



**Bull, Housser
& Tupper** LLP

3000 Royal Centre . PO Box 11130
1055 West Georgia Street
Vancouver . BC . Canada . V6E 3R3
Phone 604.687.6575 Fax 604.641.4949
www.bht.com

Reply Attention of:	R. Brian Wallace
Direct Phone:	604.641.4852
Direct Fax:	604.646.2506
E-mail:	RBW@bht.com
Our File:	05-2543
Date:	October 11, 2005

BC Utilities Commission
6th Floor – 900 Howe Street
Vancouver, BC V6Z 2V3

Attention: Mr. Robert J. Pellatt
Commission Secretary

Dear Sirs/Mesdames:

Re: Terasen Return on Equity Hearing

Attached is the evidence of Dr. Laurence Booth in this matter. This evidence is sponsored by the British Columbia Utility Customers, a group made up of the Joint Industry Electricity Steering Committee (JIESC), the Commercial Energy Consumers Association of British Columbia (CEC), The Lower Mainland Large Gas Users Association and The British Columbia Old Age Pensioners Organization et. al. (BCOAPO). Paper copies of this evidence will be delivered to the Commission tomorrow. We have inserted the occasional blank page in the attached Acrobat PDF document to ensure that each appendix will start on a new page if the document is printed using double-sided printing.

Due to the overwhelming volume of Information Responses filed by Terasen in this matter it was not possible for Dr. Booth to complete his review of all of the Responses before finalizing his evidence. If there is anything additional arising out of the Terasen Information Responses we will seek leave to file supplementary evidence at a later date.

Yours truly,

Bull, Housser & Tupper LLP

A handwritten signature in cursive script that reads 'R. Brian Wallace'.

R. Brian Wallace
RBW/sg/1350197

**FAIR RETURN AND CAPITAL STRUCTURE FOR
TERASEN GAS INC**

EVIDENCE OF

Laurence D. Booth

BEFORE THE

British Columbia Utilities Commission

October 2005

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1.0 INTRODUCTION

2.0 FINANCIAL AND ECONOMIC OUTLOOK

3.0 THE REGULATORY FRAMEWORK AND TERASEN'S RISK

4.0 FAIR ROE ESTIMATES

5.0 REASONABLENESS OF THE ESTIMATES

6.0 AN ADJUSTMENT MECHANISM.

APPENDIX A: Professor Booth's Curriculum Vitae

APPENDIX B: Fair rate of return standard and Comparable Earnings

APPENDIX C: Discounted Cash Flow Estimate

APPENDIX D: Internationalisation and the Market Risk Premium

APPENDIX E: Canadian market Risk Premium estimates

APPENDIX F: US Market Risk Premium Estimates

EXECUTIVE SUMMARY

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27

The Joint Industry Electricity Steering Committee (JIESC), the Commercial Energy Consumers Association of British Columbia (CEC), The Lower Mainland Large Gas Users Association and The British Columbia Old Age Pensioners Organization et. al. (BCOAPO), collectively the British Columbia Utility Customers have asked me to provide an independent assessment of the fair rate of return on common equity for Terasen, which I continue take to be the low risk utility benchmark for BCUC ratemaking purposes. They also asked me to comment on Terasen’s business risk and its request for a higher common equity ratio and a recalibration of the BCUC adjustment formula.

My overall assessment is as follows:

- Canada is entering the middle years of the business cycle and is now several years from the slowdown of the early 2000s. Long Canada yields are expected to increase to just under 5.00% over the next year as the Bank of Canada starts to increase rates to offset what might otherwise be an overheating economy. Inflation is expected to remain in the mid range of the 1.0-3.0% operating range of the Bank of Canada with most of the pressure coming from rising energy prices.
- I continue to recommend that the BCUC adjust for changes in business risk through the use of deferral accounts, as far as is practicable, and then changes in the common equity ratio, rather than ROE adjustments. However, I fail to see any significant changes in the business risk of Terasen and my prediction is that its demonstrated ability to earn its allowed ROE will continue. I therefore judge its 33% common equity ratio to be adequate and in line with the 35% allowed Enbridge Gas Distribution and Union Gas, which are both allowed 35% by the Ontario Energy Board, but which do not have the same regulatory protection as Terasen.

- 1 • Using the traditional risk premium test, utilities are assessed as having relative
2 risk of 45-55% of the market as a whole and the current market risk premium I
3 estimate to be 4.5%. Recent market risk premium studies support this 4.5%
4 estimate, rather than the higher estimates used by Ms. McShane. Including
5 estimates from a multi-factor risk premium model gives an average fair return of
6 approximately 7.25%, adding in a 50 basis point "cushion" gives a fair ROE of
7 7.75%.
- 8 • Formula adjustment mechanisms are now in use in the major jurisdictions in
9 Canada, and have been reviewed and continued by the both the National Energy
10 Board and the Ontario Energy Board, and have recently been introduced by the
11 Alberta Energy and Utilities Board. In my judgement the use of an adjustment
12 mechanism with currently allowed parameters overstates the fair ROE,
13 particularly after it is recognized that the use of an adjustment mechanism *lowers*
14 the risk to a utility investor. This is because it converts the equity investment in a
15 utility into a form of floating rate preferred share, where observed yields are
16 significantly lower than current allowed ROEs.
- 17 • In 1994 I testified before the BCUC with my late colleague Dr. Berkowitz and
18 recommended an 80% adjustment of the allowed ROE to changes in the long
19 Canada yield. I have subsequently testified that the 75% adjustment allowed by
20 the NEB and OEB and recently used by the Alberta EUB is reasonable and has
21 given approximately correct answers, given the collapse in the real yield on long
22 Canada bonds. It is my judgment that while the BCUC formula has used a 100%
23 adjustment for long Canada yields below 6.0%, which might seem harsh, the
24 overall allowed ROEs have been fair and reasonable. Further I can find no
25 evidence that the use of an adjustment mechanism has harmed shareholders or
26 caused a loss in financial flexibility on the part of any utility.
- 27 • The evidence from recent takeovers of Canadian utilities indicates that they are
28 very attractive investments since the takeovers are uniformly at significant
29 premiums to book value. Once it is recognised that the takeover premium is a

1 non-earning asset it, is obvious that investors are willing to “eat through” this
2 non-earning asset simply to get the return from the book assets in the rate base. In
3 turn this implies that these assets are being allowed a too-generous rate of return.
4 **It seems contrary to public policy that one dollar invested in the rate base**
5 **should immediately be worth more than a dollar in the equity market.**

- 6 • Kinder Morgan’s (KMI) proposed takeover of Terasen Inc is at an 11.8X
7 expected 2006 EBITDA or 2.7X book value. This extreme valuation implies that
8 the financial parameters applied to the Terasen companies are extremely generous
9 and confirms my judgment that they should be reduced. The KMI takeover also
10 calls into question the lack of ring fencing of Terasen Gas and the need for
11 restrictions on inter affiliate cash management and transactions. Failing such ring
12 fencing, in the face of the double leverage used by KMI to finance the transaction,
13 there is a grave risk that Terasen Gas Inc’s bond rating will suffer and ratepayers
14 will be paying unfair and unreasonable debt costs.

15

16

1 **1.0 INTRODUCTION**

2 **Q. PLEASE DESCRIBE YOUR NAMES, QUALIFICATIONS AND EXPERIENCE.**

3 **A.** Laurence Booth is a professor of finance and finance area co-ordinator in the Rotman
4 School of Management at the University of Toronto, where he holds the CIT Chair in Structured
5 Finance. A detailed resume is filed as Appendix A to this testimony. Further information and
6 copies of working papers by Dr. Booth can be can be downloaded from
7 <http://www.rotman.utoronto.ca/~booth>.

8

9 **Q. PLEASE DISCUSS HOW YOUR TESTIMONY IS ORGANISED.**

10 **A.** In its main evidence (page 2) Terasen lists several reasons to re-evaluate its financial
11 parameters; paraphrasing they are:

- 12 1. TGI currently has the lowest ROE of any regulated utility in Canada;
- 13 2. The asymmetry in the adjustment mechanism above and below 6.0% produces
14 inadequate returns;
- 15 3. There have been significant changes in the economy and capital markets since
16 1999 and the financial parameters need to be revised accordingly;
- 17 4. The business risk of TGI has increased since the adjustment mechanism was
18 instituted in 1994 and reviewed in 1999;
- 19 5. The financial flexibility of TGI (and TGVI) needs to be sufficient to allow TGI
20 (and TGVI) to attract capital on reasonable terms;
- 21 6. The BCUC should consider other equity cost estimating techniques such as DCF
22 and Comparable Earnings (CE) as well as risk premium tests.

23 My testimony is organised around addressing these issues.

24 In Section II I will discuss where we are in the economy and contrast our current situation with
25 that existing in 1999, when the BCUC last reviewed its adjustment mechanism. This addresses
26 issue # 3. I will then discuss Terasen's business risk, which addresses issue # 4 and the fair rate
27 of return which addresses issue #6. In Appendix B I discuss in detail the fair return standard and

1 why comparable earnings testimony should be ignored. This addresses issue #1 as well as issue #
2 6. In Appendix C, as well as the body of my testimony, I present DCF estimates, which
3 addresses issue #6. I finish with a discussion of the BCUC adjustment mechanism and the
4 question of financial flexibility and bond ratings, which addresses issues # 2 and 5.

5

1 **2.0 FINANCIAL AND ECONOMIC OUTLOOK**

2 **Q. WHAT IS YOUR OUTLOOK FOR ECONOMIC GROWTH IN CANADA?**

3 **A.** Basic macroeconomic data for the last twenty plus years is provided as background in
4 Schedule 1. Economic conditions can sometimes change quite rapidly as the impact of hurricanes
5 and oil price shocks are unpredictable. However, there is a rhythm to the economy, which
6 reflects the momentum as shocks gradually work through the system; this is what is generally
7 referred to as the business cycle. The basic economic variable here is the rate of economic
8 growth. The trend line for economic growth is around 3.5% so that periods with growth
9 significantly below that are periods of contraction or recession, whereas periods of growth
10 significantly above that are expansionary periods.

11 Note that at the start of the period in Schedule 1 in 1983 Canada was pulling out of a slowdown
12 and then again from 1989 until 1993 Canada was mired in a deep recession in response to a
13 normal cyclical slowdown as well as restructuring that accompanied the passage of the Free
14 Trade Agreement (FTA). We can also see the strong economy of the mid 1980s and again the
15 mid to late 1990s, when real economic growth was over 4.0%. Most recently, we can see the
16 mild slowdown of the early 2000's as recession in the United States and the effects of the stock
17 market crash in Canada weakened the economy. 2001 was then a period of moderate growth,
18 caused in part by the startling events of September 11th. The Canadian economy then picked up
19 steam in 2002 and outperformed other major industrialised economies. 2003 was then forecast to
20 be a strong year, but the second quarter was hit by a perfect storm.

21 First, economic conditions in the US were weaker than anticipated and in marked contrast to
22 Canada, which led to a 15% depreciation in the trade weighted value of the US dollar. The
23 spread in short term rates between Canada and the US reached 1.75%, which led to a rapid run
24 up in the value of the Canadian dollar. Finally, Severe Acute Respiratory Syndrome (SARS) and
25 a single incident of Bovine Spongiform Encephalopathy (BSE or mad cow disease) caused an
26 interruption in tourism and beef exports to the US and elsewhere. These four effects were largely
27 temporary as the Bank of Canada lowered interest rates in July 2003 so that some of the steam
28 went out of the strengthening Canadian dollar and economic growth picked up in 2004.

1 For 2005 we again have good economic growth with forecasts for the year coming in at 3.2-3.5%
2 as strong growth soaks up the remaining available labour and the unemployment rate drops
3 below 7.0%. Consumer spending is strong as low interest rates support the purchase of consumer
4 durables, as well as record residential housing sales. Further Business investment remains strong
5 with additional rebuilding of inventory. Even the effects of the oil price increases have been
6 largely muted by external interest in Canada's oil sands reserves and the perception that Canada
7 has positive exposure to oil and gas prices. This perception, allied to the continuing strength of
8 the current account surplus, which has been running at over 1.0% of GDP, has lead to a
9 strengthening Canadian dollar which has crept above 86 cents US. The overall strength of the
10 Canadian economy lead the Bank of Canada to reverse its stimulus policy and start increasing
11 short term interest rates (September 7) with a 0.25% increase in September and more expected
12 over the next six months as the overnight rate is expected to move into the high 3.0% range.

13

14 **Q. WHAT IS YOUR OUTLOOK FOR INFLATION?**

15 **A.** Over the past several years, the Canadian economy has experienced low and stable
16 inflation together with reasonably strong economic growth. The graph in Schedule 2 shows the
17 average CPI inflation rate since 1951. What is clear from this graph is the enormous run up in
18 inflation from the early 1950's through to its peak in the early 1980s. Since then it dropped to
19 plateau at the 4.0% level through the 1980s before the effects of the major slow down in the
20 early 1990s caused it to drop to its cyclical low in 1994/5, where it almost touched price stability.
21 Since that time the consumer price index has remained broadly in the middle of the Governor of
22 the Bank of Canada's 1-3% range.

23 Schedule 3 graphs the average annual inflation rate along with the average yield on long Canada
24 bonds and Treasury Bills since 1961. The graph shows that prior to 1981, inflation was
25 increasing steadily, until the Bank of Canada engineered a recession in 1982-3 to bring inflation
26 under control. Similarly, in the late 1980's there was a gradual increase in inflation and wage
27 settlements that peaked about 1991, as again, the Bank of Canada engineered a recession to bring
28 down the rate of inflation. Although the absolute rate of inflation has been brought down
29 considerably from these earlier periods, the same pattern of increasing inflation from 1994-2001

1 is evident as in the earlier periods of 1986-1990 and 1976-1982. In each case, interest rate
2 increases slowed down the economy and with it the rate of inflation.

3 Schedule 5 shows that the long Canada real bond yielded 1.67% on September 20, 2005 or 254
4 basis points below the equivalent nominal bond yield of 4.21%. The real bond guarantees the
5 investor protection from inflation, whereas the nominal bond has built into the yield
6 compensation for both the expected rate of inflation and a real yield. As a result, the spread
7 between the nominal and real rate can be taken as one estimate of the market's forecast of the
8 long run inflation rate. Other measures of inflation come in slightly lower as the GDP deflator
9 has been running at 2.0%, similar to the current CPI inflation rate, while "core" inflation, which
10 nets out the more volatile items, is at about 1.40%.

11 The graph in Schedule 4 shows the aggregate net lending of governments in Canada, where a
12 negative number indicates government borrowing or a fiscal deficit. What is clear from Schedule
13 4 is the dramatic improvement in the fiscal position of all layers of government since the early
14 1990s and their return to balanced budgets. This in turn has reduced the supply of government
15 bonds and the need for the Bank of Canada to follow accommodative monetary policy which in
16 turn has supported the drop in inflation.

17

18

19

20 **Q. WHAT ARE CONDITIONS LIKE IN BRITISH COLUMBIA?**

21 **A.** The BC economy has been slightly stronger than the overall Canadian economy with
22 economic growth in 2003 at 2.5% and in 2004 3.3% with forecast growth of 3.5% for 2005. For
23 all three years the BC economy has or is expected to grow at a little less than 0.5% faster than
24 Canada as a whole. Strength in forestry, tourism and construction has underpinned the economy
25 with overall employment gains particularly strong in construction (30% or 39,000 jobs), this in
26 turn has lead to the lowest unemployment rate since 1981 (6.1% December 2004) and the
27 provincial budget verging on a surplus. The strong provincial economy has lead to shortages in

1 some trades and inflation picking up to over 2.0%. There is no indication that the state of the
2 provincial economy poses any special risks to Terasen at present.

3

4 **Q. WHAT ARE YOUR INTEREST RATE FORECASTS?**

5 **A.** Schedule 5 provides data on the full range of interest rates across the broad maturity
6 spectrum as of September 20, 2005. What is evident is that interest rates for long maturity
7 instruments are higher than at the short end of the maturity spectrum; this is referred to as a
8 ‘normal’ yield curve. Schedule 3 charts the history of short and long term interest rates together
9 with inflation since 1961. It is clear that short term Treasury bill yields have continued their long
10 decline from their peaks in 1981 as inflation has receded. This long run decline has been
11 punctuated by periods when Treasury bill yields have increased to support the dollar (1996) or
12 fight a too vigorous economy (late 1980’s and 1990’s). In contrast, long term rates have
13 continued their gradual year over year decline without these peaks. This is because long term
14 bond investors look not just at the next 91 days, but far off into the future. As such, long-term
15 bond yields reflect the *long* term future of the Canadian economy, while T-Bill yields reflect
16 *short* term expectations.

17 Schedule 3 also indicates that the only times that the Treasury bill yields have exceeded those on
18 long Canadas for significant periods of time were in 1980-1982 and 1989-1991. In both cases,
19 the Bank of Canada was trying to engineer a slow down in the economy, due to its fears of
20 accelerating inflation. This same tightening of the spread between long Canadas and 91-day
21 Treasury bill yields was evident throughout 1998-2000, as the Governor of the Bank of Canada
22 tried to slow down an “over-shooting” economy. However, since the economy slowed during
23 2001 monetary policy reversed direction and short-term interest rates have fallen dramatically.
24 This policy stance continued through 2005 until September, when the Bank of Canada increased
25 its overnight rate on fears of increased capacity utilisation and a decline in the output gap.

26 Another way of looking at the impact of the Bank of Canada’s monetary policy is to recognise
27 that monetary policy works through both interest rates and the exchange rate: higher interest
28 rates and a stronger dollar together slow down the economy by impacting interest sensitive and

1 export industries. To examine both of these effects, the Bank of Canada maintains a “monetary
2 conditions index” or MCI, which is reproduced in the graph in Schedule 6. Again, the dramatic
3 changes of 1981-82 and 1988-1990 are evident, as the MCI increased dramatically. We can also
4 see the long run monetary loosening ending in 1998 with the levelling off of the MCI as the
5 Bank of Canada started to worry about a too strong economy. This stance was reversed by the
6 end of 2001 as the stock market crash exposed the economy to another shock, with further
7 loosening helped by a weak dollar. It has been the subsequent strength in the value of the
8 Canadian dollar that has lead to the recent upturn in the MCI and allowed the Bank of Canada to
9 leave interest rates largely alone.

10 The Consensus Economics (Consensus 2005) forecast for 10-year Canada bonds is that rates will
11 continue to be under pressure and the near term estimate is for 10-year Canada bond yields of
12 4.1% three months out and 4.6% one year out. This is a 20-80 basis point increase from the
13 3.90% level of September 20, 2005. Given the range of the consensus forecast of 3.7-4.9% three
14 months out and 3.3-5.5% one year out, there is clear disagreement on where interest rates are
15 heading. Of interest is that the median or middle estimate is 4.0% and 4.70% for three and twelve
16 months out respectively. The current spread between 10-year and long-term Canada bonds in
17 Schedule 5 is 31 basis points. Adding the 31 basis point spread to the mean Consensus forecast
18 of 4.6% would put long Canada bond yields at 4.91% based on the average estimate and 5.01%
19 based on the median. I see no reason to second guess these consensus estimates and for
20 convenience base my fair return estimates on a *long Canada bond yield of 5.00%*.

21

22 **Q. WHAT HAS BEEN THE RECENT STATE OF CANADIAN CAPITAL**
23 **MARKETS?**

24 **A.** Since the onset of the last major recession in the early 1990s, capital markets have been
25 dominated by federal and provincial government financing. Their importance, however, has been
26 receding. Overall government “lending,” representing the aggregate of all levels of government,
27 was running at the rate of over minus \$60 billion during 1992 and 1993 or at its peak over 9.0%
28 of GDP. Government net lending subsequently declined almost year by year as the economy

1 recovered and governments finally got their spending under control. Schedule 4 graphs the
2 government's net lending as a percentage of GDP.

3 The disastrous consequences of government fiscal policy starting in the early 1970s is obvious in
4 Schedule 4, as governments started to run persistent deficits (net lending was negative indicating
5 net borrowing). However, it is equally clear that since 1992 all layers of government have made
6 serious efforts to restore some sanity to their finances. By 1997 lending had become genuine
7 lending and governments in aggregate were in surplus for the first time in twenty-three years. In
8 2000 all layers of government in aggregate ran a surplus of \$32 billion as tax revenues soared
9 and expenditures on welfare, unemployment, etc., declined along with the unemployment rate.
10 This amounted to over 3.0% of GDP, the biggest surplus since 1951, when governments were
11 still actively paying down the war debt. Although the weakening economy has eroded the
12 aggregate surplus since then, it is remarkable that the weakening economy of the early 2000's
13 did not impose more pressure on government finances.

14 The overall decline in government "lending" has opened up room for private sector borrowing as
15 corporations have returned to the equity and bond markets, following the strengthening of their
16 balance sheets. Fuelled by healthy consumer spending, corporate profits have rebounded from
17 the extreme cyclical lows of 1992-1994. Schedule 7 graphs the level of pre-tax profits to GDP. In
18 2000 pre-tax corporate profits reached 12.0% of GDP as the economy peaked. This level is
19 higher than the last cyclical highs of 1988-1989 and only slightly below the resource boom
20 fuelled highs of the 1970s. Although pre-tax profits dropped off to 11.0% of GDP for 2001 and
21 2002 as the economy weakened, they have subsequently spurted forward again on high resource
22 prices and reached an all time high of 14% of GDP in the second quarter of 2005. This profit
23 data is mirrored in the capacity utilisation data in Schedule 8, where we can see the drop in
24 utilisation in 2001 through the middle of 2004 and the strong rebound since then with utilisation
25 rates again at close to all time highs.

26 The profit and capacity utilisation data provide the same signals as the inflation and interest rate
27 data, that the peak of the cycle was in 2000 with a minor slowdown in 2001-2003. We are now in
28 a strengthening phase of the business cycle as the economy is strong. This combination of
29 declining interest rates and booming corporate profits has lead to stronger equity prices and a

1 strengthening value of the Canadian dollar. Schedule 9 graphs the C\$ in terms of its US dollar
2 value, where we can see clearly that its long run secular decline, when it was heading for a sub
3 60 cent US level, was reversed in the Fall of 2002 after which it has gone from strength to
4 strength and has recently been over 86 cents US.

5 From its 1995 price level of 15 times trailing corporate earnings, the Price Earnings (PE) ratio of
6 the broad TSE300 index doubled to over 30X in the late 1990s boom. It is incredibly difficult to
7 get a 30X PE ratio in a normal stock market, leading many to question the valuation of the stock
8 market at that time.¹ However, the TSE300 index peaked at over 11,000 in late summer 2000 up
9 from 7,000 the year before. The situation in the US was even more serious as the stock market
10 “exuberance” led to a bubble in Internet and Technology stocks that partly spilled over into
11 Canada. The Governor of the Federal Reserve Board, Alan Greenspan, publicly worried about
12 the “irrational exuberance” of the stock market, while the Fed’s valuation model showed the
13 stock market significantly over valued by the summer of 2000.

14 In response, the Governor of the Bank of Canada and Governor Greenspan both started to push
15 up short term interest rates to remove some of the excesses and achieve the so called “soft
16 landing.” By the fourth quarter of 2000 the economy was starting to weaken and the stock
17 market softened, weakening almost month by month. In the process the TSE300 gave up almost
18 all of the excess that resulted from the run up from the end of 1999, but in the process led to a
19 severe drop in investor confidence especially amongst those who got caught up in the momentum
20 of ever increasing stock prices in the first half of 2000.

21 As shown in Schedule 10 the S&P/TSX Composite Index ² peaked in September 2000. As stock
22 prices fell throughout the remainder of 2000, the S&P/TSX Composite finished the year with a
23 modest gain of 6.0%. Since the beginning of 2001, the drop in technology stocks that marked the
24 fourth quarter of 2000 continued with the tech heavy Composite continuing to fall. By August
25 27, 2001 the S&P/TSX Composite was at 7,399, a 35% decline from the 11,389 level of a year

¹ See Laurence Booth “Time to Pass the Old Maid” *Canadian Investment Review*, Summer 1999. The full 1998 paper can be downloaded at <http://www.rotman.utoronto.ca/~booth>

² As of May 1, 2002, the TSE300 was renamed the S&P/TSX Composite.

1 earlier. In September 2002 the index fell to under 6,000, indicating losses of almost 50% from
2 the cyclical high and one of the worst bear markets since the 1930s.

3 Since September 2002 the TSX/S&P Composite has rebounded and most of the market
4 movements have been forward with more sustained upward momentum since March 2003. As of
5 September 2005 the TSX/S&P Composite was over 10,000, still below its peak, but indicating
6 much more confidence in the stock market.

7

8 **Q. HOW DOES THE STATE OF THE ECONOMY AFFECT CORPORATE**
9 **PROFITS?**

10 **A.** Schedule 7 graphs the level of pre-tax corporate profits as a percentage of GDP. These
11 profits are taken directly from corporate tax returns and so avoid all the one time only accounting
12 losses that rocked Nortel, JDS Uniphase and others. Consequently, they are a more accurate
13 measure of corporate operating profits. The graph shows that profits are currently running at all
14 time highs of over 14% of GDP.

15 Another way of assessing corporate profitability is to look at the aggregate data maintained by
16 Statistics Canada (*Quarterly Financial Statistics for Enterprises*). Statistics Canada started
17 reporting quarterly return on equity data in 1980 based on Standard Industrial Classifications
18 (SIC) and then moved to North American Industrial Classifications (NAICs) in 1999. Schedule
19 11 graphs this average annual ROE against the spread between the yield on BBB debt and long
20 Canada bonds from Scotia Capital's Handbook of Canadian Debt market Indices. It shows that as
21 of 1980 the average ROE was 15.05% and the yield spread that rewards investors for holding
22 BBB rated debt instead of default free Canada bonds was very low at just over 50 basis points.
23 "Corporate Canada's ROE" then declined during the 1982 recession as the yield spread widened.
24 The ROE then hovered around the 10% level during the growth oriented 1980's with a stable
25 yield spread. As ROEs fell from 1989 onwards, investors grew concerned about credit risk and
26 the yield spread increased dramatically to almost 350 basis points in 1993. The profit recovery
27 during the mid 1990s then caused the yield spread to contract only to widen in the early 2000s as
28 ROEs weakened.

1 The graph in Schedule 11 indicates the way in which the business cycle affects firms. During
 2 expansions, profitability increases and credit risk is lessened, causing investors to buy corporate
 3 bonds on narrower spreads over similar Canada bonds. During recessions the reverse happens: as
 4 profitability is reduced credit risk tends to increase causing spreads to widen. Profitability in this
 5 sense affects the market access of cyclical firms.

6 In contrast to competitive firms, ROE regulated firms have much more stable earnings.
 7 Consequently, even during recessions they have access to capital markets on reasonable terms.
 8 The following table gives the yield spread on CBRS Utility and Non-Utility indexes during the
 9 last major downturn.³

10 Utility vs. Non-Utility Yield Spreads

	CBRS Non-Utility Less Utility Yield Spreads		
	<u>A+</u>	<u>A</u>	<u>BBB</u>
1989	15	8	-9
1990	18	0	6
1991	-8	-18	17
1992	49	48	138
1993	145	36	271
1994	68	36	105

11
 12 A positive value in the first column, for example, means that in 1989 non-utility A+ rated debt
 13 yielded on average 15 basis more than A+ utility debt. The rating categories run from the
 14 effective best in Canada, A+ to the lowest investment grade, which is BBB.⁴ Within the grade
 15 there are sub grades and firms often trade at a higher level before being upgraded from say BBB

³ CBRS has now been taken over by S&P as a result the format of the data has changed and the table can not be updated.

⁴ There were and still are very few AAA rated corporate issuers to the extent that CBRS stopped calculating AAA-rated average yields.

1 to A. However, we would expect that the yield spread would average out to zero, that is non-
2 utility A bonds would yield the same as utility A bonds. As can be seen in the above table, this
3 was not the case during the last recession. As the economy weakened in 1990 and 1991 and hit
4 bottom in 1992 concern over credit risk heightened and spreads widened dramatically. From
5 1992-1994 non-utility issuers saw a dramatic widening of their spreads compared to “equivalent”
6 utility issuers. In many cases they found it difficult to raise capital on reasonable terms.
7 However, as the CBRS data shows, utility issuers were not affected to the same degree and the
8 capital market financed utility debt at lower yields across all rating categories during the last
9 recession. Effectively, a “flight to quality” often makes it easier for utilities to raise capital
10 during weaker economic times than non-utilities.

11 Schedule 12 shows more up to date information on corporate spreads using the A and BBB
12 monthly spread data from the Scotia Capital long bond indexes. The cyclical behaviour of
13 spreads is again clearly visible. The BBB and to a lesser extent A spread over equivalent Canada
14 bonds again clearly widened during the recession/slowdowns in both the early 1990s and early
15 2000s. However both spreads have tightened recently reflecting the stronger economy and lower
16 credit concerns.

17 The combination of booming corporate profits and lower credit spreads has lead to strong
18 financing activity. In Schedule 13 is the aggregate level of financing in Canada over the last
19 twelve years form data provided by the Investment Dealer’s Association (IDA). This data
20 reflects all the factors that I have discussed so far. Government borrowing was routinely 60-70%
21 of total financing as government debt crowded out private financing. However, over the last
22 several years there has been significant refinancing of existing, as well as new corporate debt
23 issues, as companies have taken advantage of lower interest rates. Corporate debt issues have
24 increased from barely 25% of the level of government debt to 50% and the process private
25 financing activity has increased from 4-5% of GDP up to the current level of 8%.

26 Schedule 14 graphs the extent of total and private sector financing as a percentage of GDP to
27 indicate how receptive the capital markets are. This data confirms the stock market, profit and
28 spread data that capital markets are currently very receptive to new financing and a prior there is

1 no indication of any financial access problems. In fact, currently Canadian capital markets are
2 very receptive to new financing activity.

3 The profitability data also allows us to assess the argument that regulated firms should be
4 allowed a return equivalent to what other companies earn on their book investments. This is
5 commonly referred to as “comparable earnings.” I am dubious about such a proposition, since
6 the selection of firms that go into the comparable sample is largely a matter of judgement with
7 enormous potential for abuse. Moreover, the average return of any sample of firms over some
8 arbitrary time period is only loosely, if at all, related to a fair rate of return. However, the data on
9 overall corporate ROEs indicates that Corporate Canada has rarely earned the “no less than 13%”
10 comparable earnings ROE estimate of Ms. McShane. This level of profitability is simply not
11 representative of Corporate Canada.

12

13 **Q. DO YOU HAVE ANY OTHER RETURN ON EQUITY DATA?**

14 **A.** Yes. In Appendix B I provide data on the ten year average ROE for all the firms with full
15 coverage provided by the Financial Post and the firms included in the TSX60 sub-index. This is
16 the universe of firms from which a sample of “comparable” firm’s ROE can be estimated. I look
17 at the full data to show several things:

- 18 • First, that average ROEs are much less than the “no less than 13%” level
19 estimated by Ms. McShane for her sample of comparable firms;
- 20 • Second, that average ROEs tends to increase as “risk“ goes down. This is because
21 significant losses pull down the average ROE, so excluding risky firms increases
22 the average ROE;
- 23 • Third, that screens can create high ROE earning samples of firms from the use of
24 seemingly innocuous assumptions about risk.

25 The central insight from the data in Appendix B is that normal ROEs from the largest firms in
26 Canada are not of the order of magnitude presented in “comparable earnings” testimony. Further

1 as I show in Appendix B the argument that these ROEs are the only estimates that can be applied
2 to book value regulated utilities is false, as the estimates are fundamentally incompatible with the
3 legal definition of a fair rate of return enunciated by Mr. Justice Lamont, which explicitly
4 focussed on a market based opportunity cost.

5

6 **Q. OVERALL, WHERE ARE WE IN THE BUSINESS CYCLE?**

7 A. Up to the middle of 2000, the U.S. was deep into an extended boom and showing distinct
8 signs of an overheating economy, whereas the Canadian economy was just getting its “second
9 wind.” The Governor of the Federal Reserve then started to slow down the U.S. economy to
10 avoid incipient inflation and the Governor of the Bank of Canada followed suit, although more
11 slowly, so that monetary policy started to head off a recession. Unfortunately the bursting of the
12 tech bubble severely destroyed investor confidence as it revealed both the extent of corruption at
13 the highest level of some US corporations and the contempt with which some first line US
14 investment banks held their retail and institutional customers. The effect of this loss in investor
15 confidence has now receded as both the US and Canadian economies are poised for good
16 economic growth. For 2005-6 both economies are expected to be strong, inflation to be contained
17 to the 2.0% middle of the Governor of Canada’s band, despite strong energy prices, and the
18 capital markets to reflect this. Barring the impact of some extreme terrorist action, it is an
19 optimistic medium term economic and financial outlook reflecting continued strong economic
20 growth and performance just passed the “middle” of the economic cycle.

21

22 **Q. HOW DO ECONOMIC CONDITONS COMPARE TO THOSE IN 1999 THE**
23 **LAST TIME THE BCUC REVIEWED ITS ADJUSTMENT MECHANISM?**

24 A. I was not involved in the last review of the BCUC’s mechanism, but the major capital
25 market indicators in 1999 versus now are as follows:

	1999	2005
GDP Growth	5.53%	3.0-3.5%

1	CPI Inflation	1.75%	2.0%
2	T Bill Yield	4.7%	2.81%
3	Long Canadas	5.68%	4.21%
4	Corporate Profits (pretax % GDP)	11.27%	14.0%
5	TSX Composite (July)	7010	10,422
6	A Spreads (December)	0.98%	0.96% (Dec 2004)

7

8 1999 was the last year before the stock market crash in the Fall of 2000 so it was almost the peak
9 of the economic cycle. Economic growth was higher than now and inflation marginally lower as
10 energy prices were depressed and profits were approaching their cyclical high. Monetary
11 authorities were worried about the effects of the strong bull market and in July 1999 the TSX
12 Composite as at 7010 and just beginning to build steam to push it to over 11,000 by August
13 2000. Consequently short-term Treasury Bill yields were at 4.70% as the yield curve was almost
14 flat with long Canada yields at 5.68%. Corporate A spreads were just under 1.0% over similar
15 long Canada maturities.

16 In contrast we are currently a bit earlier in the business cycle. Economic growth is forecast at
17 3.0-3.5% and although inflation and corporate profits are higher they largely reflect the dramatic
18 increase in oil and gas prices, rather than the stage in the business cycle. Treasury Bill and long
19 Canada bond yields are about 1.5% lower, reflecting the recent accommodative monetary policy
20 stance of the Bank of Canada. Only very recently has the Bank moved towards slowing down the
21 economy and it is still very much in the early stages. Interestingly, corporate A spreads at the end
22 of 2004 were largely unchanged from their values at the end of 1999. Overall I would judge us to
23 be perhaps a year or two behind 1999 in the business cycle, so that we have a few more years of
24 good economic growth and low inflation ahead of us. Apart from the impact of high oil and gas
25 prices on the foreign exchange rate, inflation rate and corporate profits I would judge the
26 economy to be very favourable at the current time, without the warning signs of 1999.

27

28

1 **2.0 THE REGULATORY FRAMEWORK AND TERASEN’S RISK**

2 **Q. WHY IS TERASEN REGULATED?**

3 **A.** Terasen Gas Inc (Terasen) provides local gas distribution service to approximately 87%
4 of the gas users in British Columbia. Unlike some gas LDCs Terasen mostly operates under
5 agreements that are in force as long as the distribution lines are operative, which means that the
6 fear of franchise non-renewals, which has periodically been regarded as a risk, for example, in
7 Alberta is not a significant factor. In providing service two factors are important: first, that the
8 company is not at risk for gas costs and second that service is provided predominantly with fixed
9 and non-variable costs. I will discuss gas costs later but for the first six months of 2005 Terasen’s
10 income statement was follows:

	\$ million
12 Revenues	746.1
13 Gas costs	476.1
14 Operation and maintenance	79.8
15 Depreciation and amortisation	39.6
16 Property and other taxes	19.9
17 Financing costs	55.0

18
19 Of significance is that the financing costs are largely fixed interest costs, while depreciation is a
20 non-cash charge reflecting prior capital expenditures and taxes are also fixed and do not vary
21 with throughput. These costs are all known in advance and are independent of the demand for
22 Terasen's distribution services. Moreover, operating expenses are also period costs and again
23 largely independent of operating demand. Without getting into a detailed analysis of Terasen's
24 cost structure, it is clear that most of its costs are “period” or fixed costs invariant to demand.

25 In a competitive market it is difficult for a new entrant to enter a market where costs are largely
26 fixed, since the incumbent can lower prices to deter entry and drive a new entrant out of the
27 market. This is because with fixed cost production long run average costs are constantly
28 declining up to the capacity limit. As well as predatory pricing, the incumbent can cross

1 subsidise losses in one area with profits in another to enhance its position in the market. As
2 competition is reduced the incumbent can then charge higher prices and earn monopoly rents.
3 These arguments are particularly relevant when the commodity is a service and not a tangible
4 good that can be resold.

