflation let alone the tax bite on the nominal 2.41% interest. So for a taxable investor current LTC yields represent a negative real rate of return.



Starting in 2010Q2, the markets became increasingly concerned that the deficit financing by governments that spurred aggregate demand and prevented a global depression had in turn increased the debt levels of many developed countries to the point where some might not be able to repay their debts. These concerns were particularly acute for the PIIGS (Portugal, Ireland, Italy, Greece and Spain or more politely the GIIPS), who in adopting the Euro as a single currency lost the power to devalue their currency to stimulate demand.

The crisis started with Greece which had consistently fudged its budget numbers. This was of no great concern until the recession layered a normal cyclical deficit on top of the Greek structural deficit. The IMF and EU agreed to a 110 billion Euro rescue plan for Greece on May, 2, 2010 and followed this up with a general 750 billion Euro rescue plan to finance other EU countries with deficit problems that had adopted the Euro. After Greece was bailed out concern switched to Ireland which had incurred a huge liability to guarantee the liabilities of all the Irish banks. Ireland faced increasing pressure until finally on November 28, 2010 Ireland agreed to an 85 billion Euro bailout, most of it allocated to restructure its banking system. After Ireland, pressure switched to Portugal, when on April 18, 2011 the Portuguese government fell and announced it would seek support from the EU and IMF and reached a deal on May 4, 2011 for $111 billion in short term support. Since Portugal's rescue package, attention has shifted to Italy with the fall of

Berlusconi's government on November 25, 2011 and the installation of a government of technocrats under Mario Monti and further austerity cuts.

In a move to end the cycle of contagion the Euro area countries agreed on an expansion of the European Financial Stability Fund (EFSF), increased "backdoor" funding of countries through the IMF, recapitalized the Euro area banking system with an increase in bank capital to 9% and agreed to a write off of 50% of the value of bank debt to Greece to try and keep Greece's debt to GDP figures within a feasible range. This was followed by a new Euro area fiscal pact signed by all countries except the UK on December 9, 2011 and ratified in March 2012 to impose more restrictions on deficit levels by member countries. However, the contagion fear from Europe, with a potential domino impact on the banking system world-wide, triggered a rush into "safe' government bonds starting in 2011 Q3, which triggered a precipitous drop in Government of Canada interest rates as Canada was perceived to be safe. In contrast, on January 13, 2012 Standard and Poors downgraded most of the countries in the Euro area and in particular France lost its AAA status. Further on November 19, 2012 Moody's also followed suit and downgraded France from AAA. These events in Europe were magnified by events in the US.

Q. WHAT ARE THE PROBLEMS IN THE US?

A. The US government's problems are part of the sovereign debt crisis. In 2007 prior to the emergence of financial problems, in aggregate what the IMF describes as the advanced countries ran an average deficit of 1.3% of gross domestic product (GDP). Over the business cycle an average deficit of 1.3% is not a problem, since the economy on average grows by more than this, so that over time the burden of the debt drops. However, 2007 was at the top of the business cycle and not an average year and countries should have been building up reserves for the bottom of the cycle, like Canada and Spain which had the largest surpluses of 1.6-1.9%. When the financial crisis precipitated the recession, most countries initiated stimulus programs on top of the automatic stabilisers that kick in. These stabilisers are the drop in tax revenues and the increase in welfare and unemployment payments that automatically cause deficits to increase during recessions. Consequently, the average deficit jumped to 9.6% of GDP in 2009 and has

since declined in 2010[11] and 2011 and is forecast to drop more in 2012 and 2013. The following is a table derived from the latest IMF Fiscal Monitor.[12]

Government Deficits as a % of GDP

	2007	2008	2009	2010	2011	2012	2013
Japan	2.4	4.1	10.4	9.4	9.8	10	9.1
US	2.7	6.7	13.3	11.2	10.1	8.7	7.3
Italy	1.5	2.7	5.4	4.5	3.8	2.7	1.8
Ireland	-0.1	7.3	13.9	30.9	12.8	8.3	7.5
Greece	3.7	9.9	15.6	10.5	9.1	7.5	4.7
France	2.7	3.3	7.6	7.1	5.2	4.7	3.5
Portugal	2.7	3.7	10.2	9.8	4.2	5	4.5
Germany	-0.2	0.1	3.2	4.1	0.8	0.4	0.4
Spain	-1.9	4.2	11.2	9.4	8.9	7	5.7
UK	2.7	5.1	10.4	9.9	8.5	8.2	7.3
Canada	-1.6	0.4	4.9	5.6	4.4	3.8	3
Advanced	1.3	4.3	9.6	10.2	7.1	6.0	5.0

Source IMF Fiscal Monitor October 2012

The "worst" of the European debt crisis has passed in the sense that deficits are declining and countries are cutting back spending and increasing taxes. However, many are very close to the limit on their "credit card" so that Italy with a relatively minor deficit is perceived to be a problem, since it already has a significant amount of debt and the problem is getting investors to roll over that debt regardless of what the deficit or debt to GDP ratio indicates. Further the austerity measures needed to bring down the deficits are now feeding back into a drop in GDP forcing even greater cuts to meet the EU targets.

In the US on August 5, 2011 S&P downgraded the bond rating of the United States from AAA to AA+ due to the lack of will on the part of President Obama and Congress in dealing with the US government's soaring debt problems and the wrangling over increasing the US government's

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[11] Excluding Ireland the average 2010 deficit was 8.15% and Ireland's is skewed by the huge one-time cost it incurred in bailing out its banks.

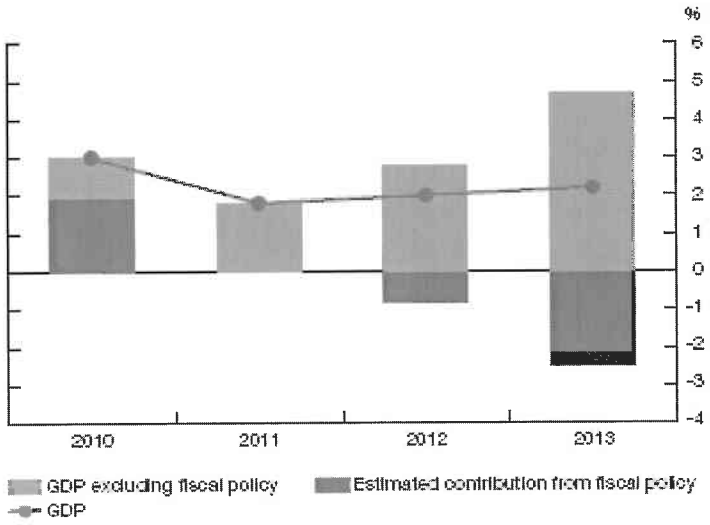
[12] IMF, Fiscal Monitor May, October 2012.

borrowing cap. What is important is that the US deficit in 2011 at 10.1% of GDP is much higher than that of either Portugal or Greece and is exceeded only by Ireland.

Eventually Congress did increase the US government's borrowing limit and a default was forestalled, but only at the cost of a commitment to set up a super committee to achieve deficit reduction targets with mandatory changes kicking in if there were no agreement. On November 21, 2011 the super committee abandoned further attempts to achieve a consensus indicating the deep ideological rifts in the US Congress. Currently the focus in the US is in avoiding the "fiscal cliff," which is the phrase given to a series of Bush era tax cuts and the sequestering budget cuts, which unless action is taken to the contrary, kick in January 2013. The following graph comes from the Bank of Canada's Financial System Review (December 2011).

Chart 10: Fiscal consolidation is projected to exert a drag on U.S. real GDP growth

Annual data



Note: The contribution of fiscal policy to growth includes both direct government expenditures and the indirect effects on other components of aggregate demand.
Sources: U.S. Bureau of Economic Analysis and Bank of Canada calculations and projections

The graph indicates that it was well known that the fiscal cliff would amount to about a 2.5% reduction in stimulus to the US economy (about half a trillion dollars). The Bank of Canada anticipated that this would reduce US growth below what it would otherwise have been but not cause a recession. However, the fear in the markets is that it will cause a recession and that

action is urgently needed. However, so far no action has been taken and Moody's has warned that it will downgrade the US below AAA if nothing happens. RBC[13] reports Moody's as stating,

> "A scenario whereby action on the budget is delayed until sometime in 2013 appears increasingly likely....Such deferment, if not accompanied by an apparent commitment to achieving agreement and credible timetable for implementing the necessary reforms to preserve sovereign creditworthiness, would be inconsistent with maintaining the highest Aaa rating"

With Congress unable to achieve any fiscal initiatives the "heavy lifting" has been left to the Federal Reserve, which on September 21, 2011 announced a new "Operation Twist." The objective of "Operation Twist" is simply to spend $400 billion buying US government long term bonds to drive interest rates down and help US mortgage refinancing and thus kick-start the US housing market. Since the US has pledged to keep short term rates where they are at the moment, the effect is "quantitative easing" at the long end of the yield curve. On June 19, 2012 the Fed indicated it would continue Operation Twist beyond its original June 30 deadline, while on September 13, 2012 the Federal Reserve introduced a third round of quantitative easing (QE). The announcement had three components:

- The Federal Funds rate will stay at 0.0-0.25% until Summer 2015, i.e., three more years;
- Operation Twist will continue indefinitely at about $40 billion a month; and
- A new QE 3 will involve an additional $45 billion a month in purchases of mortgage backed securities.

In total the Fed is committed to an indefinite purchase every month of $85 billion of long dated securities to drive down long term interest rates and inject cash into the US economy through its bond buying program. This is unprecedented in the history of US monetary policy and will continue as long as there is need, that is, until the US unemployment rate comes back to closer to its natural non-accelerating inflation rate of unemployment (NAIRU) of about 5.3 %.

The tsunami of falling US long term interest rates through "Operation Twist" and fear of Euro area sovereign debt failures combined with Canada's AAA bond rating has led to the dramatic collapse in Canadian long term interest rates, which is unlikely to reverse soon. The Governor of

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[13] RBC US Market Economics and Rates Focus, November 9, 2012

the Bank of Canada, Mark Carney, was interviewed by the BBC on August 8, 2012 and as reported by Reuters[14] indicated that he had been swimming against the global current since April with his message that borrowing costs will soon have to rise in Canada. Policy makers in most other major economies were looking for ways to stimulate their economies further amid the European debt crisis, and disappointing growth in the United States and China. However, Reuters reported Governor Mark Carney as saying

> "We're in a very different place than the major crisis economies, such as the U.K.,"
>
> "Our economy's almost back at full capacity, the labor market's been growing, we're growing above -- we had been growing above trend, and the extent to which we continue to grow above trend, we may withdraw some of that monetary policy stimulus."
>
> "But we have a financial system that's firing on all cylinders and so we will have to adjust -- we will adjust if it's appropriate,"

Reuters went on to report Governor Carney as saying that the country's relatively strong economic fundamentals had helped push the Canadian dollar to parity with the U.S. dollar on Friday for the first time since May and that the currency's value reflected a "safe-haven premium". As Governor Carney said

> "There are relatively few places in the advanced world that investors can put their money with a degree of certainty that something catastrophic is not going to happen,"

It goes without saying that a financial system "firing on all cylinders," while it describes Canada, it is not an accurate statement of conditions in the US.

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[14] Bank of Canada's Carney still leaning towards rate hike, Reuters, August 8, 2012.

Q. WHAT IS YOUR FORECAST FOR THE LONG CANADA BOND YIELD FOR 2013?

A. In its Monetary Policy Report of July 2012, the Bank of Canada produced the following table.

Table 3: Summary of the base-case projection for Canada[a]

	2011	2012				2013				2014			
	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Real GDP (quarter-over-quarter percentage change at annual rates)	1.9 (1.8)	1.9 (2.5)	1.8 (2.5)	2.0 (2.4)	2.3 (2.5)	2.3 (2.5)	2.4 (2.2)	2.6 (2.3)	2.7 (2.2)	2.5 (2.2)	2.3 (2.2)	2.2 (2.2)	2.2 (2.2)
Real GDP (year-over-year percentage change)	2.2 (2.2)	1.8 (2.0)	2.5 (2.7)	1.9 (2.3)	2.0 (2.5)	2.1 (2.5)	2.3 (2.4)	2.4 (2.4)	2.5 (2.3)	2.6 (2.2)	2.6 (2.2)	2.4 (2.2)	2.3 (2.2)
Core inflation (year-over-year percentage change)	2.1 (2.1)	2.1 (2.1)	2.0 (1.9)	1.9 (1.8)	1.9 (1.8)	1.9 (1.8)	2.0 (2.1)	2.0 (2.1)	2.1 (2.1)	2.1 (2.1)	2.0 (2.0)	2.0 (2.0)	2.0 (2.0)
Total CPI (year-over-year percentage change)	2.6 (2.6)	2.4 (2.4)	1.7 (2.0)	1.2 (2.2)	1.6 (2.2)	1.5 (2.1)	1.5 (1.9)	2.0 (1.9)	2.0 (1.9)	2.0 (1.9)	2.0 (2.0)	2.0 (2.0)	2.0 (2.0)
Total CPI excluding the effect of the HST and changes in other indirect taxes (year-over-year percentage change)	2.5 (2.5)	2.2 (2.3)	1.6 (1.9)	1.1 (2.1)	1.5 (2.1)	1.5 (2.1)	1.6 (2.0)	2.1 (2.0)	2.1 (2.0)	2.1 (2.0)	2.0 (2.0)	2.0 (2.0)	2.0 (2.0)
WTI[b] (level)	94 (94)	103 (103)	93 (103)	86 (104)	87 (105)	88 (105)	89 (105)	89 (104)	89 (103)	88 (102)	86 (101)	87 (99)	87 (99)
Brent[b] (level)	109 (109)	118 (118)	109 (122)	100 (121)	99 (119)	98 (117)	98 (115)	98 (113)	97 (112)	96 (110)	96 (108)	95 (106)	94 (104)

a. Figures in parentheses are from the base-case projection in the April 2012 *Monetary Policy Report*.
b. Assumptions for the prices of West Texas Intermediate and Brent crude oil (US$ per barrel), based on an average of futures contracts over the two weeks ending 13 July 2012.

The Bank forecasts real GDP growth at approximately 2.1% year over year for 2012, down from the 2.4% forecast in April as it recognises the slowdown in the economy. It then forecasts a pick up to 2.3% in 2013 and 2.4% in 2014, which is close to what the Bank of Canada regards as the economy's long run potential. This is similar to the Consensus Economics (July 2012) forecast of real growth of 2.1% for 2012 and 2.3% 2013. In contrast the Royal Bank of Canada is slightly more bullish forecasting 2.3% real growth for 2012 and 2.6% for 2013. Similarly the Bank of Canada forecasts that core inflation will stay at approximately the middle of its range of 2.0% for 2012/3 while total CPI inflation will be very slightly lower. The Consensus Economics inflation forecast for 2012 and 2013 is at 1.9% and 2.0% respectively. While the Bank of Canada does not forecast interest rates, I see no significant difference in the Bank's overall forecast for the economy versus that of the Consensus or my own.

In terms of interest rates we have seen a flattening of the yield curve as short term interest rates increase and long term rates have dramatically fallen. Normally we would expect to see higher longer term rates at this stage of the recovery, but external weakness is depressing longer term

rates around the world and Canada is not immune to this. Noticeably the yield on the long term Canada bond was at 3.75% before the Portuguese bailout and the S&P warning on the US government deficit. Last Summer RBC had the following interest rate forecast (Financial Markets Monthly June 3, 2011)

	10Q2	10Q3	10Q4	11Q1	11Q2	11Q3	11Q4	12Q1	12Q2	12Q3	12
Canada											
Overnight	0.50	1.00	1.00	1.00	1.00	1.25	1.75	2.25	2.50	2.75	3.(
Three-month	0.50	0.88	0.97	1.10	1.20	1.70	2.15	2.40	2.65	2.90	3.'
Two-year	1.39	1.40	1.71	1.85	1.75	2.15	2.40	2.80	3.00	3.35	3.7
Five-year	2.32	2.04	2.46	2.65	2.50	3.00	3.30	3.50	3.65	3.85	4.(
10-year	3.08	2.75	3.16	3.25	3.25	3.50	3.80	3.95	4.05	4.15	4.'
30-year	3.65	3.34	3.55	3.80	3.75	4.00	4.30	4.45	4.50	4.50	4.5
United States											
Fed funds	0 to 0.25	0 to 0.25	0 to 0.25	0 to 0.25	0 to 0.25	0 to 0.25	0 to 0.25	0 to 0.25	0.50	1.00	1.5
Three-month	0.18	0.16	0.12	0.15	0.20	0.20	0.25	0.35	0.65	1.25	1.7
Two-year	0.61	0.44	0.61	0.70	0.80	0.90	1.10	1.25	1.60	2.00	2.5
Five-year	1.79	1.27	2.01	2.10	2.00	2.30	2.60	2.80	3.05	3.40	3.7
10-year	2.97	2.48	3.30	3.45	3.25	3.65	4.00	4.15	4.25	4.45	4.5
30-year	3.91	3.67	4.34	4.50	4.55	4.60	4.85	4.90	4.95	5.00	5.(
United Kingdom											

RBC saw the 30 year LTC rate increasing to 4.55% by the end of 2012 so that the maturity spread between short term Treasury Bills and LTC yields would drop from the then current 2.52% to 1.55%. The RBC forecast last summer put Canada almost "back to normal" by the end of 2012.

However, the current (November 8, 2012) RBC interest rate forecast has the US Federal Funds rate at 0.0-0.13% out to 2013Q4 and the 30 year long US Treasury bond yield increasing from 2.80% as of 2012Q3 to 3.95%. Consequently RBC sees the US 30 year yield as over 1.0% lower than their forecast of June 2011. For Canada, RBC is forecasting that the overnight rate will start increasing in 2013Q3 and reach 1.50% by 2013Q4, while the LTC yield will increase from 2.40% to 2.95% by 2013Q4. In this case the forecast LTC yield is 1.60% lower than in June 2011. It is quite clear that the Euro crisis and problems in the US have caused RBC's "back to normal" forecast of the Summer of 2011 to be put off, almost indefinitely.

The RBC forecast for Canada is more optimistic than that of the (September) Consensus that puts the ten year Canada bond yield at 1.80% three months out and 2.2% twelve months out, so adding the current spread for the 30 year bond implies a forecast LTC yield of barely 2.80%.

I would judge forecast LTC yields of marginally less than ***3.0%*** as well below any "equilibrium" yield, since they are only 1.0% above the forecast inflation rate and mean locking in a negative real yield for a typical taxable investor. This is an interest rate that is not made in Canada but reflects US and Eurozone problems.

Q. WHAT ABOUT THE US?

A. What is clear from the above discussion is that the US, Europe and Canada are all on different trajectories. The European countries are retrenching to lower both their debt and deficits relative to GDP and as a result face probably eighteen months of slower growth as this fiscal stimulus is removed from their economies. In contrast, the US is still pursuing a highly stimulative policy of deficit financing with very low interest rates. However, this cannot go on indefinitely; eventually the US has to get to grips with its financial problems. Until it does the US is highly dependent on the impact of Operation Twist and further quantitative easing by the Federal Reserve. What this means is that the US is behind Europe and has yet to take its harsh fiscal medicine. If it does not take the necessary fiscal measures it will probably be downgraded by both Moody's and Fitch and is likely to resort to higher inflation to reduce its debt problems. This is probably why long term US treasury yields are so much higher than the equivalent in Canada.

Q. WHAT HAS BEEN THE STATE OF THE CORPORATE BOND MARKET?

A. The following graphs the generic yield or default, spreads between corporate and government bonds of the same maturity using the AA, A, and BBB indexes maintained originally by Scotia Capital markets.[15]

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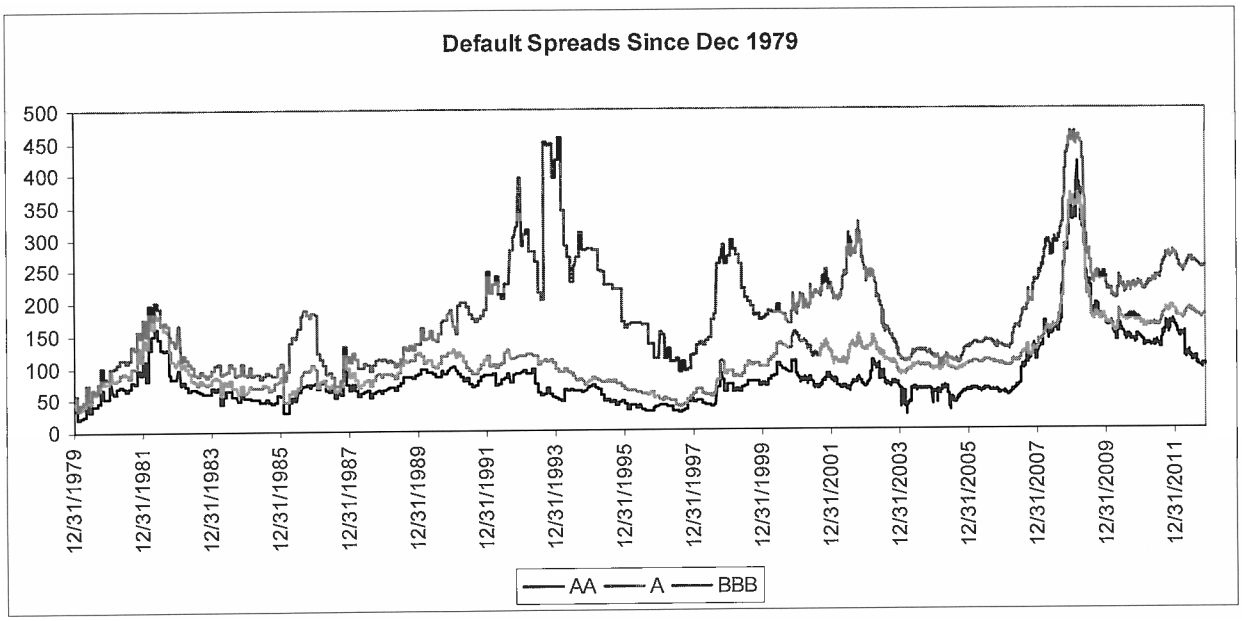
[15] The most recent data is from Datastream, which updates original data from Scotia Capital's Handbook of Debt Market Indices.



Corporate bonds have default risk since companies can run into financial difficulty whereas governments borrowing in their own currency like Canada cannot.[16] These yield spreads usually behave in a predictable manner. In a recession as the risk of bankruptcy increases investors sell off default-risky corporate debt and their liquidity drops. As a result their bond prices fall and their yields increase relative to the long Canada bond yield causing a wider spread. Conversely as the economy recovers and this risk recedes the spread narrows. We can see this clearly in the high spreads during the long recession of the early 1990s, the panic of the Asian crisis and the bursting of the Internet Bubble and in particular the financial crisis of 2008-9. Note also that usually the spread increases most for the BBB bond which is the riskiest. The exception to this general rule was during the last financial crisis when the spreads for even A and AA bonds widened dramatically as liquidity in the market dried up as many banks ceased making a market in corporate bonds except on an agency basis.[17]

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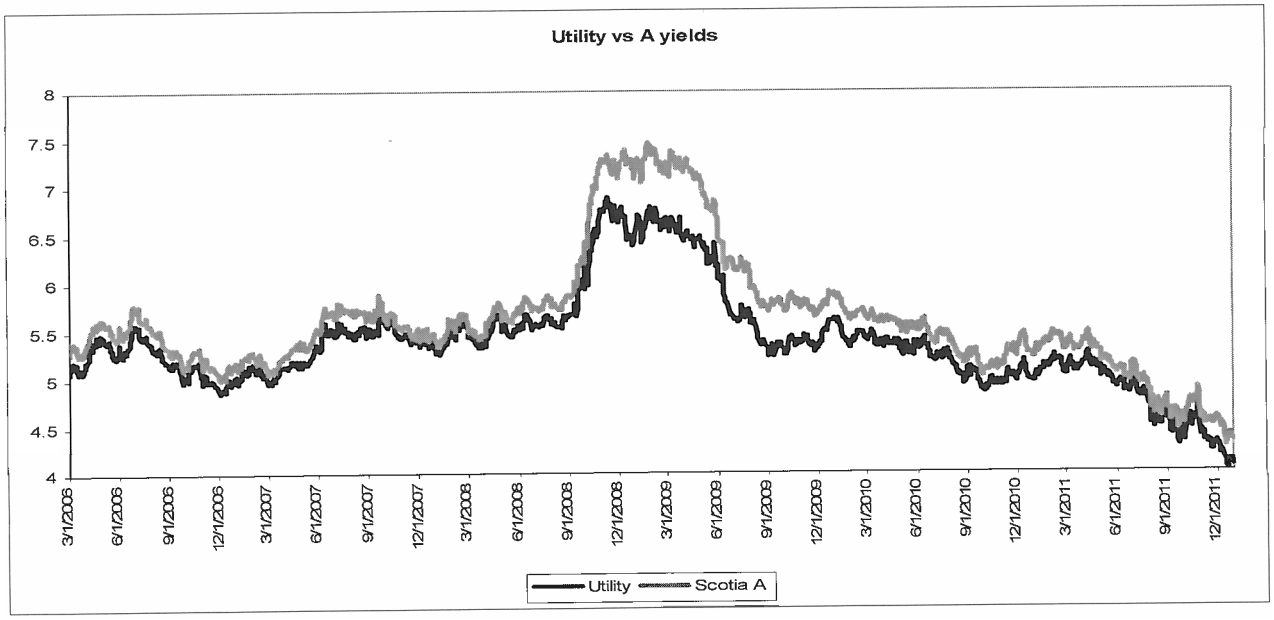
[16] This assumes they simply print more money to pay off their debts. The US can do this, but it was the behaviour of Tea Party members in Congress arguing that the US should default that so frightened global investors in 2011.

[17] Agency trades do not require capital, whereas normally banks hold an inventory and trade out of inventory for clients.

It is also important to distinguish between generic "A" and utility spreads. In the Ontario Energy Board report on the cost of capital[18] the OEB decided to re-set the ROE based on changes in both the long Canada bond yield and the utility bond yield using a series maintained by Bloomberg (C29530Y). The following graphs the corporate credit spread based on the yields from the Scotia Capital "A" bond index and the Bloomberg utility series.



What is important to note is that utility yields were consistently lower than the generic A yields as the financial crisis started to emerge and remained so until the recent collapse in bond yields. This is consistent with the experience of the FortisBC Energy bond yields.

This behaviour of yield spreads is not unusual. In fact, in previous testimony I have noted that during the prolonged recession in 1992-1994 the same phenomenon was observed using the CBRS utility and non-utility spreads.[19] This behaviour points to the fact that the market does recognise that utilities are lower risk than equivalently rated bonds when the "going gets tough", that is, that utility bonds are really lower risk than their actual ratings indicate.

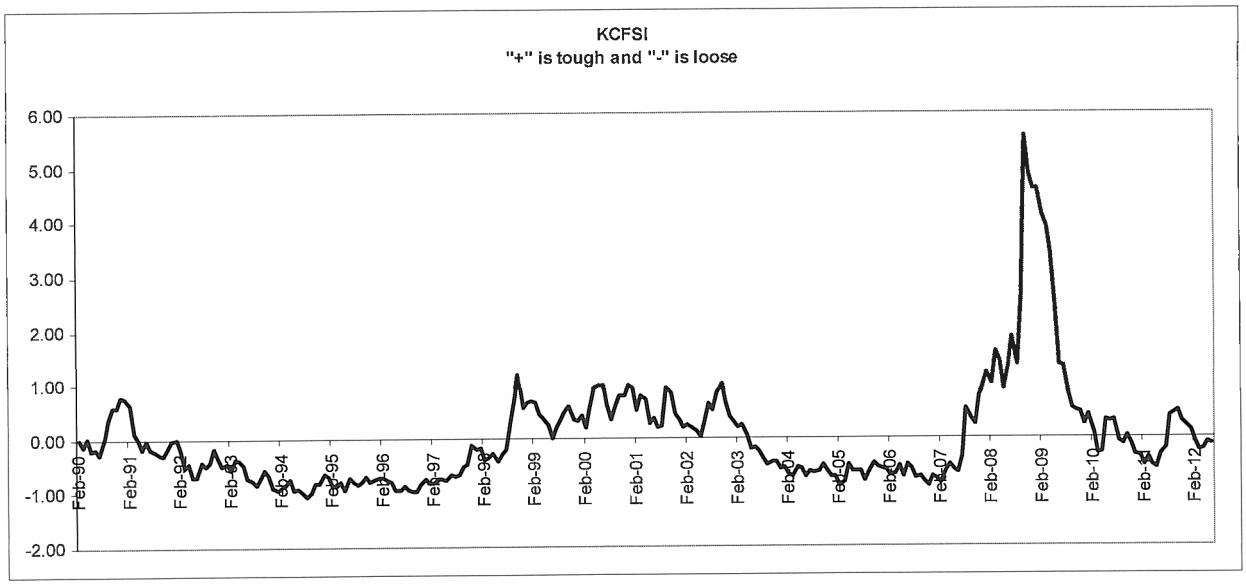
Q. WHAT HAS BEEN THE STATE OF CAPITAL MARKETS GENERALLY?

[18] EB-2009-0084

[19] CBRS was the Canadian Bond Rating Service which was taken over by S&P.

A. Since the financial crisis several boards have suspended their automatic ROE adjustment mechanisms due to the extreme conditions experienced during the crisis; most referenced conditions in the credit market or credit spreads similar to those I have just discussed. In response several more comprehensive indicators of financial stress have been developed.

In the US the Federal Reserve Bank of Kansas City has developed the Kansas City "Financial Stress" Index (KCFSI) which is graphed below.

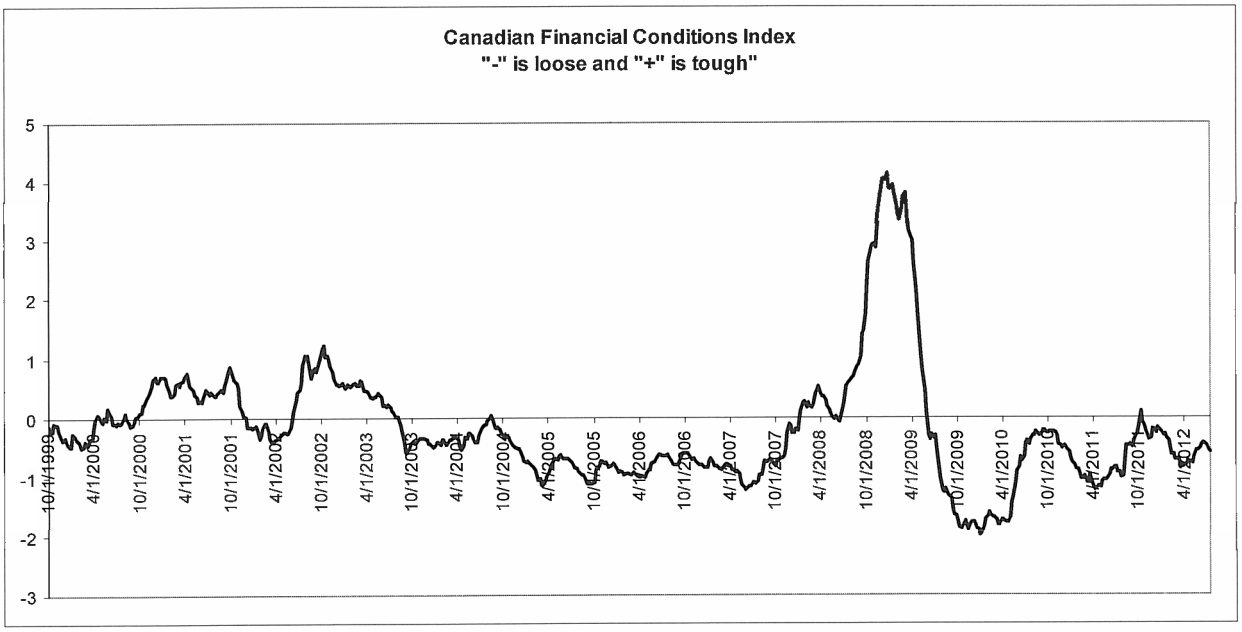


This index is designed to capture a variety of financial indicators in addition to the two which I have traditionally focussed on, which are the spreads between corporate and government yields, both the short term spreads in the money market and longer term spreads in the bond market. The additional indicators include the volatility index, the state of bank share prices, and the behaviour of stock and bond returns. When the KCFSI is above 0 it indicates that capital markets are under stress; similarly when it is below 0 it indicates relatively easy, "stress-free" capital market conditions. The value of the KCFSI is simply that it captures in one number the impact of a variety of capital market indicators.[20]

[20] Technically it captures the common element in all these indicators by using principal components analysis.

The major insight of the KCFSI is that it emphasises the enormous pressures in the US financial system during the financial crisis. Unlike the internet bubble crash in 2001 the crisis in 2008/9 struck at the very core of the US financial system, which is the banking system, where liquidity, that is, the ability to trade securities at close to their true market value, dried up in many parts of the capital market and the US government had to intervene on a massive scale. After consistently improving the KCFSI started to back up in 2010 and has recently been around 0, indicating neither stress nor easy financial market conditions.

The work by the Kansas City Fed follows pioneering work done by researchers at the Bank of Canada who developed a simpler financial conditions stress index,[21] which is graphed below.



The Bank of Canada indicator similarly tracks the enormous stress in the financial markets during the financial crisis. However, unlike the KCFSI the index reflects marginally looser or easy recent financial market conditions.

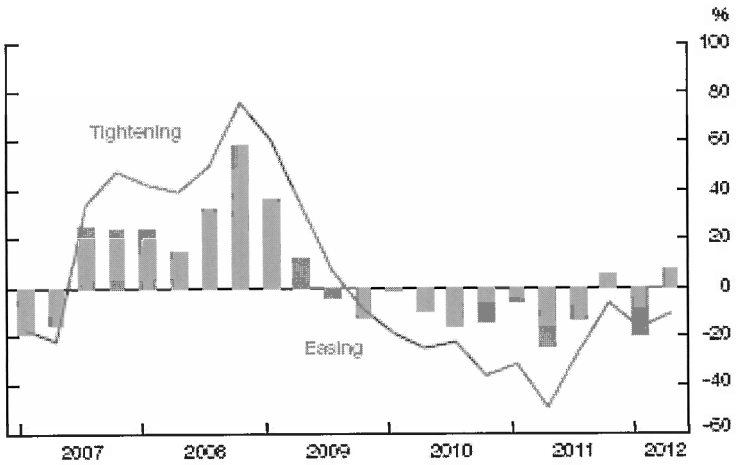
The performance of the Canadian Financial Conditions index mirrors the assessment of the Bank of Canada in its Financial System Review (December 2011), where it indicated that credit

[21] The Bank of Canada index is actually the inverse of this, I multiplied it through by -1 to get the same interpretation as for the KCFSI

conditions were little changed in Canada. The graph below supports that assessment with recent data from the Monetary Policy Report (July 2012) showing that credit conditions for Canadian firms remain relative easy.

Chart 18: **Survey results suggest that credit conditions for Canadian firms remain very stimulative**

Balance of opinion



Overall it is undoubtedly true that even with relatively elevated corporate spreads, companies have easy access to financial markets. With A utility borrowing costs hovering around 4.0%, and BBB rated issuers only slightly higher, the capital market is very attractive for corporate issuers, while lending officers are no longer keeping their purses tightly shut.

Q. WHAT ABOUT THE EQUITY MARKETS DURING AND AFTER THE FINANCIAL CRISIS?

A. The Canadian equity market was severely impacted by events in the United States as were markets around the world. However, Canadian utility companies behaved exactly as you would expect: as low risk defensive investments they did not decline with the stock market as a whole. In Appendix C Schedules 5-7 are graphs of the prices for the six major publicly traded utilities against the TSX Composite index. What it demonstrates is that as utilities they exhibited their low risk stature by not being as responsive to general market risk. As of the end of 2011, relative to the previous five years, every utility was trading significantly above the TSX except

for Valener, which is the old Gaz Metropolitain Limited Partnership units. The fact is any investor would have loved to hold a diversified portfolio of Canadian utilities through the last five years rather than the TSX Composite!

Further no utility in Canada was unable to raise capital on fair and reasonable terms during the financial crisis. Several of them raised shorter term debt financing, rather than long term financing, which is exactly what competitive non-regulated firms had to do, whose behavior they are regulated to mimic. On December 9, 2008 a story in the Calgary Herald[22] discussed the implications of the price of oil dropping from $144US to $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 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."

Although Pat Daniels stated that people don't realise how low risk Enbridge's business is, this is not true as the stock market clearly noticed. In my judgment, almost all the utilities demonstrated

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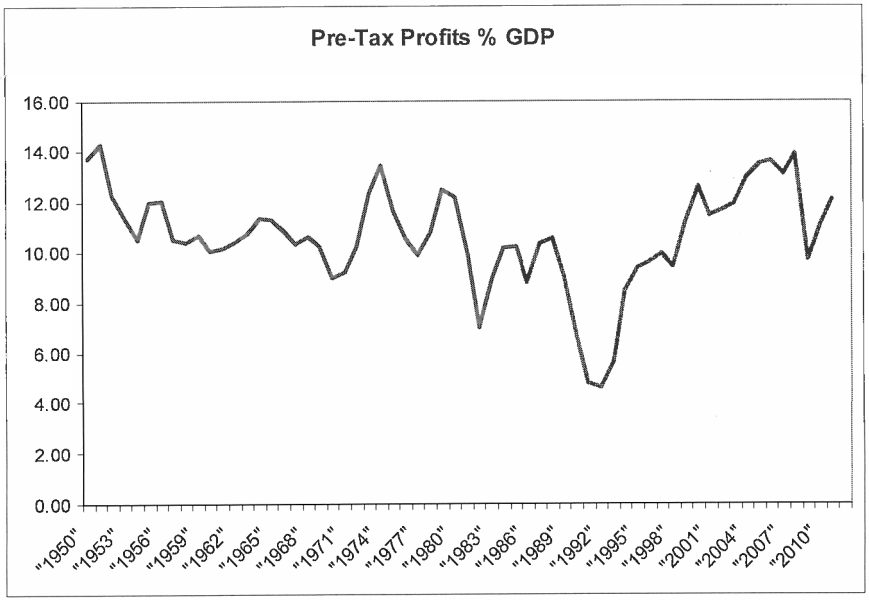
[22] Shaun Polczer, "Pipeline companies weather darkest hour; Executives say crisis worst in oil patch history" Calgary Herald, December 9, 2008.

the low risk nature of their business throughout the financial crisis. This is not to say that they have no risk, the fact that they did move with the market indicates they do have market risk.

What is clear is that capital market conditions today are much easier than in 2009, but even at that point in time utilities had good market access. This is particularly true once it is remembered that during the financial crisis even AA credits were treated as A or BBB credits. As a regulated utility when the going gets tough, Canadian utilities can still finance when others can't. In conclusion there is nothing in current capital market conditions to indicate that NP needs any sort of "cushion" to improve its capital market access so that it can obtain funds on fair and reasonable terms.

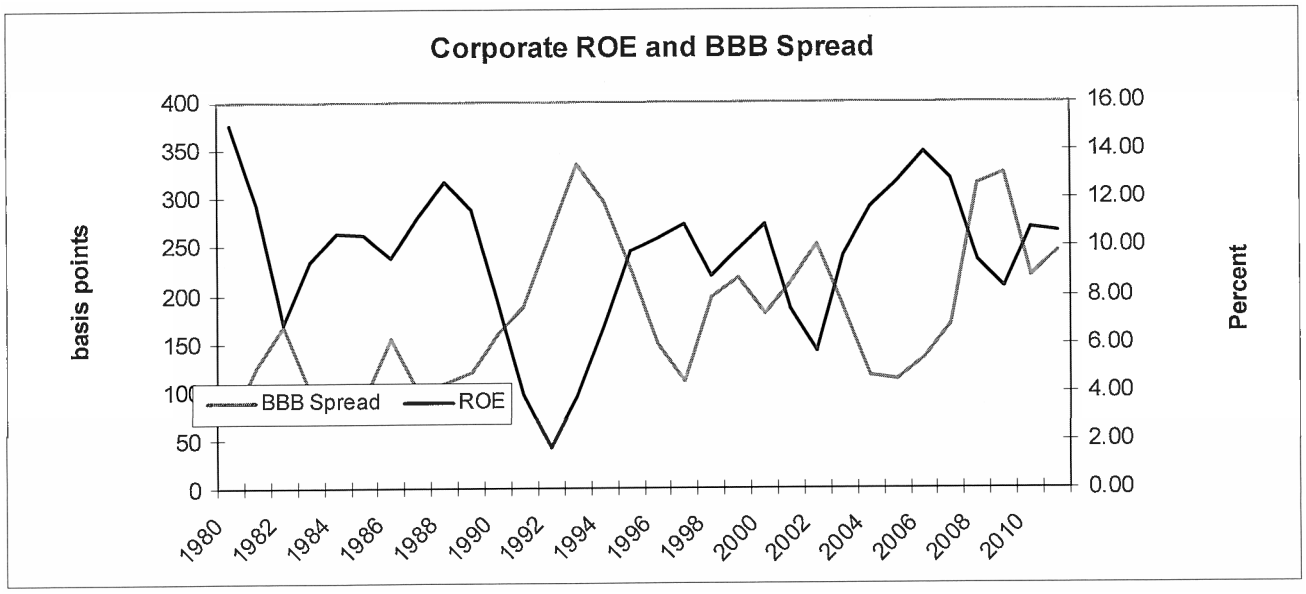
Q. HOW DOES THE STATE OF THE ECONOMY AFFECT PROFITS AND THE CAPITAL MARKET?

A. The following graphs the level of pre-tax corporate profits (Cansim V498077) as a percentage of GDP (Cansim V498074). These profits are taken directly from corporate tax returns and so avoid all the one time only accounting losses that rocked Nortel, JDS Uniphase and others. Consequently, they are a more accurate measure of corporate operating profits than normal accounting profits.



The graph shows that profits through 2008 were running at all-time highs at just under 14% of GDP as high commodity prices significantly affected the profitability of Corporate Canada. These profits then slightly decreased in 2009 and came back to above average in both 2010 and 2011. Since 1950 before tax corporate profits have averaged 10.62% and are currently at 12.10% of GDP%.

Another way of assessing corporate profitability is to look at the aggregate data maintained by Statistics Canada (*Quarterly Financial Statistics for Enterprises*). Statistics Canada started reporting quarterly return on equity data in 1980 based on Standard Industrial Classifications (SIC) and then moved to North American Industrial Classifications (NAICs) in 1999. The following graphs this average annual ROE against the spread between the yield on BBB debt and long Canada bonds from Scotia Capital's Handbook of Canadian Debt market Indices.



The graph shows that as of 1980 the average ROE was 15.05% and the corporate yield 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 investments caused the yield 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 corporate 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. We can then see the high ROEs of the last few years reflected in very low credit spreads and the impact of the financial crisis. Interestingly, although we see the standard inverse relationship between ROEs and the corporate spread during the recent financial crisis and the corporate spread hitting the same highs as in 1983, the ROE never dropped below the average (or median) for Corporate Canada since 1980. This indicates again that the recent financial crisis was not made in Canada and we were side swiped by events primarily in the United States.

Q. DOES THE PROFITABILITY DATA HAVE ANY IMPLICATIONS FOR THE FAIR ROE?

A. Yes, since ultimately stock market returns are driven by the returns earned by companies, that is, what is sometimes referred to as "comparable earnings." In 1925 John Maynard Keynes pointed out[23] that there were two sources of returns from investing in the stock market. The first is called the ***investment return*** which Keynes defined as "forecasting the prospective yield of an asset over its entire life."[24] In modern terminology this would be the internal rate of return on the firm's cash flows, or an approximate average return on equity. The second component he called the ***speculative*** return, which involved forecasting the psychology of the market and what Keynes referred to as the change in the basis of valuation. In modern terminology this would be a change in the price earnings ratio. Keynes discussed this speculative return as being generated by the "state of confidence" and "animal spirits" but he also pointed out it is affected by the level of interest rates.[25]

Keynes' point would be that a firm may earn 10%, but if the valuation of that firm changes by 10% then the investor would earn both a speculative return as well as an investment return. This total return is then what we look at when we look at the returns over long periods of time on the TSX Composite or the SP500. However, in aggregate the change in the basis of valuation cannot

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[23] Quoted in John Bogle, The Lessons of History, September 12, 2011, John Maynard Keynes, 1925, Review of Common Stocks as Long Term Investments, Edgar Lawrence Smith

[24] This definition comes from chapter 12 of the General Theory of Employment Interest and Money, Macmillan London, 1936

[25] Page 149 of the General Theory

go on forever. We cannot continue to have a state of high confidence any more than interest rates can continue to increase or decrease: both of them will tend to revert back to some long run average. However, professional investors according to Keynes are mainly concerned with speculative returns or forecasting the change in the basis of valuation six months out. In contrast buy and hold or fundamental investors are mainly concerned with the investment return: finding good companies and holding them regardless.

Warren Buffet is probably the most successful fundamental investor of the last fifty years. He repeated Keynes' argument by stating:[26]

> "*The most the owners in aggregate can earn between now and judgment day is what their businesses in aggregate earn.*(italics in original) True by buying and selling that is clever or lucky, investor A may take more than his share of the pie at the expense of investor B. And yes, all investors feel richer when stocks soar. But an owner can exit only by having someone take his place. If one investor sells high, another must buy high. For owners as a whole, there is simply no magic - no shower of money from outer space – that will enable them to extract wealth from their companies beyond that created by the companies themselves."

