FAIR RETURN FOR NEWFOUNDLAND POWER (NP)

EVIDENCE OF

Laurence D. Booth

BEFORE THE

Board of Commissioners of Newfoundland and Labrador.

May 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. However, I see little point in an extensive discussion of NP's business and financial risk, since all are in agreement that this has not changed.

2) The Canadian economy has now recovered from the recession and is drawing down on the remaining spare capacity so we can expect several years of above average growth. Up until Spring 2011 I (and most forecasters, including the equity market) expected strong economic growth and that the Bank of Canada would 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. I use this rate as base for my recommended ROE for 2012, since we can't use actuals as we are almost half way through the year already. However, this recovery to normal has been delayed for at least 2 years due to the Euro crisis and continuing problems in the US, where the actions of the Federal Reserve in 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.

3) While financial stress has almost disappeared from the system, corporate spreads over government bond yields remain high at 181 bps mainly due to unusually low government bond yields. I have therefore been recommending a credit spread adjustment of 50% of the change in the credit spread from the normal spread of 100bps. This adds 40 bps to simple CAPM estimates of the ROE, but should even out over the business cycle.

4) 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 yields of 3.00% for 2012 and 3.50% for 2013. 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.

5) Using my 4.50% forecasted long Canada bond yield for 2012 I would have recommended a fair ROE for 2012 of 8.15% in a range 7.65%-8.70% if there had been a hearing in Summer 2011. This recommendation includes a 0.40% corporate credit spread adjustment. If the Board decides to set the ROE for 2013 at this time, I would use a forecast long Canada bond yield of 3.50% but then add 0.80% for the impact of the Euro Crisis and Operation Twist and recommend a fair ROE of 7.95% in a range 7.45%-8.50%.

6) If the Board decides to set a fixed rate for two years I would recommend 8.15% for both years, given the uncertainty surrounding long term bond yields at present. As a point of comparison the Alberta Utilities Commission recently set its generic ROE at 8.75%, which I regard as marginally generous (Decision 2011-474, December 8, 2011) and given its lower financial risk NP should probably be allowed less than this.

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 Board of Commissioners of Newfoundland and Labrador, 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. The Consumer Advocate of the Province of Newfoundland and Labrador has asked me to review Newfoundland Power's (NP) application and associated evidence and to offer an opinion as to the fair rate of return on common equity (ROE) for both 2012 and conditionally 2013, as well as commenting on the appropriate capital structure for NP. My understanding is that the Board will review the adjustment mechanism in a subsequent hearing, perhaps later this year.

Q. DO YOU HAVE SOME OVERALL REMARKS?

A. Yes. In answer to CA NP001 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."

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 like 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 is the explicit policy of the AUC and the NEB, whereas other boards like the OEB and the BCUC make risk adjustments through both the common equity ratio and the 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 be allowed a lower allowed ROE than a benchmark Canadian utility. 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. Logically NP's allowed ROE should be less than 8.75%.

How much differences in common equity ratios are worth in terms of an ROE trade-off are largely a matter of judgment. However, the 5% higher common equity ratio, as compared to a Canadian comparable utility, is easily worth at least a 0.25% reduction in the allowed ROE, which would bring the AUC adjusted allowed ROE very similar to the 2011 ROE allowed NP of 8.38%. In its July 19, 2011 credit assessment on NP 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."

Of relevance is the assessment: "Notwithstanding that NPI's 2011 allowed ROE of 8.38% is currently one of the lowest in Canada, its 45% common equity is one of the highest in Canada and the PUB's decisions are timely and balanced." In this sentence Moody's is clearly articulating the acknowledged fact that NP's lower financial and regulatory risk, combined with its average business risk imply that it should be allowed a lower allowed ROE than the benchmark.

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[1] See CA NP003

[2] See CA NP004.

[3] See CA NP002

Also DBRS reported the company's actual ROE and coverage ratio, while in answer to CA NP007 NP provided the average interest cost; together they are as follows:

	ROE	Interest	Coverage
2006	9.0	8.14	2.26
2007	8.6	7.88	2.20
2008	8.8	7.72	2.53
2009	8.6	7.67	2.40
2010	8.9	7.63	2.41

Note that NP's coverage ratio has tended to increase as the embedded interest cost has come down as NP has rolled over old expensive debt at current low levels, while the actual ROE has shown little trend. In 2014 and 2015 NP has $62 million in high coupon (over 10%) debt that will be rolled over at rates similar today of just over 4.0% (A rated debt). This will cause the embedded debt cost to continue to decline and all else constant NP's key interest coverage ratio will continue to increase.

NP issues first mortgage bonds and the main covenant restriction is that it can't issue more debt if the interest coverage ratio drops below 2.0X or the debt ratio exceeds 60%. Given the trend in the interest coverage ratio and the current regulated 45% common equity ratio, neither of these restrictions is binding. It is scarcely surprising therefore that Moody's confirmed the A2 rating on NP's first mortgage bonds in a July 19, 2011 credit report, while DBRS confirmed it's A rating on NP in its own January 24, 2012 credit report. These ratings exceed the median credit rating for regulated utilities in both the US and Canada. This assessment is then consistent with the prior note of NP's average business risk and lower financial risk. The obvious conclusion is that NP is in excellent financial health with the current regulated financial parameters.

Q. WHAT IS DRIVING THESE CREDIT ASSESSMENTS?

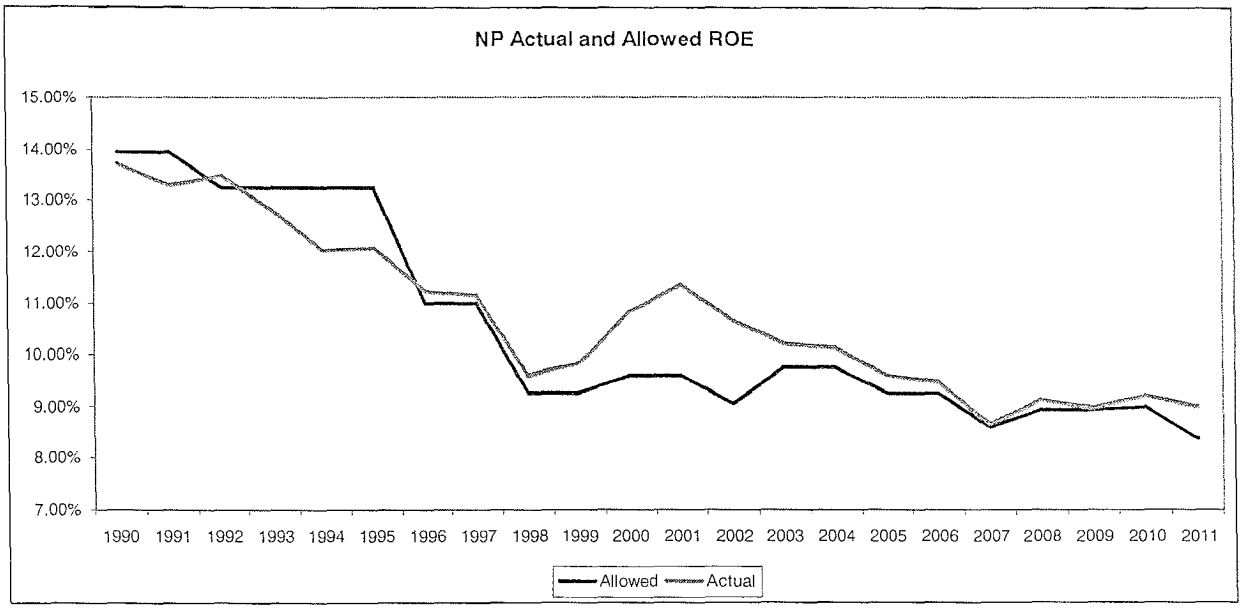
A. Moody's clearly indicates in its report that 50% of the weight is based on the regulatory framework and the ability to recover costs, which again is part of the regulatory framework. 10% is then based on diversification and market position and 40% on NP's key financial metrics. Moody's assesses a methodology grid rating of A3 and actually assigns NP an issuer rating of

Baa1 with the first mortgage bonds notched up by two rating classifications to "A" due to the fact there is essentially no other debt outstanding.

DBRS comes to the same assessment as Moody's with an additional analysis of the main deferral accounts which smooths the company's earnings, namely:

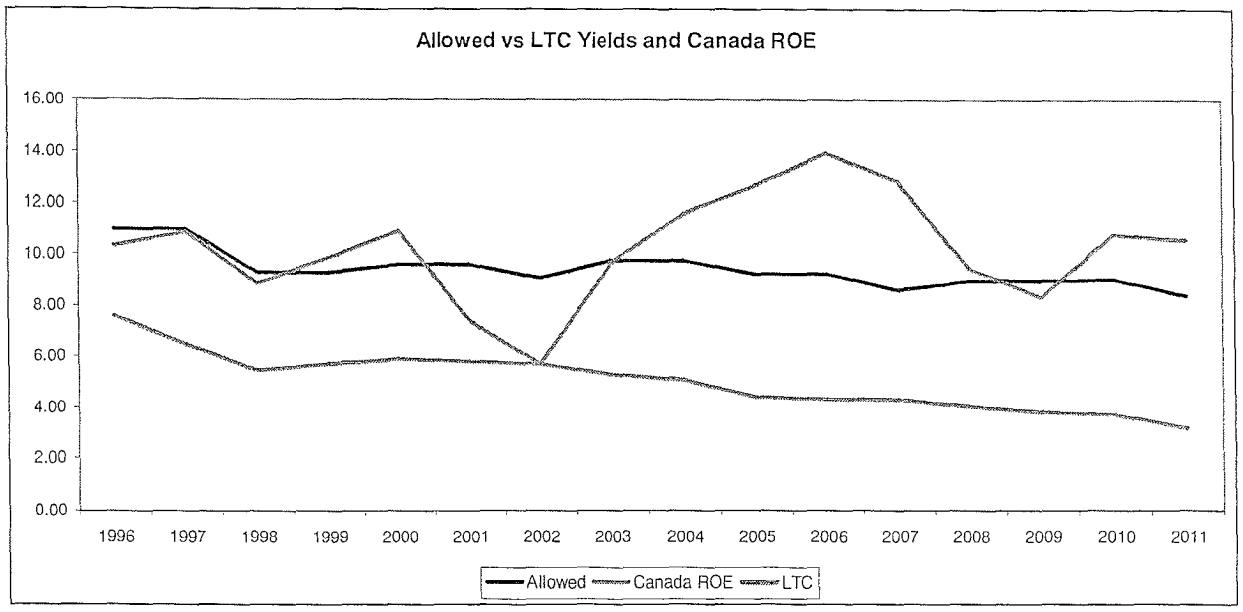
- The weather normalisation reserve
- Rate stabilisation account
- Demand management incentive account
- Pension expense variance deferral account
- Other post employment benefits deferral account

The amount of regulatory protection shows up in NP's ability to earn its allowed ROE. In answer to CA NP024 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.

Finally the following graphs the allowed ROE for NP, along with the average long Canada yield and ROE for Canada as a whole from Schedule 1. The data is for the post 1995 period after which NP consistently over-earned. Throughout this period the average allowed ROE for NP was 9.41% and its actual ROE 9.93%. In comparison the average ROE over this period calculated by Statistics Canada was 10.23% and the average long Canada bond yield 5.05%. So implicitly NP was earning 4.88% over the long Canada bond versus the average company in Canada earning 5.18%, so NP earned 94% of the average company ROE for a demonstrably low risk utility, which seems very high.



Q. ARE YOU RECOMMENDING A CHANGE IN NP'S COMMON EQUITY RATIO?

A. No. the foregoing remarks are simply to put NP's low risk status into perspective, point out how financially strong the company is and how its profitability compares to an average company. I would dispute the company's assertion that financial market conditions have changed appreciably since the time of the 2009 hearing, if the implication is that they have deteriorated. I regard conditions in the financial market as being better than in 2009. Further there is very little in NP's testimony that supports this claim except a brief discussion in the evidence of Ms. McShane (pages 24-36).

However, we are still living with the aftermath of the financial crisis and while Canada has recovered, much of the developed world (Europe) is still locked either in recession or is struggling with financial constraints (US). Consequently, I do not recommend a change in NP's common equity ratio just yet ***unless*** the Board decides to significantly increase NP's ROE, since both a higher ROE and lower financial risk are incompatible with NP's average risk profile.

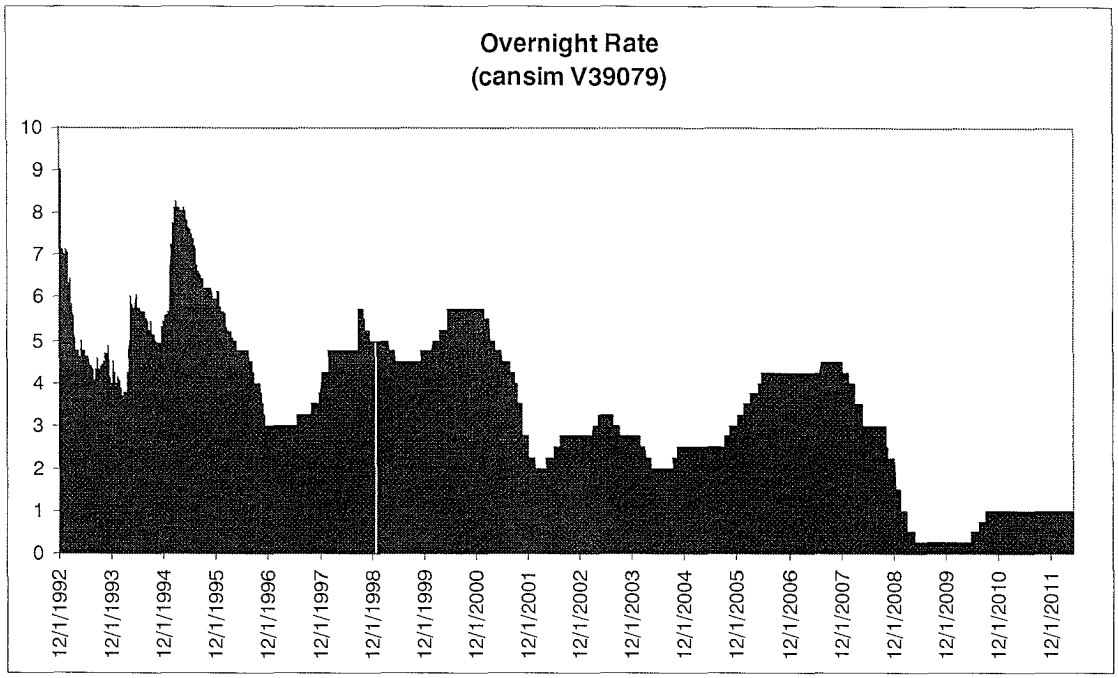
As a result, the major focus of my testimony is in a discussion of financial developments since 2009 and how they affect the fair ROE. In structuring my testimony, I have consolidated and updated much of the work I presented in 2009. Appendix B discusses both the Canadian and US market risk premium evidence; Appendix C discusses the relative risk adjustments for a benchmark utility; and Appendix D discusses the discounted cash flow (DCF) evidence. I have not updated the Appendix that deals with Ms. McShane's comparable earnings evidence since she acknowledges that no regulator in Canada has placed any significant weight on such evidence for over ten years (CA NP040), Dr. Vander Weide does not produce such evidence, the Statistics Canada estimate of the average corporate Canada ROE is under 10% and such evidence does not reflect NP's motivation for this hearing that "Financial market conditions have changed dramatically in recent years." This is because comparable earnings evidence is unrelated to financial market conditions.

II: FINANCIAL AND ECONOMIC OUTLOOK

Q. WHAT ARE CAPITAL MARKET CONDITIONS AT PRESENT?

A. Basic macroeconomic data since 1987 is provided as background in Schedule 1. 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.

At the time of my 2009 testimony the overnight rate was still at 0.25%, but I was expecting a recovery and for the overnight rate to increase, which it did. 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 January 17, 2011 the Federal Government announced a second round of tightening in the mortgage market by restricting amortisation periods to 30 years, reducing the maximum amount that can be borrowed to 85% of appraised value and no longer insuring home equity lines of credit. 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 and by the end of 2011 levels of personal indebtedness in Canada exceeded 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, that is, basically the next three years. The assumption is that in the face of rock bottom US interest rates the Bank will keep the 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

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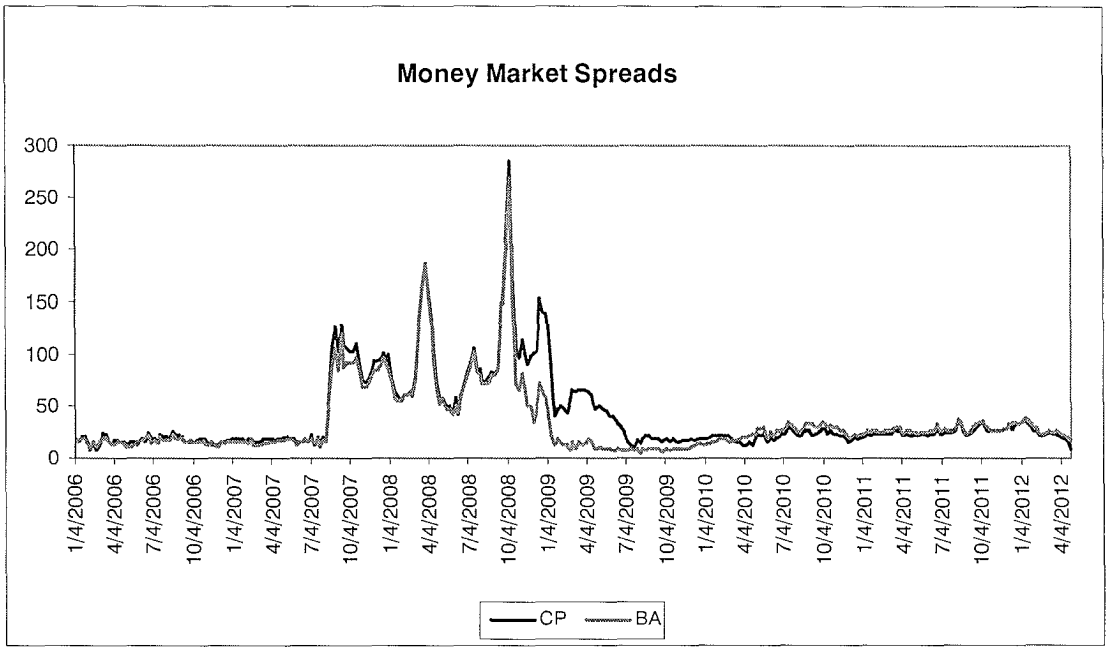
[4] In April 2012 housing starts increased by 14.0% to an annualized pace of 244,900 indicating a very strong housing market in Canada.

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.



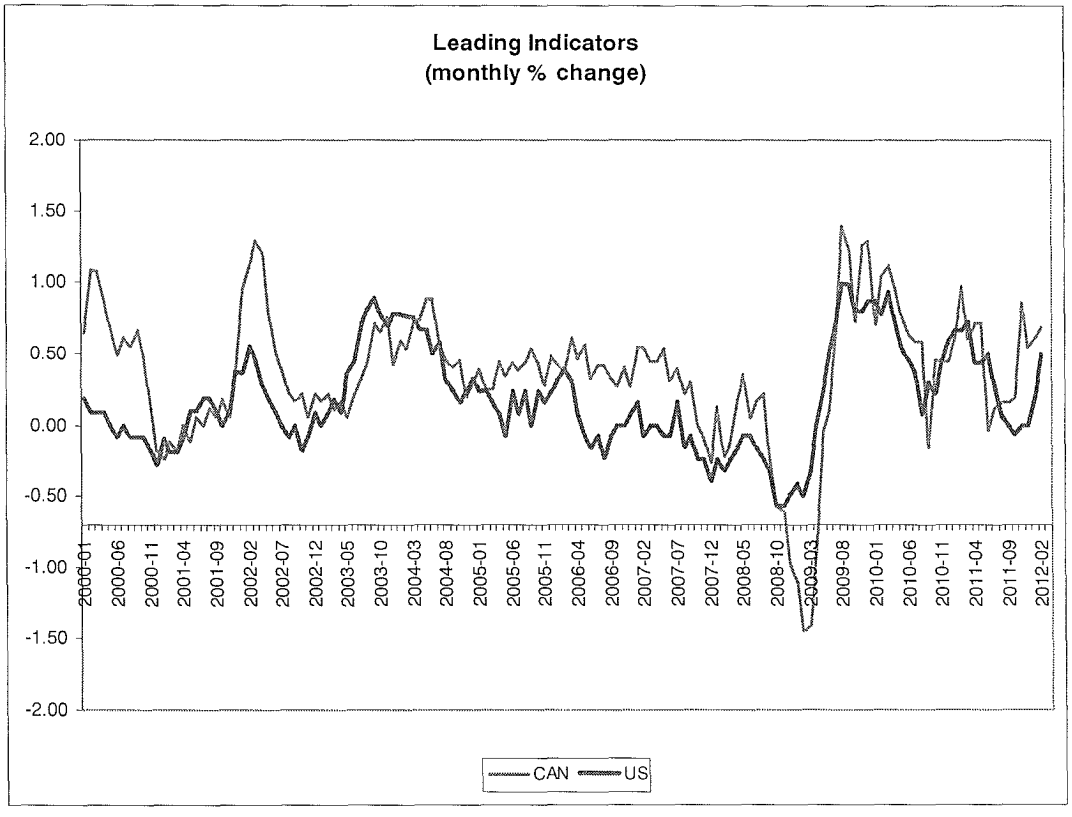
Before discussing these spreads, it is important to note that investors in the money market are mainly "parking" their money, rather than investing, since their main concern is security of principal. Consequently with any hint of default the market seizes up. This happens periodically in the CP market 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

[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.

close to normal levels for the past two years. Currently these spreads are under 20 bps (End of April 2012) as Treasury Bill yields have started to back up in the expectation that the overnight rate will increase. However, since T Bill yields are still exceptionally low at 1.06% actual CP funding costs for prime borrowers are still at very low levels at 1.23%. 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. The Leading Indicators are a composite of economic values such as the stock market and surveys of consumer confidence that together predict the short run behaviour of the economy.

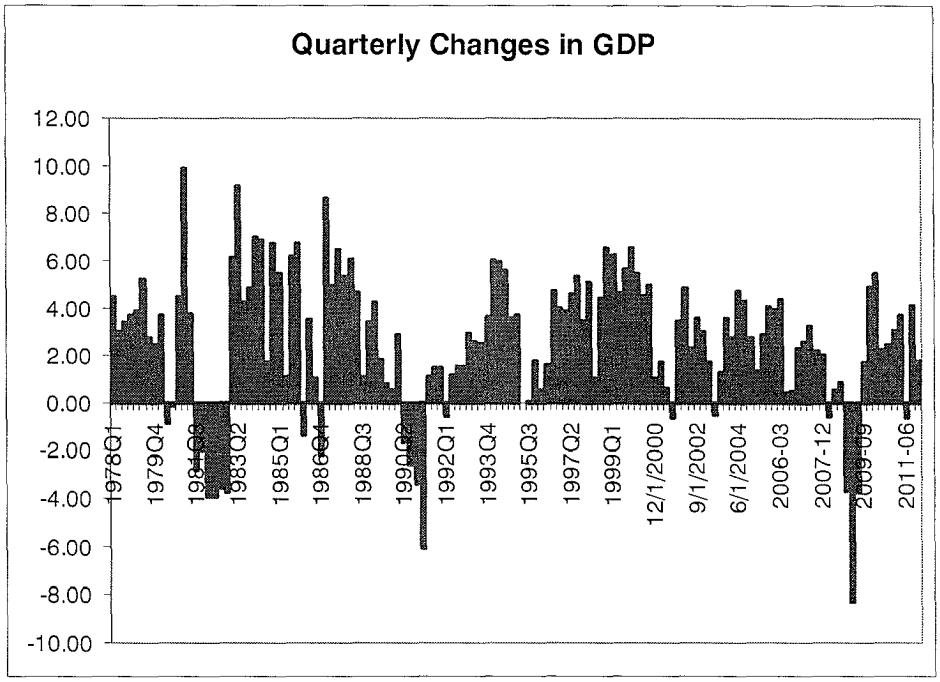


We can clearly see the drop in the leading indicators during the slow-down in 2001 and the rapid recovery in 2002 after which they stabilised throughout the period 2002-2007. However, starting in 2007 they start to weaken, particularly in the US and then there were severe declines in the

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?

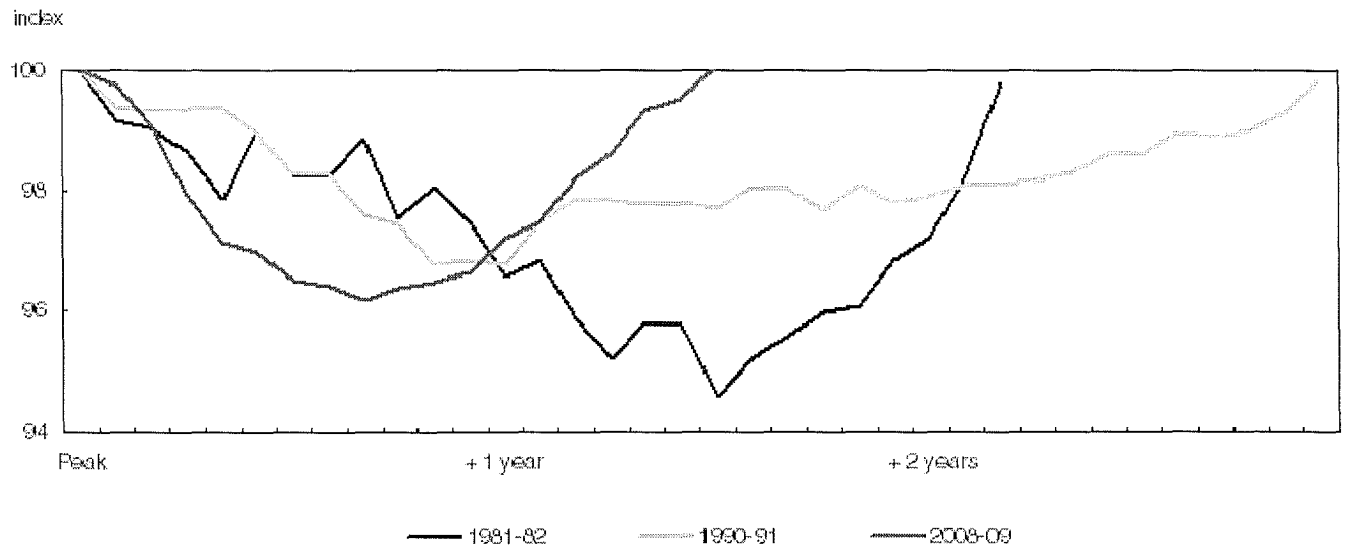
A. The following graph has the quarterly change in real GDP since the start of 1978.



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%,[6] before moderating in 2009Q2 with a sharp snap back 2009Q3 into 2010Q1. The 2009 hearing into NP was held at the time of this rapid snap back in economic growth in Canada. 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 into 2012.