5 For these reasons the economics of a fixed cost “service” industry is such that a single firm
6 usually survives in the market with the potential for abuse of its dominant position.
7 Consequently, industries like natural gas transmission and distribution, electricity generation,
8 transmission and distribution, telecommunications, railways etc have traditionally been subject to
9 government regulation. The presumption is that without such regulation, the activities and prices
10 of the dominant firm would be unreasonable. In this respect it is important to note that it is
11 regulation that follows the underlying economics, not vice versa. Changing the regulation does
12 not, in and of itself, change the underlying economics or the dangers for the abuse of a dominant
13 position as recent experience with "deregulation" indicates. This economic imperative is
14 reflected in the statutes under which regulated companies operate, where *firms are regulated to*
15 *mimic the actions of a competitive firm and yet reap the scale economies of the natural*
16 *monopolist.*

17 The litmus test for the competitive firm is the absence of monopoly profits. Conversely, the
18 regulated firm only earns normal profits and the equity holders earn a fair return on their
19 investment. Although legal statutes differ marginally from one jurisdiction to another, they are
20 similar to the regulations by which the Supreme Court of Canada came to determine a fair rate of
21 return. In *BC Electric Railway Co Ltd., vs the Public Utilities Commission of BC et al* ([1960]
22 S.C.R. 837), the Supreme Court of Canada had to interpret the following statute:

23 (a) The Commission shall consider all matters which it deems proper as affecting the
24 rate:

25 (b) The Commission shall have due regard, among other things, to the protection of
26 the public interest from rates that are excessive as being more than a fair and
27 reasonable charge for services of the nature and quality furnished by the public
28 utility; and to giving to the public utility a fair and reasonable return upon the

1 appraised value of the property of the public utility used, or prudently and
2 reasonably acquired, to enable the public utility to furnish the service:

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

10 Most statutes also allow the regulatory authority to examine all factors that enter into the rates to
11 ensure that the rates are "fair and reasonable." This includes the firm's capital structure decision,
12 since this has a very direct and obvious impact on the overall revenue requirement. To allow the
13 regulated utility to freely determine its capital structure will inevitably lead to rates that are
14 unfair and unreasonable, otherwise the management of the regulated firm is not fulfilling its
15 fiduciary duties to act in the best interests of its stockholders.

16

17 **Q. WHAT RISKS DO INVESTORS FACE IN INVESTING IN UTILITIES?**

18 **A.** Investors are interested in the rate of return on the *market value* of their investment. This
19 investment can be represented by the standard discounted cash flow model,

$$P_o = \frac{ROE * BVPS * (1 - b)}{K - g}$$

20

1 where P_0 is the stock price, ROE the return on *book equity*, $BVPS$ the book value per share, b the
2 retention rate (how much of the firm's earnings are ploughed back in investment) and K and g
3 are the investor's required rate of return and growth expectation respectively.⁵

4 Of the different sources of risk, we normally focus on the firm's *business* risk, its *financial* risk,
5 and its *investment* risk. For regulated utilities we also add a fourth dimension, namely its
6 *regulatory* risk. In terms of the above equation the firm's accounting return on equity (**ROE**)
7 captures the business, financial and regulatory risk, which together we term income risk, whereas
8 all the other factors are reflected in investment risk, which is the way in which investors react to
9 the income risk and other macroeconomic variables. The regulator primarily affects income risk,
10 whereas investment risk is determined in the capital market and reflects, for example the impact
11 of changing interest rates.

12 **Business risk** is the risk that originates from the firm's underlying "real" operations. These risks
13 are the typical risks stemming from uncertainty in the demand for the firm's product resulting,
14 for example, from changes in the economy, the actions of competitors, and the possibility of
15 product obsolescence. This demand uncertainty is compounded by the method of production
16 used by the firm and the uncertainty in the firm's cost structure, caused, for example, by
17 uncertain input costs, like those for labour or critical raw or semi-manufactured materials.
18 Business risk, to a greater or lesser degree, is borne by **all** the investors in the firm. In terms of
19 the firm's income statement, business risk is the risk involved in the firm's earnings before
20 interest and taxes (EBIT). It is the EBIT, which is available to pay the claims that arise from all
21 the invested capital of the firm, that is, the preferred and common equity, the long-term debt, and
22 any short-term debt such as debt currently due, bank debt and commercial paper.

23 If the firm has no debt or preferred shares, the common stock holders "own" the EBIT, after
24 payment of corporate taxes, which is the firm's net income. This amount divided by the funds
25 committed by the equity holders (shareholder's equity) is defined to be the firm's return on
26 invested capital or ROI, and reflects the firm's operating performance, independent of financing

⁵ This equation is in every introductory finance textbook as $d/(K-g)$ where d is the dividend or $ROE \cdot BVPS \cdot (1-b)$.

1 effects. For 100% equity financed firms, this ROI is also their return on equity (ROE), since by
2 definition the entire capital investment has been provided by the equity holders. The uncertainty
3 attached to the ROI therefore reflects all the risks prior to the effects of the firm's financing and
4 is commonly used to measure the business risk of the firm.

5 As the firm reduces the amount of equity financing and replaces it with debt or preferred shares,
6 two effects are at work: first the earnings to the common stock holder are reduced as interest and
7 preferred dividends are deducted from EBIT and, second the reduced earnings are spread over a
8 smaller investment. The result of these two effects is called financial leverage. The basic
9 equation is:

$$10 \quad ROE = ROI + (ROI - R_d(1 - T)) \frac{D}{S}$$

11
12 where D , and S are the amounts of debt, and equity respectively in terms of book values. If the
13 firm has no debt financing ($D/S = 0$), the accounting return to the common stockholders (ROE) is
14 the same as the return on investment (ROI). In this case the equity holders are only exposed to
15 business risk. As the debt equity ratio increases, the spread between what the firm earns and its
16 borrowing costs is magnified. This magnification is called financial leverage and measures the
17 **financial risk** of the firm. The simplest way to measure this financial risk is through the debt
18 equity ratio.

19 The common stockholders in valuing the firm are concerned about the total "income" risk they
20 have to bear, which is the variability in the accounting ROE. This reflects both the underlying
21 business risk as well as the added financial risk. If the firm operates in a highly risky business,
22 the normal advice is to primarily finance with equity, otherwise the resulting increase in financial
23 risk might force the firm into serious financial problems. Conversely, if there is very little
24 business risk, as is the case with regulated utilities, the firm can afford to carry large amounts of
25 debt financing, since there is very little risk to magnify in the first place.

26 Business risk is then equivalent to variability in EBIT or the ROI , both of which reflect the
27 variability in the firm's operating costs and revenues. To analyse this we normally look at how
28 easy it is to forecast operating costs and how stable revenues are.

1 These comments mean that a regulatory board has a variety of tools to manage the regulated
2 firm's income risk. The *first* is that the Board can manage the different components of business
3 risk. The basic way that a board can do this is by establishing deferral accounts. The essence of
4 deferral accounts is simply to capture major forecasting errors. Instead of having the utility's
5 stockholders "eat" any cost over runs in terms of a lower earned rate of return, the regulator can
6 simply pass the extra costs to a balance sheet deferral account. The value of the deferral account
7 is then charged to the ratepayers over some future time period. In this way "ratepayers" always
8 pay the full cost of service and stockholder risk is lowered.

9 A **second** tool is for the regulator to alter the amount of debt financing. If the regulator feels that
10 the firm's business risk has increased (decreased) it can reduce (increase) the amount of debt
11 financing so that the total risk to the common stockholder is the same. Both of Canada's national
12 regulators, the National Energy Board and the CRTC, have recognized this. When the CRTC
13 opened up Canada's telecommunications market to long distance competition it specifically
14 increased the allowed common equity component of the Telcos to 55% to offset their increased
15 business risk. Similarly, when the National Energy Board decided to go to a formula based
16 approach for the return on equity in 1994 it reviewed all the capital structure ratios for the major
17 oil and gas pipelines and set the oil pipelines at 45% common equity, Westcoast at 35%, and the
18 remaining mainline gas transmission companies at 30%. In each case the different equity ratio
19 adjusted for differences in perceived business risks.⁶ Most recently the Alberta EUB has also
20 established different common equity ratios for a variety of different regulated utilities that
21 include local gas distribution companies, pipelines, electricity Discos and electricity transmission
22 companies.

23 The **third** tool available for the regulator is to directly alter the allowed rate of return, so that the
24 stockholder only earns a rate of return commensurate with the risks undertaken. The CRTC, for
25 example, has historically allowed Northwestel 0.75% more than the other Telcos primarily due
26 to the "ruggedness" of its operating region. Similarly this Commission has used Terasen as a low

⁶ Westcoast was allowed a higher common equity ratio because of the greater share of non-mainline assets in its rate base. The mainline tolls were based on a 30% deemed common equity which has subsequently been increased to 31%.

1 risk benchmark and then allowed other utilities, like FortisBC, a premium ROE. In the case of
2 FortisBC the BCUC has recently allowed it both a higher common equity ratio and an extra
3 0.75% on the allowed ROE.

4 **Q. WHICH TOOLS DO YOU ADVOCATE USING?**

5 **A.** It makes sense that any significant forecasting risks that are largely beyond the control of
6 the firm should be managed through the use of deferral accounts. The reason for this is simply
7 that they do not affect the efficiency of the utility and there are diversification gains by spreading
8 the variability over a large number of customers. As a result, deferral accounts are a “win-win”
9 solution as they reduce the operating risk faced by the company, thereby allowing a higher debt
10 ratio and they lower overall cost of capital thereby benefiting customers.

11 In the case of Terasen it has three major deferral accounts,

- 12 • Gas cost reconciliation account⁷ to ensure that all gas costs are recovered and
13 charged to customers,
- 14 • Revenue Stabilisation Adjustment Mechanism (RSAM) which captures forecast
15 versus actual residential and commercial customer use,
- 16 • Short and long term interest rate deferral accounts to absorb interest rate
17 fluctuations.

18

19 In JIESC-BCOAPO-CEC-8.1 Terasen was asked to indicate the major items of revenue and
20 expense that were not covered by deferral accounts. The company indicated that only 18.1% of
21 revenues were not covered by deferral accounts and while it indicated that 46.2% of expenses
22 were not covered by deferral accounts it included depreciation which is a non-cash expense and
23 fixed so it is subject to zero forecasting risk. On the expense side the major item not covered by
24 deferral accounts is Operations and Maintenance expenses, which are largely under the control of
25 the company, since they can in many cases be adjusted to meet target. Terasen indicated that it
26 has never asked for deferral accounts for these non covered revenues and expenses. It is clear
27 that Terasen has more deferral accounts than the big Ontario LDCs, since neither Union nor

⁷ As of April 2004 this account has been split into two accounts to help support commodity unbundling.

1 Enbridge Gas Distribution (EGDI) are allowed deferral accounts for interest expense and do not
2 have a comprehensive RSAM.

3 With a choice between capital structure versus ROE adjustments; my preference is to adjust for
4 business risk in the capital structures for two main reasons. First, the market seems to consider
5 any changes in the allowed capital structure to be a more permanent change, while it expects the
6 ROE to change with capital market conditions. Since business risk is the primary determinant of
7 capital structure, it is to be expected that a board will change an allowed capital structure
8 relatively infrequently in response to changes in business risk. Second, allowing firms to chose
9 their capital structure and then adjusting the ROE to a fair return runs the risk that although the
10 equity holders are getting a fair rate of return the overall utility income and thus rates are too
11 high and unfair.⁸

12 One corollary to the decision of many boards such as the National Energy Board and the Alberta
13 EUB to adjust capital structures in response to business risk differences is that the risk faced by
14 shareholders in utilities is very similar. To a great extent regulators have reduced differences in
15 business risk by allowing the use of deferral accounts and altering equity ratios.

16

17 **Q. WHY IS THE COMMON EQUITY RATIO IMPORTANT?**

18 **A.** The firm's capital structure has a direct impact on the overall cost of capital. This topic
19 has been the subject of enormous academic inquiry over the last forty years and has generated
20 two Nobel Prize winners in Professors Franco Modigliani and Merton Miller. However, for all
21 the sophistication of the academic models, the most important issue is that certain types of
22 financial instruments have a tax-preferred status. In Canada this status is accorded to debt
23 instruments, since interest payments are tax deductible, whereas equity dividends are not. As a
24 result, there is a built-in tax advantage to any corporation using debt financing. This tax
25 advantage goes to the *shareholders* of unregulated firms and to the *customers* of regulated firms,

⁸ The reason for this is simply that the overall cost of capital is not being minimised so that overall rates are unfair and unreasonable.

1 since the use of debt reduces the firm's revenue requirement. As will be discussed later, this
2 asymmetry in benefits for the regulated firm is a motivating factor behind regulated companies
3 continually striving to increase their equity ratios.

4 The primary fact to remember is that equity costs are paid out of **after-tax** income, whereas debt
5 costs are tax deductible. Hence, for example, if debt costs are 7.0% and equity costs are 9.0%,
6 then at a 50% tax rate (for simplicity), the **pre-tax costs** are actually 18.0% for the equity
7 ($.09/(1-.50)$) compared to 7.0% for the debt. Conversely the after tax costs are 3.5% and 9.0%;
8 either way the costs of debt versus equity have to be compared on the same tax basis. It is these
9 "same tax" cost comparisons, whether before or after tax, that competitive firms make in
10 deciding their financing. This implies that there is an incentive for competitive firms to finance
11 with debt: as they replace expensive equity with "cheap" debt, their cost of capital goes down.
12 Hence, for the *same fixed amount of operating income*, it is the stockholders who benefit from
13 the tax advantage of debt financing for competitive firms.

14 That publicly traded competitive firms do not finance with extremely high debt levels is due to
15 the increased costs of financial distress that are associated with higher fixed financial charges. In
16 extreme cases, the higher fixed financial charges can force a firm to be reorganised, or taken
17 over, when it could probably have otherwise survived had it been financed with less debt. As a
18 result, it is a basic rule of corporate finance that the financial risk is **layered** on top of business
19 risk: firms with high business risk are advised not to issue too much debt, otherwise their
20 solvency could be jeopardised in the event of adverse market developments. This is simply the
21 financial leverage principle discussed earlier.

22 This basic discussion is relevant since publicly traded firms are constantly re-assessing their
23 capital structures ("improving their balance sheets") in light of changing market conditions and
24 the changing risk of financial distress. It also explains why capital structures differ from one firm
25 to another, since both the nature of their assets and expected cash flows are different. One firm
26 with mainly hard tangible assets will use large amounts of debt, since these types of assets are
27 easy to borrow against. Another firm that spends significant amounts on advertising will have
28 relatively little debt, since it is harder to borrow against brand names and "goodwill." Yet another
29 firm will use very little debt, since it is not in a tax paying position and cannot use the tax shields

1 from debt financing. In each case, the firm will solve its own capital structure problem based on
2 its own unique factors.

3 This discussion puts the utility capital structure in perspective, since utilities have the lowest
4 business risk of just about any sector in the Canadian economy. Consequently, they should have
5 the highest debt ratios. There are several reasons for this:

6 **First**, as previously discussed the costs and revenues from gas distribution
7 services are very stable so that the underlying uncertainty in operating income is
8 very low. As such financial leverage is magnifying almost non-existent business
9 risk, and zero times anything is still zero!

10 **Second**, in the event of unanticipated risks, regulated utilities are the **only** group
11 that can go back to their regulator and ask for “after the fact” rate relief. As
12 monopolies their rates can be increased in the event of financial problems, while
13 demand is typically insensitive to these rate increases. In contrast, if unregulated
14 corporations face serious financial problems they usually compound one another.
15 This is because unregulated firms encounter difficulties raising capital and
16 frequently suppliers and customers switch to alternates in the face of this
17 uncertainty creating severe financial distress.

18 **Third**, the major offset to the tax advantages of debt is the risk of bankruptcy. In
19 liquidation there are significant external costs that go to neither the equity nor the
20 debt holders. These costs include “knock down” asset sales, the loss of tax loss
21 carry forwards, and the reorganisation costs paid to bankruptcy trustees, lawyers
22 etc. This causes non-regulated firms to be wary of taking on too much debt, since
23 value seeps out of the firm as a whole. In contrast, it is highly unlikely that
24 Terasen’s distribution pipelines would be ripped up and sold for scrap.

25 **Finally**, most private companies have an asset base that consists largely of
26 intangible assets. For example, the major value of Nortel was its growth
27 opportunities; of Coca Cola its brand name; of Merck its R&D team. It is
28 extremely difficult for non-regulated firms to borrow against these assets. Growth
29 opportunities have a habit of being competed away; brand names can waste away,
30 while R&D teams have a habit of moving to a competitor. Regulated utilities in
31 contrast largely produce un-branded services and derive most of their value from
32 tangible assets. Unlike intangible assets, tangible assets are useful for collateral,
33 for example in first mortgage bonds, and are easy to borrow against.

34 Consequently, utilities have very low business risk; have reserve borrowing power by being able
35 to return to the regulator, minuscule bankruptcy/distress costs and hard tangible assets that are
36 easy to borrow against. In fact, in many ways, utilities are unique in terms of their financing

1 possibilities,⁹ and are prime candidates for using large amounts of debt to utilise their very
2 significant tax advantages.

3

4 **Q. ARE THERE CAPITAL STRUCTURE PROBLEMS WHEN UTILITIES ARE**
5 **PART OF UTILITY HOLDING COMPANIES (UHCs)?**

6 **A.** Yes. I will discuss the Kinder Morgan proposed takeover later, but there are always
7 problems when a utility is part of a UHC. As indicated above if there is a tax advantage to using
8 debt, then competitive firms will use debt. However, for ROE regulated utilities this tax
9 advantage flows through to the consumer as a lower tax charge in the revenue requirement. As a
10 result there is no advantage to the utility using debt. However, for utilities owned by UHCs the
11 situation is worse, since the parent has an incentive to finance the utility with as much equity as
12 possible, so that the tax advantages to using debt are shifted to the parent. In this way it is the
13 UHCs shareholders that get the tax advantages instead of the customers of the utility. This is
14 often called the “double leverage” problem, where the utility assets support debt at both the
15 utility level and then again at the parent level. As long as the UHC has an investment grade bond
16 rating, double leverage essentially means that a benefit belonging to the customers is being
17 appropriated by the UHC shareholders.

18 This situation has recently become worse as some rating agencies, such as Standard and Poors,
19 rates debt based on the credit rating of the parent. The principle here is that if the parent gets into
20 trouble it will raid the subsidiary unless it is “ring fenced” or insulated from the parent in some
21 way. Without this ring fencing the subsidiary is as risky as the parent *regardless* of its debt ratio.
22 Consequently, double leverage can not just transfer the tax advantages to the parent’s
23 shareholders, but it also may result in lower bond ratings and higher debt cost for the utility. As a
24 result, the cost of debt may increase and customers get hit not once, but twice.

⁹ When we analyse corporate financial decisions we normally include a number of explanatory variables and then add a “dummy” variable for whether or not the industry is regulated, since the mere fact of regulation is frequently the most significant feature of a firm’s operations.

1 With so few “pure play” utilities left in Canada it is difficult to assess the appropriate capital
2 structure for a pure utility. However, what is clear is that the regulated capital structures
3 generally understate the true debt bearing capacity of regulated assets and can be taken as
4 minimum debt levels.

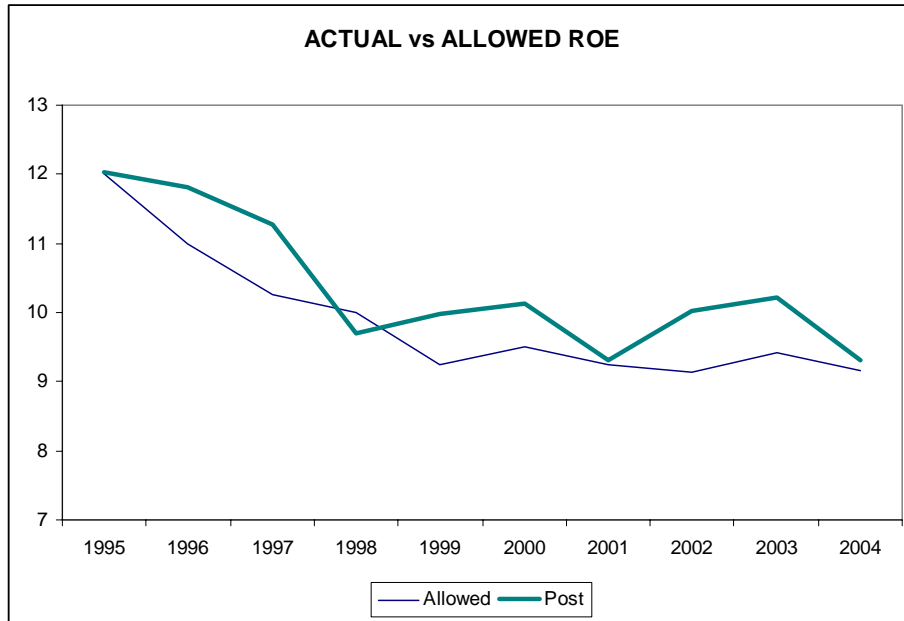
5

6 **Q. HOW DO THESE COMMENTS APPLY TO TERASEN?**

7 **A.** I have already indicated the significant amount of regulatory protection afforded Terasen
8 through deferral accounts. The BCUC has recognised the value of this protection through its
9 33% allowed common equity ratio, which is marginally lower than the 35% allowed the big
10 Ontario LDCs. Of note is that approximately 60% of Industrial customers arrange for their own
11 gas supply, while approximately 75% of large volume commercial customers do so. As Terasen
12 notes in its 2004 Annual Information Form (AIF) “Customers arranging their own supply in fact
13 reduce the credit risk to Terasen.” Also the BCUC is generally regarded as a progressive
14 regulator in encouraging the use of incentive or performance based regulation. The essence of
15 these PBR measures is for 50:50 sharing of earnings above and below the allowed ROE, which
16 effectively reduces Terasen’s earnings exposure, since it is only exposed to 50% of the
17 variability instead of 100%.

18 The following graph indicates Terasen’s allowed and actual (post sharing) ROE since 1995 when
19 the adjustment formula went into effect and the company started operating under PBR. Of note is
20 that Terasen has consistently exceeded its allowed ROE, even under the effects of PBR. The
21 graph indicates the degree of regulatory protection afforded Terasen and the obvious fact the
22 incentive based PBR essentially works to increase Terasen’s earnings and not to expose it to any
23 additional risks. This is why DBRS describes the regulatory environment in BC as “supportive,”
24 and in this case they are referring to supportive of the bond rating, that is good for bond holders
25 and credit risk.

26



1

2 The only “blip” in Terasen’s performance came in 1998 when it failed to earn its allowed ROE. .
 3 In answer to JIESC-BCOAPO-CEC 7.1 Terasen indicated that the reason for this was employee
 4 severance payments resulting from a major reorganisation, which were not covered by its PBR
 5 settlement. These expenses are not normal operating expenses and do not reflect on Terasen’s
 6 going forward ability to earn its allowed ROE. The above data clearly indicate Terasen’s low risk
 7 nature.

8

9 **Q. IS TERASEN THE ONLY REGULATED FIRM THAT CONCISTENTLY EARNS**
 10 **ITS ALLOWED ROE?**

11 **A.** No, most Canadian regulated firms are heavily protected and earn their allowed ROEs. In
 12 Schedule 15 is data on the earned vs. actual ROEs for the major gas transmission pipelines
 13 owned by TransCanada Corporation since 1990. Note that Foothills continues to be a full cost of
 14 service pipeline and exactly earns its allowed ROE.¹⁰ Similarly despite the changing supply
 15 position in the WCSB and the introduction of Alliance, the TCPL Mainline continues to over

¹⁰ The BC System’s deviation from allowed in 2001 was part of the agreement on the change of control of ANG. In CAPP 31(a) no explanation was provided for the 2003 BC System results.

1 earn its allowed ROE, in fact it has never earned less than its allowed ROE except in 1994 when
2 the NEB disallowed some costs related to fuel imbalances.¹¹ In Schedule 16 is the same earned
3 vs. allowed ROE for the two premier gas local distribution companies in Canada and NGTL
4 (NOVA at the time of RH-2-94). The data for the two Ontario Gas LDCs is based on weather
5 normalised ROE's since these utilities are not allowed deferral accounts for variances due to
6 weather. Further the NGTL data is not strictly comparable since for a significant amount of time
7 NGTL operated under incentive regulation and the early data conflicts with that reported by
8 CBRS in 1994. However, the message is very similar regulated utilities on a forward test year
9 consistently over earn their allowed ROE's. In practical terms there is very little risk involved in
10 operating an ROE regulated utility in Canada.

11

12 **Q. HAS TERASEN'S BUSINESS RISK INCREASED DUE TO HIGH GAS COSTS?**

13 **A.** Not at present. The company points to the reduced number of customer additions and the
14 trend towards high rise building that are best served by electricity. However, this does not
15 necessarily increase their risk. In the first place the company continues to add customers. In the
16 first half of 2005 the company added 2,484 customers compared to 1,838 in the same period of
17 2003. By July 2005 the company had 794,614 customers compared to 792,130 customers at the
18 end of 2004 and 780,380 and 774,558 at the end of 2003 and 2002 respectively. Clearly the
19 company continues to grow its customer base. Further, while average residential and commercial
20 use is falling, this happened over a period that was significantly warmer than normal, which
21 presumably reduced space heating demand.

22 Terasen was also asked (JIESC-BCOAPO-CEC 6.1) to tabulate residential customers switching
23 to alternative energy supplies. However, in answer it indicated that it does not track residential
24 customers switching to alternative fuels. If this is a significant risk to the company, one would
25 think that the company would be closely monitoring the situation: the fact that it isn't indicates
26 that currently this is not a serious risk. Further in JIESC-BCOAPO-CEC 6.2 the company

¹¹ See answer to CAPP 82(b).

1 indicated that at current energy prices, using gas costs the typical residential customer about 90
2 dollars a year more than using electricity. However, with switching costs in terms of capital
3 equipment to the tune of 3,000 dollars switching involves a 30 year payback and is obviously not
4 economic. In its 2004 AIF (March 2005) Terasen simply states “Natural gas maintains a
5 competitive advantage in terms of pricing when compared to alternative sources of energy in
6 British Columbia.”¹²

7 The fact that demand for natural gas use continues to grow is a major factor in forecasts that
8 indicate a continuing shortage of natural gas and increasing emphasis on developing alternative
9 supplies to fill the predicted shortage. In both the US and Canada hearings are being discussed to
10 bring Alaskan and Mackenzie Delta natural gas down to major markets in both the US and
11 Canada. The fact that these pipelines involve huge capital expense and will be built over
12 environmental sensitive areas indicates that there is little likelihood of a significant drop off in
13 the demand for natural gas.

14 Finally in terms of Terasen, if natural gas becomes uncompetitive, for example for residential
15 users, then over time users will switch, say to electricity. However, there are two dimensions to
16 the risk to Terasen. In the first place the risk is essentially a forecasting risk. As residential
17 customers drop off the system then it is a question of whether Terasen can predict this drop off in
18 terms of its revenue requirement. Currently this is not happening, but if it does, the risk is not
19 that it will happen but that Terasen does not forecast it and thus can not rebalance to achieve its
20 revenue requirement. The second and more risky situation is if the company can not rebalance to
21 achieve its revenue requirement. This unlikely situation might occur if industrial and commercial
22 users refuse to pay the higher rates resulting from the loss of residential load. In this case the
23 recovery of the rate base is in question and Terasen runs the risk of stranded assets. However, if
24 this risk is realistic, then the correct response is to change the depreciation rate so that the cost of
25 potentially stranded assets is recovered from the existing users. The company acknowledged this
26 in answer to JIESC-BCOAPO-CEC 7.2 and that the BCUC approved partial implementation of
27 higher depreciation rates in BCUC Order G-51-03.

¹² Note that the large number of customer disconnections in 2003 and 2004 was due to a change in collection policy and an increase in customer lock offs.

1 For the above reasons I fail to see any significant increase in risk for Terasen from higher natural
2 gas costs and do not recommend an increase in either the deemed common equity ratio or the
3 allowed ROE due to this.

4

5 **Q. WHAT COMPARATORS WOULD USE FOR TERASEN?**

6 **A.** Before the Alberta EUB in 2003 I compared the different utilities in the Alberta generic
7 hearing on the following basis:

8 The major short term risks caused by cost and revenue uncertainty:

- 9 • On the cost side since regulated utilities are capital intensive most of their costs
10 are fixed. The major risks are in *operations and maintenance* expenditures.
11 However, over runs are usually under the control of the regulated firm and can be
12 time shifted between different test years.
- 13 • On the revenue side the risks largely stem from rate design, critical features are:
- 14 ○ Who is the customer and what *credit risk* is involved. For example, electricity
15 transmission operators who recover their revenue requirement in fixed
16 monthly payments from the provincially appointed TA, who is responsible for
17 system integrity, have less exposure than the local gas and electricity
18 distributors who recover their revenue requirement from a more varied
19 customer mix involving industrial, commercial and retail customers.
- 20 ○ Is there a *commodity charge* involved? The basic distribution function is very
21 similar to transmission, except when the distributor buys the gas or electricity
22 wholesale and then also retails the commodity. The distributor is then exposed
23 to weather and price fluctuations depending on rate design.
- 24 ○ Even if there is no commodity charge, how much of the revenue is recovered
25 in a *fixed versus a variable usage* charge? Utilities that recover their revenue
26 in a fixed demand charge face less risk than those where the revenues have a
27 variable component based on usage.

28 The medium and long term risks are mainly as follows:

- 29 • *Bypass risk.* The economics of regulated industries are as natural monopolists
30 involved in “transportation” of one kind or another. However, one utility may not
31 own all the transportation system so that it may be economically feasible to
32 bypass one part of the system. This happens for local gas distributors, when a
33 customer can access the main gas transmission line directly, rather than through

1 the LDC, or when a large customer may be able to bypass part of the transmission
2 system. This is often a rate design issue: a postage stamp toll clearly leads to
3 uneconomic tolls and potential bypass problems, whereas distance or usage
4 sensitive tolls will discourage it. Similarly, rolled in tolling will encourage
5 predatory pricing by potential regulated competitors.

- 6 • *Capital recovery* risk. Since most utilities are transportation utilities, the critical
7 question is the underlying supply and demand of the commodity. If supply or
8 demand does not materialise then tolls may have to rise and the utility may not be
9 able to recover the cost of its capital assets. Depreciation rates are set to mitigate
10 this risk to ensure that the future revenues are matched with the future costs of the
11 system.

12 A common thread running through the above brief discussion is rate design and regulatory
13 protection. There can be significant differences in underlying business risk that are moderated by
14 the regulator in response to those differences. The lowest risk utility is then one with the
15 strongest underlying fundamentals and the least need to resort to regulatory protection. In
16 contrast, another utility may have similar short term income risk, but only because of its need to
17 resort to more extensive regulatory protection, so that it faces more problematic longer term
18 risks.

19 On this basis I judged the lowest risk regulated utilities in Canada to be electricity transmission
20 assets, since these have the following characteristics:

- 21 • Minimal forecasting risks attached to O&M
- 22 • Revenue recovery via the TA through fixed monthly charges
- 23 • Limited (non existent) by-pass problems
- 24 • Minimal capital recovery problems, since there are many suppliers of electricity
25 as a basic commodity.
- 26 • Deferral account for capital expenditures

27
28 and recommended 30% common equity ratios.

29 I then placed the gas transmission pipelines as the second lowest risk group. Here I classified
30 Foothills and the TCPL BC System (formerly ANG) as of equivalent risk to electricity
31 transmission assets with NGTL having marginally more risk than Foothills and the TCPL BC
32 System, since it is exposed to bypass and recovers its revenues through a forward test year from

1 a greater variety of shippers. However, the combination of distance sensitive tolls, the ability to
2 offer load retention service and a more rapid depreciation rate significantly reduce any increase
3 in risk NGTL may have faced since 1995. I therefore judged that on its own NGTL could
4 maintain its financial flexibility on the same 30% common equity ratio allowed mainline gas
5 transmission assets. However, because NGTL was then allowed 32% and was almost
6 “indistinguishable” from the TCPL Mainline, I recommended the same 33% common equity
7 ratio that this Board currently allows the Mainline.

8 I then judged the local distribution companies (LDCs), including both gas and electric as the next
9 riskiest. These companies are distinguished by their retail operations, which mean that their
10 revenues are recovered from a large number of industrial, commercial and residential consumers.
11 This exposes them to both the business cycle and weather fluctuations. This revenue recovery is
12 also a function of their rate design that may expose them to commodity charges and a fixed and
13 variable recovery charge. Within this group the conventional yardstick for LDCs is that
14 Consumers (Enbridge Gas Distribution Inc or EGDI) and Union Gas are both allowed 35%
15 common equity by the Ontario Energy Board. However, whereas the Ontario Energy Board
16 allows a purchased gas variance account (PGVA) to ensure that the full costs of gas are
17 recovered, they are still subject to volume related variances. In contrast, the BCUC allows BC
18 Gas (Terasen Gas) a more comprehensive deferral account, but limits the allowed common
19 equity ratio to 33%. With these yardsticks I recommended 35% common equity ratio for a
20 typical local distribution companies.

21 Finally, I recommended 42% as the upper end of a reasonable range for the common equity of
22 ATCO pipelines, given that the BCUC allows PNG, a smaller and much riskier pipeline, 36%
23 common equity. However, this ranking was provisional being dependent on the EUB developing
24 clear rules on intra Alberta pipeline competition and a rate design that lowers ATCO Pipeline’s
25 risk. It was, and remains, my judgement that none of the Alberta utilities were as risky as Pacific
26 Northern Gas (PNG) with a 36% common equity ratio or Gaz Metropolitan (GMI) with a 38.5%
27 common equity ratio, where I continue to regard these two as the riskiest regulated utilities in
28 Canada.

1 Having assessed the business risk of Terasen I can see no reason to alter this judgment. Earlier
2 this year I pointed out that FortisBC had consistently earned its allowed ROE and since 1994 it
3 had also managed to increase its allowed common equity ratio from the 35% allowed in 1994 to
4 its current 40%. However, I regarded this as acceptable since it was in the middle of a major
5 system expansion and needed access to the capital markets, which is always difficult for a
6 relatively small utility. I can see no similar requirement for Terasen. In fact if the company is
7 correct and new additions are slowing this will reduce the growth of the company and eventually
8 Terasen will become a declining rate base company similar to the TCPL Mainline. In many ways
9 being a declining rate base company reduces risk, since the company will not need to access the
10 capital markets as frequently.

1 that the investors required return (K) is equal to the risk free rate (R_F) plus a risk premium, which
 2 is the market risk premium (MRP) times the security's beta coefficient (β).

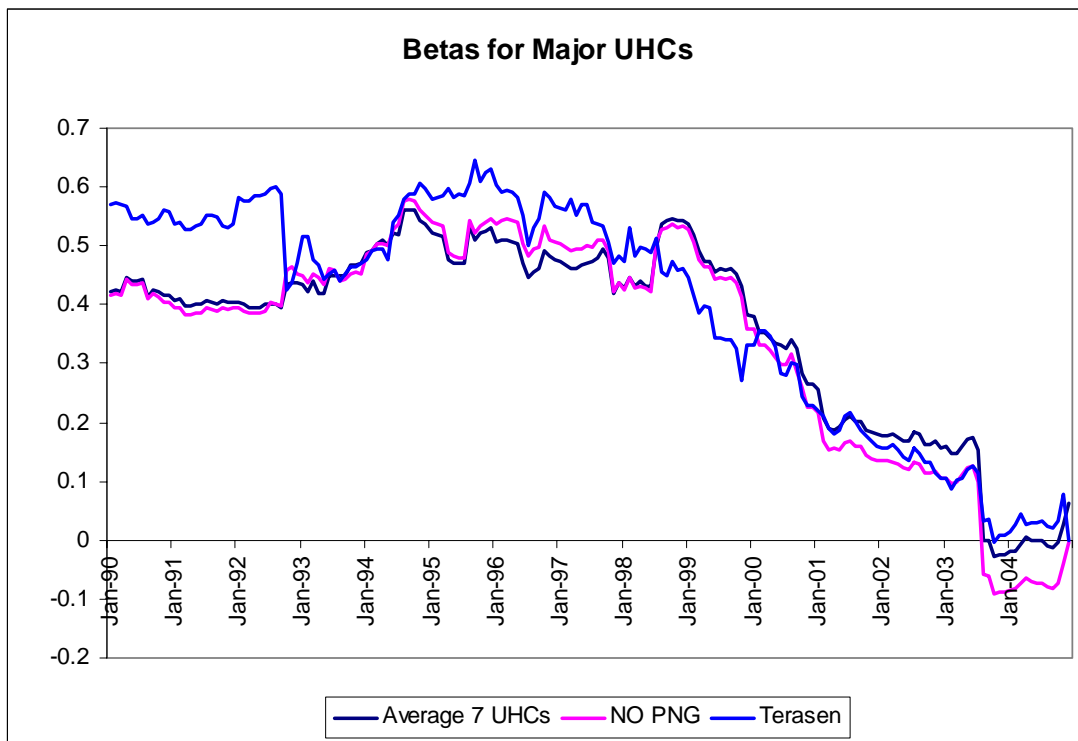
3 The CAPM is the premier model for estimating required or fair rates of return. However, when it
 4 was originally tested early results showed that it tended to over estimate returns for high risk
 5 ($\beta > 1$) stocks and under estimate for low risk ($\beta < 1$) stocks. However these tests used the Treasury
 6 bill yield as the risk free rate, which is only appropriate for very short horizon (91 days)
 7 investments. In regulatory hearings it is customary to use the CAPM with the long Canada yield
 8 since equities have longer time horizons than even the longest maturity long Canada bond, since
 9 they have no maturity date. The use of the CAPM with a long Canada yield will be referred to as
 10 the "classic" CAPM. To the extent that long Canada bonds earn a maturity premium of about
 11 1.0% over the average Treasury bill yield, this classic CAPM automatically increases the risk
 12 free rate and adjusts for the bias noted in these early tests of the CAPM.