Buffet's main criticism was for the financial professionals who help individuals to trade so that in aggregate investors lose part of the pie in fees. However, Keynes, Bogle and Buffet all point out the basic fact that short run returns can deviate from the returns generated by the economy and earned by firms, the investment return, but in the long run this is all there is.

This idea was taken up by Benjamin Graham who looked at cyclically adjusted price earnings ratios. More recently Professor Robert Shiller at Yale University has popularised this by averaging the SP500 earnings over a ten year period and calculating the current PE based on these cyclically adjusted earnings. His chart is reproduced below along with the yield on the ten year US Government bond. We can see immediately why Shiller put the yield on the long US bond on the graph since as pointed out by Keynes this affects the PE ratio. In particular, increased interest rates in the 1970's peaking in the early 1980s were associated with declining PE ratios and the subsequent decline led to the big bull market that ended with the 2008 stock

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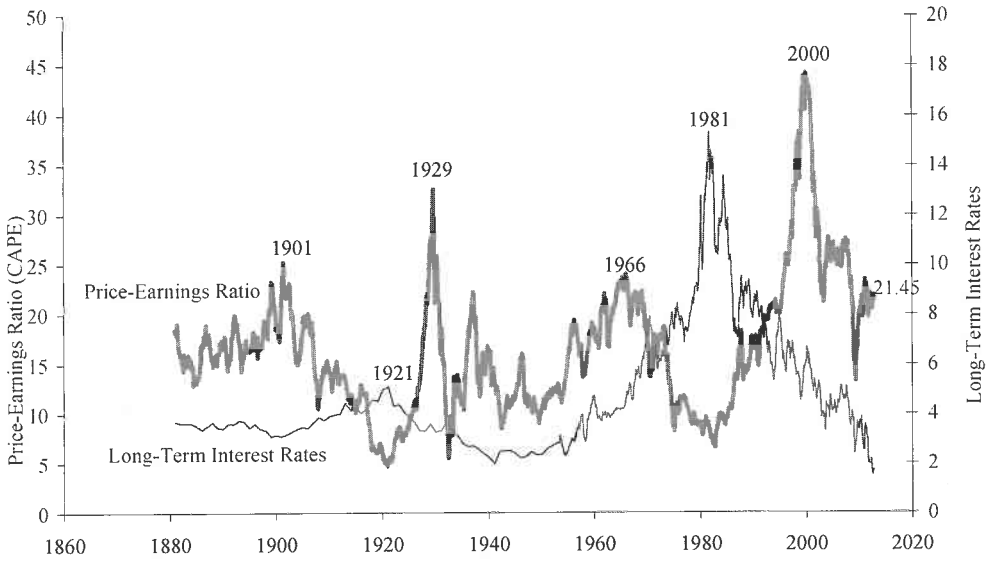
[26] Warren Buffet's comments in Berkshire Hathaway's 2006 Annual Report as reported in Fortune, March 20, 2006.

market crash. However, the main point is that the PE ratio tends to revert back to normal. Shiller's average PE ratio is 16.0X, but his latest estimate has the SP500 at 21.5X or above the long run average. This is why many judge the current stock market to be over-valued, but this charge ignores the fact that current interest rates are so very low.



This discussion of what generates stock market returns is provided since in the long run the average stock market return should approximate the average investment return,[27] that is the speculative return should average out to zero. There are two ways in which we can look at the investment return; the first is to look at average rates of return on equity and the second to look at a Gordon growth model for the economy as a whole.

In Schedule 3 is the average ROE for Corporate Canada since 1987 as reported by Statistics Canada (Table # 1800003). Over this 25 year period the average ROE has been 9.30%. The second column reports the annual return on the TSX Composite which over the same period has been 9.61% or 0.31% more. However, the rough equality over 25 years hides the significant year to year variation where speculative returns have been significantly high or low. For example, in

[27] It is an approximation since it depends on the market to book ratio at the start of the period.

1987 Corporate Canada earned 11.19% but the TSX Composite only 5.88%, so there was a short term speculative loss of 5.31%. It wasn't until 1999 than the TSX returned 21.37%, compared to Corporate Canada's ROE of 11.47%, that the speculative return turned positive. In each year we can see that the speculative return is highly volatile and on average 5-6 times more volatile than the investment return.

The second way of looking at the investment return is that used by Jack Bogle, the founder of Vanguard Mutual funds. He estimated the investment return using the Gordon model, where at the start of each year he added the subsequent five year earnings growth to the dividend yield. He then took this analysis back to 1900 and provided the graph in Schedule 4. This marginally understates the investment return since he should have used the forecast dividend yield, but as he noted it did not materially affect the results. He estimated this investment return at 8.8% or slightly less than the average US stock market return of 9.1%. However, since he underestimated the investment return the difference in reality is *de minimus*. Just like Keynes, Bogle also noted the persistent tendency for reversion towards the mean, which is another way of saying that high or low stock markets and PE multiples do not last. As Bogle noted (page 11)

> "Over the long run it is the durable economics of enterprise – enterprise – that has determined total return: the evanescent emotions of investing – speculation –so important over the short run, has ultimately proven to be meaningless."

The approach of Keynes, Buffet and Bogle is a standard approach used by fundamental investors who look at individual stocks, rather trying to time the market. However, it is sometimes used to time the market over a long horizon. In a US Equity Strategy Report (July 18, 2012) RBC pointed out that historic long run equity returns in the US had been 9.4% nominal or 6.2% real since 1900. However, going forward they used what they termed a "Grinold-Kroner-Siegel" supply side model, which is actually just the modified DCF model, where long run return (R.) was equal to:

$$R = \underbrace{\frac{D}{P}}_{\text{Income}} \underbrace{- \Delta S + i + g}_{\text{Earnings Growth}} \underbrace{+ \Delta PE}_{\text{Repricing}}$$

1

2 This equation says that the long run return is equal to the dividend yield minus share dilution,
3 caused by stock issues, plus inflation and real earnings growth, plus the change in the PE
4 multiple.

5 RBC placed the dividend yield at 2.1% and while they judged average share dilution from new
6 issues to be 2.0% going forward they expect increased share buybacks to cause this to drop to -
7 0.50% so the adjusted dividend yield is 1.60%. They anticipated inflation in the US at 2.1% and
8 real growth of 3.8% for a nominal growth forecast of 5.9% almost identical to my estimate for
9 the Canadian market. RBC then forecast that the normalised Shiller PE ratio will move back to
10 16-18X partly due to changing demographics in the US as the proportion of peak savers
11 (demanders of equities) drops as the baby boomers age. They forecast that this would cause a
12 change in the basis of valuation reducing the long run (ten year) equity market return by 1.0%.
13 RBC's long run forecast is therefore for a 4.9% US equity market return. The following graphic
14 pulls together the RBC forecast:

Bringing It All Together - A Mediocre Long-Term Environment

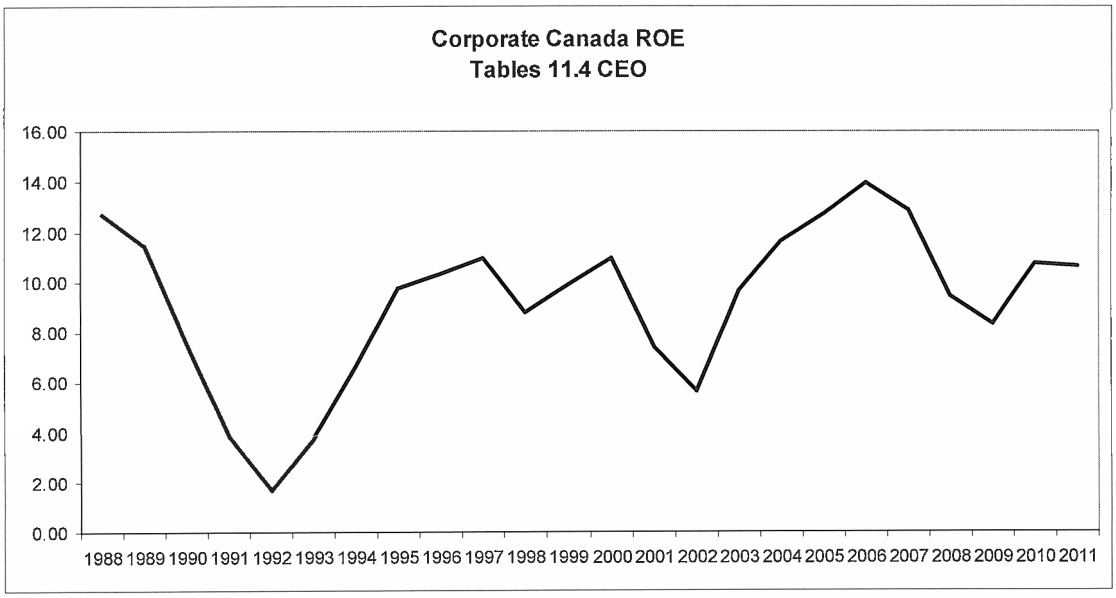
S&P 500 10 year Return Forecast	
+ Dividend yield	2.1%
- Net Share Issuance	-0.5%
+ Inflation	2.1%
+ Real Earnings Growth	2.2%
+ Change in PE	-1.0%
= Total Equity Return	4.9%

- Our supply-side framework brings us to a forecast of 4.9% annual returns over the next decade.

Source: RBC Capital Markets

15

16 However, profits and the return on equity clearly vary with the business cycle so below I graph
17 the Statistics Canada ROE for all firms from 1988 without the BBB spread.



Overall this Statistics Canada ROE data reinforces the aggregate profitability data that the top of the business cycle was in 2007. ***For the whole period since 1988 the median Statistics Canada ROE for Corporate Canada was 9.83% and the average slightly less at 9.23%.*** What this means is that the "average" firm in Canada does not earn the level of ROE requested by NP and recommended by its witnesses; yet as the chart shows there is considerable year to year volatility in the overall earned ROE that is not faced by shareholders in NP.[28]

Q. WHAT ARE YOUR CONCLUSIONS ABOUT CONDITIONS IN THE "MONEY MARKET"?

A. Overall the Canadian economy is good shape. As the Bank of Canada noted the remaining spare capacity will be used up in 2013/4 and the financial system is firing on all cylinders. The stock market is valuing utilities very favourably, credit is easy and utilities are issuing 40 and 50 year debt at very low rates. The only "problem" is that as one of the few AAA rated issuers the Government of Canada is borrowing on extremely low interest rates; significantly lower than the US government. However, this does not indicate any "heightened risk aversion in the credit markets." Overall market conditions are remarkably benign.

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[28] Note the volatility of the average ROE for Corporate Canada is reduced by the automatic diversification across all companies in Canada. The individual ROEs are obviously much more volatile.

III RISK PREMIUM ESTIMATES OF THE FAIR ROE

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

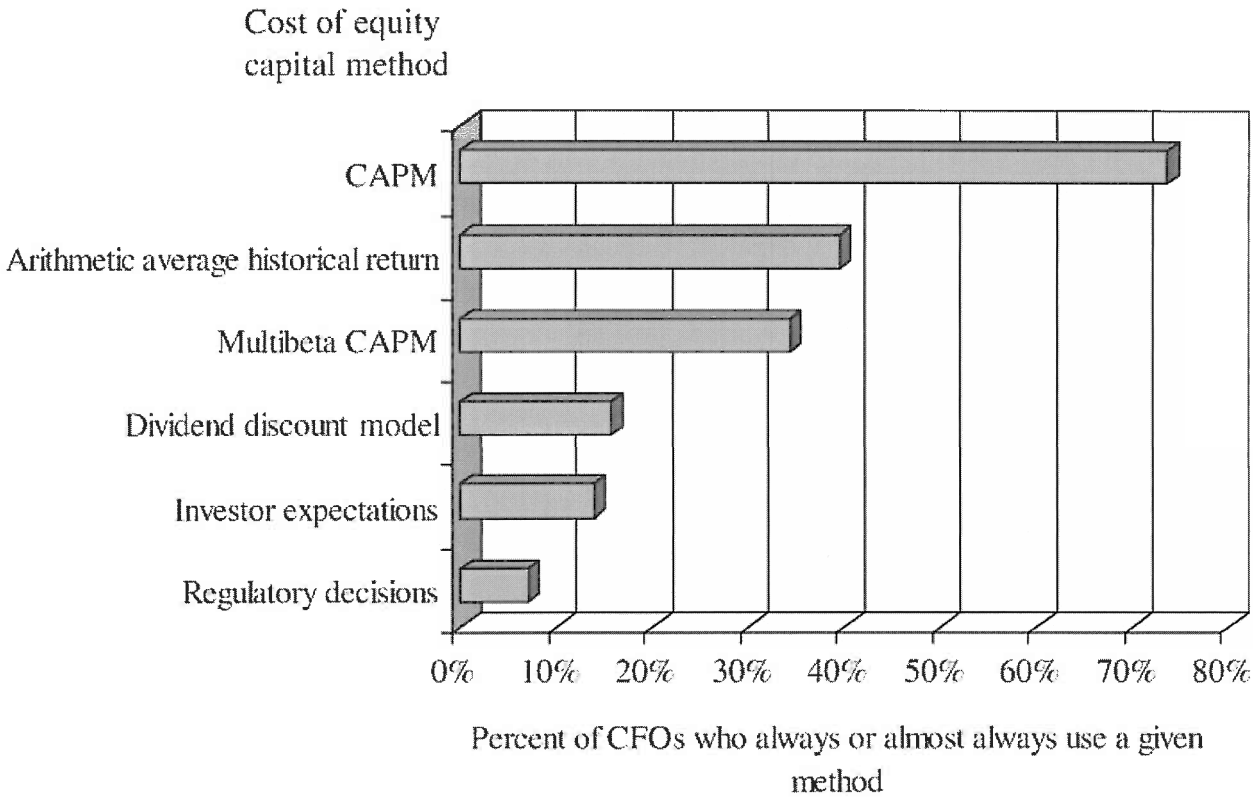
A. The capital asset pricing model or CAPM is the most common way of estimating the fair rate of return. It is a special form of risk premium model which simply says,

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

In words the investor's required or fair rate of return (K) is equal to the risk free rate (R_F) plus a risk premium. Where the CAPM differs from other risk premium models is that it specifies that the risk premium is comprised of the market risk premium (MRP) times the security's relative risk or beta coefficient (β). In this regard any fair ROE can *always* be decomposed into a risk free rate and a risk premium, so the CAPM is perfectly general: its contribution is simply to relate an individual risk premium to the overall market risk premium and its relative risk coefficient.

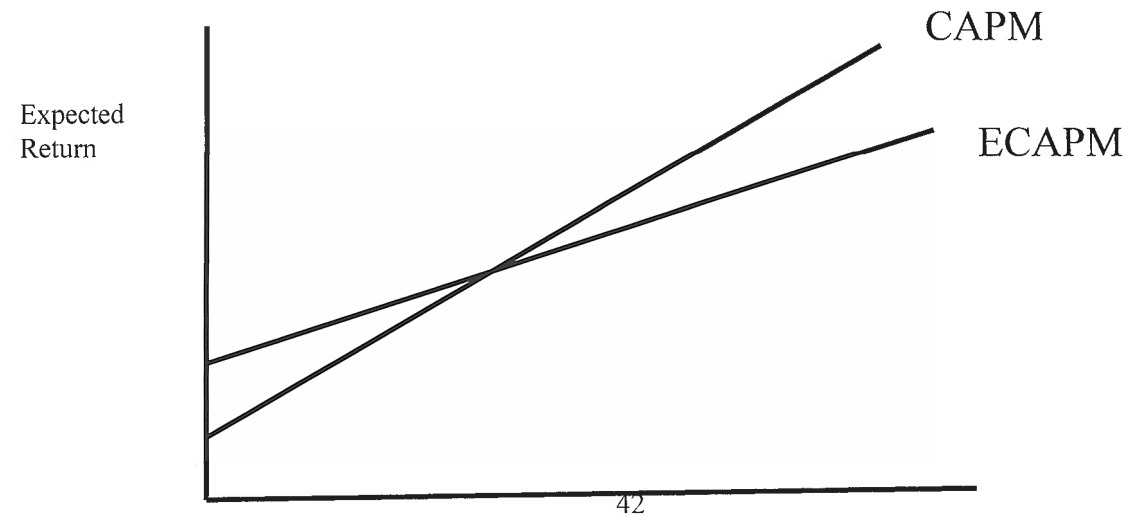
Why the CAPM is so widely used is because it is intuitively correct. It captures two of the major "laws' of finance: the ***time value*** of money and the ***risk value*** of money. I will discuss the third law of finance the ***tax value*** of money later, but the time value of money is captured in the long Canada bond yield as the risk free rate. 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." Where the CAPM normally gets controversial is in the beta coefficient; since risk is constantly changing so too are beta coefficients. This sometimes casts doubt on the model as people find it difficult to understand why betas change. Further it also makes testing the model incredibly difficult. However, the CAPM measures the right thing: which is how much does a security add to the risk of a diversified portfolio, which is the central idea of modern portfolio theory. It also reflects the fact that modern capital markets are dominated by large institutions that hold diversified portfolios.

Currently, the CAPM is overwhelmingly the most important model used by a company in estimating their cost of equity capital. The following table comes from a survey of 392 US Chief Financial officers by Graham and Harvey in the Journal of Financial Economics 2001:



70% of US CFOs use the CAPM and a further 30% use a multi-beta approach similar to the two factor model I often use. Note in this respect that multi-beta models, while slightly more general, don't alter the average rate of return which is anchored by the risk free rate and market risk premium: all they do is generate slightly different estimates for individual firms.

Although the CAPM is the premier model for estimating required or fair rates of return, early tests showed that it tended to over-estimate returns for high-risk ($\beta>1$) and under-estimate returns for low risk ($\beta<1$) stocks. This is illustrated in the following graph



For this reason some expert witnesses have used an empirical CAPM or ECAPM, where the risk free rate is increased, the market risk premium flattened as in the above graph or the beta adjusted. For low risk stocks like utilities such a practice clearly increases the estimate of the fair rate of return. However, while this practise is consistent with the early empirical tests it is not appropriate when used for estimating utility rates of return. To understand why we should understand how these tests were conducted.

First, the ECAPM is based on tests that use the 30 day return on the 90 day Treasury bill yield as the risk free rate. As a result the tests are based on trying to see whether the CAPM predicts 30 day returns. Such a practice is only appropriate for very short horizon (30 days) investments. In regulatory hearings it is customary to use the CAPM with the LTC bond yield, since equities have longer time horizons than even the longest maturity LTC bond. To the extent that LTC yields have averaged a maturity premium of about 1.25% over the Treasury bill yield, this use of the CAPM automatically increases the risk free rate and lowers the slope in the same way as the ECAPM. In this way it adjusts for the bias noted in these early tests of the CAPM.

The second problem is that these tests used actual betas and were simply mechanical: whatever was the beta over the previous five year period was used in the test as a forecast beta. This is not how betas have ever been used in a regulatory context. I have always used judgement in adjusting betas back to their average value, a practice accepted by many boards, whereas company witnesses in part adjust them using the Marshall Blume adjustment model appropriate for a typical or average stock.[29] I discuss this procedure in my Appendix C where I discuss relative risk adjustments, but the point is simply that the empirical tests that justify the ECAPM don't do this.

At the current point in time the 91 day Treasury Bill yield is 1.00% and with the Fed's commitment to keep the Federal Funds rate at 0.0-0.25% constant through the end of 2014 the likelihood is that the Canadian Treasury bill yield will also remain around this level. With the forecast long Canada bond yield for 2013 at about 3.00% the use of a long Canada bond yield as

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[29] They often hide this by simply using other people's betas that they know have been adjusted in this way.

the risk free rate already increases the CAPM estimate by over 2.00% over a "normal" ECAPM estimate, so there is no need for any further adjustment. Finally, note that if I used the CAPM in the way that it has been tested I would use the recent actual beta coefficient. In Appendix C I show that Canadian Utilities has a recent beta coefficient of 0.03, so a naïve CAPM estimate, similar to that in the tests, would be for a CAPM fair return of say 1.00% + 0.03*MRP, with an MRP of 5% this indicates a fair return of 1.15%, which I don't think anyone would accept as fair!

The fact is that by using forecast LTC yields as the risk free rate and judgment in estimating beta coefficients, the right adjustments have already been made to the way the CAPM was tested and from which the ECAPM was derived. If the ECAPM is used with a long Canada bond yield and adjusted betas it simply represents double or triple counting for the same effect.

Q. IS THERE ANY OTHER SUPPORT FOR THE CAPM?

A. Yes. Levy and Roll have recently revisited the question of the empirical support for the CAPM. Richard Roll in a path breaking paper[30] pointed out that as long as the market portfolio is ex post efficient then by definition the CAPM will work in empirical tests and all securities will lie along a straight line relating returns to betas. In the Levy and Roll paper[31] they reverse engineer the tests and consider how much the sample parameters can vary to make sure the normal proxies for the market portfolio are efficient. Levy and Roll find that even slight variations, within the normal estimation bounds, make the proxies efficient. As they conclude:

> "This article shows that a small variation of the sample parameters, well within their estimation error bounds, can make a typical market proxy efficient. Thus, the empirically measured return parameters and the market portfolio weights are perfectly consistent with the CAPM using a typical proxy..... Hence, minor changes in estimation error reverse previous negative and disappointing findings for the CAPM."

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[30] Richard Roll, "A Critique of the Asset Pricing Theory's Tests: Part 1: On Past and Potential Testability of the Theory", Journal of Financial Economics 4: 129-76, 1977.

[31] Moshe Levy and Richard Roll, "The Market Portfolio May be Mean Variance Efficient After All," Review of Financial Studies, 2010.

The point is that the normal criticism of the CAPM provided by utility witnesses relies on very old and stale tests of the CAPM and the Levy and Roll results show that even slight changes in the parameters will nullify those results.

Q. WHAT IS YOUR SIMPLE CAPM ESTIMATE FOR A BENCHMARK UTILITY?

A. In Appendix B I estimate the market risk premium of common equities over long term Canada bonds at 5.0-6.0%. This estimate is drawn from the Canadian capital market history going back to 1924 so encompasses periods very similar to today, such as the bleak 1930s of slow growth and falling prices, as well as booms and serious inflation problems such as the 1970's. While the Canadian data points to a market risk premium of under 5.0%, I give weight to the US evidence for two main reasons. First, most of the restrictions on keeping Canadian capital within Canada have been removed resulting in significant capital outflows and higher expected returns on Canadian investments. Second, Canadian governments have moved to a primary surplus on their budgets. The primary surplus is the actual surplus after stimulus expenditures and the impact of an economic slow-down have been removed. The result has been lower interest rates in Canada than the United States for the last five plus years, which has removed the historic bias of a smaller Canadian market risk premium over a higher and riskier Canadian government bond yield. Finally, I give significant weight to survey results by Professor Fernandez, who now annually surveys thousands of academics, financial analysts and corporate executives making investment decisions.

My Appendix C discusses relative risk adjustments or betas. The recent history of Canadian and low risk US utilities is of beta coefficients about 0.30-0.35 as they have withstood the impact of the financial crisis much better than the market as a whole, that is, the crisis demonstrated yet again the low risk nature of regulated utilities. These estimates are consistent with the price behaviour of Canadian regulated utilities and estimates by the Royal Bank of Canada. It is indisputable that as low risk investments the relative risk of Canadian utilities has been about 0.30-0.35. However, any estimates reflect the time period over which they are estimated and once a unique event falls out of the estimation window it is no longer in the estimate. On a going forward basis I do not expect the US financial system to collapse again, as it did in 2008/9, and trigger a global meltdown. As a result, I believe that the relative risk of Canadian utilities will

move back to their historic range reflecting normal market risk. This is why I continue to judge the relative risk of a Canadian utility to be 45-55% of that of the market as a whole.

I would therefore judge the going forward utility risk premium to be 2.25% to 3.30% representing the combination of the low end of the relative risk adjustment and the low end of the market risk premium (.45 and 5%) combined with the top end of both (.55 and 6%). If this is added to a 3.00% forecast long term Canadian bond yield for 2013 and a 0.50% flotation cost allowance, I would judge a "simple" CAPM fair return to be as follows:

Simple CAPM Estimates	2013
Low end	**5.75%**
High end	**6.80%**

Q. DO YOU USE THIS SIMPLE CAPM ESTIMATE FOR YOUR RECOMMENDATION?

A. No. The CAPM estimate is appropriate under "normal" circumstances, since it uses a normal or average market risk premium and assumes that conditions in the bond market affecting the long Canada bond yield are also driving conditions in the equity market, that is, that the correct "opportunity cost" for an equity investor is the bond market plus a risk premium. However, at the current point in time conditions in the Canadian bond market are being driven by the US Federal Reserve's Operation Twist and panic on the part of foreign investors looking for a safe home for their Euros. These are not "average" market conditions and while they affect the Canadian bond market they may not have the same impact on the equity market. This has been reflected in the decisions of other regulators since the onset of the financial crisis.

A good example is a 2009 Gaz Metro decision which specifically stated that it regarded the CAPM as being the most appropriate model for determining a reasonable rate of return. It also presented the following table to show how it arrived at its fair ROE for Gaz Metro (Paragraph 2956):

Parameters	Bottom of range	Top of range
Risk-free rate	4.23%	4.50%
Market risk premium before financial crisis	5.50%	5.75%
Benchmark gross beta (not adjusted)	0.50	0.55
Adjustment for Gaz Métro's risks	0.25%	0.35%
Issuance costs	0.30%	0.40%
Sub-total n° 1: Result produced by CAPM	**7.53%**	**8.41%**
Adjustment to take account of results of other models	0.25%	0.50%
Sub-total n° 2: Rate of return before adjustment to take account of effect of financial crisis	**7.78%**	**8.91%**
Adjustment to account for the effect of the financial crisis	0.25%	0.55%
Total: Rate of return after adjustment to account for the effect of the financial crisis	**8.03%**	**9.46%**

If we look at the bottom of the range we can clearly see how the CAPM result was obtained: a 4.23% LTC forecast yield plus a utility risk premium of 5.5% * 0.50 or 275 bps to which a 0.30% flotation cost allowance was added to get 7.28%. A similar approach was used to get the high end estimate of 8.06%. Ignoring the additional ROE for Gaz Metro's higher risk than the benchmark, the Regie estimated a CAPM fair ROE of 7.28%-8.06% based on a forecast long Canada bond yield very similar to my own forecast for 2012. The Regie then increased the range by 0.75% - 1.40% for

1) Gaz Metro's higher risk: 0.25% - 0.35%
2) The result of other models: 0.25% - 0.50%
3) The financial crisis: 0.25% - 0.55%

The AUC adopted a similar approach in its generic decision (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 arriving at their reasonable CAPM range of 7.13%-8.62% the AUC used similar values to the Regie: a market risk premium range of 5.00-5.75% and a relative risk (beta) coefficient of 0.50-0.63 and a forecast long Canada yield of 4.13-4.50%. Together with a 0.50% flotation allowance these result in a bottom-to-top range of 7.13-8.62%, which is slightly wider than the Regie's. In addition the AUC added an additional 0.50% to the ROE largely due to changes in yield spreads and its assessment that this "reasonable range" for the CAPM may be unreasonably low. The overall adjusted CAPM range was 7.63-9.12% and by considering the results from other models the AUC awarded an ROE of 9.0%.[32]

In its own 2009 decision, the Board also based its allowed ROE for NP on the CAPM. The Board used a 4.5% risk free rate, a 6% market risk premium, a beta of 0.60 and a 0.50% flotation cost allowance for a CAPM fair return of 8.60%. The Board then decided that NP was an average risk Canadian utility and allowed a 9.0% ROE due to financial market conditions and NP's credit metrics. I would interpret the latter as adding to the CAPM estimate based on credit market concerns similar to other boards.

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

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[32] In its 2011 generic decision the AUC (page 15) estimated a CAPM range of 6.40-9.0% produced from essentially the same beta coefficients, but a higher market risk premium range of 5.0-7.25% and a lower forecast long Canada bond yield of 3.40-3.80%. .

> 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 relatively high risk assessment (beta) placed on Terasen Gas Inc. (TGI) of 0.60-0.66.

I mention these decisions since they were made in 2009 in the aftermath of the worst of the financial crisis when utilities were claiming that the ROEs flowing from automatic ROE adjustment formula were not fair and reasonable. In almost every instance the decisions reflected reasonable values for the market risk premium, relative risk adjustment and forecast long Canada bond yields, but added a financial crisis risk premium, largely based on conditions in the credit market or credit spreads.

Q. DO YOU AGREE WITH A CREDIT SPREAD ADJUSTMENT?

A. Yes. Before several boards in 2009 I stated that much of the increase in credit (or corporate) spreads was caused by liquidity problems in the market making function of investment banks, that is, they were sellers of corporate bonds since their solvency was in question and survival was the most important imperative. Obviously several of them failed and some of the survivors only survived as a result of the US government's TARP program. However as a result of this it was extremely difficult to disentangle the credit risk component in corporate spreads from the liquidity component. However, I judged the liquidity component to be the most important.

Since then research at the Bank of Canada has helped to disentangle the liquidity from the pure default risk components in the corporate spread. Garcia and Yang[33] looked at Canadian US$

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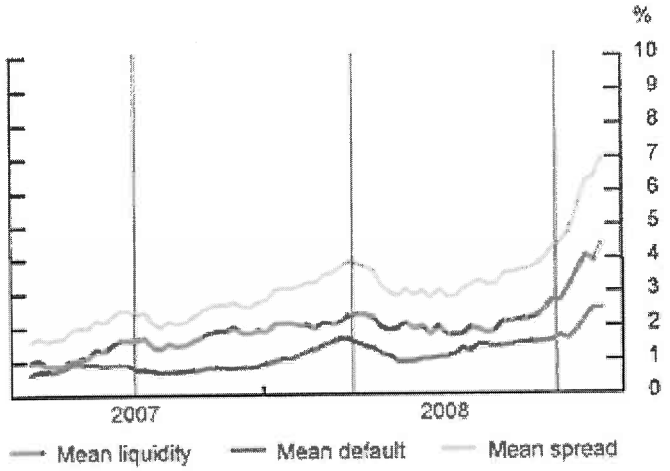
[33] A. Garcia and J. Yang, "Understanding Corporate Bond Spreads Using Credit Default Swaps," Bank of Canada Review, Autumn 2009

issuers in the US market, where credit default swaps were traded. They had to look in the US market, since there is no data within Canada. However, for these Canadian, investment grade, US$ issuers, investors could purchase credit default swaps to insure against default. Further, since the liquidity risk is minimal in credit default swaps, by comparing these spreads with conventional yield spreads, they were able to disentangle the two components. The graph that follows provides their key result.

Chart 2: Corporate bond spreads for an average investment-grade firm

Synthetic zero-coupon 5-year bond



Note: The green lines represent the dates when Bear Stearns liquidated two hedge funds that had invested in mortgage-backed securities (31 July 2007), the Federal Reserve Bank of New York announced that it would provide term financing to facilitate JPMorgan Chase's acquisition of Bear Stearns (24 March 2008), and Lehman Brothers filed for Chapter 11 bankruptcy (15 September 2008).

Source: Bank of Canada estimates

The average (mean) overall spread increased from under 200 basis points (bps) in 2007 to 700 bps at the peak of the crisis. However, the vast bulk of this increase was due to liquidity effects, where the spread increased from 100 bps to over 400 bps. In contrast, the pure default risk component increased from under 100 bps to about 250 bps. Garcia and Yang conclude (page 29)

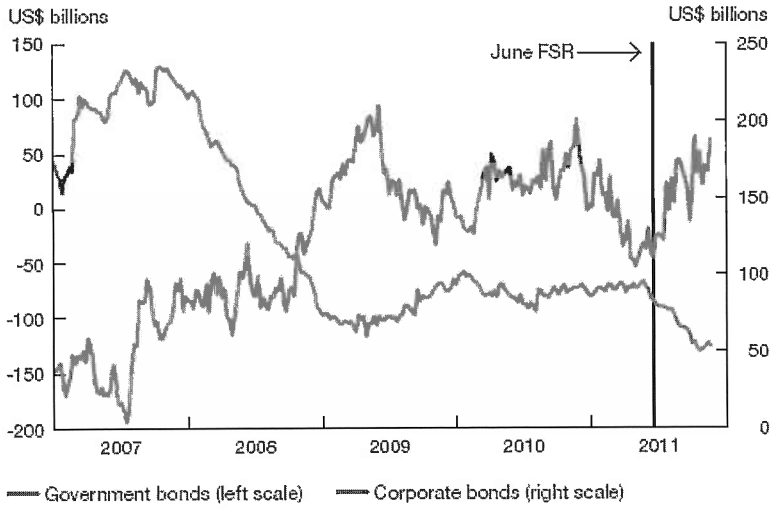
> "our results show that for investment grade firms, the majority of the spread corresponds to liquidity: on average, the liquidity component accounts for 63% of the spread."

Garcia and Yang go on to say that for non-investment grade bonds the result is reversed, that is, it is the pure default risk that dominates rather than the liquidity risk. Although it remains very

difficult to disentangle the liquidity from the pure default risk components on corporate spreads, the Garcia and Yang results confirm the view that I expressed before boards in 2009 that there are factors in the bond market that affect corporate spreads that are *independent* of the equity market. As a result, it is incorrect to reward the equity holders with a 1:1 adjustment to changes in the spreads between utility and Government of Canada bonds, since equity holders are not affected by the regular liquidity changes in the bond market during a flight to quality.

This liquidity effect is still at work in the bond market. In its December 2011 Financial System Review the Bank of Canada provided the following graph:

Chart 4: U.S. primary dealers have reduced their holdings of corporate bonds



Source: Bloomberg

Last observation: 23 November 20

The graph clearly shows the decline in inventory of corporate bonds held by investment dealers in the US since the financial crisis as well as the latest sharp drop off in 2011 Q3 and Q4, which again has been associated with increasing corporate credit spreads.[34]

Garcia and Yang show that 63% of the change in spreads between corporate and Government of Canada yields is caused by changes in liquidity. These changes can be ignored as far as changing the allowed ROE, since they do not affect equity holders as liquidity in the equity market

[34] This liquidity may be further reduced by the Dodd-Frank Act which will restrict proprietary trading and may indirectly affect market making.

generally increases during a flight to quality. This leaves only 37% of the change in spreads due to the pure default risk that may also affect the equity holders and thus the fair ROE. In my judgment this supports the use of a 37% adjustment of the allowed ROE to changes in spreads between utility and corporate bond yields. Given the imprecision of "37%" since 2010 I have been recommending a 50% adjustment to changes in corporate (utility) yield spreads to pick up this credit market effect.

While I judge much of the corporate spread to be bond market specific, the changes in the spread do pick up the business cycle, with increased spreads during recessions when investors are more risk averse and lower spreads during the boom when they get optimistic and less risk averse. In this way the corporate credit spread adjustment generates a conditional risk premium, where the risk premium is conditional on where we are in the business cycle. This makes the CAPM estimate a little more sensitive to the business cycle. Further, the average corporate credit spread is about 100 bps and I would expect the adjustment to average out to zero over the course of the complete business cycle.

At the current point in time "A" spreads are at 180 bps or 80bps more than normal or average for the business cycle, this would indicate that the fair ROE should increase by 0.40% for this credit market effect. This adjustment in turn is very similar to that allowed by regulators during the financial crisis over their normal CAPM estimate.

I regard this sort of adjustment as converting the CAPM into a conditional CAPM where the CAPM holds conditional upon the state of the financial markets.[35] However, I still regard the resulting ROE as an under estimate at the current point in time.

Q. WHY IS THIS SPREAD ADJUSTED CAPM AN UNDER-ESTIMATE AT THE MOMENT?

A. In Appendix B Schedule 6, I develop a model to explain the behaviour of the real yield on long Canada bonds, defined as the nominal yield minus the average of past, current and future

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[35] At the current point in time I also view the size of the spread as being caused by the reduced supply of AAA rated government debt as much as by increased demand caused by a flight to quality.

CPI inflation. Ignoring the dummy variables for WW2 and the 1970s, when there was huge liquidity during the petro dollar recycling period, the model essentially says that the real LTC bond yield is 1.04% plus a premium based on bond market uncertainty and a premium based on the size of the government deficit. The model does well in explaining the very high yields when there was huge volatility in the bond market and Canada was running deficits approaching 10% of GDP. However, while we have seen bond market uncertainty go down, the aggregate deficit in Canada has gone from a surplus to almost 5% of GDP. Normally this would cause a flood of government debt pushing down prices and pushing up yields. Plugging numbers into the regression model would predict real long Canada yields of almost 4.0%, rather than the skimpy 0.22% we actually see (2.22% long Canada yield minus 2.0% inflation) However, the flood of government debt is being bought in part by non-residents and my model's estimates are mainly derived from periods when the Canadian bond market was essentially segmented from the rest of the world. Although I would not base an estimate on this real yield model, it does indicate that current real Canada bond yields are not being made solely in Canada.

An additional insight is from looking at preferred yields. In old testimony I (along with my late colleague Dr. Berkowitz) presented four ROE estimation methods. One of them estimated the fair ROE by looking at the premium of the earned ROE over the yield on traditional fixed rate preferred shares and how this premium was valued by investors in terms of the market to book ratio for a sample of traditional rate regulated Telcos. The reason for doing this was that preferred shares are an equity instrument taxed at the same rate as dividend income from ordinary shares. As a result the tax bias from comparing the fair ROE from a regulated utility with the yield on long Canada bonds is removed, since interest income is fully taxed whereas dividend income via the dividend tax credit is not. This is the third iron law of finance I mentioned at the start of my testimony.

This tax effect is well known in capital markets. BMO-Nesbitt-Burns used to produce a Preferred Share Quarterly that tracked the performance of the preferred share market. In their June 2004 issue Nesbitt Burns provided the following yields:

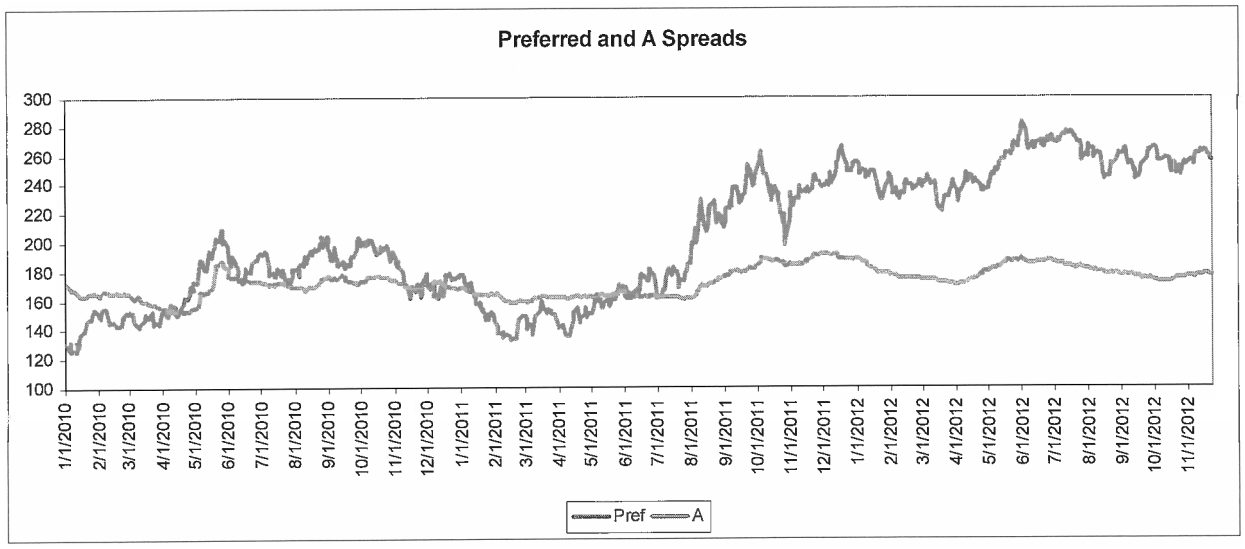
	June 2004
Retractable Preferreds (%)	
Dividend yield	4.01
Mid Canada yield	4.09
After tax spread (corp)	1.77
After tax spread (indiv)	0.63
Straight Preferreds (%)	
Dividend yield	5.48
Long Canada yield	5.34
After tax spread (corp)	2.54
After tax spread (indiv)	0.98
Floating Rate Preferreds (%)	
Dividend yield	3.42
BA (3 month)	2.12
After-tax spread (corp)	2.25
After-tax spread (indiv)	1.22

The retractable preferreds are compared to mid Canada bonds, since the retraction feature shortens their maturity as compared to a long bond. The traditional straight preferreds are compared to long Canada bonds, while the floating rate preferreds are compared to 90-day Bankers acceptances (BAs), since their dividends are usually reset quarterly.

The important point about the comparison is that what we observe in the capital market is a pre-tax yield. This is determined by both risk and taxes. Take the straight preferreds, for example, in June 2004 the long Canada bond had a yield of 5.34%, while straight preferreds had a yield of 5.48%. Clearly the preferreds would be regarded as riskier than the long Canada bond, since the corporate issuer can default. However, the yield on the preferred shares was only 0.14% higher. The reason is that the dividend income gets more favourable tax treatment than the interest income from the long Canada bond. The correct comparison is the after tax yield difference, which BMO-Nesbitt-Burns gives as 2.54% in favour of the preferred shares for corporates and 0.98% for individuals, which is the correct result: that on an after tax basis the riskier preferreds give a higher yield. Note also that for the short term bonds, the pre-tax mid Canada yield at 4.09% was higher than the yield on the retractable preferreds. An ill-informed person might incorrectly state that the mid Canada bond was riskier than the retractable preferreds on the basis

of the second rule of finance: the risk-value of money. A better informed person however would point to the after tax spread of 0.63-1.77% and point out the third rule of finance: the tax value of money.

Unfortunately BMO no longer distributes the Preferred Share Quarterly and until recently I have not had access to a preferred share dividend yield series. However, note that in June 2004 the long Canada bond yield is given as 5.34% and the preferred share yield at 5.48%. At the end of June 2004 the Scotia Capital "A" and Bloomberg utility yields were 6.34% and 6.26% respectively for spreads of about 100 basis points over the long Canada bond yield, which is about "average" for a complete business cycle. Since then Standard and Poors/TSX have published a preferred share index and the spread of the yield on this index along with that on the Scotia Capital "A" bonds over equivalent maturity long Canada bonds is graphed below.



On January 1, 2010 long Canada bonds yielded 4.14%, utility bonds 5.59%, "A" bonds 5.86% and TSX's preferred share series 5.44%. So the spreads were 130 bps for the preferreds, 145 bps for utility bonds and 172 bps for the generic "A" bonds. Compared to June 2004 these spreads had increased; the preferred share spread from 14 bps to 130 bps and the "A" spread from 100 bps to 172 bps and the spread for the riskier preferreds had increased more than that for the "A" bonds. The graph then indicates two things. First, the generic "A" and utility spreads moved in tandem, but increased slightly over the long Canada bond. This is the change that the corporate credit spread adjustment would pick up. Second, while the preferred yield spread moved in

tandem with the bond spreads until August 2011, after then the spread increased dramatically. Another way of saying this is that by the end of December 2011 the preferred share yield had dropped 0.44% to 5.0%, while the A and utility A bond yields had dropped by 1.54% from 5.59% to 4.05% (utility) and by 1.53% from 5.86% to 4.33% (generic "A").

The implication of the change in yields over 2010 and 2011 is that after the Federal Reserve embarked on Operation Twist to twist the US yield curve and lower the yield on long term US government bonds, there was a direct effect in Canada. Moreover, this affected both the government and to a lesser extent the corporate bond market, since yields on both came down after September 2011. However, yields in the preferred share market did not come down to the same degree causing the preferred share yield spread to widen. This is probably because preferred shares are unattractive to foreign investors, since the dividends attract with-holding taxes. Regardless the preferred share yield spread has increased from 130 bps over long Canada bonds to about 260, whereas the generic "A" spread has increased from 172 to 180bps. It is difficult to precisely estimate the impact of Operation Twist since the duration of these instruments differ, but I would place the "Operation Twist" impact on the Canadian bond market as approximately 80 bps, which is approximately the spread increase of preferred yields over "A" bond yields since Summer 2011.

There are many problems with relying on a preferred share index, but clearly Canadian bond yields have been affected by the actions of the US Federal Reserve and as a result in my judgment are currently not as indicative as an opportunity cost for equity investors as normally. At the current point in time I would upwardly adjust my CAPM ROE estimate for 2013 by 0.40% for the credit spread adjustment and by 0.80% for the impact of Operation Twist. In total I would add 1.20% to the simple CAPM estimates. This produces a fair ROE in the following range.

CAPM Estimates	2013
Low end	**6.95%**
High end	**8.00%**

Overall this would indicate a 2013 fair ROE of 7.50% for a benchmark utility.

5.0 DCF ESTIMATES OF THE FAIR ROE

Q. WHAT ARE YOUR DCF ESTIMATES?

A. In appendix D I review the DCF model and apply the model to the market as a whole and highlight the problems in applying it to individual stocks. For the market as a whole I would estimate the fair return as being 9.30% in Canada and slightly higher in the US. With forecast long Canada bond yields at 3.0% for 2013 plus my 0.80% Operation Twist adjustment this means a market risk premium of over 5.50%, broadly consistent with historic earned market risk premiums and the judgment of the respondents to Fernandez' survey. Similarly for the S&P gas and electric index the historic utility risk premium is about 3.40%. Again this is broadly consistent with my Canadian utility risk premium range, since the US evidence is over the ten year US bond not the 30 year bond.