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.[7]



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

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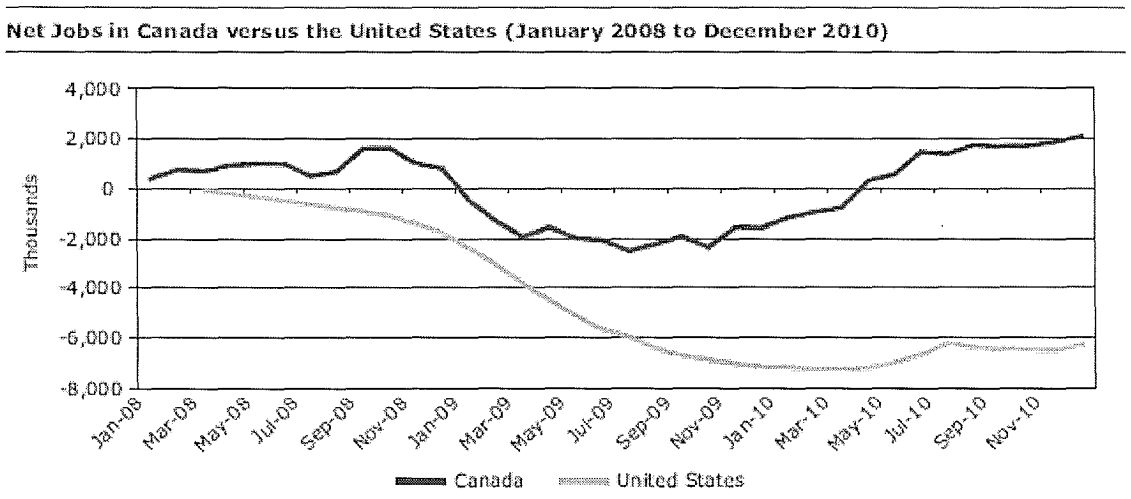
[6] The current version of the GDP accounts start in 1961.

[7] 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

"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 the Dominion Bond Rating Agency (DBRS) provides a "jobs" analysis for the US and Canada.[8] Similar to the Statistics Canada graph, it shows that the Canadian economy has recovered and returned to creating employment. In stark contrast, the US economy is 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.

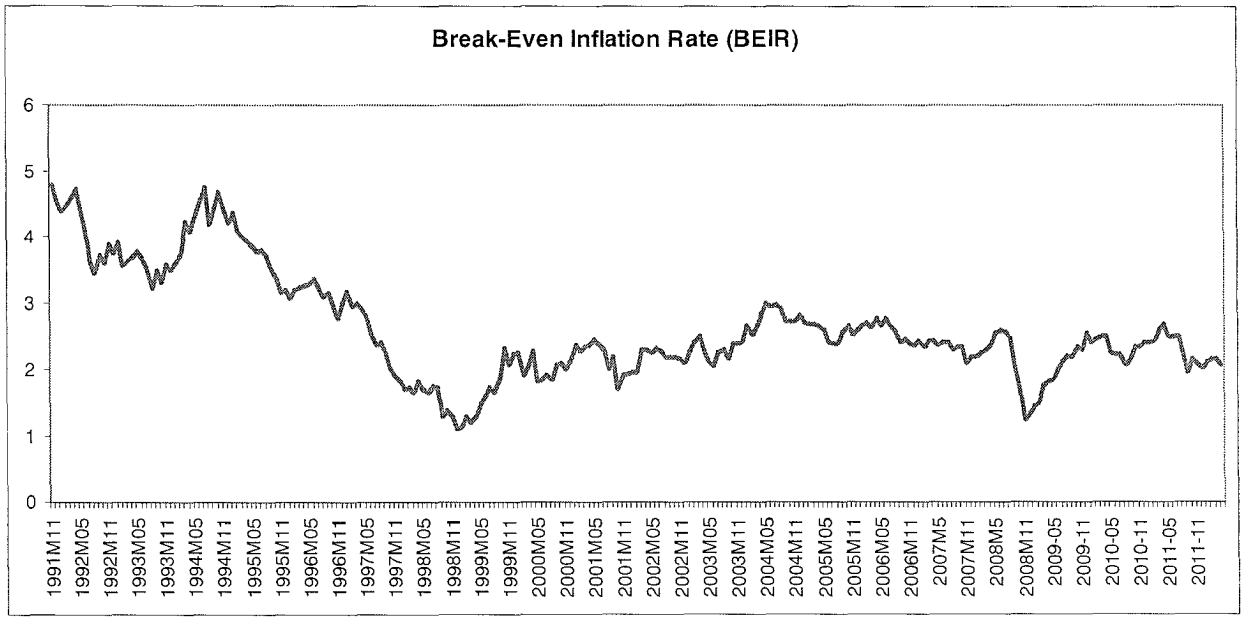
Q. WHAT IS YOUR OUTLOOK FOR INFLATION?

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

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

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 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 the 2008Q3 when the BEIR dropped from its "normal" level of just above 2.0% to 1.26% in November 2008.[9] 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 and currently sits at just over 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 April 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 is because the Bank of Canada is still keeping interest rates low to enhance the recovery. This spread will decrease as short term interest rates return to their more normal levels and the overall maturity structure of interest rates increases.

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 so that yields finished 2011 at 2.46% and currently they are only marginally higher.

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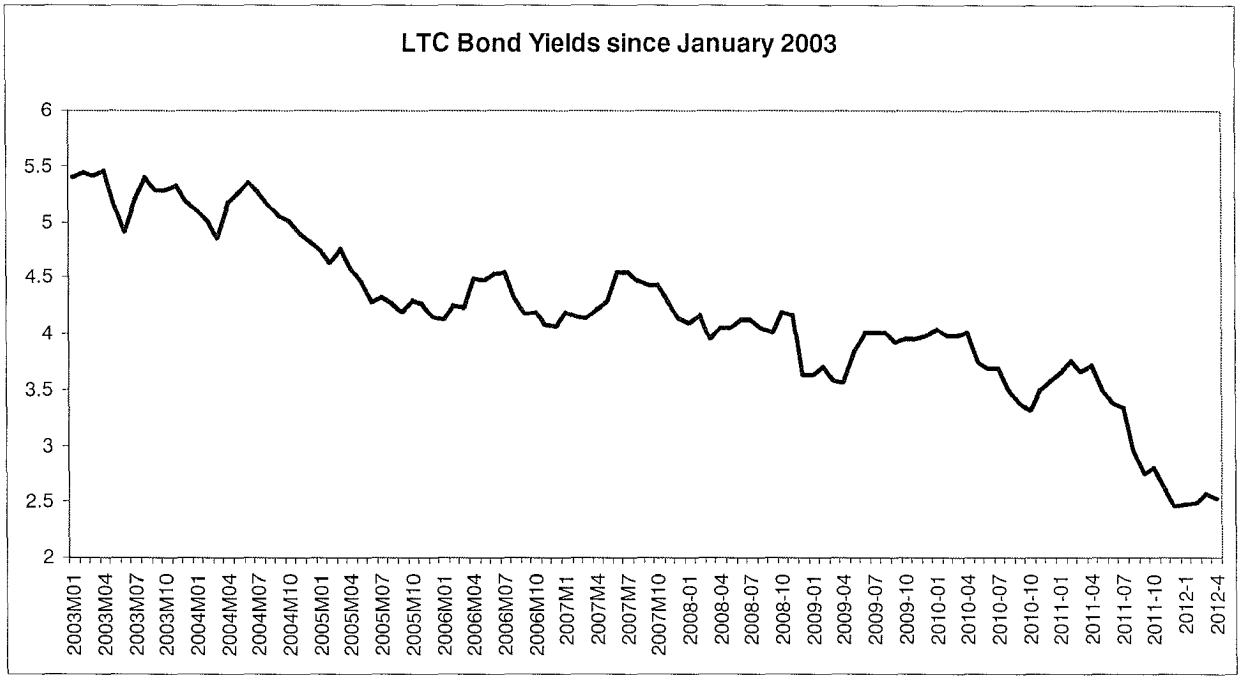
[9] The average BEIR since Canada returned to a budgetary surplus is 2.23%.



Starting in 2010 Q2, 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 without some restructuring. These concerns were particularly acute for the PIIGs, Portugal, Ireland, Italy, Greece and Spain, 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.[10] However, the contagion fear from Europe, with a potential domino impact on the banking system world-wide, triggered a rush into "safe' government bonds throughout 2011 Q3 and Q4 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. 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 9.0% of GDP and then

[10] The Czech Republic has still not signed the agreement and whether the austerity measures survive has been thrown into question by the election of Mr. Francoise Hollande in France and split elections in Greece (May 6, 2012).

marginally declined in 2010[11] and 2011 and is forecast to drop more in 2012. The following is a table derived from tables from the IMF.[12]

Government Deficits % of GDP

	2007	2009	2010	2011	2012
US	2.7	12.8	10.3	9.6	7.9
Canada	-1.6	4.9	5.6	4.3	3.2
UK	2.7	10.3	10.2	8.5	7
Germany	-0.02	3.1	3.3	1.7	1.1
France	2.7	7.6	7.1	5.9	4.6
Italy	1.5	5.3	4.5	4	2.4
Portugal	2.7	9.4	7.3	5.9	4.5
Spain	-1.9	11.1	9.2	6.1	5.2
Ireland	-0.01	11.4	31.9	10.3	8.6
Greece	3.7	13.6	7.9	8	6.9

The IMF judges that 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 mainly 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 borrowing cap. What is important is that the US deficit in 2011 at 9.6% of GDP is much higher than that of either Portugal or Greece. Additionally there is the problem that the US "counts" differently to Europe. In the US the official public debt number is only for the debt held by the public and ignores debt held both internally by, for example, social security, and the debt of the individual states. If the US used the European definition of public debt its official figure of 62%

[11] Excluding Ireland the average deficit is 7.8% and Ireland's is skewed by the huge one-time cost it incurred in bailing out its banks.

[12] IMF, Fiscal Monitor May, November 2010, September 2011; 2011 and 2012 are forecasts.

of GDP would jump to 92%, the same as that for Portugal. Similarly, if the US deficit were measured the same as that for European countries, its deficit would be 10.6% of GDP, basically twice that of Portugal! The upshot is that while Portugal is rated BBB- by S&P and facing a crisis as non-residents will only roll over its external debt at rates over 10%, the US has a larger deficit and the same amount of public debt and yet currently faces no refinancing problems.[13]

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. 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.

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

Q. WHAT IS YOUR FORECAST FOR THE LONG CANADA BOND YIELD FOR 2012?

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

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[13] See the Economist, "America's Polyanna Principle", April 30, 2011 for a discussion

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)	1.8 (2.0)	2.5 (1.6)	2.5 (1.8)	2.4 (2.1)	2.5 (2.6)	2.5 (3.1)	2.2 (3.1)	2.3 (3.0)	2.2 (2.6)	2.2	2.2	2.2	2.2
Real GDP (year-over-year percentage change)	2.2 (2.1)	2.0 (1.7)	2.7 (2.3)	2.3 (1.9)	2.5 (2.1)	2.5 (2.4)	2.4 (2.7)	2.4 (2.9)	2.3 (3.0)	2.2	2.2	2.2	2.2
Core inflation (year-over-year percentage change)	2.1 (2.2)	2.1 (2.1)	1.9 (2.0)	1.8 (1.9)	1.8 (1.7)	1.8 (1.9)	2.1 (1.9)	2.1 (2.0)	2.1 (2.0)	2.1	2.0	2.0	2.0
Total CPI (year-over-year percentage change)	2.6 (2.8)	2.4 (2.2)	2.0 (1.5)	2.2 (1.7)	2.2 (1.7)	2.1 (1.8)	1.9 (1.9)	1.9 (2.0)	1.9 (2.0)	1.9	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 (2.7)	2.3 (2.1)	1.9 (1.4)	2.1 (1.6)	2.1 (1.6)	2.1 (1.5)	2.0 (1.9)	2.0 (2.0)	2.0 (2.0)	2.0	2.0	2.0	2.0
WTI[b] (level)	94 (94)	103 (101)	103 (102)	104 (102)	105 (101)	105 (100)	105 (99)	104 (98)	103 (98)	102	101	99	99
Brent[b] (level)	109 (109)	116 (112)	122 (111)	121 (110)	119 (109)	117 (107)	115 (106)	113 (105)	112 (103)	110	108	106	104

a. Figures in parentheses are from the base-case projection in the January 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 April 2012

The Bank forecasts real GDP growth at approximately 2.4% year over year for 2012 and 2013 before levelling off at 2.2%, which is what the Bank of Canada regards as the economy's potential. This is similar to the Consensus Economics (April 10, 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 2.6% real growth for both 2012 and 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 also at 2.0%. 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 increased 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	12Q4
Canada											
Overnight	0.50	1.00	1.00	1.00	1.00	1.25	1.75	2.25	2.50	2.75	3.00
Three-month	0.50	0.88	0.97	1.10	1.20	1.70	2.15	2.40	2.65	2.90	3.15
Two-year	1.39	1.40	1.71	1.85	1.75	2.15	2.40	2.80	3.00	3.35	3.75
Five-year	2.32	2.04	2.46	2.65	2.50	3.00	3.30	3.50	3.65	3.85	4.05
10-year	3.08	2.75	3.16	3.25	3.25	3.50	3.80	3.95	4.05	4.15	4.15
30-year	3.65	3.34	3.55	3.80	3.75	4.00	4.30	4.45	4.50	4.50	4.55
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	1.50
Three-month	0.18	0.16	0.12	0.15	0.20	0.20	0.25	0.35	0.65	1.25	1.70
Two-year	0.61	0.44	0.61	0.70	0.80	0.90	1.10	1.25	1.60	2.00	2.50
Five-year	1.79	1.27	2.01	2.10	2.00	2.30	2.60	2.80	3.05	3.40	3.75
10-year	2.97	2.48	3.30	3.45	3.25	3.65	4.00	4.15	4.25	4.45	4.50
30-year	3.91	3.67	4.34	4.50	4.55	4.60	4.85	4.90	4.95	5.00	5.05
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%. In essence the RBC forecast put Canada almost "back to normal" by the end of 2012.

However, the Euro Crisis and problems in the US have caused this back to normal scenario to be put off. The current RBC forecast (May 2012) is below

	Actuals					*Forecast*						
	11Q1	11Q2	11Q3	11Q4	12Q1	12Q2	12Q3	12Q4	13Q1	13Q2	13Q3	13Q4
Canada												
Overnight	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.25	1.50	1.75	2.00	2.00
Three-month	0.93	0.93	0.80	0.82	0.91	1.05	1.10	1.30	1.60	1.80	2.05	2.10
Two-year	1.82	1.59	0.88	0.95	1.20	1.20	1.30	1.55	1.80	2.05	2.25	2.40
Five-year	2.77	2.33	1.39	1.27	1.57	1.60	1.85	2.00	2.20	2.35	2.50	2.65
10-year	3.35	3.11	2.15	1.94	2.11	2.10	2.20	2.35	2.50	2.60	2.80	2.90
30-year	3.72	3.53	2.83	2.50	2.64	2.65	2.75	2.85	2.95	3.05	3.30	3.50
United States												
Fed funds	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13
Three-month	0.09	0.03	0.02	0.02	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Two-year	0.80	0.45	0.25	0.25	0.33	0.25	0.25	0.25	0.40	0.50	0.55	0.75
Five-year	2.24	1.76	0.96	0.83	1.04	0.80	0.85	0.95	1.10	1.25	1.40	1.60
10-year	3.47	3.18	1.92	1.89	2.23	1.95	2.05	2.25	2.40	2.55	2.75	2.90
30-year	4.51	4.38	2.90	2.69	3.35	3.20	3.40	3.65	3.75	3.90	4.05	4.15

Unlike last year where RBC saw the Bank of Canada increasing the overnight rate to 3.0% by the end of 2012, RBC sees the over-night rate only increasing to 2.0% through 2013, while the 30 year LTC rate instead of increasing to 4.55% by the end of 2012 will only reach 2.85%, before gradually increasing to 3.50% by the end of 2013. In essence the RBC forecast puts off the return of Canada "back to normal" until after 2014, instead of 2012.This RBC forecast is broadly consistent with that of the Consensus that puts the ten year Canada bond yield at 2.57% twelve months out, so adding the current 0.57% spread for the 30 year bond implies a similar 3.14% long term Canada bond yield mid-way between RBC's 2012 and 2013 forecasts.

In terms of a fair ROE for NP, if I had been asked to testify in 2011 I would probably have used a forecast long Canada bond yield similar to that of RBC of an average of 4.50% for 2012. However, at the current point in time that forecast for 2013 would be considerably lower at about 3.50% for 2013. This is significantly below what we would expect at this stage of the business cycle with on-going 2% inflation.[14] In particular this forecast means a zero real rate of return for a taxable upper income investor, that is, a yield that is not compatible with normal markets.

Q. WHAT ABOUT THE U.S.?

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 two years of slower growth as this 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 a further bout of quantitative easing by the Federal Reserve. It is hardly surprising therefore that the Fed has announced that it is keeping the Federal Funds rate at 0.0-0.25% until the end of 2014.

Of importance is that currently long term US government interest rates (Treasuries) are yielding 0.71% more than equivalent maturity long Canada bonds, despite the impact of Operation Twist. Further RBC is forecasting that this gap will not narrow appreciably over the next two years so that at the end of 2013 it will still be 0.65%. Most estimates of the fair rate of return hinge on the long term government bond yield, since this is the only estimate of the expected rate of return that is objective. The evidence is that the more benign financial and economic conditions in Canada are forecast to lead to fair rates of return of 0.65-0.71% *less* than those in the United States. These fundamental differences in capital market conditions between the US and Canada mean that estimates from the US capital market cannot be used in Canada without making a yield adjustment. The fact is that the Canadian government has no trouble financing its operations borrowing at lower rates than the US government.

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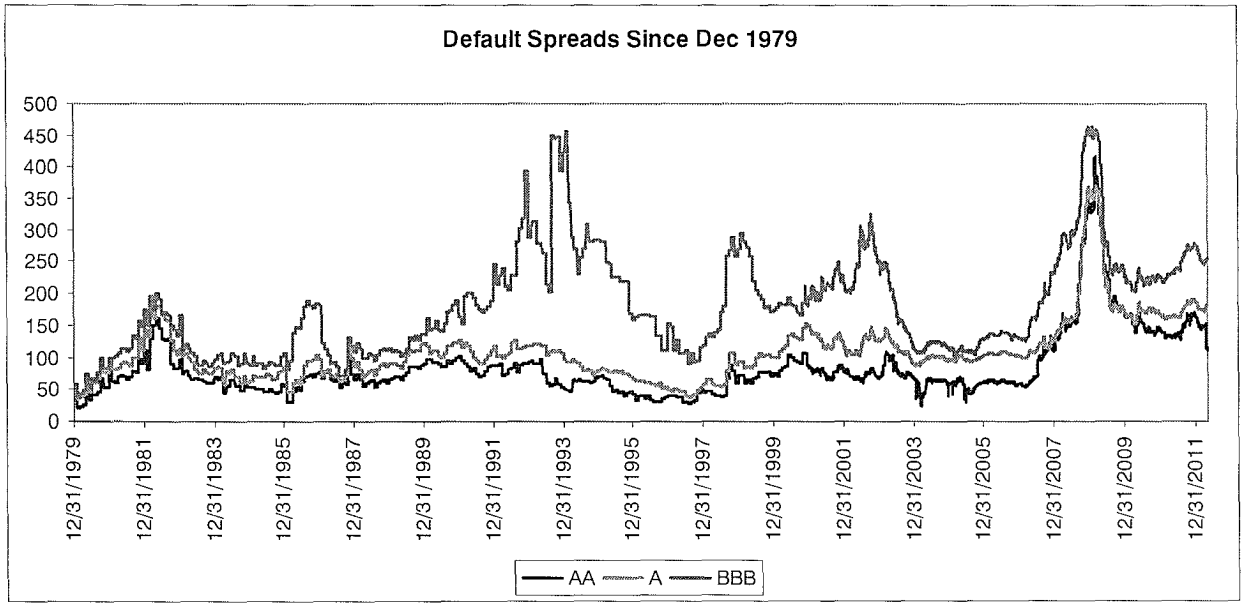
[14] In contrast German bonds have recently sold on negative real yields.

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

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



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.[16] Currently these

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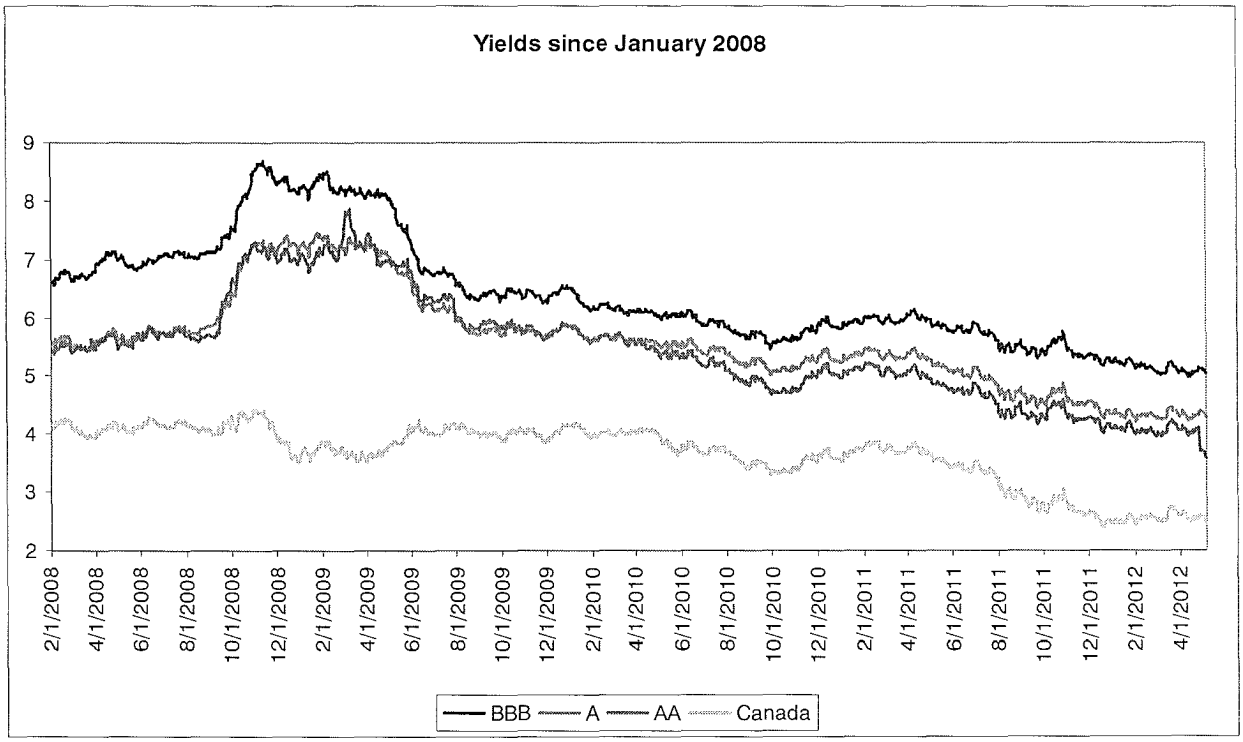
[15] The most recent data is from Datastream, which updates original data from Scotia Capital's Handbook of Debt Market Indices.

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

spreads have been backing up and the "A" spread now stands at 181 bps, a 30bps increase from the level it dropped to in mid-2010 and a still a very large 80 bps over what was regarded as normal. This 180 bps spread is very similar to the level at the time of my 2009 testimony; the difference is that at that time the spread was dropping rapidly, whereas now it has been stuck at that level for some time.

To see exactly what was happening during the financial crisis and how things have developed since then, the following graphs the yields themselves rather than the spreads since January 2008. What is clear is that prior to Lehman Brothers' failure on September 14, 2008, yields on corporate debt were slowly increasing whereas those on LTC bonds were not. However as the crisis developed post Lehman, LTC yields dropped, while corporate bond yields increased. This is the behaviour that prompted many of the ROE reviews on the argument that the ROE automatic adjustment mechanism tied allowed utility ROEs to the long Canada yield and implied falling ROEs at a time when their borrowing costs were increasing due to the increasing corporate bond yields. This "anomalous" behaviour continued through June 2009 and the stress tests of the US banking system, so that by the Summer of 2009 and my NP testimony it had largely disappeared.



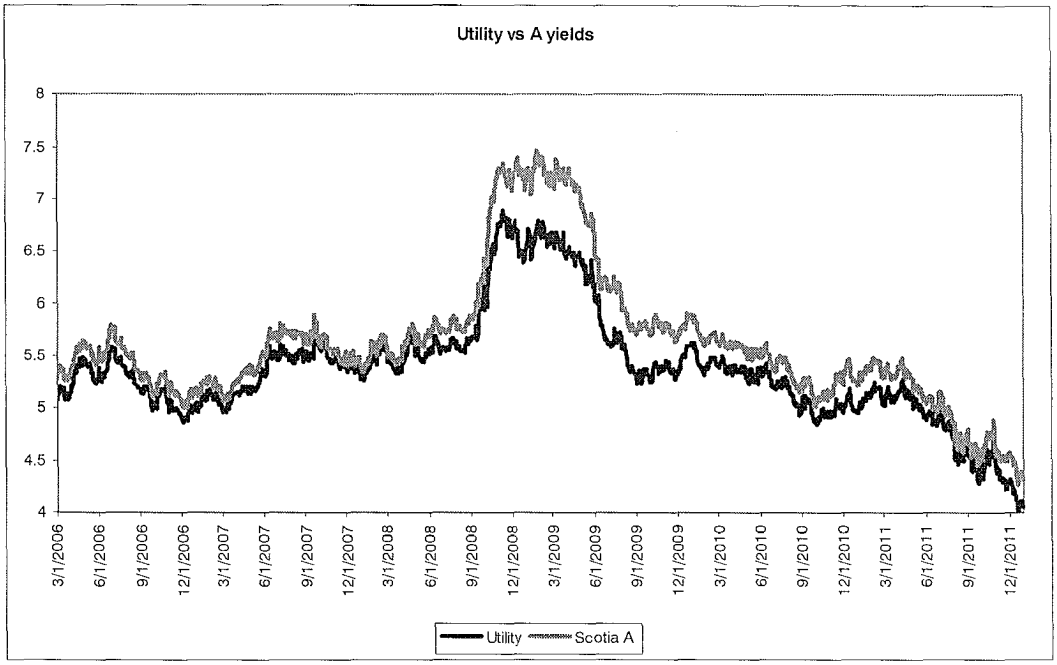
Since the Summer of 2009 yields on long Canada bonds as well as those on corporate debt have moved quite closely together such that "A" bond yields were at 4.28% on May 5, 2012.

It is also important to distinguish between generic spreads and utility spreads. In the OEB report on the cost of capital[17] the OEB decided to re-set the ROE based on changes in both the long Canada bond yield and the utility bond yield. For the utility bond yield they decided to use a series maintained by Bloomberg (series C29530Y). This is a synthetic series created by fitting yields from a series of utility bonds of differing maturities and working out the implicit yield on a long utility bond. The Bloomberg description follows.

> **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).

The following graphs the Bloomberg utility series and the yields on the Scotia Capital "A" bond index since the start of the financial crisis.

[17] EB-2009-0084



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 on 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.[18] 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.

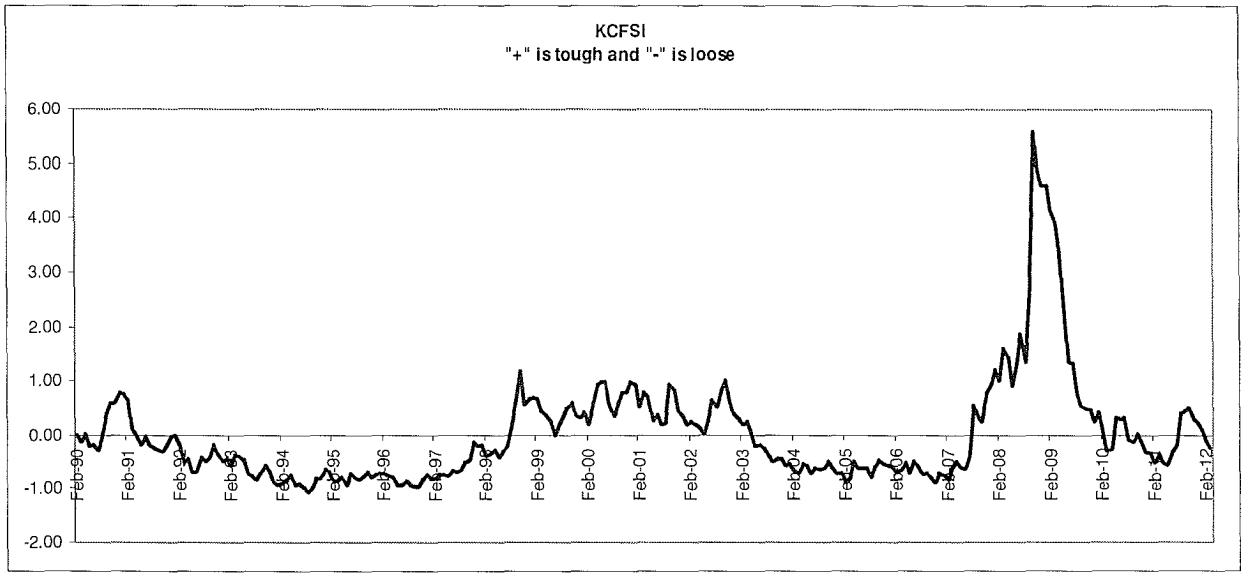
Q. WHAT HAS BEEN THE STATE OF CAPITAL MARKETS GENERALLY?