13 The betas for the major Canadian utilities for each of the 5-year periods ending 1985 through
 14 2004 are as follows:

	TCPL	Terasen	CUL	TAU	EMERA	Fortis	PNG	Average	No PNG
31/12/1984	0.77	0.33	0.54	0.56		0.73	0.39	0.55	0.59
31/12/1985	0.79	0.21	0.48	0.62		0.66	0.55	0.55	0.55
31/12/1986	0.85	0.14	0.47	0.53		0.52	0.38	0.48	0.50
31/12/1987	0.59	0.47	0.32	0.22		0.25	0.46	0.38	0.37
30/12/1988	0.63	0.52	0.37	0.20		0.30	0.45	0.41	0.41
29/12/1989	0.60	0.56	0.38	0.22		0.25	0.42	0.41	0.40
31/12/1990	0.59	0.56	0.39	0.27		0.21	0.47	0.42	0.40
31/12/1991	0.54	0.54	0.37	0.28		0.25	0.46	0.41	0.39
31/12/1992	0.55	0.47	0.47	0.40		0.38	0.35	0.44	0.45
31/12/1993	0.45	0.47	0.51	0.47		0.37	0.56	0.47	0.45
30/12/1994	0.58	0.60	0.59	0.56	0.54	0.45	0.45	0.54	0.55
29/12/1995	0.53	0.63	0.49	0.58	0.54	0.51	0.45	0.53	0.55
31/12/1996	0.48	0.57	0.55	0.57	0.51	0.38	0.29	0.48	0.51
31/12/1997	0.34	0.48	0.63	0.46	0.40	0.31	0.44	0.44	0.44
31/12/1998	0.56	0.46	0.60	0.53	0.56	0.49	0.59	0.54	0.53
31/12/1999	0.25	0.33	0.52	0.27	0.43	0.34	0.52	0.38	0.36
29/12/2000	0.18	0.23	0.35	0.07	0.29	0.24	0.49	0.27	0.23
31/12/2001	-0.05	0.16	0.24	0.08	0.22	0.16	0.45	0.18	0.13
31/12/2002	-0.07	0.10	0.19	0.10	0.17	0.15	0.47	0.16	0.11
31/12/2003	-0.42	0.01	0.04	-0.06	-0.05	-0.04	0.36	-0.02	-0.09
15 31/12/2004	-0.21	0.00	0.03	0.14	-0.01	0.03	0.46	0.06	0.00

16 Since the average beta for the market as a whole is 1.0, these beta estimates indicate that these
 17 utilities and utility holding companies (UHCs) are lower risk than the typical stock.

1 The most recent individual beta estimates are graphed below both for the average, the average
2 minus PNG and Terasen Inc:



3
4 When betas are estimated there is always measurement error, since unique events can just
5 happen to coincide with stock market movements to exaggerate or moderate the underlying risk.
6 The beta estimates for TransCanada Corporation , for example (TCPL) reflect the collapse of its
7 stock market price as it divested non-regulated assets in the last 1990s just as the stock market
8 was booming and then its recovery in 2000-2001 as the market dived. It is for this reason that
9 betas are usually grouped into industries and examined over time. The last column in the prior
10 table gives the average for the UHCs, which can be regarded as an “industry” beta with and
11 without the riskiest utility (PNG).

12 The data shows that for the five year periods ending in 1984 and 1985 the average beta was
13 0.55¹³. The average then drops through to 1992 before increasing back to 0.54 for the period
14 1990-1994 before dropping from the 0.50 level in the late 1990s to 0.06 for the most recent five

¹³ Betas are estimated over five year periods so the 1984 estimate covers the period 1980-1984.

1 year period. Over this long period the average beta for the utilities has been in a range from a
 2 negative number to 0.55. The top of this risk assessment is higher than that obtained by
 3 examining the variability of accounting ROEs alone, reflecting the fact that some of the risk is
 4 investment risk, independent of the income risk. The bottom of the range reflects some unique
 5 factors from the stock market bubble of the late 1990s.

6 Another way of looking at the data is to look at the betas of the relevant TSX/S&P Composite
 7 sub-indexes. These are graphed in Schedule 18. The great advantage of the sub-index betas is
 8 that they include more companies than the individual estimates and the data is more readily
 9 available.¹⁴ This is particularly important due to the fact that a large number of regulated firms,
 10 like Consumers Gas, Maritime Electric, Island Tel etc., have disappeared through corporate
 11 reorganisation. Although, this means that their individual company betas have also disappeared,
 12 it does not mean that their economic impact has disappeared. Consumers Gas now shows up as
 13 part of Enbridge, Island Tel as Aliant etc., so their economic impact continues to show up in the
 14 sub index betas. However, there are two disadvantages: the first is the impact of BCE's non
 15 regulated operations on the sub index betas; the second is that the sub indexes are weighted
 16 according to the TSE weights for each company. Consequently, these are not simple averages but
 17 market value weighted averages, so that big companies like BCE have a disproportionate weight.

18 The Telco, Gas and Electric, Pipeline and utility sub-index betas up to the end of 2002 when the
 19 TSE sub indexes were changed are as follows:

	Gas/Electric	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

20

14 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.

1 The sub-index betas obviously largely tell the same story as the individual company betas. Telco
2 risk has undoubtedly increased as competition has been introduced, particularly long distance,
3 and consequently they have been removed from ROE regulation. This has caused the betas for
4 both the Telcos and the Utility sub-index to increase, since BCE has been such a large part of the
5 Utility index. This has been exaggerated by the fact that the sub indexes are based on market
6 value weights so that BCE has a huge influence on both the Telco and the Utility sub-indexes.
7 However, the recent behaviour of the Gas and Electric and Pipeline sub-indices require
8 explanation.

9 It is important to remember that betas are simply a statistical estimate of the extent to which a
10 stock moves with the general market over a particular period of time. By convention, betas are
11 estimated over a five-year period. This means that if a critical event happens during the
12 estimation period, then the beta estimate will pick it up. However, once the event “passes out” of
13 the five-year estimation window, the impact of the event will disappear from the beta estimate.
14 For example, the graph in Schedule 18 shows that beta estimates were trending to a common
15 average until 1987, after which the pipeline beta increased and the others decreased. This lasted
16 for five years until they again came together.

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

23 Professional judgement would indicate that it is unreasonable to just use the statistical estimate
24 without recognising the underlying events that caused it, and then to make appropriate
25 adjustments. It is my judgement that betas tend to revert to their long run average levels: for the
26 market as a whole this is 1.0, but for regulated firms from Schedule 18, this is about 0.5-0.6.
27 There is no indication from Schedule 18 that the non-Telco betas are reverting to 1.0,¹⁵ quite the

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

1 opposite all the evidence is that gas and electric betas have been on a long run downward trend.
2 Consequently it is illogical to weight them with 1.0, since there is no expectation that their risk is
3 increasing to that of an average firm. So what explains the current betas? The answer is Nortel
4 and the Internet bubble.

5 During the late 1990s, the technology and internet boom were driving North American markets.
6 Nortel was controlled by BCE, so that BCE's stock price was being driven by Nortel and the
7 internet boom. In fact, this was driving the entire Canadian stock market as Nortel and JDS
8 Uniphase became an increasing part of the market and at one point made up almost 35% of the
9 value of the TSE300. As the prices of Nortel and JDS Uniphase stock increased, so did the Telco
10 and Utility indices and the TSE300. When this boom turned into a crash and Nortel declined
11 from \$124 to under \$1, Nortel took the Canadian market and the Telco and Utility indices down
12 with it. This is what caused the high beta estimates for the Telco and Utility indexes in both 2000
13 and 2001.

14 In contrast, the gas and electric and pipeline betas declined. The reason for this was that as the
15 market went on a technology driven boom and bust, these stocks were largely ignored. In the
16 case of the Pipeline sub index, the collapsing share price of TransCanada Pipelines during 1999
17 and its recovery during 2000, was against a strong equity market in 1999 and a weak one in
18 2000. This movement of TransCanada's share price against the general market movement
19 induced a negative correlation and the low beta estimate for the pipeline sub index.¹⁶

20 For the last several years the story in the Canadian equity markets has been recovery from the
21 "bubble" in Nortel's stock price. Unless a similar bubble is expected in the next few years, taking
22 the recent beta estimates at face value makes little sense. It is my professional judgement that
23 after examining the behaviour of the betas we will not have another Internet bubble in the stock
24 market over the next few years. Further, the betas of gas and electric companies will revert to
25 their recent range of around 0.50 once the data from this anomalous period has passed out of the
26 estimation window.

16 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.

1 If simple purely statistical support for this estimate is needed, the average beta estimate for the
2 gas and electricity sub index of the TSX over the entire period 1963-2002 has been 0.61 and of
3 the utility index 0.54. Weighting these long run averages for ROE regulated utilities equally with
4 the 2002 gas and electric estimate of 0.14 gives an “adjusted” beta estimate of 0.34-.38. This
5 estimate of 0.34-0.38 can be regarded as a simple statistical estimate.¹⁷

6

7 **Q. HAVE THESE INDEX BETA ESTIMATES CONTINUED TO BE AT LOW**
8 **LEVELS?**

9 **A.** Yes. The tables of individual beta estimates go to the end of 2004 and show that betas are
10 still at very low levels. In addition although the TSE discontinued the most useful sub indexes in
11 2002, the new S&P/TSX indexes do have a utility index. There are problems in the coverage of
12 the new S&P/TSX sub indexes since they reflect S&P’s world wide view of what constitutes a
13 sub index with little concern for regional differences as a result there are many anomalies as S&P
14 tries to squeeze a square peg into a round hole.. However, Schedule 19 shows that the betas of
15 the new utility subindex continued to decline through 2003 before trending upwards to a zero
16 beta by the end of 2004.

17

18 **Q. WHAT ADDITIONAL EVIDENCE HAVE YOU LOOKED AT?**

19 **A.** One of the most important investment characteristics of utilities is their high dividend
20 payouts. This is why they appeal to Canadian investors who can use the dividend tax credit and
21 why their shares are generally held by Canadian and not foreign investors. This means that utility
22 share prices are driven by interest rates as well as common market factors and suggests a two-
23 factor risk premium model, where there are two risk premiums: the market risk premium and a
24 term spread risk premium that reflects exposure to interest rate risk. Interest rate risk is the risk

¹⁷ Note that the overall average is unduly influenced by the earliest time period when the investment risk attached to investing in utilities was higher than at present.

1 of investing in long Canada bonds, instead of treasury bills. As interest rates increase returns
2 from long Canada bonds go down and vice versa. This exposure to interest rate risk also
3 characterises utility stocks since their dividend rich returns makes them “interest sensitive.”

4 I therefore estimated a two factor model for utilities where their returns were driven by the
5 common market factor, the TSX Composite return, as well as the return on the long Canada
6 bond. The beta from this two factor model along with the conventional beta estimate is graphed
7 in Schedule 20. As can be seen the one and two factor beta estimates for the gas and electric and
8 pipeline subindexes show essentially the same behaviour over time. Given the measurement
9 error involved in any statistical estimation and the sensitivity of the estimates to economic
10 conditions, I discount the current estimates and judge a reasonable range for normal market
11 conditions going forward to be 0.45-0.55.

12

13 **Q. WHAT IS YOUR RISK PREMIUM OVER BONDS ESTIMATE?**

14 **A.** From Appendix E the Canadian market risk premium of equities over long-term bonds
15 since 1956 has been in a range 1.95-2.70% based on annual holding periods. If I extend the data
16 back to 1924 the range increases to 5.00-5.21%. However, conditions in the bond market prior to
17 1956 were substantially different from what they have been since and most of the decline in the
18 market risk premium has been caused not by a decline in equity returns but an increase in bond
19 market returns, commensurate with their increased risk. My Appendix F shows that similar
20 changes have occurred in the US, where the US market risk premium since 1956 has similarly
21 been in a range 4.06-5.61%, which is a substantial drop from the estimates from 1926 of 6.41-
22 6.61%.

23 My assessment is that much of the drop in the market risk premium has been caused by an
24 increase in the risk of investing in long government bonds. The twin problems of government
25 deficits and inflation drove up market yields in the 1970s and 1980s and caused the risk of
26 investing in government bonds to approach that of investing in equities. One way of looking at
27 this is to chart the yield on the real return bonds, which is in Schedule 21. Of note is that from
28 1991 through the end of 1996 the yield on the real return bond was around the 4.50% level. This

1 is the period when the government deficit and borrowing was approaching 10% of GDP. This
2 crowding out in the bond market created a significant risk that the government would inflate
3 itself out of its deficit problems causing bond investors to demand higher yields to protect
4 themselves. Significantly, as the government deficit began to fall so too did the yield on the real
5 return bond. Notably since government moved into surplus the yield on the real return bond has
6 been in free fall and has recently been under 2.0%.

7 The impact of government financing problems has primarily been in the government bond
8 market where this inflation risk has been most obvious. In Appendix F Schedule 5, I graph
9 government bond betas from 1926-35 until the end of 2004. From this data it is clear that bond
10 betas increased dramatically until the mid 1990s when they peaked at over 0.50. Since deficits
11 have been tamed (at least in Canada) government bond betas have decreased accordingly and this
12 reduction in risk has lead to commensurate declines in real and nominal government bond yields.
13 At a bond beta of 0.50, at their peak, government bonds had about a 225 basis point risk
14 premium embedded in them, a level similar to that of low risk utilities. This is why at that time I
15 was recommending very low risk premiums. This 225 basis risk premium has now largely been
16 removed from government bond yields, as the yield on real return bonds has declined by a
17 similar amount.

18 I currently estimate the market risk premium at 4.5%. This is significantly higher than the
19 experienced market risk premium earned in Canada over the last 48 years, but takes into account
20 the influence of the earlier data, the recent unexpected performance of the bond market, due to
21 declining long Canada bond yields, and the reduction in risk in the bond market. From the
22 previous discussion of the risk of a typical regulated utility, the appropriate beta range is 0.45-
23 0.55. This would imply a risk premium of 2.025%-2.475%. Adding this risk premium to the long
24 Canada yield forecast of 5.0% produces an estimate in a range of approximately 7.0-7.5%.

25

26 **Q. HAVE YOU ESTIMATED ANOTHER RISK PREMIUM MODEL?**

27 **A.** Yes. The CAPM is a single factor model, where all that matters is the risk of holding
28 securities in a diversified portfolio. However, the two-factor model indicates that the CAPM

1 does not capture all of the risks that affect securities. It has been known for some time that the
2 CAPM, when used with Treasury Bill yields as the risk-free rate, tends to give low estimates for
3 certain types of securities, which is partly why for regulatory reasons it is normally used with the
4 long Canada bond yield.¹⁸ However, this practice caused many of the problems in regulatory
5 awards in the mid 1990s when the long Canada bond yield was so high due to inflation concerns,
6 government deficits and the large risk premium embedded in government bond yields, which did
7 not have a counterpart in the equity market.

8 The exposure of utility returns to this interest rate factor I call “gamma” to contrast it with the
9 beta which is the exposure to the market risk. Schedule 22 graphs the gammas of the gas and
10 electric and pipeline sub indexes up until 2002. These gammas are more stable than the
11 equivalent beta estimates and show that on average gammas are about 0.50. As a result I judge
12 utility stocks to have about half the exposure to the equity market as the average stock and half
13 the exposure to the bond market as the long Canada bond.

14 The two-factor model partly adjusts for the known estimation problems of the CAPM by directly
15 incorporating the risk of the long Canada bond through a term or interest rate risk premium. For
16 example, the data indicate that utilities have about half as much interest rate risk as the long
17 Canada bond and half as much risk as the stock market. If yields on long Canada bonds increase
18 and the return on the long Canada bond is only 2.0% while the stock market increases by 10%,
19 then the return from holding the utility stock will be 6% over the risk-free rate: 5% due to
20 exposure to the market factor and 1% from exposure to the interest rate factor.

21 However, incorporating the interest rate risk into the risk premium model means that other
22 adjustments are necessary as well. In particular, since the interest rate or term premium is the
23 premium over Treasury Bill yields, the market risk premium must be estimated in the same way.
24 In Appendix E (Schedule E1) I show that the realised return difference between long Canada
25 bonds and Treasury Bills was 1.03% using arithmetic returns over the period 1957-2004,
26 whereas the yield difference averaged 1.27%. The market risk premium over Treasury bills

18 This is also why the market risk premium is normally estimated over the long Canada bond return, rather than over Treasury Bills returns.

1 would therefore be on average about 1.00% higher than over long Canada bonds. Consequently
2 the 4.5% that I am using for the market risk premium over long Canada bonds should be
3 increased to about 5.50% over Treasury Bill yields. The utility risk premium would therefore be
4 $0.5 \times 5.50\%$ for the equity market risk premium plus $0.5 \times 1.0\%$ or 0.50% for the interest rate risk
5 premium, or 3.25%. This would then be applied to the forecast Treasury Bill yield of 3.70% to
6 get an overall estimate of 6.95%.

7 However, a problem with the estimate of 6.95% is that it is based on a short term Treasury bill
8 yield and even though this forecast yield is greater than the current yield it still reflects short run
9 expectations and the temporary impact of monetary policy. What is needed is a “long-term” risk-
10 free rate, or average Treasury Bill yield, that strips out the term premium from the long Canada
11 bond yield. We can estimate this simply by subtracting the term premium of 1.00% from the
12 forecast 5.0% forecast long Canada bond yield. I use this 4.00% estimate as the Treasury Bill
13 yield expected over the same life as the long term bond.

14 With a long Canada bond yield of 5.00%, a term premium of 1.00%, a market risk premium over
15 T-bill yields of 5.50%, the two-factor model estimates the fair return as 7.25% as follows:

$$\begin{aligned} K &= R_f + \beta * [RM - R_f] + \gamma * [Term] \\ &= 4.00\% + .5 * 5.50\% + .5 * 1.00\% = 7.25\% \end{aligned}$$

18 where the market risk premium coefficient (β) is the average of my beta estimates.

19

20 **Q. PLEASE SUMMARISE YOUR ESTIMATES.**

21 **A.** The risk premium testimony is based on two models: a ‘classic’ CAPM risk premium
22 model and a two-factor model. The ‘classic’ CAPM estimate is based on an historic average
23 market risk premium “adjusted” for the changing risk profile of the long Canada bond. The
24 newer two-factor model takes into account the interest rate sensitivity of utility stocks. Both
25 models have been estimated over individual firm data as well as sub-index data and over
26 extensive periods of time. As more estimation procedures and larger data sets are used, there are

1 of course more estimates. However, by examining the impact of different economic conditions,
2 as well as the risk return relationship in the US and Canada, I can be confident that the fair return
3 is bracketed by the estimates. The methods provided the following fair return estimates:

4 **Classic CAPM estimate:** **7.00 – 7.50%**

5 **Two-factor model estimate:** **7.25%**

6 I put equal weight on both estimates and take the average of 7.25% as being reasonable. A 7.25%
7 return means a real return of about 5.25% with a long-run inflation forecast of 2.0%, in the
8 middle of the Bank of Canada's operating range. This 5.25% represents a real return close to that
9 earned by the TSE300 index as a whole since 1956. Note that in my Appendix E, Schedule 1, I
10 estimate the real return on the TSE300 since 1956 at 10.72% minus inflation of 4.25%
11 (arithmetic return estimates) or a real return of 6.47%, so awarding 1.22% less for a low risk
12 company like Terasen seems generous.

13

14 **Q. IS THIS YOUR RECOMMENDED ALLOWED RETURN?**

15 **A.** No, regulated firms should be allowed to recover their issue costs in the allowed return in
16 the same way that issue costs attached to debt are included in the embedded debt cost. The equity
17 issue costs are made up of a number of components including in house costs which are passed on
18 as general administrative costs plus the costs paid the investment banker. These costs are made
19 up of two kinds: the out of pocket reimbursement of expenses plus the under pricing of a new
20 issue to ensure a successful offering. Overall these costs run up to 5.0% for a normal issue,
21 although they can be smaller for larger issues since there are economies of scale.

22 The conventional way of working out the extra return that is required is to use the constant
23 growth model and recognise that because of these costs the firm has to earn a higher return on its
24 net proceeds than the nominal amount of stock that it has sold. For example, assuming a stock
25 with a 4% expected dividend yield and 4% growth, the cost of equity is 8.0%, that is

26
$$K = \frac{d}{P} + g = 4.0\% + 4.0\%$$

1 However, if the firm only receives a net of 95% of the current stock price, that is, 5% issue costs
2 then the equity cost is

3
$$K = \frac{d}{P} + g = \frac{4.0}{0.95}\% + 4.0\% = 8.21$$

4 which is 8.21% or 21 basis points more.

5 In the example, if the investor wants a fair return of 8%, the firm has to be allowed an 8.21%
6 return on the net proceeds of 95% of the issue size. In this way 8.23% on 95% of the proceeds
7 provides the 8.0% return on the amount paid by the investor. Clearly, the higher the dividend
8 yield component and the less growth, the higher the impact of the new issue costs. For example
9 if the dividend payout is 100%, then the flotation cost allowance would be 42 basis points. This
10 is because the firm, by definition, is being forced into more new issues than a firm that reinvests
11 more.¹⁹

12 Once the tax deductibility of some of these costs is considered, a "flotation or issue cost"
13 allowance of 15 basis points is reasonable plus the out of pocket expenses. However, I normally
14 add 50 basis points as a cushion to the direct estimates in line with this practice of many boards.
15 This is mainly to ensure that there is no dilution and stock prices are more variable than a 5%
16 flotation cost allowance would indicate. Adding 0.50% to my estimates produces a range of
17 7.50-8.0% and a best estimate of 7.75% for a 275 basis point utility risk premium.

¹⁹ Note that with 5% issue costs, the idea is that the stock should sell at a market to book ratio of 1.053, so that it will net out book value on any new issue. With utility market to book ratios vastly in excess of 1.052 it is difficult to rationalise any flotation cost allowance, since it is unlikely that there will ever be any dilution.

1 **5.0 REASONABLENESS OF THE ESTIMATES**

2 **Q. THIS ESTIMATE IS LOWER THAN THE COMPANY’S REQUESTED ROE. DO**
3 **YOU HAVE ANY CORROBORATING EVIDENCE?**

4 **A.** Yes. First it has to be pointed out that the size of the equity risk premium is usually
5 estimated from historic data and in the U.S. it has been pegged at 6.00% using the Ibbotson et al
6 data. This became very controversial when people started doing simple tests of reasonableness.
7 For example, in Schedule 23 is a simple future value chart showing how one dollar compounds
8 at 6.00%, 10.5% and 12.0%. By year thirty, an investment at 6.0% would have grown to \$5.74
9 whereas an investment at 10% would have grown to \$19.99 and an investment at 12% to \$29.96.
10 These are staggeringly large premiums for the 10 and 12% returns that proxy for the equity
11 market versus a lower “bond” market return, which leads to the natural question of how risk
12 averse do people have to be in order to require these huge premiums. Mehra and Prescott²⁰
13 argued that the degree of risk aversion was unreasonably high. As Siegel²¹ points out, “the
14 historical (equity) return has been too high in relation to the return on risk-free assets to be
15 explained by the standard economic models of risk and return without involving unreasonably
16 high levels of risk aversion.” The high earned returns phenomenon is now known as the “Equity
17 Risk Premium Puzzle,” since people have been at a loss to understand the historic U.S. record.

18 There have been two major approaches to explaining the puzzle. First, Siegel has shown that the
19 US results are time specific. He estimates the following risk premium estimates over long bonds:

	<u>Geometric</u> ²²	<u>Arithmetic</u>	<u>Real Return</u>	
21	1802-1998	3.5	4.7	3.5
22	1802-1871	2.2	3.2	4.8
23	1871-1925	2.9	4.0	3.7

²⁰ R. Mehra and E. Prescott, “The Equity Premium Puzzle,” *Journal of Monetary Economics*, (March 1985)

²¹ Jeremy Siegel, “The Shrinking Equity Premium,” *Journal of Portfolio Management*, (Fall 1999).

²² The difference between arithmetic and geometric returns is discussed at length in my Appendix E.

1	1926-1998	5.2	6.7	2.2
2	1946-1998	6.5	7.3	1.3

3 From the above data there seems to be a U.S. market risk premium of 6.7-7.3% since 1926,
4 which is the type of data normally presented by company witnesses in rate hearings. However, as
5 the time period is lengthened, the equity risk premium drops significantly. For the longest
6 available period the equity risk premium in the U.S. is only 4.7%. This leads to the question of
7 why so much reliance is placed on U.S. data since 1926? The answer to this is that Fisher and
8 Lorie²³ of the University of Chicago started the data base at 1926 simply to capture the huge run
9 up in stock prices prior to the Great Crash of 1929 and their original data base is the foundation
10 for most of the subsequent capital market data and research. If they had used all of the data that
11 was available to them at the time, subsequent US market risk premium estimates, as Siegel
12 shows, would have been much lower.

13 The final column of Siegel's table shows the real return on Treasury Bonds (Nominal minus
14 actual inflation). Over the whole period the actual real return has been 3.5%, but over the periods
15 since 1926 and 1946 it has been only 2.2% and 1.3% respectively. This is the root of the puzzle,
16 not that equity returns have been so large but that bond returns have been so low. This is the
17 theme of Appendices E & F, that the enormous increase and volatility of interest rates in the post
18 war period has lead to unreasonably low estimates of realised historic bond returns. Siegel points
19 out that the introduction of Treasury Indexed Securities or TIPS in 1997 in the U.S. has lead to
20 the direct observation of the US real bond return at 4.0%, which compared to the 1926-1998
21 actual returns indicates that the realised bond return was 1.8% less than expected. This means
22 that, but for this bias, the U.S. market risk premium should have been 4.9% (6.7-1.8) or
23 essentially the long run average U.S. market risk premium.

24 It is important to note that much of the debate about the market risk premium in the US stems
25 from the fact that until 1997 they have not had an inflation indexed bond and the above bias was
26 not obvious. In contrast, this has been well known in Canada, since we have had a real return

²³ L. Fisher and J. Lorie, "Rates of Return on Investments in Common Stocks," *Journal of Business*, 37-1, 1964.

1 bond since 1991. In fact, many of Siegel’s arguments were previously made by me in a 1995
2 paper in the *Canadian Investment Review*.²⁴ In this case, following historic US evidence amounts
3 to the “one-eyed following the blind.”

4 The second way of resolving the puzzle has been to estimate a forward looking model using the
5 discounted cash flow (DCF) model to estimate the equity return and then subtract the long bond
6 yield. In most applications the Gordon constant growth model²⁵ is used where the equity cost is
7 the forecast dividend yield (expected dividend d_1 divided by current share price P) plus the
8 expected capital gain or growth yield (g).

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

9

10 **Q. DO YOU PROVIDE A DCF ESTIMATE?**

11 **A.** My Appendix C presents data for the US utilities followed by Standard and Poors. This
12 data is used to estimate a DCF required rate of return that is then subtracted from the US
13 government bond yield to estimate the utility risk premium appropriate for these U.S. utilities.
14 This estimate of the utility risk premium is that it has averaged 2.20% over ten year US treasury
15 bond yields and been falling. This is supported by the increase in the market to book ratios of
16 these companies indicating that the market has been paying higher and higher prices for the same
17 stream of utility earnings. That is, the required rate of return has fallen faster than allowed rates
18 of return.

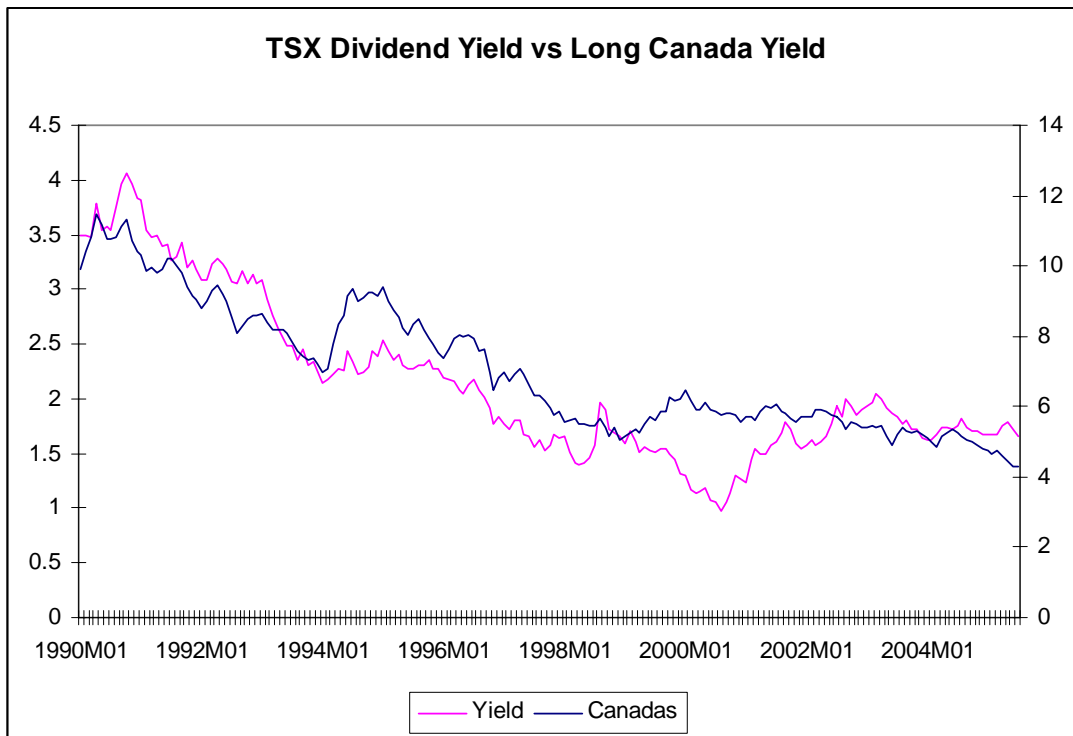
19 However, to be conservative, I have also estimated the utility risk premium assuming both a
20 higher return on equity and a higher retention rate than has actually been the case. These
21 adjustments serve to increase the forecast growth rate and also the utility risk premium to up to
22 2.65%. These estimates confirm the risk premium estimates from the one and two factor models,
23 since if the risk premiums are valid for Canada, they would imply a fair return of 7.20-7.65%

²⁴ Laurence Booth, “Equities over Bonds, but by how much?” *Canadian Investment Review*, Spring 1995.

²⁵ Developed in Appendix C.

1 (long Canada yield forecast of 5.0% plus the prior risk premiums) plus the 0.50% flotation cost
2 which are broadly inline with the my recommendation.

3 We can look at the DCF estimate for the Canadian market as a whole. The dividend yield on the
4 Canadian market is currently about 1.7% and has followed the yield on the long Canada bond
5 downward. The following chart indicates just how closely the yield on the TSX Composite and
6 that on the long Canada bond track each other.



7
8 I would forecast a maximum dividend yield would be about 2.0%, which would allow for 17%
9 growth, which given the record profit levels at the moment is not unreasonable. Further some
10 have argued that share repurchase provides a surrogate for corporate dividend payments, so that
11 the actual dividend yield is understated by about 0.50%. If this is the case a maximum forecast
12 dividend yield might be 2.5%. This leaves the critical question: what is a reasonable growth
13 estimate?

14 From the previous graph the current dividend yield on the TSX Composite (left hand scale) is
15 about 2.5% less than that on the long Canada bond (right hand scale). This 2.5% is the obvious
16 break-even growth rate indicating that with risk aversion equity investors must be expected share

1 price growth of at least 2.5%. For individual firms there is a huge forecasting error attached to
2 estimating growth rates, but for the market as a whole there is less error. This is because many of
3 the gains made by some firms are at the expense of other firms. Holding a diversified portfolio
4 removes this risk and leaves the investor exposed to the overall level of profits and dividends. At
5 the economy level there is then a constraint on how much of the national income (GDP) can go
6 to profits, since as the profit share increases it does so at the expense of personal incomes, which
7 in turn leads to higher wage demands.

8 In Schedule 7 I provided a graph of annual pre-tax corporate profits as a share of GDP. In
9 Schedules 24 is the dividend payout based on the earnings and dividends of the TSX Composite
10 firms where both are adjusted to their index weights. Typically dividend payouts have been
11 about 50% for these large firms with a slight downward trend, except for the undefined payouts
12 in the early 1990s and in 2002 when huge corporate losses caused the payouts to be negative,
13 that is, positive dividends paid out of negative earnings. One of the problems with the data in
14 Schedule 24 is that it is drawn from accounting statements, so that the losses in 2002 for
15 example, were not cash losses but simply writ-offs of bad acquisitions made primarily by Nortel
16 and JDS Uniphase.

17 Schedule 25 graphs dividends and after tax profits as a percentage of GDP where the after tax
18 profits are those reported for tax purposes and do not reflect all the accounting games that go into
19 GAAP profits. As is to be expected, aggregate dividends are more stable than aggregate after tax
20 profits. While profits plummeted during the recessions in 1981, the early 1990s and marginally
21 in the early 2000s the effect is not nearly as pronounced as indicated by Schedule 24. In fact it is
22 quite clear that the losses in 2002 were not widespread, nor reflective of true operating earnings.

23 From Schedule 25 dividends on average are around 2.3% of GDP and after tax corporate profits
24 about 6.0%. Further there is no upward or downward trend. Corporate profits tend to peak at
25 around 7-8% of GDP at the top of the economic cycle and then fall back. Likewise dividends are
26 more stable, but rarely exceed 3.0% of GDP. It is hard, therefore, not to conclude that in the
27 long-run, dividends and after tax profits grow at about the same rate as the overall economy, but
28 that in the short run, there is considerable volatility! Given that the average real Canadian growth
29 rate since 1961 has been 3.63% and the Bank of Canada's operating band for inflation centres on

1 2.0%, this implies long-run growth rate in dividends and earnings at about 5.70% (1.02×1.0363).
2 If this is combined with the 2.5% maximum forecast dividend yield the DCF equity return for the
3 Canadian market is about 8.2%. This may be marginally low since energy prices are pushing up
4 the short run inflation forecast and we may see a bigger short term boost to dividends due to the
5 high level of corporate profits. However, it simply underscores that a 7.75% allowed rate of
6 return for a low risk regulated utility like Terasen is fair and reasonable.

7 Schedule 26 shows the dividend payout of the aggregate dividends from aggregate after tax
8 profits. Again the recessions of 1981 and the early 1990s is clearly evident, although not the
9 slowdown of the early 2000's. However it is obvious from this aggregate data that the aggregate
10 payout is closer to 40%, implying a 60% retention rate. With the corporate ROE of about 10%
11 from Schedule 1, this would imply dividend growth of 6.0% ($b \times ROE$), which is approximately in
12 line with the nominal GDP growth rate. This would imply a DCF equity cost for the market as a
13 whole closer to 8.5%, but again it confirms its general level.

14 Of note are two quite recent independent estimates of the Canadian market risk premium by
15 industry professionals. The first was a recent report by TD Economics (May 2003) "Investing for
16 the Long Haul," which estimated long run rates of return at cash (T. Bills) 4.60%, long bonds
17 5.75% and common equities 7.75-8.75%. The equity return estimate came from "assuming a
18 reasonable risk premium, Canadian equities, as represented by the S&P/TSX, are likely to
19 provide an annual return of roughly 7.75% over the long haul." The 7.75% lower end to the
20 range came from looking at long run earnings and dividend growth of 4.8% using more
21 pessimistic assumptions than I used above. The higher estimate of 8.75% came from the US
22 S&P500 assuming both higher US inflation and productivity growth. This recent TD estimate
23 confirms the observation of many that Canadian risk premiums are lower than in the US and that
24 the 8.2% estimate is reasonable when compared to TD's estimate of 7.75-8.75% for the market as
25 a whole.

26 The second was a report by Rajiv Silgado the chief investment officer of Barclays Global
27 Investors Canada Ltd, who in a summary published in the Canadian Investment Review
28 (Summer 2003) reported the following equity market risk premiums:

29

1	Canada	US	UK	Japan	Aus	Europe
2	3.75%	4.50	5.75	2.50	4.50	5.00

3 Mr. Silgado estimated the equity risk premiums by using a modified growth model, but the
4 critical points again are a lower equity market risk premium in Canada than the US and the much
5 lower level of equity market risk premiums than those used by company experts.