I have traditionally viewed my DCF estimates as checks on my CAPM estimates, since in my view CAPM estimates are usually in the right "ball-park." However, the recent very low long Canada bond yields have forced me to re-evaluate this and look at historically what drives the DCF vs. the CAPM estimates, since they should be consistent. The CAPM equation is as follows:

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

In words, the required (fair) return is the risk free rate (Rf) plus the risk premium comprised of the market risk premium (MRP) times the beta coefficient (β). For the market as whole we can simply drop the beta.

The risk free rate is directly observable since the practise in Canada is to use the long Canada bond yield as the risk free rate, while the market risk premium is reasonably objective, particularly now that we have Fernandez' survey data from thousands of professionals in the area. Consequently, the major area of dispute is the relative risk or beta coefficient, and even here there is not much doubt that utilities are lower risk than the market. Hence the big advantage of the CAPM is that it is difficult to make big mistakes. The CAPM also avoids one of the big problems with DCF estimates in that the forecast inflation rate is automatically incorporated into

the long Canada bond yield, since we use the nominal rather than the real yield. This is currently not a significant problem, since inflation is so low, but part of the reason the DCF model fell out of favour was that it was giving bad signals when applied mechanically in the 1990s, when there was a structural break in the forecast inflation rate.

The classic Gordon growth model,[36] referred to as the DCF model in most testimony before regulatory bodies, is as follows:

$$K = \frac{d_1}{P} + g$$

In words, the required rate of return is the forecast dividend yield plus the long run growth rate, since it is the long run growth rate in earnings and dividends that drives long run capital gains. Conceptually the DCF model and CAPM should give exactly the same values but, of course, since they approach it from a different perspective there is always estimation error. For the market as a whole the forecast dividend yield can be estimated with very little error, so the estimation error is with the forecast long run growth rate, which also is easier to estimate than for an individual stock. As a result, if the CAPM and DCF estimates differ significantly, then it is mainly due to the difficulty in estimating the growth rate in the DCF model and the risk premium in the CAPM.[37]

We can assess the relative value of the DCF and CAPM by graphing the "known" parts of both models for the overall market, which are the long Canada bond yield and the TSX dividend yield.

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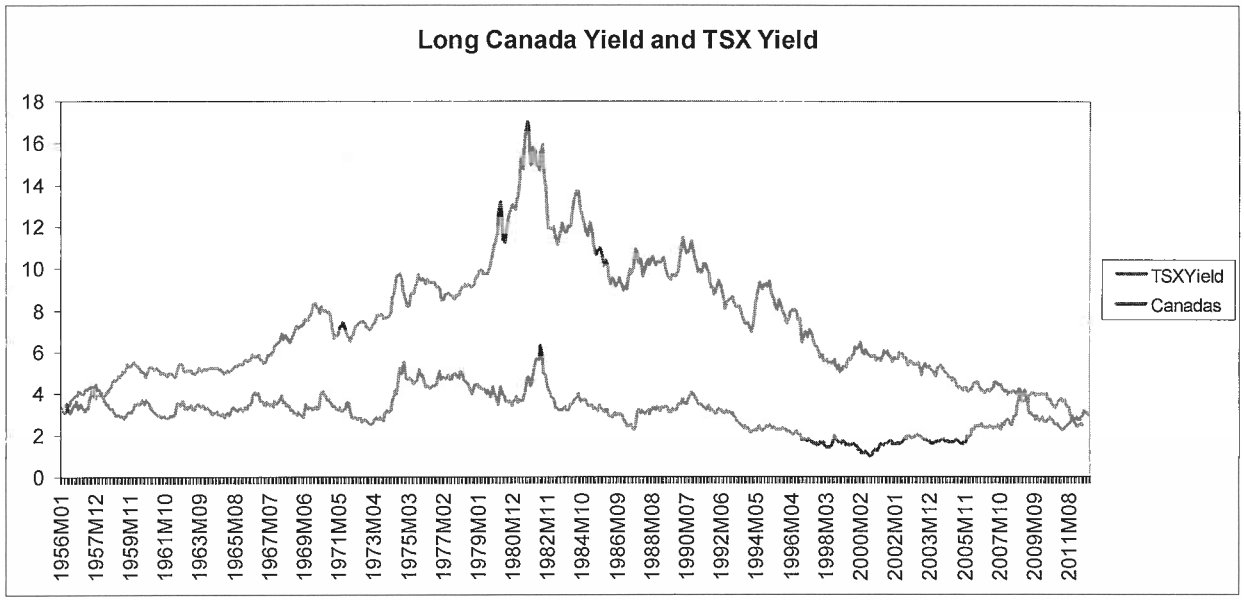
[36] Named after the late Professor Myron Gordon of the University of Toronto.

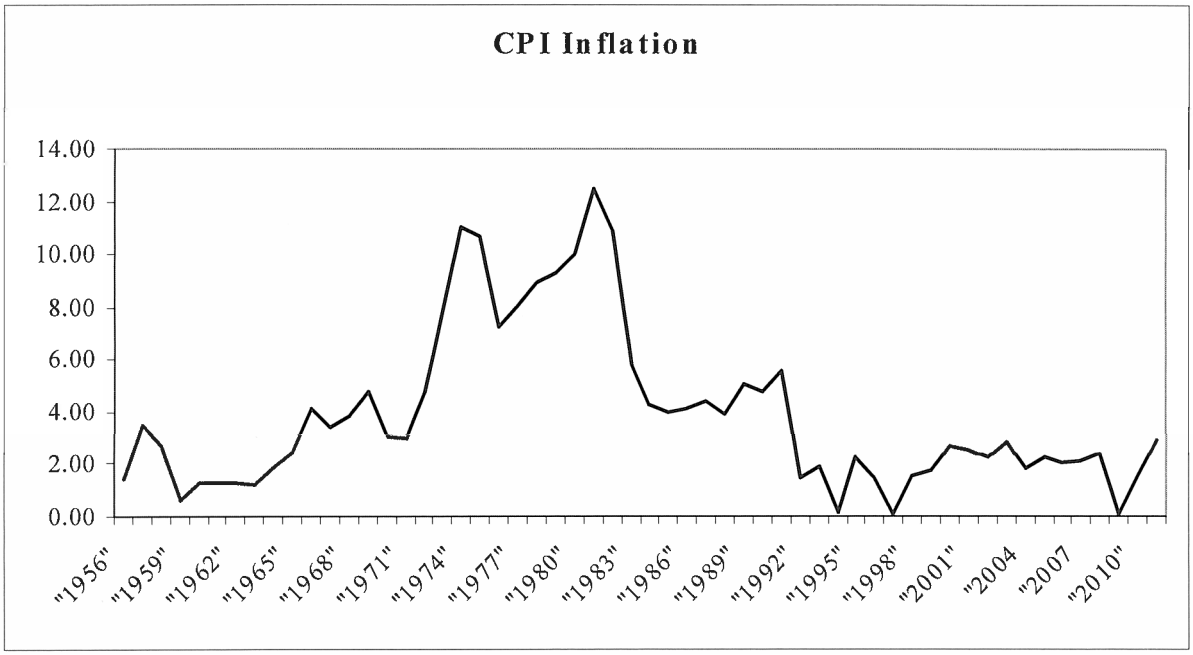
[37] Note since for the CAPM we are dealing with the market return the following analysis is general for any risk premium model



Since both the DCF model and CAPM should give the same answer, we can set them equal to each other, which indicates that for the market as a whole

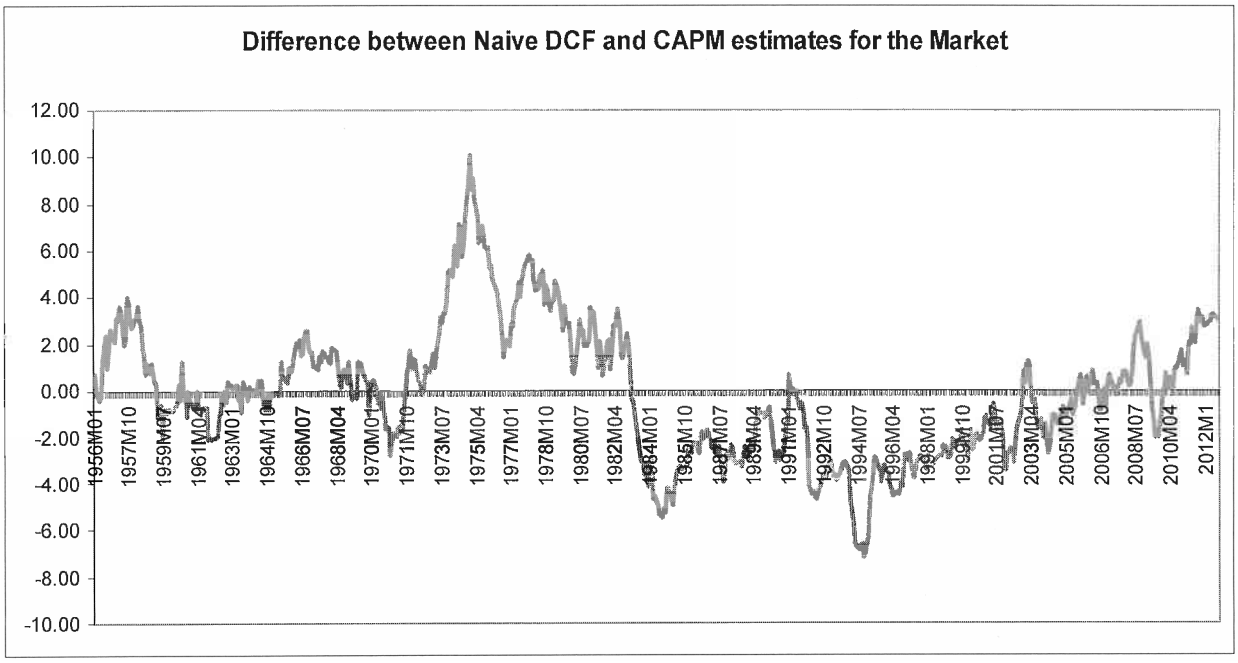
$$CAPM - DCF = R_F - {}^{d_1}/_{P} = g - MRP$$

Or in words the directly observable spread between the long Canada bond yield and the TSX dividend yield is equal to the long run dividend growth rate minus the market risk premium. From the above graph we can see that there is generally a very large difference between the two indicating that the expected growth rate was much higher than the market risk premium, which would pull up the dividend yield to close to the long Canada bond yield. The reason for this was the gradual increase and then decrease in the CPI inflation rate over this long period graphed below. This inflation rate is directly captured in the long Canada bond yield and yet is in the "unobserved" growth rate in the DCF model. Note for example, that the increasing and high rates of inflation in the 1960-1980 period coincides with the big difference between the LTC yield and the TSX dividend yield.



It is possible to come up with a simple or naïve estimate of the market return by adjusting for this inflation/real yield bias to the estimates. For example, we can assume that for the DCF model the forecast growth rate is the actual CPI inflation rate at the time, based on year over year changes, and then add a 3.50% real growth rate. This gives a simple growth rate forecast to add to the dividend yield and thus a simple or naïve DCF estimate for the market as whole. Similarly, we can add a long run market risk premium of 3.5% to the long Canada yield for a simple CAPM estimate. For the entire period 1956-2011 the average naïve DCF estimate is 10.63%, while the average naïve CAPM estimate is 10.83%, or a difference of only 0.20% between the two, so on average these assumptions seem to make sense.

To see how robust this simple procedure is, the following graphs the difference between the two estimates for every month since 1956. The graph indicates that the difference was very large from the mid 1970's until the late 1990's. The reason for this difference is twofold. First, in the 1970s inflation was increasing and bond yields did not reflect this as investors simply did not believe that the Bank of Canada and the Government would allow these high levels of inflation to continue. This resulted in very low real yields on LTC bonds. As a result whereas the DCF estimate directly captured the year over year inflation rate, the LTC yield did not leading to a positive difference between the DCF and CAPM estimates.



Once investors caught up to the impact of high inflation the reverse set in, as the budget deficits at the Federal level convinced the market that the government would inflate its way out of its deficit problems, rather than bring down inflation. As a result, while the year over year inflation rate dropped dramatically, LTC bond yields did not at first similarly drop, leading to very high real yields and simple CAPM estimates exceeding their DCF equivalents. It is this phenomenon of low real bond yields in the 1970s and 1980s and high real bond yields in the 1990s that is the major reason for the positive deviations from 1970-1982, and the negative deviations afterwards.

The second reason is simply that the real GDP growth rate and the market risk premium have not remained constant since 1956. I testified extensively in the 1990s to the effect that the market risk premium was very low due to the high real interest rates and risks attached to government bonds. Subsequently, I have increased my estimates of the MRP as this risk has been removed. Similarly, the real growth rate has dropped over time and is probably lower than the 3.5% I used in the simple model.

However, the point is that we can "ballpark" the broad range for the DCF estimate for the market just as we can for risk premium models like the CAPM. At the end of September 2012 TSX dividend yield was 3.00% and the year over year inflation rate 2.31%, so with the 3.5% real

growth rate the simple DCF estimate is 8.88%.[38] Similarly with the current long Canada yield of 2.31% and a 3.5% market risk premium the simple CAPM estimate is 5.81%. As a result, there is currently a 3.07% difference when we subtract the CAPM estimate from the DCF estimate. Further note from the graph that this difference between the two has gradually gone from negative to positive over the last 15 years as long Canada bond yields have gone down. The reason for this is simply the fact that the real yield on the long Canada bond has dropped so that whereas we have year over year 2.31% inflation in the DCF model we only have an LTC yield of 2.31% in the risk premium model or in this case a real yield of 0%.

Of course current DCF and risk premium estimates are not the naïve ones graphed above but instead allow for differences in the market risk premium and growth rates, but this analysis confirms the implications of the current problems in the bond market on the CAPM estimates due to Operation Twist and the impact of the business cycle. As a result it supports my adjustments to the CAPM estimates and the value of currently looking at DCF estimates.

Q. WOULD YOU USE THESE ESTIMATES?

A. No. These are very simple estimates that use average numbers. They are presented simply to show that while the DCF and CAPM estimates are consistent over long periods of time, they both have problems when used mechanically during periods of very high and very low real yields. The analysis also helps explain why DCF estimates fell out of favour in the 1990s while the validity of recent CAPM estimates has recently been questioned.

Q. IS THERE ANY OTHER EVIDENCE ON THE VALIDITY OF THESE ESTIMATES?

A. Yes. What is important is that there is another side to estimating the fair ROE and cost of equity capital. This is that the required rate of return on the part of the investor (cost of equity capital) is also the expected rate of return. Defined benefit pension funds need this expected rate of return to determine whether a fund is in deficit or surplus. On October 19, 2012 TD

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[38] This is 1.03*1.0231+.035

Economics produced its own analysis of the long run returns of the type needed in defined benefit pension plans.[39]

FINANCIAL PROJECTIONS OVER THE NEXT DECADE	
Financial Instrument	Average Annual % Return
Cash (3-Month T-bills)	2.00%
Bonds (DEX Universe Bond Index)	3.00%
Equities	
Canada (S&P/TSX Composite)	7.00%
U.S. (S&P 500)	7.00%
International (MSCI EAFE)	7.00%
Source: TD Economics	

The important point about the TD Economics forecast is that the going forward risk premium for equities minus bonds is 4.00%. This is not the market risk premium, since adjustments need to be made but it is certainly in the right ballpark.

Q. WHAT ADJUSTMENTS NEED TO BE MADE?

A. As TD Economics notes its return forecast is for ten year geometric returns so they have to be converted to arithmetic returns. To make this adjustment for very long returns we add half the variance of the arithmetic return as explained in my Appendix B, with data in Schedule 8. Historically the standard deviation of equity returns has been about 20% (0.20) so the variance is 0.04 and half this is 0.02 or 2.0%. Similarly, the volatility of the long Canada bond return has been about 9% (0.09). I would suspect that this overstates the future volatility, since it is unlikely we will see LTC yields at almost 20% again, but this means a variance of 0.0081 and half this is 0.4%. So converting these long run returns means an equity over bonds risk premium of 5.60% as follows:

[39] TD Economics, An Economic Perspective on long-term financial returns, available at

	Long run	1/2 the variance	Arithmetic
Equities	7.0%	2.0%	9.0%
Bonds:	3.00%	0.40%	3.40%

However, the TD Economics forecast is over the yield on the DEX universe bond index and not over long Canada bonds. The universe of bonds would have lower duration than long Canadas, but can be expected to earn more since they have default risk. Given the prior long Canada forecast of 3.0%, this would increase the market risk premium estimate to about 6.00%. As a result, I regard TD Economics forecast as being consistent with a current market risk premium of about 6.00%.

Note that TD Economics equity market return is slightly lower than my own forecast of 9.30%. However, a TD Economics market risk premium of 6.00% is consistent with my own range of 5.0-6.0% plus my Operation Twist adjustment of 0.80%, which moves my mid-point to 6.30%.

Q. WHAT IS YOUR FAIR ROE FOR A BENCHMARK UTILITY?

A. I would judge a fair ROE for 2013 to be in a range 6.95-0-8.0% for 2013 with a recommended rounded mid-point for 2013 of 7.50%. My estimates are based on the following:

Risk premium

Base adjusted LTC forecast:	3.80%
Normal utility risk premium:	2.25%-3.30%
Credit spread adjustment:	0.40%
Issue costs:	0.50%
Fair ROE:	7.00-8.00%
Point estimate:	7.50%

DCF:

Canadian equity market return:	9.30%
US SP500 Electric Utility risk premiums	3.00-3.50%
Low risk US sample Median DCF:	8.73%

Comparable Earnings

Market return:	9.28%

VII AN ROE ADJUSTMENT MECHANISM

Q. WOULD YOU RECOMMEND THE USE OF AN ROE ADJUSTMENT MECHANISM?

A. Yes. Until the onset of the financial crisis, Canadian regulatory boards seemed to be content that their automatic ROE adjustment formulae were awarding fair and reasonable ROEs. In many cases these ROE formulae were adopted at the request of the utility. Regardless they had been periodically reviewed and confirmed with minor changes multiple times. Some salient examples are:

- The NEB confirmed 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 rebased and confirmed its ROE formula in a Gaz Metro decision in 2007.

As the Alberta Utilities Commission noted in its Decision 2009-216, November 12, 2009 page 12,

> 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.

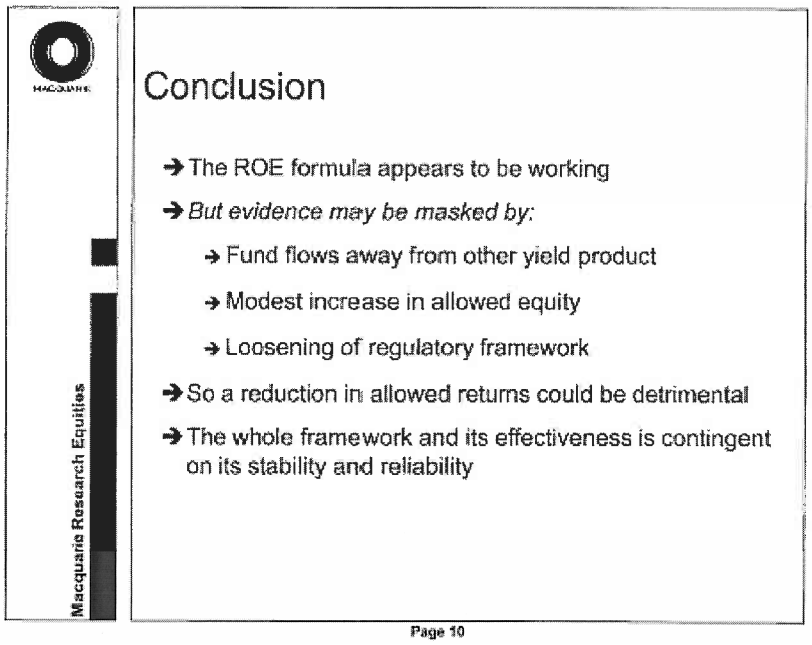
Similar statements were made by this Board (Order # PU43 (2009)) when in the decision (page 13) it was stated

> 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]

Finally before CAMPUT in 2008 Matt Akman of MacQuarie provided the following slide in a presentation:



I was on the same panel as Mr. Akman and as is clear from this slide, he had no obvious problems with the ROE formulae at that time. Consequently, it is quite clear from the impact of

the multiple ROE formula reviews and the statements of the regulators themselves, as well as analysts, that the ROE formulae were generating fair and reasonable ROEs until the extraordinary events of 2008-2009.

Q. SO HOW WOULD YOU ENHANCE THE ADJUSTMENT MODELS SINCE SO MANY WERE SUSPENDED?

A. The key problem with the "old" ROE adjustment models was that they *only* linked the ROE to the forecast long Canada yield. As a result, during the financial crisis the ROE formula indicated declining ROEs while at the time the utility cost of debt was increasing. An enhanced ROE formula has to deal with this, which can be done by incorporating the credit market adjustment I have used in my direct ROE estimates.

To illustrate I can use the data for the period when the NEB formula was judged to be providing fair and reasonable ROEs.[40] I use the NEB data simply because the NEB formula was unchanged from 1994 until 2008. In particular, the NEB examined its ROE formula in a TransCanada cost of capital hearing in 2001 and concluded (RH-4-2001, page 53):

> *Views of the Board*
>
> Having carefully considered all of the evidence relating to rate of return on common equity, the Board has concluded that the RH-2-94 Formula continues to yield returns that are appropriate for the Mainline. In arriving at this conclusion, the Board gave primary weight to the evidence related to ERP analysis.

The Board then went on to use the 5.73% RH-2-94 formula forecast LTC bond yield and estimated a higher market risk premium of 5.50-6.0% as a result of reduced barriers to international investment and a decline in interest rates. Further the Board noted that the resulting equity risk premium for the TransCanada Mainline that results from the RH-2-94 formula of 3.88% was well within the range of estimates provided by the company's witness, Dr. Vilbert.

Specifically I can use the data for 2000 which was prior to the RH-4-2001 decision and a time when capital market conditions were "normal". The table set out below is based on data provided

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[40] I would judge them to be at the top of a fair and reasonable range

by Ms. McShane on behalf of Enbridge in a 2010 Line 9 hearing before the NEB. For 2000 the credit spread was 0.94% so the enhanced ROE formula is

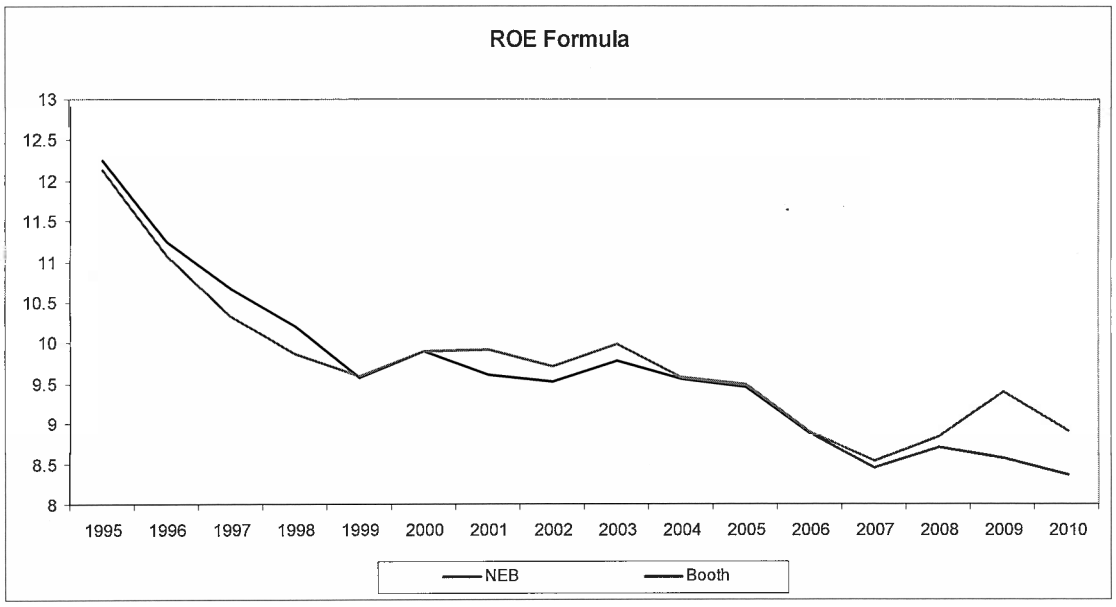
$$ROE = 9.90\% + 0.75*(LTC\ Yield\ -6.12\%) + 0.50*(Spread - 0.94\%)$$

This uses the data at a time when just about every board in Canada accepted an NEB style ROE adjustment formula as giving fair and reasonable ROEs. The 2000 date also has two advantages:

1. The yield spread of 0.94% was approximately normal. Since 1980 the A spread using Scotia Capital's index has averaged just over 100 bps, which is biased slightly high due to the unprecedented levels of the last few years.
2. As long as the Bank of Canada sticks to its 1.0-3.0% inflation forecast I would anticipate that the LTC yield will average close to 5.00%, not too far below the 6.12% forecast.

	LTC	Spread	NEB	Booth
1995	9.25	0.71	12.25	12.13
1996	8.03	0.42	11.25	11.07
1997	7.14	0.27	10.67	10.33
1998	6.53	0.28	10.21	9.88
1999	5.69	0.99	9.58	9.60
2000	6.12	0.94	9.9	9.90
2001	5.73	1.56	9.61	9.92
2002	5.63	1.31	9.53	9.72
2003	5.98	1.32	9.79	9.99
2004	5.68	0.97	9.56	9.59
2005	5.55	0.98	9.46	9.49
2006	4.78	0.96	8.88	8.91
2007	4.22	1.07	8.46	8.54
2008	4.55	1.18	8.71	8.84
2009	4.35	2.58	8.57	9.39
2010	4.19	1.88	8.37	8.92

Using this data I can then backfill the allowed ROEs generated by the original NEB and my enhanced ROE formula as graphed below.



Several conclusions are immediate.

- First, my ROE formula tracks the NEB's old ROE formula quite closely, except for the periods when the spread was significantly different from average. This is what we would expect. For example, in the late 1990s the spread was only abnormally small and as a result the allowed ROE drops more with my formula than with the old NEB formula because credit conditions were so easy. In contrast, during the slowdown and/or recession years of 2000-2003 and again 2008-2010 the ROE with my formula exceeds the old NEB formula ROE, since it picks up the impact of these higher spreads.

- Second, as a result of the spread adjustment my model avoids the major complaint levelled at the old ROE formulae: that during these periods of crisis, the allowed ROE and utility borrowing costs move in opposite directions. In particular, the ROE was 55 basis points higher for 2010 with my new formula than the old NEB formula; an increase which approximates the "bonus" added by many regulators at that time.

- Third, for 2009 the ROE at 9.39% was 35 basis points less than the 9.70% the NEB allowed TQM. However, this is probably misleading since this sort of credit spread data was not available at the time of the hearing.

I developed this NEB enhanced ROE formula in 2010 for an Enbridge Line 9 hearing before the NEB and subsequently recommended it to the Regie which accepted it in 2010 in a Gazifere hearing and in 2011 for Gaz Metro.[41]

[41] D-2010-147, November 26, 2010 and D-2011-182, November 25, 2011.

However, at that time the Bank of Canada was increasing the overnight rate, markets were reverting to normal, and the Canadian economy was clearly in recovery mode. This changed with the US Federal Reserve's adoption of Operation Twist. This has caused the collapse in long term interest rates causing me to put a "floor" under the formula of 3.80%, which I regard as the lowest rate consistent with a normal cyclical low.

Taking 7.50% as a starting fair ROE the formula would be as follows:

$$ROE = 7.50 + 0.50*(Spread-1.80\%) + 0.75*(max(Forecast\ LTC\ Yield, 3.80\%) - 3.80\%)$$

In words the ROE is 7.50% and will change by 50% of the change in credit spread from 1.80% and increase by 75% of the change in the forecast LTC yield above 3.80%. However, my enhanced formula is not tied to my own recommended ROE; the Board can use it with its own starting fair ROE.

Q. HAS ANY OTHER BOARD ACCEPTED THIS STYLE OF FORMULA?

A. Apart from the Regie which adopted my recommended formula, the OEB adopted a similar formula with a 50% adjustment to changes in the forecast long term Canada yield instead of 75%. The OEB also tied the credit spread to the Bloomberg utility yield and not the generic A spread. The AUC liked the idea of the ROE formula, but persisted with a fixed rate for the time being, but is reviewing this again in 2013. The AUC said (2011 Decision)

> 164. All parties to this proceeding preferred a formula that considered both changes in Government bond yields, and changes in utility bond spreads. The Commission agrees that this type of formula will better reflect any fluctuations in financial market conditions and deal with the concerns about a single variable formula. Moreover, as Dr. Booth explained, such a formula would be counter-cyclical because allowed returns would increase in difficult economic times and decrease in strong economic times, but over the business cycle this will average out.[114] (footnote in original)

Q. CAN YOU EXPLAIN FURTHER HOW YOU DISAGREE WITH THE OEB?

A. Yes. My reason for using 0.75 is based on how the market and utility risk premia behave given my assessment of the relative risk of a benchmark utility. Suppose that the market risk premium is 5% at a forecast LTC yield of 6.0%, and that a utility has a beta coefficient of exactly

0.50. With this data, the market's required return is 11%; which is the long Canada yield of 6% plus the market risk premium of 5%. The utility's fair return is then 8.5%, which is the long Canada yield plus half the market risk premium. For simplicity I ignore any flotation cost allowance.

If the forecast LTC yield declines by 1.0% to 5% and the adjustment coefficient is 0.50, then the allowed utility ROE would decline by half the change in the LTC yield or 0.50% to 8.0%. Its risk premium would correspondingly increase by 50% of the change in the LTC yield or 0.50% to 3.0%. However, if the utility risk premium increases by 0.5% and the beta is 0.50, this means the market risk premium increases by 1.0% to 6.0%. As a result, the market's fair rate of return is unchanged at 11.0%. Consequently we get the strange result that if the adjustment coefficient is set at 0.5, the overall required return on the market is *independent* of the forecast LTC yield, which renders the whole notion of a risk premium over the LTC yield moot.

On the other hand, if the adjustment mechanism is set at 1.0 it also means that the riskiness of the long Canada bond relative to the equity market is constant. My Appendix B shows that this has not been the case, since a major factor driving LTC yields has been government debt financing and inflationary expectations, neither of which have been constant over long periods of time. Consequently, I judge the market risk premium to move inversely with long Canada bond yields, which means that an adjustment coefficient has to be between these two extremes of 0.50 and 1.0. As a result, I regard an adjustment coefficient of 0.75 of the utility ROE to forecast LTC yields to be reasonable and have always supported ROE adjustment mechanisms with a 75% adjustment to forecast changes in the LTC yield.

Also in both the BCUC and the NEB's initial decisions they were faced with a wide range of expert opinion as to the adjustment coefficient and the NEB used 0.75 and the BCUC 1.0. However, the BCUC subsequently came down to 0.75 as forecast LTC yields came down. So the fact that the 0.75 adjustment worked so well for so long argues in its favour. The only contrary argument is that the capital markets have made their adjustment to the Bank of Canada's 2.0% inflation target in a 1.0-3.0% range, whereas in 1993/4 inflation was significantly higher and the going in forecast LTC rate for 1994 in the NEB model was 9.25%. It is highly unlikely we will get to this range of forecast LTC yields in the near future. As a result, there is not the same

significance attached to a 0.75 versus a 0.50 adjustment coefficient as there was in 1994. As long as the going in ROE is fair I have no objection to a 0.50 adjustment coefficient.

The other change to the OEB formula is the use of the Bloomberg utility index. This is a fitted yield based on market prices for "A" rated long term utility bonds. The big advantage is that it is available to anyone with a Bloomberg terminal and is a direct estimate of the yield on long term utility debt. The Board can then estimate a synthetic 30 year LTC yield from the Consensus forecast of the ten year bond yield and then add the credit spread by subtracting the 30 year utility debt yield from the 30 year LTC yield.

Bloomberg Fair Value Curves: The Bloomberg Fair Value Canada 30-Year A-rated Utility (C29530Y) curve is a yield curve based upon the yields and maturities of Canadian dollar-denominated fixed-rate bonds, issued by Canadian utility companies, with ratings of A+, A, A- from S&P, Moody's, Fitch and/or DBRS. The index is not comprised solely of 30-year bonds, but rather is "derived" using an optimization model that solves simultaneously for all yields and maturity points in constructing the term structure of Canadian A-rated utility bond Issuances to best fit the existing bond yield data. The bond yields and maturities listed below serve as inputs to the optimization model and cannot be traced directly to the curve, i.e. the specific points on the curve are derived from the optimization model and do not correspond to any specific bond yield. The yields are from the secondary market (not new issues), thereby eliminating the ability of an issuing company to skew results. The same group of bonds is used to derive the Canadian Utility A-rated bond index for each maturity category. As each of the bonds rolls down the curve, new longer maturities are added. The Bloomberg 30-Year Canadian Corporate A-rated curve is derived similarly (C28730Y).

Q. IS THIS FORMULA NECESSARY WITH THE CURRENT LEVEL OF FORECAST LTC YIELDS?

A. In my judgment yes. It is almost impossible to think of a situation where objective market estimates of the fair ROE, such as long term corporate A bond yields, have dropped so much without a commensurate drop in the opportunity cost of investing in Canadian utilities. The dramatic increase in the PE ratios for utility stocks, relative to the market as a whole, simply confirms this statement. However, this process can quickly reverse causing the same utilities to be allowed sub-par ROEs. An automatic adjustment formula avoids this problem without the need for a new hearing.

With a minimum 3.80% forecast LTC yield in my enhanced ROE formula, unless the forecast LTC yield increases or the credit spread changes the ROE is constant. If on the other hand, forecast LTC yields increase from their current level of 3.0% to above 3.80%, which means that the current sovereign debt crisis in the Eurozone and the US has passed, the ROE will increase. However, if forecast LTC yields revert back to "normal" levels, the formula will automatically increase the ROE and award a fair ROE consistent with the performance of the ROE formula prior to the financial crisis. I would therefore regard the formula as having little downside risk of allowing an unfair ROE and yet capturing the upside as the government bond market reverts to normal.

Q. WHAT ALTERNATIVE TO YOUR ROE FORMULA WOULD YOU RECOMMEND?

A. The genesis of the ROE formulae were that they were introduced in 1993/4 when the level of LTC yields was much higher than currently. Further the Government of Canada was confronted with a huge fiscal deficit and scepticism that it would reduce this by increasing taxes and/or cutting spending, so it introduced real return bonds to indicate its commitment. Since that time the Government and the Bank of Canada have renewed their commitment to a 2.0% inflation target in a 1.0-3.0% range and I do not see a departure from this as likely in the foreseeable future. I would therefore regard a fixed ROE as a viable option.

Normally I would recommend a fixed rate based on current forecasts of the LTC yield. What should be clear is that I do not regard current forecast long Canada bond yields as being effective market rates in the sense that they are being determined solely by rational investors trading off expected return for increased risk. Instead, I regard them as being disequilibrium rates as a result of the distortion introduced by global policy makers. Longer term all things must pass, as also will the intervention by the global policy maker. As the distortion passes I expect long Canada bond yields to revert to normal given the fact that the Bank of Canada is committed to the continuation of its 1%-3% range for expected inflation.

In June 2004 the BMO data indicates that long Canada bond yields were at 5.34% when credit spreads were about average for the business cycle. Similarly in June 2011 RBC forecast that long Canada bond yields would be at 4.55% by the end of 2013 before the tsunami of events in 2011

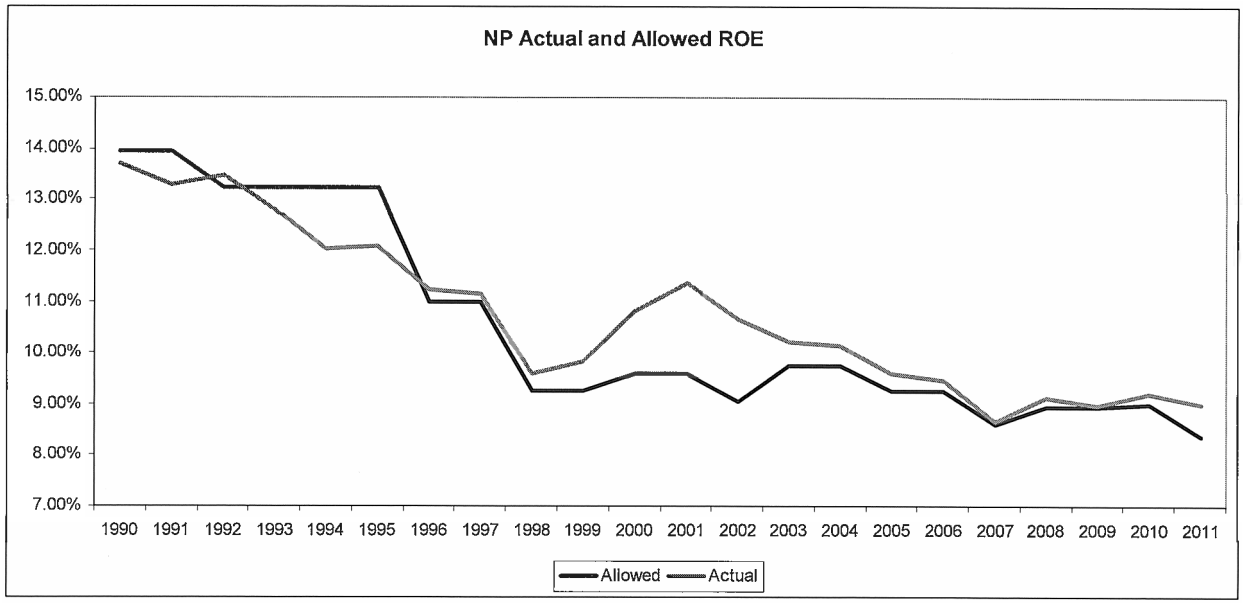
had an impact. I would judge the supply of long Canada bonds to slow down as the Government of Canada reduces its deficit to zero, so that rates might not reach the 5.34% level of June 2004. I would regard an equilibrium long Canada bond yield of about 5.00% as being reasonable. On this basis and without the need for an Operation Twist or credit market adjustment I would judge a benchmark fixed rate ROE to be approximately 8.25%.

The discussion of the yield curve in Section II indicates that interest rates are expected to increase in Canada, so I expect the formula produced ROE to increase with these interest rates and average out to the fixed rate of 8.25% over the full business cycle. Consequently, I regard 8.25% as being a reasonable fixed rate ROE for a benchmark utility. Should the Board wish to remove the need for repetitive rate hearings into the fair ROE, I would suggest either reverting to an ROE adjustment formula or fixing it indefinitely at 8.25%.

VI: BUSINESS RISK CAPITAL STRUCTURE AND FINANCIALS

Q. THE COMPANY STATES THAT NP IS AN AVERAGE RISK CANADIAN UTILITY. DO YOU AGREE?

A. In my judgment there are substantial differences in the underlying business risk of different Canadian utilities that has been to a large extent offset by differing degrees of regulatory protection. The amount of regulatory protection shows up in NP's ability to earn its allowed ROE. In answer to CA NP024A NP provided its actual and allowed ROE back to 1990. This data is graphed below.



NP explains the history behind the poor earnings in 1994 and 1995 when it under-earned by 1.22% and 1.18% and the fact that its common equity ratio was increased at that time (P.U.36). However, what is striking is that since 1995 it has over-earned by an average of 0.52% and never once failed to earn its allowed ROE. Risk is the probability of harm, and the demonstrated evidence for NP is that it has not experienced risk since 1995 due to the extensive regulatory protection it has enjoyed. It is this demonstrated ability to recover its costs that supports NP's above average bond rating and differentiates Canadian from US utiliites.

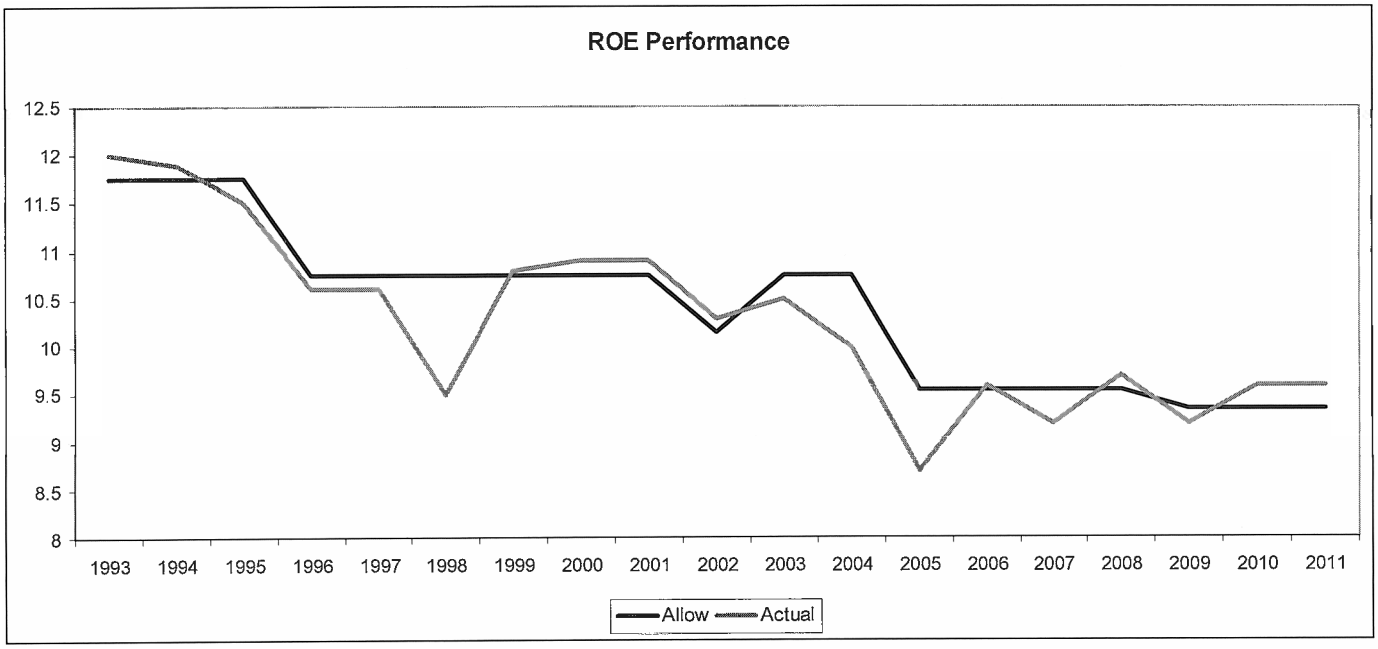
NP's ability to earn its allowed ROE is due to the extensive set of deferral accoutns available to it. DBRS lists the following main deferral accounts which have the effect of smoothing the company's earnings, namely:

- The weather normalisation reserve
- Rate stabilisation account
- Demand management incentive account
- Pension expense variance deferral account
- Other post employment benefits deferral account

These types of deferral accounts are a major factor in allowing Canadian utilities to earn their allowed ROE, as I will discuss in Section VII when discussing Moody's view of Canadian versus US regulatory protection. From an investor's point of view the weather normalization account eliminates the influence of abnormal weather on NP's earnings. The RSA allows the power costs of Newfoundland and Labrador Hydro to be passed through. The DMIA then removes almost all the residual demand side risk by limiting the variability in the unit cost of power due to demand. The final two accounts remove pension and post-employment benefits.

Q. IS THIS TYPICAL FOR CANADIAN UTILITIES?

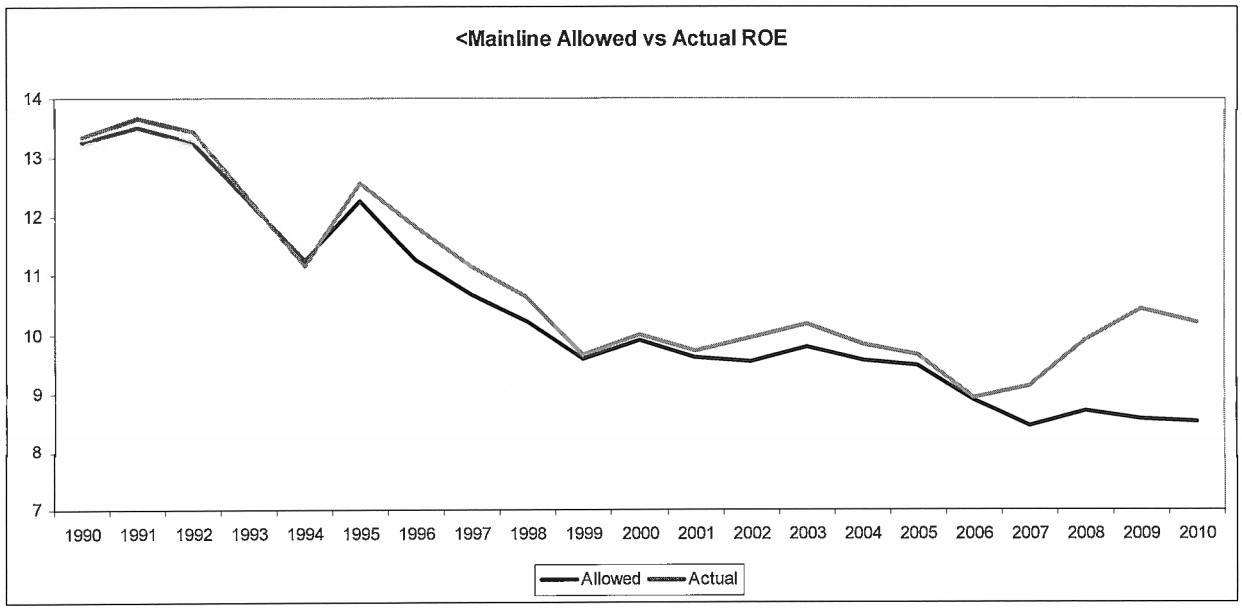
A. Yes. DBRS and Moody's both point out that while NP has some generation (about 7%) it is basically a transmission and distribution utility. The closest comparables in Canada would be other electric companies, including ATCO Electric, FortisBC (West Kootenay Power) and Nova Scotia Power Inc (NSPI). Of these NSPI is the largest conventional integrated electric utility in Canada. The following is a graph of NSPI's allowed versus actual ROE. Over the whole period since 1993 NSPI under-earned the average of its ROE range by 0.13%, but exceeded the bottom of its allowed ROE range by 0.12%. In only four years, 1998, 2004, 2005 and 2207 did the actual ROE drop below the bottom of NSPI's allowed ROE range, while it never exceeded the top of the range. Much of this variability was the effect of commodity prices and NSPI's historic exposure to solid fossil fuel for electricity generation.