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

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

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.

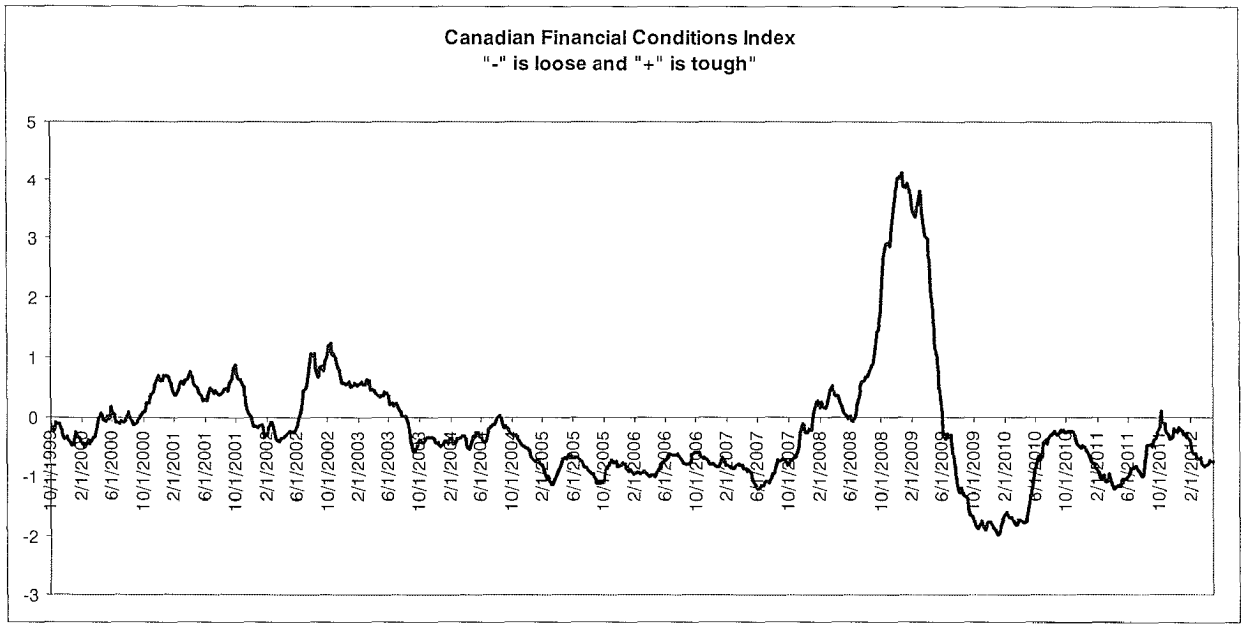


When the KCFSI is above 0 it indicates that capital markets are under stress; similarly when the KCFSI is below 0 it indicates relatively easy, "stress-free" capital market conditions.

The value of the KCFSI is simply that it captures in one number the impact of a variety of capital market indicators.[19] However, for our purposes its major insight 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 KCFS index started to back up in 2010 and has recently been around 0, indicating neither stress nor easy financial market conditions.

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

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,[20] which is graphed below.



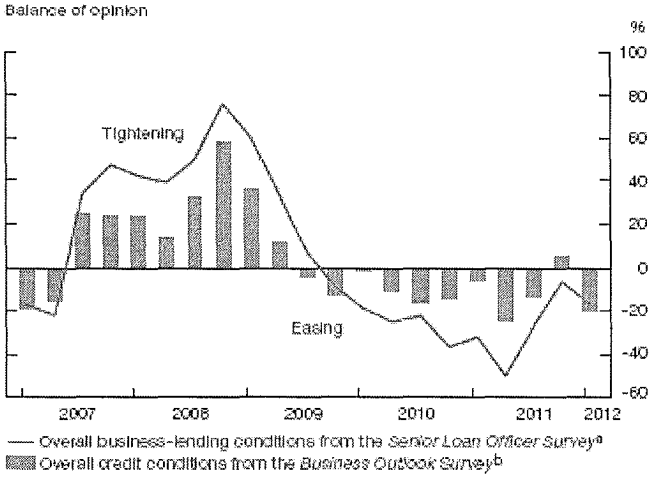
The Bank of Canada indicator similarly tracks the enormous stress in the financial markets during the financial crisis. However, unlike the KCFSI the index continues to reflect loose or easy financial market conditions, primarily due to the better health of the Canadian banking system.

The performance of the Canadian index mirrors the assessment of the Bank of Canada in its Financial System Review (December 2011), where it indicated that credit conditions were little changed in Canada in Q3 2011. The graph below supports that assessment with recent data from the Monetary Policy Report (April 2012) showing that credit conditions for Canadian firms remain relative easy. At the time of the 2009 hearing we were just coming off dramatic tightening in credit standards and conditions, whereas for the last few years conditions in Canada have been relatively easy. This is in marked contrast to credit conditions elsewhere in the world

[20] 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

where banks are still selling off existing loans and restricting new loans in order to rebuild their capital levels to meet new higher prudency standards imposed by the bank for International Settlements.[21]

Chart 18: Survey results suggest that credit conditions for Canadian firms began to ease again in 2012Q1



a. Weighted percentage of surveyed financial institutions reporting tightened credit conditions minus the weighted percentage reporting eased credit conditions
b. Percentage of firms reporting tightened credit conditions minus percentage reporting eased credit conditions

Source: Bank of Canada — Last observation: 2012Q1

In terms of the business cycle in 2009 we were at the very start of the recovery. Now three years later we are still recovering, since the pace of recovery in Canada has been limited by the very weak recovery in the United States and Europe. What has helped Canada has been a strong banking system, high commodity prices and stable government finances. However, serious problems persist in the sovereign debt markets while austerity measures that currently exist in Europe and must soon exist in the United States will restrict the pace of economic growth.[22] This

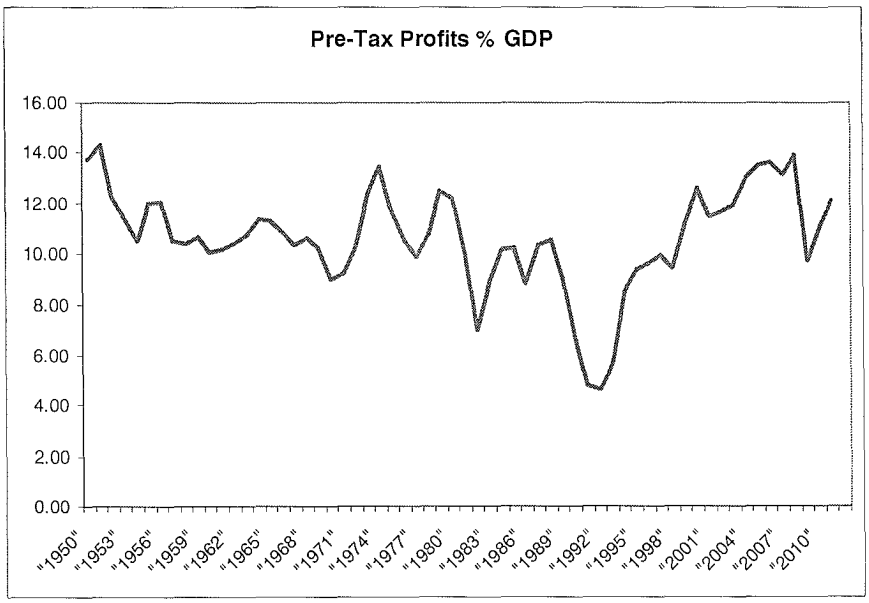
[21] The BIS "Basel 3" standard imposes much higher common equity (approximately 3X previous levels) supporting loans and new liquidity requirements, that is, holding low earning, largely, government securities as a buffer. The combination of both means less bank lending.

[22] Currently a number of tax measures in the US will expire unless Congress comes up with some form of consensus, which is difficult in an election year and with such dissension in Congress. The Economist (November 26, 2011) indicated that expiring tax cuts in the US could amount to 2.6% of GDP and the Bank of Canada estimates this could knock a similar amount of what would otherwise be strong US growth in 2013.

means that we will continue to see periodic "flights to quality" as investors fret about the sustainability of the US recovery and the possibility of sovereign debt restructurings. Consequently, while the stress in the financial system is much reduced, corporate spreads over LTC yields are still about 80 bps higher than one would expect almost three years into a "recovery" while those yields themselves are at unsustainably low levels.

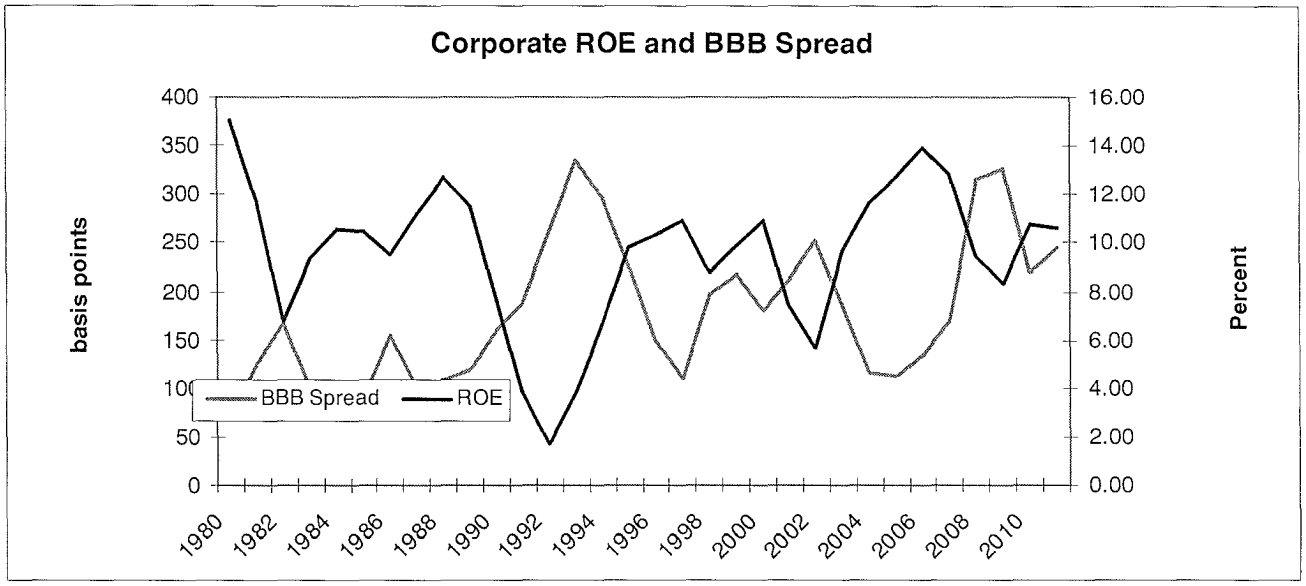
Q. HOW DOES THE STATE OF THE ECONOMY AFFECT PROFITS AND THE CAPITAL MARKET?

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.

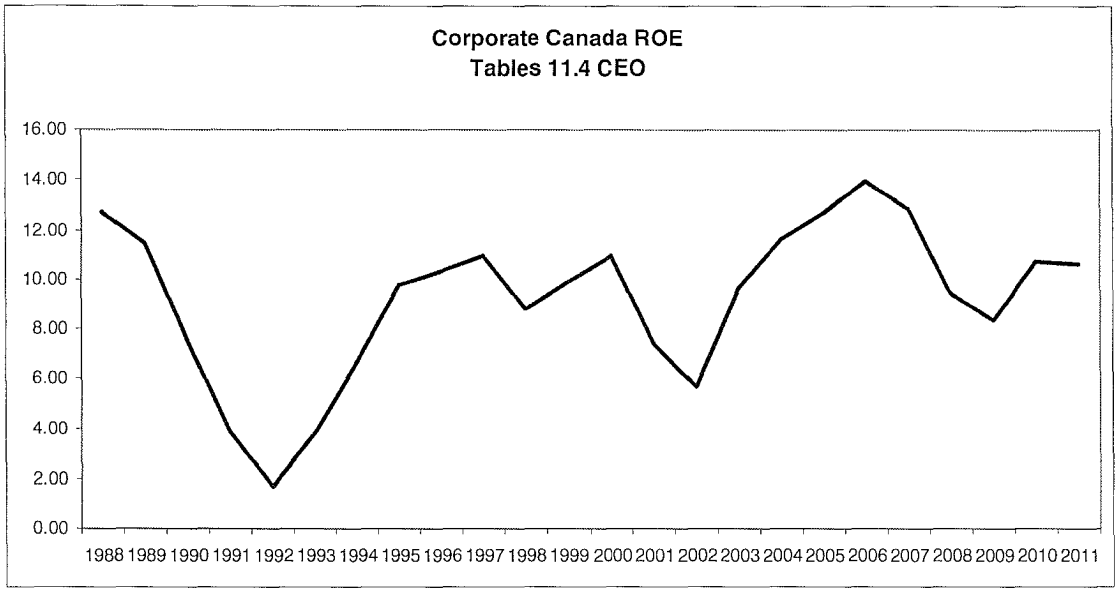


The graph shows that as of 1980 the average ROE was 15.05% and the corporate yield spread was very low at just over 50 basis points. "Corporate Canada's ROE" then declined during the 1982 recession and investor fears over the recovery of their investments caused the yield spread to widen. The ROE then 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 YOUR PROFITABILITY DATA HAVE ANY IMPLICATIONS FOR THE FAIR ROE?

A. Yes. The stage in the business cycle affects the level of corporate profits. However, expressing profits as percentage of GDP isn't useful for indicating what firms typically earn as ROEs. Below I graph the Statistics Canada ROE estimate 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.[23]

[23] 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.

One yardstick of a fair ROE often suggested by company witnesses is the rate of return earned by other companies, usually called "comparable earnings." It is not supported by either economic reasoning or legal precedents in Canada.[24] However, the Statistics Canada ROE data indicates that the typical firm earns an ROE of less than 10% and is subject to much more risk than NP.

[24] And not used by Dr. Vander Weide.

IV FAIR ROE ESTIMATES

Q. THE BOARD HAS TRADITIONALLY PUT PRIMARY WEIGHT ON ESTIMATES FROM THE CAPITAL ASSET PRICING MODEL CAPM, IS THIS JUSTIFIED?

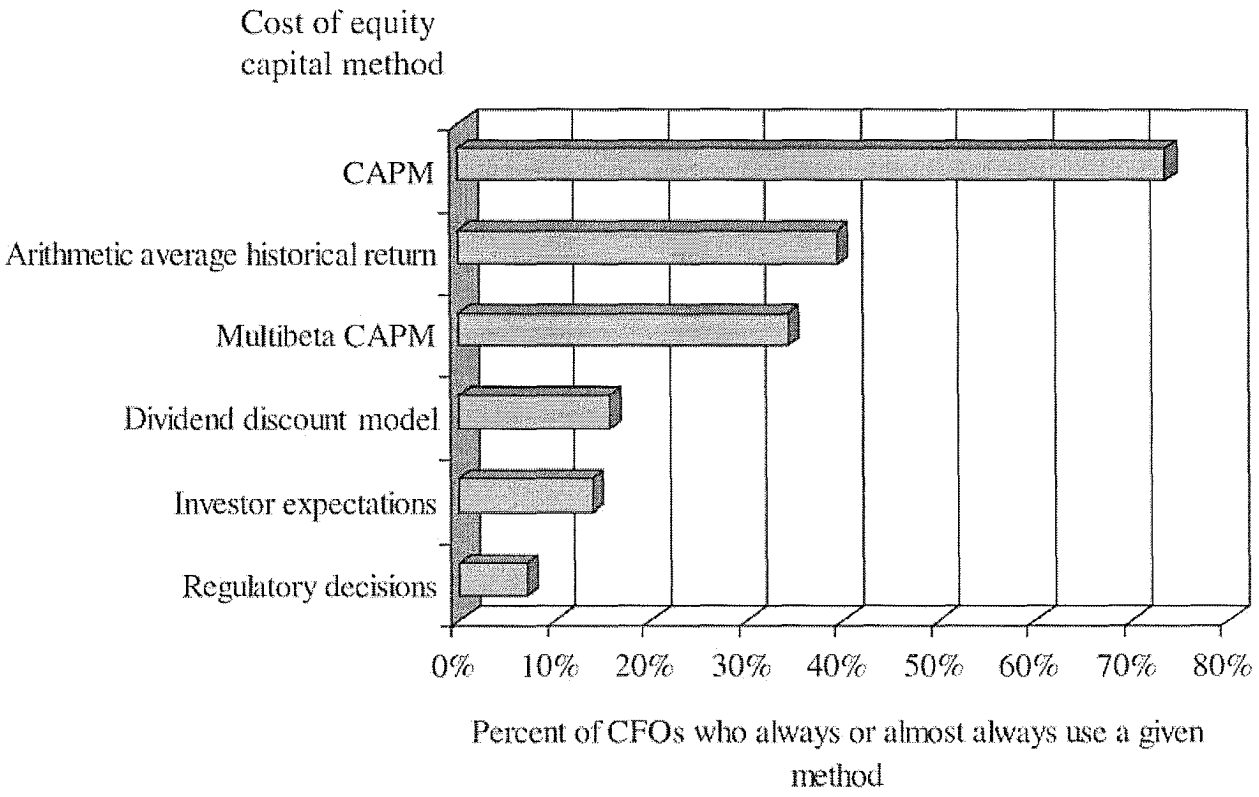
A. Essentially, yes. The CAPM is the most common risk premium model it simply says,

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

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

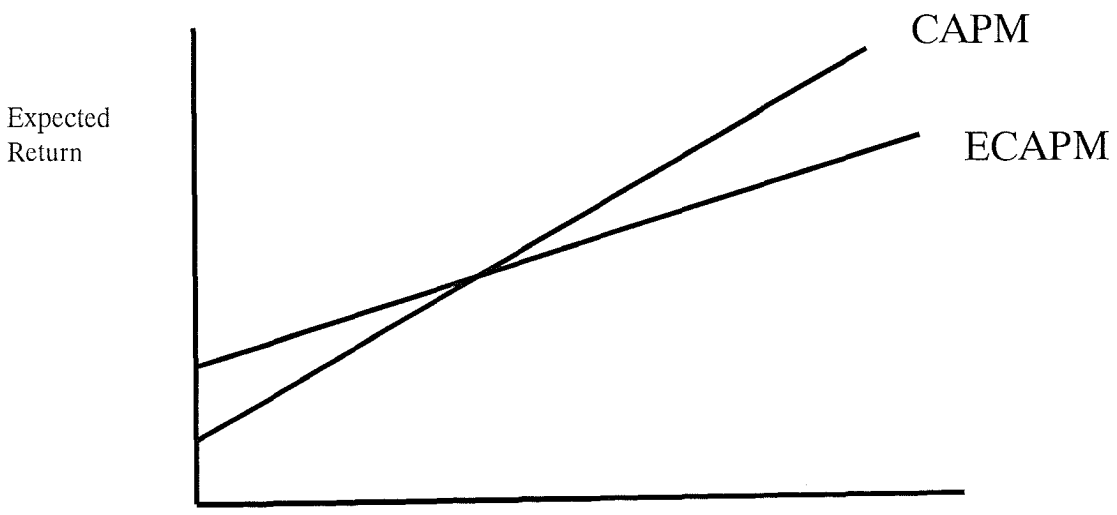
Why the CAPM is so widely used is because it is intuitively correct. It captures two of the major "laws' of finance: the ***time value*** of money and the ***risk value*** of money. I will discuss the third law of finance the ***tax value*** of money later, but the time value of money is captured in 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 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.

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 usually use.

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 experts 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 I do not think that it is 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 adjustment model appropriate for a typical or average stock due to Marshall Blume.[25] 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 1.06% 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 2012 at about 3.00% the use of a long Canada bond yield as

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[25] 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 about 2.00% over a "normal" ECAPM estimate, so the need for any further adjustment is moot. 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 1.06% + 0.03*MRP, with an MRP of 5% this indicates a fair return of 1.21%, which I don't think anyone would accept as fair!

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 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 the 4.50% forecasted long term Canadian bond yield for 2012, I would judge a CAPM fair return to be 6.75%-7.80%. If I use the forecast 3.50% for 2013 the CAPM fair return is 1.0% less or 5.75%-6.80%. I would then add a normal floatation cost adjustment of 0.50% to get a fair ROE range of:

Simple CAPM Estimates

2012: 7.25%-8.30% *fair ROE 7.75%*

2013: 6.25%-7.30% *fair ROE 6.75%*

Q. DO YOU USE THIS SIMPLE CAPM ESTIMATE FOR YOUR ROE 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 normal 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.

For example in a 2009 Gaz Metro decision, while the Regie (Paragraph 289) specifically stated that it regarded the CAPM as being the most appropriate model for determining a reasonable rate of return, also presented the following table to show how it arrived at its fair ROE for Gaz Metro (Paragraph 2956):[26]

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 forecast for 2012 as of the Summer of 2011. The Regie then increased the range by 0.75% - 1.40% for

[26] Note this is a direct extract from the Regie's decision and contradicts NP's statement (CA NP011-13) that the Regie did not make an explicit reference to an extra risk premium for Gaz Metro.

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%.

In its 2009 decision, this Board also based its allowed ROE for Newfoundland Power (NP) on the CAPM.[27] 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.

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[27] Order P.U.43(2009)

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)

> 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. This higher risk ranking reflected the BCUC's assessment of TGI's increased business risk.

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 similar to this Board's 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.

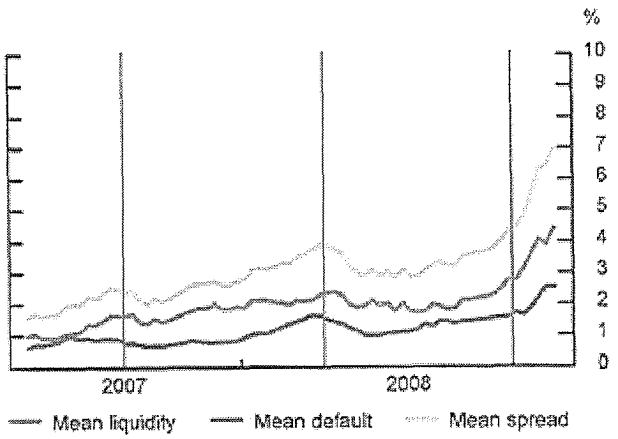
Q. DO YOU AGREE WITH A CREDIT SPREAD ADJUSTMENT?

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 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[28] looked at Canadian US$ 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)

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

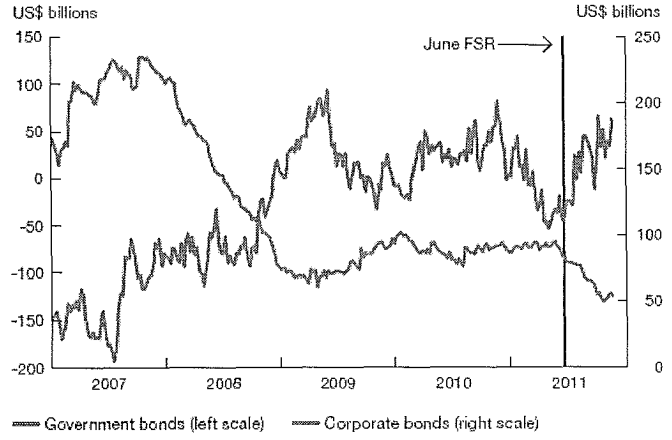
"our results show that for investment grade firms, the majority of the spread corresponds to liquidity: on average, the liquidity component accounts for 63% of the spread."

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 makes no sense 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.

Of interest is that Ms. McShane implicitly accepts this judgment, In CA NP053 she acknowledges that Fortis issued 11.7 million shares in December 2008 right in the middle of the worst of the financial crisis between September 2008 and March 2009. However, she also acknowledges (CA NP052) that utilities had trouble accessing the debt markets and generally had to issue shorter term debt. The obvious conclusion is that debt and equity markets behaved differently during the financial crisis and there is not a one to one transfer from corporate credit spreads to the equity market.

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

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 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%" I have been recommending a 50% adjustment to changes in corporate (utility) yield spreads to pick up this credit market effect.

This policy is similar to that adopted by the Ontario Energy Board, which was concerned that the fair ROE should be accurate throughout the business cycle. The OEB stated (Decision EB-2009-0084, page 29)

> "As such, it is not sufficient for a formulaic approach for determining ROE to produce a numerical result that satisfies the FRS[29] on average, over time. The Board is of the view that each time a formulaic approach is used to calculate an allowed ROE it must generate a result that meets the FRS, as determined by the Board using its experience and informed judgment.

My reading of the OEB decision is that rather than simply suspend their ROE adjustment formula, or provide a short term bonus, the OEB sought the "holy grail" of a formula that could even handle the worst financial crisis since 1937. To do this the OEB adopted an ROE formula that varied the allowed ROE with changes in the utility yield spread over that for long Canada bonds as well as changes in the forecast long Canada bond yield. The OEB uses a 50% adjustment to both changes, which essentially means a 50% adjustment to changes in the forecast utility bond yield, rather than the long Canda bond yield.

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[29] FRS means the fair return standard

Since 2010 I have been recommending a 50% adjustment to corporate credit spreads to the fair ROE. The basis for this is simply that the market risk premium estimates are largely long run averages and are relatively insensitive to current capital market conditions. 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 181 bps or 81bps more than normal or average for the business cycle, this would indicate that the fair ROE should increase by 0.40%. This adjustment in turn is very similar to that allowed regulators during the financial crisis over their normal CAPM estimate.

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 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

0.59% we actually see (2.59% 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.