6 The above types of analyses are not specific to Canada. Arnott and Ryan,²⁶ two finance
7 "professionals," that is, non-academics, estimated the real growth rate in US dividends at 1.0%
8 from 1926-1999. This is well below the real growth rate in US GDP, implying that US aggregate
9 dividends grow at a slower rate than the corresponding values for Canada. They also produced
10 the following table for international growth rates over the 1969-1999 period:

Arnot and Ryan DPS and EPS Growth Rates

	<u>US</u>	<u>Canada</u>	<u>UK</u>	<u>Japan</u>
12 Real GDP	2.3%	2.9%	2.1%	1.6%
13 Real EPS	1.4%	-2.2%	1.3%	-3.4%
14 Real DPS	1.3%	-0.9%	2.2%	-1.6%
15 Average	1.3%	-1.5%	1.7%	-2.5%

17 This data shows more pessimistic growth rates than the earlier Canadian data alone, since the
18 time horizon is shorter. It is possible to make dividends grow faster than earnings by companies
19 increasing their dividend payout, which is what happened in the UK. However, across all these
20 major economies, the Arnott and Ryan data indicates that corporate profits and dividends have
21 not kept up with GDP and that the average GDP growth rate is much less than the 3.75% used
22 above for Canada.

23 Arnott and Ryan argued that the actual returns on the U.S. equity market came from a reduction
24 in the required rate of return. As the investor reduces the required rate of return, market prices
25 increase causing a change in the valuation of the same dividend or earnings stream. They show
26 that 2.0% of the U.S. real equity return came from this change in the basis of valuation and make
27 the obvious point that this cannot continue forever. They conclude

²⁶ R. Arnott and R. Ryan, "The Death of the Risk Premium," *Journal of Portfolio Management* (Spring 2000).

1 “More important still, our 3.2% outlook for real returns falls short of the real
2 return available in inflation-indexed government guaranteed bonds. For the first
3 time in U.S. capital markets history, the equity risk premium is probably negative,
4 barring some very aggressive assumptions regarding economic growth and the
5 share of growth that makes its way to the investor in today’s enterprises.”

6 I am not as pessimistic as Arnott and Ryan are for the US, but it is clear that a DCF model results
7 in required return estimates considerably below the actual realised equity returns earned since
8 1926.

9

10 **Q. DO YOU HAVE ANY ANALYSTS’ "FORWARD LOOKING" ESTIMATES?**

11 **A.** It is generally accepted that analysts’ earnings forecasts are biased high. There is
12 increasing concern that with the decline in fixed commissions, security analysts no longer get
13 paid for the quality of their research. Instead, analysts have received a share of investment
14 banking fees stemming from corporate underwritings and mergers and acquisitions. In such an
15 environment it is difficult for an analyst to be objective with their earnings forecasts or place a
16 sell order on a stock. To do so would cut the analyst's firm off from future underwritings.
17 Consequently they have effectively become part of the sales team for equities. This conflict of
18 interest has been most evident in the Internet and Technology fiascos of the late 1990s, when
19 prominent analysts issued strong buy recommendations on the way up and kept them in place on
20 the way down and got sued in the process.

21 A Wall Street Journal article (29/4/2003) dealt with the US\$1.4 billion settlement between US
22 Attorney General for New York Elliot Spitzer and a series of major US investment banks. Apart
23 from the settlement, two analysts Jack Grubman of Salomon and Henry Blodget of Merrill
24 Lynch were both charged with issuing fraudulent research reports and agreed to pay penalties of
25 \$15 million and \$4 million, respectively; they were also banned from the securities business for
26 life. In addition, the following extracts from the WSJ article indicate that there was widespread
27 lack of objectivity in analyst reports. From these admissions, it was quite general for analyst pay
28 to be tied to investment banking business, so their reports were optimistic to please corporate
29 management and pave the way for investment banking business and fees for the analyst’s firm.

- 1 • The SEC singled out former star technology-industry banker Frank Quattrone of CSFB²⁷
2 for criticism for his role in directing analysts' coverage to win investment-banking business
- 3 • The SEC charged that CSFB issued fraudulent research on two stocks, Digital Impact
4 Inc. and Synopsis Inc.; produced misleading research on Numerical Technologies Inc., Agilent
5 Technologies Inc. and Winstar Communications
- 6 • Merrill Lynch was charged with fraud for its research on GoTo.Com and InfoSpace Inc.
7 and for making exaggerated statements about certain stocks,
- 8 • The SEC said that J. P Morgan paid its analysts based in part on the amount of
9 investment-banking business they brought in.
- 10 • Regulators found that analysts at Goldman Sachs were also paid in part based on their
11 participation in investment banking-related activities.
- 12 • At UBS Warburg, regulators charged that six research analysts were promised
13 "investment-banking bonuses" based on the investment-banking fees they helped win,
- 14 • Two Paine Webber analysts were promised compensation equal to 15% of underwriting
15 fees that the firm earned in their sectors.
- 16 • At Piper Jaffray the SEC charged, analysts helped pitch for deals at meetings with
17 potential underwriting clients
- 18 • At Lehman Brothers regulators found analysts' pay was tied to their success in pulling in
19 banking business
- 20 • At Bear Stearns regulators charged, analysts were "encouraged" to work closely with
21 bankers. At one meeting, the head of research told analysts, "being a partner to banking is part of
22 your job."
- 23 • The securities unit of J.P. Morgan Chase was also charged with allegedly exerting
24 "inappropriate influence" by investment bankers over analysts

25 In light of these potentially fraudulent activities and pressure on analysts to take into account
26 investment banking relationships, putting any weight on these biased, optimistic analyst reports
27 seems foolhardy.

28 Academics have long recognised the bias inherent in analyst forecasts. However, this bias has
29 also long been recognised in the professional investment strategy reports. The difference
30 between the strategy reports from investment banks and the analyst reports is that the strategy
31 reports are concerned with overall market values. Consequently, the strategy reports will offer a
32 "sell" signal on equities in general (or changes in the asset mix towards bonds) while the same
33 company's analysts continue to recommend "hold" on the individual equities. The reason for this

²⁷ Credit Suisse First Boston

1 of course is that the company with a sell recommendation on its stock will rarely do investment
2 banking business with an investment bank that has a negative analyst. On the other hand, a
3 general recommendation to lighten equities and move towards bonds doesn't target individual
4 firms and thus does not alienate corporates and jeopardise future investment banking business.

5 For example, on September 28, 2001, Credit Suisse First Boston (CSFB) issued a substantial
6 report on whether equity markets were over or under valued in response to September 11, 2001.
7 They relied on several valuation measures, one of which was a standard DCF model. They used
8 analyst forecasts (Institutional Brokers Estimation Service or IBES) out to five years and then
9 trend earnings thereafter. Using trend earnings moderates any bias in the analyst forecasts since
10 they are not projected out to infinity as is often the case. CSFB then equated this earnings stream
11 to the current market value to determine the implied equity risk premium. Their equity risk
12 premium estimate for the U.S. market was 5.3%, but they added:

13 "We would remind readers that over the last ten years IBES earnings numbers have on
14 average been 6.0% too optimistic 12 months prior to reporting date."

15 They then "stress tested" their estimates using more reasonable numbers and the equity risk
16 premium dropped to 3.0%-3.8%. Even at this level they warned that because of the bias in
17 analyst forecasts, "Some of our assumptions may be overly optimistic."²⁸

18 In a later section of the same report, CSFB valued the U.S. market using the DCF model. In this
19 case they inputted their cost of equity estimate for the U.S. market and used this to discount the
20 stream of earnings generated by the consensus economic growth rate. Their estimate of the US
21 market equity discount rate was 8.5%, which was broadly consistent with their 3.0-3.8% market
22 risk premium. It is also pretty much the same as my own estimate for the Canadian market using
23 the same approach.

24 There has also been independent academic corroboration of the CSFB approach. Claus and
25 Thomas²⁹ used IBES earnings forecasts similar to CSFB, but unlike CSFB they noted the bias in

²⁸ Note that Ms. McShane has in the past (ATCO Pipelines GRA 2003/4 admitted the over optimism bias to analyst forecasts, but still not made any downward adjustments on the speculation that investors believe these biased forecasts.

1 the forecasts but did not reduce them, so the estimates are high.³⁰ Their market risk premium is
2 then the estimated discount rate minus the yield on the ten-year bond. Schedule 27 provides their
3 estimates for the last ten years for the U.S. and some other countries. Note these estimates are
4 higher than would be used in a regulatory hearing for two reasons. First, in a regulatory hearing
5 the risk premium would be over the thirty-year bond yield, so these risk premiums need to be
6 reduced by the spread between the ten and thirty year bond yield (about 30 basis points). Second,
7 as mentioned the earnings growth forecasts would have to be adjusted for the analyst bias.

8 Despite these qualifications, there are two important conclusions from the Claus and Thomas
9 research. First, their average for the US of 3.40% is consistent with the CSFB stress tested
10 estimate of 3.0-3.8%. Second, the Claus and Thomas estimates for Canada are for an average
11 risk premium of 2.23%, which is 1.17% less than their US estimates. This is consistent with the
12 independent evidence that I have provided where I conclude that the US market risk premium is
13 higher than in Canada. My estimates in Appendix F are based on historic estimates, whereas
14 Claus and Thomas' estimates are forward-looking, but the conclusions are the same.

15

16 **Q. CAN YOU COMPARE YOUR ESTIMATE OF THE MARKET RISK PREMIUM**
17 **TO THOSE IN RECENT STUDIES?**

18 **A.** Yes. In Schedule 28 is a table showing my estimate of 4.50% for the Canadian market
19 risk premium together with recent studies showing alternative estimates derived by both
20 academics and non-academics. The table shows for each study whether the estimate of the
21 market risk premium is based on arithmetic or geometric return estimates and whether it is an
22 historic or forward looking estimate. In a few instances, these classifications are not applicable
23 (n/a). In the Claus and Thomas study, for example, a DCF model is employed in which the
24 authors use IBES earnings growth data to estimate the market return from which the yield on 10-

29 J. Claus and J. Thomas "Equity premia as low as 3%? Evidence from analyst's earnings forecasts for domestic and international stock markets," *Journal of Finance*, October 2001.

30 They noted (page 1657) "We considered a variety of biases that may exist in the IBES forecasts but found only the well-known optimism bias to be noteworthy."

1 year US Treasuries is deducted to arrive at the market risk premium. Similarly, in the Fama &
2 French and Arnott & Bernstein studies, the authors also employ growth models while in the
3 Graham & Harvey study, the authors use CFO forecasts of the market risk premium one year and
4 ten years forward.

5 What is clear from Schedule 28 is that the 4.5% market risk premium estimate is quite
6 reasonable when compared to these recent studies. These estimates are based on historic realised
7 data, forward looking methodologies, and evidence from both the US and Canada. The picture
8 that emerges is that the Canadian market risk premium is significantly less than the 5.5-6.0%
9 adopted by the National Energy Board in its Decision RH-4-2001 (pages 53-54) where it
10 reviewed its adjustment mechanism. The overwhelming evidence is that my 4.50% market risk
11 premium is a reasonable input for the determination of a fair return on equity for a BC low risk
12 benchmark utility.³¹

13

14 **Q. IS THERE ANY OTHER EVIDENCE FROM COMPANIES ON EXPECTED**
15 **RATES OF RETURN?**

16 **A.** Yes. Much of the new evidence on the size of the market risk premium comes from
17 investment professionals since it is a critical input for the valuation of pension fund assets and
18 liabilities. In a defined pension plan a company makes a promise to its workforce in terms of a
19 pension based on some form of average of final salary and numbers of year's service. This
20 liability has to be matched with assets that are expected to generate enough future income to
21 meet these liabilities. If the assets are not expected to generate a high enough return to meet these
22 liabilities then the firm has an unfunded pension liability and has to report this in its financial
23 statements. One way of meeting this unfunded liability is simply to forecast a higher expected
24 rate of return on plan assets, but the firm's actuaries will not let the firm chose any rate of return;

³¹ Work on the market risk premium is mushrooming into a cottage industry. Two more recent pieces of research recommending a 3.0% market risk premium are R Guay, "The equity risk premium and risk management in a global portfolio," a presentation to the 2003 CIR risk management conference and S. Foerster, "What happens next?" in D. Brean (editor) The perfect storm: DC plan management in a turbulent time, 2003.

1 it has to be one that is reasonable in light of market conditions. This forecast rate of return on
 2 pension assets is the opposite to the firm's weighted average cost of capital: the firm estimates
 3 what different liabilities cost it, while the pension fund actuary estimates what those assets are
 4 expected to earn.

5 The information on pension plan assets and expected rates of return is now included in some
 6 firm's financial statements. On May 12, 2003 the Report on Business of the Globe and Mail
 7 surveyed firms in the TSX index and found information on 104 firms with defined benefit
 8 pension plans. In aggregate these firms had an unfunded pension liability of \$18.7 billion and the
 9 focus was on the implications of this for both the companies and plan beneficiaries. As part of
 10 this analysis the ROB looked at whether the assumptions on the expected rate of return on plan
 11 assets were reasonable, since the situation would be even worse if companies were making
 12 unrealistic assumptions as to future rates of return. The ROB found that the average rate of return
 13 on plan assets was expected to be 7.56% down from 7.75% in 2001. ATCO and Canadian
 14 Utilities both assumed an expected rate of return of 8.0%, TransCanada 7.52% and Terasen Inc
 15 7.5%.

16 At the time of the preparation of the annual report long Canada bond yields were about 5.5%, so
 17 to generate an average return of 7.56% requires a significant common equity component. Equally
 18 clear most of these pension plans require a fixed income component to meet their ongoing
 19 commitments to current beneficiaries. Depending on the structure of these liabilities most
 20 pension plans have an asset mix of 50-60% common equity. Assuming that the fixed income
 21 component earns 5.5%, it is possible to back out the average expectation for the common equity
 22 return and as a result the implied market risk premium:

	Equity		MRP	
Asset allocation:	50%	60%	equities 50%	60%
Typical plan: 7.56% return implies	9.62	8.93	4.12%	3.43%
ATCO Plan 8.0% return implies	10.5	9.67	5.0%	4.17%
TCPL plan 7.52% return implies:	9.54	8.87	4.04%	3.37%
Terasen Plan 7.50% return implies	9.50	8.83	4.0%	3.33%

1 These estimates were obtained from solving for the equity rate of return that generates the
2 overall rate of return for the given portfolio mix. For example for a 50:50 plan with Terasen's
3 expected rate of return of 7.50% and a 5.5% bond return the equity return has to be 9.50%, which
4 implies a market risk premium of 4.0%

$$5 \qquad \qquad \qquad 7.5 = 0.5 * 5.5 + 0.5 * K$$

6 From this data it appears that only the ATCO/CU pension plan is assuming a market risk
7 premium above the 4.5% that I have estimated in this testimony. Otherwise, TCPL and Terasen
8 both seem to be assuming a 3.3- 4.0% market risk premium.

9 The above comments have to be hedged marginally since Terasen in 2002 might have been
10 assuming a fixed income component earning less than the 5.50% long Canada return or a pension
11 plan more heavily invested in bonds than is normal.³² However, what is clear is that the finance
12 professionals in charge of the pension plans of Corporate Canada, including the holding
13 companies of regulated firms, are assuming rates of return on their pension plan assets of about
14 7.50%. It is cause for concern that the finance professionals running the pension plans for these
15 UHCs seem to be making more conservative assumptions about the equity market risk premium
16 than the experts they hire to make ROE recommendations.

17

18 **Q. DO YOU ADJUST YOUR ESTIMATES FOR THE**
19 **“INTERNATIONALISATION” OF THE WORLD’S CAPITAL MARKET?**

20 **A.** No. These issues are discussed in more detail in Appendix D However, it is undoubtedly
21 true that investors are more aware of international investment opportunities now than say twenty
22 or thirty years ago. At that time the world was characterized by currency restrictions, investment
23 controls and very limited international investing opportunities. Since then most currencies have
24 become freely convertible, most investment restrictions have been removed and there has been

³² Pension plans have long lived assets, that is equities and long bonds, since they have long lived pension liabilities. Detailed information on asset mix etc of these plans is not revealed in most company's annual report.

1 an increase in the coverage of international stocks among investment advisors. This latter
2 coverage has been enhanced by international collaboration between investment banks and the
3 growth of some major international investment banks. Hence, it is inevitable that investors will
4 increasingly invest in different stock markets to diversify their risk. However, this diversification
5 *reduces* risk and with it the risk premium. In the same way that diversification across stocks in a
6 domestic market reduces risk, then so too diversification across international markets reduces
7 risk. Consequently, the removal of pension limits on foreign investments, and the gradual
8 reduction in tax restrictions etc, should decrease the equity market risk premium in both Canada
9 and the US. I am not aware of any basis in financial theory for simply averaging the US market
10 experience with that in Canada on the assumption that relaxing investment restrictions will
11 increase risk premiums: *except in pathological cases financial theory states the exact opposite.*

12 Further it has to be pointed out that Canadian stocks have always been affected by what happens
13 in the US equity market. One obvious linkage is that the standard barometer of the US equity
14 markets, the Standard and Poors 500 index has always included Canadian stocks. In fact, it
15 wasn't until July 10, 2002 that S&P cleaned up its S&P500 index to exclude foreign stocks and
16 make it a 100% US index. Prior to that time there had been many Canadian stocks included in
17 the Index, like Inco and Barrick, and one, Alcan, had been in the index for 65 years. Similarly
18 some Canadian stocks have at times been part of the Dow Jones index. Hence, taking the
19 performance of US indexes as representing only US stock market performance is incorrect.

20

1 **6.0 AN ADJUSTMENT MECHANISM**

2 **Q. HAVE YOU ANY COMMENTS ON THE BCUC ADJUSTMENT MECHANISM?**

3 **A.** I am firmly convinced current adjustment mechanisms give reasonable, if high, estimates
4 of the fair ROE. The adjustment mechanism of the National Energy Board, the Ontario Energy
5 Board, the Manitoba Public Utilities Board as well as this Commission's mechanism all operate
6 on the same principle. A going in risk premium over the forecast long Canada rate is determined
7 and subsequently the allowed ROE is adjusted in a formulaic manner with the forecast long
8 Canada rate. At various times the resulting allowed ROE has been rounded, but this practise has
9 now stopped. There are three parts of the formula that need to be considered:

10 The *first* is the size of the going in risk premium. My testimony recommends a 275 basis point
11 risk premium over the forecast long Canada yield of 5.00%. In contrast, the three major formula
12 users produce the following risk premiums at a 5.0% long Canada rate:

- 13 • NEB **406** basis points (300 basis point risk premium at 9.25% LTC and
14 0.75 adjustment)
- 15 • BCUC **350** basis points (350 basis point risk premium at 6.00% LTC and
16 no adjustment)
- 17 • OEB **396** basis points (340 basis point risk premium at 7.25% LTC and
18 0.75 adjustment)

19

20 The *second* issue is the forecast long Canada yield. By a convention established by the NEB the
21 forecast long Canada yield is based on the Consensus Economics forecast for the average of the
22 ten year long Canada bond yield three and one year hence, plus a spread adjustment to convert it
23 to a thirty year Canada bond yield. This spread adjustment is based on the spread in the month
24 preceding the determination of the allowed ROE. This whole exercise is done as close to the
25 beginning of the test year as is practicable.

1 The *third* issue is the adjustment coefficient, where apart from this Commission boards have
2 settled on either 0.75 or 0.80. I am not aware of any research to justify any of these coefficients³³
3 and do not believe that risk premiums vary in a mechanical fashion with interest rates. However,
4 in previous testimony I have supported adjustment mechanisms in the past one reason for this is
5 that it balances the interests of shareholders and consumers and is a viable compromise that
6 avoids annual repetitive rate hearings. It also is in the right “range,” which can be illustrated by
7 an example.

8 Suppose for simplicity that the market risk premium is 5% at a long Canada yield of 6.0%, and
9 that a utility has a beta a coefficient of 0.50. In this case, the utility's return is then 8.5%, which is
10 the long Canada yield plus half the market risk premium. If the long Canada yield declines to 5%
11 and the adjustment coefficient is 0.50, then the utility return would decline to 8.0% that is, by
12 0.50% compared to the 1.0% drop in the long Canada yield. Its risk premium would then
13 increase to 3.0% over the long Canada yield. However, if the utility's beta is constant at 0.50 this
14 means that the market risk premium increases to 6.0% since the utility risk premium is half the
15 market risk premium. In this case, the market required return is unchanged at 11.0%. The
16 conclusion is therefore that if the adjustment coefficient is set at 0.5, the overall required return
17 on the market is independent of the long Canada yield. These calculations are shown below:

18

19	Risk-Free	MRP	Beta	Utility Return	Market Return
20	6.0	5.0	0.50	8.50	11.0
21	5.0	6.0	0.50	8.00	11.0

22

23 This example indicates that an adjustment coefficient of 0.5 renders the whole notion of an
24 equity risk premium over the long Canada yield moot.

³³ I wrote a paper “A Quasi Expectational Model for Estimating Risk Premia” in September 1997, partly spurred by the NEB’s 1994 hearing. That paper is available at <http://www.rotman.utoronto.ca/~booth> and found that risk premia varied directly with interest rates when Canadian Telcos were on an historic test year. They then varied inversely with interest rates 1979-81 and have subsequently continuously declined.

1 On the other hand, if the adjustment mechanism is set at 1.0 it also means that the riskiness of the
2 long Canada bond relative to the equity market is constant. My Appendix E shows that this has
3 not been the case, since a major factor driving long Canada yields is government debt financing
4 and inflationary expectations, neither of which are constant. Consequently the market risk
5 premium has moved inversely with long Canada bond yields over long periods of time. In my
6 view an adjustment coefficient of 0.75, the average of these two extremes is reasonable. In the
7 1993 BCUC hearings, the 1994 NEB Multi-Pipeline hearing and before the PUB in Manitoba,
8 Professor Berkowitz and I recommended a 0.80 adjustment mechanism, while in the 2001
9 TransCanada Mainline hearing we recommended that the NEB maintain its 0.75 adjustment
10 mechanism, while before the Alberta EUB in 2003 I recommended 0.75 adjustment mechanism.
11 In my judgement whether the adjustment is 0.75 or 0.80 is not material.

12

13 **Q. WHAT IS THE RECENT REACTION TO ADJUSTMENT MECHANISMS?**

14 **A.** Apart from the Alberta EUB, both the National Energy Board and the Ontario Energy
15 Board have reaffirmed the validity of their adjustment mechanism. In RH-4-2001 the NEB
16 reaffirmed its adjustment mechanism and stated (page 54 reasons for Decision)

17 “in the Board’s view this provides a strong confirmation that the ROEs resulting from the
18 RH-2-94 Formula represent a reasonable estimate of the cost of equity capital for the
19 Mainline.”

20 The allowed ROE was therefore set at 9.53% for 2002.

21 It is also important to note that the NEB has subsequently increased the common equity ratio for
22 the TransCanada Mainline from 30% to first 33% and then 36% in subsequent hearings.
23 However, none of this increase in the common equity ratio was the result of the NEB deciding
24 that its adjustment mechanism was giving unfair allowed ROEs. In each case the increase was
25 based on supply considerations concerning the Western Canadian Sedimentary Basin, increased
26 “pipe on pipe” competition in the form of the Alliance pipeline and the observation that the
27 Mainline was operating significantly below its design capacity. Of note is that the Westcoast
28 Transmission Mainline now has 31% common equity up from the 30% allowed by the NEB in
29 1994, while the other major gas pipelines continue to operate with 30% common equity ratios. In

1 other words the NEB has decided that the combination of 30-31% common equity ratios plus the
2 application of its adjustment mechanism continues to give fair and reasonable returns to the
3 common stockholders.

4 In a recent decision the Ontario Energy Board (RP-2002-0158, paragraph 142) confirmed its
5 adjustment mechanism by stating,

6 “Therefore, with respect to the first and primary issue of whether a new benchmark ROE
7 should be established for EGD and Union, we find that the current ROE Guidelines
8 methodology continues to produce appropriate prospective results. We have not found
9 any demonstrated need to set a new benchmark ROE.”
10

11 In the case of Union and Enbridge no business risk arguments were put forward to suggest that
12 their allowed common equity ratios should be increased. In fact as far as I am aware neither
13 Union nor Enbridge have requested any increase in their common equity ratios for at least the
14 last fifteen years. The only exception to this was that after Union merged with Centra Gas
15 Ontario, the new combined firm was allowed 35% common equity.

16 From this brief review of the decisions of the NEB and OEB, I can no indication that either body
17 felt that their adjustment mechanism needed recalibration for changes in general conditions in
18 either the economy or the capital market.

19

20 **Q. ARE YOU SAYING THAT THE BCUC ADJUSTMENT MECHANISM IS**
21 **WRONG?**

22 **A.** Partly yes. I think that the logic behind an assymmetric adjustment is correct, that is, above
23 6.0% it seems that everyone agrees that there is an inverse relationship between interest rates and
24 the market risk premium. Similarly I think everyone would agree that at very low levels of
25 interest rates, the inflation/interest rate/lock in premium is removed so that the long Canada bond
26 yield simply reflects the risk-free rate over long investment horizons. The problem is where does
27 this switch happen? In my judgment the choice of 6.0% for this cut off is quite arbitrary

1 My Schedule 5 in Appendix F indicates that at the time the adjustment mechanisms were being
2 introduced there was significant risk attached to investing in the long Canada bond, which made
3 it as risky as utility shares. For this reason I believe that in 1995 the going in risk premiums in all
4 jurisdictions adopting a formula mechanism were too high, since they were based on historic risk
5 premia, without a full adjustment to the fact that the yield on the long Canada bond was too high
6 because it was risky. However the subsequent adjustments were all in the right direction.

7 For example, the NEB risk premium at a forecast long Canada yield of 9.25% was 3.00%. At a
8 5.0% forecast yield, the risk premium increases by 1.06% to 4.06%. By happenstance in 1995 the
9 long Canada bond beta was 0.5, this was the peak and for a very short period of time, but if we
10 use simple numbers to illustrate then a 0.50 bond beta and 4.5% market risk premium means that
11 the market risk premium today would be 2.25% higher than it was in 1995. This is simply
12 because the market risk premium is expressed over a risky long Canada bond yield. Conversely
13 with a utility beta of 0.50 this would mean that the utility risk premium would increase by half
14 this or 1.13% very close to the NEB adjustment. These numbers are for illustration only, since I
15 don't believe that required rates of return adjust mechanistically, but fortuitously I judge that the
16 NEB formula basically got it right; its just that the NEB got the risk premium too high in the first
17 place!

18 One final observation is that in 1999 the long Canada yield was 5.68% versus the current yield of
19 4.21% for a 1.47% decline. In contrast, the real return bond has seen its yield drop from 4.06% to
20 1.61% a drop of 2.45%, despite increasing inflation fears. This extra drop in the real yield seems
21 to me to indicate that the assumption of a break at 6.0% has in retrospect been aggressive.

22

23 **Q. WHAT WOULD YOU RECOMMEND?**

24 **A.** I would judge the break in the adjustment mechanism to be closer to 4.0% than 6.0%, so
25 that the risk premium should increase as the long Canada bond yield declines from 6.0% to
26 4.0%. Using the NEB formula I would judge the current BCUC formula to be understating the
27 increase in the utility risk premium by 0.25%, this is 0.25 times the difference between the
28 BCUC break rate of 6.0% and my current forecast long Canada yield forecast of 5.0%. However,

1 I also believe that the formula is awarding too high an ROE and that it is also clear that the
2 adjustment mechanism itself lowers risk.

3

4 **Q. WHY DOES THE ADJUSTMENT MECHANISM LOWER INVESTMENT RISK?**

5 **A.** The adoption of an automatic adjustment mechanism turns the common equity of a
6 regulated utility into a form of floating rate preferred share. Traditional floating rate preferred
7 shares can be described as follows:

8 'Floating rate preferreds offer a hedge against rising interest rates. Their dividend
9 will adjust (according to a formula) to a change in interest rates, subject to any
10 stated maximum or minimum yield. The variable dividend yield is designed to
11 allow the preferred's price to remain relatively stable during a fluctuating rate
12 environment.'

13 This is very similar to what results from the application of an adjustment mechanism to a utility's
14 allowed rate of return.

15 The objective of regulation is to treat investors fairly. This is accomplished by awarding a fair
16 return such that the share price should only increase by the amount of earnings retained within
17 the firm and not paid out as a dividend. If a utility paid out 100% of its earnings as a dividend,
18 the share price should approximate its book value, as long as it continues to be awarded its fair
19 return. In this case, similar to floating rate preferreds, the annual reset of the allowed return
20 allows the price to remain relatively stable during a fluctuating interest rate environment. By
21 making the annual reset a function of long Canada yields, through the adjustment mechanism,
22 utility shares then offer a similar hedge against rising rates, since the utility's ROE will change
23 with the long Canada bond yield.

24 The only substantial difference between utility shares on an ROE adjustment mechanism and
25 floating rate preferred shares is that only part of the utility's ROE is paid out as a dividend and
26 the adjustment, for example using the NEB formula, is to 75% and not 100% of a fixed income
27 yield. These differences between floating rate preferred shares and ROE adjustment mechanism
28 utility shares do not, however, negate the fact that they have much in common. One critical

1 feature is that the dividend income has favourable tax treatment. As George Lewis of RBC-
2 Dominion Securities points out,³⁴

3 “The Canadian tax code, in an effort to mitigate the effects of double taxation,
4 taxes dividends received by individuals and corporations at a lower rate than
5 interest income. Since dividends are paid out of after-tax corporate earnings
6 (whereas interest is a tax deductible expense of companies), corporations receive
7 dividends free of income tax, while individuals’ dividend income is taxed at a
8 lower effective rate (under the dividend tax credit system) than their interest
9 income. This means that a given dividend yield on a common share results in a
10 higher after tax income than the same numerical yield (interest rate) on a fixed
11 income (i.e., bond) instrument.”

12 At the time of his analysis, George Lewis put the pre-tax equivalent yield (PTEY) at 1.37; that is
13 a 10% dividend yield was equivalent to a 13.7% bond yield. He further noted that the prices of
14 Canadian utilities tended to increase as they increased their dividend payout.

15 The tax effect is well known in capital markets. BMO- Nesbitt-Burns produces a Preferred Share
16 Quarterly that tracks the performance of the preferred share market. In the Summer 2004 issue of
17 their Preferred Share Quarterly BMO-Nesbitt Burns provided the following yields:

	<u>June 2004</u>
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

³⁴ Chapter 11 in Joe Kan (editor) *Handbook of Canadian Security Analysis*, John Wiley & Sons Canada, 2001.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29

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 91-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 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 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.

The Nesbitt-Burns data vividly indicates that risk matters in the capital market, but so too do taxes. It also points to the inappropriate comparison of the ROE for a utility with the long term Canada bond yield. The correct comparison with an ROE adjustment mechanism is to a similar floating rate preferred share. In this respect an annual adjustment mechanism would put a utility's ROE in between the quarterly floating rate preferreds and the retractable, generally five year, preferreds, since the reset is annual. This would indicate that the true risk premium is much higher than the 2.75% that I am recommending. This comparison also renders US comparables of doubtful value, since due to these tax implications the EUB utilities are predominantly "Canadian stocks," or as George Lewis of RBC-Dominion Securities, stated:

1 “However, while the impact of institutional and foreign investors can have a
2 significant impact on the trading levels of utility companies, in general a typical
3 utility will have a greater proportion of individual and domestic shareholders than
4 the typical Canadian company.”

5 Hence one of the features of the adjustment mechanism is that it makes the equity return
6 analogous to a form of floating rate preferred share, which lowers investment risk. Also
7 the very fact that a formulaic adjustment is used removes some regulatory risk due to
8 delayed ROE awards as well as the possibility of a punitive award.

9 The combination of an adjustment mechanism over long Canada bond yields without explicit
10 recognition of either the tax preference for preferred shares or the higher interest rate risk of the
11 long Canada bond makes the current formulas attractive to investors and more than fair.

12
13 **Q. IS THERE ANY EVIDENCE THAT THE ADJUSTMENT MECHANISM IS NOT**
14 **GIVING A FAIR ROE?**

15 **A.** Not that I am aware of. In the final analysis "fair" is determined in the equity market by
16 the reaction of investors. It is a basic principle of regulation that equity investors invest money
17 up front and then rely on the Board awarding them a fair ROE. In this case if the equity investor
18 invests one dollar in regulated assets, there is an implicit contract that they will be given the
19 opportunity to earn a fair ROE, such that the dollar that is invested is still worth a dollar, that is,
20 that there is no confiscation of wealth by subsequently awarding a sub-standard ROE. This is the
21 basic meaning behind Mr Justice Lamont's definition of a fair ROE.

22 What this means is that once a dollar has been invested in a regulated utility, the investor has to
23 be given the opportunity to earn what he could earn in the market on other equivalent
24 investments, if he still had the dollar to invest. This process is akin to someone investing in a
25 savings account where a judge has to determine the correct savings rate each period that can be
26 withdrawn from the fund. The important implication is that if the judge (regulator) is successful
27 then the savings will always be worth their original investment. This is the meaning of the basic
28 result in finance that fair means that the market to book ratio equals one. The only thing different
29 about utilities, as compared to the savings example, is that there is some very minor business

1 risk, although as I showed earlier full cost of service pipelines like Foothills have no income risk
2 and exactly earn whatever ROE the NEB allows.

3 In Schedule 29 is a table of earned ROEs, preferred stock yields and market to book ratios for a
4 sample of ROE regulated Telcos up until 1996.³⁵ This sort of data was previously included by
5 Professor Berkowitz and myself in estimates of risk premiums over preferred stock yields filed
6 before this Board in 1994. These risk premiums were then consistent with the above remarks
7 about preferred share yields being the correct tax comparison. Note that for 1970-1983 their
8 market to book ratios were hovering around 1.0 and at times were significantly below 1.0, as the
9 combination of high inflation (Schedule 2) historic test years and regulatory lag exposed these
10 Telcos to significant risk. As interest rates fell (Schedule 3) from the early 1980s highs, the
11 market to book ratios of these utilities increased significantly as allowed ROEs were not cut
12 sufficiently to reflect these market changes. The point is that observing the market to book ratio
13 is a valid way of assessing how investors are reacting to utility allowed ROEs.

14 Schedule 30 is a graph of the market to book ratios for a sample of Canadian utility holding
15 companies (UHCs). The key implication is that, except for PNG, the market to book ratios are all
16 well above 1.0. For PNG it is clear that despite the efforts of the BCUC to reduce PNG's risk, the
17 market is still sceptical of the company's long run prospects. These market to book ratios include
18 to a differing degree the impact of non-regulated operations, but there is a clear indication that
19 none of these companies have suffered a loss of financial flexibility as regulators have moved to
20 the use of adjustment mechanisms.

21 Further there is direct evidence of the value of regulated assets from sales between firms. I will
22 deal with the Kinder Morgan proposed acquisition of Terasen later, but there are other
23 observations.. For example,

- 24 • TCPL purchased the 50% of Foothills that it did not own at a market to book of
25 1.6 based on the common equity. Foothills, of course, accesses the WCSB, earns
26 the NEB formula and has 30% common equity. Moreover since TCPL already

³⁵ Source data is from my paper, The Importance of Market to Book ratios in Regulation, NRRI Quarterly Bulletin, Winter 1997.

1 owned 50% of Foothills the number of potential buyers was limited, which
2 reduced the price.

- 3 • Aquila purchased TransAlta's distribution and retail business at a market to book
4 of 1.5 based on a total rate base of \$472mm (premium of \$238mm);
- 5 • Fortis purchased Aquila's Alberta interests for a premium of \$215mm over a rate
6 base of \$601mm.
- 7 • AltaLink purchased TransAlta's transmission business for a \$200mm premium
8 over a rate base of \$644mm.
- 9 • Hydro Quebec recently announced a \$266mm gain on the sale of its interest in the
10 gas distribution assets in the province.

11

12 Note that in all these cases, the market to book ratio based on the equity is much greater than that
13 based on the total rate business, since the debt is normally assumed and is valued at close to its
14 book value. For example in Fortis' purchases from Aquila it paid \$1.3 billion for total rate base
15 assets of \$943mm (in Alberta and BC) for an overall premium of \$357mm over rate base and an
16 overall market to book of 1.38X. However, it "assumed" the existing debt which was 60% of rate
17 base, so effectively Fortis assumed about \$565.8mm in debt and paid \$734.2mm for the 40%
18 book equity of \$377.2 mm. The market to book ratio based on equity was therefore about 1.96X.
19 The final value depended on closing transactions, but the point is that the market to book based
20 on the common equity was well above the indicated values based on total rate base.

21 Overall I conclude that current adjustment mechanisms are generous and that boards across
22 Canada have failed to lower allowed ROEs as adjustment mechanisms have lowered utility
23 investment risk, just as the use of forward test years and deferral accounts have lowered business
24 risk compared to before 1983, when inflation was a serious problem.

25

26 **Q. IF ROE AWARDS ARE GENEROUS WHY ARE THE BOND RATING**
27 **AGENCIES EXPRESSING CONCERN?**

28 **A.** The bond rating agencies are concerned with accurately predicting the credit quality of a
29 firm's debt. In this task they face an asymmetry; if they get it right they get little credit, but if
30 they make errors and firms default, that they previously rated investment grade, then they get

1 severely criticised. They therefore take a conservative approach and sometimes over react. In this
2 respect the most dramatic re-evaluation has occurred on the part of Standard and Poors (S&P) as
3 it has “harmonised” ratings between the US and Canada as a consequence of its takeover of the
4 Canadian Bond Rating Service (CBRS). In doing this harmonisation S&P has taken a
5 quantitative approach and seemingly simply taken standard ratios from the US and applied them
6 in Canada with little qualitative adjustment for the different institutional environment.