However, this changed in 2010 and 2011 with the introduction of a Fuel Adjustment Mechanism (FAM) which essentially removed this exposure. For both these years NSPI has been at the top of its allowed ROE range since as DBRS remarked the FAM has contributed to more predictable earnings. The point of the comparison with NSPI is that I would have regarded NSPI as riskier than NP due to this fuel cost exposure on the generating side. However, with the substantive removal of this exposure NSPI's risk has been reduced significantly and now looks more like NP. Notably NSPI has a 37.5% common equity ratio and in September (2012) settled on a 9.0% ROE.

Q. ARE THERE OTHER FACTORS THAT LOWER NP'S RISK?

A. Yes. The ability to earn the allowed ROE I regard as short term risk, that is, the return on capital and regulation has equalized this across most utilities in Canada. For example, the following is the same graph for the TransCanada Mainline:



Over this entire 21 year period the Mainline over-earned an average of 0.43% more than the allowed ROE. In 2007 the Mainline entered a five year settlement agreement with its shippers and its over–earning increased to 0.67% and then jumped to 1.2% in 2008; 1.85% in 2009 and 1.68% in 2010. In this experience the TransCanada Mainline's experience is similar to that of NP. However, this ability is only due to the actions of the National Energy Board in protecting the mainline. In RH-4-2001 the NEB stated (page 24)

> To date, TransCanada's earnings have not been affected by the excess capacity or increased pipe-on-pipe competition since the Mainline has been allowed to increase its tolls with the result that it has earned its full Revenue Requirement. Nonetheless, there is some uncertainty over the Mainline's future ability to attract sufficient gas volumes, which could have an impact on its earnings. Specifically, the Mainline's ability to recover its full cost of service would be put in jeopardy if its throughput declined to a point where the resulting tolls exceeded what the market could bear. While there is no indication that such an outcome is to be expected, the possibility that it may happen appears to have increased since 1994. Accordingly, the Board is of the view that there has been an increase in pipe-on-pipe competition since 1994, which acts to increase the Mainline's prospective business risk.

The NEB's view in RH-4-2001 is consistent with an increase in the capital recovery risk, that is, the return *of* capital, whereas the ability to earn the allowed ROE reflects the return *on* capital. The former represents *long run* risk, whereas the latter represents *short run* risk. Currently the

TransCanada Mainline is at the end of a year long hearing before the NEB to deal with the dramatic increase in its risk of capital recovery that has resulted from the emergence of new shale gas basins in North America and their impact on the pipelines that connect different basins to markets.

Currently the TransCanada Mainline is facing significant long run risk involved in capital recovery, that is, the possibility of stranded assets. However, NP is not facing any risks of this kind. It is a T&D utility that serves the bulk of Newfoundland and its geographic coverage means there is no possibility of competition. Moreover, unlike other electric utilities there is no possibility of significant competition from a gas utility due to the fragmented size of its market. I would therefore assess it to have very low short term risk of the return of capital and negligible long term risk attached to capital recovery.

I would also note that DBRS remarks that NP has a stable customer base with limited industrial customers. The limited growth potential that DBRS notes is actually counter balanced by strong free cash flow, so that NP can fund not only its capital expenditures but also its dividend flows to its parent, largely out of internal cash flow. A growth utility would not be able to do this; instead it would face financing pressures to fund rate base expansion. DBRS notes that consumption growth will largely be tied to economic prosperity within the province but RBC in their recent provincial update (November 19, 2012) notes that at 3.0% in 2011 Newfoundland and Labrador's economic growth was third best in Canada behind Alberta and Saskatchewan.

Q. WHAT IS THE VIEW OF THE RATING AGENCIES?

A. DBRS (September 10, 2012) rates NP as A with low business risk, reasonable regulatory environment, stable financial profile and strong customer base. DBRS remarks on NP's strong balance sheet on page 2, where it specifically states "the high allowed equity in the capital structure allows Newfoundland Power to generate greater earnings and incur lower interest payments relative to utilities with lower equity allowances." Moody's has a similar view when it states "Regulatory decisions tend to be timely and balanced and NPI's deemed equity is one of the highest in Canada." Moody's goes on to mention the fact that the Fortis practise is to treat its subsidiaries as operationally and financially independent. This would be a plus for the rating, as is the fact that NP issue first mortgage bonds which partially acts as a ring fencing mechanism.

I would compare NP with the following Canadian electric utilities, which vary in size but have similar common equity ratios.

ATCO Electric	39%
Maritime Electric:	40%
Fortis BC	40%
NSPI:	37.5%

I can see no reason why NP should have 45% common equity and would instead recommend that NP's common equity ratio be reduced to 40%.

Q, HOW WOULD THIS AFFECT THE CREDIT RATING?

A... Given the fact that the capital markets are still unsettled due to the Eurozone crisis and the problems in the US I would recommend that the 5% in common equity (just over $40 million) be replaced with preferred shares. At the end of September 2012 BMO estimated the yield on retractable preferred at about 3.41%. These preferreds generally have a retraction feature where the investor can retract or demand payment every five years so they sell on yields relative to mid-term Canada bonds. However, unlike bonds these are similar to equity and paid out of after tax income so they therefore support the credit rating, as they do not add fixed interest. The main impact is that the yield would be less than half the cost of the common equity. For example the saving relative to the current 8.80% allowed ROE would be about 5.4% after tax or 7.20% pre-tax assuming a conservative 25% tax rate. This would reduce the revenue requirement by about $3 million.

In terms of NP's credit metrics DBRS reports the following key ratios:

	2007	2008	2009	2010	2011
EBIT Interest coverage	2.20X	2.73	2.59	2.76	2.88
Cash Flow to Debt:	12.9%	16.2	15.0	18.6	18.1

For 2011 the loss of EBIT of $3 million would have reduced the EBIT interest coverage ratio from 2.88X to 2.80X and the cash flow to debt from 18.1% to 17.5%. I do not regard either of these changes as significant enough to cause any problems with NP preserving its A bond rating.

There has been a large amount of preferred shares sold this year as investors are "hungry for yield" given the drop in fixed income yields. Rob Nicholson of RBC Capital markets before CAMPUT this August indicated that in the first half of this year over $3 billion in preferred shares had been issued by Canadian utilities. Most of these issues have been rate reset preferreds where the rate is periodically reset to market rates. NP's shareholder Fortis has issued a large amount of preferred shares over the last few years. On November 13, 2012 marketwire indicated that Fortis issued $200 million of cumulative redeemable first preference shares, series J. So the market remains receptive to these issues.

VIII: US ESTIMATES

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

A. The recommendations of the US witnesses on behalf of NP are heavily based on US utilities and I generally regard US estimates as biased high when applied to Canadian utilities for two reasons. First, US financial markets exhibit more risk than Canadian markets and have generated 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 utilities can only be used in Canada if significant adjustments are made.

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

A. Apart from the statistical evidence in Appendix B that the S&P500 index has exhibited more volatility than the TSX Composite, we have the fact that experts generally 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 from which we have barely recovered even now over 3 ½ years since it happened.

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[42]

> *"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

[42] Canwest news service, November 14, 2008

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.[43] 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. These differences are symptomatic of basic cultural differences between the US and Canada.

The US allowed banks to fail, or took them over, at a significant cost to tax payers and is now trying to design a system where any future bailout costs are recouped from the banks and not tax payers. In other words it is a policy of allowing the banks to be "aggressive" but making sure the cost of any failures are paid through this quasi insurance fund. In contrast, Canada regulates its banks more closely, never had any banking problems during the financial crisis and objects to paying a tax that is not needed given its more prudent regulatory policy. This is very similar to the attitude towards public utilities, where the US has allowed 6 public utilities to fail, a situation that is in sharp contrast to the significant regulatory protection in Canada.

These philosophical 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, higher borrowing costs and a strong C$.

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[44] it cited three major factors that determined how it rated the supportiveness of regulation. These were (paraphrasing)

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[43] I refer to tier 1 capital as common equity but it also included non-cumulative perpetual preferred shares.

[44] Rating methodology: global regulated electric utilities, Moody's March 2005.

- 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.

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.[45] 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

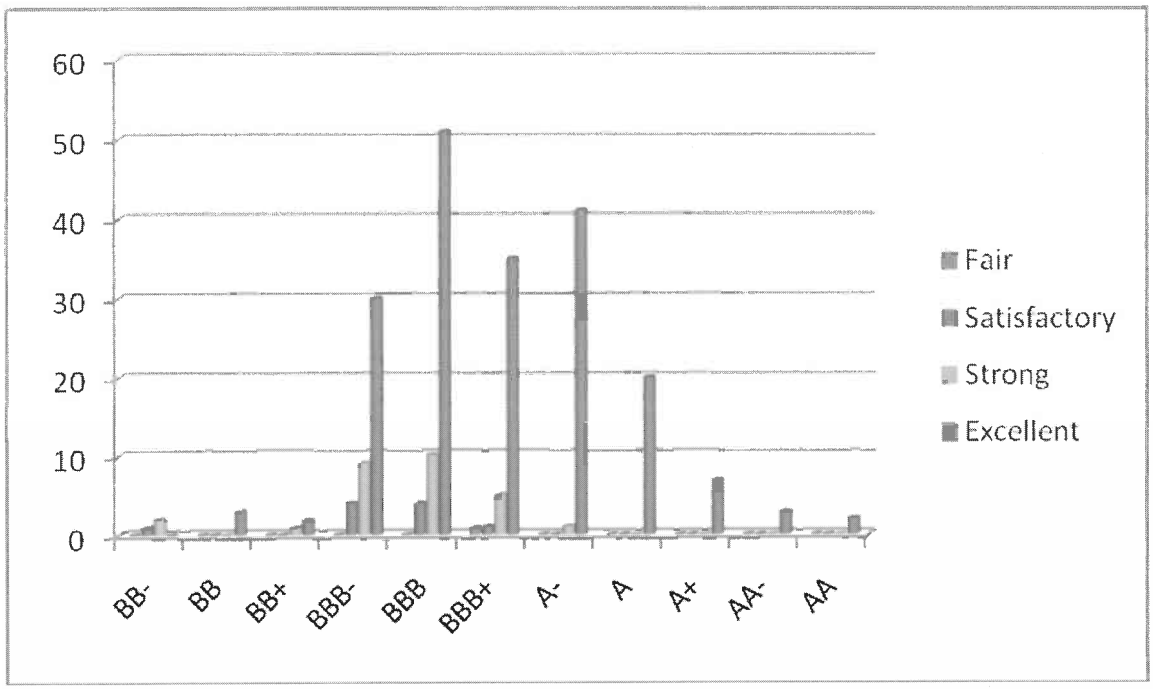
[45] Infrastructure Finance; Regulated Electric and Gas Utilities, August 2009.

> 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."

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. 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. In answer to an information request in the 2010 Line 9 hearing before the National Energy Board (IOL information request #197d) Ms. McShane provided the following histogram of US bond ratings and their respective business risk scores. The histogram provides the total number of US utilities in each rating class broken out according to their business risk ranking from Fair to Excellent. Two observations are apparent. First, many of the lower rated companies are also rated "excellent" in terms of business risk (even some with junk bond ratings, i.e., rated BB+ or lower) so this is not a main determinant of their bond rating. Second, and more important, the typical (modal or median) bond rating in the US is "BBB", whereas for Canadian utilities where the mode and median is "A" and all would be A except for considerations of size and poorly rated parent holding companies.[46]

[46] I use A and BBB generically without modifiers. S&P will not rate a sub higher than its parent unless it is ring fenced, that is, insulated from a raid by its poorly rated parent. Enron raided its subs to the tune of $2 billion when the parent ran into trouble.



What is clear is that despite their poorer financial ratios, Canadian utilities have higher bond ratings, which simply reflects the importance placed by the rating agencies on the differing regulatory approaches in the US and Canada.[47]

Q. IS THERE ANY OTHER SUPPORT FOR MOODY'S OBSERVATION?

A. Yes. In Schedule 6 I have reported the annual ROEs for 14 of the US integrated electric companies indicated in Schedule 5 as indicated in S&P's analyst reports and the annual ROE for NP over the same time period. In the far right column I then report their average ROE and the standard deviation or volatility of their annual ROE. NP's average ROE since 2002 has been 9.50% which puts it in the middle of the pack as the average for the 14 US utilities ranges from PNM Resources 5.0% to 14.10% for the Southern company. However, when we look at the volatility of their ROEs, NP is by far the lowest risk electric utility with a standard deviation of its ROE of only 0.64% whereas for the US utilities it ranges from 1.31% to 7.96% and this

[47] In answer to CA-NP-367 MS. McShane provided the bond ratings of US electric companies and confirmed that the overwhelming majority have some form of BBB bond rating.

understates the range as when a utility has a negative ROE, S&P reports it as nm for not meaningful for which I substituted zero.

What is clear from this ROE data is that US electric utilities have much more income or ROE volatility than does NP, which explains their greater stock market risk. It is extremely rare for a Canadian utility to lose money or get ROEs in the low numbers reported by US electric utilities. These observations support my standing recommendation, which is to use caution in interpreting data from the US.

Q. ARE THERE OTHER FACTORS DEPRESSING BOND RATINGS IN THE US?

A. Yes. S&P has been concerned for some time that US regulators have not protected US bond holders from corporate M&A activity and raids by poorly rated parent or holding companies. This was a feature of the late 1990s when many local telephone companies either took over or were taken over by Internet companies and were subsequently downgraded. In response, S&P implemented a policy that the credit rating of a regulated telecom cannot be higher than the credit rating of its parent. For non-telecom utilities S&P states that it[48]

> "rarely view(s) the default risk of an unregulated subsidiary as being substantially different from the credit quality of the consolidated entity. Regulated subsidiaries can be treated as exceptions to this rule – if the specific regulators involved are expected to create barriers that insulate a subsidiary from its parent."

In other words there is a cross subsidy from the regulated to the unregulated entity *unless* the regulated entity is "ring fenced" so that any problems on the non-regulated side do not impact the regulated side. S&P refers to this as "structural insulation techniques" which may involve:

- separate incorporation of the sub
- independent directors
- minority ownership stakes
- regulatory oversight to insulate the subsidiary
- Restrictions on holding company cash management programs

S&P is very forthright in that the onus lies on the regulators. It states

---

[48] S&P, Corporate Ratings Criteria, 2003, pages 44-45.

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

My reading of these remarks is that having been "burned" with these US telecoms and the lack of reaction from US public service commissions, S&P is now taking a tougher line on all utilities.

This policy was reinforced by the problems surrounding Enron, where FERC was less forthcoming than expected in reining in the financial policies of US pipelines. After Enron siphoned off $1.5 billion from its two natural gas pipelines, the FERC instituted a review of inter-affiliate transfers. Many expected FERC to impose minimum equity ratios of 30% and requirements such as maintaining an investment grade bond rating before the parent could manage the subsidiary's cash. However, when the FERC announcement was made in November 2003 it fell far short of S&P's expectations. As S&P noted

> "the degree of oversight by the FERC has traditionally been less than sufficient to justify insulation. That the FERC took almost two years to respond to the Enron pipeline situation indicates that timely intervention that would protect bondholder interests is not likely when a regulated utility's parent is experiencing financial problems. It seems clear to Standard and Poors that the new rule falls far short of providing the requisite insulation to justify any ratings separation for utilities regulated primarily by FERC"

It is clear from this comment from S&P that the business risk of a utility is only one factor in the bond rating. Further the combination of weak US regulatory oversight and ownership of a utility within a diversified holding company with a weak bond rating dooms the utility to also have a weak bond rating ***regardless*** how strong its common equity ratio and how high its allowed ROE.

The upshot is that even US utilities with an excellent business risk profile, similar to that of Canadian utilities, will have poorer financial market access unless they are in a regulatory jurisdiction that mimics the degree of protection Canadian utilities experience and are structurally insulated or "ring fenced" from their aggressive parents.

Q. HAVE CANADIAN REGULATORS CONFIRMED THIS?

A. Yes. This Board commented on Ms. McShane use of US "comparables" in 2009 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 Board 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. Here the Board found "overwhelming" evidence that Ms. McShane's sample of US utilities were riskier on almost every measure than NP, which it regarded as an average risk Canadian utility. Further the Board noted Moody's view of the regulatory environment in Newfoundland as being "relatively more supportive than those of other international jurisdictions such as the United States."

Also the BCUC (decision page 52) commented on Ms. McShane's use of US comparables in 2009 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.

In its 2009 Gaz Metro decision the Regie concluded (paragraph 295) that

> "The evidence therefore does not make it possible to conclude that the regulatory, institutional, economic and financial contexts of the two countries and their impacts on the resulting opportunities for investors are comparable."

The decision of the Board of Commisioners of Newfoundland and Labrador as well as the BCUC and the Regie indicate that a sample of US "comparables" cannot be used as a benchmark for a Canadian utility's fair ROE without either significant evidence that the regulatory, institutional, economic and financial are the same or making significant adjustment.

Q. DOES MOODY'S CONTINUE WITH THIS ASSESSMENT?

A. Yes. In Moody's July 19, 2011 credit assessment on NPI Moody's states

> "All of NPI's operations are located in Canada whose regulatory and business environment we consider to be supportive relative to those in other jurisdictions. Furthermore, we consider the PUB to be one of the most supportive regulators in Canada. Notwithstanding that NPI's 2011 allowed ROE of 8.38% is currently one of the lowest in Canada in Canada, its 45% common equity is one of the highest in Canada and the PUB's decisions are timely and balanced."

This assessment directly supports its view of lower risk in Canada than other jurisdictions (without explicitly stating the US this time) plus points out that the lower allowed ROE is offset by NPI's higher common equity ratio. If the Board then allows a higher ROE similar to other Canadian utilities there is nothing to offset the higher common equity ratio. The NP credit rating

confirms that Moody's continues to judge the regulatory protection in Canada as enhancing credit ratings above what they would otherwise be based solely on their financial metrics, ie., ratios like debt ratio and interest coverage ratio.

Q. DOES MOODY'S CONTINUE WITH THEIR GENERAL ASSESSMENT ON REGULATION?

A. Yes. In answer to CA-NP-369 Ms. McShane provided copies of two recent Moody's documents[49] These documents essentially spell out in more detail the results of the 2009 assessment. Again Moody's repeated the language of the earlier document stating

- "they viewed Canada's business and regulatory environments as being more supportive than many of those in the U.S. Accordingly most utilities in Canada score in the A range on the regulatory framework factor."

- "More typically however, and as is characteristic of most utilities in the U.S. and eslwhere in Asia, the ability to recover costs and earn authorized returns is less certain and subject to political and sometimes political scrutiny."

50% of Moody's credit rating is based on these two factors of regulation and on the two categories only Oman Power and Water Procur Co and Hong Kong and China Gas Co among the transmission and distribution utilities scored higher than NP.

Q. WHY DID YOU JUDGE US UTILITIES AS WARRANTING A 90-100 BPS HIGHER ROE IN 2009?

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 a 0.50% higher forecasted 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 a typical US utility is higher than the 0.50 mid-point I am using for a Canadian benchmark, then the difference in the fair ROE between Canadian and US utilities

---

[49] Regulatory Frameworks-Ratings and Credit Quality for Investor-Owned Utilities and Cost Recovery Provisions Key to Investor Owned Utility Ratings and Credit Quality, June 2010.

would be significantly greater than 1.0%. This assessment will vary over time but a 100 bps higher ROE for a US utility is certainly reasonable.

Q PLEASE SUMMARISE YOUR RECOMMENDATIONS.

A. I judge NP as warranting a 40% common equity ratio, so that 5% of its existing common equity can be replaced with preferred shares. I judge a fair ROE for a benchmark utility as being 7.50% for 2013 and would recommend an ROE adjustment model that adjusts by 50% of the change in utility credit spreads and 75% of the change in forecast LTC yields subject to a minimum forecast LTC yield of 3.80%. If the Board does not accept an ROE adjustment model I would recommend a fixed rate ROE of 8.25% that would remain indefinitely. This would reflect my expectation that the Euro crisis is waning while the US is recovering so I would expect long term bond yields to increase.

Q. DOES THIS 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	9.7
1989	7.58	2.62	5.06	12.02	9.92	0.84	11.79
1990	8.16	0.19	4.81	12.81	10.81	0.86	7.48
1991	10.32	-2.09	5.61	8.83	9.81	0.87	3.53
1992	11.24	0.88	1.45	6.51	8.77	0.83	1.56
1993	11.42	2.34	1.90	4.93	7.88	0.78	3.69
1994	10.43	4.80	0.12	5.42	8.58	0.73	6.57
1995	9.54	2.81	2.22	6.98	8.35	0.73	9.55
1996	9.73	1.62	1.48	4.31	7.54	0.73	10.29
1997	9.16	4.23	1.69	3.21	6.47	0.72	10.86
1998	8.35	4.10	1.00	4.74	5.45	0.67	8.83
1999	7.58	5.53	1.75	4.70	5.68	0.67	9.82
2000	6.85	5.23	2.69	5.48	5.92	0.67	10.92
2001	7.23	1.78	2.52	3.85	5.79	0.67	7.41
2002	7.66	2.92	2.25	2.57	5.67	0.65	5.68
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	11.62
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	12.86
2008	6.15	0.52	2.37	2.62	4.06	0.94	9.44
2009	8.23	-2.46	0.30	0.40	3.85	0.88	8.32
2010	7.99	3.05	1.78	0.50	3.71	0.97	10.75
2011	7.46	2.46	2.89	0.94	3.22	1.01	10.57
Cansim	V13682111	v1992067	v41690973	V122484	V122501	V37426	V634672/V63462

SCHEDULE 2

CANADA BOND YIELDS

Overnight money market rates		1.00
Benchmark bonds		
Canada	91 day Treasury Bill yield	0.99
Canada	Six month Treasury Bills	1.03
Canada	One year Treasury Bills	1.09
Canada	Two year	1.12
Canada	Three year	1.21
Canada	Five year	1.39
Canada	Seven year	1.56
Canada	Ten year	1.84
Canada	Long term (30 year)	2.41
Canada	Real return bonds	0.39
Marketable Bond Average yields		
Canada	1-3 year	1.12
Canada	3-5 year	1.32
Canada	5-10	1.64
Canada	Over tens	2.31

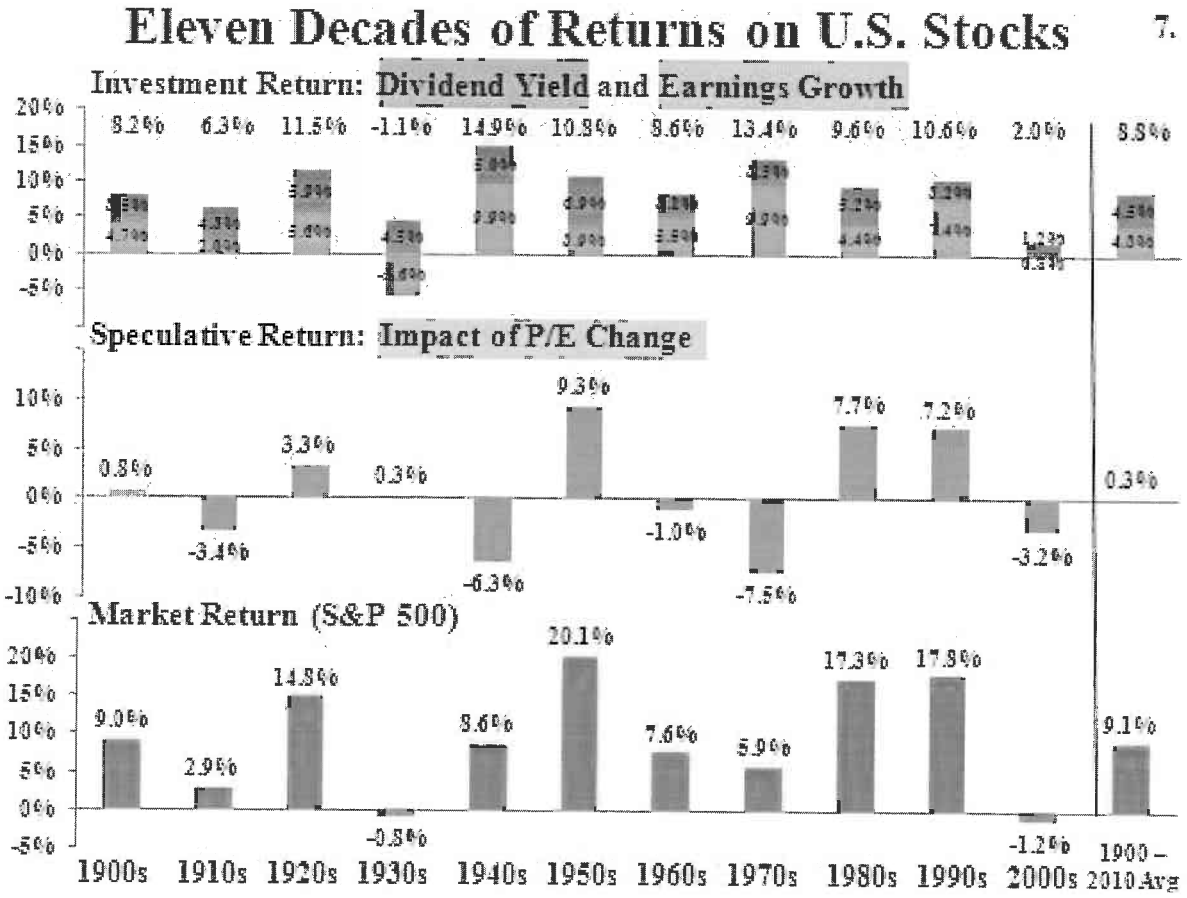
Source: Bank of Canada's web site at http://bankofcanada.ca/en/securities.htm, for October 27, 2012.

Schedule 3

Investment and Speculative TSX Returns back to 1987

	ROE	TSX	Speculative
1987	11.19	5.88	-5.31
1988	12.69	11.08	-1.61
1989	11.47	21.37	9.90
1990	7.57	-14.80	-22.37
1991	3.87	12.02	8.15
1992	1.69	-1.43	-3.12
1993	3.81	32.55	28.74
1994	6.70	-0.18	-6.88
1995	9.77	14.53	4.76
1996	10.35	28.35	18.00
1997	10.93	14.98	4.05
1998	8.78	-1.58	-10.36
1999	9.88	31.71	21.83
2000	10.93	7.41	-3.52
2001	7.42	-12.57	-19.99
2002	5.67	-12.44	-18.11
2003	9.64	26.72	17.08
2004	11.63	14.48	2.85
2005	12.70	24.13	11.43
2006	13.95	17.26	3.31
2007	12.86	9.83	-3.03
2008	9.44	-33.00	-42.44
2009	8.32	35.05	26.73
2010	10.75	17.61	6.86
2011	10.59	-8.71	-19.30
Average	9.30	9.61	0.31
Volatility	3.08	17.02	16.64

Jack Bogle's Investment and Speculative Returns in the US back to 1900



SCHEDULE 5

AUS MONTHLY REPORT

NOVEMBER 2011

RETURN ON BOOK VALUE OF COMMON EQUITY

HIGH		LOW	
DPL Inc. (NYSE-DPL)	19.4	Otter Tail Corporation (NDQ-OTTR)	5.0
El Paso Electric Company (NYSE-EE)	13.7	FirstEnergy Corporation (ASE-FE)	5.5
Nextera Energy (NYSE-NEE)	12.9	Great Plains Energy Incorporated (NYSE-GXP)	6.0
Cleco Corporation (NYSE-CNL)	12.7	Central Vermont Public Serv. Corp. (NYSE-CV)	7.4
Southern Company (NYSE-SO)	11.8	Hawaiian Electric Industries, Inc. (NYSE-HE)	7.6
American Electric Power Co. (NYSE-AEP)	10.6	Westar Energy, Inc. (NYSE-WR)	8.2
Portland General Electric (NYSE-POR)	10.3	Progress Energy Inc. (NYSE-PGN)	8.5
Edison International (NYSE-EIX)	10.1	ALLETE, Inc. (NYSE-ALE)	8.7
IDACORP, Inc. (NYSE-IDA)	9.2	Pinnacle West Capital Corp. (NYSE-PNW)	8.8
Pinnacle West Capital Corp. (NYSE-PNW)	8.8	IDACORP, Inc. (NYSE-IDA)	9.2

COMBINATION ELECTRIC & GAS COMPANIES

RETURN ON BOOK VALUE OF COMMON EQUITY

HIGH		LOW	
UGI Corporation (NYSE-UGI)	30.9	Ameren Corporation (NYSE-AEE)	1.2
Exelon Corporation (NYSE-EXC)	19.5	Pepco Holdings, Inc. (NYSE-POM)	4.9
UIL Holdings Corporation (NYSE-UIL)	19.1	NiSource Inc. (NYSE-NI)	6.3
Public Service Enterprise Group (NYSE-PEG)	17.7	NV Energy (NYSE-NVE)	6.3
CenterPoint Energy (NYSE-CNP)	16.1	CH Energy Group, Inc. (NYSE-CHG)	6.4
Entergy Corporation (NYSE-ETR)	14.7	Unitil Corporation (ASE-UTL)	7.1
CMS Energy Corporation (NYSE-CMS)	14.5	Black Hills Corporation (NYSE-BKH)	7.4
OGE Energy Corp. (NYSE-OGE)	14.3	Integrys Energy Group (NYSE-TEG)	8.2
Dominion Resources, Inc. (NYSE-D)	14.2	Vectren Corporation (NYSE-VVC)	8.5
UniSource Energy Corporation (NYSE-UNS)	13.8	Empire District Electric Co. (NYSE-EDE)	8.7

NATURAL GAS DISTRIBUTION, TRANSMISSION AND INTEGRATED NATURAL GAS COMPANIES

RETURN ON BOOK VALUE OF COMMON EQUITY

HIGH		LOW	
South Jersey Industries, Inc. (NYSE-SJI)	14.5	Questar Corporation (NYSE-STR)	5.1
National Fuel Gas Company (NYSE-NFG)	14.4	Southern Union Company (NYSE-SUG)	8.4
New Jersey Resources Corp. (NYSE-NJR)	14.4	Atmos Energy Corporation (NYSE-ATO)	8.9
ONEOK, Inc. (NYSE-OKE)	14.1	RGC Resources, Inc. (NDQ-RGCO)	9.2
El Paso Corporation (NYSE-EP)	13.6	Northwest Natural Gas Co. (NYSE-NWN)	9.3
Energen Corporation (NYSE-EGN)	12.4	Southwest Gas Corporation (NYSE-SWX)	9.5
AGL Resources Inc. (NYSE-AGL)	12.3	Gas Natural, Inc. (NDQ-EGAS)	9.6
Laclede Group, Inc. (NYSE-LG)	11.6	WGL Holdings, Inc. (NYSE-WGL)	9.9
Piedmont Natural Gas Co., Inc. (NYSE-PNY)	11.3	Delta Natural Gas Company (NDQ-DGAS)	10.2
NICOR Inc. (NYSE-GAS)	10.7	EQT Corporation (NYSE-EQT)	10.2

SCHEDULE 6

	Annual ROEs											
	2011	2010	2009	2008	2007	2006	2005	2004	2003	2002	STDEV	Average R(
Allettte	9.1	7.8	6.9	10.5	12.4	12.2	2.9	3.6	10.6	10	3.30	8.60
AEP	10.7	9.1	11.4	13.2	11.7	10.7	11.7	13.8	7	0.3	3.91	9.96
Cleco	14.3	21	9.8	9.9	16.1	9.6	29.5	12.5	0	13.3	7.78	13.60
Edison	0	12.3	8.8	13.5	13.6	15.1	17.1	3.8	15.9	29.4	7.96	12.95
First Enrgy	8.1	9.2	12	15.6	14.5	13.8	9.8	10.4	5.5	9.5	3.13	10.84
IDA Corp	10.5	9.7	9.2	7.8	7.1	9.3	6.3	7.8	5.4	7	1.63	8.01
NextEra	13.1	14.3	13.1	14.6	12.7	13.9	11	12	13.4	10.7	1.31	12.88
PNM Resources	11	0	3.1	0	3.5	8.2	5.7	7.1	5	6.4	3.48	5.00
Southern	11.59	12.7	11.7	13.6	14.6	14.3	15.2	15.4	16.1	15.8	1.47	14.38
Westar	8.9	9	6.4	8.9	10	11.1	9.6	8.2	16.4	0	4.07	8.85
Portland	9	8	6.6	6.5	11.4	5.9	5.2	7.5	2.7	5.8	2.34	6.86
PNW	8.8	10	2.4	6.1	8.6	9.2	7	8.1	8.4	8.3	2.15	7.69
Hawaian	9.2	7.8	5.9	6.8	7.2	9.3	10.5	9.4	11.1	12	1.97	8.92
Great Plains	5.9	7.5	5.7	5.8	10.8	9.8	13.7	16.4	16	14.8	4.34	10.64
US Average	***9.30***	***9.89***	***8.07***	***9.49***	***11.01***	***10.89***	***11.09***	***9.71***	***9.54***	***10.24***	***3.49***	***9.94***
NP	***9***	***9.21***	***8.96***	***9.13***	***8.66***	***9.46***	***9.6***	***10.12***	***10.22***	***10.65***	***0.64***	***9.50***

0 indicates losses S&P does not report negative ROEs
Data for El Paso not available

Appendix A

Joseph L. Rotman School of Management
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Professor Laurence Booth
CIT Chair in Structured Finance

Rotman

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TEACHING AND RESEARCH INTERESTS. Main interest is teaching domestic and international corporate finance. Research interests centre on the cost of capital, empirical corporate finance and capital market theory.

ACADEMIC BACKGROUND:

D.B.A.,	Indiana University, (finance major).
M.B.A.,	Indiana University, (finance major).
M.A.,	Indiana University, (Economics).
B. Sc.(Econ),	London School of Economics.

AWARDS & HONOURS
MBA Second Year Instructor of the Year Award, 1996, 1998 (joint) & 2000
Best paper in corporate finance, 1999 SFA meetings
ASAC Distinguished Professor Address 1990,
Director Financial Management Association 1988-90,
English Speaking Union Fellow,
Fulbright,
Elected to Beta Gamma Sigma,
First class honours B.Sc.(Econ)
CBV (Chartered Business Valuator),
National Post Leader in Management Education Award 2003

ACADEMIC EMPLOYMENT: CIT Chair in Structured Finance (1999-), Professor of Finance, Rotman School of Management, University of Toronto (1987-Present), Visiting Professor Nankai University (China) 1989, the Czech Management Centre (1998), visiting scholar London School of Economics (1985).

TEACHING EXPERIENCE: Graduate (MBA) courses on The Economics of Enterprise, the Economic Environment of Business, Business Finance, Corporate Financing, International Financial Management, Mergers & Acquisitions, Financial Management, Capital Markets & Corporate

Financing (EMBA), Financial Theory of the Firm (Ph.D), Capital Markets Workshop (Ph.D). Undergraduate courses (B.Comm) in International Business and Business Finance. Executive courses (2-5 days) on Money and Foreign Exchange Markets, Business Valuation, Financial Strategy, Equity Markets, Capital Market Innovations, Mergers & Acquisitions and Finance for Non-Financial Managers.

JOURNAL ARTICLES

"Stochastic Demand, Output and the Cost of Capital: A Clarification," Journal of Finance, 35 (June 1980),

"Capital Structure, Taxes and the Cost of Capital," Quarterly Review of Economics and Business, 20 (Autumn 1980,

"Stock Valuation Models Under Inflation," Financial Analysts Journal, (May-June 1981),

"Market Structure, Uncertainty and the Cost of Equity Capital," Journal of Banking and Finance, (May 1981),

"Capital Budgeting Frameworks for the Multinational Corporation," Journal of International Business Studies, (Fall 1982),

"Hedging and Foreign Exchange Exposure," Management International Review, (Spring 1982),

"Correct Procedures for Discounting Risky Cash Outflows," Journal of Financial and Quantitative Analysis, (June 1982),

"Total Price Uncertainty and the Theory of the Competitive Firm," Economica, (May 1983),

"Portfolio Composition and the CAPM," Journal of Economics and Business, (June 1983),

"On the Negative Risk Premium for Risk Adjusted Discount Rates," Journal of Business Finance and Accounting, (Spring 1983),

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Other civil cases include: prudent investments in a money market fund; the use of inverse floaters; the valuation of a brick company; the purchase of a private company by a Crown corporation; the liability of an investment dealer in a deficient private offering memorandum; the role of the Crown in managing moneys placed "in trust," the motivation for differential investment decisions, the materiality of press releases and the role of event clauses in contracting.

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SERVICE:

Executive Committee: 1980-2, 1989-90, 1993-4, 2001-3, 2009-10
Finance Area Co-ordinator 1987-91, 1994-2008
External Advisory Board, Health Administration Faculty, 1985-92.
Editorial Board Activities:

- Journal of Economics & Business 1982-87.
- Finance Section Editor, Canadian Journal of Administrative Sciences 1993-2005.
- Journal of Multinational Financial Management 1989-.
- Journal of International Business Studies 1992-
- Associate Editor, Multinational Finance Journal, 1995-
- Journal of Applied Finance 2003-2007

Director at large Multinational Finance Society 1998-
Co-Chair 1991 Northern Finance Association meetings.
Chair 1998 Northern Finance Association meetings
Chair 2008 MFS annual meetings.
President Multinational Finance Society, 2010-11
Programme Committee member FMA meetings, October 1993.
Programme Committee member SFA meetings November 2002.
Programme Committee member, MFS meetings 2002-10
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Programme Committee Member, European Financial Management 2006-2010
Programme Committee member, NFA meetings 2008-
Investments Committee, Trinity College, U of T.
Pension Committee, Governing Council University of Toronto, 2011
Special committee on the Supplementary Retirement Arrangement (SRA) University of Toronto, 2011
Frequent media commentator.

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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 solution that if you started and

[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

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 arithmetic 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.

Market Risk Premium Estimates Going Forward and Backwards

In Schedule 1 I graph the market risk premium using Canadian data and these three estimation techniques in two ways.[2] In the top graph starting in 1924-1928 the realised market risk premium is estimated using each of the three techniques and is then updated each year with the new data so the second observation is for the period 1924-1929. In this way the graph captures the "learning" that goes on from 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. 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 and the impact of the post war bond market uncertainty increases.

An alternative to the above procedure is to work backwards, that is, start in the five-year period 2007-2011 and then go back in time, which is the lower graph in Schedule 1. 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 volatility that mimics in many ways what was observed in the 1920's and 1930's. However, as we work back through time and add in progressively older data the influence of the recent market volatility recedes and

2 The graphs use data from the Canadian Institute of Actuaries, "Report on Canadian Economic Statistics" April 2011 updated for 2011

once we get back to the 1950's we finally get a market risk premium about 4.0%. However, this graph illustrates why current market participants generally assess the risk premium of equities over bonds as much lower than 5.0%, since this is what they have experienced over the last 20-30 years.

In Schedule 2 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 2011, this is essentially a subset of the data graphed in Schedule 1. Note for example, that the most recent ten-year period has an earned risk premium of 0.14%, 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 1942-2011 it reaches 5.0% before dropping again as we add the data from the 1920's and 1930's until we reach 4.76%.

The usefulness of the different holding periods in Schedule 2 is simply to note the variability in the experienced risk premium that results from individuals choosing to base estimates on a subset of the data. A high estimate could, for example, be generated by ending the time period in the early 1980s by using stale data from old textbooks, since this was the period when interest rates were at their peak and as result realised returns on bonds were much less than anticipated. Equivalently a low market risk premium could be generated by emphasizing the most recent period since 1981 when the very high returns from holding bonds during this declining interest rate period gives a negative market risk premium.

We can illustrate this problem simply by graphing the behaviour of interest rates which is done in Schedule 3. Note for example, that there was very little interest rate variability in the 1930's but then starting in the 1950's interest rates started to increase with inflation, thereby causing losses in anyone holding long term bonds. This process ended in 1981, since when this process has gone into reverse and until we reach the current period of very low interest rates when long Canada bonds ended 2011 at just 2.46%. For 2011 the average long Canada bond yield (cansim 122487 over 10 year bonds) was 3.21% almost the average level for 1936 of 2.97% as globally investors fretted over a repeat of the Great Depression and sought the safety of government

bonds.

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%.[3] However, there is ***no*** support for the assumption that either bond market risk or average bond market returns have been constant. As Schedule 3 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 1956-2011, 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 increased substantially. Effectively bond market risk doubled, while equity market risk was much the same if not less.

This changing bond market risk is illustrated in Schedule 4 which graphs the equity market risk divided by the bond market risk, where each is estimated as the standard deviation of returns over the prior ten year period so the series start with the first observation for the period 1924-1933. We can clearly see the dramatic decrease in relative equity market risk starting in the 1950s, where equities dropped from being six times riskier than long term Government of Canada (GOC) bonds to their low point prior to the Internet Bubble crash of essentially the same risk. Since then the increased equity market volatility combined with relative stability in long Canada bond yields has caused equities to revert to being over three times riskier than GOC bonds.

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 5 I show that the Canadian bond market beta was very

[3] 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.

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 risk 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. However since the Canadian government solved its structural budget problems we have seen the bond market beta revert to its more typical negative or insignificant relationship

Schedule 5 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 6 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 5.0% 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 3.5% 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 26 basis points. That is, the effective 5% increase in the standard deviation of bond market returns before and after 1956 was associated with about a 130 basis point increase in real Canada yields between these two periods. This was 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 was a 130 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 24 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 well over 2.0% to the real Canada yield relative to what would have been produced with a balanced budget.

When these two effects are added together we can explain the huge increase in real yields in the early 1990s. In 1994, for example, when real yields were over 7%, the deficit added about 1.75% and the bond market uncertainty about another 2.65% or in total almost 4.5 % to the real yield. It is easy to see that with this dramatic increase in real yields in the bond market there was very

little "extra" risk for low risk equities over bonds at this time. This is why in the mid 1990's I was recommending very "skimpy" utility risk premiums.

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 7 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 prior to the financial crisis 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.

Since the onset of the financial crisis we have had the impact of a new variable, which is global investor interest in GOC bonds. Before the foreign property rule was removed Canadian investors could only hold 30% of their tax preferred portfolio in foreign assets.[4] These assets tended to be foreign equities. Once this rule was removed Canadian institutions could buy foreign bonds and we have seen the emergence of the Maple bond market During the current financial crisis foreign investors have flocked to the GOC bond market as Canada has been seen as one of the few stable AAA rated bond issuers in the global bond market. This has had the effect of lowering real yields in Canada to under 0.50% by the end of 2011 even in the presence of aggregate government deficits in Canada of 4.6% of GDP.

4 Mainly registered retirement savings plans (RRSPs) and institutional pension plans.

If we use the regression model in Schedule 6 the real yield should be about 4.0% with the current aggregate deficit and bond market volatility. The current government deficit adds about 1.11% to the intercept or real yield of 1.05% and the slight increase in bond market volatility adds another 1.83%. At a 2% forecast inflation rate[5] this implies a long Canada bond yield consistent with current government deficits of about 6.00%. If Canada were still insulated from the rest of the world, these increased budget problems of the Canadian government and the associated additional financing would have driven up Canadian bond yields. Instead, the dire shape of the rest of the developed world has made Canada look good and caused bond prices to go up and yields to go down. However, what is clear is that current government of Canada long term bond yields are well below what would be regarded as "normal" yields.

US Estimates

The Canadian data is one time series of equity and bond market returns and reflects unique events that happened in Canada; 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 8 provides US estimates of the market risk premium along with the comparable Canadian estimates for the period 1926-2011.

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"[6] 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.

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5 This is the Bank of Canada's inflation target agreed to with the Federal Government.

[6] 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.

However, the difference between the US and Canadian AM market risk premium estimates of 1.15% (5.70%-4.55%) is split between a difference in the average equity return of 0.49% and a difference in the average government bond return of 0.69%, 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[7] 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 the Canadian market risk premium estimate to just over 5.0%.

Finally we have to bear in mind that currently Canada is in a 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. We can see this in the graph of real interest rates in Canada and the US in Schedule 9. 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 on average been about 0.30% lower than the US TIPs yield.8 This is consistent with the emergence of Canada as a capital exporter and lower required returns in Canada. It also means that the lower historic market risk premium in Canada estimated over higher Canadian GOC bond yields may

[7] 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.