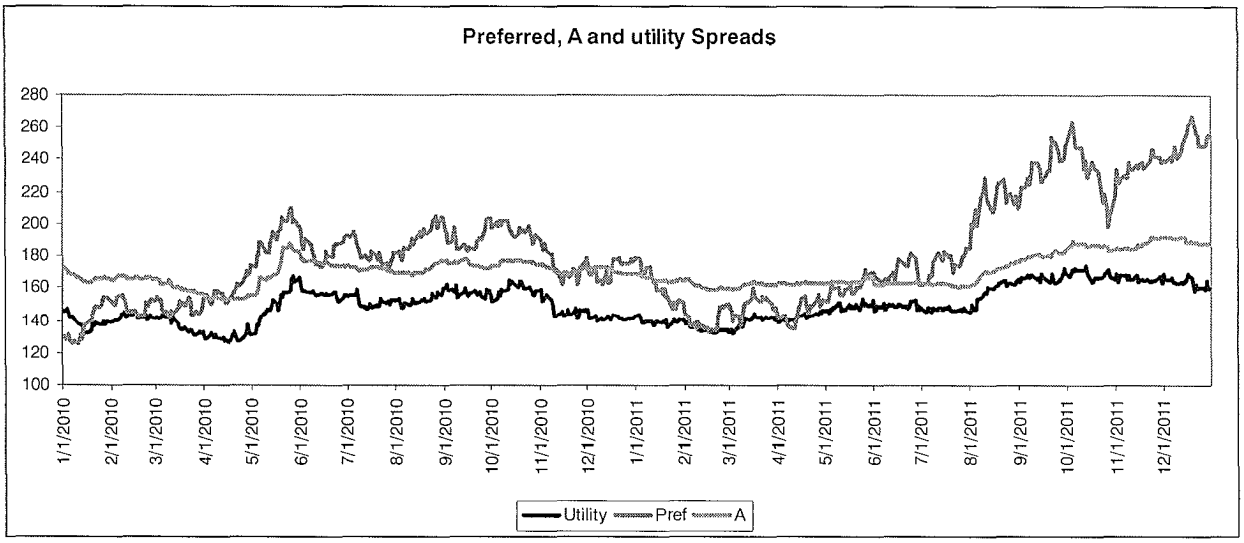
This tax effect is well known in capital markets. BMO-Nesbitt-Burns used to produce a Preferred Share Quarterly that tracked the performance of the preferred share market. In their June 2004 issue Nesbitt Burns provided the following yields:

	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 "normal" 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 of the Bloomberg utility and 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 250, whereas the utility spread has only increased from 145 to 160 bps and the generic A spread from 172 to 180bps. I would therefore place the "Operation Twist" impact on the Canadian bond market as approximately 80 bps, which is approximately the spread increase since September 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 0.80% to produce a fair ROE in a range

CAPM Estimates

2012: 7.65%-8.70% *fair ROE 8.15%*

2013: 7.45%-8.50% *fair ROE 7.95%*

For the 2012 estimate this is my simple CAPM estimate increased by 0.40% for the corporate credit spread adjustment. There is no "Operation Twist" 0.80% adjustment, since I used the 4.50% forecast LTC yield of June 2011 and at that time there was no significant Euro crisis or Operation Twist impact.

For 2013 my simple CAPM estimate is increased by both the 0.40% corporate credit spread adjustment and the 0.80% Euro Crisis and Operation Twist adjustment.

Q. HAVE YOU MADE SIMILAR RECOMMENDATIONS BEFORE?

A. Implicitly yes, but the full implications of Operation Twist have only recently been evident. However, at the end of 2011 the Consumer Advocate asked me to comment on a request by NP that its allowed ROE be maintained at 8.38% as a placeholder for 2012, rather than adjusted downwards to 7.85% by the application of the Board's ROE adjustment model. I agreed with this request and cited the implications of my new model with a credit adjustment and the decline in expectations surrounding the long Canada bond yield. Although I regarded 7.85% as reasonable in the sense of being within a reasonable range, I did not think it fair compared to other allowed ROEs and felt that the Board should hear evidence.

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 9.1-9.5% in Canada and somewhat higher at 9.0-10.0% in the US. With forecast long Canada bond yields at 3.0-3.5% plus my 0.80% preferred share adjustment this means a market risk premium of just over 5.0% broadly consistent with the historic earned market risk premium in Canada. Similarly for the S&P gas and electric index the historic utility risk premium is 2.68%-3.26% again this is broadly consistent with my 2.25-3.30% range derived from my CAPM estimate for Canadian utilities. I also show how unreliable DCF estimates are when estimated from analyst growth forecasts that are known to be biased.

I tend to view 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,[30] referred to as the DCF model in most testimony before regulatory bodies, is as follows:

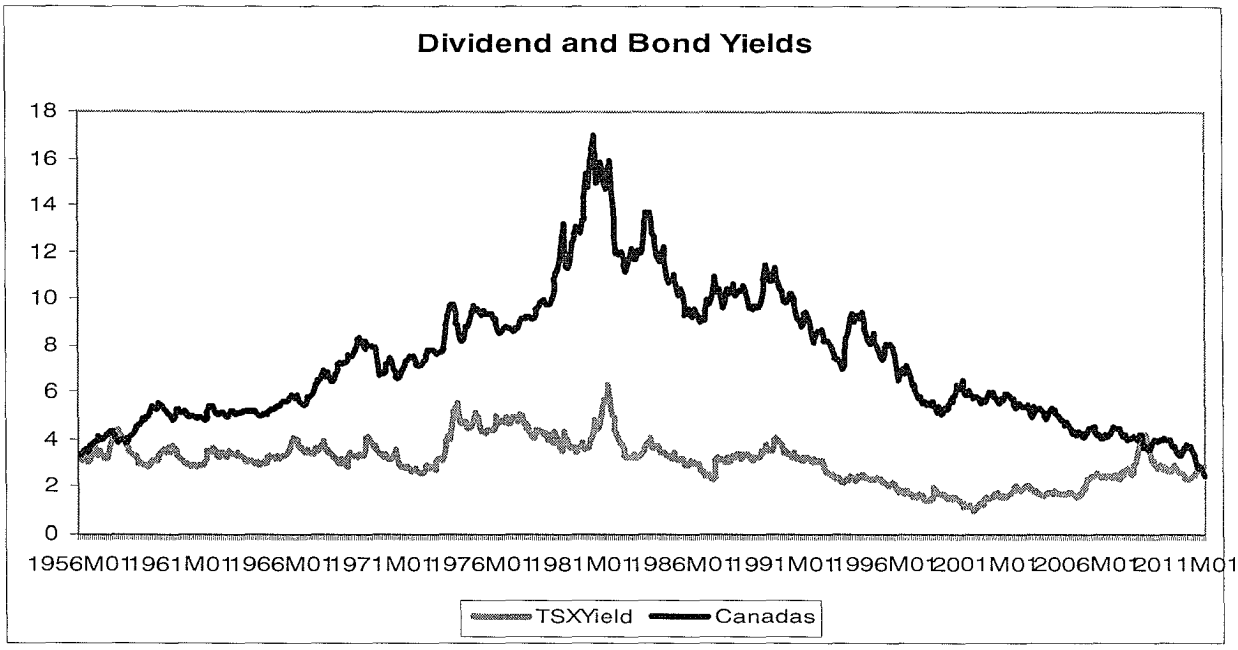
$$K = \frac{d_1}{P} + g$$

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.

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

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

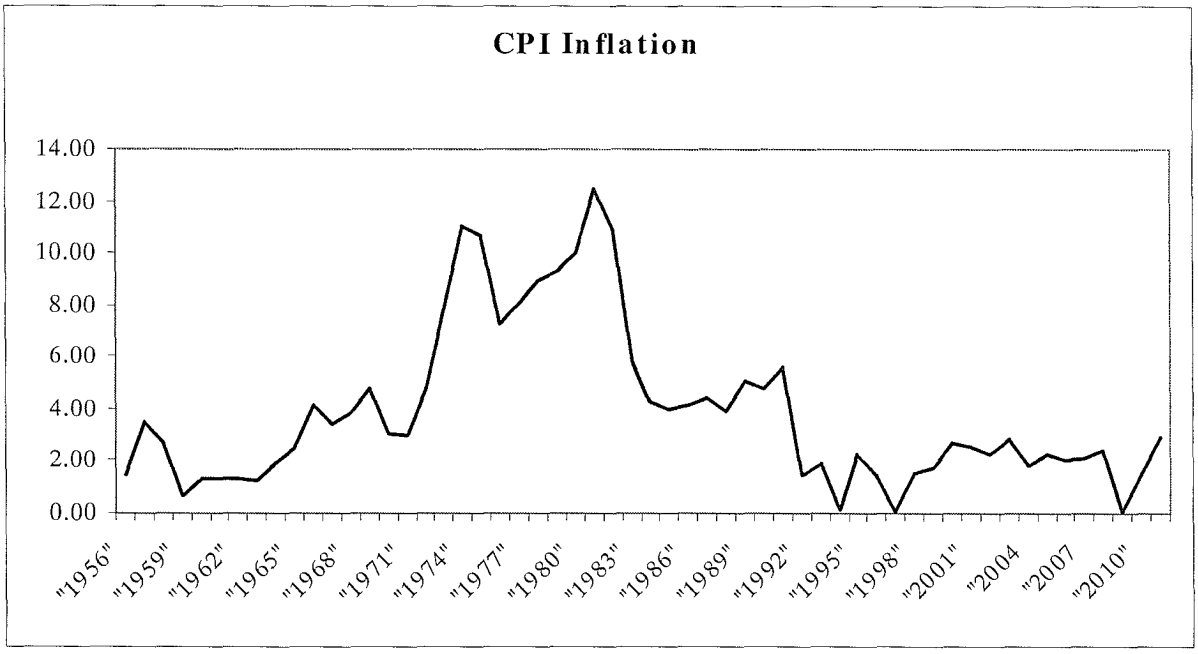
yield.



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

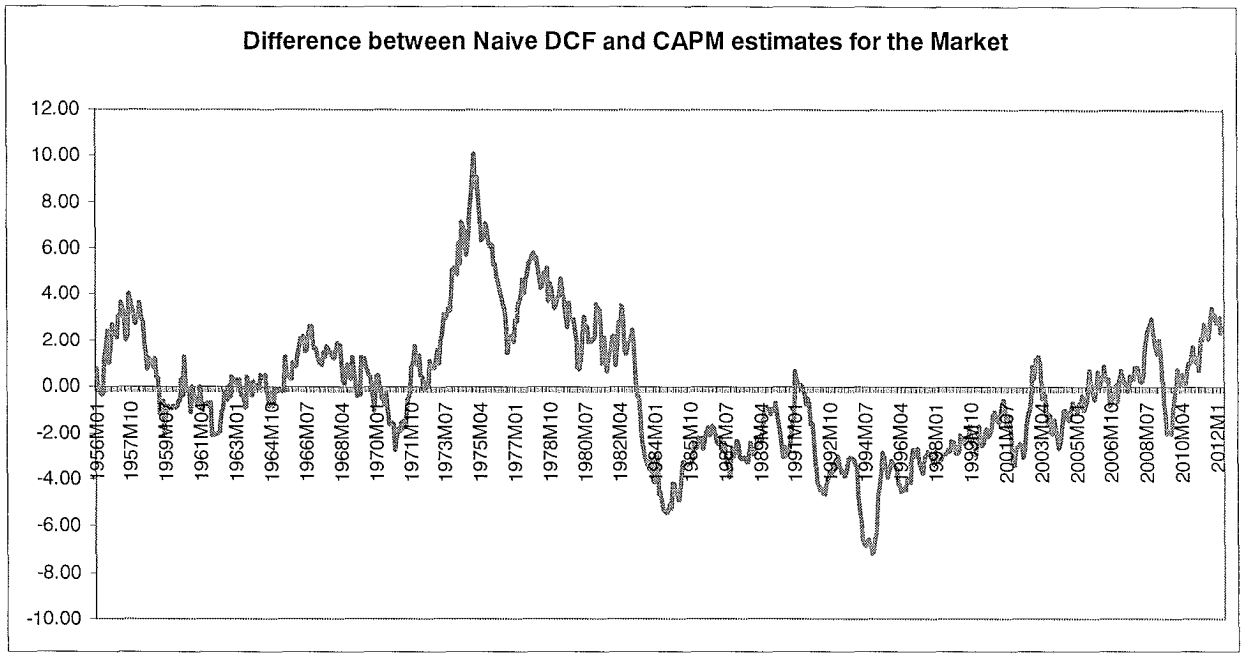
$$CAPM - DCF = R_F - {}^{d_1}/_{P} = g - MRP$$

Or in words the directly observable spread between the long Canada bond yield and the TSX dividend yield is equal to the long run growth in the dividends 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. This indicates that it is possible to come up with a simple or naïve estimate of the market return by adjusting for these obvious biases. 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 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.

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 differences were 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 with 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 yields in the 1970s and 1980s and high real 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 the CAPM. Currently the TSX dividend yield is 3.04% and the projected year over year inflation rate is 2.00%, so with the 3.5% real growth rate the simple DCF estimate is 8.60%.[31] Similarly with the current long Canada yield of 2.59% and a 3.5% market risk premium the simple CAPM estimate is 6.09%. As a result, there is currently a significant difference between the two which is the last few positive difference observations in the graph indicating a higher DCF than CAPM estimate for the market expected return. This assessment confirms the current problems in the bond market due to Operation Twist and where we are in the business cycle.

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. Currently, using a forecast LTC yield of 3.00% to 3.50% and my current Canadian market risk premium estimate of 5.0% I would judge the CAPM estimate of the market return of 8.30% to be marginally low, but if I had used the 3.5% that "fits" the historic data it would be unrealistically low, whereas the current naïve DCF estimate of 8.60% is more reasonable. This exercise simply shows the importance of doing cross checks to make sure the estimates are consistent as well as understanding the economic forces that generate them.

[31] This is 1.0304*1.02+.035

VI: US ESTIMATES

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

A. The recommendations of both Ms. McShane and Dr. Vander Weide are heavily based on US utility holding companies 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 regulated 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 Schedule 8 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[32]

> *"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

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[32] Canwest news service, November 14, 2008

equity and 10% total capital for the Canadian banks, whereas the Bank for International Settlements requirements are for a minimum of 4% and 8% respectively. Further, the Canadian banks significantly exceed these minimums with the Royal Bank of Canada, for example, recently at just under 10% for common equity and 13% for total capital.[33] OSFI has also enforced the latest Basel 2 standards that use more refined risk weights for different banking assets. In contrast, the US has yet to adopt Basel 2 for all its banks and generally its banks operated with far less capital, which is partly why they experienced such disastrous results, These differences are symptomatic of basic cultural differences between the US and Canada.

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.[34]

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?

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

[34] The efforts of the BCUC in protecting Pacific Northern Gas are a classic example.

A. Yes. Moody's is one of the two major US bond rating agencies and in a major review of its rating methodology[35] it cited three major factors that determined how it rated the supportiveness of regulation. These were (paraphrasing)

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

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.[36] 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,

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

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

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

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) 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.[37]

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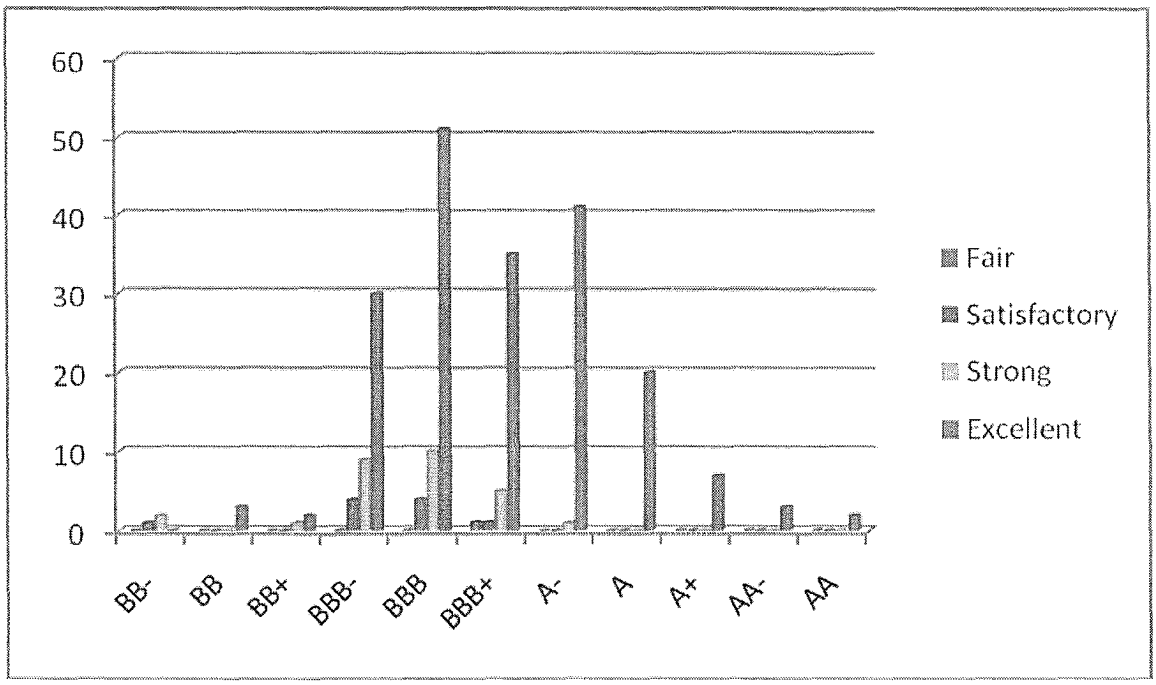
[37] I use A and BBB generically without modifiers. S&P will not rate a sub higher than its parent unless it is ring fenced, that is, insulated from a raid by its poorly rated parent. Enron raided its subs to the tune of $2 billion when the parent ran into trouble.



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.

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

A. Yes. S&P has been concerned for sometime 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[38]

> "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."

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

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

> "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 commission, 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.

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 this Board as well as the BCUC and the Regie indicate that a sample of US "comparables" can not 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 its July 19, 2011 credit assessment on NP 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 explictly stating the US this time) plus points out that the lower allowed ROE is offset by NP's higher common equity ratio. Typically less financial leverage reduces financial risk and is used as an offset to higher business risk so the overall risk is similar to that of a benchmark

utility and they can all get the same allowed ROE.[39] In NP's case, the lower financial risk is for a utility that is already average in terms of business risk, so an overall lower allowed ROE is warranted as Moody's implies.

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

A. If the US market risk premium is 1.0% higher than in Canada, and US and Canadian utilities had equal relative risk coefficients of 0.50 then that would warrant a 0.50% difference in their ROEs. When this is added to a 0.70% higher forecasted long Treasury yield (compared to LTC Canada yield) then you have a 1.2% 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 I am using for a Canadian benchmark,[40] then the difference in the fair ROE between Canadian and US utilities would be significantly greater than 1.0%. This assessment will vary over time but a 100 bps higher ROE for a US utility seemed reasonable.

Q. DO YOU HAVE ANY FINAL COMMENTS ON US UTILITIES?

A. Yes. At Schedule 3 are the recent earned ROEs for US electric companies, gas companies and combination gas and electric companies generally as of Q2 2011 and as reported in the December 2011 AUS Monthly Utility Report. The data is provided to illustrate the wide range in earned ROEs by US utilities and should be compared to the fact that Canadian utilities generally have a long history of over earning their allowed ROEs. Of interest is that several of these utilities are included in the normal sample of utilities used by Ms. McShane and other witnesses appearing on behalf of utilities. The data confirms the general observation that US utilities have much more short run risk than Canadian utilities, that is, Canadian utilities have more regulatory protection.

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[39] This is the traditional policy of both the National Energy Board and the Alberta Utilities Commission.

[40] Note utility experts before this Board use a carefully screened sample of lower risk US utilities to compare to the Canadian universe. It is always possible to find a low risk company somewhere to compare to Canadian firms. In fact there is no reason to limit it to the US, except that is the data that US witnesses have available to them. The question is whether US investors in a riskier capital market recognise this lower risk.

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[illegible]

SCHEDULE 2

CANADA BOND YIELDS

Overnight money market rates		1.00
Benchmark bonds		
Canada	91 day Treasury Bill yield	1.06
Canada	Six month Treasury Bills	1.15
Canada	One year Treasury Bills	1.32
Canada	Two year	1.31
Canada	Three year	1.41
Canada	Five year	1.58
Canada	Seven year	1.70
Canada	Ten year	2.02
Canada	Long term (30 year)	2.59
Canada	Real return bonds	0.55
Marketable Bond Average yields		
Canada	1-3 year	1.32
Canada	3-5 year	1.51
Canada	5-10	1.81
Canada	Over tens	2.49

Source: Bank of Canada's web site at http://bankofcanada.ca/en/securities.htm, for May 3, 2012.

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

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),

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"The Influence of Production Technology on Risk and the Cost of Capital," Journal of Financial and Quantitative Analysis (March 1991),

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"The Cost of Equity Capital and Fair Rate of Return on Equity (ROE) for a Canadian Utility" Canadian Regulation, Gordon Kaiser (Editor) 2011.

TESTIMONY

Expert financial witness (individually & with the late Professor M.K. Berkowitz) in rate hearings for Altalink partners, ATCO Gas (South), ATCO Pipelines (South), ATCO Electric, Bell Canada, Consumers Gas, Teleglobe, Maritime T&T, Island Tel, BC Tel, AGT, Newfoundland Tel, Union Gas, Ontario Hydro, Centra Gas Ontario, NB Tel, Northwestel, Pacific Northern Gas, BC Gas, West Kootenay Power, TransCanada Pipelines, TransEnergie, Trans Mountain Pipelines, IPL, Westcoast Energy, Nova Gas Transmission, Foothills Pipeline, TQ&M, ANG, and Centra Gas Manitoba.

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.

Ph.D SUPERVISOR:

George Pink, A Dominance Analysis of Canadian Mutual Funds, 1988,

Greg Lypny, An Experimental Study of Managerial Pay and Firm Hedging Decisions, 1989,

Frank Skinner, Credit Quality Adjustments and Corporate Bond Yields, 1990,

Rui Pan, Probability Analysis of Option Strategies, 1994,

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Bin Chang, Information in Financial Markets, 2008

Ambrus Kesckes, Three Essays on IPOs, 2008 (Co-chair with Jan Mahrt-Smith)

Jun Zhou, Industry Influences on Corporate Financial Policy, 2010.

CASE WRITING:

A fair rate of return for Bell Canada, 1986.
Canvend 1984, A & B, 1988.
Peoples Jewellers, 1988.
Great Lakes Forest Products A, 1989.
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Peoples acquisition of Zale, 1990.
American Can Canada, 1990.
Great Lakes Forest Products A, 1993 (with W. Rotenberg)
BC Telephone, 1993
103 Kirsten Avenue, 1994
Great Lakes Forest Products B, 1994 (with W. Rotenberg)
Mill Creek Jewellery,1995 (With E. Kirzner)
Chapters, draft 2002.
Second Cup Valuation, draft 2002.

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
Programme Committee Member, Global Finance Conference, 2006.
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.

February 2012

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 compound rate of return earned on an investment approaches that of the compound return. In estimating the market risk premium, I believe that the correct time period for calculating arithmetic rates of return is a **one-**year holding period. The reason for this is primarily because most regulated firms are regulated on the basis of annual rates of return and rates are almost always expressed as annual percentages.

In addition to the arithmetic and compound rates of return I also estimate the arithmetic rate of

return by means of an ***ordinary least squares*** regression model. This is a statistical technique that estimates the annual rate of return by minimising the deviations of the annual values around the estimate. Ordinary least squares (OLS) is the standard technique for estimating economic models and is commonly used for estimating other annual growth rates, such as the growth rate in dividend growth models.

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.

In 1994 the National Energy Board introduced its formula ROE with a forecast long Canada bond yield of 9.25% and a utility risk premium of 3.0%. The real yield on the long Canada bond was about 7% using the difference between the long Canada bond and expected inflation versus 5% using the real return bond. The difference reflected the market's scepticism that the government would not simply inflate itself out of its financial troubles. This allowed ROE then adjusted by 75% of the change in the forecast long Canada bond yield or conversely the utility risk premium changed by 25% of the change in the forecast long Canada bond yield. If the forecast long Canada bond yield is 3.25%, for arithmetic simplicity, then this 6.0% drop in the long Canada bond yield has increased the utility risk premium by 1.50%. With a utility beta of 0.50 this implies a 3.00% increase in the market risk premium since the early 1990s, consistent with the low market risk premium during this period of fiscal deficits.

On the other hand, the regression model in Schedule 6 indicates that long Canada bond yields would probably be about 6.0% if Canada were still a segmented from the rest of the world. In this case using a forecasted long Canada bond yield of 6.25% for simplicity, the 3% drop in long Canada bond yields would only have increased the utility risk premium by 0.75% and the market risk premium by 1.5% over this "correct" long Canada bond yield. In this case the market risk premium over the current globally depressed long Canada bond yield should be increased by approximately 4.50%; that is, by 3% to offset the current depressed long Canada bond yield and

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

another 1.5% for the inverse relationship between interest rates and the market risk premium.

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.

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.

[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.

[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.

- 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 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

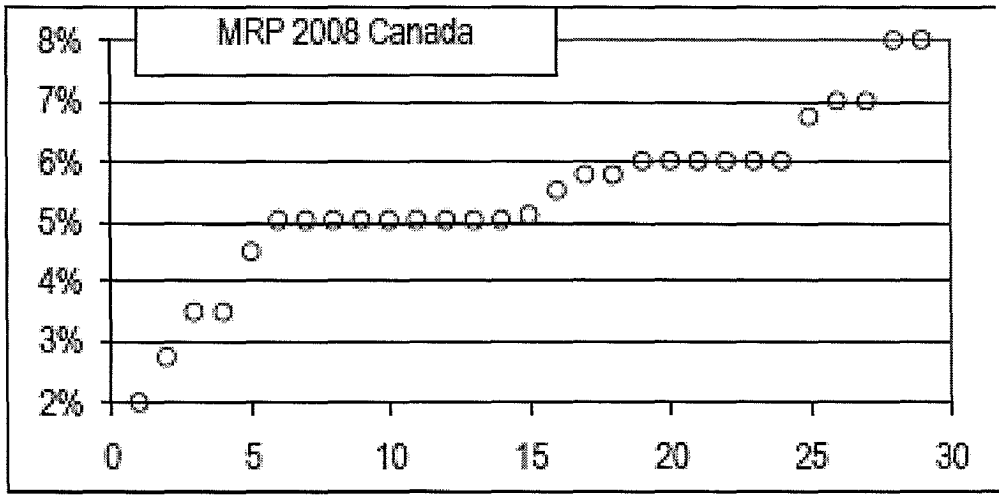
8 For the last six months the yields have been very similar.

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%. The following table indicates the range of estimates for Canada.



As is clear most finance faculty in Canada think the market risk premium is either 5.0% or 6.0%. There are a few down at 2% or 3% and even two people up at 8.0%. However, what is absolutely clear is that my arithmetic mean (AM)estimates are typical of estimates of Canadian faculty who

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

work in the area and are not "low," quite the opposite they are consistent with professional judgement in Canada and the US.

Professor Fernandez followed up this survey with another one in 2010 to professors of finance, financial analysts and companies, where he specifically asked for the market risk premium used in estimating the required or fair rate of return on equity.[10] For the financial analysts, whose profession is valuing companies and recommending stock purchases, Fernandez reported the following result from 601 analysts:[11]

Table 2. Market Risk Premium used in 2010 by 601 analysts

		USA & Canada	Euro	UK	Other	Sum
MRP used in 2010	Average	5.1	5.0	5.2	6.3	
	St. dev.	1.1	1.3	1.4	2.2	
	MAX	10.0	11.9	10.0	25.0	
	Q3	5.5	5.5	5.7	7.0	
	Median	5.0	5.0	4.5	5.9	
	Q1	4.5	4.0	4.0	5.0	
	min	2.5	3.0	3.5	0.7	
	Number	104	197	31	269	601

The average for the US and Canada was for a market risk premium of 5.1% with the median slightly less at 5.0%.

Similarly the result from 901 companies was:

Table 6. Market Risk Premium used in 2010 by companies

		USA	Euro	UK	Other	Sum
MRP used in 2010	Average	5.3	5.7	5.6	7.5	
	Median	5.0	5.5	5.5	7.0	
	St. dev.	1.8	1.5	1.8	3.2	
	MAX	11.2	12.1	10.0	22.5	
	min	1.9	3.0	1.3	3.0	
	Number	205	543	30	123	901

In this case the average was slightly higher for the response from US and Canadian companies at 5.3%, but the median was the same at 5.0%.

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10 Market risk premium used in 2010 by Analysts and Companies: a survey with 2,400 answers" Pablo Fernandez, IESE Business School, May 17, 2010.