7 On March 5, 2003 S&P indicated that it was putting several Canadian utilities on credit watch
8 and was re-evaluating their ratings, primarily as it re-evaluated the nature of Canadian regulatory
9 protection. Subsequently several of them were downgraded including Terasen Inc.

10

11 **Q. HAVE THESE DOWNGRADES AND REVIEWS HAD AN IMPACT ON**
12 **BORROWING COSTS?**

13 A Not as far as I can determine. Schedule 31 tracks spreads of major utility issues form data
14 provided by RBC-DS against the equivalent maturity long Canada bond. The absolute level of
15 the spread is not significant, since the spread is affected by the bond’s maturity, what is
16 important is the trend since the end of 2002 and from March 2003 around the time of the S&P
17 announcement. The average spread is in the final row. The average spread was 91 basis points at
18 December 1999, increased to 138 and 129 basis points by December 2000 and December 2001;
19 it then increased again to 152 basis points at the end of 2002. Since December 2002 it decreased
20 throughout 2003 to finish at 95 basis points in December and since then it has been marginally
21 above 90 basis points. Overall utility spreads were slightly higher in December 2001 than they
22 are today, since the trend in profits and economic conditions is now generally up rather than
23 down. As a result, the current business environment results in marginally lower credit risk.

24 If we look at the individual issues, the three A rated issuer spreads at the end of December 2001
25 were 90-130 basis points, at the time of the S&P review (about March 2003) they were 80-123
26 basis points whereas at the end of this period they were 50-108 basis points. For the A- issuers
27 the spreads were 80-150, 70-201 and then 49-119. For the BBB+ issuers the spreads were 80-
28 191; 105-205 and 60-135, while for the BBB issuers they were 88-235; 150-250, and 70-141.

1 Overall it is clear that spreads have tightened since the announcement of the S&P review.
2 Overall, it seems that the S&P announcement and review (and downgrades) has had a negligible
3 impact on these issuers.

4 From this spread data there is no indication that S&P's decision to impose harsher credit
5 standards on Canadian utility holding companies has had any impact on either their borrowing
6 costs or presumably the marketability of future debt issues. Spreads for issues rated A- and
7 below, the ones that presumably would have been affected the most by S&P's announcement,
8 have almost all declined since the end of 2002 and the time of S&P's announcement.³⁶ The fact
9 that the market has shrugged off S&P's new harsher credit standards should not be surprising
10 given that they received a negative reaction when they were announced and have lead Terasen to
11 cancel its engagement with S&P.

12 This data from RBC-DS is consistent with more recent data provided by BMO-Nesbitt Burns in
13 a research report (August 3, 2005) on the Kinder Morgan proposed takeover of Terasen Inc.
14 They produced the graphs that I reproduce in Schedules 32 and 33. The graph in Schedule 32
15 indicates that Terasen Gas Inc's debt trades on similar spreads to that of Enbridge Gas
16 Distribution (EGDI) and Union Gas. The spread on EGDI is generally slightly lower particularly
17 when spreads widened two years ago, but there is no indication that Terasen can not access the
18 debt markets with its lower ROE and higher debt ratio than the two Ontario LDCs. Further in
19 the graph in Schedule 33 Terasen is compared to other BBB rated S&P companies. Here two
20 points are important, first BMO compares the debt costs at 5 year, instead of 10, this is because
21 lower rated companies generally can not access longer term markets. However, Terasen recently
22 issued 30 year MTNs which indicates that it is not a "true" BBB rated company. Second, it is
23 clear that the Terasen debt trades on much lower yields than the other S&P BBB rated credits.
24 Both these pieces of information indicate that the S&P BBB rating for Terasen is out of line with
25 what the market feels is the correct rating and it is the market that buys Terasen debt not S&P.

³⁶ Note that since July 2001 S&P has downgraded CU Inc, Newfoundland Power, Westcoast, Fortis BC Gas (Teresen), Epcor Utilities Enbridge Consumers Gas, and Union Gas.

1 The fact is that S&P is known to be a harsher judge of credit quality than either DBRS or
2 Moodys. For example, in a February 1998 report, Credit Ratings in Canada, DBRS indicated that
3 its ratings for the same companies were 0.23 categories, that is, a “high” or “low” qualifier,
4 higher than Moodys and 0.55 higher than S&P. This would indicate that approximately in four
5 ratings three would be the same between Moodys and DBRS with one Moodys a category lower,
6 whereas for S&P two would be the same and two a category lower. However, in comparing S&P
7 and DBRS ratings in the companies in Schedule 31 the S&P ratings are a total of nineteen
8 “notches” below those of DBRS, so that S&P rates these utilities on average at least a notch
9 below DBRS, where a notch is a modifier such as a high or low or plus or minus.

10 For two companies Union Gas and Terasan Gas Utility (BC Gas) the differences are marked and
11 S&P rates them *three* notches lower than DBRS. In both cases DBRS rates them as A, whereas
12 S&P rates them BBB. In March 2004 Terasan announced the discontinuance of its engagement
13 with S&P, stating that there is no benefit to an S&P rating, since it does not agree with S&P’s
14 credit assessment and does not plan to issue US dollar debt. The fact that S&P could come up
15 with ratings so profoundly different from DBRS indicates that something has “spooked” S&P,
16 that has not “spooked” the Canadian rating company or the Canadian market.

17

18 **Q. WHY DO YOU THINK S&P HAS TAKEN SUCH A HARD LINE WITH**
19 **CANADIAN UTILITY HOLDING COMPANIES?**

20 **A.** DBRS provided six reasons for their higher average ratings than the US agencies:

- 21 • less penalty for size
- 22 • better knowledge of Canadian companies
- 23 • treatment of sovereign rating principle
- 24 • technical factors in the treatment of holding companies
- 25 • specific industry biases
- 26 • unsolicited ratings not generally done by DBRS

27

1 Only some of these six factors are relevant for utilities. For example, it is known that the US
2 agencies now have a policy of rating all public market debt and on average assign marginally
3 lower ratings for unsolicited ratings, compared to when one that is solicited and paid for.
4 Similarly, the industry bias has traditionally focused on oil and gas companies not utilities, while
5 the sovereign treatment refers to rating government debt. What is left is: size, Canadian
6 knowledge and the holding company problems.

7 S&P has specific rules on how to rate the parent of a holding company that issues debt versus a
8 subsidiary and to illustrate I will refer to some examples from S&P's Corporate Ratings Criteria
9 handbook with respect to telecom companies that have motivated this policy.

- 10 • Frontier Telephone was rated AA- and was purchased by Global Crossing and the
11 rating subsequently lowered to BB+. The New York Public Service Commission
12 did not prevent the acquisition.
- 13 • Cincinnati Bell was rated AA- when its parent acquired IXC Communications,
14 which had a B- rating, and subsequently Cincinnati Bell's rating was dropped to
15 BBB-. The Public Utilities Commission of Ohio did not create any roadblocks or
16 impose any penalties on Cincinnati Bell.
- 17 • Qwest acquired US West Communications, which was rated A+ and S&P warned
18 its rating would be cut to BBB- but regulatory concern was on service quality not
19 protection of bond holders.

20 Each of the three prior examples were taken from the “go go” era of the late 1990s when telecom
21 was in a state of flux and the internet revolution was going to transform telecom. Hence, these
22 were deals involving local telecom providers with stellar bond ratings and riskier internet and
23 broadband providers. In each case, the local public utilities commission evaluated the acquisition
24 and reflected on service questions but did not step in to protect the bond holders from significant
25 credit downgrades. The downgrades were the direct result of a change in the riskiness of the
26 holding companies which “infected” the subsidiary, since the parent had control of the sub and
27 could over-leverage it or dividend cash out to support parent company debt. In response, S&P
28 now has a policy that the credit rating of a regulated telecom can not be higher than the credit
29 rating of its parent.

30 For non-telecom utilities S&P

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

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

- 8 • separate incorporation of the sub
- 9 • independent directors
- 10 • minority ownership stakes
- 11 • regulatory oversight to insulate the subsidiary

12
13 S&P is very forthright in that the onus lies on the regulators. It states

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

18 My reading of these remarks is that having been “burned” with these US telecoms and the lack
19 of reaction from US public service commission S&P is now taking a tougher line on all utilities;
20 an approach that they are bringing into Canada.

21 Finally FERC has been less forthcoming than some expected in reining in the utilities. After
22 Enron siphoned off \$1.5billion from its two natural gas pipelines, the FERC instituted a review
23 of inter-affiliate transfers. Many expected FERC to impose minimum equity ratios of 30% and
24 requirements such as maintaining an investment grade bond rating before the parent could
25 manage the subsidiary’s cash. However, when the FERC announcement was made in November
26 2003 it fell far short of S&P’s expectations. As S&P noted

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

1 It is clear from this comment from S&P that it is their disenchantment with events in the US that
2 has triggered their review of regulatory protection in Canada. Further they are not the only ones.

3 In a recent article in Public Utilities Fortnightly (August 2004) two members of the New Jersey
4 Board of Public utilities state

5 “ring fencing holds out the prospect for insulating regulated utilities from the traditional
6 failed diversification investments of the parent holding company..... Successful ring
7 fencing is even more critical considering that state regulators are facing challenges
8 created by failures of corporate governance, accounting scandals, and in some cases
9 alleged criminal conduct in energy markets. Ring fencing may be the only regulatory
10 device capable of levelling the playing field and forcing the holding companies to absorb
11 the consequences of failed non-utility investments.”

12 With FERC failing to implement ring fencing and these types of concerns being raised in the US
13 it is hardly surprising that S&P has adopted a negative tone towards both US and Canadian
14 utilities.

15

16 **Q. IS THE US EXPERIENCE RELEVANT FOR CANADA?**

17 **A.** To some extent yes. Although we have not had the problems that they have had in the US
18 that does not mean that we can't have them. Further, with Kinder-Morgan's (KMI) takeover of
19 Terasen there could be the same problems that have bedevilled Enron and other US UHCs,
20 where when the parent ran into problems they looked to the regulated subsidiary to strip it of
21 cash.

22 The fact is that Kinder-Morgan is paying a huge premium to buy Terasen. CIBC World Markets
23 (August 19, 2005) estimates that KMI is paying 11.8X forecast 2006 EBITDA (earnings before
24 interest, tax, depreciation and amortisations) when it estimates that other Canadian utilities are
25 selling at an average of 8.8X 2006 forecast 2006 EBITDA. Another way of looking at this is that
26 CIBC estimates that KMI is paying 2.7X Terasen's book value, whereas other UHCs are selling
27 at 2.1X a number that is skewed high by Enbridge's historically high price to book. There are
28 several issues involved with this huge takeover premium, but the obvious one is that it is difficult
29 to argue that Terasen has problems attracting capital or that its financial parameters are somehow

1 unfair when someone clearly values it so highly. From basic finance theory an ROE regulated
2 firm's price to book should be marginally above 1.0, anything consistently in excess of that
3 indicates that the financial parameters are too generous. Clearly a price to book of 2.7X indicates
4 that either Terasen's financial parameters are way too generous or that KMI has found a new
5 way to wring cash out of Terasen. Further these comments apply to Terasen Gas Inc as well as
6 the parent company, since KMI specifically said that it likes the gas LDC business.

7

8 **Q. HOW CAN KMI WRING OUT MORE VALUE?**

9 **A.** One key insight is the way that the deal is being financed. KMI is buying Terasen Inc
10 through the assumption of Terasen debt, with the \$3,790 million equity cost being financed by
11 cash and an additional \$2,000 million in debt. What this means in simple terms is that KMI is
12 using double leverage, that is, it is correctly estimating that the low risk Terasen assets can
13 support more debt. Further it plans to either use Terasen Inc or a new Canadian subsidiary to
14 borrow the \$2,000 million in permanent financing for the acquisition. Specific details are vague,
15 but the CIBC report includes some remarkable claims, which if true question the validity of
16 normal ROE regulation.

17 Specifically, the CIBC (August 19, 2005) report claims that KMI plans a "double dip" financing
18 structure³⁷ and that one of the advantages of the deal is that the after tax cost of debt is about
19 2.0%. Further CIBC then provides a table where Terasen's income tax is reduced by an
20 additional \$46 million as a result of KMI's \$131 million interest costs. This raises two issues:

- 21
- 22 • CIBC (and KMI?) are assuming that Terasen's income tax can be reduced without
any reduction in the revenue requirement.
 - 23 • CIBC (and KMI?) are assuming that interest charges can be allocated without any
24 reduction in the equity component. That is if Terasen's regulated operations are to
25 be charged with additional debt costs then it has to result from a substitution of
26 debt for equity and yet the revenue requirement is not being reduced by the
27 reduction in equity earnings.

³⁷ Double dip normally refers to a situation where two interest deductions are made, one in the US and one in Canada.

1 The CIBC report is troubling since it conflicts with standard regulatory practise. If the \$2,000
2 million in acquisition financing is to be pushed down to the operating companies, then the
3 revenue requirement should be altered, given the recognition that Terasen Gas Inc, for example,
4 can carry more debt. If on the other hand the debt will be at the parent level in a Terasen Inc
5 equivalent company, then there are also serious implications since the question is then raised as
6 to where the interest deductions will come from, since the primary source of cash at the parent
7 level is operating company dividends which are passed through tax free.

8 The fact that there will be an additional \$2,000 million of debt at the parent level that will need
9 financing from the operating company raises serious concerns about the management of the cash
10 flow at Terasen Gas Inc as well as the other regulated operations. This concern has been raised
11 by others. BMO-Nesbitt-Burns states (August 3, 2005)

12 “DBRS believes that ownership by a lower rated entity, KMI, could expose Terasen to
13 increased dividend payments to support KMI’s higher debt load..... Terasen Gas’
14 ratings are being reviewed due to lack of ringfencing or other restrictions that could limit
15 its ability to make dividend payments to Terasen Inc.. Moody’s rates Terasen Inc. one
16 notch below that senior unsecured rating of Terasen Gas at A2. The one notch differential
17 reflects the structural subordination of Terasen’s debt to operating subsidiary debt at
18 Terasen Gas, Terasen Gas Vancouver Island, Corridor, Trans Mountain and Express.”

19
20 Clearly BMO-Nesbitt Burns has the same concerns that should an Enron type problem hit KMI
21 that it will simply dividend money out from Terasen Gas to support the parent. If the fear of this
22 type of problem becomes endemic, then Terasen Gas Inc’s bond ratings and debt costs will suffer
23 simply due to its highly leveraged parent. Customers will then have to assess whether they
24 should be forced to pay higher interest costs on new debt simply due to the highly leverage
25 ownership structure of Terasen Gas’s parent.

26 Given the highly leveraged nature of the KMI takeover transaction, I would suggest the
27 following:

- 28
29 • Terasen’s financial parameters remain as is. There is no demonstrated need to
30 increase Terasens’ ROE or common equity ratio when it has been bought at such
31 a high market to book ratio;

- 1 • Further to the above, there is no need to *increase* Terasen Gas’s financial
2 parameters to help pay for the KMI takeover of Terasen Inc; quite the opposite
3 the takeover indicates that these parameters are too generous
- 4 • That Terasen Gas be “ring fenced” to prevent it being raided to support the
5 parent’s debt load and to ensure that the interest cost on Terasen Gas debt
6 included in the revenue requirement is fair and reasonable.
- 7 • This ring fencing should include at least the following:
 - 8 ○ Restrictions on dividend payments to a maximum of 70% of Terasen Gas’s
9 earnings;
 - 10 ○ Prohibition on intercorporate loans and tax sharing agreements;
 - 11 ○ Restrictions on the management of Terasen Gas’s cash, such that Terasen Gas
12 maintains separate cash management services with a separate Treasurer and
13 CEO signing off on Terasen Gas Inc’s financial statements,

14

15 I would then recommend that the Commission establish a policy of automatically reviewing the
16 financial policies of any of the companies it regulates if they are put on credit watch with
17 negative implications that might lead to non-investment grade bond ratings. In essence it should
18 not wait two years, similar to FERC, and then not take measures to protect the bond holders,
19 since the utility and the customers will inevitably suffer.

20

21 **Q. DOES TERASEN HAVE FINANCIAL FLEXIBILITY WITH YOUR**
22 **RECOMMENDATIONS?**

23 **A.** Yes. On February 25, 2005 Terasen Gas raised \$150 million in 30 year MTNs at a
24 coupon of 5.90% at close to par (99.457) so this was effectively the cost of the debt. At the time
25 the yield on 30 year long Canada bonds was about 4.70% so the spread was approximately
26 1.20%. With a 5.0% forecast long Canada yield this means an over all cost of capital of 5.30% at
27 a 35% corporate tax rate with 33% common equity. This is estimated as follows:

	Pre-Tax	After-Tax	Weighting	Share
28 Senior debt	6.20%	4.03%	67%	2.70%
29 Common equity	11.85%	7.75%	33%	2.56%

1 The pre-tax cost of debt is the 5.0% forecast long Canada yield plus the 120 basis point spread
 2 and the equity cost is my recommended 7.75%. The pre-tax cost of capital is the EBIT cost of
 3 8.10% ($5.26/(1-\text{Tax rate of } 35\%)$). The interest coverage ratio is then simply the EBIT divided by
 4 the interest or $8.10/4.15$, which is 1.95X. This understates the true interest coverage since it
 5 ignores the fact that Terasen finances partly with cheaper short term debt, but it is very close to
 6 the interest coverage ratio of 2.0X that Terasen has been targetting in presentations to interested
 7 parties.

8

9 **Q. WHY HAVE YOU USED A CURRENT DEBT COST?**

10 **A.** These are reference number and reflect the interest cost that is consistent with my ROE
 11 recommendations. It makes no sense to target a particular interest coverage ratio and allow a
 12 higher ROE simply because a utility has a high embedded cost of debt. For example, suppose a
 13 utility has a current embedded cost of debt of 10.0%. In this case with my recommended ROE its
 14 cost of capital would be calculated as follows:

	Pre-Tax	After-Tax	Weighting	Share
16 Senior debt	10.0%	6.00%	67%	4.02
17 Common equity	11.85%	7.75%	33%	2.56%

18 Where all that has changed is the debt cost. However, the pre tax cost of capital is now 10.12%
 19 and the interest coverage 1.51X ($10.12 / 6.7$), down from the 1.95X with the current cost of debt.
 20 Clearly, with the ROE set on the basis of lower interest rates, firms with higher embedded debt
 21 costs will see their coverage ratios squeezed.

22 With a lower interest coverage ratio it is possible that a utility could be downgraded, particularly
 23 by a rating agency that simply “runs the numbers.” In this case, it is possible that the utility
 24 would ask for a higher ROE to target say the 1.95.X coverage that it would have with a current
 25 cost of debt. This would obviously mean a higher ROE. However, awarding a higher ROE makes
 26 no sense, since the pre tax cost of capital will then increase even more. In effect, the rate payer is
 27 then being asked to pay twice for the higher embedded cost of debt: once and directly through
 28 the higher embedded interest cost and again, indirectly, through the higher ROE required to

1 maintain the interest coverage ratio. Obviously, it is in the interests of the company to ask for a
2 higher ROE to compensate for the higher embedded cost of debt, but this is rewarding the equity
3 holder with a higher ROE simply because interest rates have dropped.

4 The correct answer to these types of market access problems is the use of preferred shares. If a
5 regulated utility has a high embedded cost of debt then it can target the use of retractable
6 preferreds to boost its interest coverage ratio until the high embedded cost debt can be
7 refinanced. The rate payer will still pay the high embedded cost of debt, but is no longer also
8 paying for an inflated ROE. Any problems unique to individual firms can be solved by the use of
9 preferred shares, instead of debt, in any incremental financing, rather than a costly increase in
10 either the ROE or the common equity ratio.

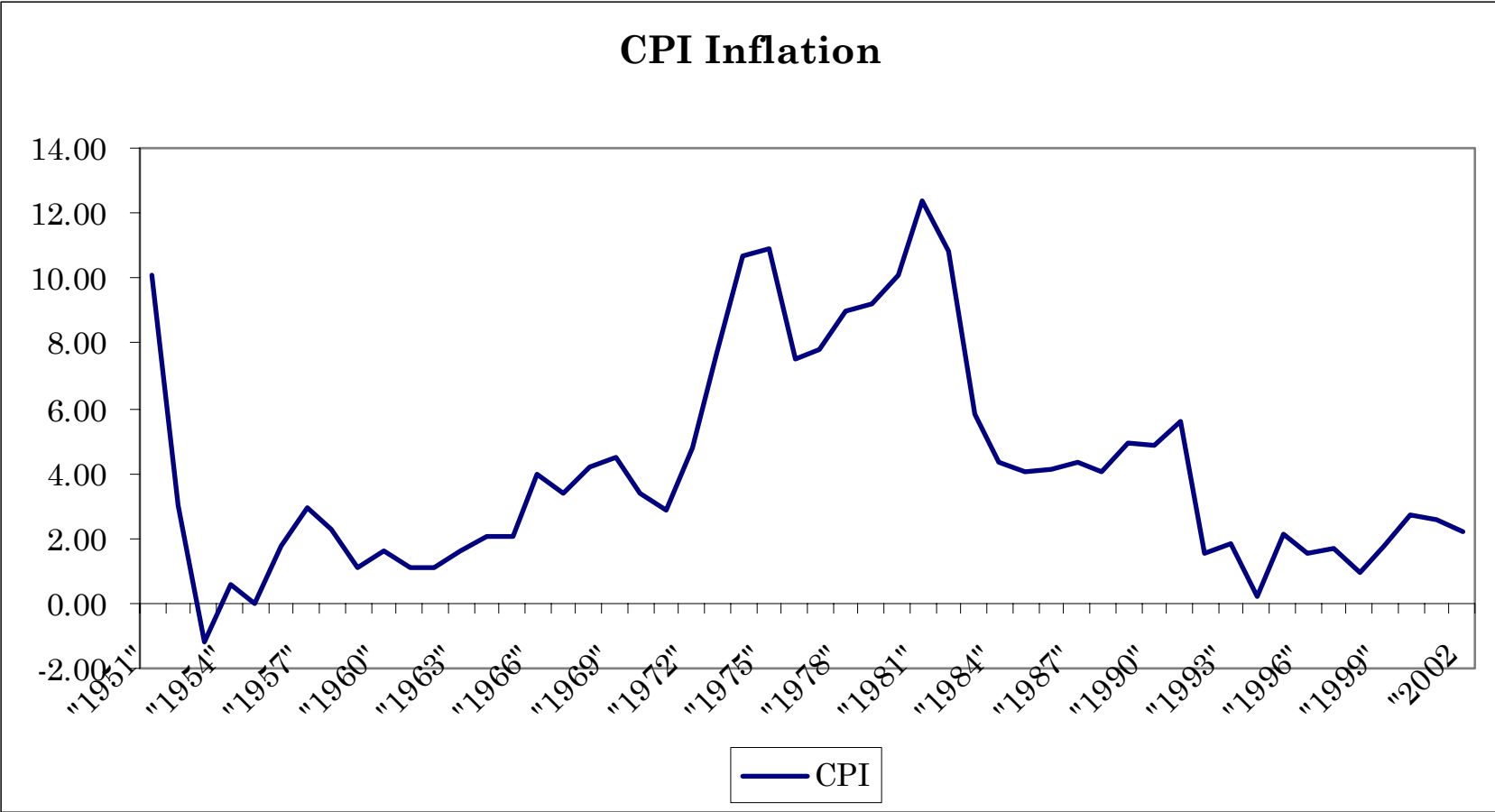
11

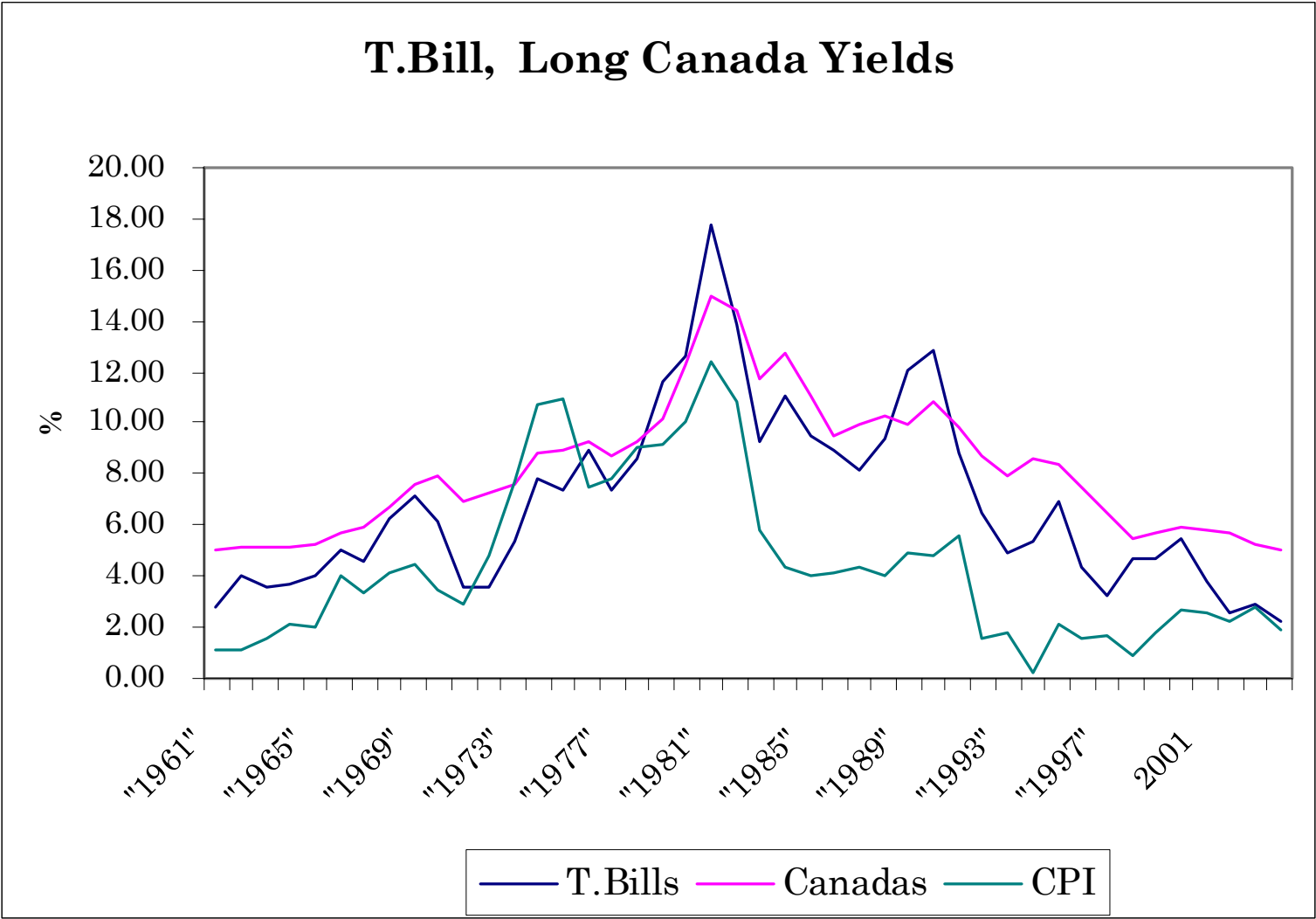
12 **Q. DOES THIS CONCLUDE YOUR TESTIMONY?**

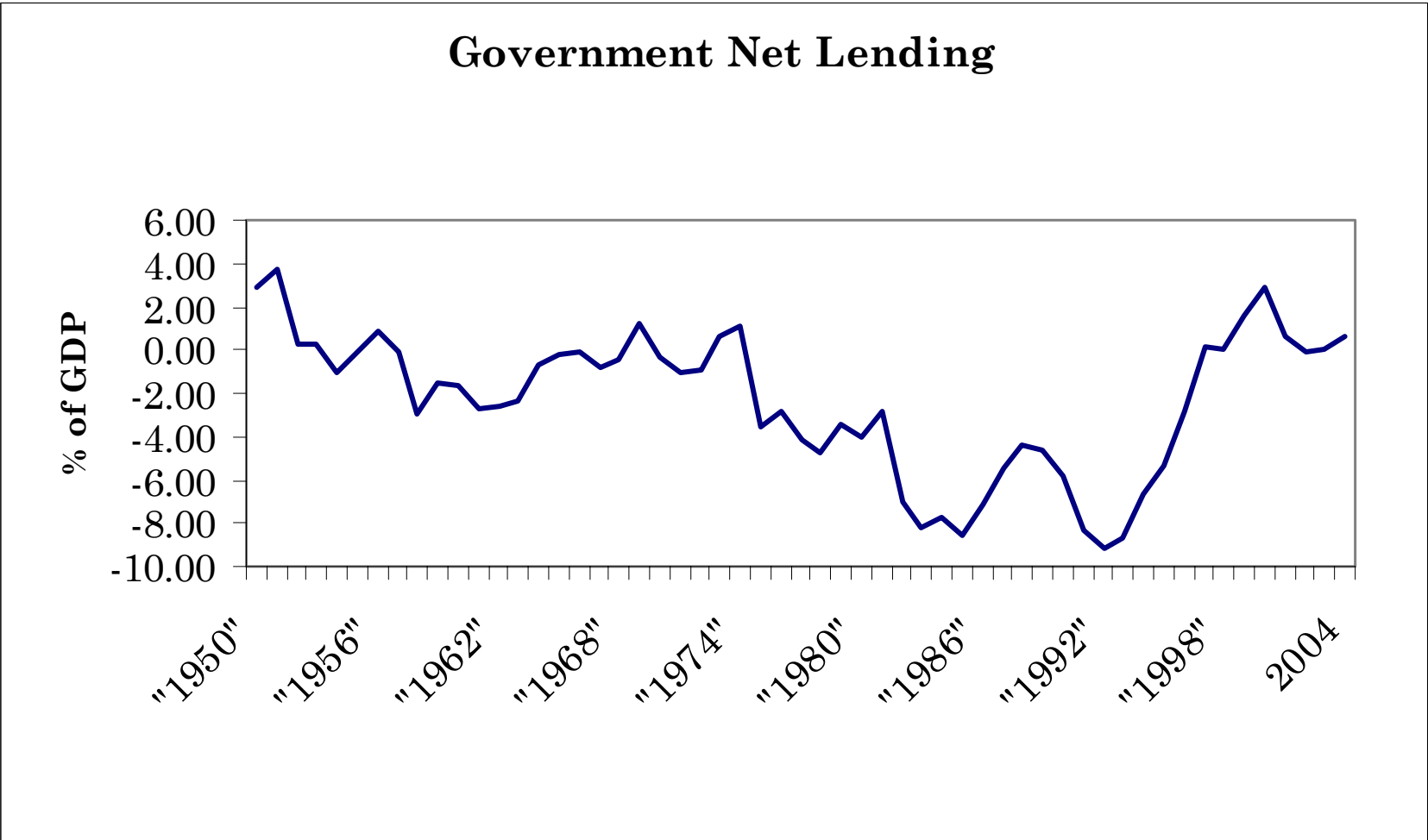
13 **A.** Yes.

MACROECONOMIC DATA

	<u>GDP GROWTH</u>	<u>UNEMP RATE</u>	<u>T BILL YIELD</u>	<u>LONG CANADAS</u>	<u>EXCHANGE RATE</u>	<u>PROFITS %GDP</u>	<u>AVG ROE</u>
1983	2.72	11.9	9.32	11.77	.811	8.93	9.34
1984	5.81	11.3	11.10	12.75	.772	10.16	10.53
1985	4.78	10.5	9.46	11.11	.733	10.24	10.47
1986	2.42	9.6	8.99	9.54	.720	8.82	9.49
1987	4.25	8.9	8.17	9.93	.754	10.36	11.19
1988	4.97	7.8	9.42	10.23	.812	10.58	12.71
1989	2.62	7.5	12.02	9.92	.845	9.07	10.88
1990	0.19	8.1	12.81	10.85	.857	6.61	5.68
1991	-2.09	10.4	8.83	9.81	.873	4.80	2.00
1992	0.87	11.3	6.51	8.77	.828	4.66	0.18
1993	2.34	11.2	4.93	7.85	.775	5.65	3.64
1994	4.80	10.4	5.42	8.58	.732	8.49	7.20
1995	2.81	9.5	6.98	8.36	.729	9.41	8.04
1996	1.62	9.7	4.31	7.54	.733	9.60	8.09
1997	4.22	9.1	3.21	6.47	.722	9.96	9.11
1998	4.10	8.3	4.74	5.45	.674	9.41	9.30
1999	5.53	7.6	4.70	5.68	.673	11.27	10.7
2000	5.23	6.8	5.48	5.92	.673	12.63	11.7
2001	1.78	7.4	3.85	5.79	.646	11.47	8.9
2002	3.09	7.7	2.56	5.67	.637	11.77	6.8
2003	2.02	7.6	2.87	5.29	.714	12.14	11.4
2004	2.93	7.2	2.27	5.08	.768	13.58	N/A