8 For the last six months the yields have been very similar.

no longer reflect expected market risk premiums over the currently lower Canadian GOC bond yields. As a result although my direct estimate of the Canadian market risk premium is under 5.0% I judge a reasonable range to be 5.0-6.0%, since this reflects the recent behaviour of real yields in Canada and the removal of regulatory protection in the Canadian equity market.

Reasonableness of the Estimates

The prior statistical work indicates that the Canadian market risk premium has been about 5.0% while that for the US has been about 1.0% higher. These estimates are consistent with the judgment of professionals in the area of capital markets. At the height of the financial crisis Professor Fernandez[9] 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.

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%.

Professor Fernandez followed up this survey with further surveys in 2009, 2010, 2011 and 2012 and extended the responses to include financial analysts and companies as well as professors of

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

finance. The 2012 survey[10] was answered by 7,192 respondents out of about 21,500 emails sent out, where only 47 said "the CAPM is not very useful." Of the 2,223 US responses the average market risk premium estimate was 5.5% and the median 5.4%. For Canada the results were reversed with a median market risk premium of 5.5% and an average of 5.4%. The maximum estimate of the market risk premium by the 94 Canadian respondents was 10.5%, the minimum 3.4% while 75% were at 6.0% or less.

Fernandez's surveys have discovered that professors of finance have traditionally been "high" in their market risk premium estimates, which was in part due to their use of historic estimates. This is still true in the US, where the average market risk premium estimate of professors of finance was 5.6% versus 5.0% for analysts and 5.5% for companies. However, in Canada this is no longer true as professors of finance are at 5.4%, the same as companies, while analysts are at 5.9%. Also Professor Fernandez reports the trend over time in the estimate of the market risk premium for the US, where there are the most responses, as follows:

2008	2009	2010	2011	2012
6.3%	6.4%	6.0%	5.7%	5.50%

Consistent with the prior table in 2008 the average market risk premium was 6.3%. This then marginally increased in 2009 to 6.4%, but has then subsequently dropped to 6.0%, then 5.7% and now 5.5%. There is no sign of a heightened market risk premium due to the aftermath of the financial crisis. In fact, the median estimate of the US market risk premium seems to have dropped quite significantly.

Conclusions

Fernandez's survey work supports my own direct estimates; that the market risk premium is generally regarded as between 5.0-6.0%. This is also confirmed by professional opinion in Canada, where on October 19, 2012 TD Economics came out with a report "An Economics

10 P. Fernandez et al, Market risk premium used in 82 countries in 2012: a survey with 7,192 answers. June 19, 2012.

Perspective on Canadian Long Term Financial Returns."[11] The following table captures the TD Economics analysis:

FINANCIAL PROJECTIONS OVER THE NEXT DECADE	
Financial Instrument	**Average Annual % Return**
Cash (3-Month T-bills)	2.00%
Bonds (DEX Universe Bond Index)	3.00%
Equities	
Canada (S&P/TSX Composite)	7.00%
U.S. (S&P 500)	7.00%
International (MSCI EAFE)	7.00%
Source: TD Economics	

The TD analysis placed long run Canadian equity returns at 7.00%, the same as in the US and internationally, whereas bond returns were forecast at 3.0% for the Dex universe bond index, that is, including corporate as well as government bonds. The implication is for a long run market risk premium of 4.00% of equities over bonds and slightly higher over government bonds. This is an increase compared to a similar report in March 2011, where Canadian equity returns were forecast at 7.5% and bond returns at 4.00%.

TD Economics is predicting a return to a balanced portfolio of 4.0-6.0%, which with 2% inflation implies a real return at a maximum of 4.0%. This is the same sort of analysis that underlies most defined benefit pension plans. Since these are long run or geometric (compound) returns an adjustment to arithmetic returns would move the equity risk over bonds to about 5.5% with that over long Canada bonds slightly higher at about 6.0%.

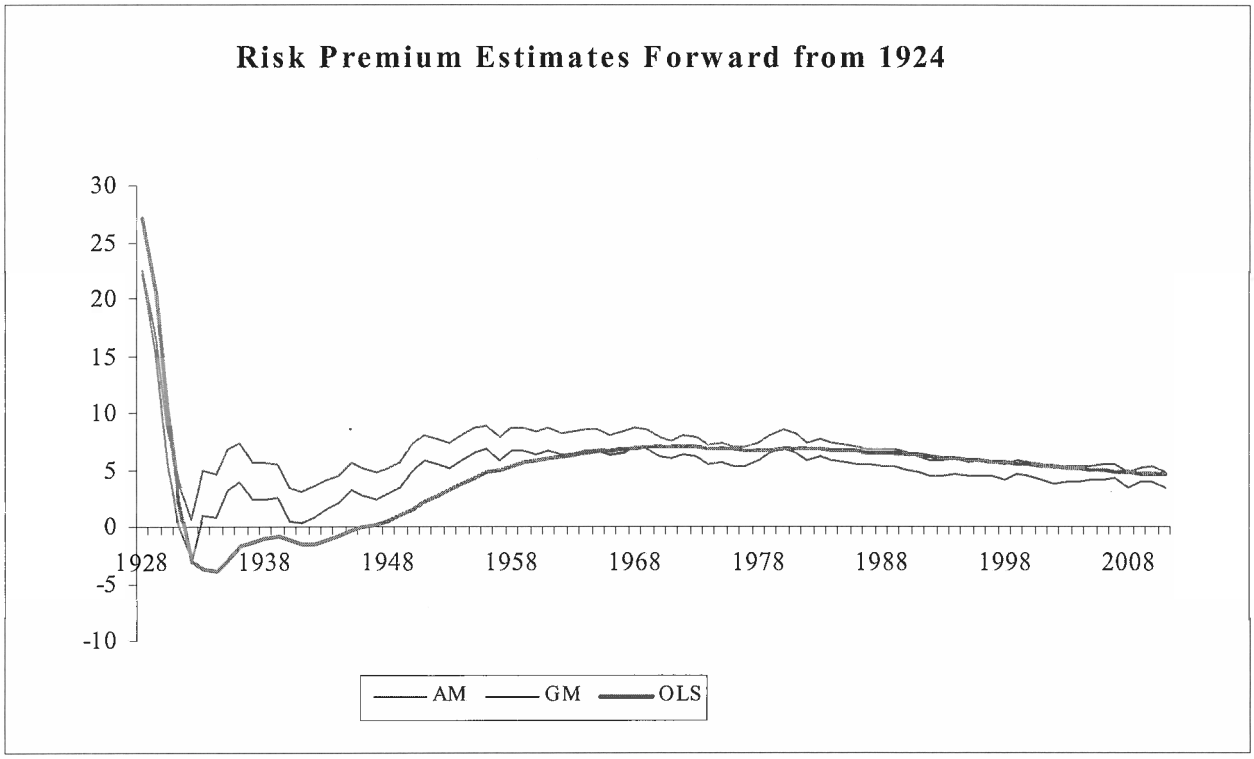
As a result while my own direct estimate of the experienced market risk premium is less than 5.0%, I judge it to currently be in a range of 5.00-6.00**%.** This estimate reflects the survey results of Fernandez and gives weight to the evidence from the US with regards to equity returns and the role of international capital flows in the US bond market. However it is significantly in excess of the long run historical experience of equity over long term bond returns in the major capital

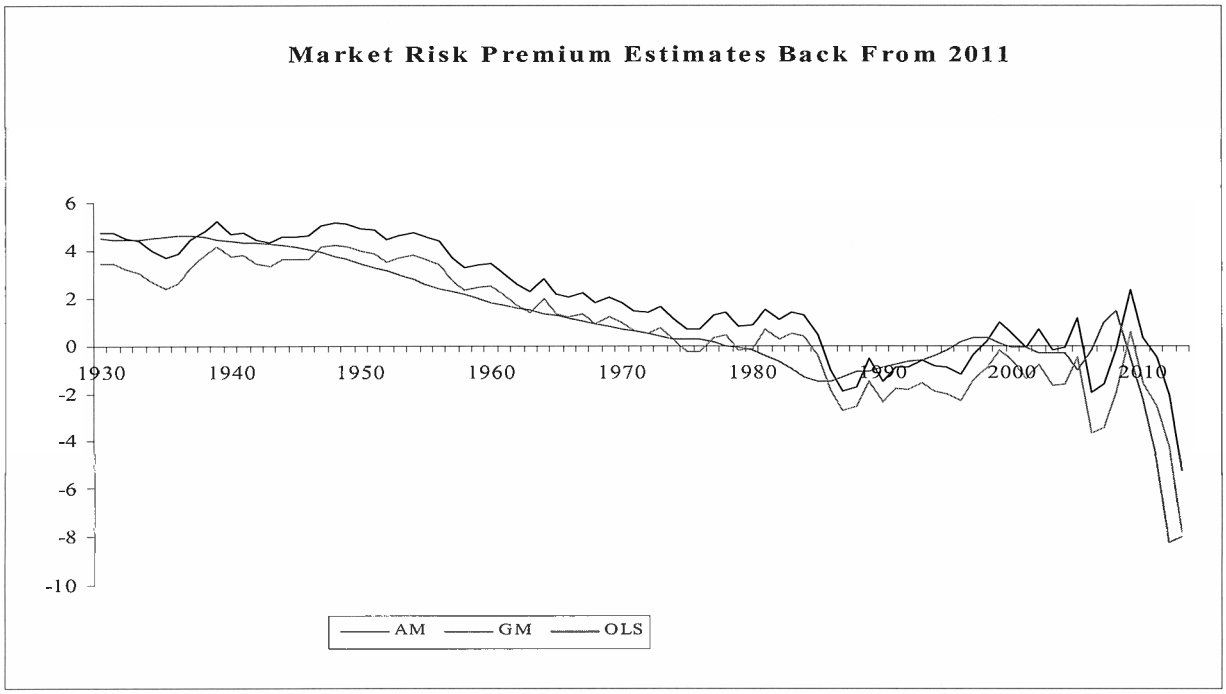
11 http://www.td.com/economics/special/ca0311_long_run_returns.pdf

markets, including that of the US and UK, as well as Canada.[12] It is also significantly in excess of a recent report by the Royal Bank of Canada that while acknowledging historic equity returns of about 9.4%, forecasts future US equity returns over the next ten years at 4.9%, that is, the total return from the equity market is forecast by RBC to be less than the market risk *premium* I am using.[13]

12 The latest issue of Credit Suisse' "Global equity returns yearbook 2012," has the equity market risk premium over bonds at 3.4% for Canada; 4.1% for the US and 3.6% for the UK.
13 RBC, US Equity Strategy Weekly, July 18, 2012.

SCHEDULE 1


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

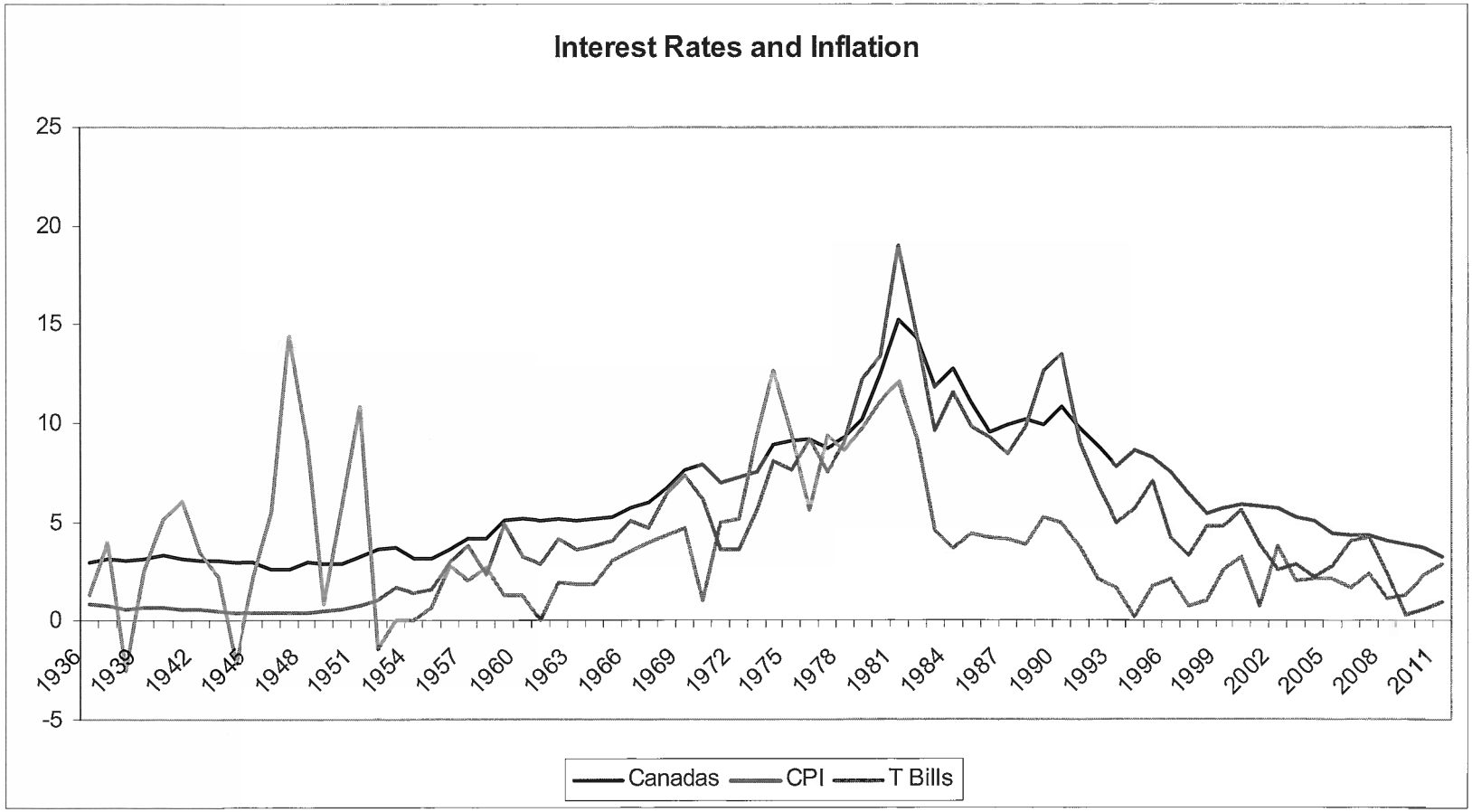

Market Risk Premium Estimates Back From 2011
6
4
2
0
-2
-4
-6
-8
-10
1930
1940
1950
1960
1970
1980
1990
2000
2010
AM
GM
OLS

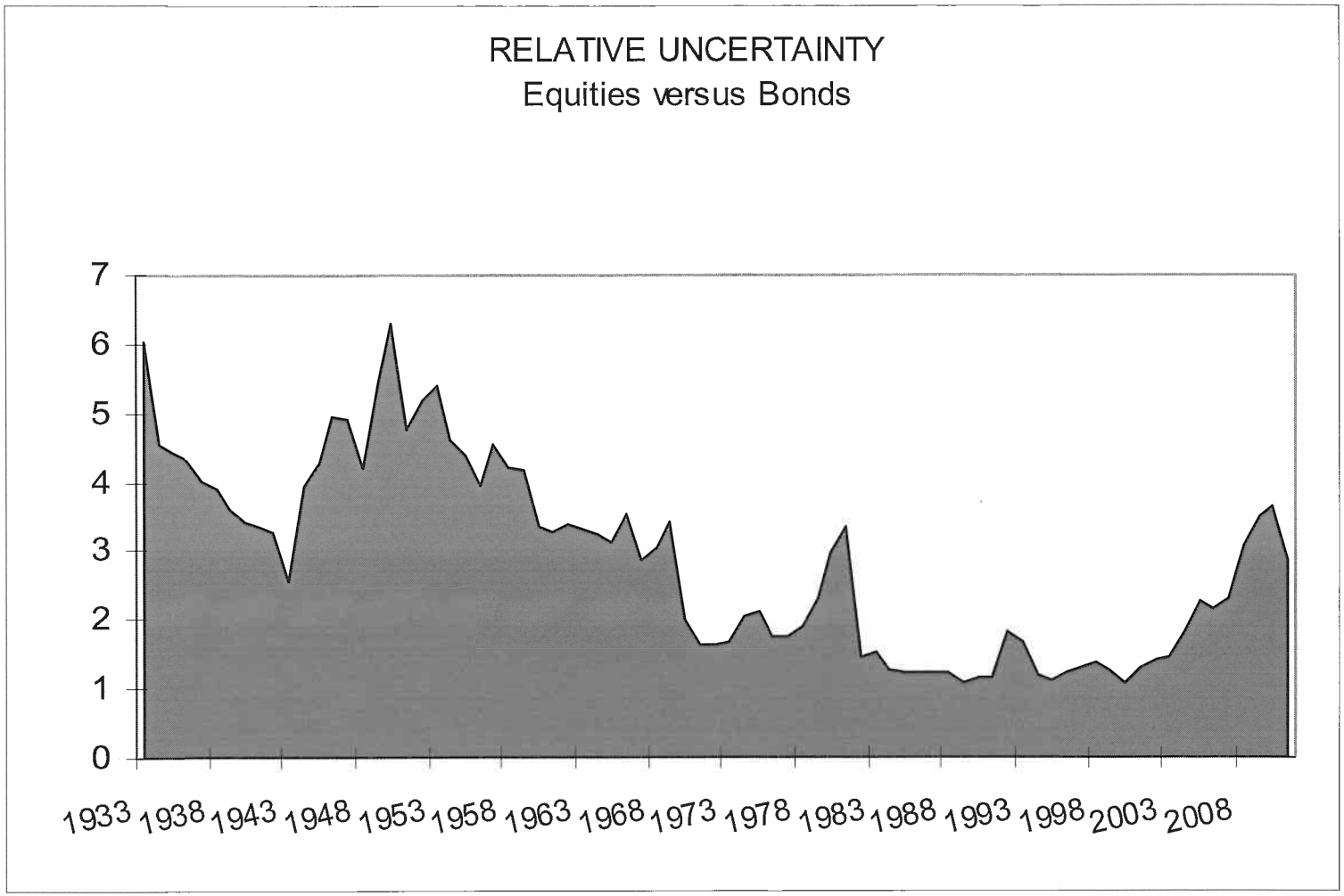
SCHEDULE 2

Earned Risk Premiums for Different Holding Periods

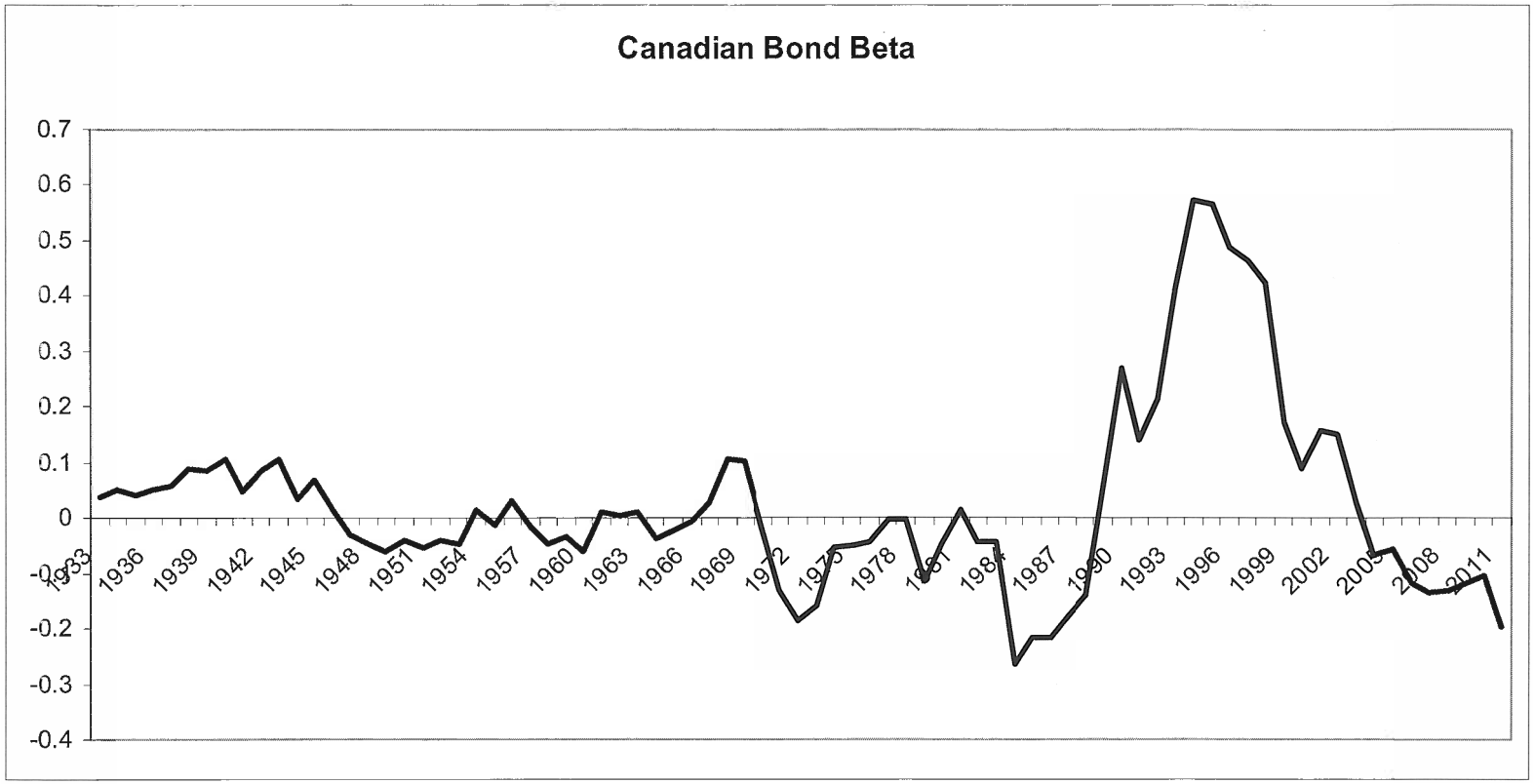
Start dates on the horizontal and ending dates on the vertical. For example, an investor would have earned a 2.26% arithmetic risk premium investing from 1962-2001.

	1932	1942	1952	1962	1972	1982	1992	2002
1941	2.53							
1951	9.54	16.55						
1961	9.94	13.64	10.73					
1971	8.26	10.17	6.98	3.24				
1981	8.80	10.37	8.31	7.10	10.97			
1991	6.38	7.15	4.80	2.83	2.62	-5.72		
2001	5.55	6.06	3.96	2.26	1.94	-2.58	0.57	
2011	4.84	5.17	3.27	1.78	1.42	-1.76	0.22	-0.14


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
2011
Canadas
CPI
T Bills


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 5


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
2011

SCHEDULE 6

FACTORS INFLUENCING THE REAL CANADA YIELD

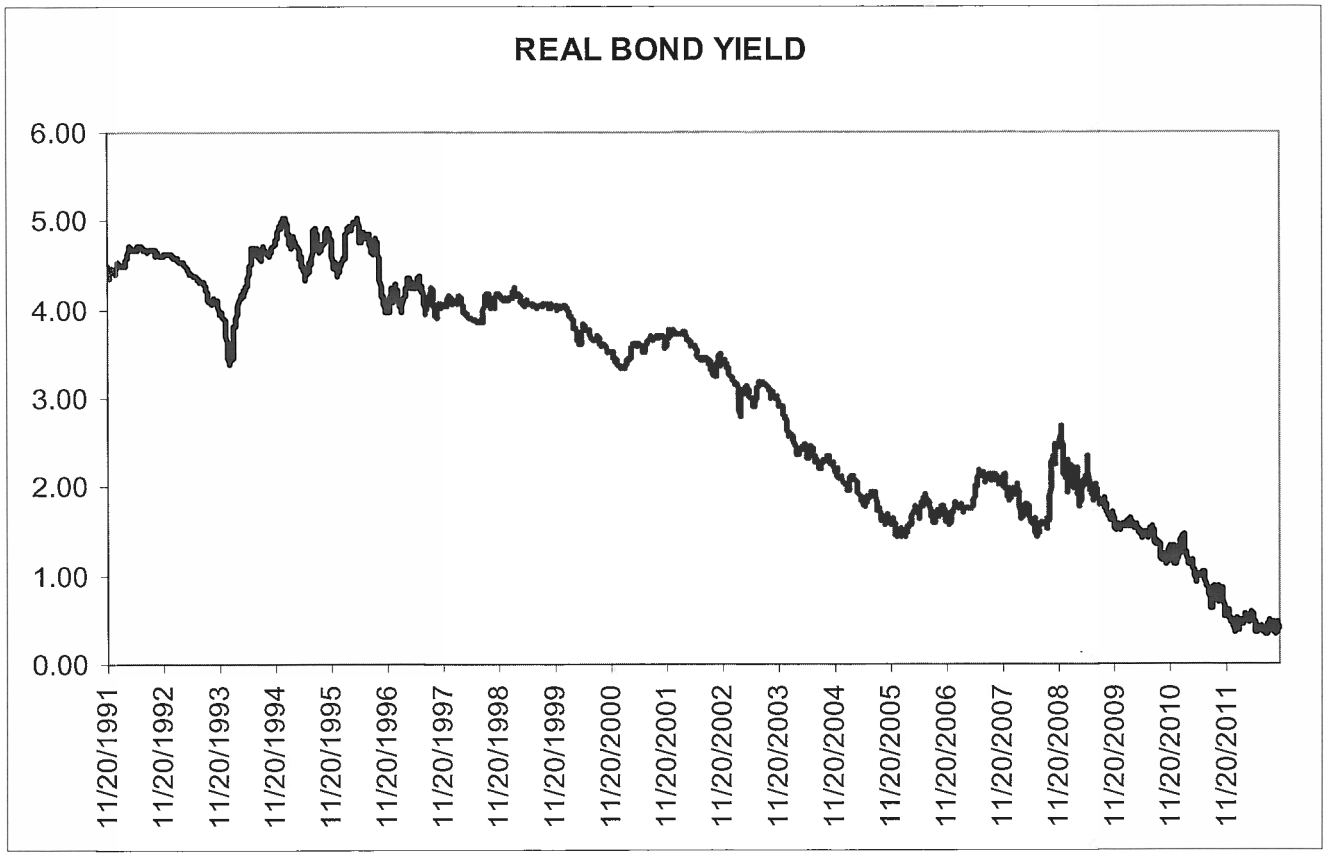
Dependent variable: Long Canada yield minus the average CPI inflation rate for the past, current and forward year.

Independent variables:

	Coefficient	T-Statistic
Constant:	1.04	
Risk: standard deviation of return on long bond index for prior ten years.	0.26	5.22
Deficit: aggregate government lending as a % of GDP.	-0.24	-7.89
Dum1: dummy variable for years 1940-51	-5.06	-11.31
Dum2: dummy variable for years 1972-80	-3.49	- 7.89

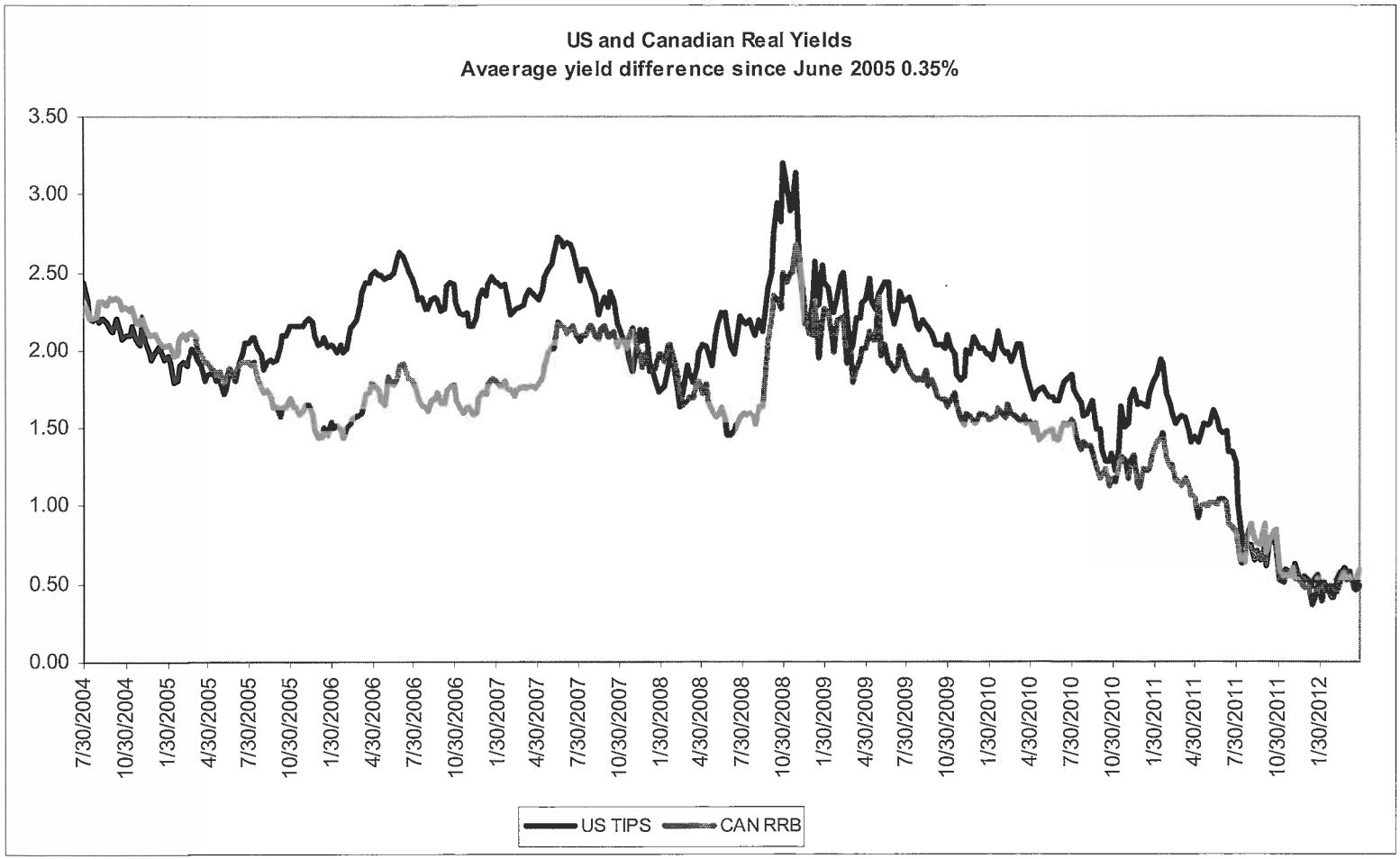
Adjusted R^2 of the regression 82.8%
Seventy five years of data 1936-2011

SCHEDULE 7


REAL BOND YIELD
6.00
5.00
4.00
3.00
2.00
1.00
0.00
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
11/20/2010
11/20/2011

Annual Rate of Return Estimates 1926-2011						
	U.S.			**CANADA**		
	S&P Equities	Long US Treasury	Excess Return	TSE Equities	Long Canadas	Excess Return
AM	11.77	6.06	5.70	11.22	6.67	4.55
GM	9.89	5.74	4.15	9.65	6.39	3.26
OLS	11.02	5.23	5.79	10.38	5.92	4.46
Volatility[1]	20.29	9.38		18.89	8.94	

SCHEDULE 9


US and Canadian Real Yields
Avaerage yield difference since June 2005 0.35%
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
7/30/2004
10/30/2004
1/30/2005
4/30/2005
7/30/2005
10/30/2005
1/30/2006
4/30/2006
7/30/2006
10/30/2006
1/30/2007
4/30/2007
7/30/2007
10/30/2007
1/30/2008
4/30/2008
7/30/2008
10/30/2008
1/30/2009
4/30/2009
7/30/2009
10/30/2009
1/30/2010
4/30/2010
7/30/2010
10/30/2010
1/30/2011
4/30/2011
7/30/2011
10/30/2011
1/30/2012
US TIPS
CAN RRB

APPENDIX C

RELATIVE RISK ASSESSMENT FOR A BENCHMARK UTILITY

Introduction

In risk premium models the relative risk coefficient adjusts the overall market risk premium up or down depending on whether the individual security (company) is more or less risky than the market as a whole. More risky stocks have a relative risk coefficient greater than 1.0 and less risky stocks a relative risk coefficient less than 1.0. All risk premium models have this same risk assessment relative to the market, whether they are the capital asset pricing model (CAPM)[1] where the only source of risk is the market risk, or models that introduce other sources of risk. However, even within a two factor model, where the risk free rate is often regarded as risky due to interest rate risk,[2] or the Fama-French three factor model[3] where size and the market to book ratio (in their model termed the book to market ratio) are additional sources of risk, the coefficient on the market is still the main measure of risk. Estrada,[4] for example, shows that for the DOW 30 US stocks the simple CAPM expected return at 9.70% is only 0.20% more than that estimated using the three factor Fama-French Model and that the market risk premium is much larger than either the size or book to market premiums.

With the CAPM the relative risk assessment is the expected covariance between the security's return and that on the market scaled by the variance of the return on the market. This is called the security's beta coefficient (β) and measures the contribution of the security to the risk of a diversified portfolio. We normally estimate actual historic beta estimates by a simple ordinary least squares (OLS) regression of the security's return on that of the market. In any OLS regression the intercept is called alpha and the slope coefficient is called beta, which is why these terms are used pervasively in finance. However, estimating beta coefficients entails the exact

1 William Sharpe, "Capital asset prices: a theory of market equilibrium under conditions of risk," Journal of Finance 19, 1964.

2 Fisher Black, "capital market equilibrium with restricted borrowing", Journal of Business, July 1972 .

3 Eugene Fama and Ken French, "The cross section of expected stocks returns," Journal of Finance 59, 1992.

4 "The three factor model a practitioners guide," Journal of Applied Corporate Finance, Spring 2011.

same problem as estimating the market risk premium, since both use the actual or historic returns. This is, the estimate is very sensitive to what happened during the estimation period. To overcome this problem in estimating the market risk premium we go back over very long periods of time. For estimating beta coefficients we can't do this to the same extent, since the risk of a firm or industry changes much more than the overall risk of the market. Instead, we tend to use estimates from similar firms and industries as well as more judgment in understanding the economic and financial factors underlying the beta estimates. In this way we can get a better understanding of the expected beta coefficient.

Historic Beta Estimates for Canadian utilities

Until 2002 we have data on the "old" Toronto Stock Exchange Indexes. However, in 2002 the organisation of these indexes was taken over by Standard and Poors who harmonized them with their global indexes. These changes roughly coincided with the loss of many traditional Canadian utilities. It was also controversial in transferring Enbridge and TransCanada from pipelines, where they were regarded as similar to utilities into energy services. However, the historic risk metrics for the Canadian utility sector using the TSE sub-indexes were as indicated in Schedule 1.

The great advantage of the sub-index betas is that they include more companies than the individual estimates and the data is more readily available.[5] This is particularly important due to the fact that a large number of regulated firms, like Consumers Gas, Maritime Electric, Terasen Gas (FortisEnergyBC) etc., have disappeared through corporate reorganisation. Although this means that their individual company betas have also disappeared, it does not mean that their economic impact has disappeared. Consumers Gas now shows up as part of Enbridge, Terasen Gas as Fortis etc., so their economic impact continues to show up in the sub index betas. However, there are two disadvantages: the first is that the largest regulated utility in Canada traditionally was Bell Canada and its parent BCE was classified as a utility. This was despite the impact of BCE's non-regulated operations on the sub index betas. The second is that the sub

5 Index data is available at the end of the month, whereas company data is only available in May-June of the following year. The TSX sub index data ends in May 2002. The Telcos were removed from the utility sub index as part of this reorganisation.

indexes are weighted according to the TSE weights for each company. Consequently, these are not simple averages but *market value weighted* averages, so that big companies like BCE have a disproportionate weight.

It is important to remember that betas are simply a statistical estimate of the extent to which a stock moves with the general market over a particular period of time. By convention, betas are estimated over a five-year period. This means that if a critical event happens during the estimation period, then the beta estimate will pick it up. However, once the event "passes out" of the five-year estimation window, the impact of the event will disappear from the beta estimate. For example, the graph in Schedule 1 shows that beta estimates were trending to a common average until 1987, after which the pipeline beta increased and the others decreased. This lasted for five years until they again came together.

If I had estimated betas during the period ending say in 1990, I would have estimated that gas and electric betas had dropped and pipeline betas increased. However, is it reasonable to say that gas and electric risk dropped during this period? The answer is no. What happened was that there was a large stock market crash in October 1987 (-22.0%) and this was such a significant factor that whatever happened in that one month affected all the beta estimates for the next five years until October 1992, when the October 1987 results were no longer in the sample period.

Professional judgement would indicate that it is unreasonable to just use the statistical estimate without recognising the underlying events that caused it, and then to make appropriate adjustments. 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 from Schedule 1, this is about 0.45-0.55.[6] There is no indication from Schedule 1 that the non-Telco betas were reverting to 1.0.[7] Consequently it is illogical to weight them with 1.0, as an "adjusted beta", since there is no expectation that their risk is increasing to that of an average firm. So what explains the dramatic changes in betas at the end of the TSE data period in 2002 as indicated below?

---

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

7 The Telcos have been reclassified out of utilities, since they are no longer ROE regulated.

	Gas/Electri	Telco	Pipes	Utility
DEC/96	0.52	0.60	0.54	0.60
DEC/97	0.47	0.61	0.44	0.59
DEC/98	0.53	0.80	0.42	0.83
DEC/99	0.37	0.96	0.18	0.96
DEC/00	0.21	0.82	0.06	0.80
DEC/01	0.17	0.87	-0.14	0.83
DEC/02	0.14	0.85	-0.18	0.80

The answer is Nortel and the Internet bubble. During the late 1990s, the technology and internet boom were driving North American markets. Nortel was controlled by BCE, so that BCE's stock price was being driven by Nortel and the internet boom. In fact, this was driving the entire Canadian stock market as Nortel and JDS Uniphase became an increasing part of the market and at one point made up almost 35% of the value of the TSE300. As the prices of Nortel and JDS Uniphase increased, so did the Telco and Utility indices and the TSE300. When this boom turned into a crash and Nortel declined from $1,240 to under $10,[8] Nortel took the Canadian market and the Telco and utility indices down with it. This is what caused the high beta estimates for the Telco and utility indexes in both 2000 and 2001.

In contrast, the gas and electric and pipeline betas declined. The reason for this was that as the market went on a technology driven boom and bust, these stocks were largely ignored. In the case of the Pipeline sub index, the collapsing share price of TransCanada Pipelines during 1999 and its recovery during 2000 was against a strong equity market in 1999 and a weak one in 2000. This movement of TransCanada's share price against the general market movement induced a negative correlation and the low beta estimate for the pipeline sub index.[9] The message is simply that "betas" do not come out of thin air: they reflect what happens in both the market as a whole as well as an individual stock or industry.

After 2002 the TSX introduced new indexes and back dated the data to 1987. For the new utility index the sub index beta estimates are in Schedule 2. This graph is slightly different from that in

8 Nortel has now filed for bankruptcy protection, the prices are adjusted for a 1:10 reverse split.

9 This stock market reaction was due to the poor performance of TransCanada's non-regulated operations in 1999 and the programme of retrenching and selling them off in 2000.

Schedule 1 in that it includes the beta coefficient estimated both with (beta1) and without (beta2) the impact of interest rate changes, as well as the sensitivity of the utility sub index to changes in interest rates which I call "gamma." We can make several comments looking at Schedule 2 in isolation and comparing it with Schedule 1.

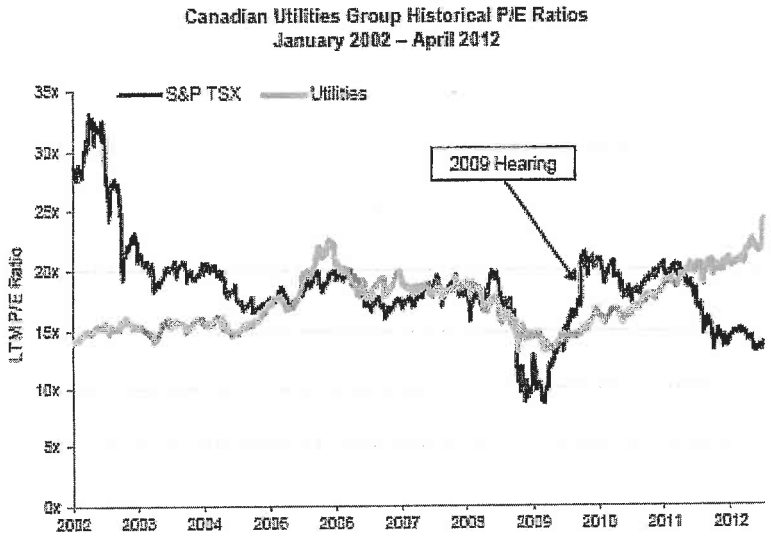
First is that the beta estimates for the utilities are essentially the same whether we include or ignore the impact of interest rate risk. Second we can clearly see the same effect as in Schedule 1; that betas were pulled down as Nortel and the tech boom affected the Canadian market. However, we can now see that by 2008 the internet bubble tech effect had passed out of the five year estimation window and betas were reverting to their normal level of 0.50. However, the stock market crash starting September 2008 clearly has delayed this movement back to normal as betas started to drift down again, although nowhere near as dramatically as in the Internet crash. Finally, utilities are clearly interest sensitive stocks as the consistent positive gamma coefficients indicate. It is also clear that this sensitivity exhibits a negative correlation (-0.43) with the beta estimates, that is, beta coefficients tend to fall as gamma coefficients increase. This is because interest rates tend to increase during good times as the stock market booms and then fall in recessions. This interest rate sensitivity reduces the exposure of utility investors to the market during recessions when interest rates tend to fall as the Bank of Canada conducts a more expansionary monetary policy.

This statistical result echoes the comment of RBC utility analyst Maureen Howe who commented that Canadian utilities are[10]

> "like convertible bonds. When interest rates are low, as they currently are, the companies trade on their bond value and are supported by tax-efficient dividend yields. When the 10-year GOC yield rises above 6%-6.5%, the Canadian companies trade on the basis of their underlying earnings and P/E."

Maureen Howe's observation is confirmed by the relative performance of the PE multiples for the TSX versus the Utilities as indicated in the following graph provided in a current hearing before the BCUC.

10 October, 3 2001 RBC Morning Comment.



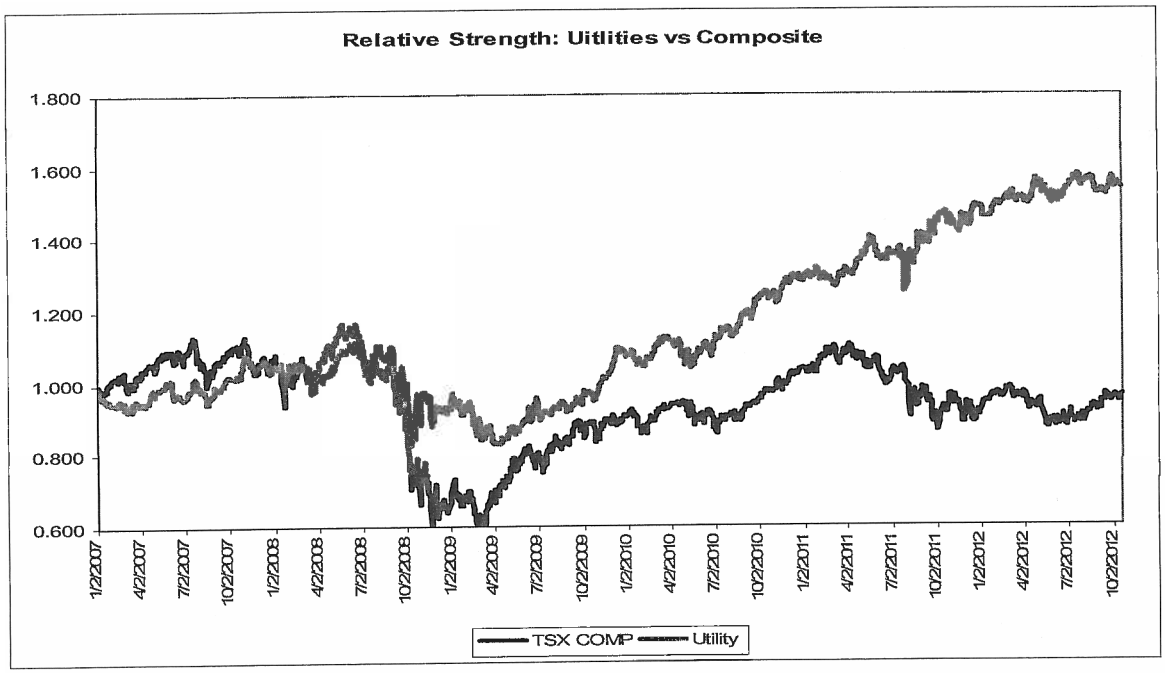
The graph indicates that whereas the PE multiple of the TSX is weaker than in 2009 the very low interest rates have supported the valuations of the dividend rich utilities so that their PE ratios have increased utilities. This observation is consistent with Maureen Howe's observation that with low interest rates utilities trade on their "bond or fixed income value.in line with the observation that their cost of equity capital has declined.