11 Unlike his earlier survey, Fernandez pooled the data for the US and Canada in 2010.

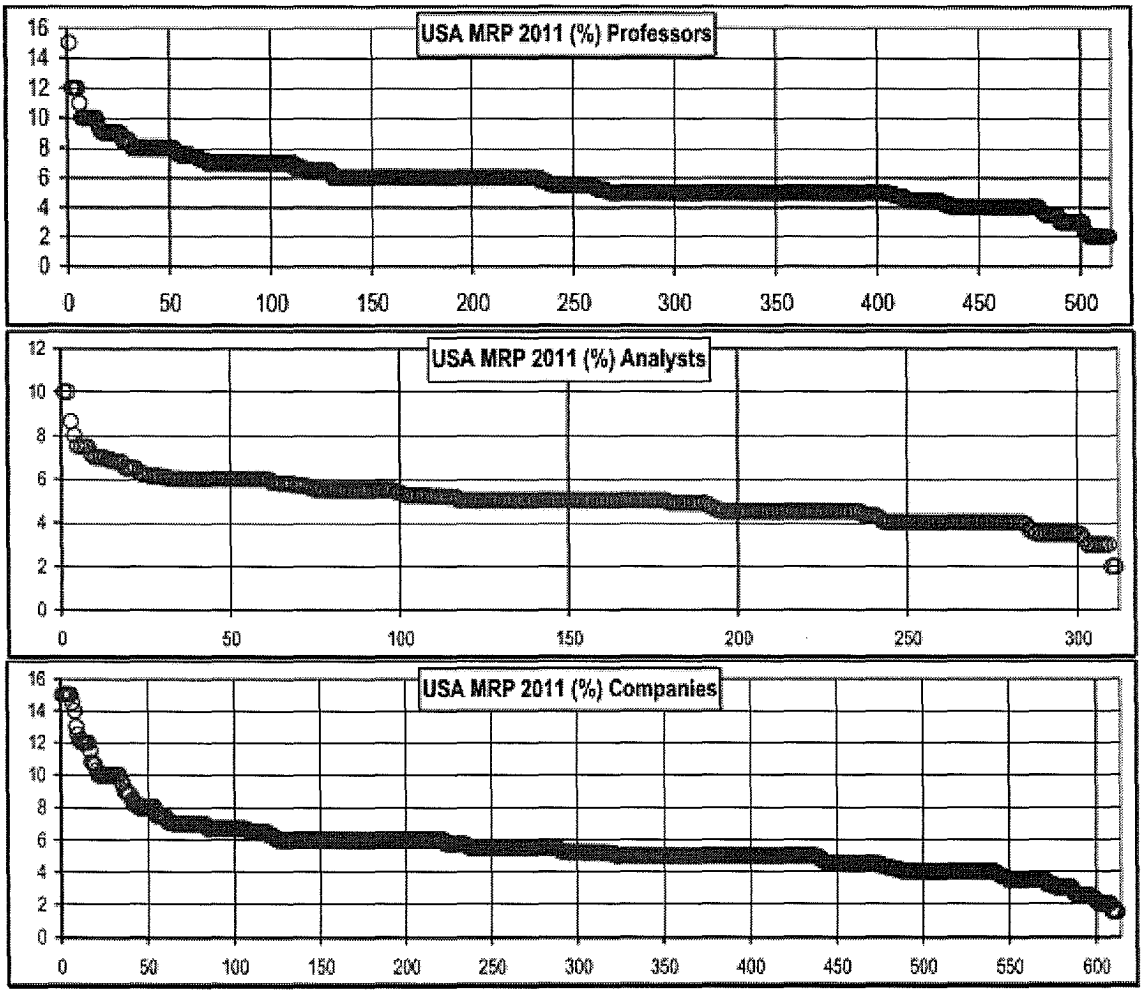
In his overall table where he reported the results from professors of finance, financial analysts and companies the results were as follows:

Table 12. Market Risk Premium used in 2010 and in 2009 by Professors, Analysts and Companies

		2010				2009			
		USA	Euro	UK	Other	USA	Euro	UK	Other
Professors	Average	6.0	5.3	5.0	7.8	6.4	5.4	4.9	8.9
Analysts	Average	5.1	5.0	5.2	6.3	5.5	5.1	5.3	6.3
Companies	Average	5.3	5.7	5.6	7.5	5.5	5.8	5.9	7.3
Professors	St. dev.	1.7	1.7	1.6	4.2	2.4	1.9	1.5	3.8
Analysts	St. dev.	1.1	1.3	1.4	2.2	1.3	1.2	1.2	2.0
Companies	St. dev.	1.8	1.5	1.8	3.2	1.8	1.6	0.8	2.3
Professors	Median	6.0	5.0	5.0	7.0	6.0	5.0	5.0	7.1
Analysts	Median	5.0	5.0	4.5	5.9	5.0	5.0	5.0	6.0
Companies	Median	5.0	5.5	5.5	7.0	5.5	5.5	5.8	7.0
Professors	Respondents	462	194	49	145	448	194	49	140
Analysts	Respondents	104	197	31	269	99	189	29	197
Companies	Respondents	205	543	30	123	189	521	28	109

With two co-authors[12] Fernandez continued his survey in a report published in April 2011 where he provided the following distribution for the three groups of professionals. The median market risk premium used in the US was 5.5% by the professors, 5.0% by analysts and 5.2% by companies. The following figure is from this latest survey and indicates the distribution of the responses. As they mention in the paper most responses are within a range of 4.0-6.0%.

12 P. Fernandez, J Aguirreamalloa and L Corres, US Market Risk Premium Used in 2011 by Professors, Analysts and Companies: A Survey with 5,731 Answers, SSRN April 8, 2011.



Conclusions

Fernandez's survey work supports my own direct estimates; that the market risk premium is generally regarded as between 5.0-6.0%.[13] This is also confirmed by professional opinion in Canada, where on March 17, 2011 TD Economics came out with a report "An Economics Perspective on Long Term Financial Returns."[14] The following table captures the TD Economics analysis:

13 His 2011 survey has the median market risk premium estimate in Canada and the US at about 5.5%.
14 http://www.td.com/economics/special/ca0311_long_run_returns.pdf

Financial Projections for the Next Decade	
Financial Instruments	Average Annual Percent Return
Cash (3-Month T-Bills)	3.40%
Bonds (DEX Universe Bond Index)	4.00%
Equities	
Canadian (S&P/TSX Composite)	7.50%
U.S. (S&P 500 Index)	7.50%
International (MSCI EAFE)	7.50%
Source: TD Economics	

1

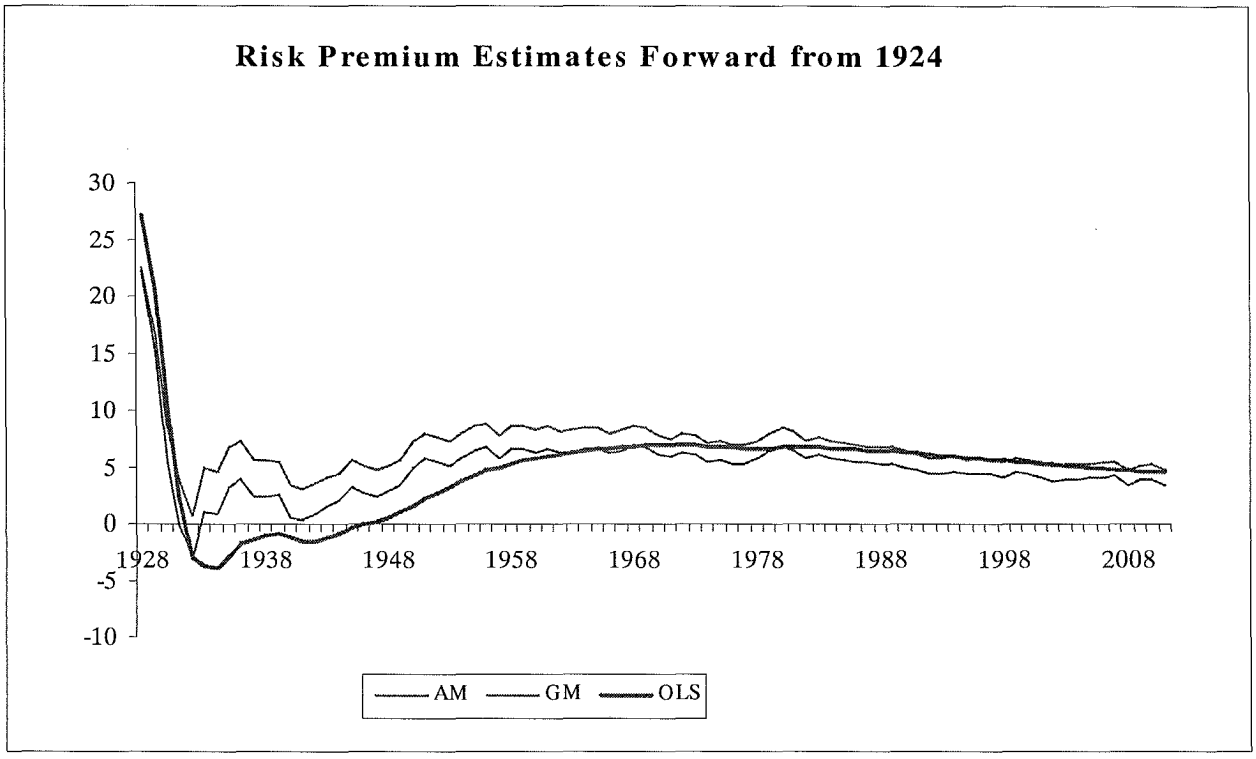
2 The TD analysis placed long run Canadian equity returns at 7.50%, the same as in the US and
3 internationally, whereas bond returns were forecast at 4.0% for the universe bond index, that is,
4 including corporate as well as government bonds. The implication is for a long run market risk
5 premium of 3.50% of equities over bonds and slightly higher over government bonds.

6 TD Economics is predicting a return to a balanced portfolio of 5.7%, which with 2% inflation
7 implies a real return of below 4.0%. This is the same sort of analysis that underlines most
8 defined benefit pension plans. Since these are long run or geometric (compound) returns an
9 adjustment to arithmetic returns would move the market risk premium to about 5.0% over long
10 Canada bonds, consistent with the judgement of professionals and my historic analysis.

11 As a result while my own direct estimate of the experienced market risk premium is less than
12 5.0% I judge it to currently be in a range of 5.00-6.00%. This estimate reflects the survey results
13 of Fernandez and gives weight to the evidence from the US with regards to equity returns and the
14 role of international capital flows in the US bond market. However it is significantly in excess of
15 the long run historical experience of equity over long term bond returns in the major capital
16 markets, including that of the US and UK as well as Canada.[15]

17

15 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.


Risk Premium Estimates Forward from 1924
30
25
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-5
-10
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1948
1958
1968
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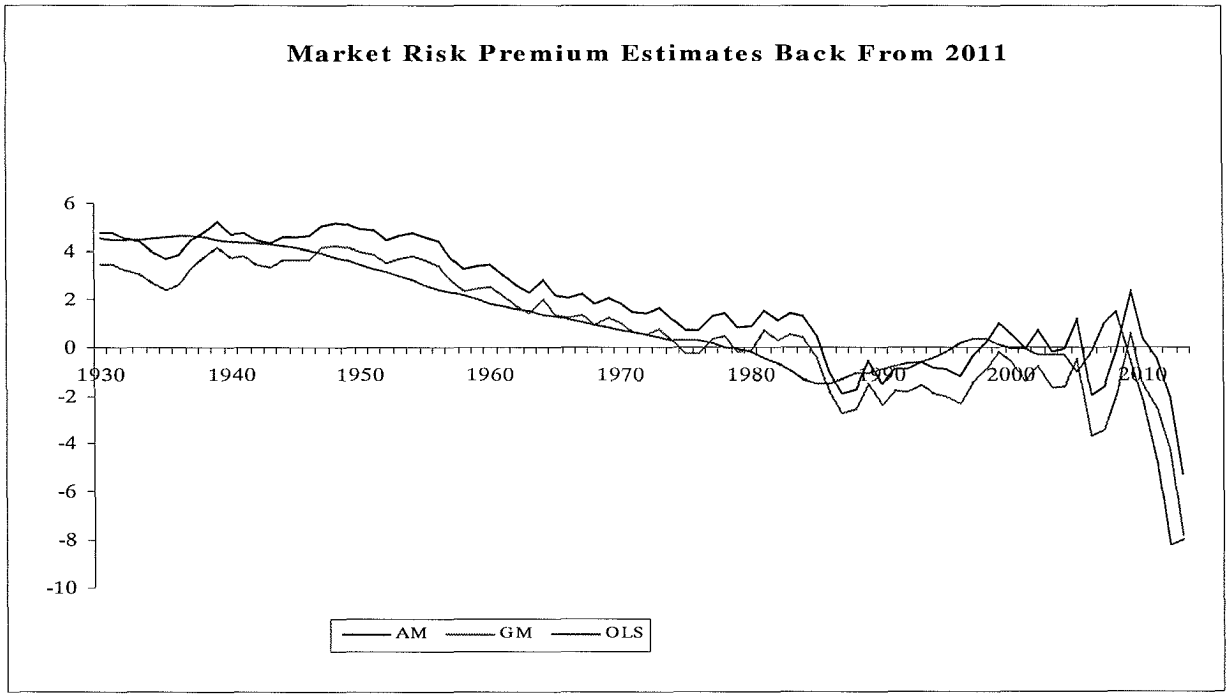
1988
1998
2008
AM
GM
OLS


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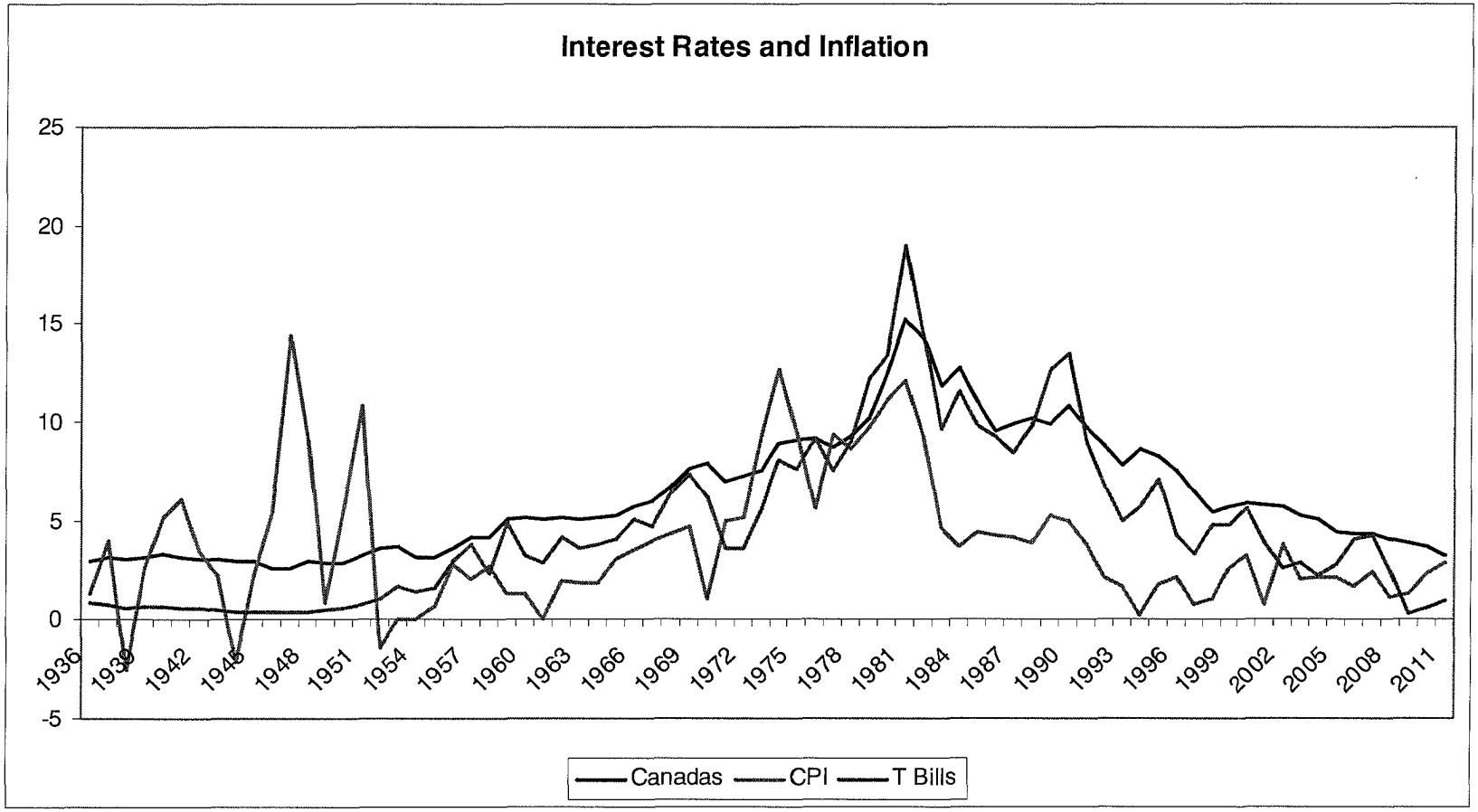
-2
-4
-6
-8
-10
1930
1940
1950
1960
1970
1980
1990
2000
2010
AM
GM
OLS

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
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-5
1936
1939
1942
1945
1948
1951
1954
1957
1960
1963
1966
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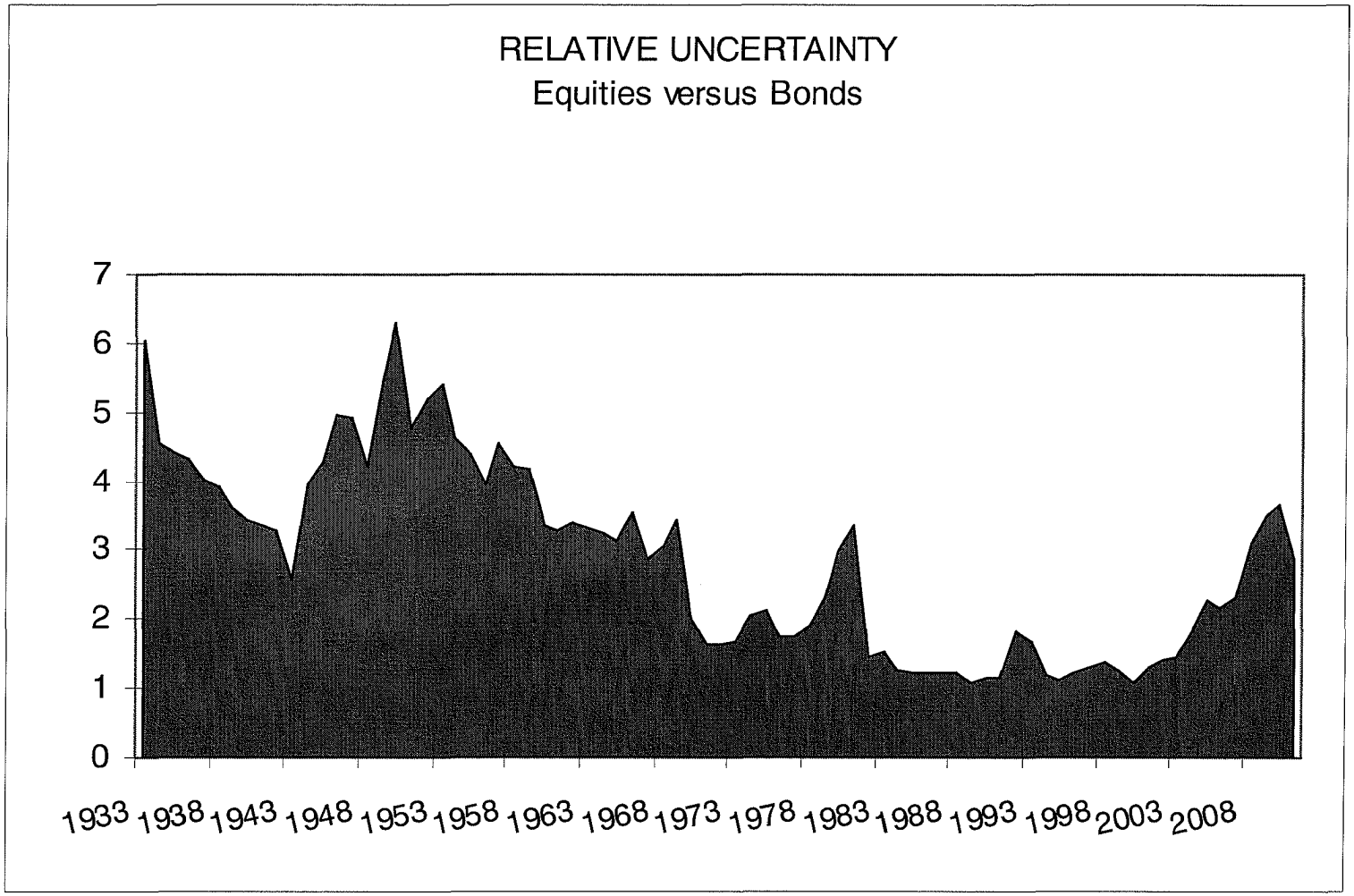
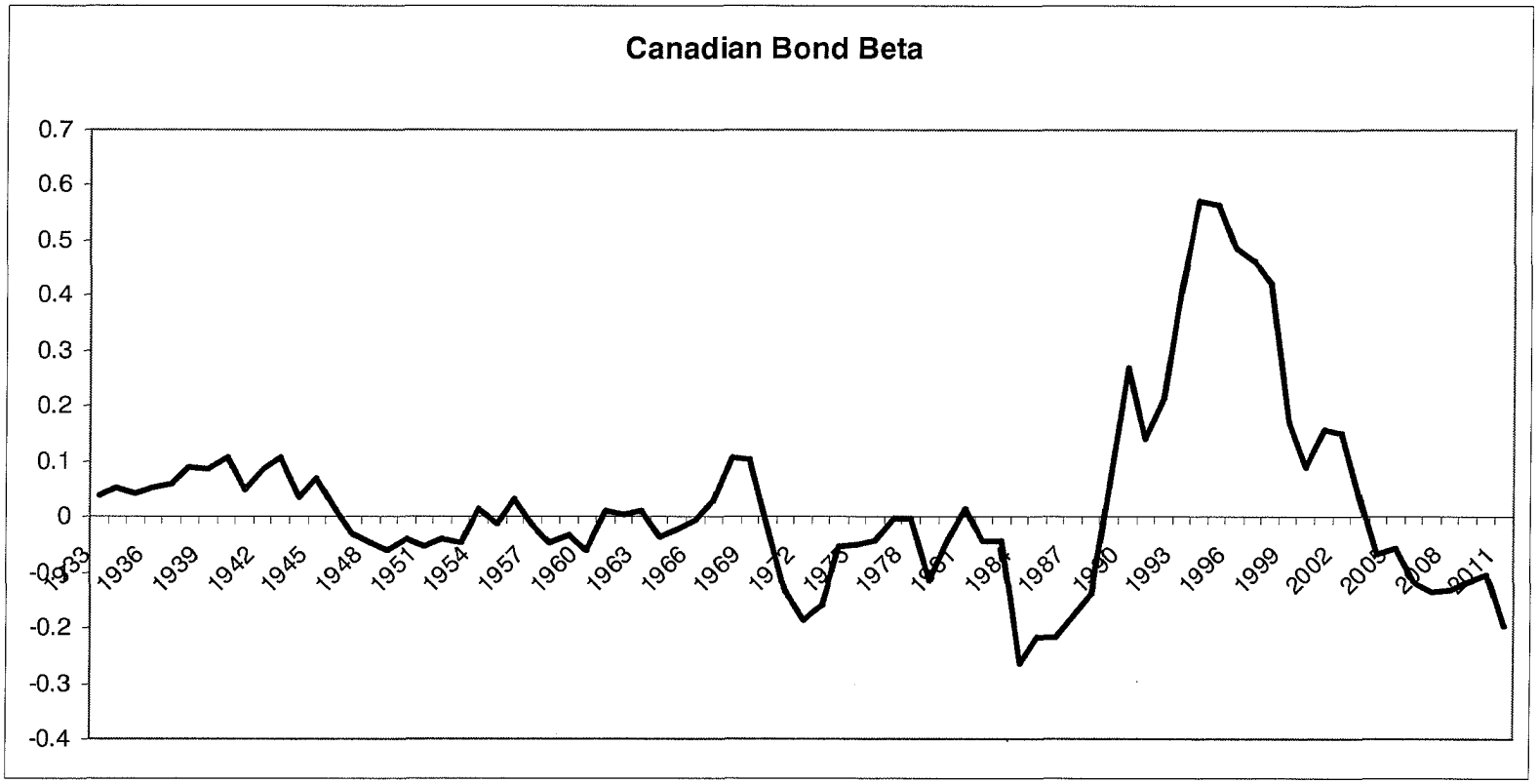
1999
2002
2005
2008
2011
Canadas
CPI
T Bills


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
1936
1939
1942
1945
1948
1951
1954
1957
1960
1963
1966
1969
1987
1990
1993
1996
1999
2002
2011

SCHEDULE 6

FACTORS INFLUENCING THE REAL CANADA YIELD

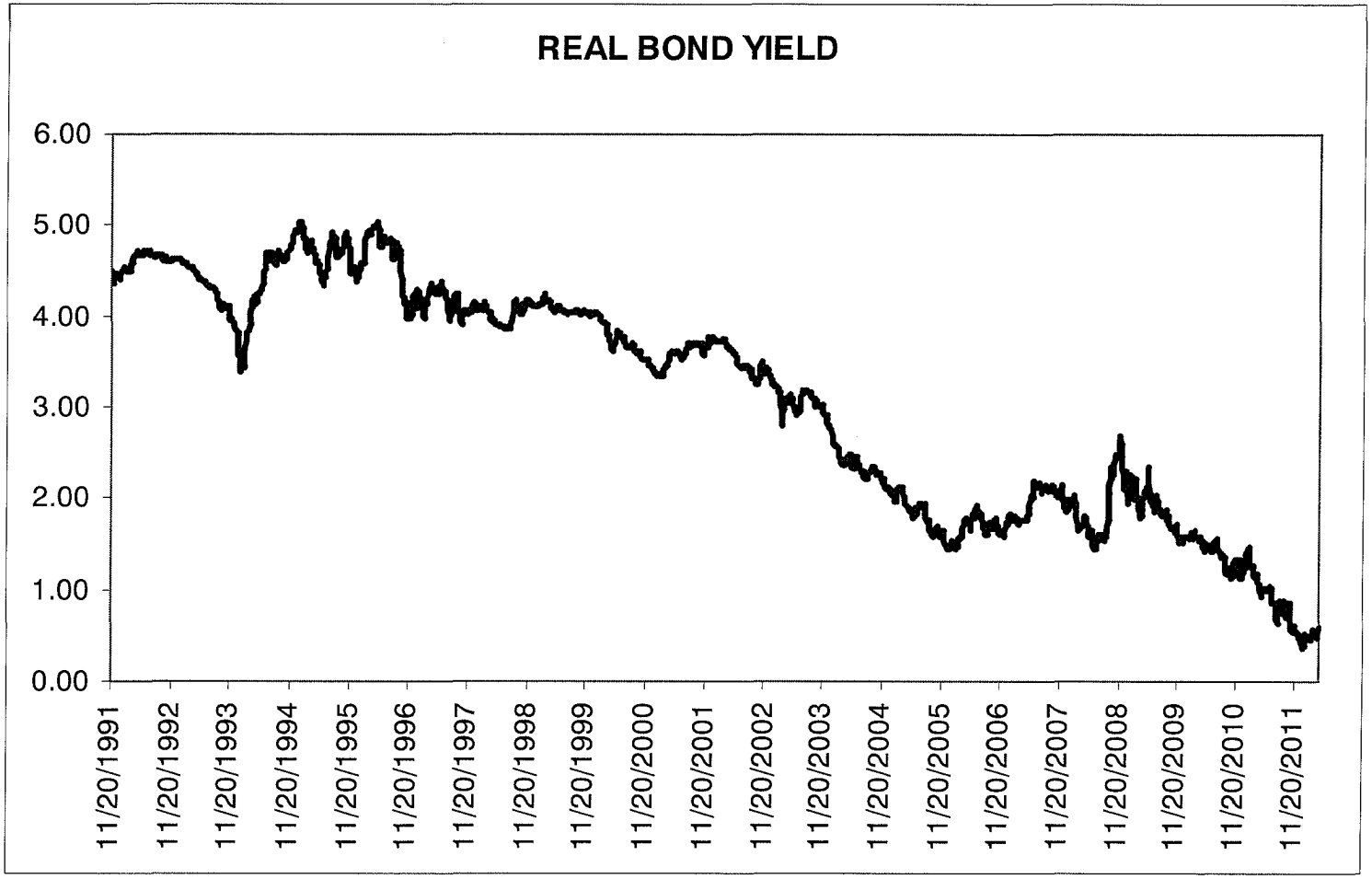
Dependent variable: Long Canada yield minus the average CPI inflation rate for the past, current and forward year.