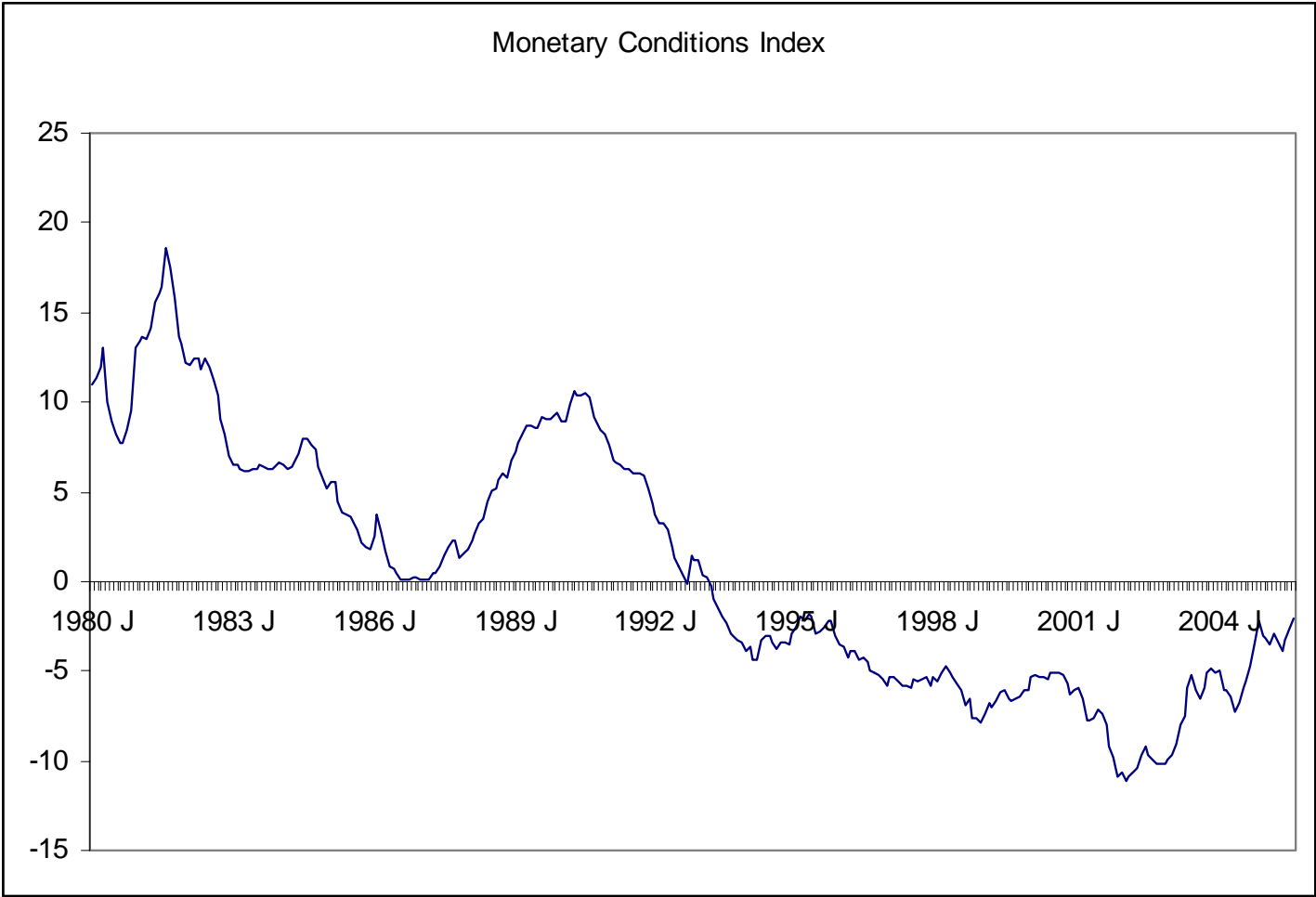


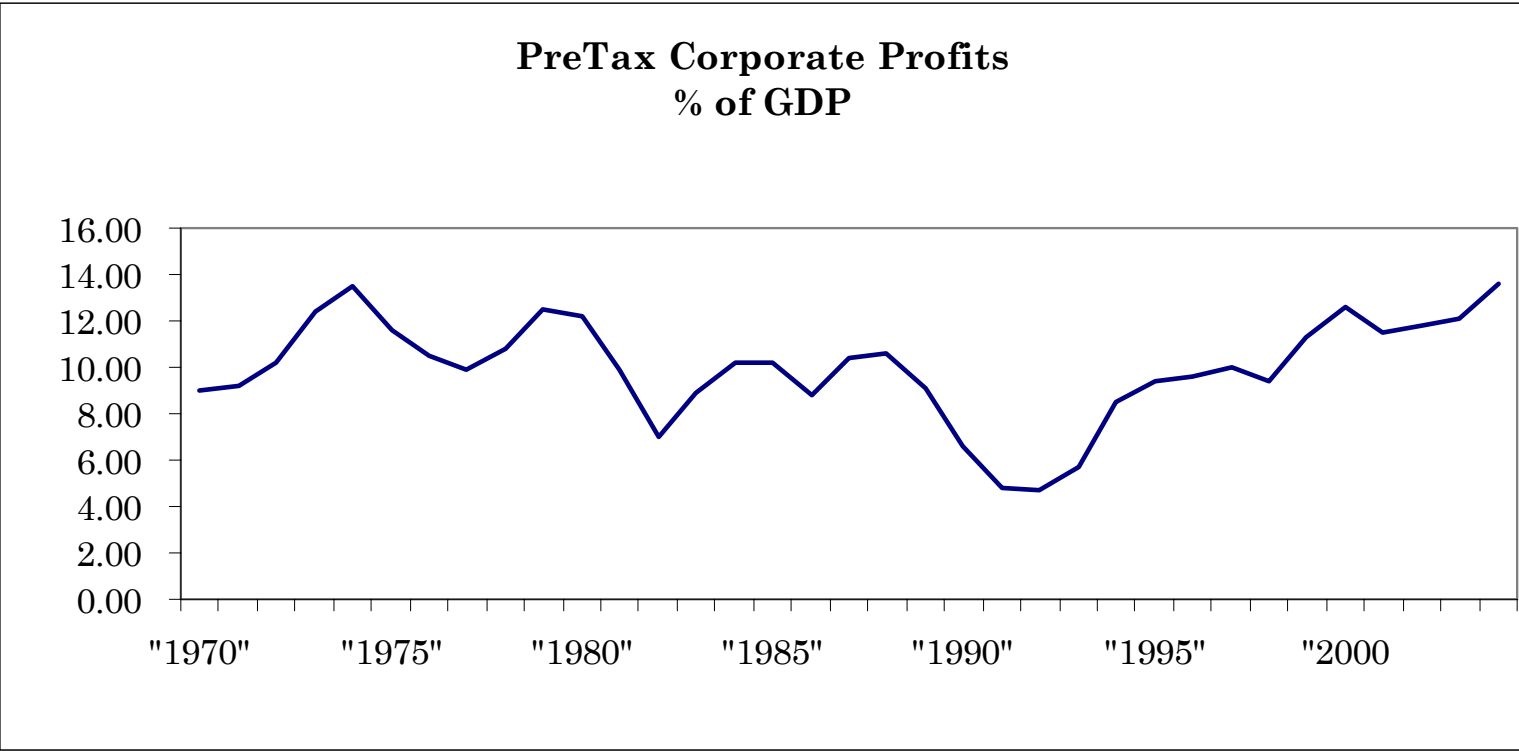


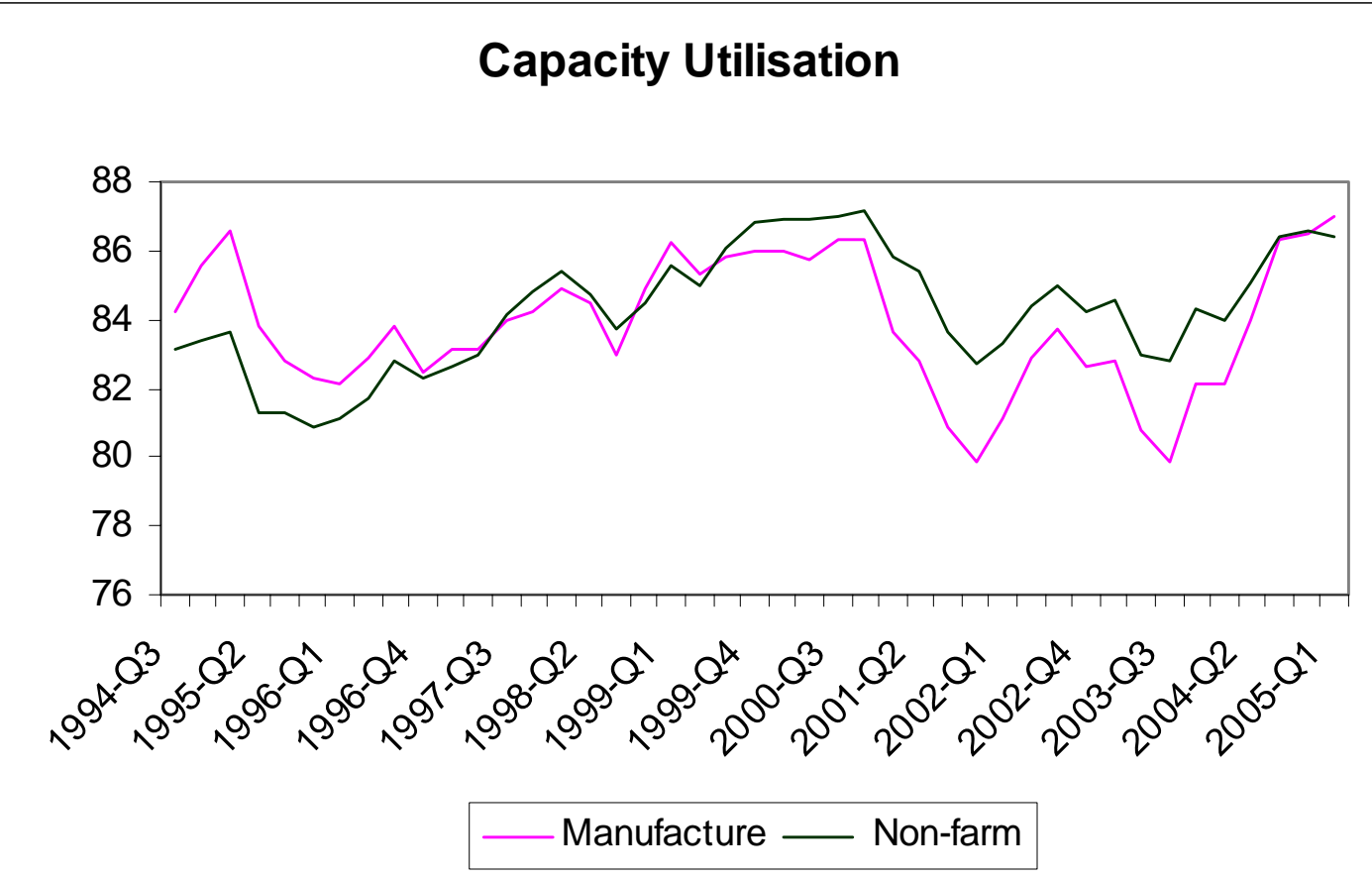
CANADA BOND YIELDS

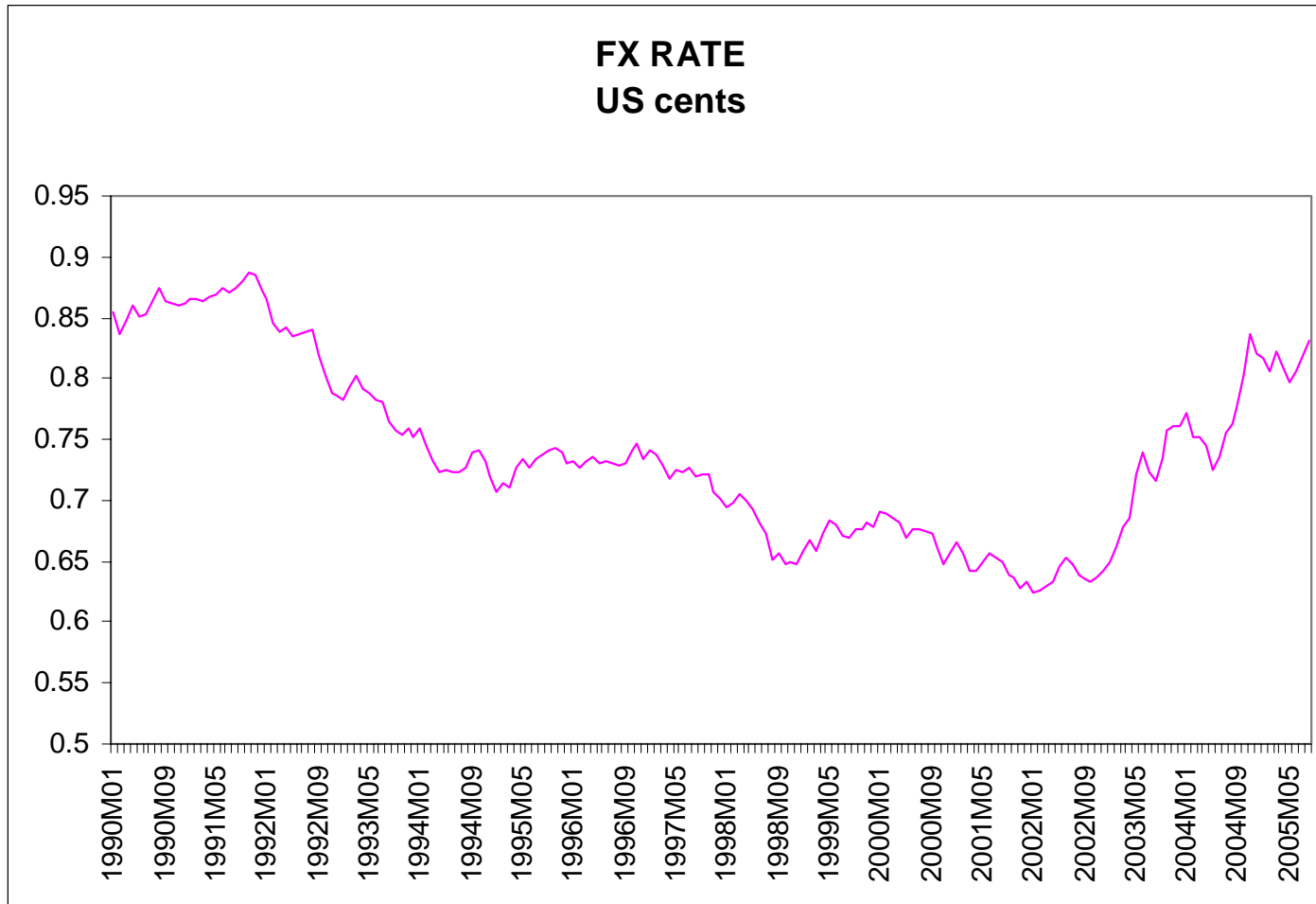
Overnight money market rates		2.99
Benchmark bonds		
Canada	91 day Treasury Bill yield	2.81
Canada	Six month Treasury Bills	2.94
Canada	One year Treasury Bills	3.09
Canada	Two year	3.19
Canada	Three year	3.27
Canada	Five year	3.50
Canada	Seven year	3.69
Canada	Ten year	3.90
Canada	Long term (30 year)	4.21
Canada	Real return bonds	1.67
Marketable Bond Average yields		
Canada	1-3 year	3.16
Canada	3-5 year	3.43
Canada	5-10	3.74
Canada	Over tens	4.20
Other		
US	Five year Treasuries	3.04
US	Long term (30 year)	4.12

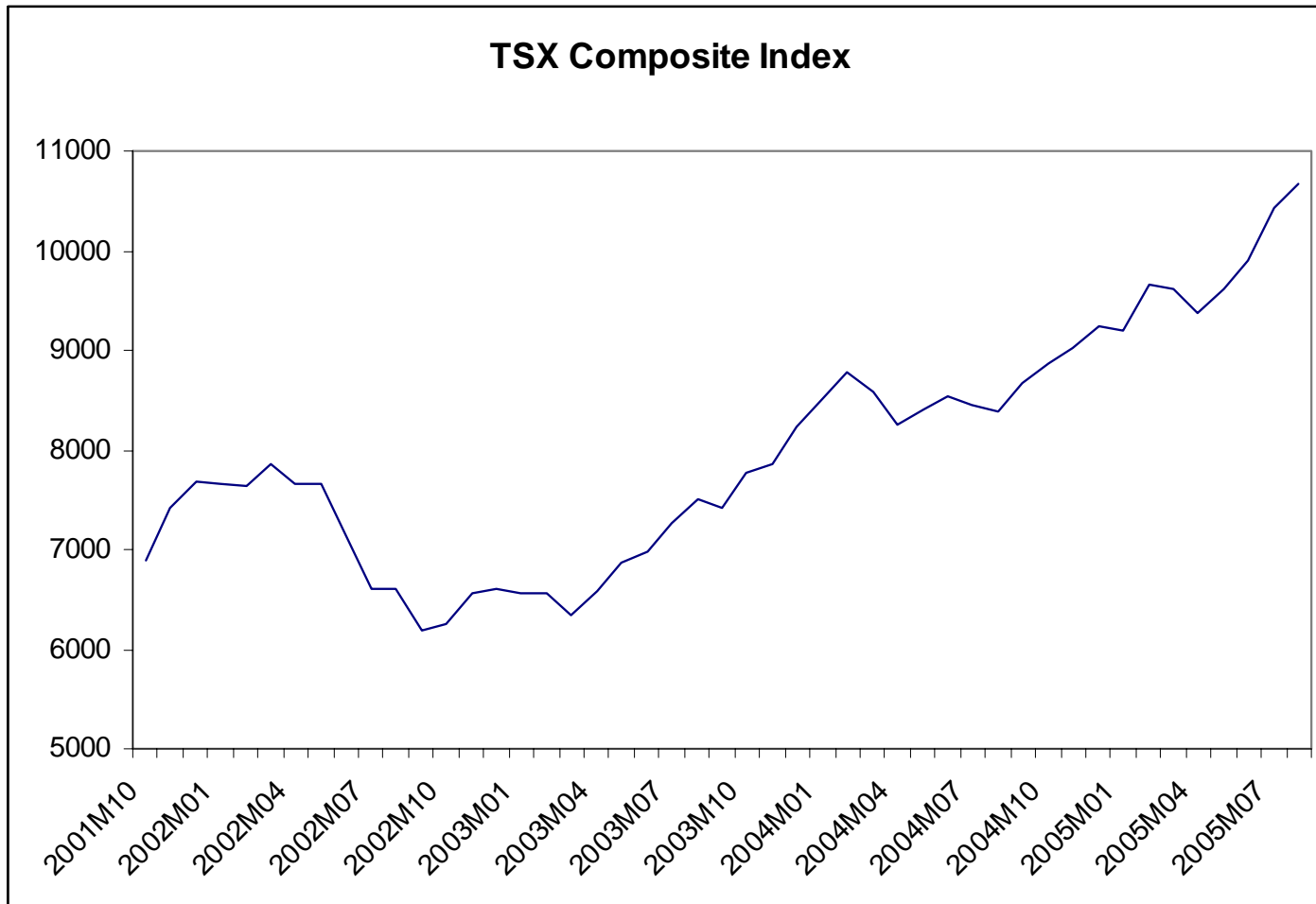
Source: Bank of Canada's web site at <http://bankofcanada.ca/en/securities.htm>, for September 20, 2005.

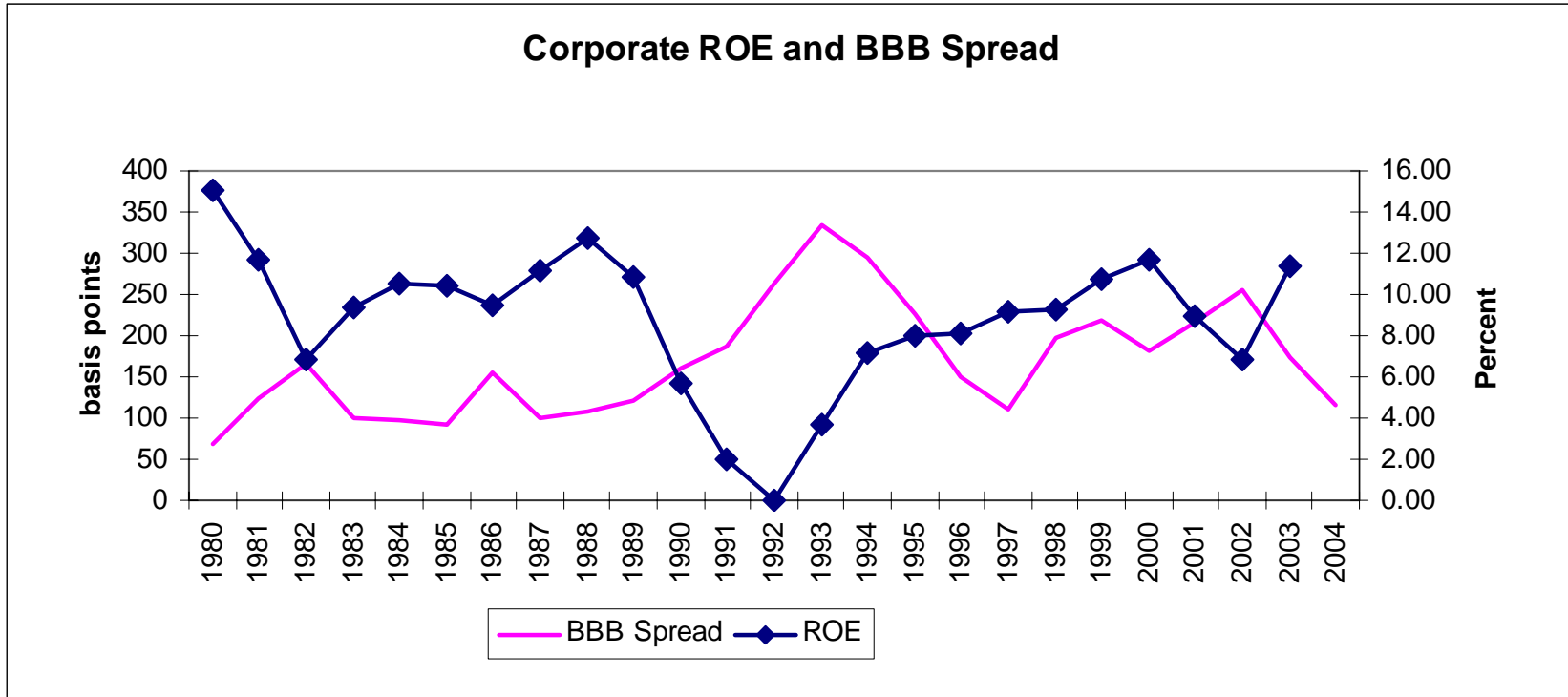


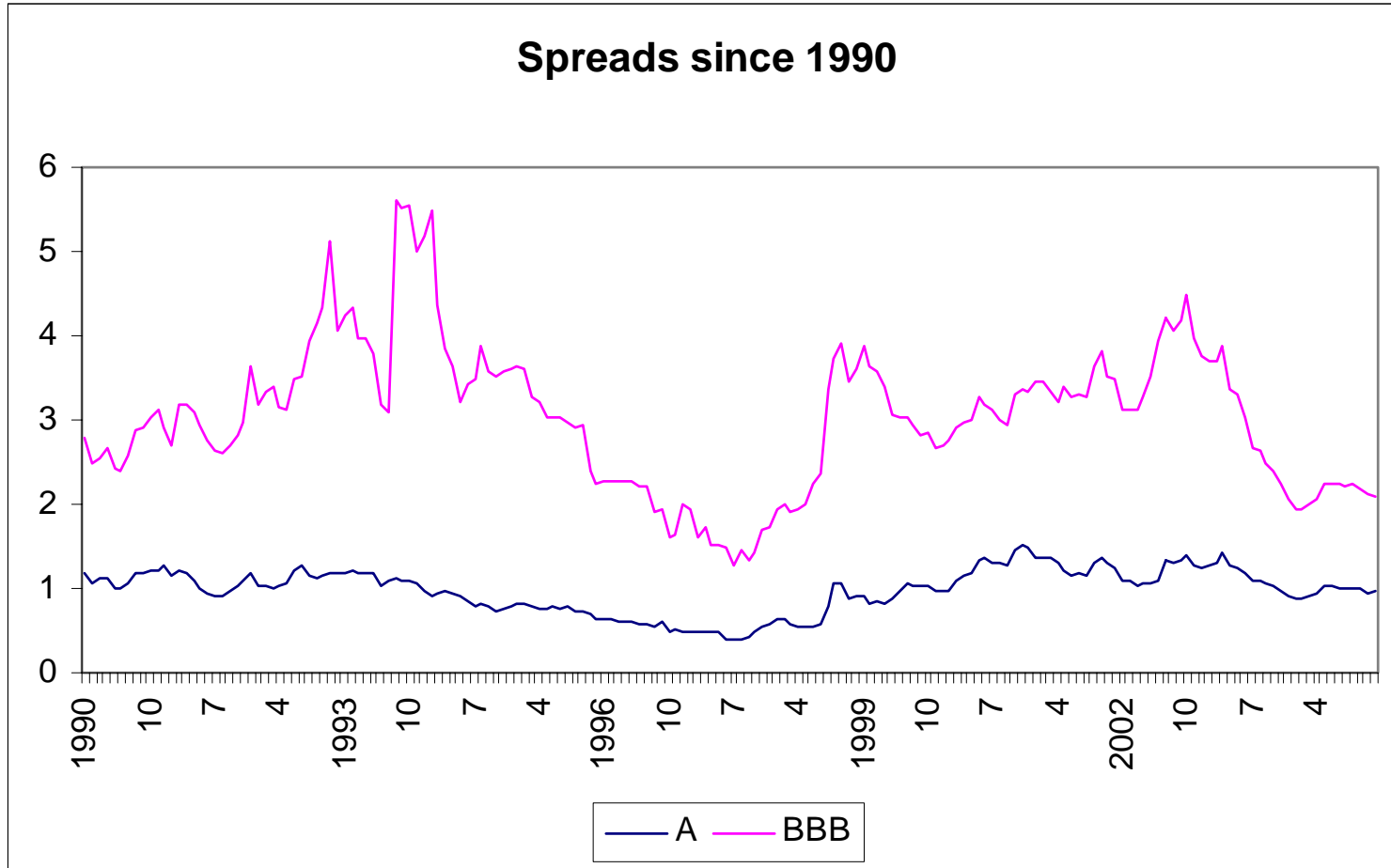








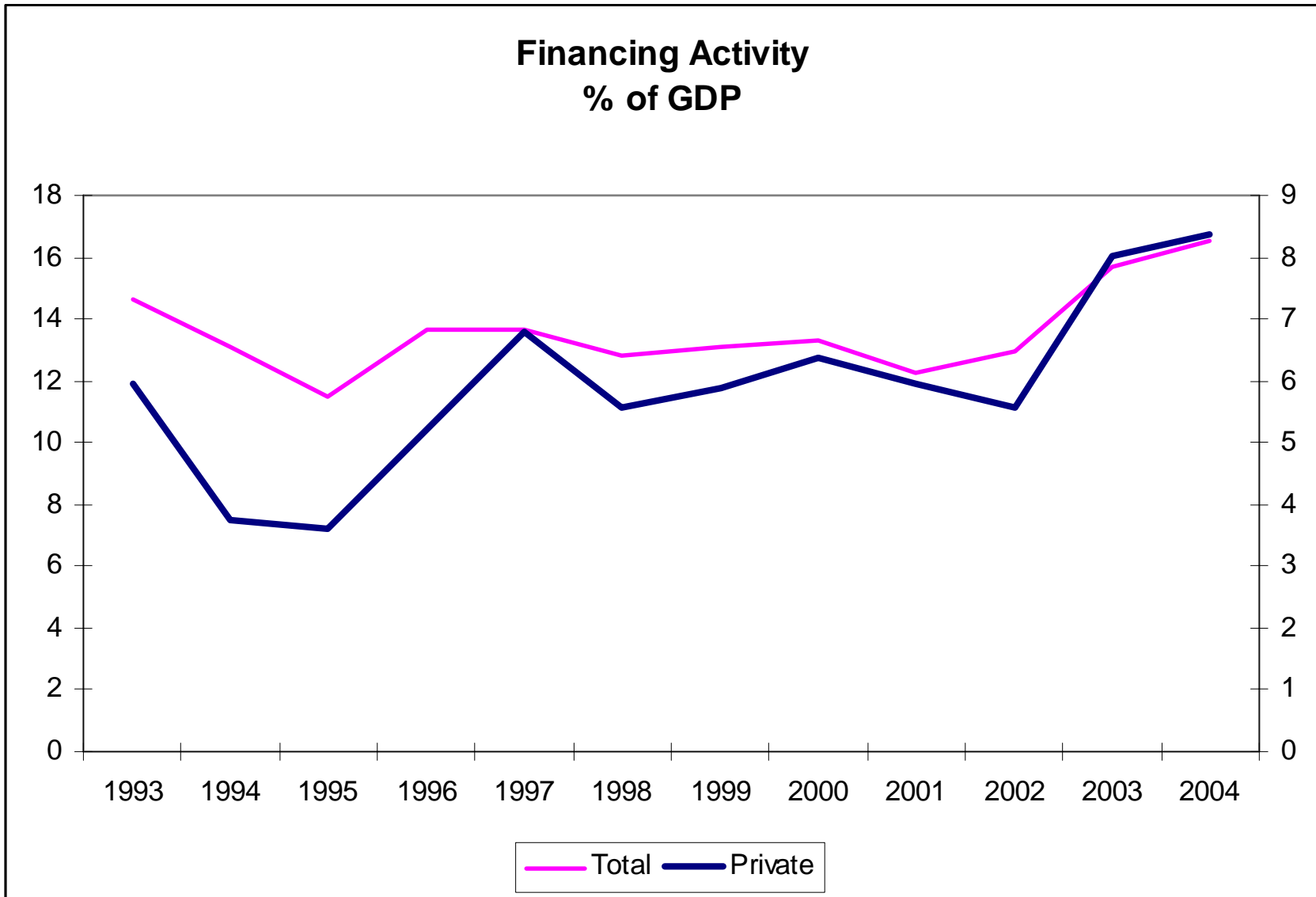




Financing Activity in Canada

\$Millions	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Government	63375.13	72085.88	64184.47	70518.54	60686.37	66361.22	70789.63	74499.6	69801.1	85379.58	93050.56	105322.1
Common equities	27156.37	17693.14	16748.78	21151.89	25617.56	18267.19	17737.76	20805.32	12117.85	14863.99	18765.65	25941.18
Preferred equities	2622.3	1388.06	1374.7	3216.84	3325.52	3661.45	3464.11	2394.69	4589.37	3097.35	4106.02	3314.03
Debt	13419.72	9309.51	10438.31	14654.6	19457.4	26617.04	34701.19	39223.04	39822.19	32373.5	54195.07	59537.24
Capital trust	0	0	0	0	0	0	0	3140	1750	2100	1650	602.75
Limited partnership	114.69	520.37	118.14	407.7	1172.07	690.33	376.57	211.63	516.93	636.32	1876.82	1545.54
Trust units	0	0	411.03	4264.3	10306.57	1822.81	1498.08	2878.83	6996.72	11023.91	17097.11	16853.15
Total	106688.2	100997	93275.43	114213.9	120565.5	117420	128567.3	143153.1	135594.2	149474.7	190741.2	213116
GDP	727184	770873	810426	836864	882733	914973	982441	1076577	1108048	1154204	1216191	1290185
Financing Ratio	14.67	13.10	11.51	13.65	13.66	12.83	13.09	13.30	12.24	12.95	15.68	16.52
Private	5.956275	3.750434	3.589589	5.221318	6.783378	5.580364	5.881036	6.377018	5.937745	5.553184	8.032511	8.354917

Source Data: <http://www.ida.ca>



EARNED ROE vs ALLOWED								
	TCPL		Foothills		TCPL BC (ANG)		TQM	
	Allowed	Actual	Allowed	Actual	Allowed	Actual	Allowed	Actual
1990	13.25	13.34	14.25	14.25	13.25	13.25	13.75	14.87
1991	13.5	13.65	14.25	14.25	13.38	13.38	13.75	13.94
1992	13.25	13.43	13.83	13.83	13.43	13.43	13.75	13.97
1993	12.25	12.31	11.73	11.73	12.08	12.08	12.25	12.5
1994	11.25	11.16	11.5	11.5	12	12	12.25	12.55
1995	12.25	12.56	12.25	12.25	12.25	12.25	12.25	12.65
1996	11.25	11.83	11.25	11.25	11.25	11.25	11.25	11.83
1997	10.67	11.15	10.67	10.67	10.67	10.67	10.67	10.94
1998	10.21	10.63	10.21	10.21	10.21	10.21	10.21	10.32
1999	9.58	9.64	9.58	9.58	9.58	9.58	9.58	9.94
2000	9.9	9.99	9.9	9.9	9.9	9.9	9.9	9.96
2001	9.61	10.01	9.61	9.61	9.61	6.86	9.61	10.21
2002	9.53	9.95	9.53	9.53	9.53	9.53	9.53	9.8
2003	9.79	10.18	9.79	9.79	9.79	8.21	9.79	10.21
	11.16	11.42	11.31	11.31	11.21	10.90	11.32	11.69
ovrearn		0.25		0.00		-0.31		0.37

NEB Regulated pipelines controlled by TransCanada Corporation, confirmed by TCPL in CAPP 31(a) in TCPLs 2004 business risk hearing.

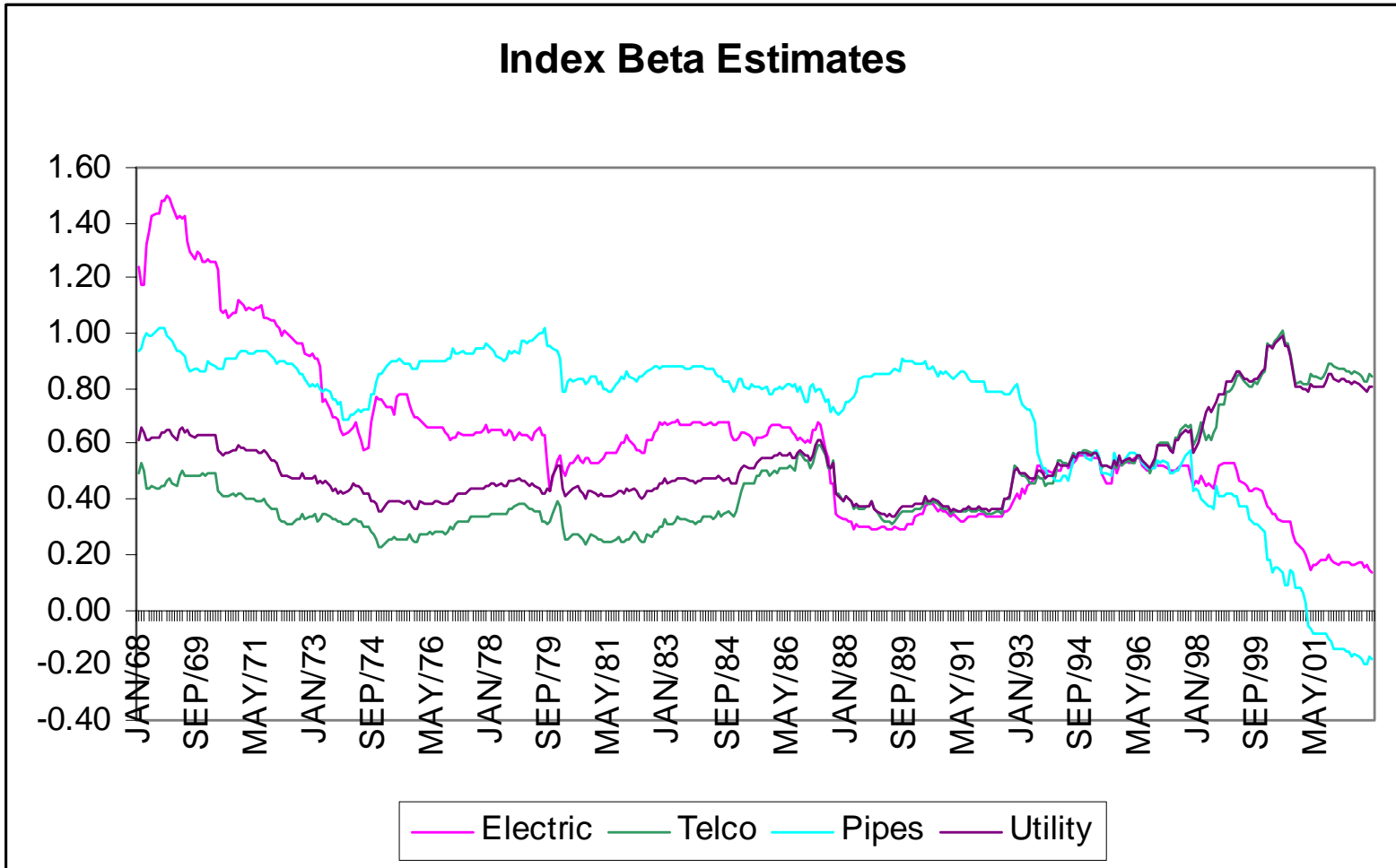
SCHEDULE 16

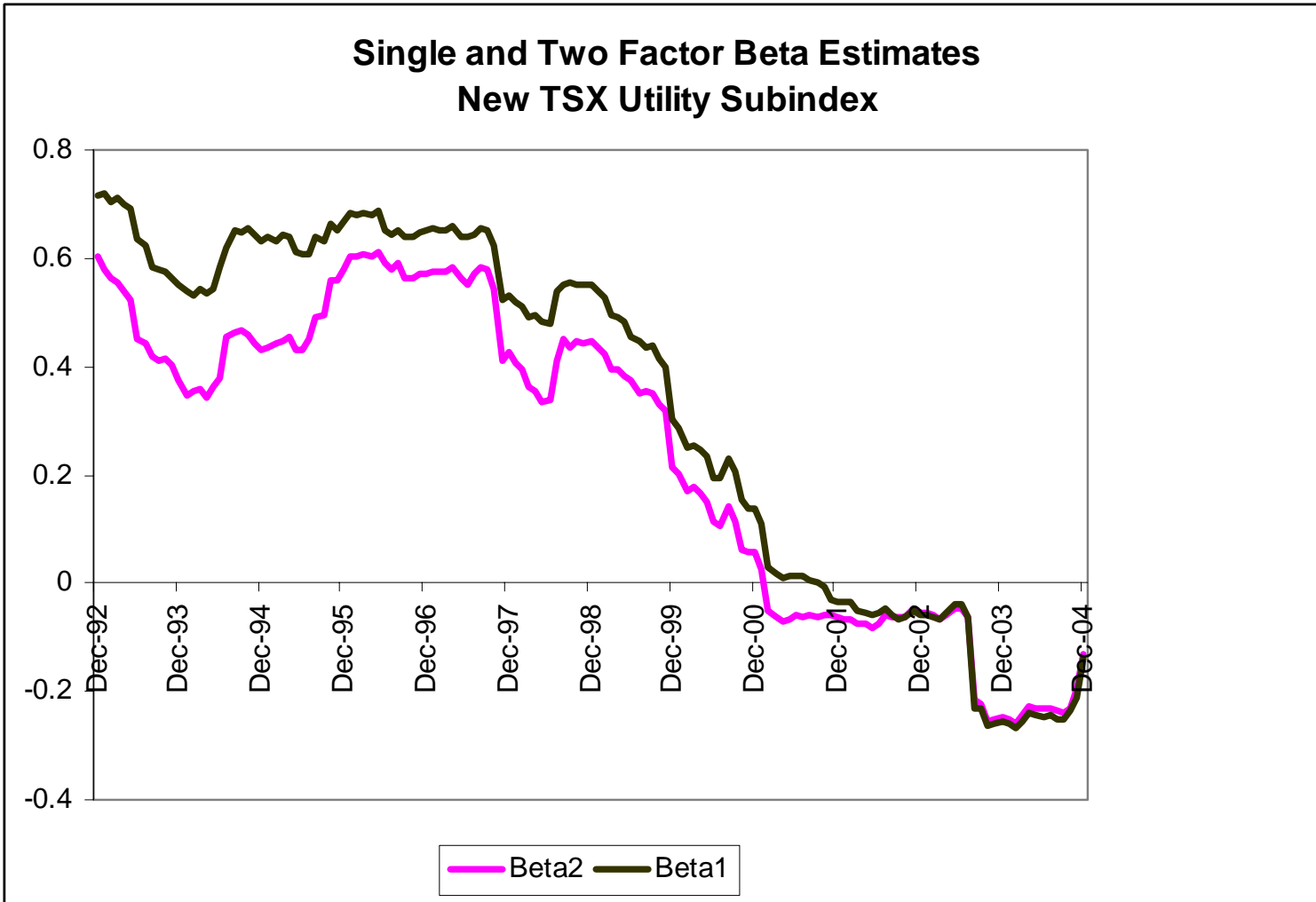
	EGDI		UNION		NGTL	
	Allowed	Actual	Allowed	Actual	Allowed	Actual
1990	13.25	13.60	13.50	13.80	13.25	15.54
1991	13.13	13.29	13.50	13.40	13.50	15.08
1992	13.13	13.40	13.00	12.50	12.50	12.80
1993	12.30	14.43	12.50	13.70	11.75	11.86
1994	11.60	12.49	11.75	14.30	11.75	11.31
1995	11.65	12.66	11.75	12.14	11.50	11.10
1996	11.88	13.14	11.75	12.12	11.25	12.10
1997	11.50	13.00	11.00	12.52	10.67	12.90
1998	10.30	11.97	10.44	12.26	10.21	12.60
1999	9.51	10.77	9.61	11.14	9.58	13.20
2000	9.73	10.83	9.95	10.10	9.90	12.40
2001	9.54	10.03	9.95	10.11	9.61	12.80
2002	9.66	11.81	9.95	11.45	9.53	12.90
	11.32	12.42	11.56	12.34	11.29	12.81
ovrearn		1.10		0.78		1.52

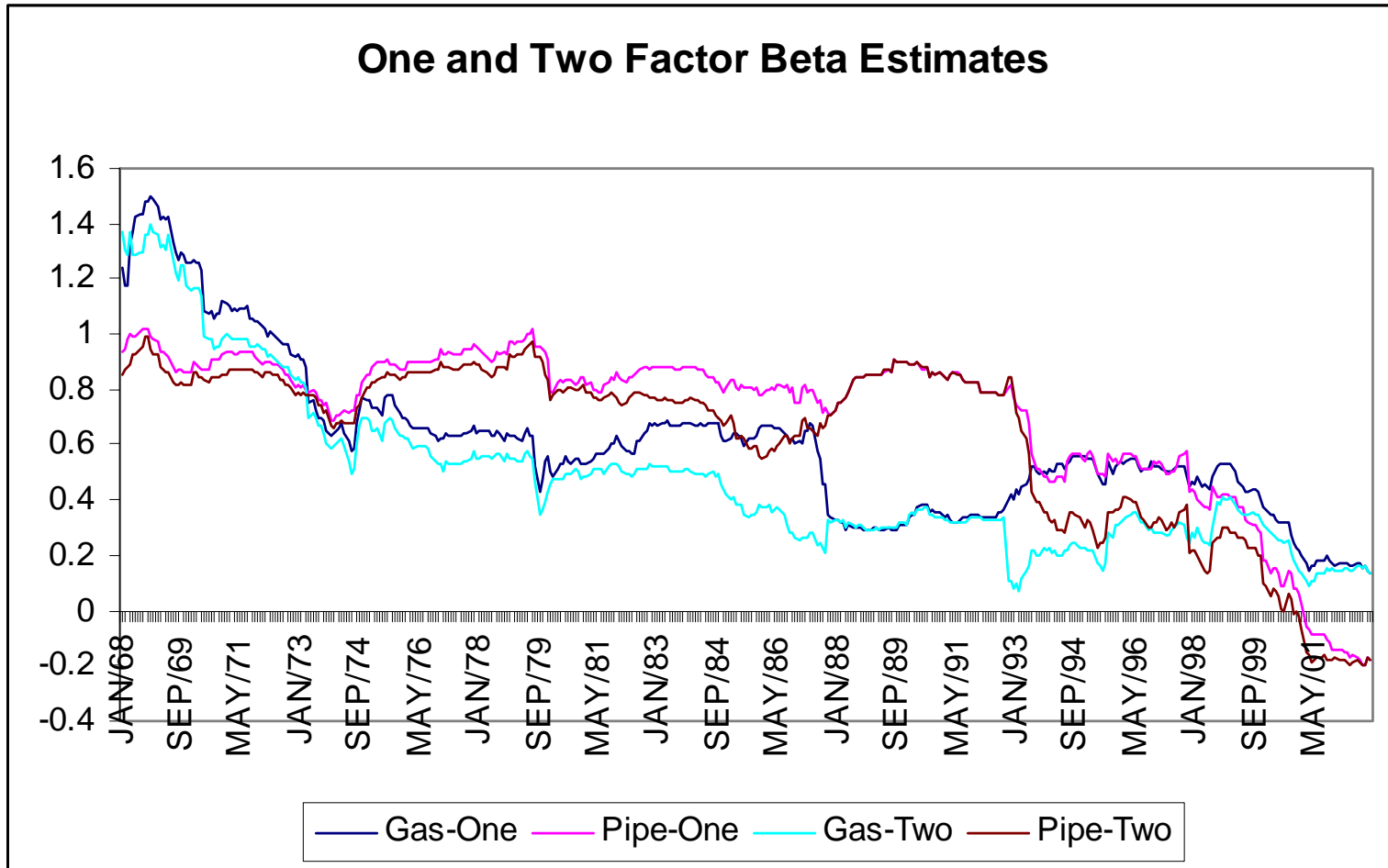
NGTL data is from CAPP-NGTL-17 from the Alberta generic hearing, where the allowed ROE is as given or the TCPL allowed ROE for the period when NGTL was not subject to an allowed ROE. The data for EGDI and Union is taken from Appendix B Schedule 10 of the pre-filed testimony of Dr. William Cannon in RP-2002-0158, the Ontario Energy Board's review of its ROE guidelines.