We can see the same effects in the individual beta estimates where the average utility beta is graphed in Schedule 3.This average is both with and without TransAlta, since it is not strictly a rate of return regulated utility anymore. Again we see the Nortel internet bubble effect and the trend of the betas back toward their normal level being interrupted by the stock market crash of 2008/9. The individual beta estimates are provided in Schedule 4. Note as indicated above, I place little weight on individual beta estimates as they reflect wheat did or did not happen during the estimation period rather than being a forward risk coefficient.

Further evidence of relative risk

The estimation of betas is a statistical exercise but all it involves is the intuition that if a stock is risky, when the market goes up it goes up more than the market and, conversely, when the market goes down it goes down more than the market. On the other hand a low risk stock does not move very much with the market. As a result, and like a bond, it lowers the overall volatility

of the portfolio. In the extreme a totally risk free asset would be uncorrelated with the market so by definition has no "market" risk.[11] Following this intuition the following graph has the relative price performance of the major utilities against the TSX Composite form the start of the crisis to the latest available prices. The chart ignores dividends but since utilities pay higher dividends than the average on the TSX adding them would simply enhance the performance of the utilities.



What the graph illustrates is that an investor in utilities in January 2007 would have sailed through the stock market crash and would currently be up about 50%, whereas a passive TSX Composite portfolio would still be down a few percentages. Of course the better performance of the utility sector versus the TSX does not indicate that they are more risky since cash outperformed the TSX as well. Instead it simply indicates the low risk nature of an investment in Canadian utility stocks.

In Schedules 5-7 I chart the price performance of the Canadian utilities against the TSX Composite index specifically over the period of the financial crisis. For example, Schedule 5 has the charts for Emera and Fortis. They clearly show the dramatic impact of the period from

11 The R squared of a regression of its stock return against the market would by definition be 0. The R squared of a "beta" regression is largely a meaningless statistic since the explained variance by definition is the R squared times the variance of the market return.

September 2008 until Summer 2009 when the TSX first dropped over 50% from its high and then recovered 60% of that 50% drop. In contrast Fortis only dropped 20% and Emera less than that. It is this performance that lowers their recent beta estimates, since they demonstrated in the worst stock market crash for decades just how low risk Canadian utilities are. Further as extreme events they have a disproportionate effect on any estimates that come from minimizing the squared error, such as ordinary least squares beta estimates.

In Schedule 6 are the same graphs for Valener (former Gaz Metro) and Canadian Utilities. Gaz Metro dropped by just over 20% and CU about the same. Finally in Schedule 7 are the same graphs for Enbridge and for Pacific Northern Gas which I have traditionally regarded as the riskiest Canadian utility. For PNG we can clearly see that it behaved much more like the market as a whole during the crash and recovery since it lost almost 50% of its value like the market. Further we can see the more dramatic recovery and its recent 50% increase in price indicating how unique factors significantly affect the beta estimates. In this case AltaGas announced on October 31, 2011 that it was acquiring PNG for $36.75 so the share price immediately jumped. The acquisition closed on December 20, 2011 and the shares are now delisted.

For Enbridge we also see that it sailed through the stock market crash and recovery with scarcely any losses. This was acknowledged at the time. On December 9, 2008 a story in the Calgary Herald[12] discussed the implications of the price of oil dropping from $144 US to $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 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

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

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."

Although Pat Daniels stated that people don't realise how low risk Enbridge's business is, this is not true as the stock market clearly noticed this. In my judgment, almost all the utilities demonstrated the low risk nature of their business throughout the recent financial crisis. This is not to say that they have no risk, the fact that their betas are positive indicates they do have market risk, as like all securities their prices move with the market. However, I am sure that many investors would have preferred to hold a diversified portfolio of utility stocks as of September 1, 2008, rather than the TSX composite.

US utility stocks as a comparison

I have started looking at the relative risk of a sample of seven low risk US utilities. The US utilities represent the intersection of two samples used previously by Ms. McShane and Dr. Vilbert both of whom have testified before Canadian boards on behalf of utilities. As a result, I regard this intersection of their "sets" as what might be regarded as smaller and purer US utilities, rather than the bigger more diversified holding companies that are in the S&P500 index. Schedule 8 provides a graph of their average beta estimates. These are estimated in the same way as the Canadian betas from monthly holding period returns over a five year time period updated monthly.

The estimates from this sample of specially chosen low risk US utilities are very similar to the population of Canadian utility holding companies. This demonstrates that it is possible to search the entire population of US utilities and create a small sample of low risk US utilities similar to the overall population in Canada. Of course it does not show that the typical US utility is equivalent in risk to the typical Canadian utility. In Schedule 9 are the recent beta estimates for the individual US utility holding companies and with this caveat we can see that their average

beta at the end of 2011 was 0.34 or almost the same as that for the Canadian utility holding companies. The betas of these low risk US utilities were increasing to average 0.64 immediately prior to the financial crisis and then as in Canada, their stability during the financial crisis caused their betas to drop.

I have traditionally judged utility risk to be in a range 0.45-0.55 based on the long run tendency for utility betas to revert to the grand utility mean. However, this mean-reversion process shows little sign of happening since we have now had two major stock market crashes in the last ten years that have reinforced their low risk status. It is my judgment that the relative risk of Canadian utilities is no more than 0.50. This is supported by the evidence from a sample of Canadian UHCs, the Canadian utility sub index, the price performance of these utilities during the financial crisis and the betas of these low risk US utilities. It is very difficult to see how 0.50 is a low end of a reasonable range for beta estimates since there is no statistical evidence from the last 20-30 years that I am aware of that would place these estimates at a significantly higher level.

Adjusted betas

Utility witnesses frequently adjust utility betas not toward their grand mean of 0.50 or so, but the overall market mean of 1.0. Such a process is justified by the seminal work of Marshall Blume[13] who showed that if there is measurement error when we estimate a very low beta the chances are the true beta is underestimated and vice versa. For the whole universe of stocks he recommended that we adjust betas by taking 2/3 of the estimated beta and adding 0.33, which essentially means weighting them 1/3 with the market mean of 1.0 and 2/3 with the actual beta. This procedure means that low betas are increased and high betas are reduced. However, low estimates for utilities do not mean they are under-estimated, since utility betas are perennially low, which is what the long history of betas estimated back to 1956 demonstrates. Instead as Gombola and Kahl demonstrated utility betas are better mechanically adjusted by weighting with their grand mean. However, I prefer to use judgment.

---

13 Marshall Blume, Betas and their regression tendencies, Journal of Finance June 1975.

Canadian utilities are generally not inter-listed in the US and mainly trade on the TSX so as far as I am aware their reported betas are usually the actual estimates. On October 26, 2012, I captured the data in Schedule 10, which includes basic quote data for 8 traded Canadian utility holding companies from the Royal Bank of Canada Direct Investing web site. In particular the following captures their beta estimates as reported by RBC

				BETAS		
	Ticker	RBC	Booth	GOOGLI	PRICE	MKT CAI
ENBRIDGE	ENB	0.24	0.32	0.14	39.14	31.3
TRANSCANADA	TRP	0.33	0.36	0.25	44.25	31.2
CANADIAN UTILITIES	CU	-0.01	0.03	0	65.85	8.47
TRANSALTA	TA	0.62	0.76	0.38	15.22	3.61
EMERA	EMA	0.21	0.21	0.22	34.87	4.33
FORTIS	FTS	0.14	0.14	0.07	33.29	6.34
VALENER	VNR	0.37	0.36	0.22	16.14	0.6
VERESEN	VSN	0.39	0.36	0.28	12.94	2.6
AVERAGE BETA		0.29	0.32	0.20		12.26
MEDIAN BETA		0.285	0.34	0.22		5.34

The average beta estimate by the Royal Bank of Canada was 0.29 or slightly lower than my estimate (Booth) of 0.32 derived using data up until December 2011. The median beta estimate is also slightly lower at 0.29. There are no significant differences in the betas estimated by RBC and my own, except perhaps for TransAlta where RBC's is lower. However, the key insight is that the RBC betas like mine have not been "Blume adjusted" by weighting the actual estimates with one. Quite the contrary, they seem to be the actual or what utility witnesses refer to as the "raw" beta estimates.

In addition I also captured the Google Finance betas.[14] What is interesting is that their betas are almost uniformly lower than either mine or RBCs with average and median betas of 0.20 and 0.22 respectively. Google clearly uses a different data provider[15] but the important insight is that their beta estimates are not Blume adjusted either.

14 Yahoo does not report betas for the Canadian companies.
15 Yahoo's data comes from Compustat (Capital IQ)

RBC also reported the following relative risk assessments (betas) in their November equity strategy report which was focused on Canadian financial institutions, which is why they are boxed in the table.

TSX Sector Betas	1 Year	3 Years	5 Years	Average
Energy	1.30	1.25	1.27	1.27
Materials	1.19	1.06	1.28	1.18
Industrials	0.87	0.90	0.87	0.88
Cons Disc	0.70	0.62	0.56	0.63
Consumer Staples	0.46	0.32	0.35	0.38
Health Care	1.05	0.53	0.50	0.70
Financials	0.82	1.04	0.92	0.93
Banks	0.81	1.00	0.91	0.90
Diversified Financials	0.57	0.82	0.77	0.72
Insurance	1.01	1.27	1.04	1.11
Real Estate	0.68	0.84	0.76	0.76
Info Tech	1.02	0.88	0.92	0.94
Telecom	0.39	0.40	0.47	0.42
Utilities	0.55	0.40	0.46	0.47

Priced as of Nov 17, 2011
Source: RBC Capital Markets Research, Bloomberg

The utility betas estimated by RBC are for the sub index and are broadly consistent with my own estimates. The utility betas average 0.47 and range from 0.55 using one year to 0.40 using three years of data which would go back and capture their demonstrated low risk characteristics during the financial crisis.

Similarly the following table gives the betas for the six surviving US[16] utilities in Schedule 9. In this case I have also added the betas as reported by Yahoo and Google Finance. Again the average beta is 0.29 according to RBC and 0.34 for my estimates. There are no serious differences in the beta estimates and again there is no indication that RBC has adjusted their beta estimates in any way. In contrast, for some companies the Yahoo Finance betas are higher. However they are not consistent with the Blume adjustment either and likely reflect different

16 Nicor was acquired by WGL in December 2011

time horizons. In contrast the Google betas are all marginally lower than those of either mine or those of RBC, again indicating there is no indication of any beta adjustment methodology.

		BETAS					
		BOOTH	RBC	YAHOO	GOOGLI	PRICE	MKT Cap
AGL	GAS	0.44	0.43	0.43	0.41	40.32	4.74
NEW JERSEY RESOURCES	NJR	0.26	0.22	0.45	0.22	44.47	1.85
NORTHWEST	NWN	0.32	0.25	0.42	0.26	47.71	1.28
PIEDMONT	PNY	0.32	0.28	0.53	0.29	31.48	2.27
VECTREN	VVC	0.4	0.36	0.39	0.34	29.20	2.4
WGL	WGL	0.29	0.22	0.44	0.22	39.46	2.04
AVERAGE		0.34	0.29	0.44	0.29	38.77	2.43
MEDIAN		0.32	0.27	0.44	0.28	39.89	2.16

In comparing the Canadian versus the US samples of utilities the US firms are quite small with average market capitalisation (total equity market value) of US$2.43 billion versus the average for the Canadian companies of $12.26 billion. Even after we adjust for the outliers and look at the medians, it still much higher for the Canadian sample at $5.34 billion versus US$2.16 billion in the US. Why this is important is that one of the constant criticisms levelled against the CAPM is that beta adjusted, small firms earn higher rates of return than large firms, which some attribute to risk, so we might expect a higher risk level for these US firms than for the Canadian sample.

However, more importantly the way RBC and I estimate betas is consistent with conventional practise. One of the biggest data providers in Canada is the Financial Post where their Corporate Analyzer data base includes ten year financial data for larger publicly listed Canadian companies. Their definition of beta is as follows:

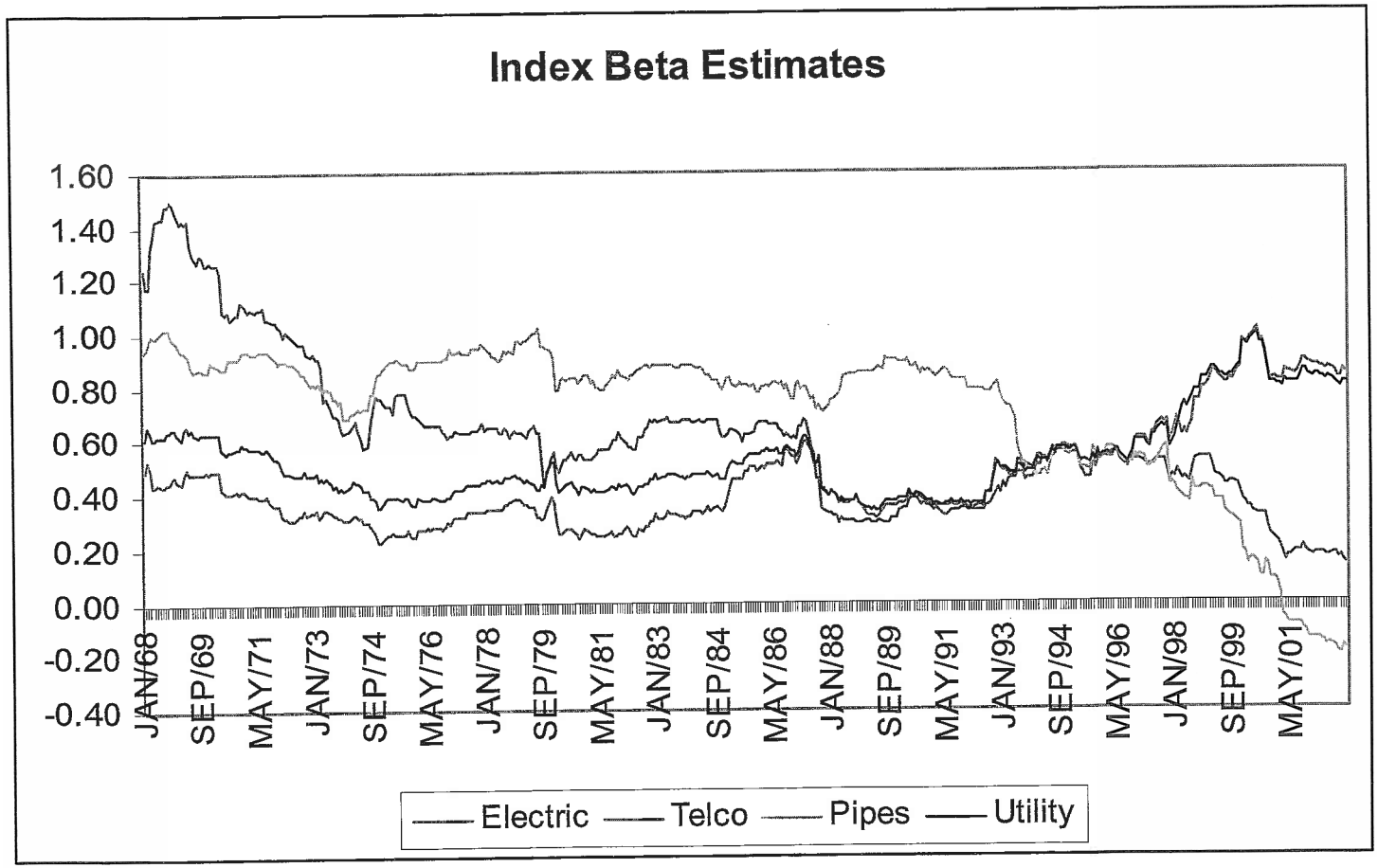
Beta (Corporate Profiles)

Beta factors are derived from a historical regression of percentage share price changes for the selected company on percentage changes in the TSE 300 price index. The unadjusted slope coefficient from this regression is the beta factor. Beta factors may be computed on a variety of weekly or monthly data. Betas shown in FP Analyzer are for 52 weeks, 36 months, 60 months and 120 months.

Again there is no discussion of "adjusting" betas using the Blume procedure.

However, even if we Blume adjust my beta estimates the "adjusted beta" is only 0.55 (0.33+0.66*0.32), while if we adjust to the utility mean of about 0.55 they are about 0.40 (.33*.55+.66*.32). I do not believe in these mechanical adjustments but they support a reasonable range going forward for the relative risk of a benchmark Canadian utility to be 0.45-0.55.

SCHEDULE 1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1.20
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0.80
0.60
0.40
0.20
0.00
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-0.40
JAN/68
SEP/69
MAY/71
JAN/73
SEP/74
MAY/76
JAN/78
SEP/79
MAY/81
JAN/83
SEP/84
MAY/86
JAN/88
SEP/89
MAY/91
JAN/93
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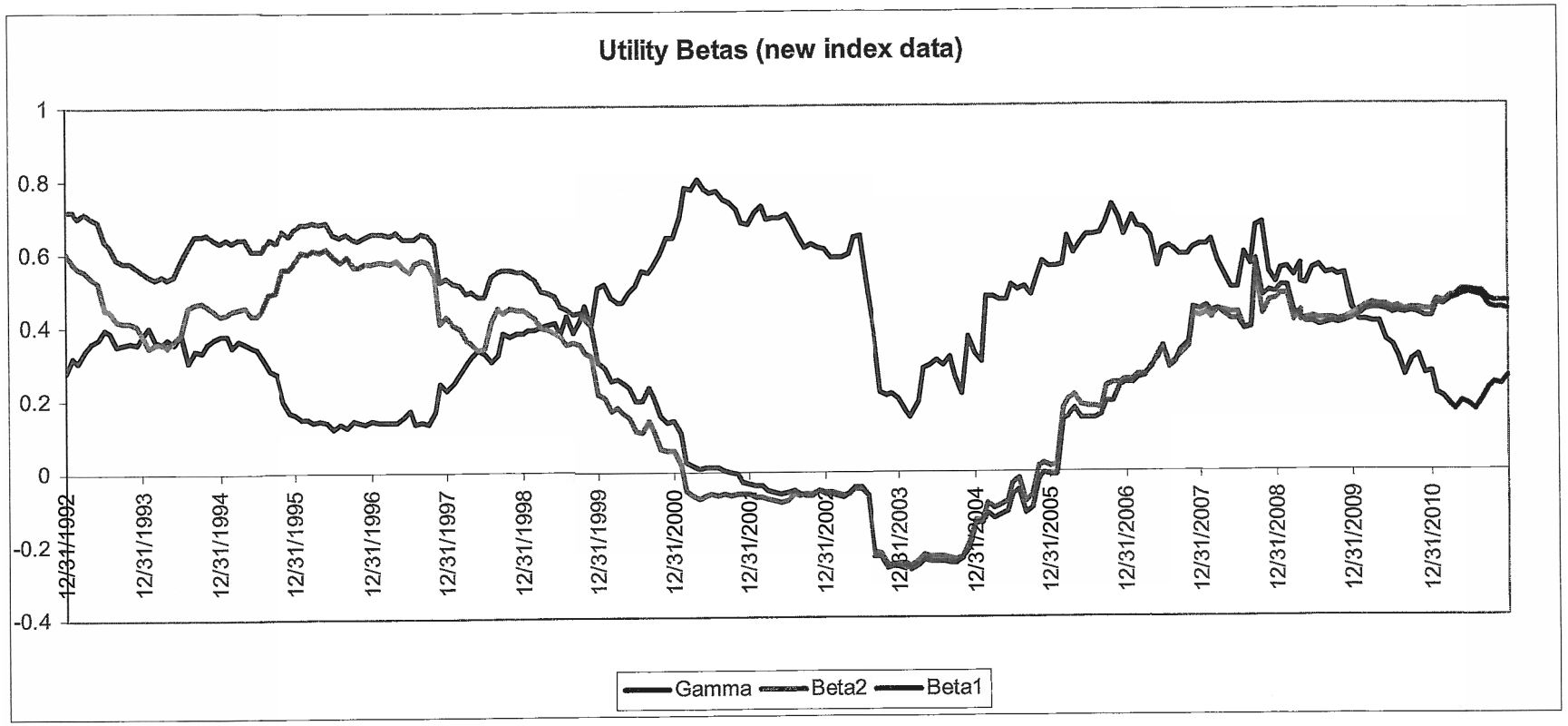
Utility

SCHEDULE 2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1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
12/31/1992
12/31/1993
12/31/1994
12/31/1995
12/31/1996
12/31/1997
12/31/1998
12/31/1999
12/31/2000
12/31/2001
12/31/2002
12/31/2003
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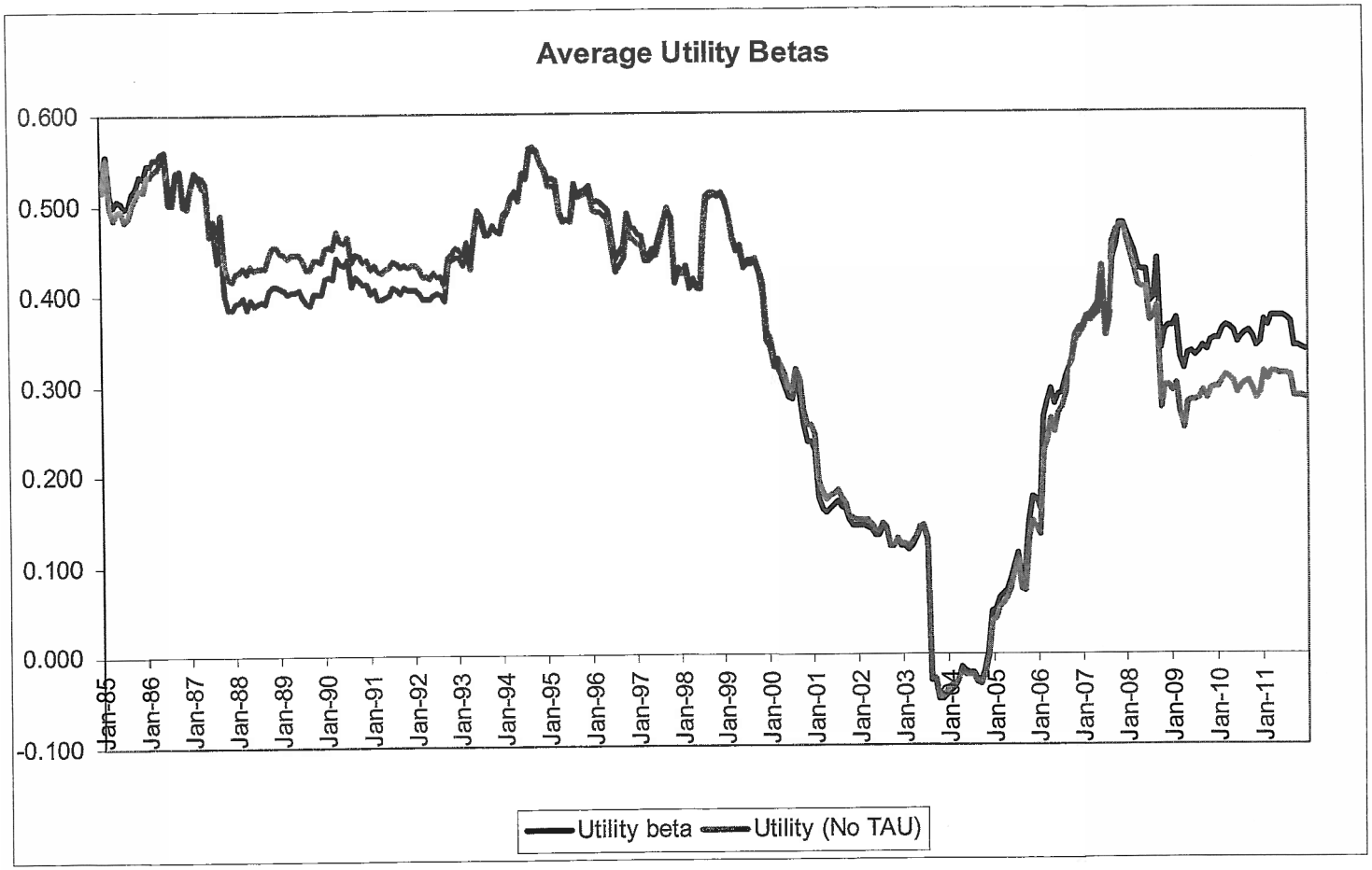
12/31/2009
12/31/2010
Gamma
Beta2
Beta1


Average Utility Betas
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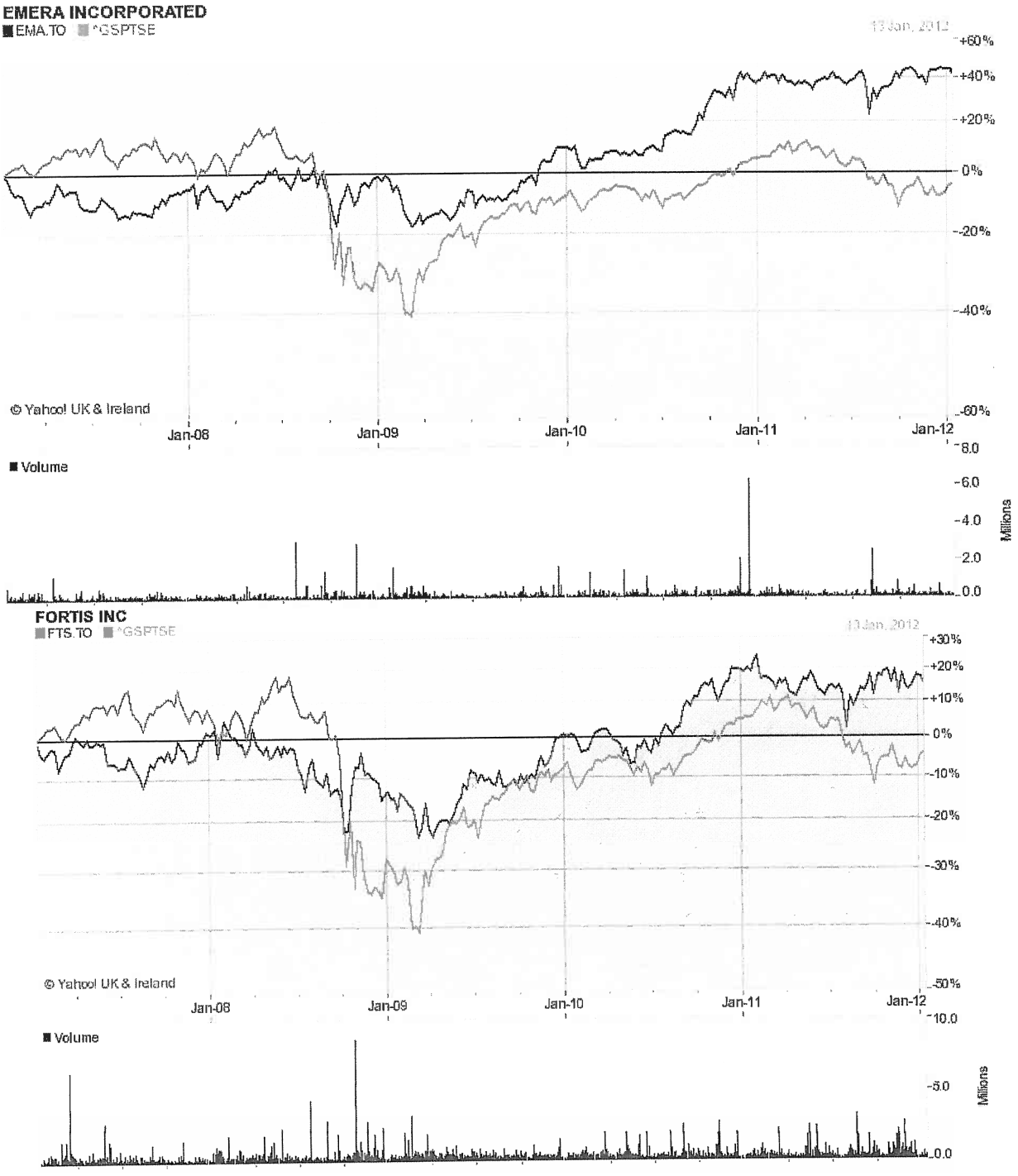
0.500
0.400
0.300
0.200
0.100
0.000
-0.100
Jan-85
Jan-86
Jan-87
Jan-88
Jan-89
Jan-90
Jan-91
Jan-92
Jan-93
Jan-94
Jan-95
Jan-96
Jan-97
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Utility beta
Utility (No TAU)

	CUL	EMERA	Enbridge	Fortis	GMI	PNG	Terasen	TRP	Ft Chicago	TransAlta	Utility beta
1985	0.60			0.66	0.29	0.55	0.21	0.79		0.62	0.53
1986	0.61			0.52		0.38	0.14	0.85		0.53	0.50
1987	0.32			0.25		0.46	0.47	0.59		0.22	0.39
1988	0.36			0.30		0.45	0.52	0.63		0.20	0.41
1989	0.36			0.25		0.42	0.56	0.60		0.22	0.40
1990	0.37			0.21		0.47	0.56	0.59		0.27	0.41
1991	0.38			0.25		0.46	0.54	0.54		0.28	0.41
1992	0.50			0.38		0.35	0.47	0.55		0.40	0.44
1993	0.58		0.39	0.37		0.56	0.47	0.45		0.47	0.47
1994	0.61	0.54	0.54	0.45		0.45	0.60	0.58		0.56	0.54
1995	0.49	0.54	0.48	0.51	0.47	0.45	0.63	0.53		0.58	0.52
1996	0.49	0.51	0.50	0.38	0.48	0.29	0.57	0.48		0.57	0.47
1997	0.61	0.40	0.44	0.31	0.38	0.44	0.48	0.34		0.46	0.43
1998	0.57	0.56	0.47	0.49	0.37	0.59	0.46	0.56		0.53	0.51
1999	0.54	0.43	0.25	0.34	0.20	0.52	0.33	0.25		0.27	0.35
2000	0.38	0.29	0.07	0.24	0.18	0.49	0.23	0.18	0.24	0.07	0.24
2001	0.28	0.22	-0.10	0.16	0.11	0.45	0.16	-0.05	0.14	0.08	0.14
2002	0.24	0.17	-0.18	0.15	0.08	0.47	0.10	-0.07	0.12	0.10	0.12
2003	0.14	-0.05	-0.40	-0.04	0.01	0.36	0.01	-0.42	-0.04	-0.06	-0.05
2004	0.13	-0.01	-0.31	0.03	0.15	0.46		-0.21	0.05	0.14	0.05
2005	0.23	0.06	-0.18	0.22	0.19	0.48		-0.18	0.17	0.41	0.15
2006	0.34	0.08	0.21	0.48	0.43	0.51		0.29	0.36	0.41	0.34
2007	0.45	0.21	0.53	0.62	0.78	0.24		0.47	0.34	0.48	0.46
2008	0.06	0.11	0.30	0.17	0.46	0.20		0.34	0.42	0.86	0.32
2009	0.08	0.16	0.32	0.20	0.38	0.43		0.39	0.45	0.78	0.35
2010	0.06	0.22	0.34	0.16	0.36	0.40		0.39	0.39	0.80	0.35
2011	0.03	0.21	0.32	0.14	0.36	0.48		0.36	0.36	0.76	0.34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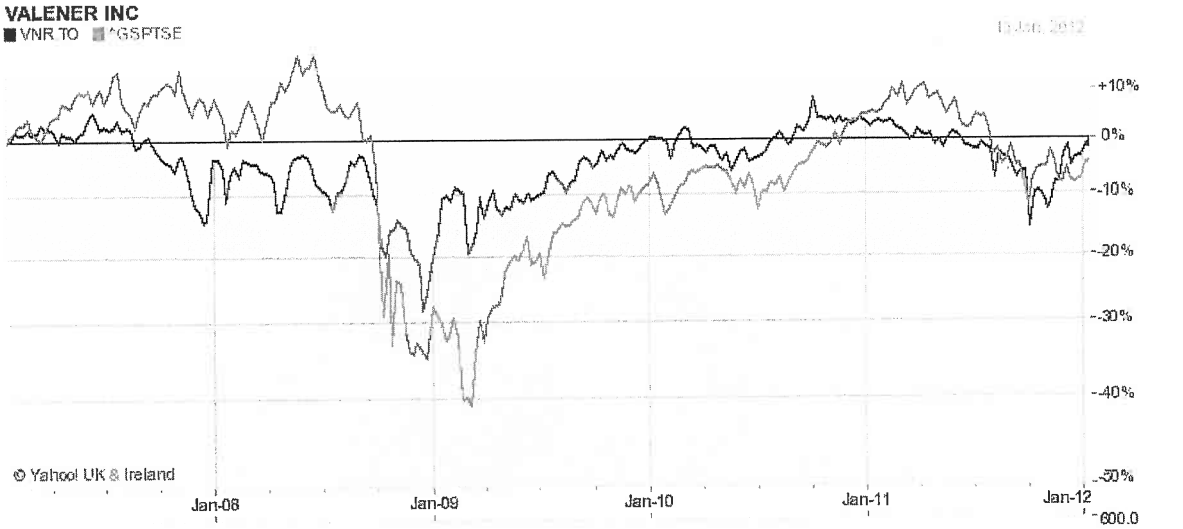
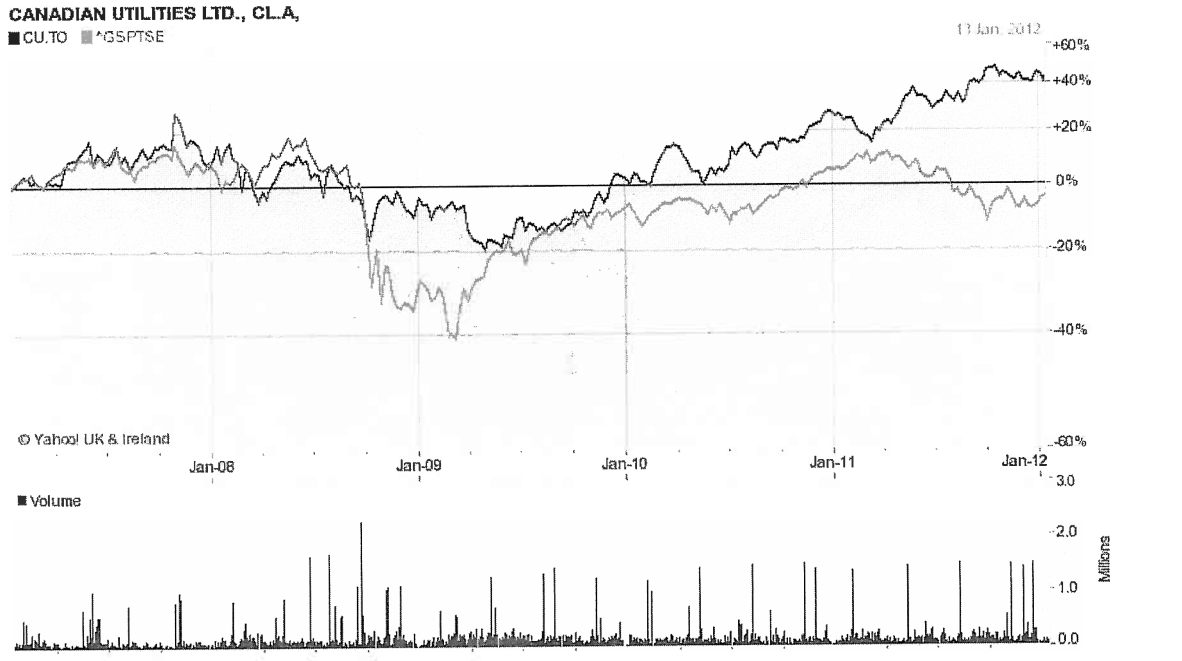
EMA.TO
^GSPTSE
13 Jan, 2012
+60%
+40%
+20%
0%
-20%
-40%
-60%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
8.0
6.0
4.0
2.0
0.0
Millions
FORTIS INC
FTS.TO
^GSPTSE
13 Jan, 2012
+30%
+20%
+10%
0%
-10%
-20%
-30%
-40%
-50%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
10.0
5.0
0.0
Millions


VALENER INC
VNR.TO
^GSPTSE
+10%
0%
-10%
-20%
-30%
-40%
-50%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
600.0
400.0
200.0
0.0
Thousands


CANADIAN UTILITIES LTD., CL.A,
CU.TO
^GSPTSE
+60%
+40%
+20%
0%
-20%
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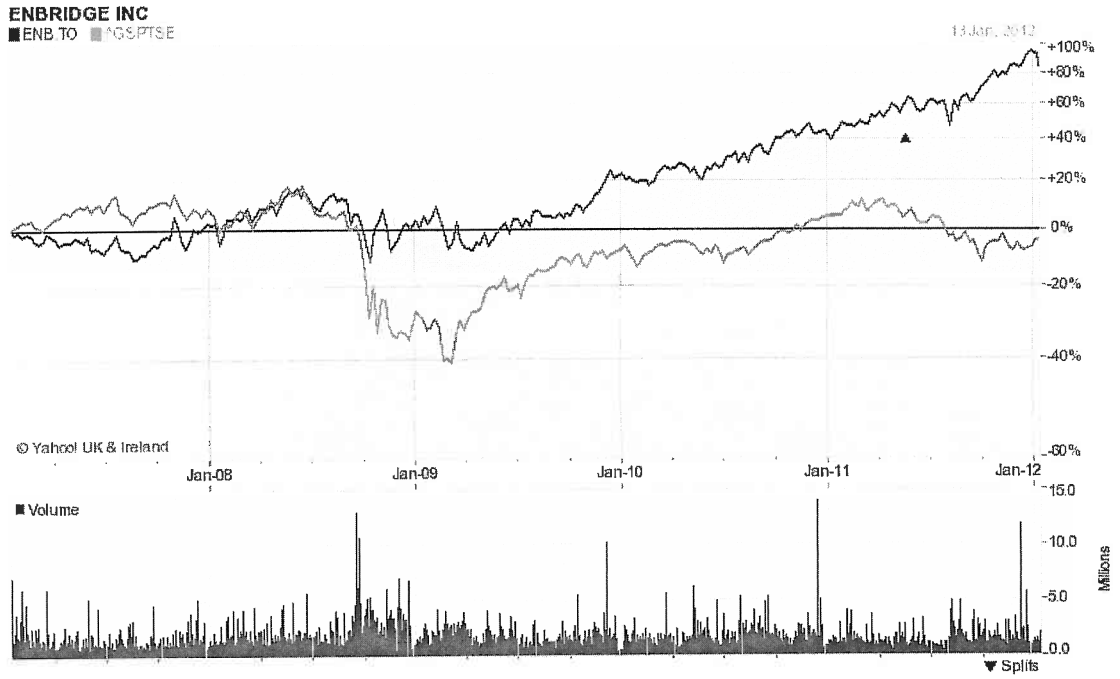
-60%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
3.0
2.0
1.0
0.0
Millions


ENBRIDGE INC
ENB.TO ^GSPTSE
13 Jan, 2012
+100%
+80%
+60%
+40%
+20%
0%
-20%
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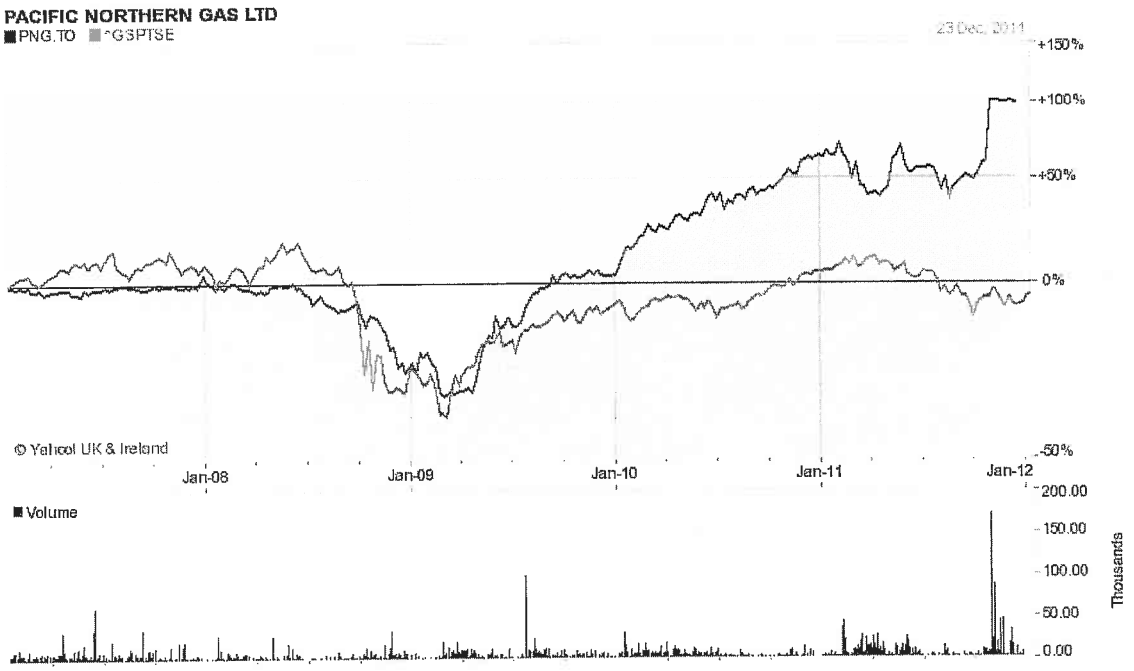
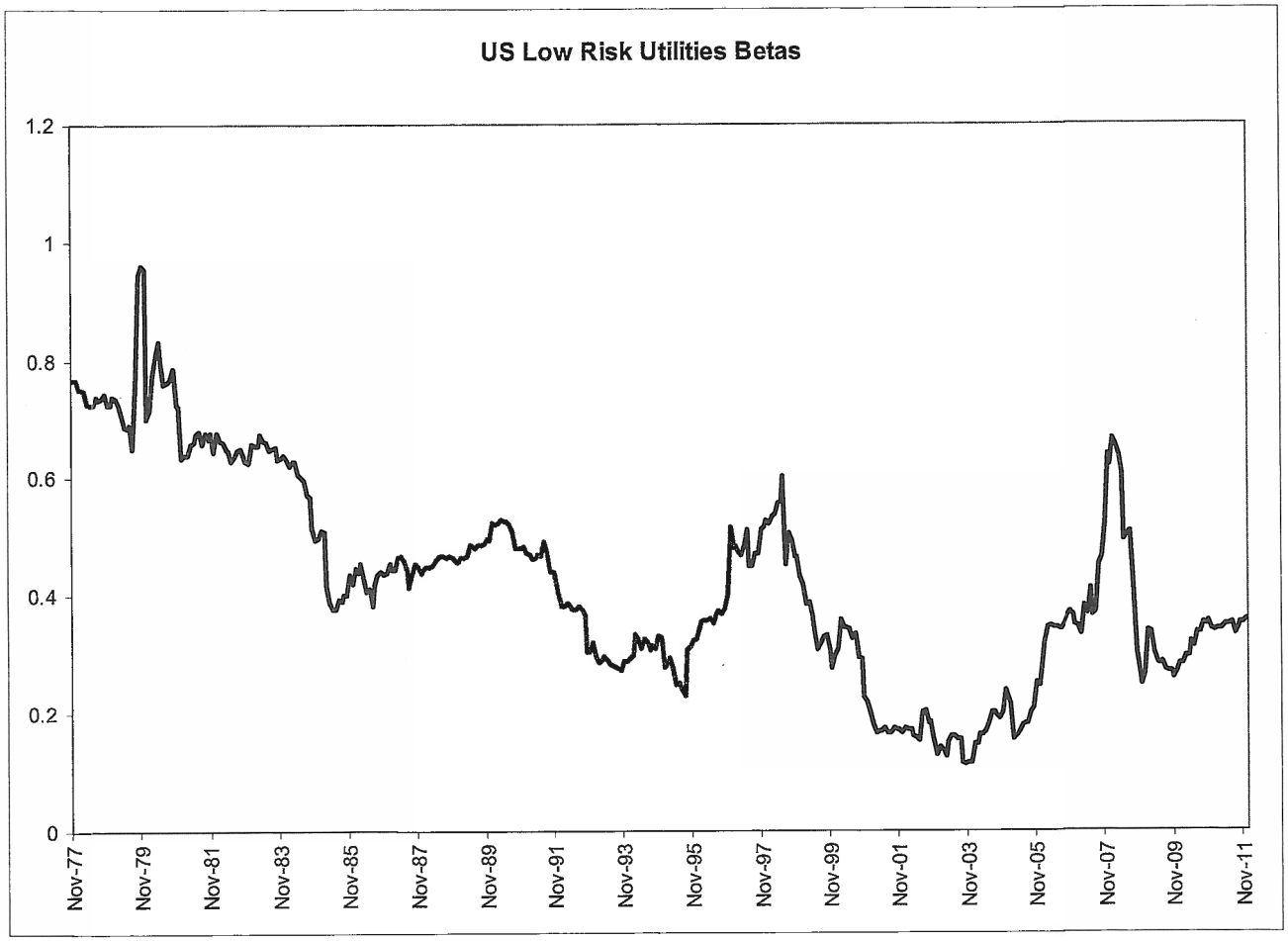
-60%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
15.0
10.0
5.0
0.0
Millions
Splits


PACIFIC NORTHERN GAS LTD
PNG.TO ^GSPTSE
23 Dec, 2011
+150%
+100%
+50%
0%
-50%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Volume
200.00
150.00
100.00
50.00
0.00
Thousands


US Low Risk Utilities Betas
1.2
1
0.8
0.6
0.4
0.2
0
Nov-77
Nov-79
Nov-81
Nov-83
Nov-85
Nov-87
Nov-89
Nov-91
Nov-93
Nov-95
Nov-97
Nov-99
Nov-01
Nov-03
Nov-05
Nov-07
Nov-09
Nov-11

	AGL	IJ Resource	Northwest	Piedmont	Vectren	WGL	Nicor	Average
12/31/1998	0.59	0.46	0.47	0.50	0.34	0.48	0.41	0.46
12/31/1999	0.42	0.33	0.19	0.30	0.14	0.29	0.26	0.27
12/31/2000	0.26	0.24	0.07	0.16	0.17	0.20	0.18	0.18
12/31/2001	0.26	0.24	0.07	0.16	0.17	0.20	0.05	0.17
12/31/2002	0.23	0.09	-0.10	0.10	0.21	0.15	0.22	0.13
12/31/2003	0.20	0.03	-0.18	-0.04	0.33	0.13	0.32	0.12
12/31/2004	0.30	0.11	0.01	0.12	0.46	0.22	0.45	0.24
12/30/2005	0.38	-0.05	0.06	0.25	0.34	0.22	0.52	0.25
12/29/2006	0.38	0.02	0.14	0.33	0.51	0.27	0.90	0.37
12/31/2007	0.50	0.51	0.75	0.58	0.56	0.70	0.87	0.64
12/31/2008	0.32	0.15	0.35	0.05	0.26	0.23	0.39	0.25
12/31/2009	0.40	0.13	0.25	0.20	0.37	0.17	0.39	0.27
12/31/2010	0.44	0.22	0.31	0.25	0.41	0.25	0.52	0.34
12/30/2011	0.44	0.26	0.32	0.32	0.40	0.29	0.48	0.36

VERESEN INC (VSN:TSX, CA)

12.92 CAD ▼ 0.08 (-0.62%) Volume: Above Average

As of 25 Oct 2012 at 2:23 PM EDT

QUOTE DETAILS

Open	12.94	P/E Ratio (TTM)	56.2x
Last Bid/Size	12.91 / 4	EPS (TTM)	0.23
Last Ask/Size	12.92 / 4	Next Earnings	24 Oct 2012
Previous Close	13.00	Beta	0.39
Volume	204,356	Monthly Dividend	0.0833
Average Volume	240,629	Dividend Yield	7.74%
Day High	12.99	Ex-Dividend Date	29 Oct 2012
Day Low	12.88	Shares Outstanding	196.6M
52 Week High	15.83	# of Floating Shares	196.4481M
52 Week Low	11.67	Short Interest as % of Float	--

VALENER INC (VNR:TSX, CA)

15.96 CAD ▼ 0.13 (-0.81%) Volume: Average

As of 26 Oct 2012 at 2:23 PM EDT.