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

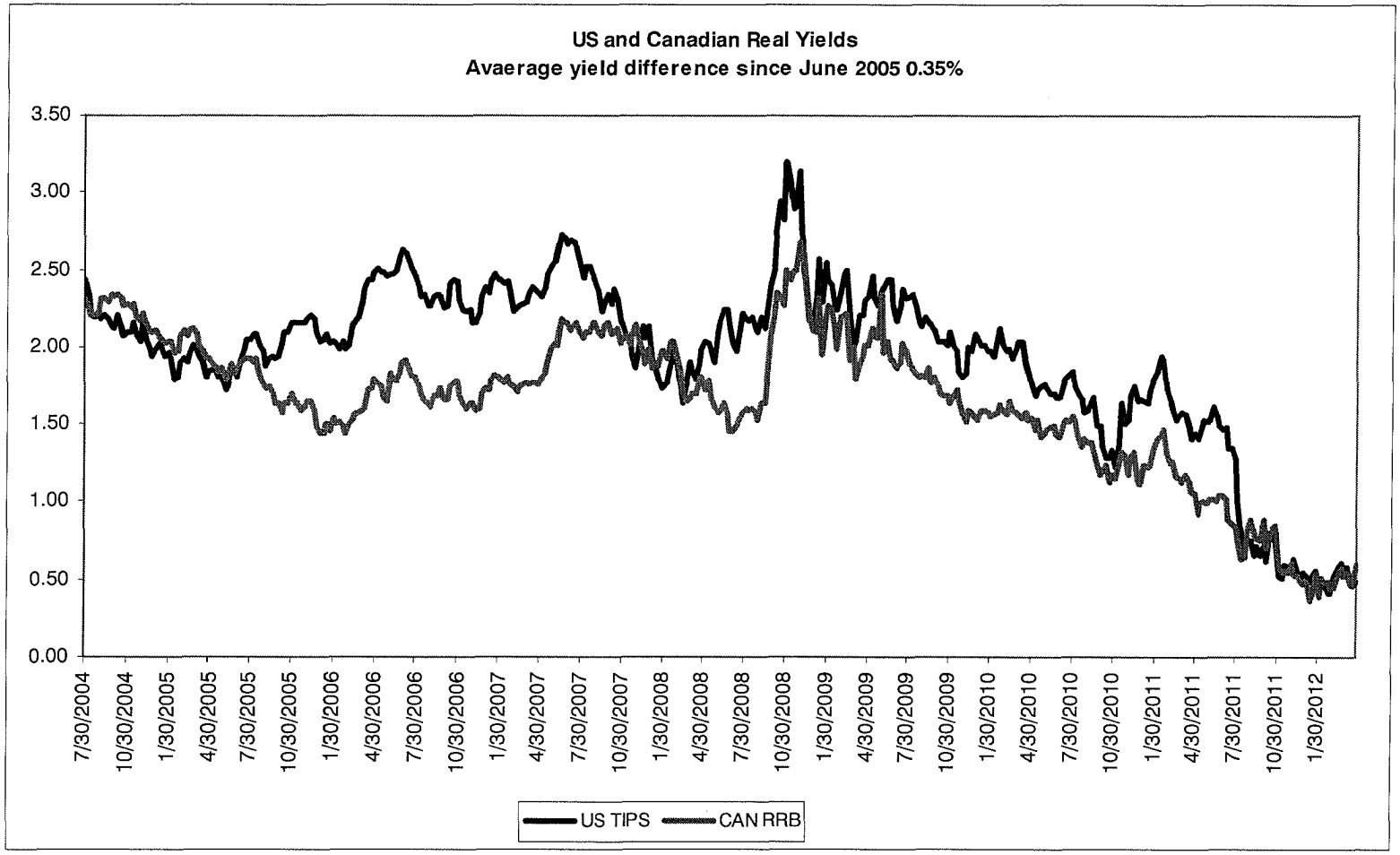
Adjusted R^2 of the regression 82.8%
Seventy five years of data 1936-2011

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, that 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 was 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 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 indexes are weighted

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.

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?

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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 2001.9

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.[10] 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.

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

9 Notably Dr. Vander Weide uses the utility index, which captures this Nortel effect and not the gas and electric index which does not.

10 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.

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 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.

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 a strictly 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.

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. Following this intuition in Schedule 5-7 I simply chart the price performance of the major Canadian utilities against the TSX Composite index 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 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[11] 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

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

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 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[12] 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

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

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.

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 May 2, 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

	Ticker	RBC	Booth	PRICE
ENBRIDGE	**ENB**	**0.29**	**0.32**	**35**
TRANSCANADA	**TRP**	**0.35**	**0.36**	**43.46**
CANADIAN UTILIT	**CU**	**0**	**0.03**	**71.2**
TRANSALTA	**TA**	**0.69**	**0.76**	**16.42**
EMERA	**EMA**	**0.2**	**0.21**	**35**
FORTIS	**FTS**	**0.14**	**0.14**	**35**
VALENER	**VNR**	**0.36**	**0.36**	**15.2**
VERESEN	**VSN**	**0.34**	**0.36**	**14.42**
AVERAGE BETA		**0.30**	**0.32**	

The average beta estimate by the Royal Bank of Canada was 0.30 or slightly lower than my estimate (Booth) derived using data up until December 2011. There are no significant differences in the betas estimated by RBC and my own. 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.

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	1.08	1.26	1.18
Industrials	0.87	0.90	0.87	0.88
Cons Disc	0.70	0.62	0.58	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

1

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

6 Similarly the following table gives the betas for the six surviving US[13] utilities in Schedule 9:

7

		RBC	Yahoo	Booth	
AGL	Gas	0.43	0.36	0.44	39.08
Vectren	VVC	0.39	0.4	0.4	26
WGL	WGL	0.24	0.38	0.29	27.1
Piedmont	PNY	0.29	0.43	0.32	30.35
Northwest	NWN	0.28	0.42	0.32	45.94
New Jerse	NJR	0.22	0.39	0.26	44.87
		0.31	0.40	0.34	

8

9

13 Nicor was acquired by WGL in December 2011

Again the average beta is 0.31 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.

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:

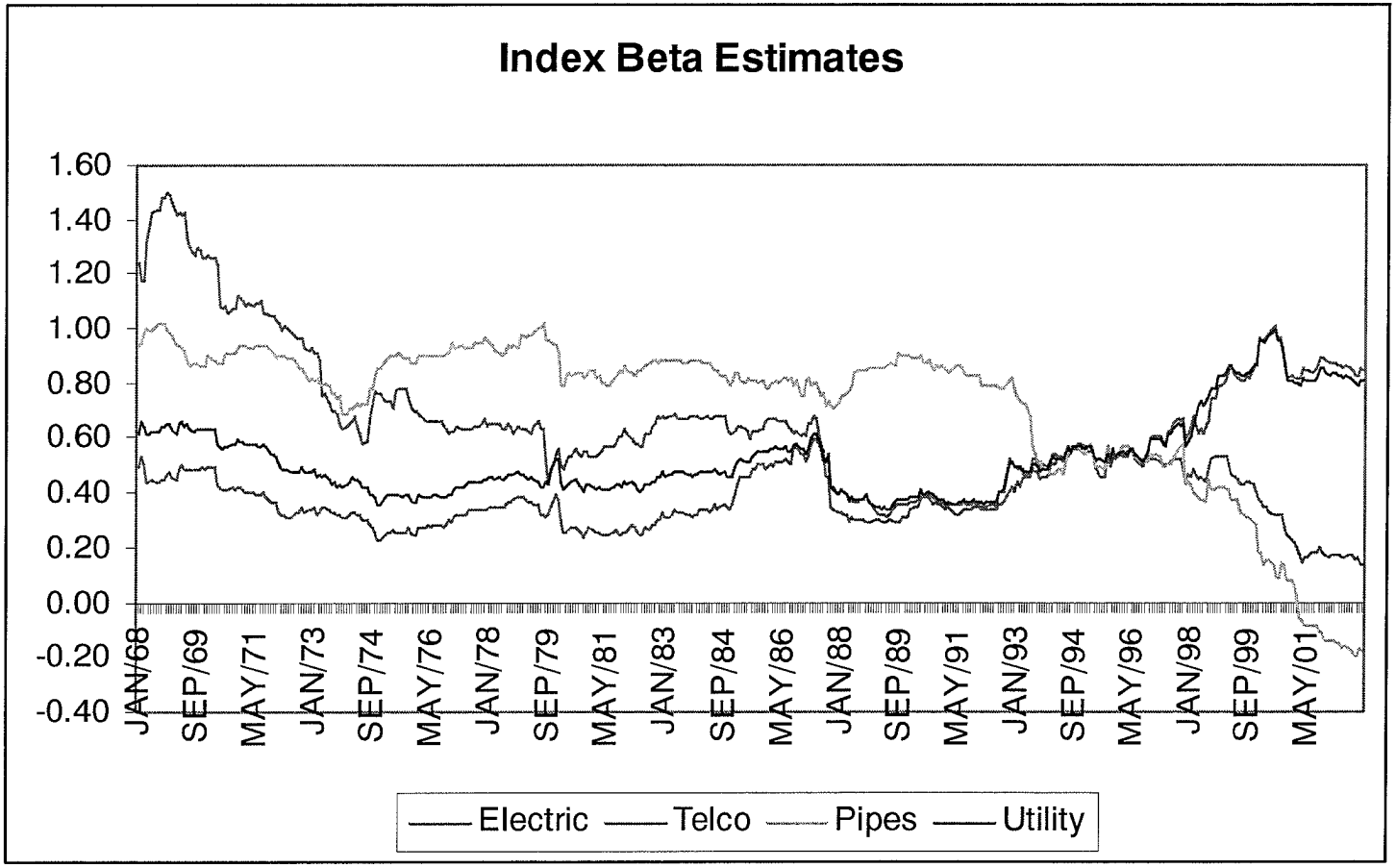
Beta (Corporate Profiles)

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.

Consequently I continue to judge a reasonable range going forward for the relative risk of a benchmark Canadian utility to be 0.45-0.55.

SCHEDULE 1


Index Beta Estimates
1.60
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
-0.20
-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
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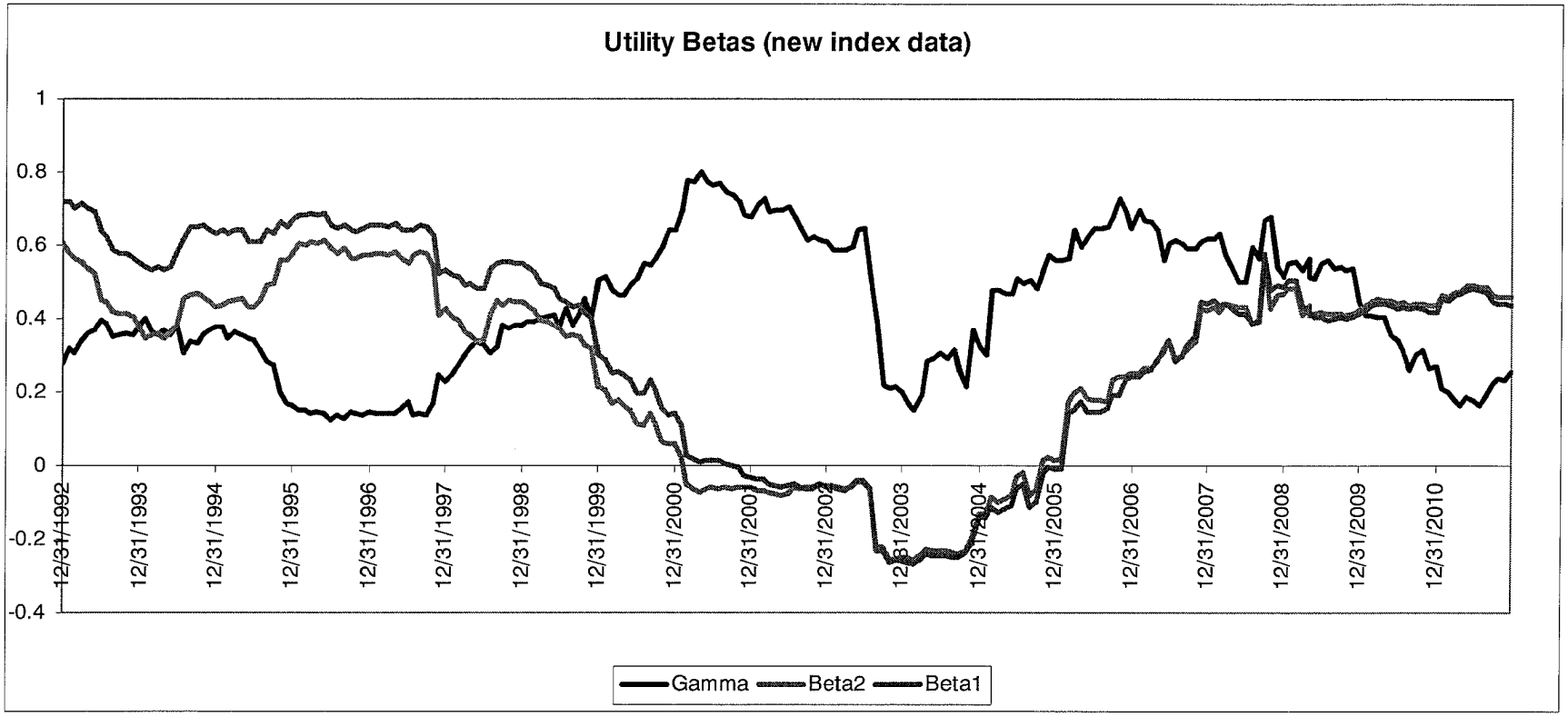
JAN/98
SEP/99
MAY/01
Electric
Telco
Pipes
Utility

SCHEDULE 2


Utility Betas (new index data)
1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
12/31/1992
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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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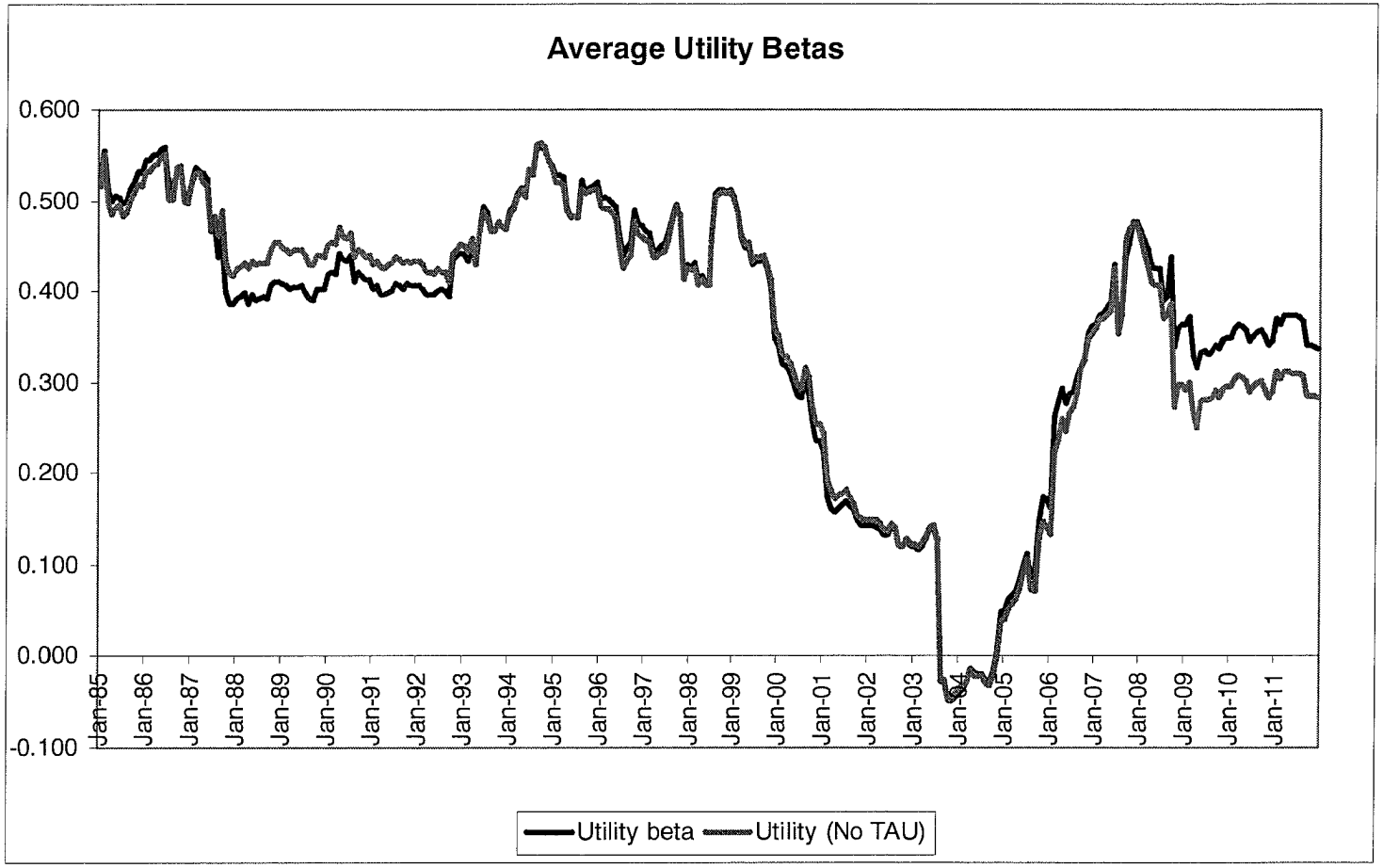
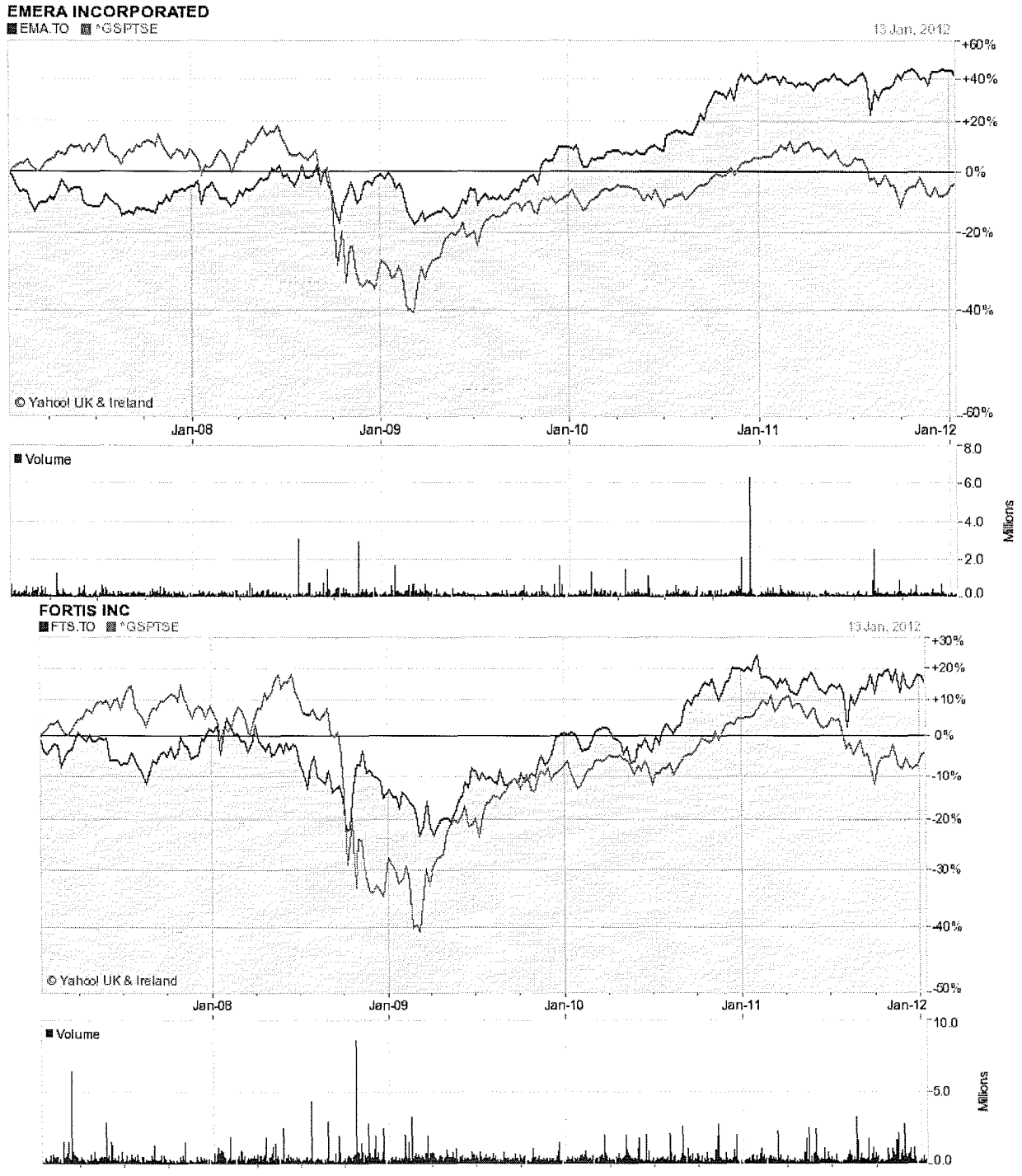
12/31/2009
12/31/2010
Gamma
Beta2
Beta1


Average Utility Betas
0.600
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


EMERA INCORPORATED
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
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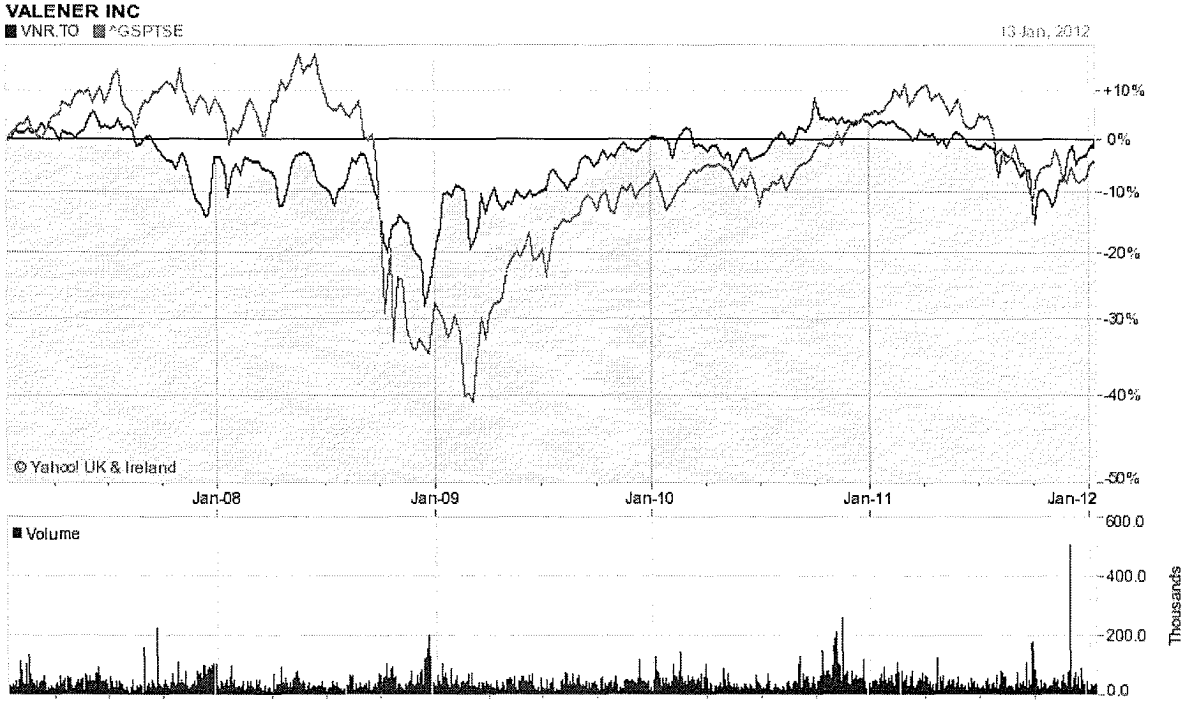
5.0
0.0
Millions


VALENER INC
VNR.TO
^GSPTSE
13 Jan, 2012
+10%
0%
-10%
-20%
-30%
-40%
-50%
© Yahoo! UK & Ireland
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
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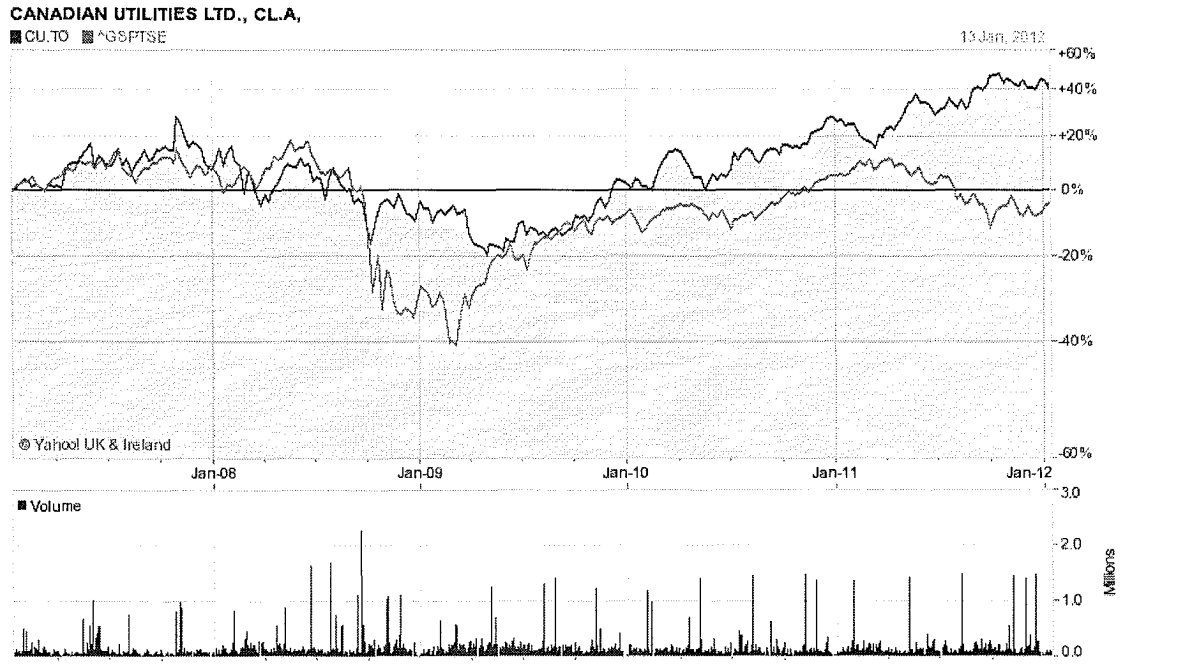
200.0
0.0
Thousands