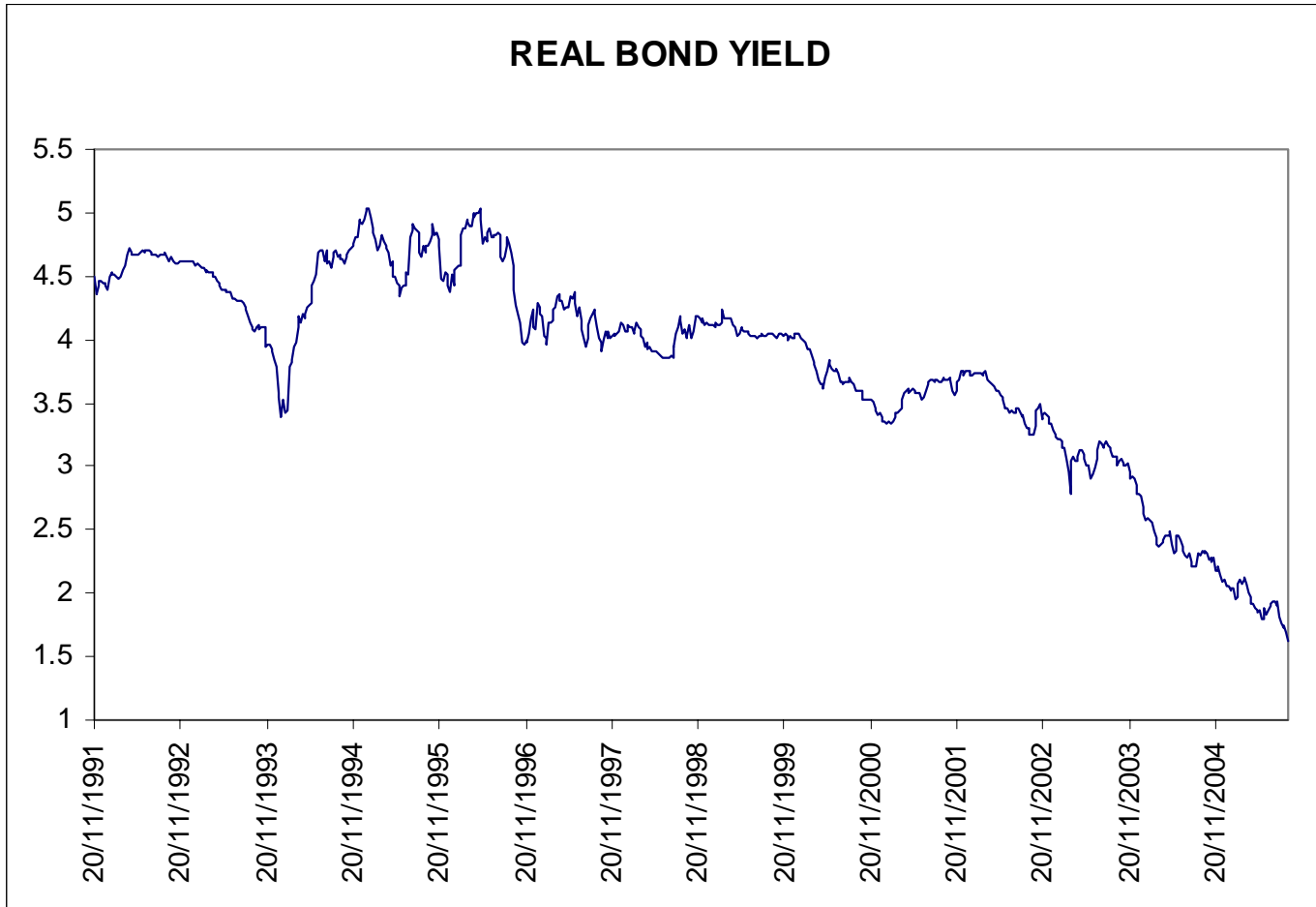
SCHEDULE 17

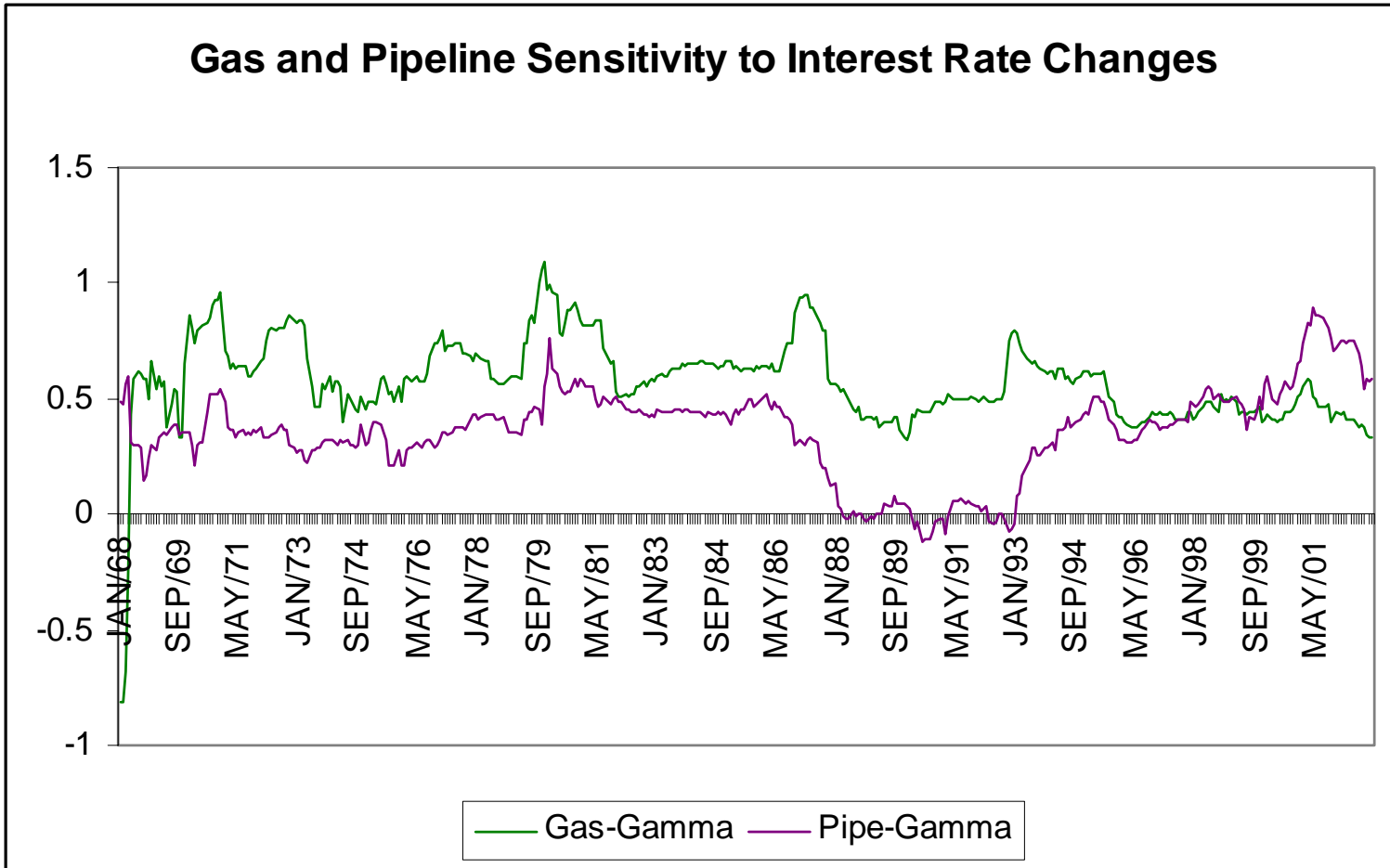
	CU Ltd	Emera	Enbridge	Fortis	GMI	PNG	Terasen	TransAlta	TCPL	Mainline	Foothills
1993	13.37	12.02	17.53	11.84	19.29	12.92	10.82	16.00	14.01	12.31	11.73
1994	13.71	11.90	9.59	10.71	19.73	13.44	7.24	15.10	12.86	11.16	11.50
1995	14.12	11.55	16.91	10.74	19.50	11.77	8.51	14.00	13.20	12.56	12.25
1996	14.86	10.59	14.47	9.61	19.91	13.32	17.59	13.24	12.33	11.83	11.25
1997	14.87	10.56	14.04	9.43	18.91	13.32	8.34	12.84	11.25	11.15	10.67
1998	14.75	9.47	13.25	7.16	19.11	10.14	12.09	16.41	7.04	10.63	10.21
1999	14.54	10.83	13.35	8.56	17.66	10.79	13.35	4.88	7.42	9.64	9.58
2000	15.44	10.88	15.65	9.71	17.93	9.75	15.16	8.14	8.44	9.99	9.90
2001	14.96	10.58	14.90	12.25	17.45	7.50	10.26	7.23	10.89	10.01	9.61
2002	17.56	6.65	10.11	11.87	18.91	5.94	9.59	2.31	11.93	9.95	9.53
STDEV	1.15	1.55	2.59	1.61	0.87	2.61	3.28	4.99	2.47	1.05	1.00

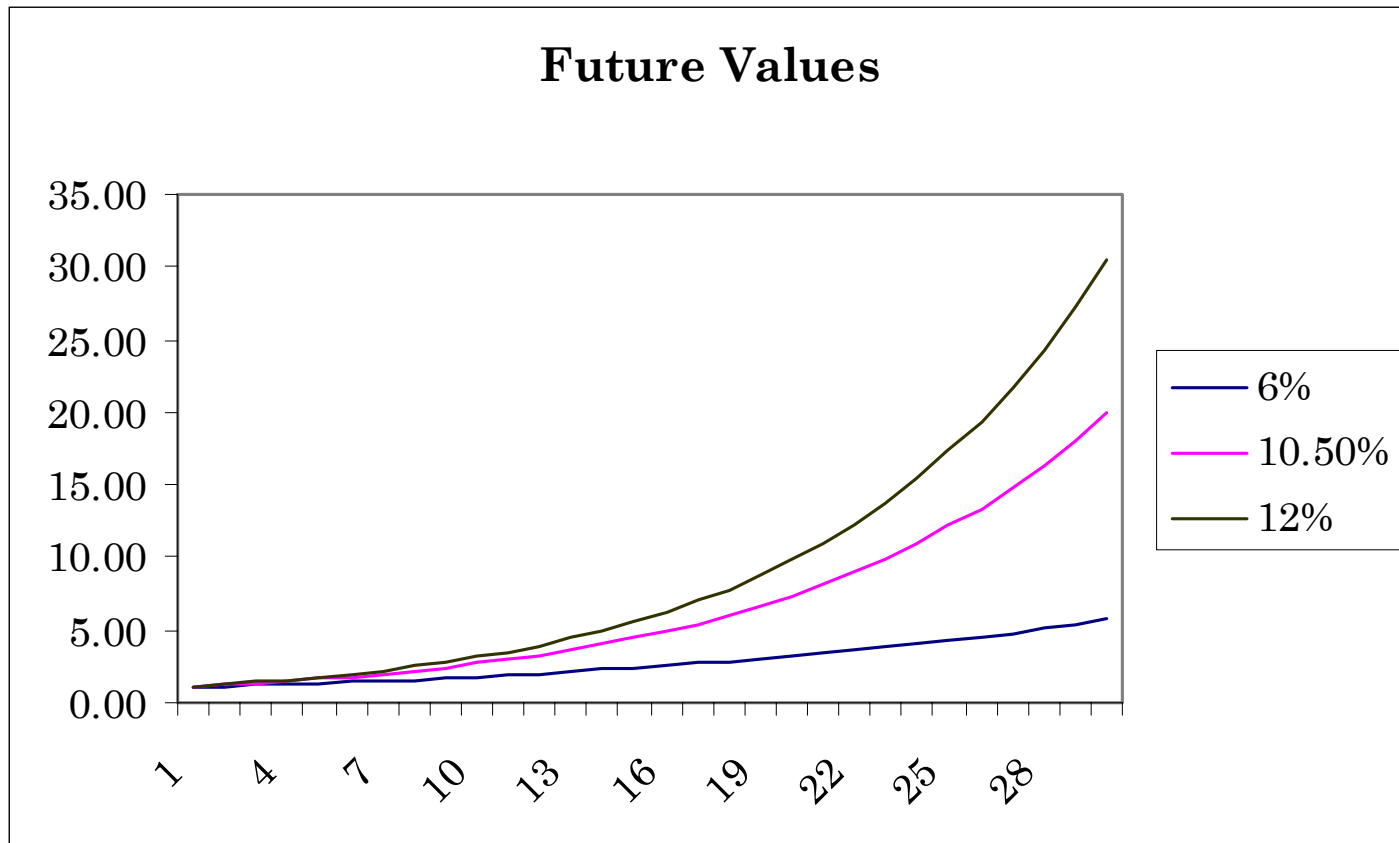


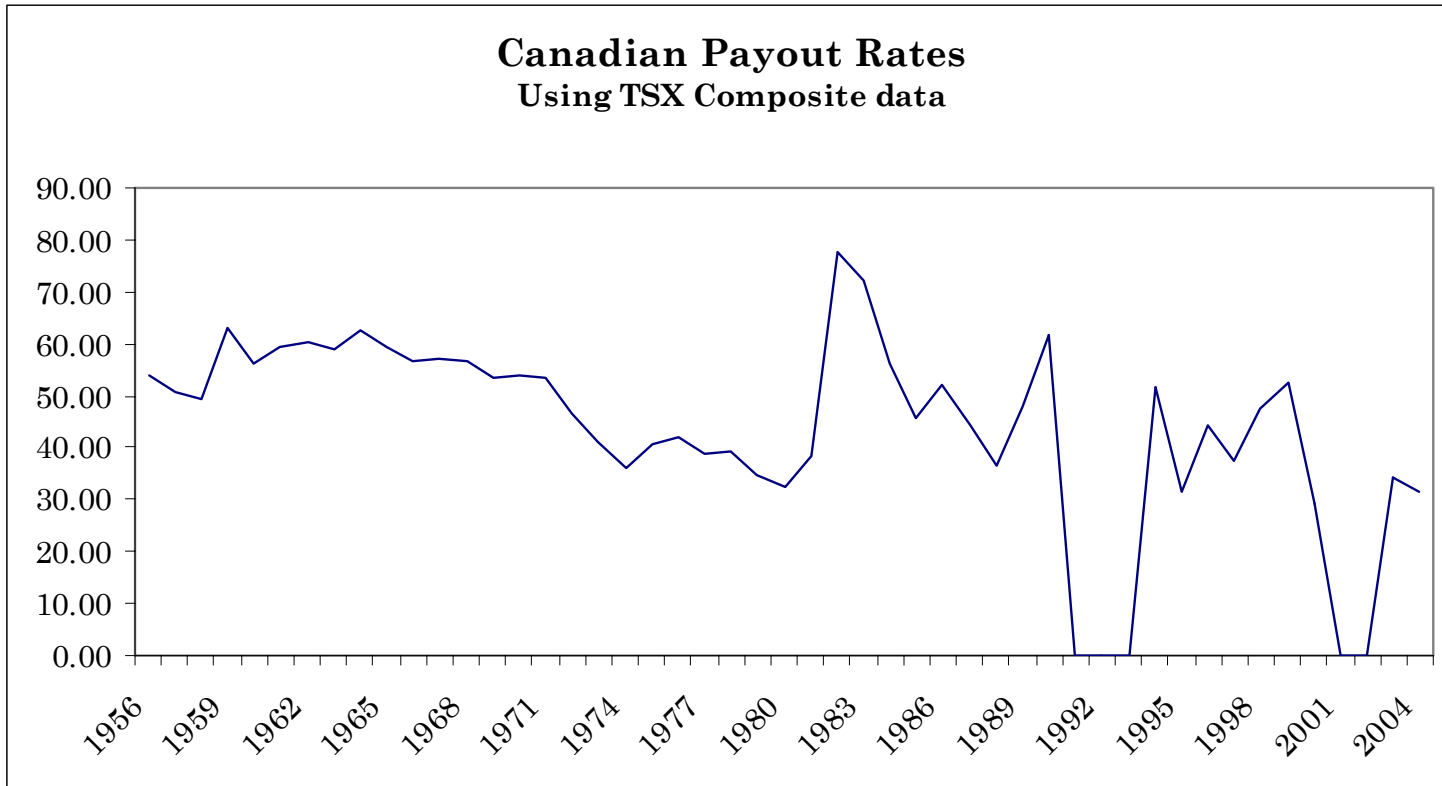


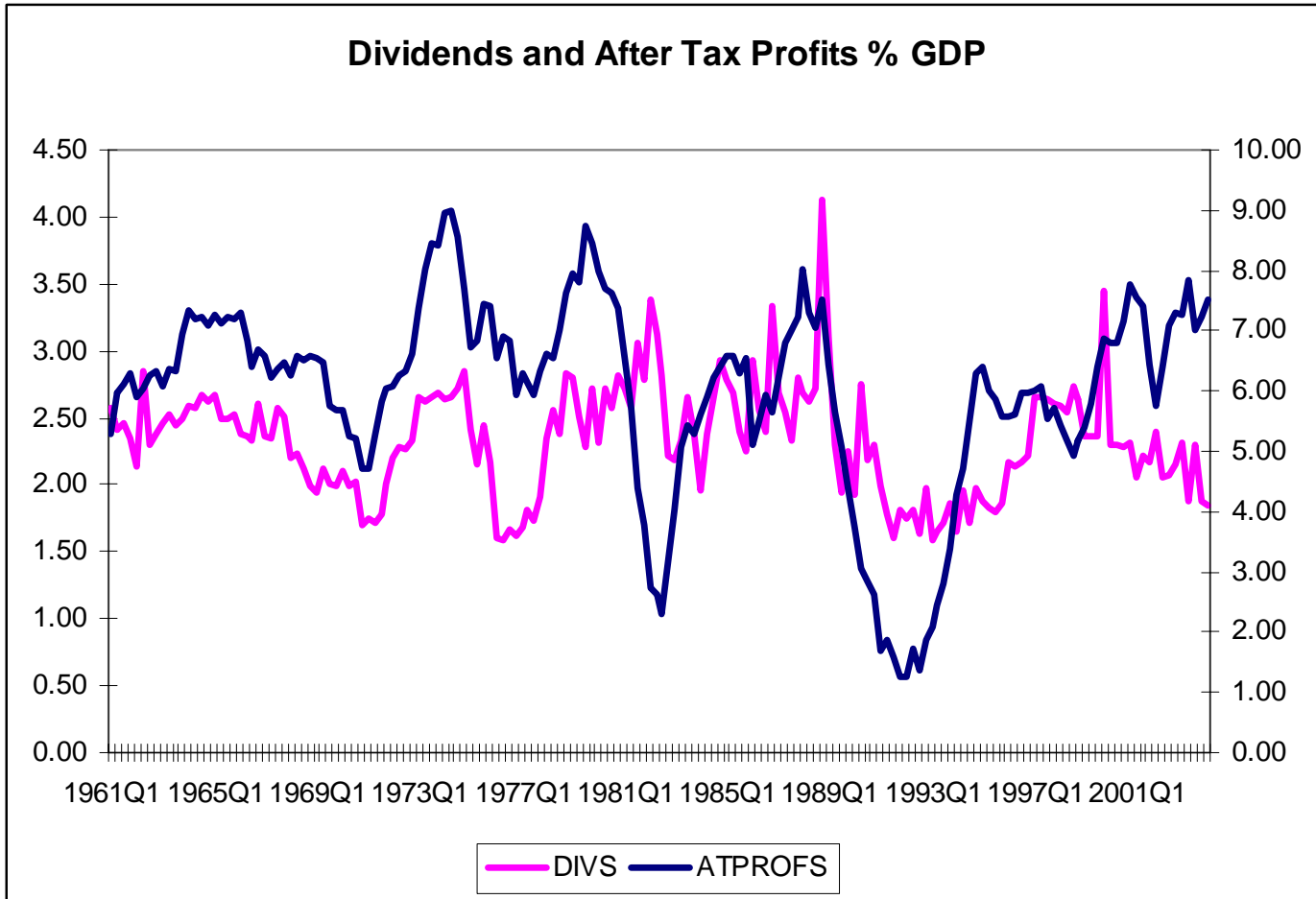


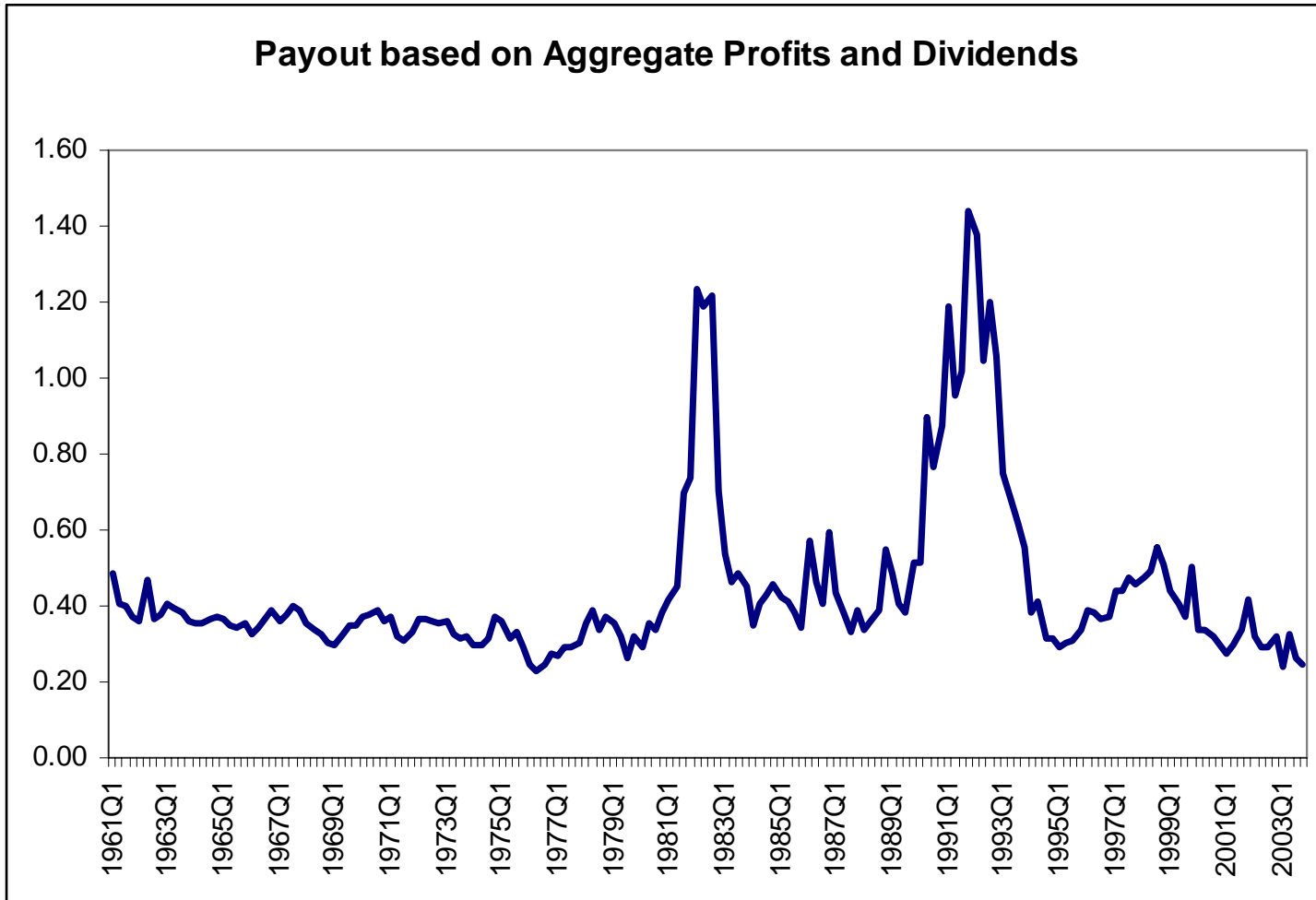












US EQUITY MARKET RISK PREMIUM

(USING THE DCF MODEL AND ANALYSTS' GROWTH FORECASTS)

Claus and Thomas Equity Market Risk Premia ^a				
	US	Canada	France	UK
1989	3.57	3.08	3.64	3.17
1990	3.54	1.51	3.04	2.57
1991	3.01	0.75	2.94	2.47
1992	3.09	0.42	2.26	2.77
1993	3.65	1.69	2.31	3.29
1994	4.06	1.65	1.7	2.87
1995	3.97	2.71	2.06	3.02
1996	3.45	2.69	2.38	3.34
1997	3.23	2.28	2.28	2.53
1998	2.51	2.68	2.53	2.09
C&T Average	3.4	2.23	2.6	2.81

- a. J. Claus and J. Thomas, "Equity premia as low as 3.0%? Evidence from analysts' earnings forecasts for domestic and international stock markets," *Journal of Finance*, October 2001.

Market Risk Premium Studies

	Holding				Market Risk
	Country	Period	Arith/Geom.	Historic/Prospective	Premium
Dimson, Marsh and Staunton ^a	Canada	1900-2000	Arithmetic	Historic	6.00%
	U.S.	1900-2000	Arithmetic	Historic	7.00%
Claus and Thomas ^b	U.S.	1985-1998	n/a	Prospective	3.40%
	Canada	1985-1998	n/a	Prospective	2.43%
Fama and French ^c	U.S.	1951-2000	n/a	Historic	2.55-4.32%
Ibbotson and Chen ^d	U.S.	1926-2000	Arithmetic	Prospective	5.90%
Arnott and Bernstein ^e	U.S.	1802-2001	n/a	Prospective	2.40%
Graham and Harvey ^f	U.S.	2001-2011	n/a	Prospective	3.60-4.70%
Mean					4.34%
Booth	Canada	1956-2001	Arithmetic	Historic/Prospective	4.50%

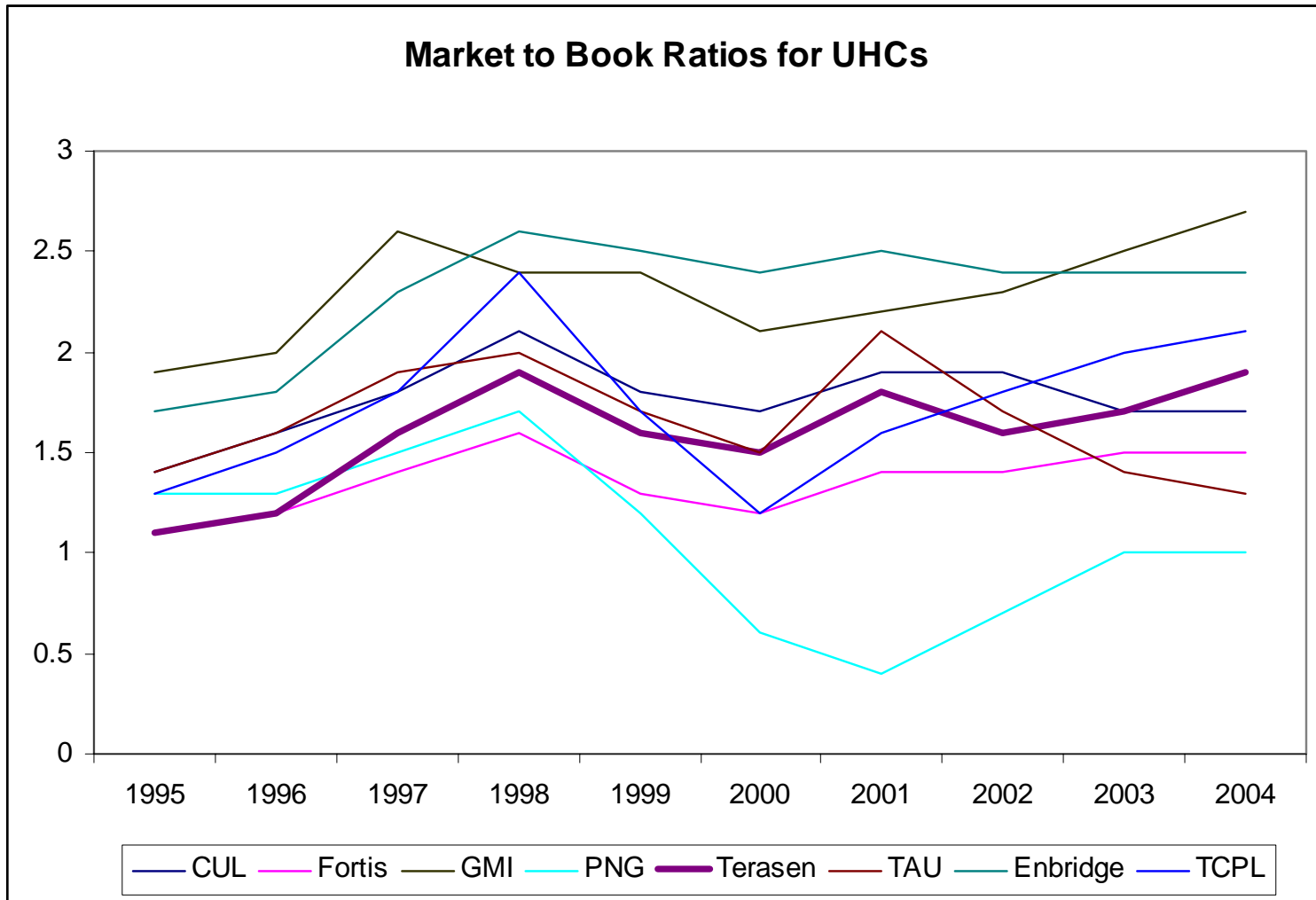
- a. E. Dimson, P. Marsh and M. Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press, 2002.
- b. J. Claus and J. Thomas, "Equity Risk Premia as Low as Three Percent? Evidence from Analysts' Earnings Forecasts for Domestic and International Stocks", *Journal of Finance*, October 2001.
- c. E. Fama and K. French, "The Equity Risk Premium", *Journal of Finance*, April 2002.
- d. R. Ibbotson and P. Cheng, "Stock Market Returns in the Long Run: Participating in the Real Economy", Yale International Center for Finance Working Paper No. 00-44, March 2002.
- e. R.D. Arnott and P.L. Bernstein, "What Risk Premium is Normal?", *Financial Analyst Journal*, March/April 2002.
- f. J.R. Graham and C.R. Harvey, "Expectations of Equity Risk Premia, Volatility and Asymmetry from a Corporate Finance Perspective", Fuqua School of Business Working Paper, Duke University, November 2001.