QUOTE DETAILS

Open	16.14	P/E Ratio (TTM)	22.0x
Last Bid/Size	15.96 / 25	EPS (TTM)	0.73
Last Ask/Size	15.99 / 2	Next Earnings	29 Nov 2012
Previous Close	16.09	Beta	0.37
Volume	15,869	Quarterly Dividend	0.2500
Average Volume	22,188	Dividend Yield	6.27%
Day High	16.14	Ex-Dividend Date	26 Sep 2012
Day Low	15.95	Shares Outstanding	37.5M
52 Week High	16.60	# of Floating Shares	33.99757M
52 Week Low	14.41	Short Interest as % of Float	--

TRANSALTA CORP (TA:TSX, CA)

15.68 CAD ▲ 0.46 (3.02%) Volume: Above Average

As of 25 Oct 2012 at 2:22 PM EDT

QUOTE DETAILS

Open	15.22	P/E Ratio (TTM)	--
Last Bid/Size	15.68 / 2	EPS (TTM)	-2.76
Last Ask/Size	15.69 / 29	Next Earnings	--
Previous Close	15.22	Beta	0.62
Volume	672,629	Quarterly Dividend	0.2900
Average Volume	475,493	Dividend Yield	7.40%
Day High	15.71	Ex-Dividend Date	29 Aug 2012
Day Low	15.17	Shares Outstanding	251.1M
52 Week High	22.85	# of Floating Shares	250.9098M
52 Week Low	13.96	Short Interest as % of Float	--

TRANSCANADA CORP (TRP:TSX, CA)

44.41 CAD ▲ 0.31 (0.70%) Volume: Below Average

As of 25 Oct 2012 at 2:21 PM EDT

QUOTE DETAILS

Open	44.25	P/E Ratio (TTM)	22.5x
Last Bid/Size	44.41 / 9	EPS (TTM)	1.96
Last Ask/Size	44.42 / 14	Next Earnings	--
Previous Close	44.10	Beta	0.33
Volume	464,842	Quarterly Dividend	0.4400
Average Volume	1,237,124	Dividend Yield	3.96%
Day High	44.62	Ex-Dividend Date	26 Sep 2012
Day Low	44.14	Shares Outstanding	704.9M
52 Week High	46.29	# of Floating Shares	704.6334M
52 Week Low	39.25	Short Interest as % of Float	--

ENBRIDGE INC (ENB:TSX, CA)

39.31 CAD ▲ 0.28 (0.72%) Volume: Below Average

As of 25 Oct 2012 at 2:21 PM EDT

QUOTE DETAILS

Open	39.14	P/E Ratio (TTM)	48.7x
Last Bid/Size	39.31 / 3	EPS (TTM)	0.80
Last Ask/Size	39.32 / 19	Next Earnings	--
Previous Close	39.03	Beta	0.24
Volume	602,028	Quarterly Dividend	0.2825
Average Volume	1,017,546	Dividend Yield	2.87%
Day High	39.50	Ex-Dividend Date	13 Aug 2012
Day Low	39.10	Shares Outstanding	797.6M
52 Week High	42.23	# of Floating Shares	795.201M
52 Week Low	34.67	Short Interest as % of Float	--

FORTIS INC (FTS:TSX, CA)

33.39 CAD ▼ 0.01 (-0.03%) Volume: Below Average

As of 25 Oct 2012 at 2:21 PM EDT.

QUOTE DETAILS

Open	33.29	P/E Ratio (TTM)	18.9x
Last Bid/Size	33.38 / 6	EPS (TTM)	1.77
Last Ask/Size	33.39 / 2	Next Earnings	--
Previous Close	33.40	Beta	0.14
Volume	102,956	Quarterly Dividend	0.3000
Average Volume	283,303	Dividend Yield	3.59%
Day High	33.51	Ex-Dividend Date	14 Nov 2012
Day Low	33.29	Shares Outstanding	190.0M
52 Week High	34.98	# of Floating Shares	189.2359M
52 Week Low	31.32	Short Interest as % of Float	--

EMERA INC (EMA:TSX, CA)

34.91 CAD ▼ 0.03 (-0.09%) Volume: Below Average

As of 25 Oct 2012 at 2:19 PM EDT

QUOTE DETAILS

Open	34.87	P/E Ratio (TTM)	19.6x
Last Bid/Size	34.90 / 2	EPS (TTM)	1.76
Last Ask/Size	34.93 / 2	Next Earnings	9 Nov 2012
Previous Close	34.94	Beta	0.21
Volume	46,705	Quarterly Dividend	0.3500
Average Volume	142,781	Dividend Yield	4.01%
Day High	35.10	Ex-Dividend Date	30 Oct 2012
Day Low	34.86	Shares Outstanding	123.9M
52 Week High	35.72	# of Floating Shares	123.8934M
52 Week Low	31.02	Short Interest as % of Float	--

CANADIAN UTILITIES LTD (CU:TSX, CA)

66.38 CAD ▲ 0.56 (0.85%) Volume: Below Average

As of 25 Oct 2012 at 2:14 PM EDT

QUOTE DETAILS

Open	65.85	P/E Ratio (TTM)	16.6x
Last Bid/Size	66.31 / 3	EPS (TTM)	3.96
Last Ask/Size	66.40 / 3	Next Earnings	1 Nov 2012
Previous Close	65.82	Beta	-0.01
Volume	25,025	Quarterly Dividend	0.4425
Average Volume	89,074	Dividend Yield	2.67%
Day High	66.38	Ex-Dividend Date	7 Nov 2012
Day Low	65.85	Shares Outstanding	87.3M
52 Week High	72.00	# of Floating Shares	59.68449M
52 Week Low	59.00	Short Interest as % of Float	--

AGL RESOURCES INC (GAS:NYSE, US)

40.32 USD ▼ **0.12 (-0.30%)** Volume: Below Average

As of 26 Oct 2012 at 2:28 PM EDT.

QUOTE DETAILS

Open	40.87	P/E Ratio (TTM)	23.3x
Last Bid/Size	40.32 / 2	EPS (TTM)	1.74
Last Ask/Size	40.33 / 1	Next Earnings	1 Nov 2012
Previous Close	40.44	Beta	0.43
Volume	118,402	Quarterly Dividend	0.4600
Average Volume	318,764	Dividend Yield	4.56%
Day High	40.97	Ex-Dividend Date	15 Aug 2012
Day Low	40.20	Shares Outstanding	117.5M
52 Week High	43.69	# of Floating Shares	116.9872M
52 Week Low	36.59	Short Interest as % of Float	1.17%

VECTREN CORP (VVC:NYSE, US)

29.20 USD ▲ **0.20 (0.69%)** Volume: Below Average

As of 26 Oct 2012 at 2:25 PM EDT.

QUOTE DETAILS

Open	29.08	P/E Ratio (TTM)	15.0x
Last Bid/Size	29.19 / 1	EPS (TTM)	1.94
Last Ask/Size	29.20 / 4	Next Earnings	5 Nov 2012
Previous Close	29.00	Beta	0.36
Volume	132,641	Quarterly Dividend	0.3500
Average Volume	309,553	Dividend Yield	4.79%
Day High	29.24	Ex-Dividend Date	13 Aug 2012
Day Low	29.00	Shares Outstanding	82.1M
52 Week High	30.75	# of Floating Shares	81.51709M
52 Week Low	27.01	Short Interest as % of Float	0.83%

NORTHWEST NATURAL GAS CO (NWN:NYSE, US)

47.71 USD ▼ **0.18 (-0.38%)** Volume: Below Average

As of 26 Oct 2012 at 2:35 PM EDT.

QUOTE DETAILS

Open	47.89	P/E Ratio (TTM)	20.4x
Last Bid/Size	47.69 / 1	EPS (TTM)	2.34
Last Ask/Size	47.73 / 2	Next Earnings	2 Nov 2012
Previous Close	47.89	Beta	0.25
Volume	42,212	Quarterly Dividend	0.4550
Average Volume	113,836	Dividend Yield	3.81%
Day High	47.99	Ex-Dividend Date	29 Oct 2012
Day Low	47.53	Shares Outstanding	26.8M
52 Week High	50.80	# of Floating Shares	26.62257M
52 Week Low	43.90	Short Interest as % of Float	4.62%

WGL HOLDINGS INC (WGL:NYSE, US)

39.46 USD ▲ **0.09 (0.23%)** Volume: Below Average

As of 26 Oct 2012 at 2:25 PM EDT.

QUOTE DETAILS

Open	39.46	P/E Ratio (TTM)	20.0x
Last Bid/Size	39.44 / 4	EPS (TTM)	1.97
Last Ask/Size	39.46 / 4	Next Earnings	12 Nov 2012
Previous Close	39.37	Beta	0.22
Volume	80,550	Quarterly Dividend	0.4000
Average Volume	189,027	Dividend Yield	4.05%
Day High	39.60	Ex-Dividend Date	5 Oct 2012
Day Low	39.34	Shares Outstanding	51.5M
52 Week High	44.09	# of Floating Shares	51.21511M
52 Week Low	37.65	Short Interest as % of Float	4.59%

PIEDMONT NATURAL GAS COMPANY INC (PNY:NYS

31.48 USD ▼ **0.16 (-0.51%)** Volume: Below Average

As of 26 Oct 2012 at 2:25 PM EDT.

QUOTE DETAILS

Open	31.70	P/E Ratio (TTM)	20.4x
Last Bid/Size	31.48 / 1	EPS (TTM)	1.55
Last Ask/Size	31.49 / 2	Next Earnings	--
Previous Close	31.64	Beta	0.28
Volume	59,629	Quarterly Dividend	0.3000
Average Volume	317,517	Dividend Yield	3.81%
Day High	31.79	Ex-Dividend Date	20 Sep 2012
Day Low	31.38	Shares Outstanding	72.1M
52 Week High	34.74	# of Floating Shares	71.16555M
52 Week Low	28.90	Short Interest as % of Float	4.31%

NEW JERSEY RESOURCES CORP (NJR:NYSE, US)

44.47 USD ▼ **0.32 (-0.71%)** Volume: Below Average

As of 25 Oct 2012 at 2:24 PM EDT.

QUOTE DETAILS

Open	44.91	P/E Ratio (TTM)	19.9x
Last Bid/Size	44.47 / 4	EPS (TTM)	2.25
Last Ask/Size	44.50 / 4	Next Earnings	--
Previous Close	44.79	Beta	0.22
Volume	35,436	Quarterly Dividend	0.4000
Average Volume	213,043	Dividend Yield	3.60%
Day High	44.91	Ex-Dividend Date	20 Sep 2012
Day Low	44.31	Shares Outstanding	41.6M
52 Week High	50.48	# of Floating Shares	41.30981M
52 Week Low	41.11	Short Interest as % of Float	4.06%

APPENDIX D

DISCOUNTED CASH FLOW ESTIMATES

The DCF Model

The standard alternative to risk premium models is the discounted cash flow model. This model infers the required rate of return by replicating the actions of an investor in valuing the firm's securities. To do this we need to define the costs and benefits attached to an investment. The cost is simply the price of the security (P_0, price at time zero) and the benefits the stream of cash inflows expected at time t in the future (C_t). However, since the investor can always invest in alternative investments, future expected cash flows are not of equal value. As a result future cash flows are "discounted," or reduced in value, to reflect this "opportunity cost." This is the basic idea behind using the discounted cash flow model,

$$P_0 = \sum_{t=1}^{\infty} \frac{C_t}{(1+K)^t}$$

where K is the discount rate or investor's required rate of return.

Once we estimate the stream of future cash inflows, we can equate them to the current price and solve for the investor's required rate of return. For example, this is the standard way of valuing bonds. At the end of every business day investment banks simply take the coupon payments on a bond and its terminal value, and use the last trading value for the bond to solve the above equation for the bond's "yield to maturity." This yield to maturity is then published in the newspaper as an objective measure of the investors' required rate of return for a default free security. I already use this DCF estimate as part of my risk premium estimates. However, we can take this a stage further and estimate the DCF required return on equity directly using this same procedure.

The expected equity cash flows are the future expected dividends. Unlike the stream of cash flows on a bond the dividends are not contractual and are more difficult to forecast, particularly for individual stocks. Consequently the DCF model is only used for low risk dividend paying stocks or the market as a whole, where the expected dividends can be assumed to grow at some long run average growth rate g. In this case, each dividend is expected to grow at the rate g, so we can substitute $d_1 = d_0 * (1+g)$ into the valuation equation. If this growth rate is assumed to be constant *forever* we get:

$$P_0 = \frac{d_1}{K - g} \qquad (1)$$

where the stock price is equal to the expected dividend per share, divided by the investor's required rate of return, minus the dividend growth expectation, g. The advantage of this formulation of the problem is that we can easily rearrange the equation to obtain,

$$K = \frac{d_1}{P_0} + g \qquad (2)$$

which states that the investor's required rate of return can be estimated as the expected dividend yield plus the expected growth rate in dividends. This is the direct analogy with the yield to maturity on a bond. This formulation of the model is often called the Gordon (or dividend discount) model after my late colleague Professor Myron Gordon of the University of Toronto.

Further it is straightforward to show that increased dividends primarily come from increased future earnings, which are generated by the firm retaining some of its current earnings for re-investment. If we set X as the earnings per share and denote b as the fraction of earnings retained within the firm, then $(1-b)X$ is the dividend and bX, the retained earnings.[1] Provided the assumptions of the DCF model hold, it is straightforward to show that dividends and earnings will then grow at a long run growth rate estimated as the product of the firm's retention rate *(b)* and its return on common equity *(r)*, which is referred to as it sustainable growth rate. Note that while K is the return that investor's

1 This assumes that the only change in shareholder's equity comes from retentions, that is, everything flows through the income statement.

require, r is the actual return on equity (*ROE*) the firm is expected to earn.[2]

An example may help to make these assumptions clear. Suppose, as in Schedule 1, the firm's book value per share is $20 and its return on equity expected to be 12%. In this case, its earnings per share are expected to be $2.40 and with a 50% dividend payout rate, its dividends per share and retained earnings are both expected to be $1.20. Moreover, since $1.20 has been retained and reinvested within the firm, next period's book value per share increases to $21.20. As a result, the firm is expected to earn $2.544 in the following year, i.e., 14.4 cents more. This additional 14.4 cents comes from earning the 12% return on equity on the $1.20 of retained earnings. The increase in earnings per share, dividend per share and retained earnings is 6% each year and is calculated directly as the product of the firm's return on equity of 12% and its retention rate of 50%. Moreover, the value of the firm's common stock can be calculated from equation (1), which also increases at this 6% rate, since only the dividend per share is expected to change.

The importance of Schedule 1 is in showing some of the implications of the dividend growth model. First, note that if the investor's fair rate of return is 10%, the stock price in Schedule 1 is $30, determined as the expected dividend of $1.20 divided by the discount rate minus the growth rate (or 0.04). This price exceeds the book value of $20 by 50%. This is because the firm's return on equity (r) is 12% and the investor's required or fair rate of return (K) is only 10%. This is the reason why economists look at market-to-book ratios to infer the investor's opportunity cost. If market-to-book ratios exceed one for a regulated company, most economists immediately assume that the firm's return on equity exceeds the return required by stock holders, implying that the regulator should lower the firm's allowed rate of return. In our example the *ROE* exceeds the required rate of return by 2% which results in a market to book ratio of 150%.

Second, it is the return on equity that drives the growth in both dividends per share and earnings per share, provided that the dividend payout is constant. If the dividend payout is gradually increased over time, then it is possible to *manufacture* a faster growth rate in dividends than earnings per share,

2 There is an additional term if the firm repeatedly sells shares at a premium to its book value, but this term is small and usually dwarfed by estimation problems.

from the same underlying level of profitability.

For example, in Schedule 2 the same data is used as in Schedule 1 except that the dividend payout starts at 50% and then increases by 2% per year. By the end of year 5 earnings per share have only risen to $2.99 instead of the $3.03 in Schedule 1, because less money has been reinvested within the firm. As a result, there is less capital to generate earnings. Thus the earnings in Schedule 2 only grow at a 5.6% compound growth rate, down from the 6% of Schedule 1. Conversely, since more of the earnings are being paid out as dividends, dividends per share are up to $1.73 instead of $1.52. This is a 9.6% compound growth rate, rather than the 6% in Schedule 1.

In the short-run, Schedule 2 demonstrates that the growth in dividends per share can be artificially manipulated by increasing the dividend payout. This is not sustainable in the long run, since the dividend payout cannot be increased indefinitely. Moreover, the manipulation can be detected by performing the basic 'diagnostic' check of tracking the behaviour of the firm's dividend payout over time, and the firm's return on equity. However, if the analyst is not aware of the change in the dividend payout, estimating the fair rate of return by adding this manipulated dividend growth rate to the expected dividend yield will overstate the investor's required rate of return. It is important in this case to base the estimate of the investor's required rate of return on a long run sustainable growth rate, estimated from the underlying growth in earnings and dividends and the two components of growth.

The third implication of Schedule 1 is that the DCF estimate using the historic growth rate is appropriate only when the assumptions of the model hold. This means that non-dividend paying firms, firms with highly fluctuating earnings and dividends, and firms with non-constant expected growth cannot be valued accurately using the formula. Usually these assumptions hold for regulated utilities, so the DCF estimate is particularly appropriate for use in determining the fair rate of return for a regulated utility. However, for non-regulated firms, these assumptions are frequently violated. As a result, estimating the investor's required rate of return by using the formula $K=d_1/P_0 + g$, is tenuous and subject to significant measurement error.

Finally, it is important to understand the assumptions underlying the DCF model. In particular equation (2) follows directly from equation (1). So if equation (1) does not hold, then neither does equation (2). In particular, it has to be remembered that the growth rate is a constant rate forever. This naturally puts bounds on the growth rate, since if the growth rate exceeds the long run growth rate in GDP then it means that each year the firm is becoming a larger slice of GDP and eventually it will dominate the economy. With real GDP growth of 2.5-3.5% and the Bank of Canada's long run inflation target of 2.0%, any long run growth rate for a particular company greater than 4.5-5.5% is by definition incompatible with the assumptions of the DCF model. So a forecast five year growth rate of 10% for example cannot be used with the DCF model, instead a two stage growth model is needed at a minimum.

For example, suppose security analysts forecast a five year growth rate for utility X of 10% and it currently has a 4% dividend yield. Using equation (2) would indicate a DCF cost of equity capital of 14.4% which is the 4.4% expected dividend yield plus the 10% growth rate. However, recognising equation (1), and the fact that the economy can only grow at a maximum of less than 6.0%, means that the DCF model cannot be used. In this case, we would use 10% for the dividend growth rate for the next five years, adjusted for analyst optimism, and then after five years a long run growth rate for a typical utility with a maximum growth rate that of the economy. If for example we use the 10% five year growth rate and a long run growth rate of 3% the actual discount rate is 9.10% or just over half the DCF estimate. It exceeds the 7.3% we would get from the forecast dividend yield plus the long run growth rate of 3% because there are more dividends over the next five years, so the discount rate is higher to bring their value down to equal the current stock price.

		1	2	3	4	5
Dividend		4.40	4.84	5.32	5.86	6.44
Price at t=5						122.81
Total cash		4.40	4.84	5.32	5.86	129.25
PV Factor		0.92	0.84	0.77	0.71	0.65
PV Cash	100.00	4.03	4.07	4.10	4.14	83.66

The important insight from the above discussion is that not any forecasted growth rate can be

substituted into the DCF model to estimate the equity cost, even if that growth rate forecast is valid. For example, a utility holding company may have significant losses and the security analyst might then expect a rapid recovery and significant short run growth. However, this means using the two stage growth model since the standard DCF model will over-estimate the equity cost in the way just discussed.

Circularity

When we apply the DCF model to estimate a fair return we estimate the dividend yield and future growth rate. In the example in Schedule 1 the dividend is forecast to be $1.20 which with a $30 stock price means a 4% dividend yield. When this is added to the sustainable growth rate of 6% we get back the investor's fair rate of return of 10.0%. However, it is sometimes alleged that this DCF estimate is circular, since the ROE used to forecast the future growth rate of 12% differs from the investor's required or fair rate of return estimated at 10%. The allegation is that if a regulatory body were to accept the 10% estimate and reduce the allowed ROE then future growth will drop and with it the stock price. As a result there is an inconsistency between the forecast ROE and the DCF fair return estimate. However, this inconsistency or circularity is false.

Note that there will always be a difference between the forecast ROE and the investor's fair return, whenever the market to book ratio differs materially from 1.0.[3] However, this does not affect the estimate produced by the DCF model. Suppose for example the ROE was decreased to 10%, after the fair return is correctly estimated at 10% using the DCF model, what happens? In this case the forecast earnings per share drop to $2 from $2.40 and with the same 50% payout the dividend is cut to $1.0 and the forecast growth rate drops to 5% (50% retention times the 10% ROE). The stock price will then also drop and using the same DCF equation the market price will fall back to its book value of $20.

3 We see this every day in the bond market where a bond selling above (below) par has a stated coupon interest rate higher (lower) than the current market interest rate.

$$P_0 = \frac{\$1}{0.10 - 0.05} = \$20$$

However, at the new price the dividend yield now increases to 5% ($1/$20) so that with the new lower growth rate of 5% we again estimate the investor's fair return accurately at 10%.

Investors will be far from happy that the allowed ROE has been cut from 12% to 10%, but that does not invalidate the use of the DCF model to estimate their fair or required rate of return of 10%. Similarly, if the regulator for some reason increases the allowed ROE to 14% then the dividend would increase to $1.40 and the forecast growth to 7%. In this case the stock price would increase to $46.67 and the dividend yield drops to 3.0%, so again the dividend yield plus growth correctly estimates the investor's fair rate of return of 10.0%.

The fact is that the DCF model simply reverse engineers the forecast cash flows to extract the investor's fair rate of return; it says nothing about whether or not the investor would be happy if the firm earned that rate of return on its book value. Further proponents of this circularity argument often apply the DCF model based on analyst growth estimates and yet these same analysts have to get their forecast growth rates from somewhere and invariably they are based on future profitability, that is ROEs. Moreover, even if they are not explicitly based on a forecast ROE, one is always implicit in a growth forecast. For example if an analyst's growth forecast of 7% is used, then with a 50% dividend payout this means by definition the analyst is forecasting an ROE of 14%. ***It is impossible to ignore the result that any forecast growth rate carries with it a forecast ROE.***

DCF Estimates for the "Market" as a whole

In terms of DCF estimates we can go from the broad to the specific. By broad I mean the market as a whole, since by holding a diversified portfolio an investor reduces the possibility of gains from one firm resulting from losses by another. In Schedule 3 is a graph of the dividend yield on

the TSX Composite along with the yield to maturity on the long term Canada (LTC) bond (Cansim V122501). At the end of September 2012 the TSX dividend yield was 3.00%, while the LTC yield (over tens) was 2.31%, which is somewhat unusual, since you have to go back to the mid 1950's for a similar situation. However, what we have in common with the mid 1950's is a period of low inflation, as shown in Schedule 4, with, as currently, a fear of lower inflation in the future; what is now needed is a forecast growth rate for the Canadian market.

In Schedule 5 is a graph of the after tax profits and dividends earned and paid in Canada from the GNP accounts back to 1961. In both cases they are scaled by GDP. The after tax profits are those reported for tax purposes and do not reflect the accounting games that go into GAAP profits. As is to be expected, aggregate dividends (right side axis) are more stable than aggregate after tax profits. Conversely after-tax profits plummeted during the recessions in 1981, the early 1990s and marginally in the early 2000s and over the last two years. Overall dividends on average have been 2.45% of GDP since 1961 and after tax corporate profits 6.42%, but much more variable. Recently after tax profits in particular have been above these long run averages at 7.0-11.0% even as the recession hit, since high resource prices have had a significant impact on the aggregate profits earned in Canada, which has been reflected in the performance of the TSX Composite index.

Note that dividends are more stable than earnings and usually do not exceed 3.0% of GDP as firms don't like to cut their dividends. This is important since some utility analysts "key" dividend growth forecasts off earnings forecasts. This is suspect since the greater variability in earnings means that their average growth rate always exceeds that of dividends in the same way that the arithmetic return always exceeds that of the geometric (compound) growth rate. However, with this caveat it is hard not to conclude that in the long-run dividends and after tax profits grow at about the same rate as the overall economy. The average real Canadian growth rate since 1961 has been about 3.40%[4] while the Bank of Canada's operating band for inflation centres on 2.0%, this implies a long-run growth rate in dividends and earnings at about ***5.50%***

4 Arguably this long run GDP growth rate may have fallen with the switch to a service and knowledge based economy.

(1.02*1.034). This is probably a low estimate for two reasons; first the GDP accounts have become less reliable as the economy has shifted to a knowledge based economy since it has become more difficult to estimate the value of productivity changes; second the arithmetic vs compound growth rate problem also affects the GDP accounts which are less variable than similar accounts for companies.

An alternative estimate of future growth for the market as a whole is to use the "*br*" growth rate. In Schedule 6 is the aggregate dividend payout from the GDP accounts. We can see very clearly the jump in the payout during the severe recessions in the early 1980s and 1990s when Corporate Canada had serious profitability problems. The median payout is 37%, the same as its most recent values. In Schedule 7 is the dividend payout based on the earnings and dividends of the TSX Composite. We can see the impact of the recessionary periods even more clearly, but this time the payout is truncated for the over 100% payout periods. The TSX data is based on GAAP profits and reflect "big bath" accounting, that when times are bad and the stock market expects bad news, firms tend to exaggerate their losses and build reserves that allow them to smooth profits in the future. The median payout for the TSX is higher at 50% for these reasons and the fact that it goes back to 1956, when payouts were generally higher. Overall I judge the dividend payout to be in a range 37-50% or a retention rate (*b*) of 50-63%.

From Schedule 1 of my main testimony the average ROE of corporate Canada back to 1987 has been about 9.2% and the median 9.70%. Multiplying these ROEs by the retention rates gives a sustainable growth rate range of 4.7% (0.50*9.2) - 6.1% (.63*9.70) which brackets the estimate of 5.5% from the long run GDP growth rate. However, given the recent higher ROEs and retention rates flowing from higher commodity prices I would judge 6.1% to be a reasonable forward estimator. If this is combined with the current TSX dividend yield of 3.00%, the DCF estimate for the market as a whole is 9.28% ((1.061*1.03)-1). This would be a reasonable estimate if the market were at the mid-point of the business cycle.

At the current point in time Canada has recovered from recession, but from Schedule 8 Corporate Canada is still running very slightly below normal, where the Governor of the Bank of Canada

expects the remaining output gap to be closed by the end of 2013. The median capacity utilisation levels are 82-84% but currently they are at 81-82% indicating that we are still in the growth stage of the business cycle approaching the average rather than leaving it. This observation is confirmed by the current 7.4% unemployment rate which while above the non-accelerating unemployment rate of 6.0% is below the average rate since 1987 of 8.2% and median rate of 7.8%. Overall I would judge the fair rate of return on the Canadian market to be 9.3%, consistent with the Canadian market selling at a premium to book value and current average ROEs of 10.59%.[5]

In Schedule 9 is a graph of the dividend yield on the S&P500 index up to January 2011. The latest monthly data is not yet available but the current yield on the S&P500 is 2.00% (September 25, 2012). In Schedule 10 is a graph of the dividend payout rate on the S&P500 firms. The average dividend payout since 1967 is 49.3% while the median payout is 43% meaning that typically 57% of the earnings for S&P500 firms are reinvested to generate future growth in earnings. However, note from the graph that the S&P500 firms suffered significant problems in 2007-2009 during the financial crisis, which is not as evident in the Canadian data, particularly the tax data. In contrast, there is no evidence of the serious problems suffered by Corporate Canada in the recessions in the early 1980s and 1990s.

Since 1977 the average ROE for the S&P500 firms was 13.40% and the median ROE 14.04%. If I pair the median payout and ROE the "*br*" growth rate is 7.97%, and if I pair the averages the growth rate is 6.79% reflecting both the higher average payout and lower average ROE. Combining these with the current dividend yield on the S&P500 index of 2.00% gives a fair return on the US market of 8.93-10.01%. I would expect some greater short term growth in the US market, since the US is below capacity with 7.80% unemployment, where the NAIRU for the US is commonly put at a level below that for Canada. I would judge a fair return on the US market to be 9.5-10.5% or about at least 0.50% higher than in Canada.[6]

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[5] The fact that the required rate of return is less than the actual rate means that average shares sell at a premium to replacement cost or book value.

[6] When I say the US I mean the SP500 firms which are some of the most powerful firms in the world and generate a significant amount of their earnings from non-US sources.

S&P Utility DCF cost estimates

As well as the data for the S&P500 as a whole, Standard and Poors also publishes data on the utilities that meet the requirements to be included in the S&P500 index. In Schedule 11 is the summary data for the standard electric and gas utilities.

The schedules provide the basic data needed for a DCF analysis. The data includes dividends, earnings, book value per share, average market values and the return on equity. From this it is possible to calculate several pieces of useful information. First, is the average payout, which is in the fourth column and its inverse: the retention rate. Utilities as low risk and low growth investments have relatively high payouts: in not one year is the payout less than 50% for the electric utilities while the average payout is over 70% and the median 67%. For the gas utilities there are several years when the payout is less than 50% and the median (64%) payout is less, while the average is distorted by payouts over 100% in 1999, 2005 and 2006. The data indicates much more stability for the electric than the gas utilities since the number of gas utilities in the S&P500 index has been dropping.7

The very high dividend payouts in the electric utilities mean that the growth potential for these utilities is low, which reduces the error in using the DCF model. It also means that utilities are quintessentially dividend or income stocks. The average dividend yield on the electric utilities at the end of 2011 was 4.70% and for the gas utilities 3.08%; that for the electric utilities in particular is significantly higher than that on the S&P500 which in December 2011 was 2.10%.

To estimate the future growth rate I can assume that each year the utility is expected to earn its current *ROE* so that its earnings will grow by the retention rate times this *ROE*. For example, in 1993 the retention rate for the electric utilities was 10.57% and the ROE 11.25% for the electric utilities implying future earnings growth of 1.19%, which is the *g (b*ROE)* in the next column. For 1993 the dividend yield for the S&P Electric utilities was 5.73% (column 8), so that the DCF

equity cost estimate was 6.99%, which is in column 10. In 1993 the average long term US Treasury yield was 5.87% (10 year) implying that the electric utility risk premium was only 1.12%. Column 11 gives the market to book ratio for these electric utilities, which in 1993 was 1.59, implying correctly that the ROE of these utilities of 11.25% exceeded their equity cost.

This calculation each year is a mechanical exercise. However individual values are affected by particular circumstances and unusually high or low earned ROEs, which can lead to counter intuitive results. For example, in 2000 for the electric utilities and 1999, 2005 and 2006 for the gas utilities, the retention rate was negative as low ROEs meant that earnings could not cover the dividend. As a result, forecast growth was negative and the implied risk premium unacceptably low. However, the opposite result occurs when earned ROEs were unusually high, such as in 2007 and 2008 for the gas utilities. In this case the retention rate is also very high implying unacceptably high estimated risk premiums.

To adjust for the volatile nature of earned ROEs for US utility holding companies (UHCs) and reduce estimation errors I repeat the analysis for each year from 1993 until 2011. This gives the average and median electric utility risk premium of 3.39% and 3.44% with 2.51% and 3.18% for the gas utilities. In this way the unacceptably low and high implied risk premiums balance each other out, as we would not expect earned ROEs to be persistently over or under those expected. Further in the last two columns I estimate the utility risk premium with two alternative growth expectations. URP2 assumes that the expected ROE is the long Treasury yield plus the average ROE earned over the US treasury yield which is 6.45% for the electrics and 6.20% for the gas utilities. This avoids part of the problem of fluctuating earned returns, while URP3 also assumes that the retention rate is the constant median rate for the whole period. In this way I avoid the problem of declining retention rates as earnings have been squeezed.

These assumptions tend to be conservative. URP3 assumes a higher ROE than was often earned, while assuming a constant retention rate allows both the higher dividend yield from a higher payout, without penalising growth expectations. Both of these assumptions tend to reduce the

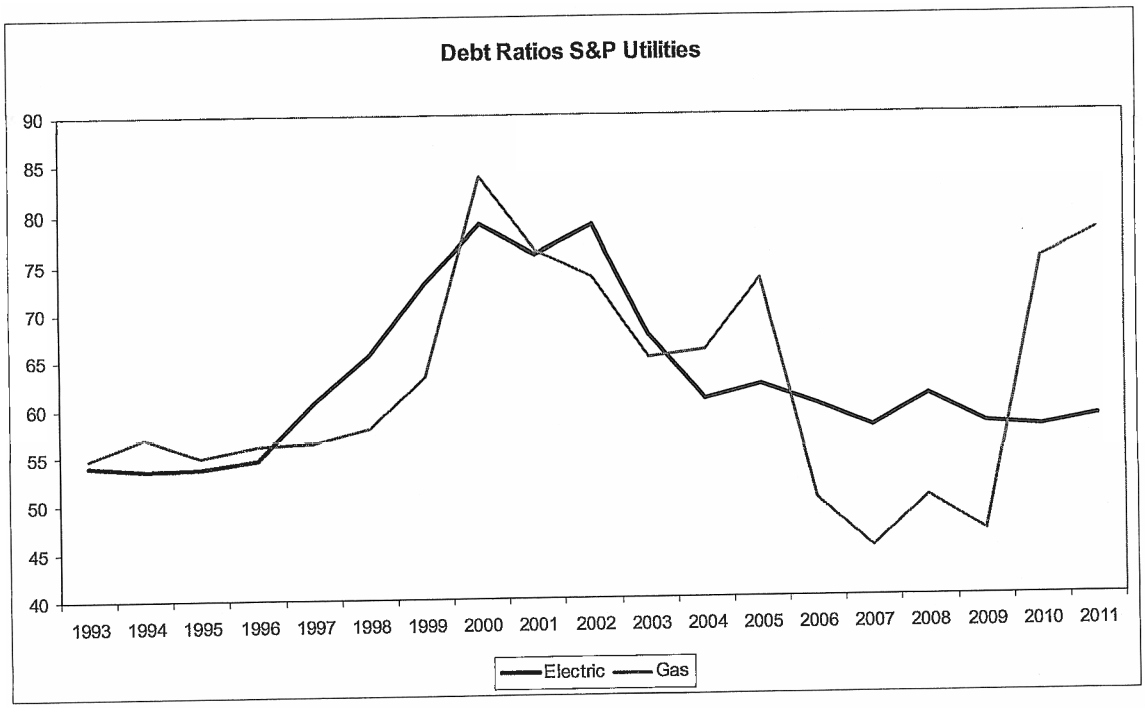
[7] As of 2011 there were 13 Electric UHCs but only 2 Gas UHCs: AGL Resources and Oneok.

volatility in the annual implied risk premium. The average and median URP2 is 3.23% and 3.14% for the electrics and 1.67% and 3.08% for the gas utilities and for URP3 the values are 3.64% and 3.61% for the electrics and then 2.71% and 1.78% for the gas utilities. However, given the much higher volatility of the ROE for the gas UHCs (3.33% versus 1.48%) I would place greater weight on the risk premium estimates from the electric companies.

From the data in Schedule 11, I derive the following conclusions:

- Risk premiums of the order of 3.00-3.50% for a typical US electric utility over ten year US government bond yields is reasonable as reflecting typical experience over the last almost 20 years.
- For the more stable US electric utilities the risk premium for the period 1993-2011 is slightly more stable at 3.39-3.44% since the dividend yield is a higher proportion of the investor's require rate of return
- At the end of 2011 the electrics dividend yield of 4.70% combined with a 31% retention rate and 10.30% ROE implied a forecast growth rate of 3.28% and an equity cost of 8.07%. This was a 5.29% over the average US treasury yield, indicating increased utility risk premiums.
- I would place no weight on the results for the US gas UHCs given their much higher ROE volatility that feeds in directly to the volatility in their estimated DCF risk premiums.

One final statistic from the SP500 UHC data is for their debt ratios. The following graph provides the debt ratio for the Gas and Electric UHCs from 1993-2011. The average over the entire period is almost identical for each class of UHC at 62-63% implying a common equity ratio on average of less than 37-38%. It is the debt ratios of the parent UHC that largely determine the S&P bond ratings, since S&P will not rate a subsidiary higher than its parent unless it is ring fenced (structurally insulated).



Individual company estimates

The DCF estimates for the market as a whole and the S&P utility indexes are more reliable than for individual companies due to the significant measurement error attached to forecasting future growth rates. For example, the forecast growth rate for the economy is more accurate since the growth rate in profits for the market as a whole is constrained by the growth rate in the economy. However, the growth rates are mechanically estimated and do not reflect market estimates. Consequently some use analyst forecast of earnings growth as a proxy for the sustainable growth rates in the former estimates. However, in my judgment these are no more reliable as can be illustrated by looking at the sample of US utilities that I analysed in Appendix C in terms of their relative risk adjustment.

The following table has data I extracted on October 26, 2012

	5 year analyst					
	DivY	Past G	Future g	K	ROE	M/B
AGL	4.6	-5.99	-5.7	-1.1	7.75	1.39
NEW JERSEY RESOURCE:	3.6	-23.21	2.7	6.3	11.52	2.23
NORTHWEST	3.8	3.38	4.5	8.3	8.67	1.74
PIEDMONT	3.8	4.09	5.35	9.15	10.83	2.18
VECTREN	4.9	10.9	5	9.9	10.81	1.59
WGL	4.1	9.44	5.6	9.7	7.84	1.58
AVERAGE	4.13	-0.23	2.91	7.04	9.57	1.79
MEDIAN	3.95	3.74	4.75	8.73	9.74	1.67

Note that the dividend yield is the forward dividend yield and ranges from 3.60% to 4.90% due to the particular circumstances of each utility, but the median dividend yield of 3.95% is consistent with the high dividend payouts of utilities and the Electric and Gas UHC data from S&P.. However the problem is the five year forecast growth rates, which range from -5.7% to +5.6% with a median value of 4.75%.[8] As a result if these earnings growth rates are substituted into the DCF equation we get DCF equity cost estimates ranging from --1.10% to 9.90% with an average of 7.04% and a median of 8.73%. Again the median ROE for these utilities was 9.74% which exceeded their equity cost so they were selling at a premium to their book value (1.67).

There are some problems with the above approach. The most obvious is that AGL's growth forecast seems to come from one utility analyst, even for some of the others it is not obvious that each of them contributed to the reported growth estimate. The absence of meaningful data for the Canadian utilities is why this approach is even more problematic for them. A second problem is the well-known optimism bias attached to analyst forecasts, which means that growth forecasts are generally too high. At Schedule 12 is a Globe and Mail article that reports on an update of a study by the consulting firm of McKinsey. They report that analysts start out optimistic when making their five year forecast, but gradually as they get more information (generally from the company) they hone in on the correct number. This is a result that has been in the academic literature for some time and is not necessarily driven by any conflict of interest as was evident in

[8] Note that AGL is in the SP500 data.

the global settlement[9] but simply an attachment effect, where analysts tend to become attached to a stock and see good in it until proven otherwise. Notably the median growth rate of these utilities over the past five years was 3.74% or 1.0% less than the forecast growth rate for the next five years.

Recently, for example, Easton and Sommers[10] have documented the optimism 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]

This optimism bias may also be evident in the earnings forecast for the utility industry and the overall S&P500 which at 7.87% and 9.99% exceeds what can be expected as long run growth estimates using reasonable assumptions on long run average retention rates and earned ROEs. A

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[9] This was the 2003 US$1.4 billion settlement between US Attorney General for New York Elliot Spitzer and a series of major US investment banks, where the investment banks admitted that security analyst compensation was tied to investment banking income and that analyst reports were in some instances fraudulent and lacked objectivity.

[10] "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.

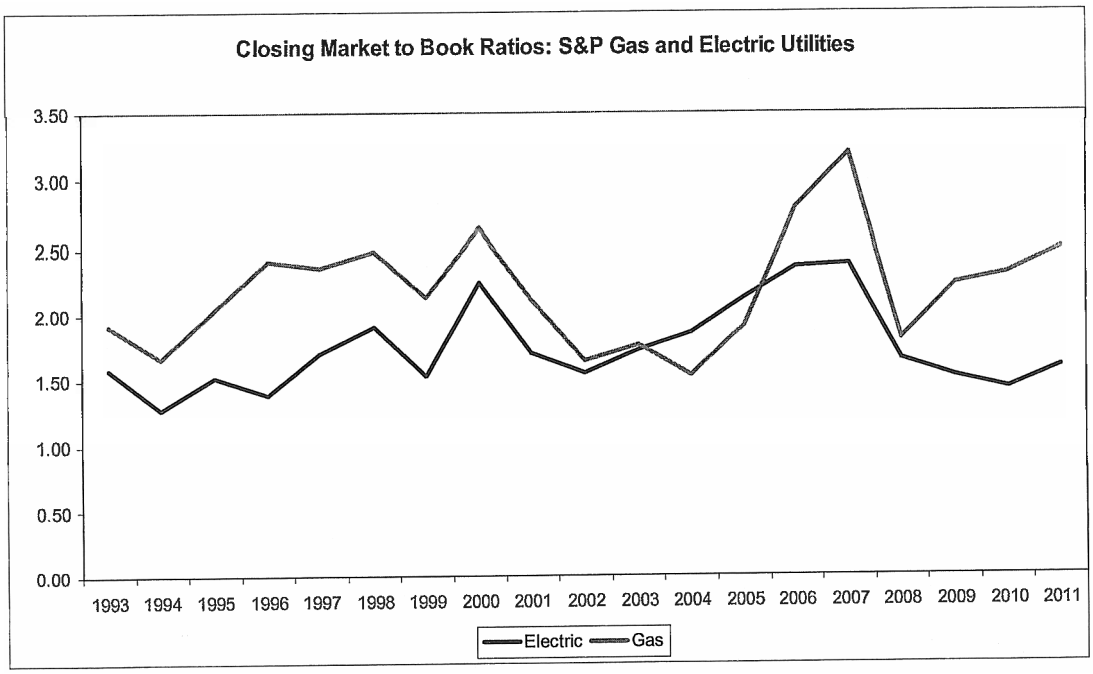
9.99% growth rate in aggregate earnings, for example, with a typical 50% retention rate implies a 20.00% incremental ROE and an extremely healthy US economy. More realistically these growth rates should be used with a two stage growth model.