CANADIAN UTILITIES LTD., CL.A,
CU.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
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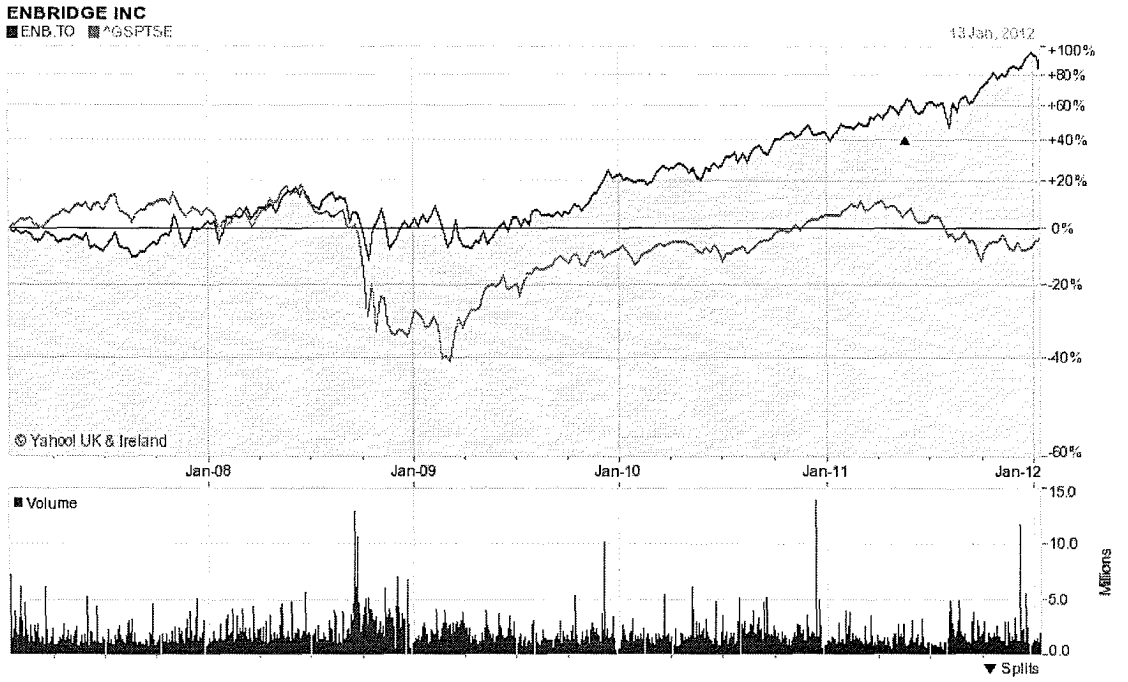
2.0
1.0
0.0
Millions


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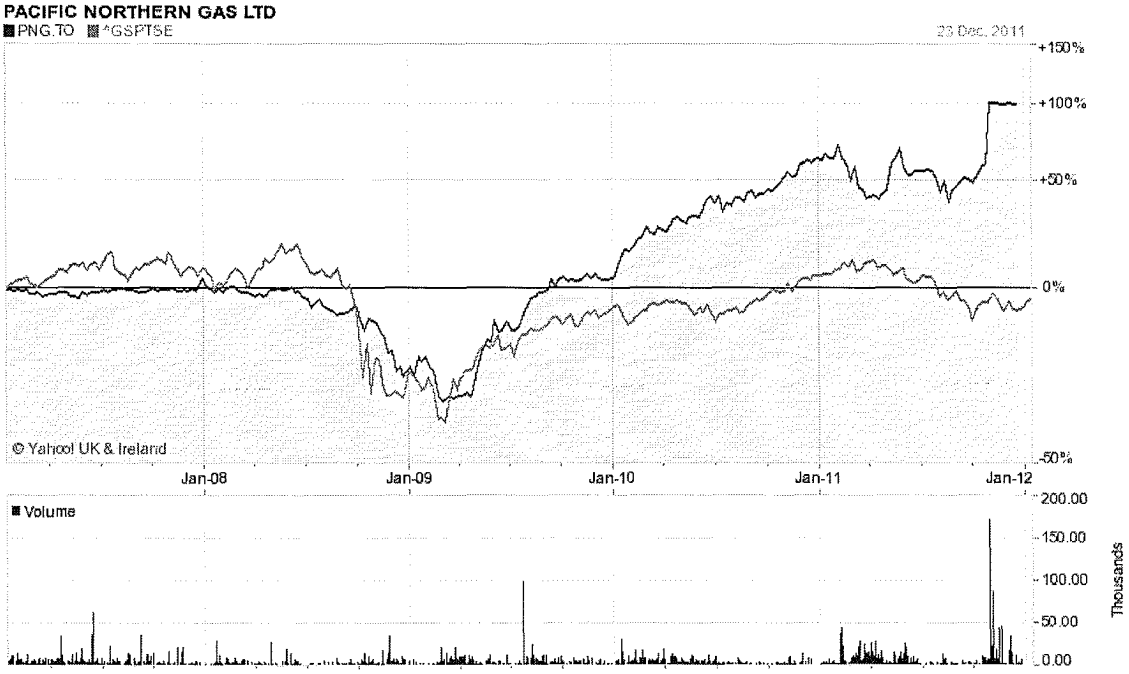
0.0
Millions
Splits


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
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	NJ 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

Canadian Utilities			
Open	71.49	P/E Ratio (TTM)	18.1x
Last Bid/Size	70.82 / 2	EPS (TTM)	3.95
Last Ask/Size	71.20 / 17	Next Earnings	26 Jul 2012
Previous Close	71.49	Beta	0.00
Volume	108,400	Quarterly Dividend	0.4425
Average Volume	96,016	Dividend Yield	2.49%
Day High	71.50	Ex-Dividend Date	8 May 2012
Day Low	70.00	Shares Outstanding	87.3M
52 Week High	71.58	# of Floating Shares	59.66151M
52 Week Low	52.17	Short Interest as % of Float	
EMERA Open	34.95	P/E Ratio (TTM)	18.0x
Last Bid/Size	34.95 / 40	EPS (TTM)	2.01
Last Ask/Size	35.00 / 6	Next Earnings	11 May 2012
Previous Close	34.95	Beta	0.20
Volume	142,708	Quarterly Dividend	0.3375
Average Volume	180,931	Dividend Yield	3.86%
Day High	35.04	Ex-Dividend Date	27 Apr 2012
Day Low	34.81	Shares Outstanding	122.2M
52 Week High	35.11	# of Floating Shares	128.201M
52 Week Low	19.95	Short Interest as % of Float	
Fortis			
Open	33.99	P/E Ratio (TTM)	19.2x
Last Bid/Size	34.34 / 6	EPS (TTM)	1.78
Last Ask/Size	34.55 / 5	Next Earnings	2 May 2012
Previous Close	34.19	Beta	0.14
Volume	408,593	Quarterly Dividend	0.3000
Average Volume	506,466	Dividend Yield	3.47%
Day High	34.60	Ex-Dividend Date	15 May 2012
Day Low	33.92	Shares Outstanding	189.3M
52 Week High	34.60	# of Floating Shares	196.5592M
52 Week Low	28.24	Short Interest as % of Float	--

ENBRIDGE Open	41.03	P/E Ratio (TTM)	31.7x
Last Bid/Size	40.92 / 1	EPS (TTM)	1.32
Last Ask/Size	40.97 / 86	Next Earnings	9 May 2012
Previous Close	41.29	Beta	0.29
Volume	865,517	Quarterly Dividend	0.2825
Average Volume	1,087,870	Dividend Yield	2.76%
Day High	41.21	Ex-Dividend Date	11 May 2012
Day Low	40.76	Shares Outstanding	784.6M
52 Week High	41.50	# of Floating Shares	747.9294M
52 Week Low	28.27	Short Interest as % of Float	--

TRANSCANADA

Open	43.26	P/E Ratio (TTM)	20.9x
Last Bid/Size	43.41 / 84	EPS (TTM)	2.08
Last Ask/Size	43.46 / 79	Next Earnings	23 Jul 2012
Previous Close	43.48	Beta	0.35
Volume	1,163,758	Quarterly Dividend	0.4400
Average Volume	1,387,247	Dividend Yield	4.05%
Day High	43.48	Ex-Dividend Date	27 Jun 2012
Day Low	43.10	Shares Outstanding	704.2M
52 Week High	44.75	# of Floating Shares	703.952M
52 Week Low	37.00	Short Interest as % of Float	

TRANSALTA Open	16.58	P/E Ratio (TTM)	12.7x
Last Bid/Size	16.42 / 7	EPS (TTM)	1.31
Last Ask/Size	16.49 / 10	Next Earnings	23 Jul 2012
Previous Close	16.58	Beta	0.69
Volume	782,890	Quarterly Dividend	0.2900
Average Volume	917,181	Dividend Yield	7.03%
Day High	16.60	Ex-Dividend Date	30 May 2012
Day Low	16.32	Shares Outstanding	224.7M
52 Week High	23.42	# of Floating Shares	224.1637M
52 Week Low	15.94	Short Interest as % of Float	

VERESEN

Open	14.93	P/E Ratio (TTM)	47.0x
Last Bid/Size	14.40 / 14	EPS (TTM)	0.33
Last Ask/Size	14.42 / 54	Next Earnings	1 May 2012
Previous Close	15.26	Beta	0.34
Volume	2,259,623	Monthly Dividend	0.0833
Average Volume	273,623	Dividend Yield	6.94%
Day High	14.93	Ex-Dividend Date	26 Apr 2012
Day Low	14.31	Shares Outstanding	193.7M
52 Week High	15.83	# of Floating Shares	192.8672M
52 Week Low	11.50	Short Interest as % of Float	--

VALENER

Open	15.14	P/E Ratio (TTM)	19.5x
Last Bid/Size	15.18 / 30	EPS (TTM)	0.78
Last Ask/Size	15.20 / 3	Next Earnings	14 May 2012
Previous Close	15.17	Beta	0.36
Volume	33,458	Quarterly Dividend	0.2500
Average Volume	29,671	Dividend Yield	6.58%
Day High	15.23	Ex-Dividend Date	28 Mar 2012
Day Low	15.10	Shares Outstanding	37.4M
52 Week High	16.88	# of Floating Shares	33.8904M
52 Week Low	13.55	Short Interest as % of Float	

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 to get:

$$P_0 = \frac{d_1}{K - g}$$

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,

$$K = \frac{d_1}{P_0} + g$$

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)*

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

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 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%.

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.

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, 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.

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.

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

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.

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 march 2012 the TSX yield was 2.88%, while the LTC yield

was 2.57%, 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 relatively 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 6.45%, 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% (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

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

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%. 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 2.88%, the DCF estimate for the market as a whole is 9.16% ((1.061*1.0288)-1). This would be a reasonable estimate if the market were at the mid-point of the business cycle, rather than just leaving the "recession or slowdown" phase.

At the current point in time Canada has recovered from recession, but from Schedule 8 Corporate Canada is still running slightly below normal capacity. The median capacity utilisation levels are

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based economy.

82-84% but currently they are at 80.5% indicating that we are still in the growth stage of the business cycle. This observation is confirmed by the current 7.2% unemployment rate which is still above the non-accelerating unemployment rate of 6.0%.

If we use a three year period for the two stage growth model:

$$P = \frac{d*(1+g)}{(1+K)} + \frac{d*(1+g)^2}{(1+k)^2} + \frac{d*(1+g)^3}{(1+k)^3} + \frac{d*(1+g)^3(1+g2)}{(1+k)^3(K-g2)}$$

where the current price (P) is equal to a dividend (*d*) growing at g for three years and then *g2* thereafter forever, discounted back at *k*. If we set the current dividend at $2.88 on a notional $100 value, the long run growth rate at 6.1% and an additional 3% growth for the next three years solving for the fair return *k*. gives 9.41% or an additional 0.25%. The higher discount rate simply results from the fact that with more short-run growth a higher rate is needed to equate the $100 present value. If short run growth is not 3% but an additional 10% then the discount rate would have to be about 10.0% or 0.90% higher. However this implies total earnings *and* dividend growth of 16.1% over the next three years, which I would judge to be on the high side since corporate profits are already significantly above their long run trend. ***Overall I would judge the fair rate of return on the Canadian market to be 9.1-9.50%, consistent with the Canadian market selling at a premium to book value and current average ROEs of 10.57%.***

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 relatively unchanged at 2.00%. In Schedule 10 is a graph of the dividend payout rate on the S&P500 firms. The average dividend payout since 1967 is 50% while the median payout is 44% meaning that typically 56% 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 1987 the average ROE for the S&P500 firms was 13.44% and the median ROE 14.22%. These are higher than the Canadian average ROE since the data is for the largest firms in the US economy, whereas that for Canada is for all firms. If I pair the median payout and ROE the "*br*" growth rate is 8.02% and if I pair the averages the growth rate is 6.75% 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 8.89-10.36%. Similar to the Canadian market I would expect some greater short term growth in the US market, since the US is significantly below capacity with 8.10% unemployment. However, with a much greater exposure to non-US earnings I would judge a fair return on the US market to be 9.0-10.0% or about 0.50% higher than in Canada.

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 traditional utilities which include the standard electric and gas utilities. Note that the S&P data includes the firms that at the time were classified into these groups so whereas there are only 2 utilities included as gas utilities in 2010, in 1993 there were 13 and the data for that year is for those 13 firms.

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 ratio. Clearly, utilities as low risk and low growth investments have relatively high payouts: in only one of the 31 years is the payout less than 50% and the average payout is over 70%. This is biased high by the large payout in 2002 for the electric utilities and in 2005 and 2006 for the gas utilities, when some utilities suffered serious problems. However, the median is still very high at 63% -67%. Note that the payout tends to increase during recessions, such as those of the early 1990s and 2000s when earnings were

depressed and dividends not cut proportionately. This indicates that US utilities are much more sensitive to the business cycle than are Canadian utilities, which usually are only indirectly affected through changes in the long Canada bond yield.

The very high dividend payout means 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 2010 was 4.96% and for the gas utilities 2.91% significantly higher than that on the S&P500 in December 2010 of 1.81%.

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 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 5.80% (10 year) implying that the electric utility risk premium was only 1.59%.

Column 11 gives the market to book ratio for these utilities, which in 1993 was 1.59, implying correctly that the ROE of these utilities of 11.25% exceeded their equity cost. This calculation is a mechanical exercise, so to reduce individual estimation errors it is repeated for each year from 1993 until 2010. This gives the average and median electric utility risk premium of 3.29% and 3.26% with 2.48% and 2.97% for the gas utilities. However, the *br* growth rate is sensitive to the actual earnings which affect the retention rate and may not capture the full amount of growth expectations. To check for this the last two columns estimate the utility risk premium with two alternative growth expectations. URP2 assumes that the expected ROE is the long Treasury yield plus 5.0%, which avoids the problem of fluctuating earned returns. URP3 also assumes that the retention rate is the constant median growth rates 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 would tend to increase the estimate of the average utility risk premium. The average and median URP2 is 2.59% and 2.68% for the electrics and 1.30% and 2.55% for the gas utilities and for URP3 the values are 3.06% and 3.13% for the electrics and then 2.25% and 1.44% for the gas utilities.

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

- Risk premiums of the order of 2.00-3.00% for a typical US electric or gas 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 1993-2010 is slightly more stable at 2.68-3.26%.
- Although 2011 data is not yet available the impact of lower US treasury yields has shown up in the US data as increasing utility risk premiums, since the most recent risk premiums are higher than average.

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 May 5, 2012

		Yield	Past G	Future G	#	K	
AGL	Gas	3.6	-5.99	-5.7	1	-2.31	
Vectren	VVC	4.8	-0.98	5	4	10.04	
WGL	WGL	4.1	16.99	4.5	7	8.78	
Piedmont	PNY	4.1	2.05	4.55	5	8.84	
Northwest	NWN	3.9	4.26	3.25	6	7.28	
New Jerse	NJR	3.5	-25.9	2.33	5	5.91	
	Median					8.03	
	Average					6.42	
	S&P500			10.43%			
	Utilities			9.46%			

Note that the current dividend yields range from 3.50% to 4.80% due to the particular circumstances of each utility, but the median dividend yield of 4.0% is consistent with the high dividend payouts of utilities. However the problem is the five year forecast growth rates, which range from -5.7% to +4.55% with a median value of 3.88%. As a result if these earnings growth rates are substituted into the DCF equation we get DCF equity cost estimates ranging from -2.31% to 10.04% with a median of 8.03% and an average of 6.42%.

There are several 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

the global settlement[5] but simply an attachment effect, where analysts tend to become attached to a stock and see good in it until proven otherwise.

Recently, for example, Easton and Sommers[6] 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 9.46% and 10.43% exceed what can be expected as long run growth estimates using reasonable assumptions on long run average retention rates and earned ROEs. A 10.43% growth rate in aggregate earnings, for example, with a typical 50% retention rate implies

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5 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.

6 "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.

a 20.86% incremental ROE and an extremely healthy US economy. This range of five year earnings growth estimate would only be as a short run estimate to be used in 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.[7] 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 biased high.[8]

Conclusion

I would judge the overall equity market return in Canada to be in a range of 9.1-9.5% and that in the US 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 2.0-3.0% 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. However, currently these individual utility DCF estimates at 6.42-8.03% are consistent with my own estimates.

7 The higher volatility of earnings growth also means that the DCF estimate based on dividend growth is over-estimated due to the standard arithmetic versus geometric growth problem.

8 This also applies to the forecast in Value Line.

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

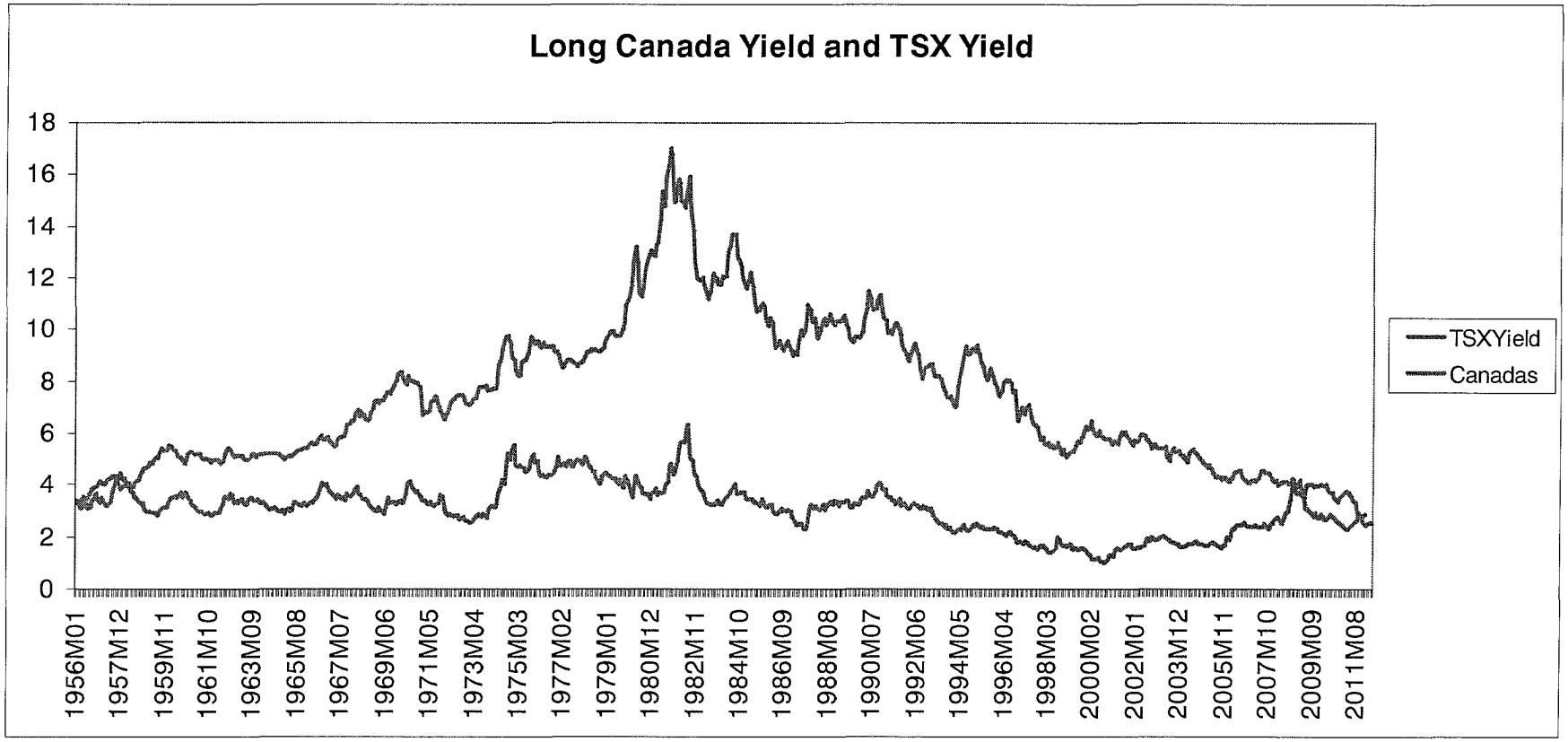
ASSUMPTIONS: Return on Equity = 12%
Dividend Payout = 50%
Cost of Equity = 10%

SCHEDULE 2

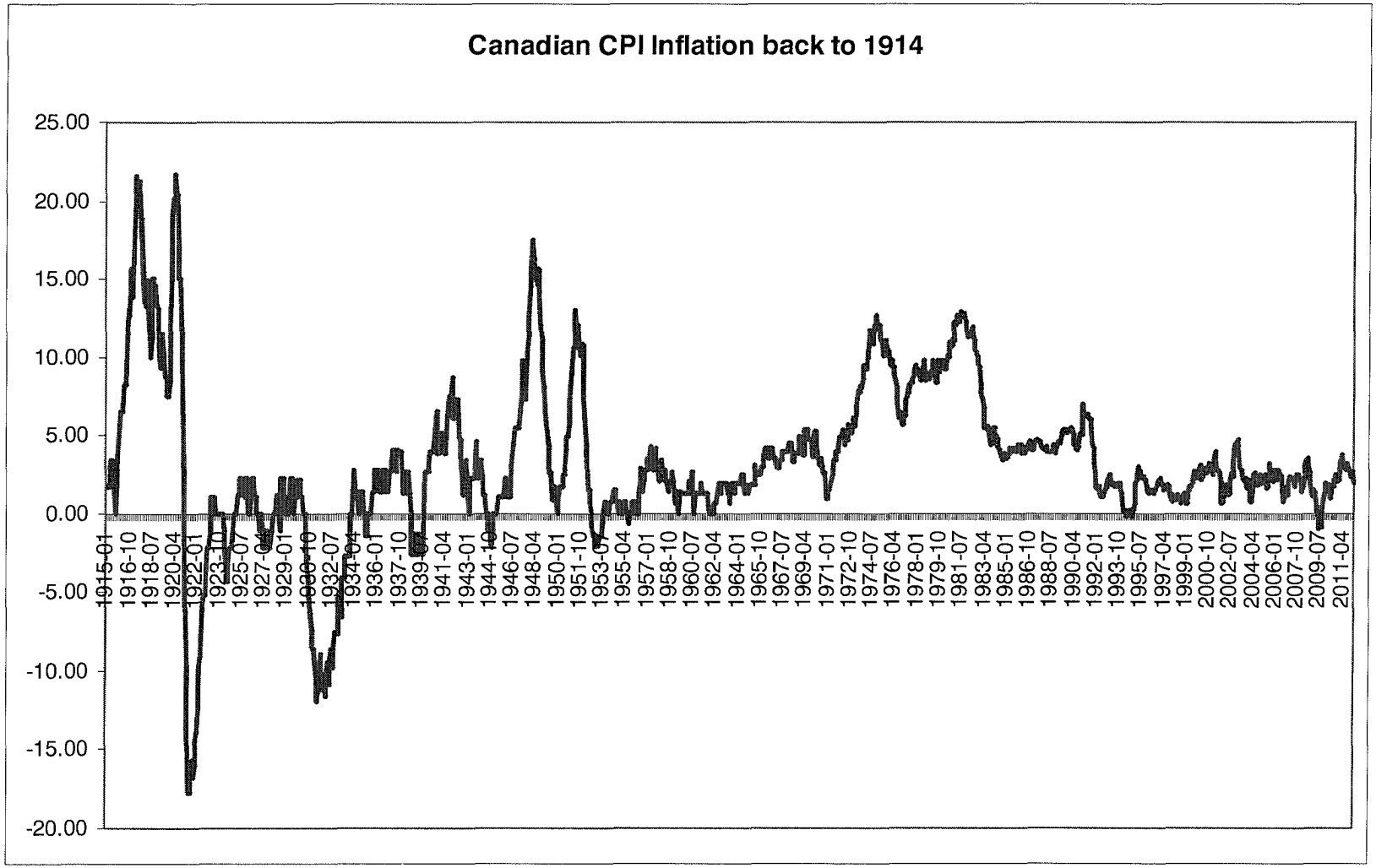
YEAR	BEGINNING BOOK VALUE PER SHARE	EARNINGS PER SHARE	DIVIDENDS PER SHARE	RETENTIONS PER SHARE
1	20.00	2.40	1.20	1.20
2	21.20	2.54	1.32	1.22
3	22.40	2.69	1.45	1.24
4	23.70	2.83	1.59	1.25
5	24.90	2.99	1.73	1.26

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

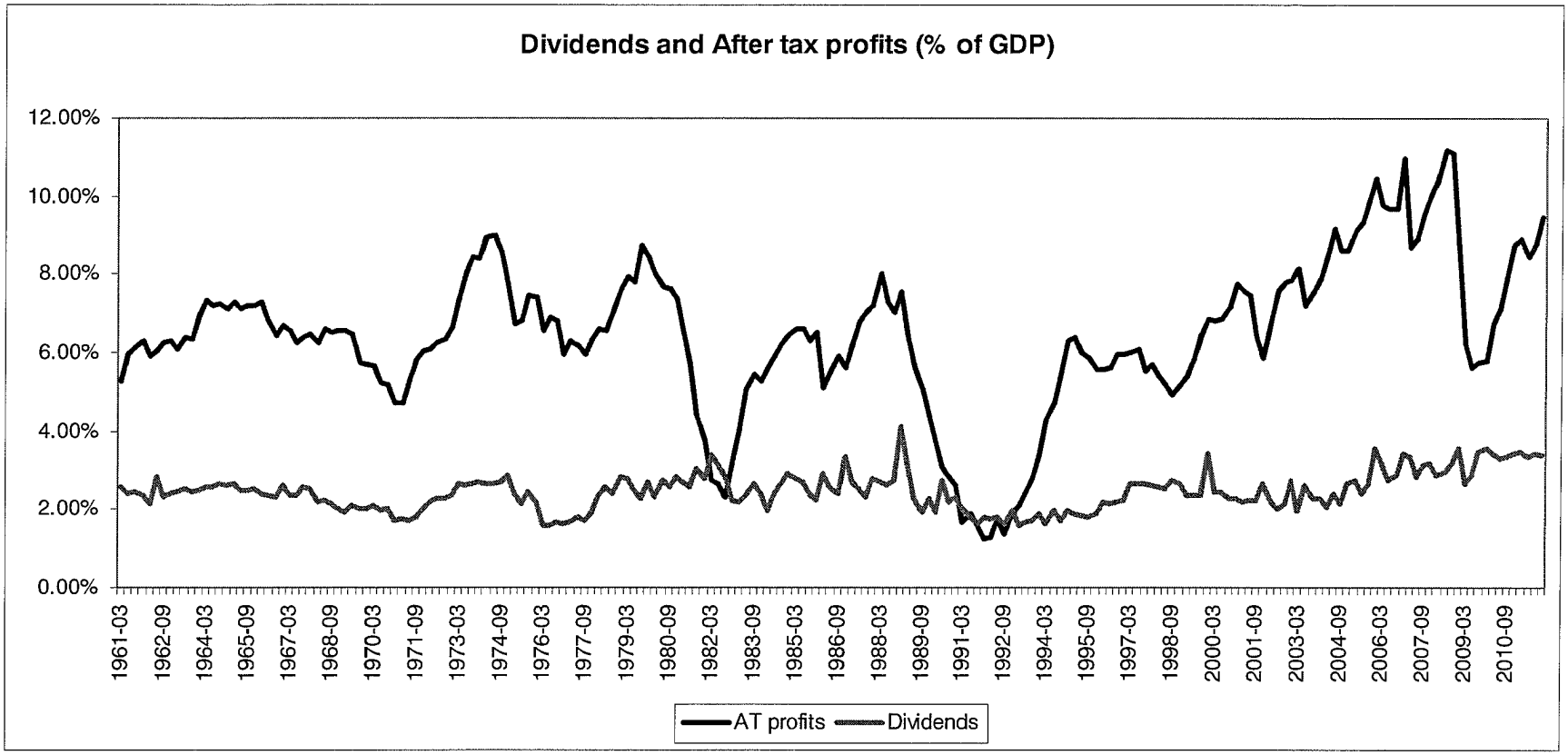
SCHEDULE3


Long Canada Yield and TSX Yield
18
16
14
12
10
8
6
4
2
0
1956M01
1957M12
1959M11
1961M10
1963M09
1965M08
1967M07
1969M06
1971M05
1973M04
1975M03
1977M02
1979M01
1980M12
1982M11
1984M10
1986M09
1988M08
1990M07
1992M06
1994M05
1996M04
1998M03
2000M02
2002M01
2003M12
2005M11
2007M10
2009M09
2011M08
TSXYield
Canadas