A final problem with the use of analyst forecasts is that they are based on earnings not dividends. This is a problem since while the model assumes that earnings and dividends grow at the same rate in practice this is not the case. Firms tend to smooth their dividends, which means they do not cut them as much when earnings fall and then delay increasing them when earnings increase. In periods such as the present when earnings are expected to recover this leads to an over-estimate of the dividend growth rate and with it the investor's required rate of return. This is not to say the estimates above for the six US LDCs are wrong, as is well known a broken clock tells the correct time twice a day. However, generally I am extremely skeptical of results based on analyst forecasts, when we know that they are generally optimistic.[11]

Conclusion

I would judge the overall equity market return in Canada to be 9.30% and that in the US at least 0.50% higher. I would judge the large US utilities included in the S&P500 index to warrant a utility risk premium on average of about 3.4% over the long treasury yield. However, there is evidence that this utility risk premium has increased over the last few years due to very low US Treasury Yields. I would judge DCF estimates using analyst growth forecast to be less reliable than DCF estimates for the market as a whole, but they confirm the low risk nature of US utilities and a fair return for them of about 8.73%. This estimate is consistent with the average ROE of US gas and electric utilities of just over 11.0% since 1993 and the following graph that indicates that these utilities generally sell on market to book ratios well above 1.0. As a result the earned ROE over states the investor's required rate of return or the cost of equity capital.

11 This also applies to the forecast in Value Line.


Closing Market to Book Ratios: S&P Gas and Electric Utilities
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011
Electric
Gas

1

SCHEDULE 1

YEAR	BEGINNING BOOK VALUE PER SHARE	EARNINGS PER SHARE	DIVIDEND PER SHARE	RETENTIONS PER SHARE
1	20.00	2.40	1.20	1.20
2	21.20	2.54	1.27	1.27
3	22.47	2.70	1.35	1.35
4	23.80	2.86	1.43	1.43
5	25.24	3.03	1.52	1.52

ASSUMPTIONS: Return on Equity = 12%
Dividend Payout = 50%
Cost of Equity = 10%

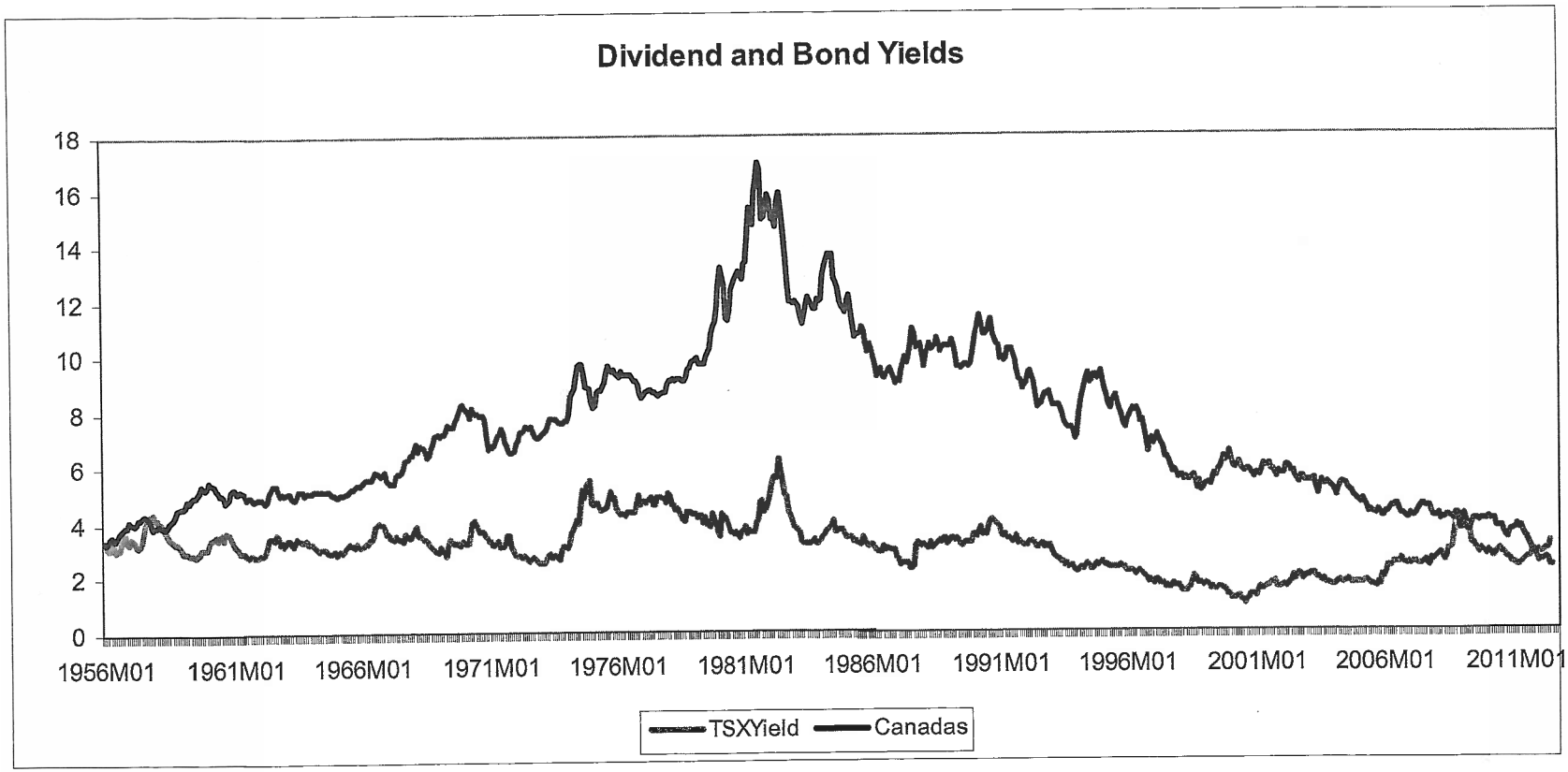
SCHEDULE 2

YEAR	BEGINNING BOOK VALUE PER SHARE	EARNINGS PER SHARE	DIVIDENDS PER SHARE	RETENTIONS PER SHARE
1	20.00	2.40	1.20	1.20
2	21.20	2.54	1.32	1.22
3	22.40	2.69	1.45	1.24
4	23.70	2.83	1.59	1.25
5	24.90	2.99	1.73	1.26

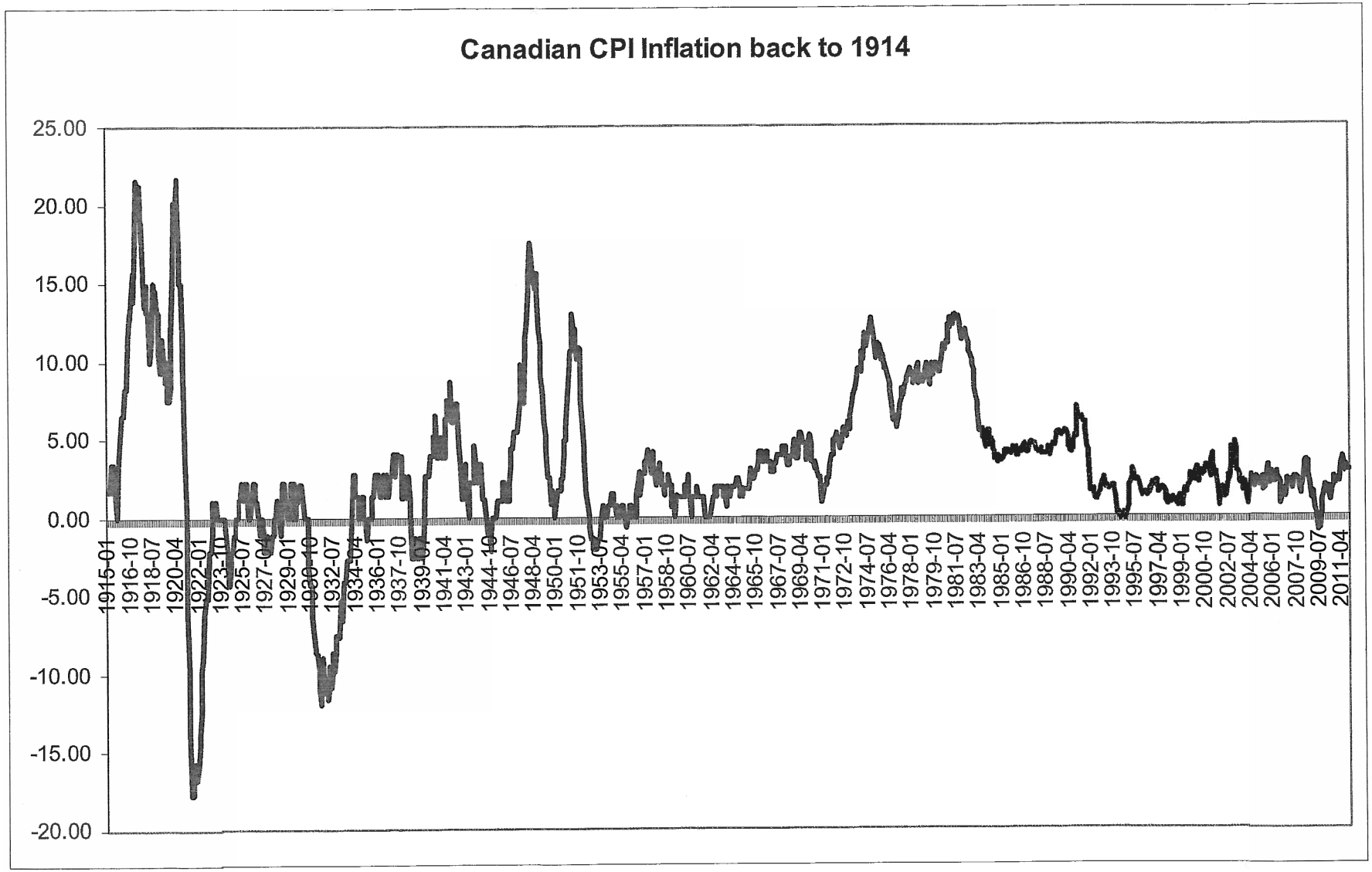
ASSUMPTIONS:

Return on Equity	=	12%
Dividend Payout	=	50% + 2% p.a.
Required Return	=	10%

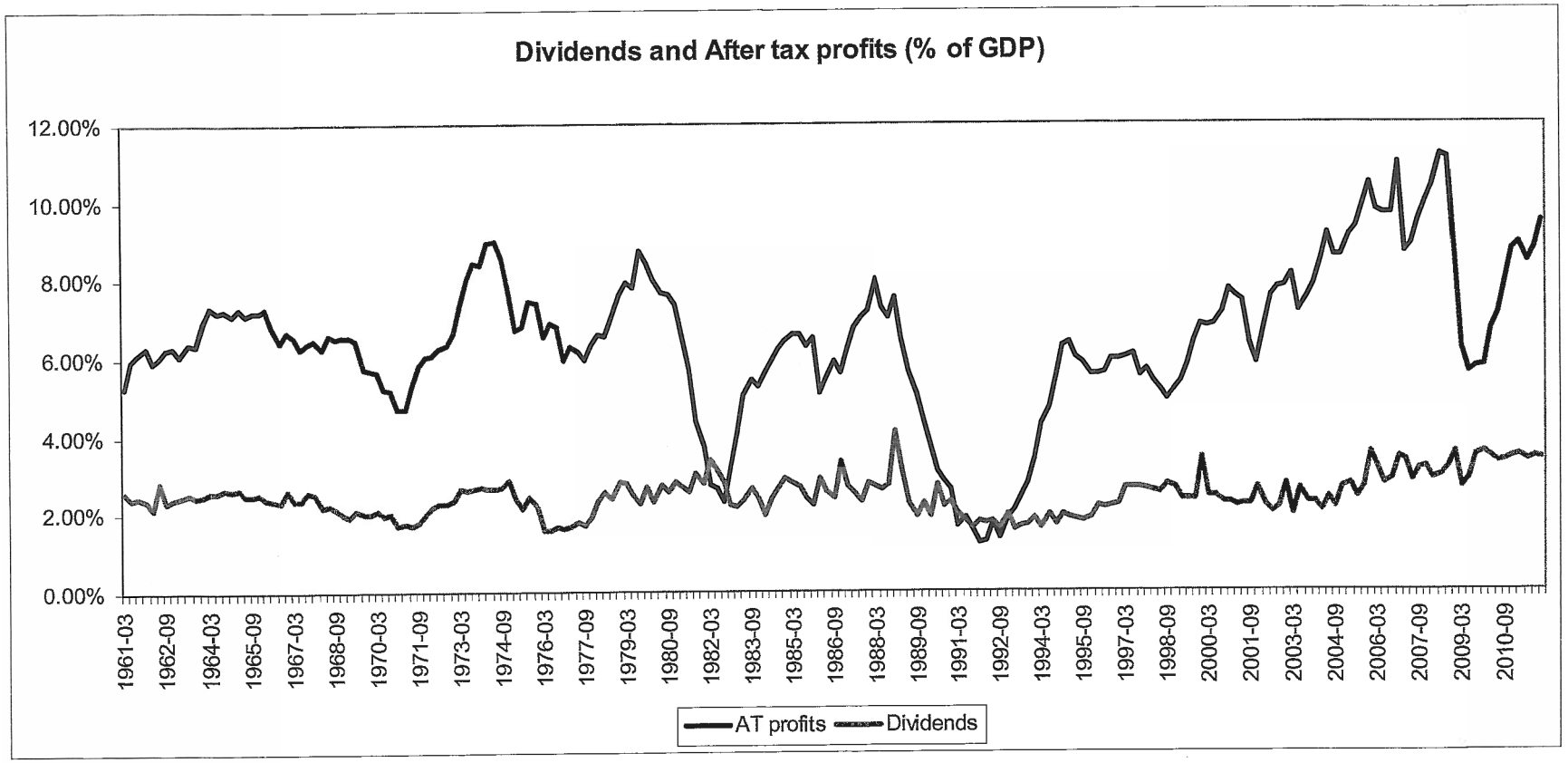
SCHEDULE3


Dividend and Bond Yields
18
16
14
12
10
8
6
4
2
0
1956M01
1961M01
1966M01
1971M01
1976M01
1981M01
1986M01
1991M01
1996M01
2001M01
2006M01
2011M01
TSXYield
Canadas

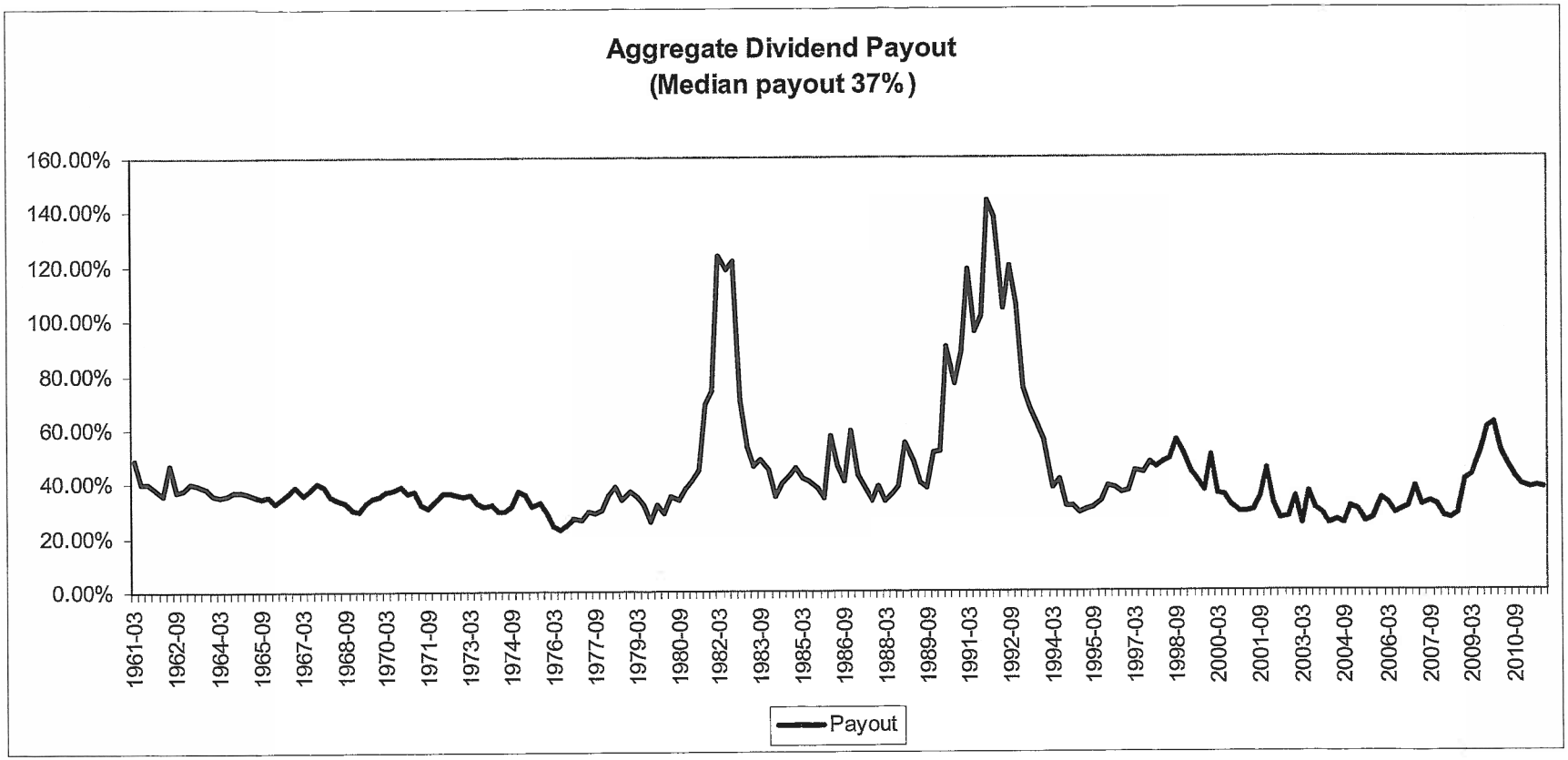
SCHEDULE 4


Canadian CPI Inflation back to 1914
25.00
20.00
15.00
10.00
5.00
0.00
-5.00
-10.00
-15.00
-20.00
1915-01
1916-10
1918-07
1920-04
1922-01
1923-10
1925-07
1927-04
1929-01
1930-10
1932-07
1934-04
1936-01
1937-10
1939-07
1941-04
1943-01
1944-10
1946-07
1948-04
1950-01
1951-10
1953-07
1955-04
1957-01
1958-10
1960-07
1962-04
1964-01
1965-10
1967-07
1969-04
1971-01
1972-10
1974-07
1976-04
1978-01
1979-10
1981-07
1983-04
1985-01
1986-10
1988-07
1990-04
1992-01
1993-10
1995-07
1997-04
1999-01
2000-10
2002-07
2004-04
2006-01
2007-10
2009-07
2011-04

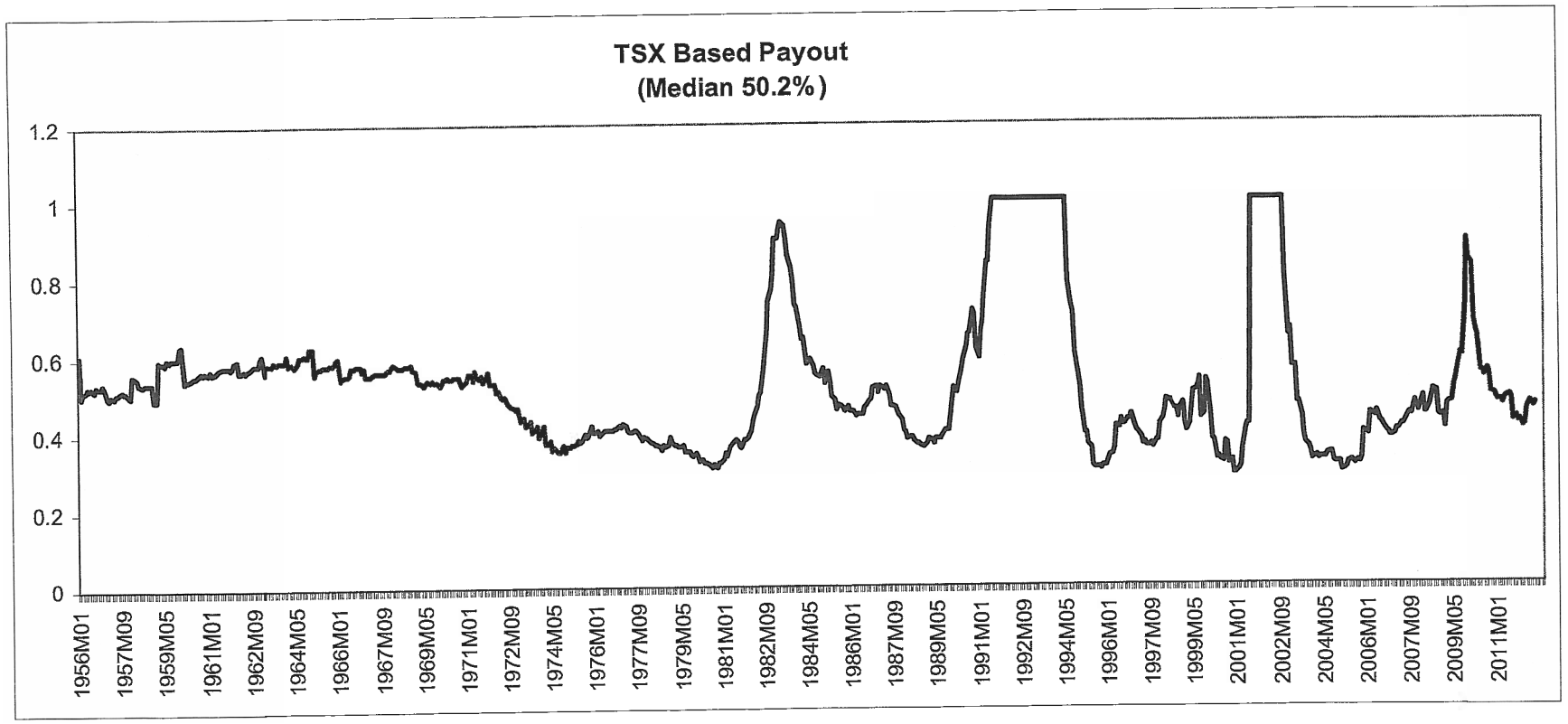
SCHEDULE 5


Dividends and After tax profits (% of GDP)
12.00%
10.00%
8.00%
6.00%
4.00%
2.00%
0.00%
1961-03
1962-09
1964-03
1965-09
1967-03
1968-09
1970-03
1971-09
1973-03
1974-09
1976-03
1977-09
1979-03
1980-09
1982-03
1983-09
1985-03
1986-09
1988-03
1989-09
1991-03
1992-09
1994-03
1995-09
1997-03
1998-09
2000-03
2001-09
2003-03
2004-09
2006-03
2007-09
2009-03
2010-09
AT profits
Dividends

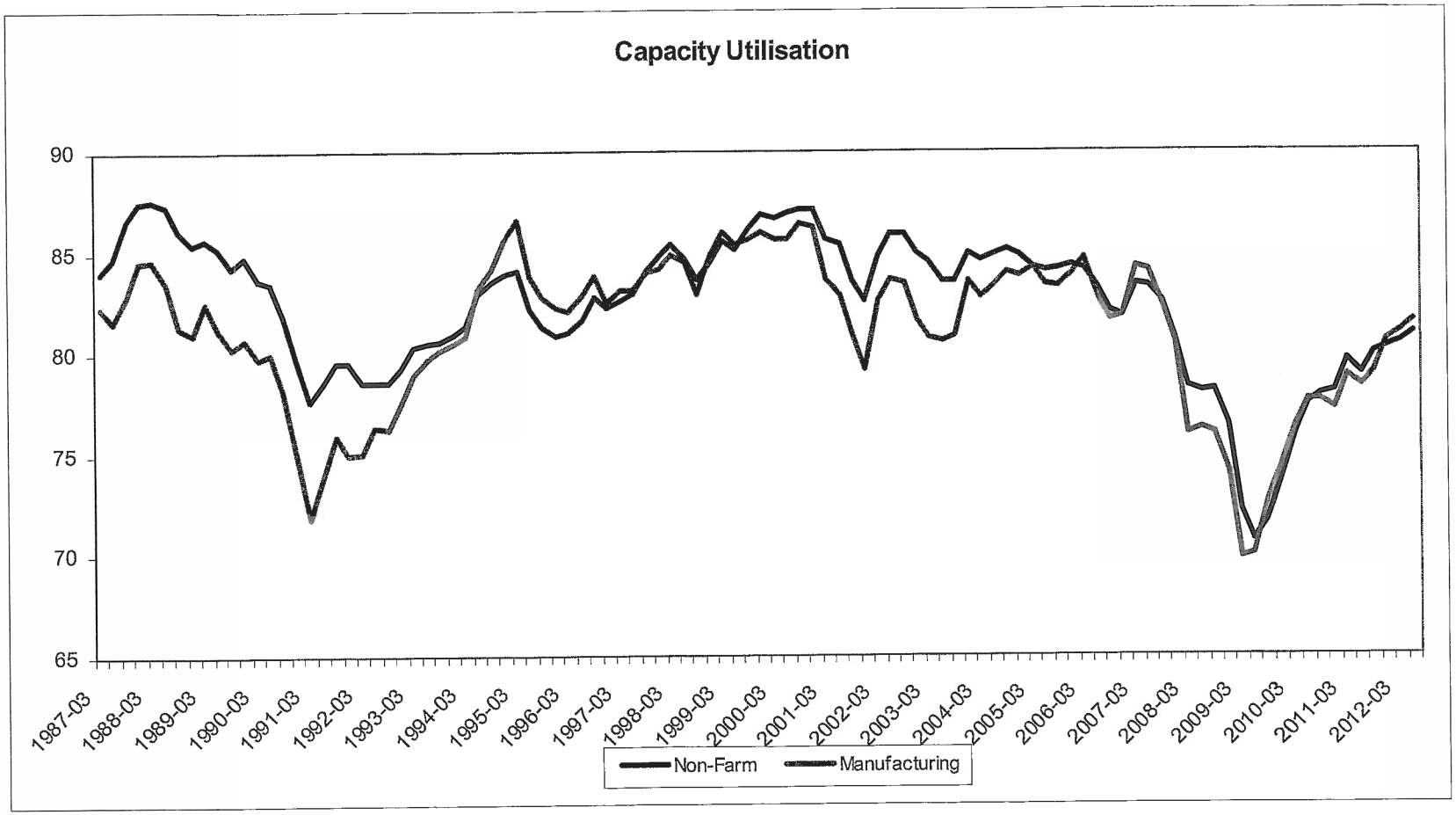
SCHEDULE 6


Aggregate Dividend Payout
(Median payout 37%)
160.00%
140.00%
120.00%
100.00%
80.00%
60.00%
40.00%
20.00%
0.00%
1961-03
1962-09
1964-03
1965-09
1967-03
1968-09
1970-03
1971-09
1973-03
1974-09
1976-03
1977-09
1979-03
1980-09
1982-03
1983-09
1985-03
1986-09
1988-03
1989-09
1991-03
1992-09
1994-03
1995-09
1997-03
1998-09
2000-03
2001-09
2003-03
2004-09
2006-03
2007-09
2009-03
2010-09
Payout

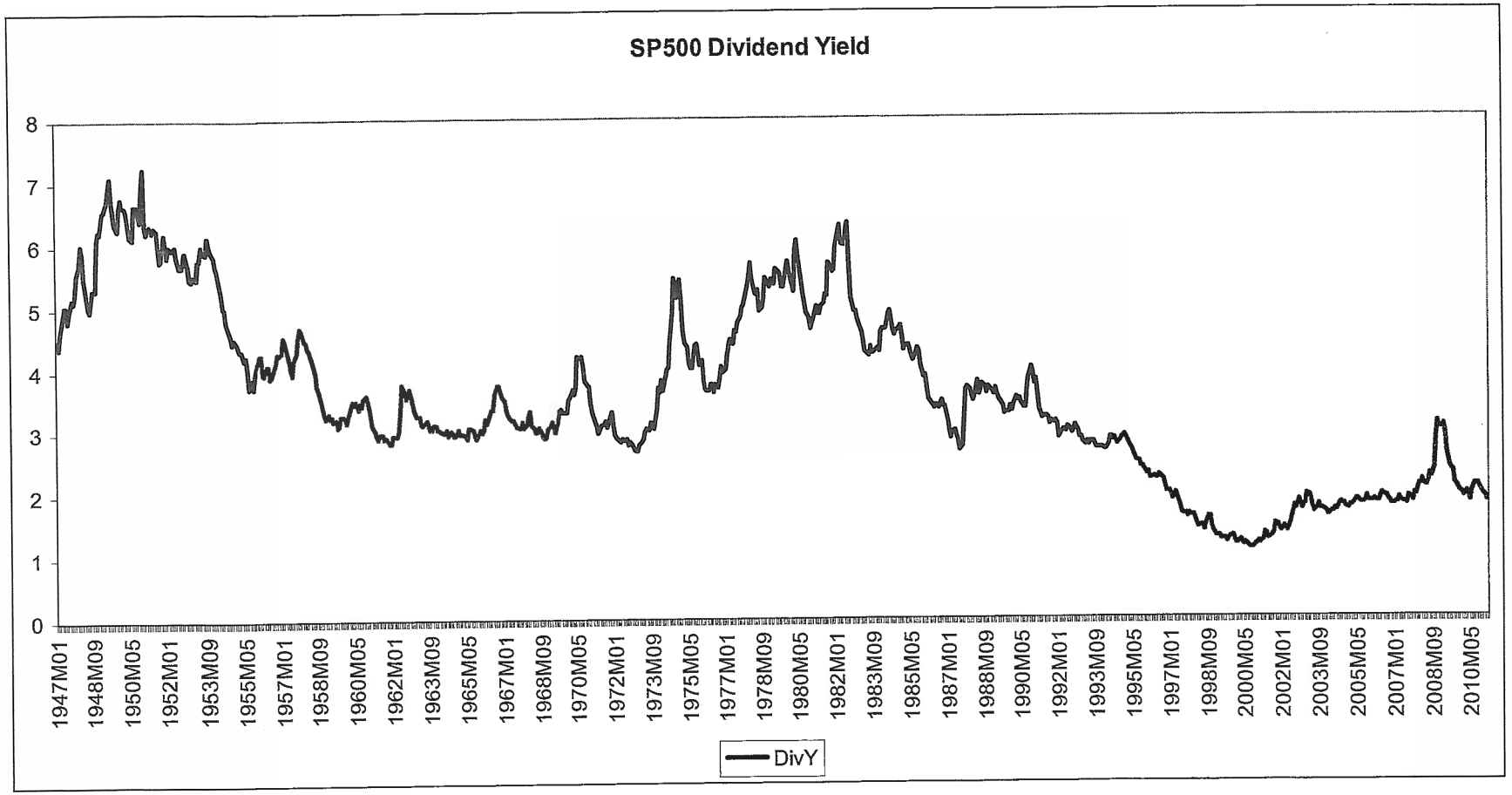
SCHEDULE 7


TSX Based Payout
(Median 50.2%)
1.2
1
0.8
0.6
0.4
0.2
0
1956M01
1957M09
1959M05
1961M01
1962M09
1964M05
1966M01
1967M09
1969M05
1971M01
1972M09
1974M05
1976M01
1977M09
1979M05
1981M01
1982M09
1984M05
1986M01
1987M09
1989M05
1991M01
1992M09
1994M05
1996M01
1997M09
1999M05
2001M01
2002M09
2004M05
2006M01
2007M09
2009M05
2011M01

SCHEDULE 8


Capacity Utilisation
90
85
80
75
70
65
1987-03
1988-03
1989-03
1990-03
1991-03
1992-03
1993-03
1994-03
1995-03
1996-03
1997-03
1998-03
1999-03
2000-03
2001-03
2002-03
2003-03
2004-03
2005-03
2006-03
2007-03
2008-03
2009-03
2010-03
2011-03
2012-03
Non-Farm
Manufacturing

SCHEDULE 9


SP500 Dividend Yield
8
7
6
5
4
3
2
1
0
1947M01
1948M09
1950M05
1952M01
1953M09
1955M05
1957M01
1958M09
1960M05
1962M01
1963M09
1965M05
1967M01
1968M09
1970M05
1972M01
1973M09
1975M05
1977M01
1978M09
1980M05
1982M01
1983M09
1985M05
1987M01
1988M09
1990M05
1992M01
1993M09
1995M05
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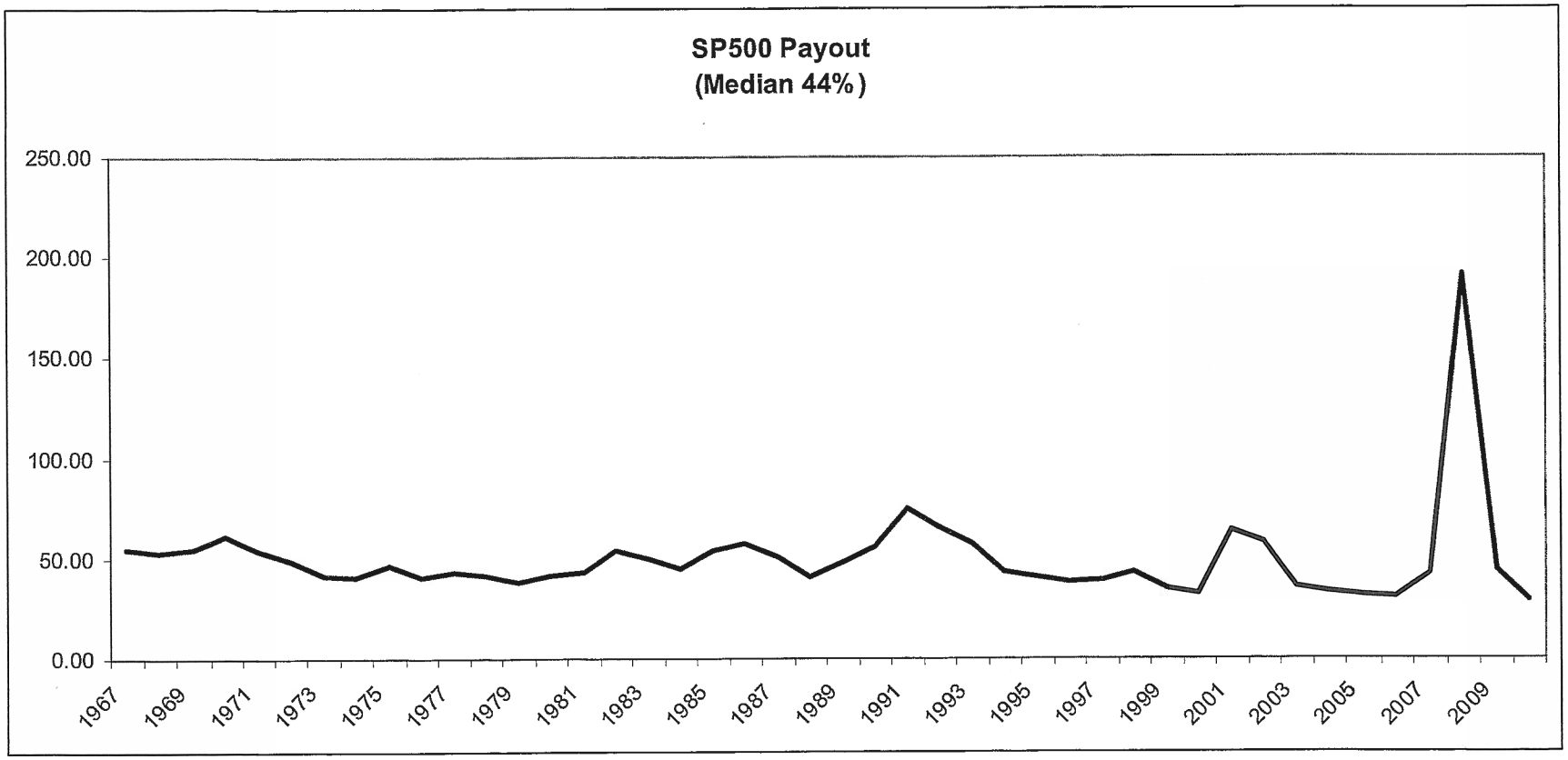
1998M09
2000M05
2002M01
2003M09
2005M05
2007M01
2008M09
2010M05
DivY

SCHEDULE 10


SP500 Payout
(Median 44%)
250.00
200.00
150.00
100.00
50.00
0.00
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009

SCHEDULE 11

S&P Electric UHC Data

	EPS	DPS	PAYOUT	RETAIN	ROE	g (B*ROE)	YIELD	US TSY	K	MB	URP	URP2	URP3
1993	7.95	7.11	89.43	10.57	11.25	1.19	5.73	5.87	6.99	1.59	1.11	1.23	4.15
1994	8.45	7.05	83.43	16.57	11.71	1.94	6.55	7.08	8.62	1.37	1.54	1.86	4.23
1995	9.23	6.97	75.51	24.49	12.36	3.03	6.23	6.58	9.45	1.39	2.87	3.04	4.22
1996	9.07	6.96	76.74	23.26	11.64	2.71	5.86	6.44	8.73	1.43	2.29	2.60	3.92
1997	7.63	6.64	87.02	12.98	10.16	1.32	5.49	6.35	6.88	1.49	0.53	0.89	3.59
1998	8.52	6.5	76.20	23.80	11.05	2.63	4.45	5.26	7.19	1.82	1.93	2.09	3.22
1999	9.31	6.24	67.02	32.98	12.36	4.08	4.60	5.64	8.87	1.69	3.23	3.14	3.14
2000	6.06	6.36	104.95	-4.95	7.04	-0.35	4.40	6.03	4.04	1.80	-1.99	-2.27	2.67
2001	10.58	5.42	51.23	48.77	13.63	6.65	3.41	5.00	10.28	1.88	5.28	4.18	2.31
2002	7.31	5.93	81.12	18.88	10.18	1.92	4.82	4.53	6.83	1.63	2.30	2.46	4.08
2003	8.44	5.29	62.68	37.32	10.61	3.96	4.31	4.02	8.44	1.51	4.42	4.37	3.89
2004	11.12	5.77	51.89	48.11	12.37	5.95	3.74	4.28	9.91	1.68	5.63	4.81	3.13
2005	10.22	6.85	67.03	32.97	11.86	3.91	3.69	4.31	7.75	2.04	3.44	3.07	3.07
2006	12.35	6.99	56.60	43.40	12.68	5.50	3.37	4.82	9.06	2.13	4.24	3.60	2.39
2007	14.82	7.85	52.97	47.03	12.81	6.02	3.09	4.54	9.30	2.20	4.76	3.88	2.28
2008	15.27	8.57	56.12	43.88	12.83	5.63	3.75	3.57	9.59	1.92	6.03	4.75	3.61
2009	13.37	8.8	65.82	34.18	10.53	3.60	5.01	3.27	8.79	1.38	5.52	5.23	5.11
2010	14.56	9.06	62.23	37.77	10.96	4.14	4.96	3.28	9.30	1.38	6.02	5.53	5.04
2011	13.94	9.49	68.08	31.92	10.11	3.23	4.70	2.79	8.07	1.47	5.29	5.00	5.10
average			**70.32**	**29.68**	**11.38**	**3.53**	**4.64**	**4.93**	**8.32**	**1.67**	**3.39**	**3.23**	**3.64**
Median			**67.03**	**32.97**	**11.64**	**3.60**	**4.60**	**4.82**	**8.73**	**1.63**	**3.44**	**3.14**	**3.61**

S&P Gas UHC Data

1993	6.11	3.43	56.14	43.86	11.55	5.07	3.15	5.87	8.37	1.93	2.50	2.74	1.78
1994	7.21	3.82	52.98	47.02	12.29	5.78	3.57	7.08	9.56	1.78	2.48	2.96	1.47
1995	5.25	4.02	76.57	23.43	8.28	1.94	3.45	6.58	5.45	1.75	-1.13	-0.04	1.65
1996	9.75	4.36	44.72	55.28	13.75	7.60	2.78	6.44	10.59	2.14	4.15	3.52	1.04
1997	6.25	5.01	80.16	19.84	8.19	1.62	2.74	6.35	4.41	2.15	-1.94	-1.05	1.06
1998	5.89	5.36	91.00	9.00	7.85	0.71	2.69	5.26	3.41	2.32	-1.85	-1.52	1.68
1999	7.4	9.34	126.22	-26.22	6.57	-1.72	3.84	5.64	2.05	1.99	-3.59	-5.02	2.65
2000	18.7	8.43	45.08	54.92	12.96	7.12	2.61	6.03	9.91	2.18	3.88	3.47	1.12
2001	9.87	8.16	82.67	17.33	7.33	1.27	2.47	5.00	3.77	2.38	-1.23	-0.54	1.62
2002	13.45	8.58	63.79	36.21	13.69	4.96	4.01	4.53	9.17	2.15	4.64	3.53	3.53
2003	14.77	7.23	48.95	51.05	13.82	7.06	4.24	4.02	11.59	1.57	7.57	5.66	4.08
2004	13.37	9.92	74.20	25.80	9.84	2.54	4.99	4.28	7.66	1.43	3.38	3.55	4.70
2005	10.42	19.06	182.92	-82.92	10.14	-8.41	9.05	4.31	-0.12	2.03	-4.42	-4.75	8.90
2006	8.26	8.89	107.63	-7.63	9.59	-0.73	3.94	4.82	3.18	2.62	-1.64	-1.76	3.26
2007	16.54	4.39	26.54	73.46	17.95	13.19	1.63	4.54	15.03	2.92	10.48	5.11	1.04
2008	19.61	4.21	21.47	78.53	18.46	14.50	1.60	3.57	16.33	2.48	12.76	5.82	1.62
2009	11.17	4.73	42.35	57.65	10.15	5.85	2.32	3.27	8.31	1.85	5.03	4.64	2.56
2010	12.04	7.48	62.13	37.87	9.7	3.67	2.91	3.28	6.69	2.07	3.41	3.32	3.16
2011	15.48	10.83	69.96	30.04	9.3	2.79	3.08	2.79	5.96	2.11	3.18	3.08	3.65
average			**71.34**	**28.66**	**11.13**	**3.94**	**3.42**	**4.93**	**7.44**	**2.11**	**2.51**	**1.67**	**2.71**
Median			**63.79**	**36.21**	**10.14**	**3.67**	**3.08**	**4.82**	**7.66**	**2.11**	**3.18**	**3.08**	**1.78**

URP assumes actual br growth, URP2 assumes that the expected ROE is the Treasury yield plus 5.0% and URP3 also assumes retention at the median retention rate. Source data is from Standard & Poors Analyst's Handbook 2012. Graphic can be expanded by pulling on the handles.

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ECONOMY AND MARKETS

MARKET LAB

Wall St.'s woeful forecasting not getting better

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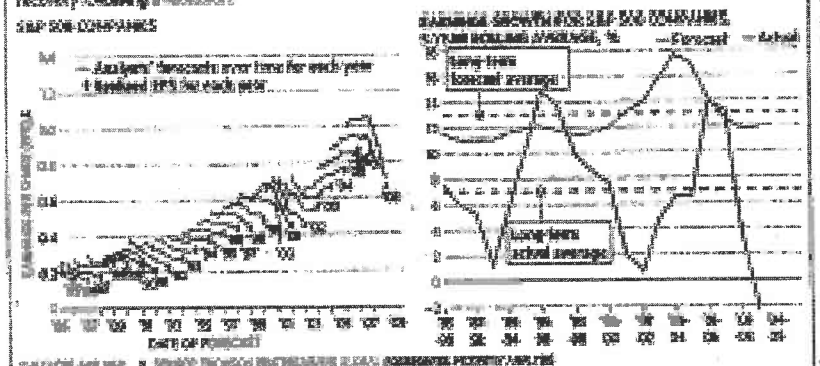
Nearly a decade ago – about the time the technology tech bubble had raised serious questions about conflicts of interest in Wall Street equity research – consulting firm McKinsey & Co. did a study on the accuracy of analysts' company earnings forecasts. The results were discouraging: Analysts were routinely overoptimistic about earnings growth, too slow to revise forecasts when economic conditions changed, and prone to increasingly inaccurate forecasts when the economy slowed.

Since then, major scandals involving biased research have come to light, Wall Street's biggest firms have paid $1.4-billion [U.S.] in penalties for those practices, and regulators have put rules in place aimed at severing equity research with more independence and distance from the investment-banking side of the business. Unfortunately, McKinsey reports, the changes have had little effect on the accuracy of analysts' projections.



DOWNTURN REVEALS SAME OLD BIASES

In an update of the 2001 study, McKinsey researchers found that from 2003 to 2008, analysts' earnings projections actually did look less unrealistically rosy. In each of those years, analysts, on average, actually underestimated S&P 500 annual earnings for the earlier portions of the year – and undershot through the entire year in 2003 and 2006.

But last we think the best evidence of a new kind of thinking within Wall Street research departments, the Street's wide-eyed optimism came back with a vengeance starting in 2003.

Going back over the past 25 years, McKinsey found that, on average, analysts' earnings growth forecasts "have been easily 100 percent too high." Annual S&P 500 earnings growth forecasts have typically been in the 10- to 12-per-cent range, while actual earnings growth has averaged 6 per cent.

BROKEN-CLOCK ACCURACY

Looking at five-year rolling average growth estimates, there have been only three periods in the past 25 years when the earnings rate of exceeded analysts' forecasts. Each came in recovery periods after the U.S. economy fell in the early 1980s and the early 2000s.

"This pattern confirms our earlier findings that analysts typically lag behind events in revising their forecasts to reflect new economic conditions," McKinsey researchers wrote. "While economic growth accelerates, the size of the forecast error declines when economic growth slows, it increases."

This pattern means that when the analysts are accurate with their forecasts, it's sort of the same way a broken clock is accurate – twice a day.

"As economic growth cycles up and down, the actual earnings S&P 500 companies report occasionally coincide with the analysts' forecasts."