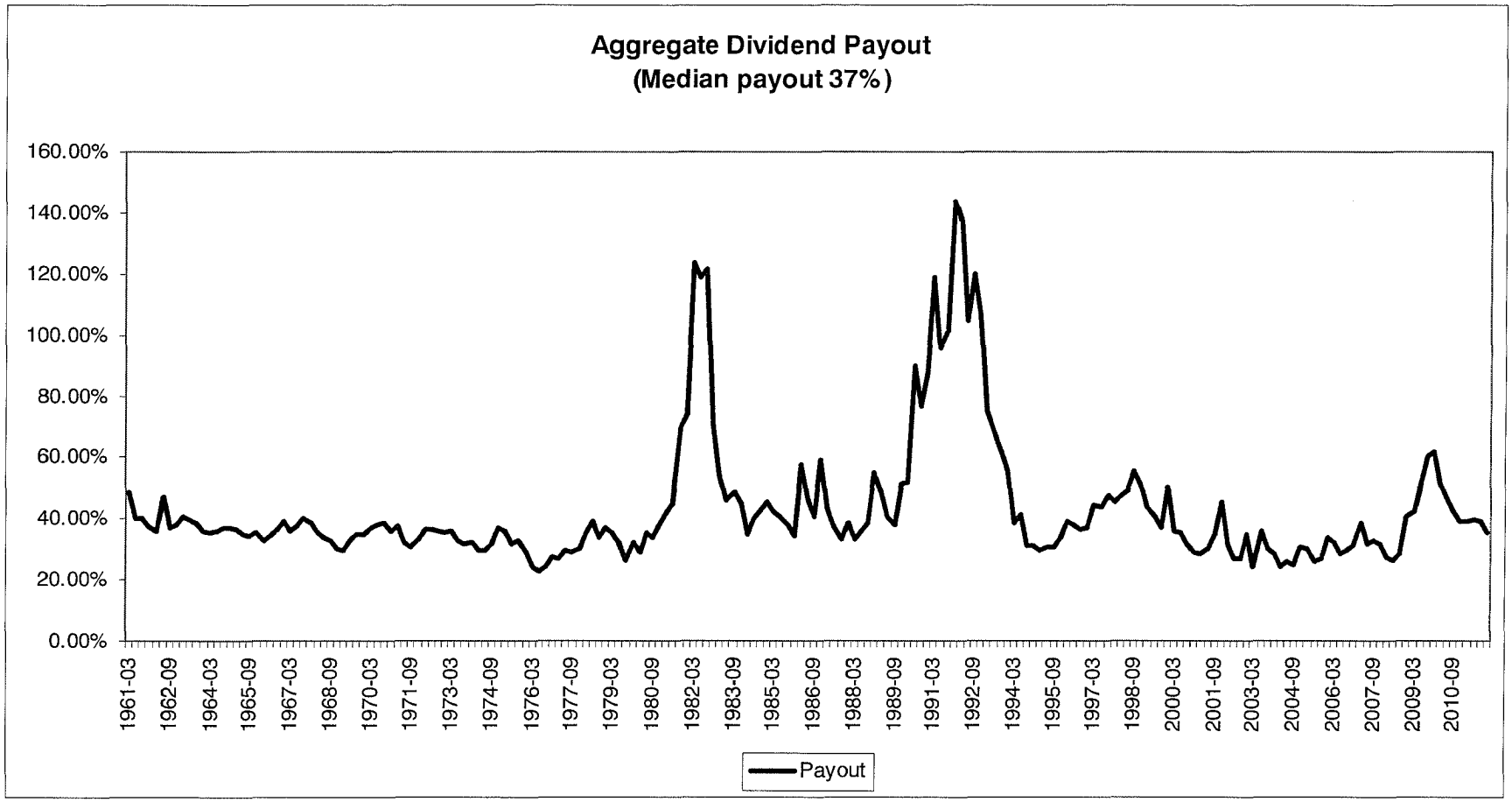
SCHEDULE 4


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

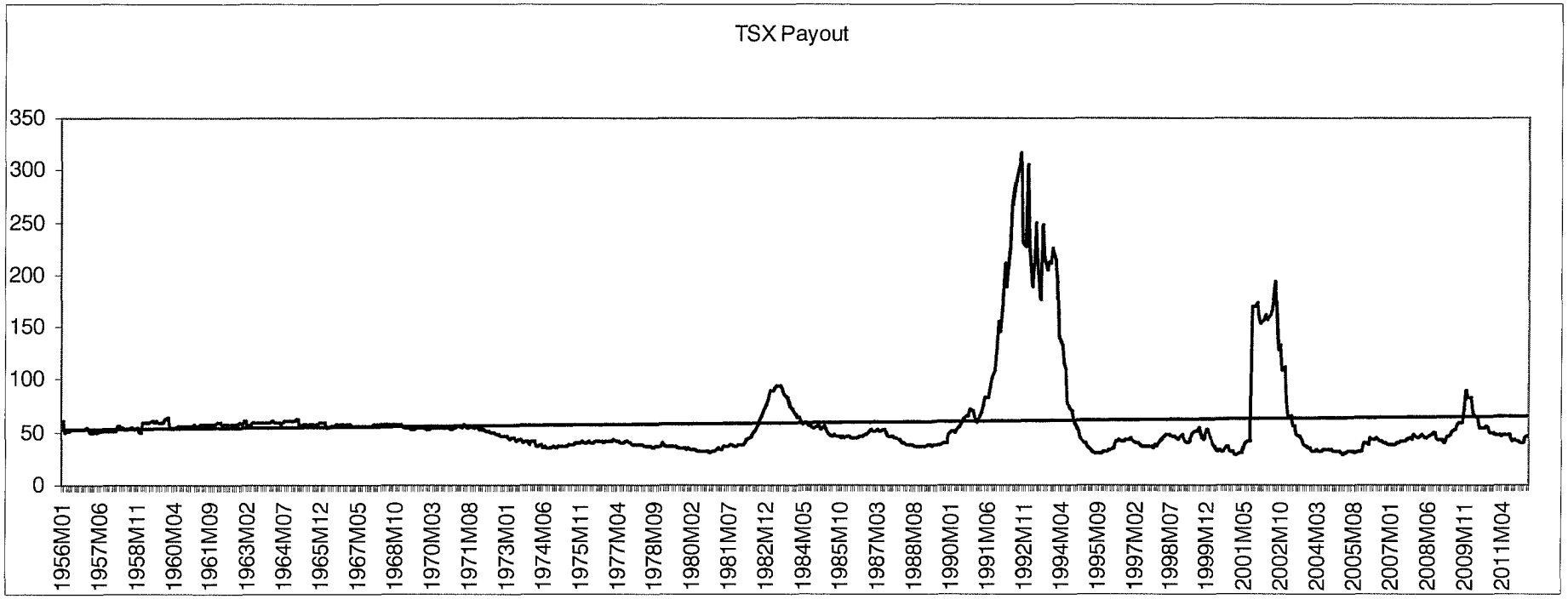
SCHEDULE 5


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 Payout
350
300
250
200
150
100
50
0
1956M01
1957M06
1958M11
1960M04
1961M09
1963M02
1964M07
1965M12
1967M05
1968M10
1970M03
1971M08
1973M01
1974M06
1975M11
1977M04
1978M09
1980M02
1981M07
1982M12
1984M05
1985M10
1987M03
1988M08
1990M01
1991M06
1992M11
1994M04
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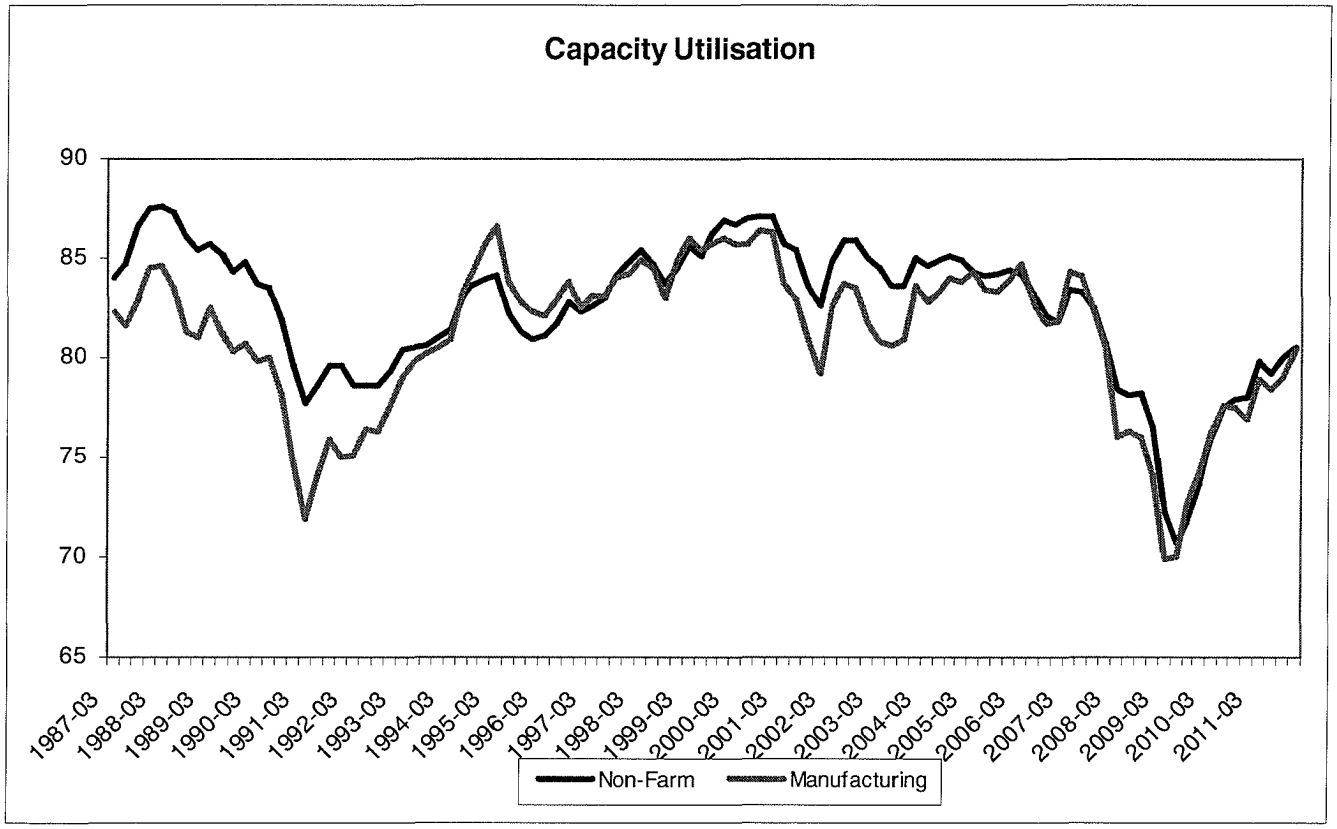
1999M12
2001M05
2002M10
2004M03
2005M08
2007M01
2008M06
2009M11
2011M04


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
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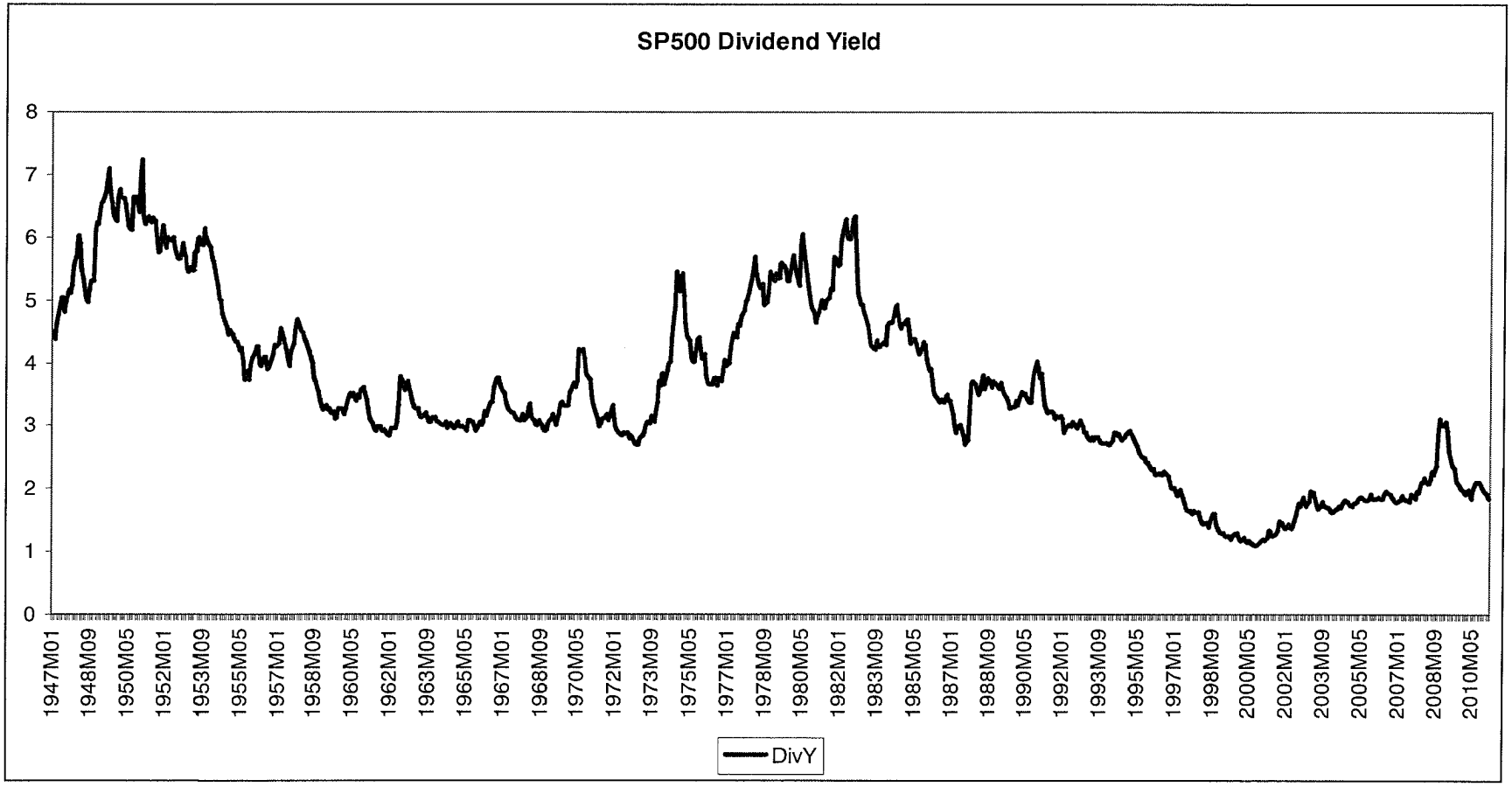
2006-03
2007-03
2008-03
2009-03
2010-03
2011-03
Non-Farm
Manufacturing

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
1997M01
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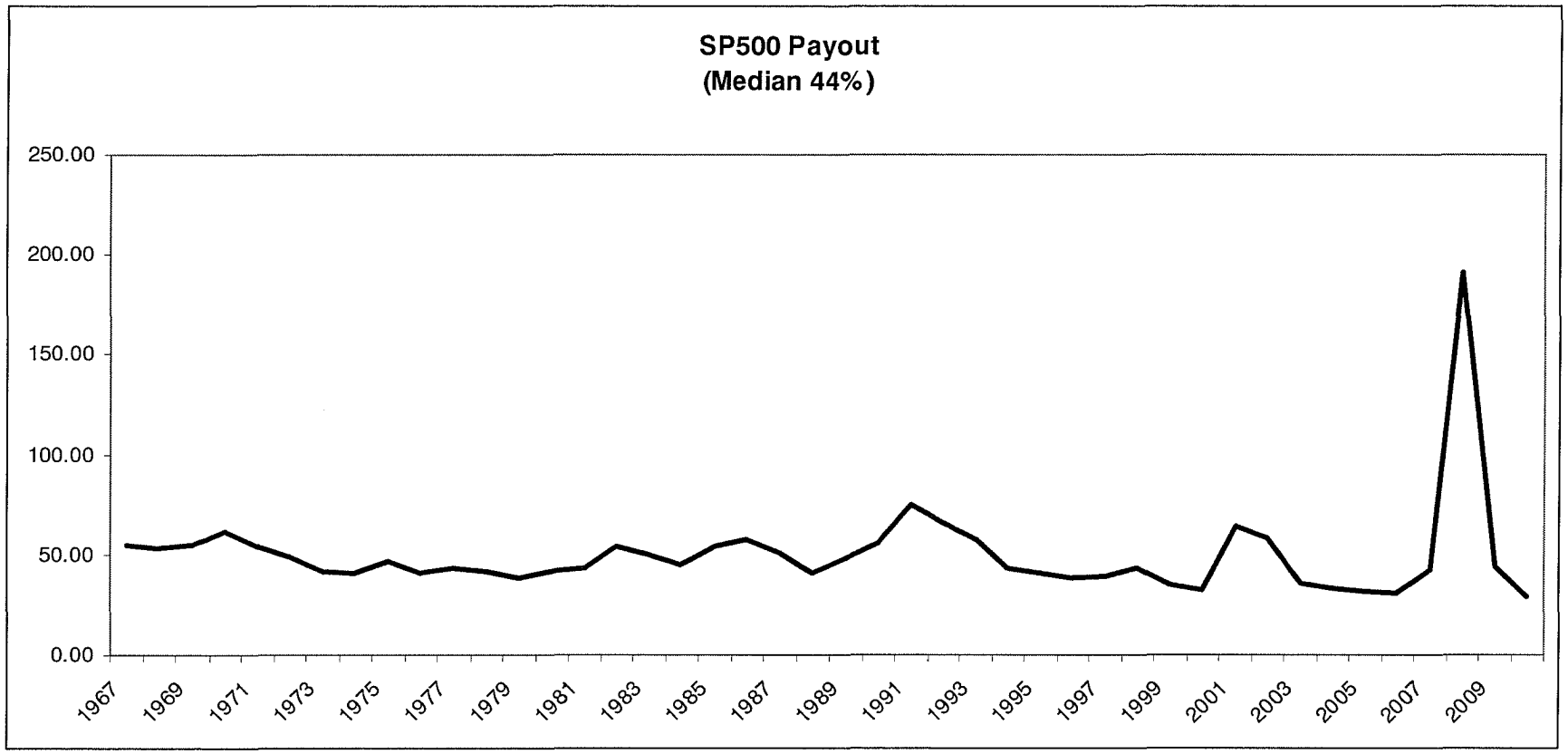
2000M05
2002M01
2003M09
2005M05
2007M01
2008M09
2010M05
DivY

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

	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	5.80	6.99	1.59	1.18	1.13	3.69
1994	8.45	7.05	83.43	16.57	11.71	1.94	6.55	7.25	8.62	1.37	1.37	1.47	3.61
1995	9.23	6.97	75.51	24.49	12.36	3.03	6.23	6.40	9.45	1.39	3.04	2.80	3.82
1996	9.07	6.96	76.74	23.26	11.64	2.71	5.86	6.52	8.73	1.43	2.21	2.18	3.37
1997	7.63	6.64	87.02	12.98	10.16	1.32	5.49	6.27	6.88	1.49	0.62	0.77	3.15
1998	8.52	6.5	76.20	23.80	11.05	2.63	4.45	5.20	7.19	1.82	2.00	1.79	2.76
1999	9.31	6.24	67.02	32.98	12.36	4.08	4.60	5.80	8.87	1.69	3.07	2.53	2.53
2000	6.06	6.36	104.95	-4.95	7.04	-0.35	4.40	5.90	4.04	1.80	-1.87	-2.07	2.25
2001	10.58	5.42	51.23	48.77	13.63	6.65	3.41	5.01	10.28	1.88	5.27	3.45	1.81
2002	7.31	5.93	81.12	18.88	10.18	1.92	4.82	4.53	6.83	1.63	2.30	2.17	3.58
2003	8.44	5.29	62.68	37.32	10.61	3.96	4.31	4.02	8.44	1.51	4.42	3.80	3.39
2004	11.12	5.77	51.89	48.11	12.37	5.95	3.74	4.28	9.91	1.68	5.63	4.09	2.63
2005	10.22	6.85	67.03	32.97	11.86	3.91	3.69	4.31	7.75	2.04	3.44	2.57	2.57
2006	12.35	6.99	56.60	43.40	12.68	5.50	3.37	4.82	9.06	2.13	4.24	2.95	1.89
2007	14.82	7.85	52.97	47.03	12.81	6.02	3.09	4.54	9.30	2.20	4.76	3.17	1.79
2008	15.27	8.57	56.12	43.88	12.83	5.63	3.75	3.57	9.59	1.92	6.03	4.09	3.12
2009	13.37	8.8	65.82	34.18	10.53	3.60	5.01	3.36	8.79	1.38	5.44	4.66	4.55
2010	14.57	9.07	62.25	37.75	10.96	4.14	4.96	3.19	9.30	1.38	6.12	5.02	4.61
average			**70.45**	**29.55**	**11.45**	**3.55**				**1.69**	**3.29**	**2.59**	**3.06**
Median			**67.03**	**32.97**	**11.68**	**3.76**				**1.66**	**3.26**	**2.68**	**3.13**
GAS													
1993	6.11	3.43	56.14	43.86	11.55	5.07	3.15	5.80	8.37	1.93	2.57	2.23	1.47
1994	7.21	3.82	52.98	47.02	12.29	5.78	3.57	7.25	9.56	1.78	2.31	2.29	1.02
1995	5.25	4.02	76.57	23.43	8.28	1.94	3.45	6.40	5.45	1.75	-0.95	-0.19	1.41
1996	9.75	4.36	44.72	55.28	13.75	7.60	2.78	6.52	10.59	2.14	4.07	2.80	0.64
1997	6.25	5.01	80.16	19.84	8.19	1.62	2.74	6.27	4.41	2.15	-1.86	-1.23	0.76
1998	5.89	5.36	91.00	9.00	7.85	0.71	2.69	5.20	3.41	2.32	-1.78	-1.57	1.37
1999	7.4	9.34	126.22	-26.22	6.57	-1.72	3.84	5.80	2.05	1.99	-3.75	-4.90	2.19
2000	18.7	8.43	45.08	54.92	12.96	7.12	2.61	5.90	9.91	2.18	4.01	2.85	0.85
2001	9.87	8.16	82.67	17.33	7.33	1.27	2.47	5.01	3.77	2.38	-1.24	-0.76	1.26
2002	13.45	8.58	63.79	36.21	13.69	4.96	4.01	4.53	9.17	2.15	4.64	3.07	3.16
2003	14.77	7.23	48.95	51.05	13.82	7.06	4.24	4.02	11.59	1.57	7.57	5.02	3.70
2004	13.37	9.92	74.20	25.80	9.84	2.54	4.99	4.28	7.66	1.43	3.38	3.23	4.32
2005	10.42	19.06	182.92	-82.92	10.14	-8.41	9.05	4.31	-0.12	2.03	-4.42	-3.67	8.50
2006	8.26	8.89	107.63	-7.63	9.59	-0.73	3.94	4.82	3.18	2.62	-1.64	-1.66	2.90
2007	16.54	4.39	26.54	73.46	17.95	13.19	1.63	4.54	15.03	2.92	10.48	4.21	0.68
2008	19.61	4.21	21.47	78.53	18.46	14.50	1.60	3.57	16.33	2.48	12.76	4.87	1.25
2009	11.17	4.73	42.35	57.65	10.15	5.85	2.32	3.36	8.31	1.85	4.95	3.89	2.13
2010	12.05	7.49	62.16	37.84	9.7	3.67	2.91	3.19	6.69	2.07	3.50	2.91	2.85
average			**71.42**	**28.58**	**11.23**	**4.00**				**2.10**	**2.48**	**1.30**	**2.25**
Median			**62.97**	**37.03**	**10.15**	**4.31**				**2.11**	**2.97**	**2.55**	**1.44**

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 2011.

SCHEDULE 12

ECONOMY AND MARKETS

MARKET LAB

Wall St.'s woeful forecasting not getting better

DAVID PARKINSON

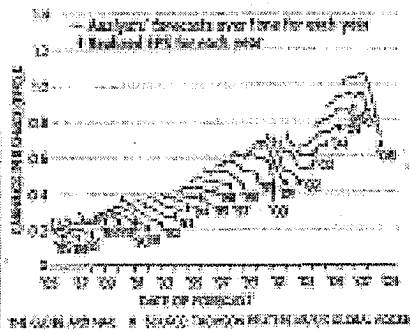
Nearly a decade ago – about the time the bursting tech bubble had raised serious questions about conflicts of interest in Wall Street equity research – consulting firm McKinsey & Co. did a study on the accuracy of analysts' company earnings forecasts. The results were discouraging: Analysts were routinely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

Since then, major scandals involving tainted research have come to light, Wall Street's biggest firms have paid $4-billion [U.S.] in penalties for these practices, and regulators have put rules in place aimed at creating 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.

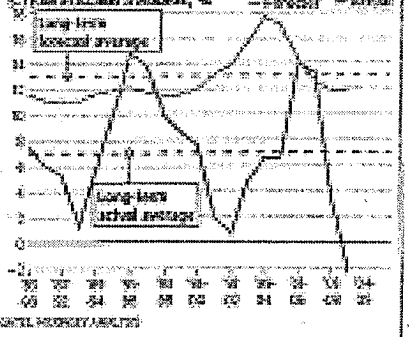
OFF THE MARK

Analysts are often too optimistic and their forecasts exceed companies' realized earnings per share. Over the past 25 years, actual growth surpassed forecasts only twice. Both times were during the recovery following a recession.

S&P 500 COMPANIES



EARNINGS GROWTH FOR S&P 500 COMPANIES
CYCLICALLY ADJUSTED ANNUAL, %



SOURCE: THOMSON REUTERS DATA; MCKINSEY GLOBAL INSTITUTE RESEARCH ANALYSIS

DOWNTURN REVEALS SAME OLD HABITS

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 ensuing portions of the year – and undershot through the entire year in 2003 and 2004.

But last year finally was evidence of a new kind of thinking within Wall Street research departments, the Street's widely eyed optimism came back with a vengeance starting in 2007.

Going back over the past 25 years, McKinsey found that, on average, analysts' earnings growth forecasts "have been nearly 100 percent too high." Annual S&P 500 consumer 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 rates, there have only been two periods in the past 25 years when the earnings met or exceeded analysts' forecasts. Both were in recovery periods after the U.S. recessions of the early 1990s 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. "When economic growth accelerates, the size of the forecast error declines; when economic growth slows, it increases."

The pattern means that while 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."