SCHEDULE 29

RETURN ON EQUITY AND MARKET TO BOOK RATIO

	<u>TELCO ROE</u>	<u>TELCO M/B*</u>	<u>PREF YIELD</u>	<u>SPREAD</u>
1970	9.63	0.97	7.42	2.21
1971	11.00	1.07	6.98	4.02
1972	11.83	1.12	7.00	4.83
1973	11.46	1.01	7.26	4.20
1974	9.94	0.86	8.90	1.04
1975	11.80	0.84	9.48	2.32
1976	12.84	0.93	9.28	3.56
1977	13.37	1.06	8.39	4.98
1978	13.43	1.17	8.34	5.09
1979	14.09	1.19	8.64	5.45
1980	13.68	1.05	9.89	3.79
1981	14.06	0.92	12.02	2.04
1982	15.08	0.91	13.78	1.30
1983	15.58	1.16	10.16	5.42
1984	14.82	1.24	9.89	4.93
1985	14.11	1.39	9.26	4.85
1986	13.16	1.41	8.92	4.24
1987	13.03	1.31	8.51	4.52
1988	12.90	1.27	8.37	4.60
1989	12.79	1.32	8.46	4.33
1990	12.68	1.26	9.20	3.48
1991	12.72	1.34	8.54	4.18
1992	12.41	1.35	8.20	4.21
1993	11.98	1.41	7.73	4.25
1994	11.49	1.50	7.96	3.53
1995	10.25	1.33	7.76	2.49
1996	11.22	1.47	7.51	3.71

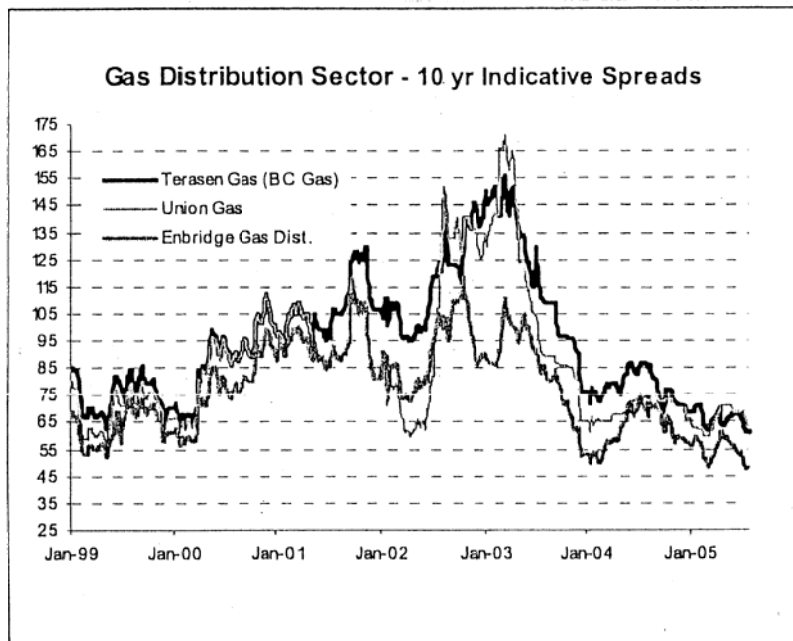
* Average high low price divided by average book value per share.

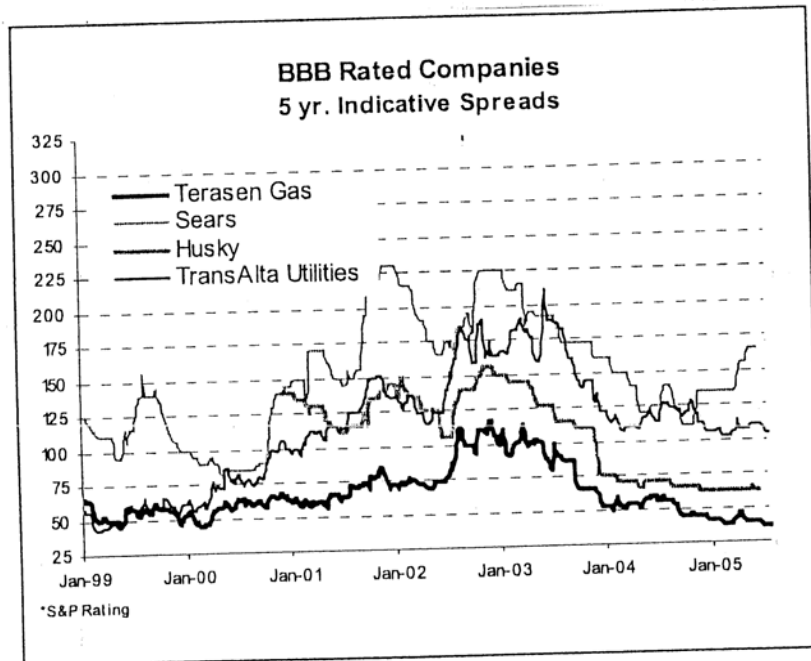


Yield Spreads on Utility/Pipeline Debt

(Source RBC Capital markets: Spread history of Canadian, Corporate and Government Issuers May 31, 2004)

			1999	2000	2001	2002	2003		2004				
	S&P	Date	DEC	DEC	DEC	DEC	MAR	JUN	SEPT	DEC	MARCH	JUNE	SEPT
CU Inc	A	2019	64	110	130	104	120	115	100	95	104	107	108
Maritime and NE Pipe	A	2019				146	123	138	138	119	85	90	85
GMI	A	2009	70	100	90	80	80	75	70	50	50	50	50
Newfoundland Power	A-	2022	115	140	150	185	170	160	160	130	130	110	110
Enbridge Pipe	A-	2009	63	90	80	65	70	70	70	47	47	49	49
TCPL	A-	2026	130	169	131	187	201	157	141	100	110	118	119
Enbridge Gas	A-	2027	93	130	136	120	135	125	100	83	86	103	99
Alliance	BBB+	2015	133	159	141	157	161	108	87	95	97	79	94
TQ&M	BBB+	2009	90	120	105	105	105	105	85	65	65	49	49
Epcor Utilities	BBB+	2029		169	191	234	205	182	150	140	129	135	135
Fortis	BBB	2010		225	235	275	250	180	180	115	105	105	105
Nova Scotia Power	BBB+	2009	70	108	80	145	135	125	95	72	72	60	60
Westcoast	BBB	2010		107	88	130	150	115	80	70	80	92	78
Union Gas	BBB	2025	87	149	126	162	176	127	126	95	102	120	122
Emera	BBB	2006			100	165	165	130	115	115	65	70	70
Terasen Gas	BBB	2029	90	150	155	175	182	169	145	129	128	129	141
Average			91	138	129	152	152	130	115	95	91	92	92







Joseph L. Rotman School of Management
University of Toronto

Rotman

Professor Laurence Booth
CIT Chair in Structured Finance

HOME ADDRESS

Suite 802, 900 Yonge Street,
Toronto, Ontario, M4W 3P5.
E-Mail Booth@rotman.utoronto.ca
(416) 978-6311

OFFICE ADDRESS

University of Toronto
105 St George Street,
Toronto, Ontario M5S 3E6
(416) 971-3048 (Fax)

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, 1978 (finance major).
M.B.A., Indiana University, 1976 (finance major).
M.A., Indiana University, 1976 (Economics).
B. Sc.(Econ), London School of Economics, 1971.

AWARDS & HONOURS MBA Second Year Instructor of the Year Award, 1996, 1998 & 2000
Best paper in corporate finance, 1999 SFA meetings
ASAC Distinguished Professor Address 1990,
Director Financial Management Association 1988-90,
English Speaking Union Fellow 1974-5,
Fulbright 1974,
Elected to Beta Gamma Sigma,
First class honours B.Sc.(Econ)
CBV (Chartered Business Valuator) awarded December 2002.
National Post Leaders 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), Associate Professor (1983-1987), Assistant Professor (1978-83). Visiting Professor Nankai University (China) 1989, the Czech Management Centre (1998), visiting scholar London School of Economics (1985).

**TEACHING
EXPERIENCE:**

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

**JOURNAL
ARTICLES**

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

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

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

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

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

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

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

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

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

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

"On the Unanimity Literature and the Security Market Line Criterion," Journal of Business Finance and Accounting (Winter 1983),

"Empirical Tests of the Monetary Approach to Exchange Rate Determination," (with R. Vander Kr, aats) Journal of International Money and Finance, (December 1983),

"The Ex-Dividend Day Behaviour of Canadian Stock Prices: Tax Changes and Clientele Effects," Journal of Finance, (June 1984) (with D. J. Johnstone),

"On the Relationship Between Time State Preference and Capital Asset Pricing Models," Financial Review (May 1984),

"Bid-Ask Spreads in the Market for Foreign Exchange," Journal of International Money and Finance (August 1984),

"An Economic Analysis of Hedging and The Canadian Accounting Treatment of Revenue Hedges," Canadian Journal of Administrative Sciences, (June 1987),

"The Dividend Tax Credit and Canadian Ownership Objectives," Canadian Journal of Economics (May 1987),

"A Note on the Demand for Labour and the Phillips curve Phenomenon," Journal of Economics and Business (July 1987) (with W. Y. Lee and J. Finkelstein),

"Adjustment to Production Uncertainty and the Theory of the Firm: A Note," Economic Inquiry (1988),

"The Deregulation of Canada's Financial System," Banking and Finance Law Review, (Jan 1989),

"Stock Returns and the Dollar," Canadian Investment Review, (Spring 1990), (With W. Rotenberg),

"Taxes, Funds Positioning and the Cost of Capital,' in R. Aggarwal (ed) Advances in Financial Planning and Forecasting, JAI Press, 1990,

"Assessing Foreign Exchange Exposure: Theory and Application Using Canadian Firms," Journal of International Financial Management and Accounting (Spring 1990) (With W. Rotenberg),

"Research in Finance at Canadian Administration and Management Faculties," Canadian Journal of Administrative Studies, (With F. Heath), (December 1990),

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

"Evidence on Corporate Preferences For Foreign Currency Accounting Standards", Journal of International Financial Management and Accounting, (with W. Rotenberg) (Summer 1991)),

"Peoples Acquisition of Zale: An application of Valuation Principles," in Canadian Investment Banking Review, (R. Rupert, Editor), McGraw-Hill Ryerson, 1992,

"The Cost of Equity Capital of a Non-Traded Unique Entity," Canadian Journal of Administrative Sciences, (June 1993),

"Lessons From Canadian Capital Market History," Canadian Investment Review (Spring 1995),

"Making Capital Budgeting Decisions in Multinational Corporations," Managerial Finance 22-1, (1996),

"Great Lakes Forest Products" Accounting Education 5 (Winter 1996) (with Professor W. Rotenberg),

"On the Nature of Foreign Exchange Exposure" Journal of Multinational Financial Management" (Spring 1996),

"The Importance of Market to Book Ratios in Regulation," Quarterly Bulletin, National Regulatory Research Institute, Winter 1997,

"A New Model for Estimating Risk Premiums (Along with Evidence of their Decline)" Journal of Applied Corporate Finance, (Spring 1998),

"The Case Against Foreign Bonds in Canadian Fixed Income Portfolios," Canadian Investment Review, (Spring 1998),

"The CAPM, Equity Risk Premiums and the Privately Held Business," Journal of Business Valuation (1999),

"Estimating the Equity Risk Premium and Equity Costs: New Ways of Looking at Old Data," Journal of Applied Corporate Finance, (Spring 1999),

"Time to Pass the Old Maid," Canadian Investment Review, (Spring 1999),

"Risk and Return in Capital Markets," Canadian Treasurer 16-2, March 2000,

"What Drives Shareholder value," Canadian Treasurer 16-3, June 2000.

"Capital Structures in Developing Countries," Journal of Finance 61-1 (March 2001, pp 87-130) (with V. Aivazian, V. Maxsimovic and A. Demircic Kunt), (abstracted in the CFA Digest-31 -3 August 2001)

"Discounting Expected Values with Parameter Uncertainty," Journal of Corporate Finance 9- 2 (Spring 2003, pp 505-519)

"Equity Risk Premiums in the US and Canada," Canadian Investment Review (Spring 2001),

"Financial Planning with Risk," Canadian Journal of Financial Planning (December 2001),

"How to Find Value when None Exists: Pitfalls in Using APV and FTE," Journal of Applied Corporate Finance (Spring 2002),

"Do Emerging Market Firms Follow Different Dividend Policies than Firms in the US: Evidence From Firms in 8 Emerging Markets," Journal of Financial Research 26-3, (September 2003, pp

371-387) (Abstracted in CFA Digest 34-1, Feb 2004) (With V. Aivazian and S. Cleary),

"Dividend Policy and the Organisation of Capital Markets, Journal of Multinational Financial Management, 13-2 (April 2003, pp 101-121 (With V. Aivazian and S. Cleary),

"What to do with Executive Stock Options," Canadian Investment Review 16-2, (Summer 2003, pp 12-18),

"Formulating Retirement Targets and the Impact of Time Horizon on Asset Allocation," Financial Services Review 13-1, (Spring 2004),

"Dividend Smoothing and Debt Ratings," Journal of Financial and Quantitative Analysis, (forthcoming) with V. Aivazian and S. Cleary.

NON-JOURNAL PUBLICATIONS: "Financial Considerations for Providing Incentives for Private Industry and their Implications for Employment Level and Stability," (with M. J. Gordon) Technical study #2, Labour Market Development Task Force, Ministry of Supply and Services Canada, 1982.

"A Comparison of the Car Insurance Industry in Ontario with The Public Monopolies in Saskatchewan, Manitoba and British Columbia," 122 pp, in C. Osbourne (ed) Report of the Inquiry into Motor Vehicle Accident Compensation in Ontario, Ontario 1988.

"Securities Market Regulation: Institutional Ownership and Diversification;" "TSE Listing Proposals for Junior Companies," and "Discount Brokerage and the Entry of Financial Institutions." Reports submitted to the Ontario Securities Commission, July 1982, June 1983 and December 1983.

"Bank Profitability, Is It Excessive? (With M. Jensen and S. Klein), Report to the House Standing Committee on Finance, Trade and Economic Affairs, May 1982.

"Survey of Foreign Bank Affiliates," Chapter 8 in Small Business Financing and Non-Bank Financial Intermediaries, Facsym 1981.

"A Methodological Error in the Application of the Capital Asset Pricing Model" Proceedings ASAC, (May 1981).

International Business, (with A. Rugman and D. Lecraw), McGraw Hill, 1985.

"Hedging Foreign Exchange Exposure," in Rugman (ed), International Business in Canada: Strategies for Management, Prentice-Hall, 1988.

"Section 1650 of the CICA Handbook: Interpreting Foreign Results Under a Flexible Accounting Standard," (With W. Rotenberg), CGA Communications, 1989.

"Liability Management in the Public Sector," Report for Ministry of Treasury and Economics, May 1990 (with P. Halpern,)

"The Tax Deductibility of Interest and Hostile Takeovers," John Deutsch Institute, May 1990.

"Regulation of Transmission and Distribution Activities of Ontario Hydro," in R. Daniels, Editor, Ontario Hydro at the Millenium: Has Monopoly=s Moment Passed? McGill-Queens University Press Fall 1996 (with P. Halpern).

"Competition and Profitability in the Financial Services Industry in Canada," in J. Mintz & J. Pesando (editors) Putting Consumers First C.D Howe Institute, 1996.

"What Drives Shareholder Value," Financial Intelligence IV-6, Federated Press , Spring 1999.

"Canada's Competitiveness over the last 20 years," Rotman Management, Spring/Summer 1999.

"A Walk through Risk and Return," Advisor's Guide to Financial Research, 1999.

"Picking the Right Stocks," Advisor's Guide to International Financial Research, 2000.

"The CAPM, Equity Risk Premiums and the Privately Held Business," reprinted in W. Albo et al, Purchase and Sale of Privately Held Businesses, CA Press, Toronto, Ontario, 2000

"Investments, Alternative Investments and Bubbles," in Advisor's Guide to New Investment Opportunities, 2001.

"The Increasing Complexity of Bank Brands," Rotman Management, Spring/Summer 2001.

"Asset allocation in the long run," Advisor's Guide to Risk Management, 2002.

"The Competitiveness of Corporate Canada," Financial Post, July 2002.

"Corporate Responsibility," Rotman Management, Spring/Summer 2003.

"The MBA International Finance course: a course whose time has come and gone, in A. Rugman (editor) Research in Global Strategic Management, JAI press, June 2003.

"The fundamentals of finance all business professionals should know and remember," Inside the Minds: Textbook Finance, Aspatore Books, June 2003.

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, 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" and the motivation for differential investment decisions.

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,

Peter Klein, Three Essays on the Capital Gains Lock-in Effect, 1996,

Guy Bellemare, Capital Market Segmentation: US -Canada, 1996,

Kevin Lam, The Pricing of Audit Services, 1997,

Sean Cleary, The Relation Between Firm Investment and Financial Slack, 1998,

Xinlei Zhao, Three Essays on Financial Markets, 2002,

Lynnette Purda, Elements of Corporate Debt Policy, 2003,

Themis Pantos, Investment Distortions in the Presence of a Sovereign Debt Overhang, 2003.

Zhao Sun, PEG ratios and Stock Returns, 2004.

**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.

Inco, 1989.

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 member 1980-2, 1989-90, 1993-4, 2001-3

Finance Area Co-ordinator 1987-91, 1994-

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-.

Journal of Multinational Financial Management 1989-
Journal of International Business Studies 1992-2002, 2003-
Associate Editor, Multinational Finance Journal, 1995-
Director at large Multinational Finance Journal 1998-
Co-Chair 1991 Northern Finance Association meetings.
Chair 1998 Northern Finance Association meetings
Programme Committee member FMA meetings, October 1993.
Programme Committee member SFA meetings November 2002.
Frequent media commentator.

August 2005.

1 **APPENDIX B**

2

3 **THE FAIR RATE OF RETURN CONCEPT AND COMPARABLE**

4 **EARNINGS**

5

6 Corporate ROEs as an opportunity cost

7

8 The owners of a firm invest money to buy real and financial assets; their personal equity
9 investment in the firm is then recorded as 'stockholder's equity' on the firm's balance sheet. In
10 order to undertake an investment the owners must expect to earn a rate of return at least equal to
11 their minimum required rate of return, cost of equity capital or fair rate of return.¹ Otherwise they
12 will not undertake the investment. Hence, there is a link between what the firm earns and what
13 the investor requires. However even if we are able to create a sample of firms that are identical in
14 risk to the firm under examination so that the cost of capital is similar, there is *no* reason for the
15 earned rate of return of the sample (commonly referred to as the “comparable earnings” to be
16 similar to either that of the firm or its cost of equity capital and fair return.

17

18 The basic problems with the earned rate of return are as follows:

19

- 20
- It is an accounting rate of return
 - It is an average not a marginal rate of return
 - It is earned on historic accounting book equity that does not reflect what can be
23 earned on investments today,
 - It is based on non-inflation adjusted numbers
 - It varies with the firms selected in the “comparable earnings” sample
- 26

27 When investors make investments they are concerned with the cash outflow in making the
28 investment and the cash inflow when the investment pays off. This is recognised in corporate
29 investment decisions where firms estimate the stream of future cash flows generated from the

¹ These terms are used synonymously.

1 investment and the cash outflow. They then use discounted cash flow techniques to evaluate the
2 investment. The net present value criterion discounts the expected cash flow stream at the cost of
3 capital to see whether the value of the project exceeds its cost, or alternatively the net present
4 value is positive. The internal rate of return (IRR) criterion finds the discount rate that sets the
5 expected stream of cash flows equal to the cost of the project. The IRR is frequently called the
6 economic rate of return and it is this rate that is compared to the cost of capital. If the IRR is at
7 least equal to the cost of capital, then the project enhances shareholder value and should be
8 accepted.

9

10 Unfortunately the accounting ROE shown in a firm's financial statements, and commonly used
11 in comparable earnings testimony, is only loosely related to the economic rate of return. For
12 example, the economic rate of return uses tax accounting for depreciation (CCA) since
13 accelerated depreciation reduces the tax paid in the early life of and project and enhances cash
14 flow. The accounting ROE in contrast uses generally accepted accounting principles (GAAP)
15 and the firm may as a result use straight line or any other acceptable method for reporting
16 depreciation. The extreme flexibility allowed in GAAP means that any prudent analyst looks to
17 the cash flow statement (sources and uses of funds) to find out the quality of a firm's earnings. If
18 there is a significant difference between cash flow and accounting earnings it is one signal that
19 the firm may be using creative accounting and the accounting ROE is not to be trusted. The large
20 number of accounting scandals in the US, from WorldCom to Enron and HealthSouth, indicate
21 that in practise there have been large differences between accounting ROEs and the true
22 economic rates of return.

23

24 However, even if the accountants measured economic rates of return, what we would observe is
25 the average and not the marginal ROE. Why this matters is that normally the set of available
26 investment opportunities is downward sloping, that is a firm may have some projects that might
27 earn say 20%, some more at 18%, 15% etc all the way down to its cost of capital say 10%. As a
28 result its average ROE will always be higher than its cost of equity capital since this is the
29 minimum rate of return, that is, the firm should not accept projects with ROEs less than the cost
30 of equity capital.

31

1 This difference between average and marginal ROEs and the cost of capital is most severe if the
2 firm is able to earn monopoly profits, since in this case its ROE will increase. In Schedule 1 is
3 an example where the firm invests at I^* since all of this money is invested at a rate that exceeds
4 the cost of capital. However, the average ROE that we would observe is simply the average of all
5 these investments and by definition significantly exceeds the fair rate of return.

6

7 What happens when a firm has significant market power is that the investor notices the high
8 ROEs and since they exceed the minimum fair return they are happy with the firm's performance
9 and bid up the stock price. As a result the stock price sells for more than the book value of the
10 funds actually invested and the market to book ratio exceeds 1.0. In a competitive market
11 economy this discrepancy does no harm, since the excess rate of return acts as the market signal
12 to attract other firms into the industry. The result is an increase in output in the industry and a
13 reallocation of resources in the direction signalled by consumers. However, for our purposes, it
14 means that even if we adjust for the accounting problems, actual ROEs are constantly diverging
15 from the investor's fair rate of return. This divergence is particularly acute in two situations:
16 where there are monopoly profits and when there are swings in the economy.

17

18 When no entry into the industry can occur, a firm may continue to earn rates of return
19 considerably in excess of any notion of a fair rate of return. For example, suppose that a firm has
20 a legal barrier to entry. In this case, the firm can continue to earn excess rates of return
21 indefinitely and the earned book rate of return will be consistently higher than the investor's fair
22 rate of return. This would be the situation for many consumer products firms, where a major
23 asset, such as a brand name or distribution system, is not reflected in the financial statements. In
24 this case, the firm's equity is understated, because the costs of developing the asset, namely
25 advertising and R&D, is expensed rather than capitalised. As a result, the economic rates of
26 return are much lower than the over-stated accounting ROEs.²

27

28 What this means is that the accounting ROE is NOT an opportunity cost. Other firms or investors
29 can not invest to earn those rates of return, since a significant cost such as a brand name is

² Note that if the value of R&D and brand names were included as assets then stockholder's equity and accounting ROEs would obviously decline.

1 missing. That is, if a strong firm with market power is earning say 15%, other firms can not
2 simply invest in that industry and earn the 15% without first generating a brand name whose cost
3 is not factored into that 15% ROE. Further a portfolio investor can't earn that 15% ROE either. If
4 a firm is earning 15% and has a market to book ratio of 2 then they would only earn 7.5% on the
5 investment that they make, since they have to buy the assets for twice book value.

6

7 The market to book problem also arises when there is significant inflation as North American
8 GAAP is based on historic cost accounting and what appears in the financial statements are the
9 historic costs, not the replacement or current value costs. Although inflation hasn't been a
10 significant problem for many years, even 3% inflation can create distortions.

11

12 Consider, for example, a situation where the investor wants a 5% real rate of return and inflation
13 is expected to be 4.76%, so the nominal required rate of return is 10%. Suppose there is a \$100
14 investment expected to earn a real return of 5% in perpetuity. What this means is that this year's
15 cash flow of \$5 is expected to increase to \$5.24 next year, and then to \$5.49 the following year.
16 Alternatively, the same expected cash flow can be calculated from the inflation adjusted value of
17 the investment, which increases from 100 to \$104.76. The firm is then expected to earn a real
18 return of 5% on this inflation adjusted book value, so that $.05 * \$104.76$ also gives \$5.24.

19

20 The above example also illustrates how the real return bond issued by the Government of Canada
21 works. The principal or par value is increased with the consumer price index and the investor
22 then receives a fixed real rate of return on this inflation adjusted principal value. Why this is
23 important is that non-regulated firms operating under inflation have the characteristics of the real
24 return bond. If these firms are inflation neutral then their profits go up with inflation, as does the
25 market value of their investment, so they continue to earn the same real rate of return. Historic
26 cost accounting does not normally recognise this increase in the market value of the assets, so the
27 earned returns are in excess of the real rate of return due to the understatement of the book value.
28 In the example if the investment value is not increased, the accounting return would be 5.24%,
29 not the actual real return of 5%.

30

1 What the example illustrates is that if non-regulated firms are inflation neutral then their reported
 2 returns are real returns. However, to the extent that their investments are not revalued and
 3 continue to be reported at historic costs, then the reported returns exceed the real return. In this
 4 case we would again observe market to book ratios in excess of 1.0. In this case it is because the
 5 assets are valued at historic, instead of current dollar values. Again investors can not buy the
 6 assets at these historic costs and as a result their fair return is overstated.

7
 8 The above inflation adjustment problems are moderated by the fact that most investments are not
 9 perpetuities and GAAP does offer opportunities to revalue assets to market values. For example,
 10 whenever a firm is acquired, purchase accounting requires that the value of the assets be written
 11 up to reflect the amount paid. However, in general there is no reason for the actual returns under
 12 even moderate inflation to reflect either real or nominal economic returns. Further, it is important
 13 to note that utilities are regulated like bonds. The rate base is fixed, just like a typical nominal
 14 bond, and the investor is then allowed the current nominal return on that investment. This means
 15 that earned returns from utilities can not easily be compared with the earned returns from a
 16 sample of even competitive low risk firms.

17
 18 The final problem is that the swings in the economy affect the assessment of the accounting rates
 19 of return. At the peak of the cycle, excess spending by consumers and businesses push up prices
 20 and firms generate large profits. Conversely, in recessions the lack of demand causes sharp price
 21 discounting, reduced margins and lowered, if not negative, rates of return. The peaks and troughs
 22 of the business cycle can be offset by averaging over the full business cycle, but this just leads to
 23 the problem that only rarely is the economy stable enough that the past business cycle can be
 24 used as a predictor of the future business cycle. However, the variability in accounting ROEs
 25 opens up enormous selection errors in choosing firms.

26
 27 To illustrate the selectivity in creating a sample of corporate ROEs it is important to know the
 28 average ROE of the universe of companies. For the 358 firms in the Financial Post data base for
 29 which they have full coverage, the average ROE was as follows:

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
31 All 358 FP companies	4.39	5.21	1.69	-3.55	-2.04	-5.99	-5.84	-4.85	0.97	0.66

1 This average is a simple average, so large firms are weighted equally with small firms. However,
 2 from the full set of firms the average ROE varies for a high of 5.21% in 1996 to a low of -5.99%
 3 in 2000. To see how the ROE varies with the risk of the firm I sorted the firms by the standard
 4 deviation of their ROE and then formed portfolios by starting with the lowest risk firm and then
 5 adding the next lowest etc so that the portfolio gradually gets riskier and riskier. The result is
 6 graphed in Schedule 2.

7
 8 This graph is dramatic. What it illustrates is that the average ROE generally falls as riskier firms
 9 are added. The reason for this is simply that the risk measure is the standard deviation of the
 10 realised return, which generally increases with losses as gains and losses are not symmetric.
 11 Obviously the losses also lower the average ROE, so the result is that the average ROE falls as
 12 riskier firms are added to the portfolio. Note also that the average ROE peaks at 12.25% and of
 13 the 358 firms only 33 have average ROEs greater than 10%, so to get a sample of firms with an
 14 average ROE greater than 10% means removing a very large number of firms.

15
 16 Reasonable screens to narrow down the sample are not difficult to find. Some of the firms
 17 followed by FP are very small with limited history, so one idea might be to restrict the sample to
 18 the TSX60 firms. In this case the average annual ROE changes to:

19

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
20 All 358	4.39	5.21	1.69	-3.55	-2.04	-5.99	-5.84	-4.85	0.97	0.66
TSX60	12.88	13.90	11.82	8.39	10.70	11.43	5.51	5.17	10.02	11.83

21
 22 In this case the average ROE *increases* in every year since by and large smaller firms are more
 23 vulnerable to competition and riskier. However, in Schedule 3 is the same graph of average ROE
 24 against “risk” and the general pattern is the same. In this case the average ROE increases as the
 25 first five firms are added, three of which are banks, after which it decreases until it levels off at
 26 about 10%. All of the firms are shown in Schedule 4 with their average ROEs.

27
 28 Reasonable screens can be devised to remove some of the other poorly performing firms. One
 29 inappropriate way is to rank firms based on the coefficient of variation. This is simply

30

$$COV = \frac{STDEV}{AveROE}$$

Ranking by COV automatically chooses firms with both a low standard deviation in their ROE, thereby cutting out firms with significant losses, as well as having high average ROEs. The COV is frequently justified as a “risk” screen. In Schedule 4 the TSX60 firms are ranked according to COV. If the top twenty firms from the TSX60 are selected based on the lowest COV, with firms with negative COVs removed, then the average for this 20 firm sample is 14.86%. If a broader sample is needed then a thirty firm sample down to including BCE would have an average of 13.88%. It is then possible to say that the selection procedure is robust and a comparable sample of firms would have an average ROE of no less than 13%.

However, as I have indicated the selection process automatically removes all the firms with low profitability. To see this note that a low COV is equivalent to a high inverse of the COV, that is average ROE per unit of risk. As a result choosing firms with low COV is exactly the same as choosing firms with the highest average ROE given their risk, that is, the best performing firms in Canada. For this as well as the above reasons comparable earnings estimates of average accounting ROEs are unrelated to the investor’s opportunity cost.

The Fair ROE Standard

It is for the above reasons that most economists ignore accounting rates of return and go directly to the capital markets for an assessment of what constitutes a fair rate of return. From economic theory, the objective of rate of return regulation is that the owners of the firm should not earn excess rates of return from the exercise of monopoly power, nor be penalised by the act of regulation. This economic proposition has been reinforced by legal precedent. In *Northwestern Utilities vs. City of Edmonton* (1929), it was stated that a utility's rates should be set to take into account "changed conditions in the money market."

A fair rate of return was further confirmed in *BC Electric* (1960) when Mr. Justice Lamont's definition of a fair rate of return, put forward in *Northwestern utilities*, ie.,

1
2 "that the company will be allowed as large a return on the capital invested in the
3 enterprise as it would receive if it were investing the same amount in other
4 securities possessing an attractiveness, stability and certainty equal to that of the
5 company's enterprise."
6

7 was adopted. This definition is what economists refer to as an opportunity cost. Only if the
8 owners of a firm earn their opportunity cost will the returns accruing to them be fair, i.e., will the
9 return neither reward the owners with excessive profits, nor reward the ratepayers by charging
10 them prices below the cost of providing the service. Hence, the opportunity cost is from
11 economic theory, as well as the Northwestern Utilities decision, a fair rate of return.
12

13 Of note is that Mr. Justice Lamont's definition includes three critical components:
14

15 (1) *The fair return should be on the "capital invested in its enterprise*
16 *(which will be net to the company)"*
17

18 This means that the return should be applied to the capital actually "invested" in the company,
19 which is normally interpreted as the "book value" of the assets, and not their market value. The
20 reason for this is that the latter (market values) changes as a result of the regulatory decision and
21 has little connection with the actual capital invested in the firm. As a result, Mr. Justice Lamont's
22 definition is normally interpreted as the original historic cost rate base. Only this represents the
23 actual money invested in the regulated utility.
24

25 (2) *"other securities"*
26

27 Mr. Justice Lamont specifically states that the alternative investment should be other securities,
28 and not the book value investment of other companies. This was a natural outgrowth of the
29 *Northwestern Utilities Limited* decision that was concerned with the authority of the Board to
30 change the allowed rate of return to reflect "changed conditions in the money market." In 1929
31 the term "money market" had a broader interpretation than its current use; "capital market"
32 would be closer to today's terminology.
33

1 The motivation for the definition was clearly the desire to change the allowed rate of return to
2 reflect the changes in "market opportunities." This is equivalent to the standard economic
3 definition of a market opportunity cost. The return should be equivalent to what the stockholders
4 could get if they took their utility investment (at book value) and invested it elsewhere. Clearly
5 this utility investment can only be invested at market prices, since the utility investor cannot
6 invest elsewhere at book value! Hence, the opportunity cost has to be measured with respect to
7 market rates of return. In particular, there is no basis for allowing a utility investor a return
8 equivalent to the accounting rate of return earned elsewhere.

9

10 (3) *"attractiveness, stability and certainty"*

11

12 These words clearly articulate what a financial economist would call a risk-adjusted rate of
13 return. Even in 1929 it was obvious that investors required higher rates of return on risky
14 investments, than on relatively less risky ones.

15

16 Further in *Federal Power Commission et al v. Hope Natural Gas Co.* [320U.S.591, 1944], the
17 United States Supreme Court decided that a fair return

18

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

21 Financial integrity is critical for a utility. Since the equity holders have made a "sunk"
22 investment, it is possible for subsequent regulated decisions to deprive the stockholders of a
23 reasonable return and thus make it very difficult to access the market for new capital. Financial
24 integrity is thus equivalent to the ability to attract capital and fair treatment to investors. The
25 investor's "market opportunity cost" accomplishes these additional objectives, since by definition
26 the opportunity cost is the rate that the investor can earn elsewhere. Thus it is a rate that attracts
27 capital and if the company can attract capital on reasonable terms it can maintain its financial
28 integrity. The upshot of these remarks is that Mr. Justice Lamont's definition of a fair rate of
29 return is essentially a *market based investor opportunity cost*.

30

1 By basing regulation on the investor's opportunity cost of capital, as defined by Mr. Justice
2 Lamont, not only is the economic objective of regulation attained, but so too is the need for the
3 return to be fair, since this is the rate at which equity capital can be raised. The obvious need to
4 maintain the credit and financial integrity of the firm is also preserved, since the firm is offering
5 a competitive rate of return and attracting capital. This is why most economists would base a
6 regulated firm's fair level of profits on the external investor's opportunity cost, as actually
7 determined in the market, and not on an accounting rate of return that is not immediately tied to
8 conditions in the "money market". The opportunity cost principle embodies all of the fairness,
9 capital attraction and financial integrity issues of concern for equitable regulation.

10

11 In its 1999 Decision, this Commission stated:³

12

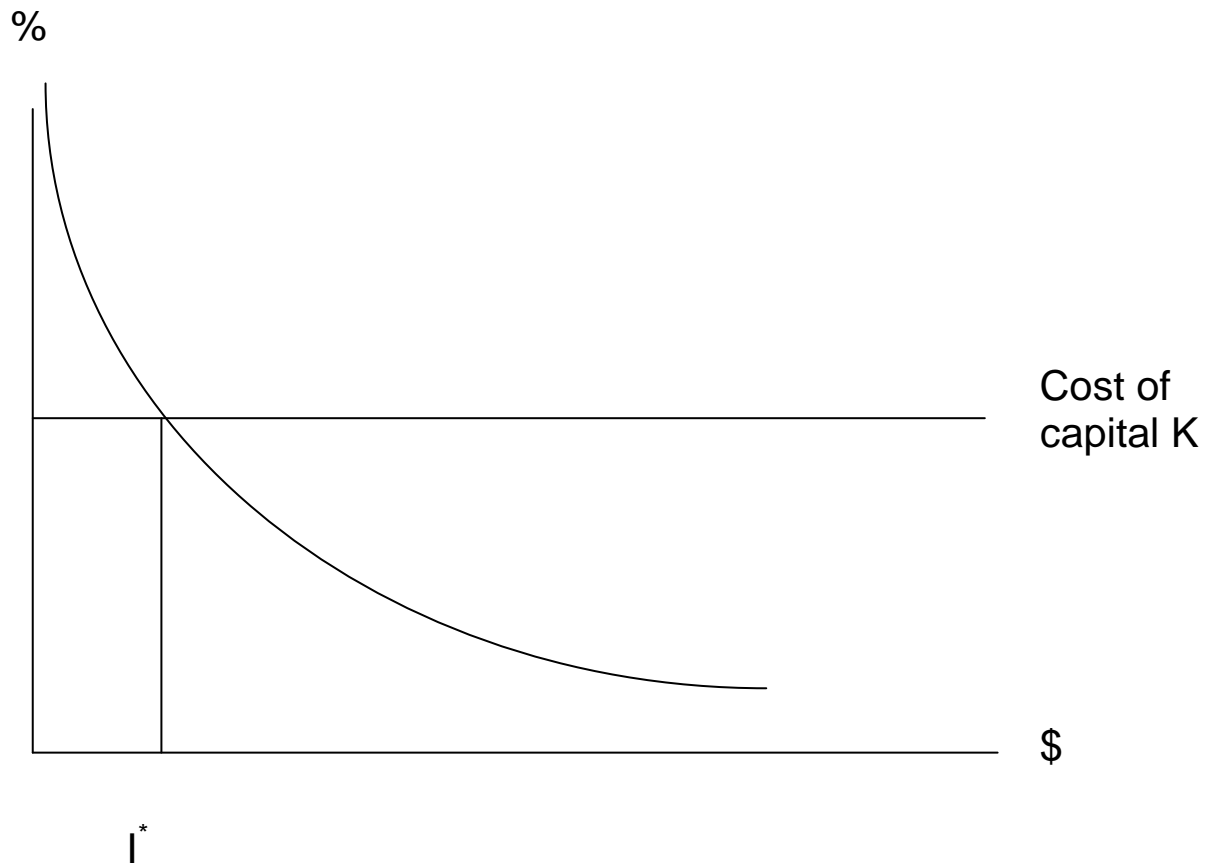
13 “In its 1994 Decision, the Commission expressed concerns that the Comparable Earnings
14 test does not measure the opportunity cost of capital (Decision dated June 10, 1994)
15 which the approved ROE should reflect. Although the Decision did not specifically set
16 out the reasons for the Commission’s concerns, it referenced concerns raised by
17 witnesses for customer groups at that hearing. These included measurement concerns
18 related to the use of accounting data and sensitivity to sample selection. The evidence
19 brought forward by the Utilities at this hearing has not alleviated those concerns.”

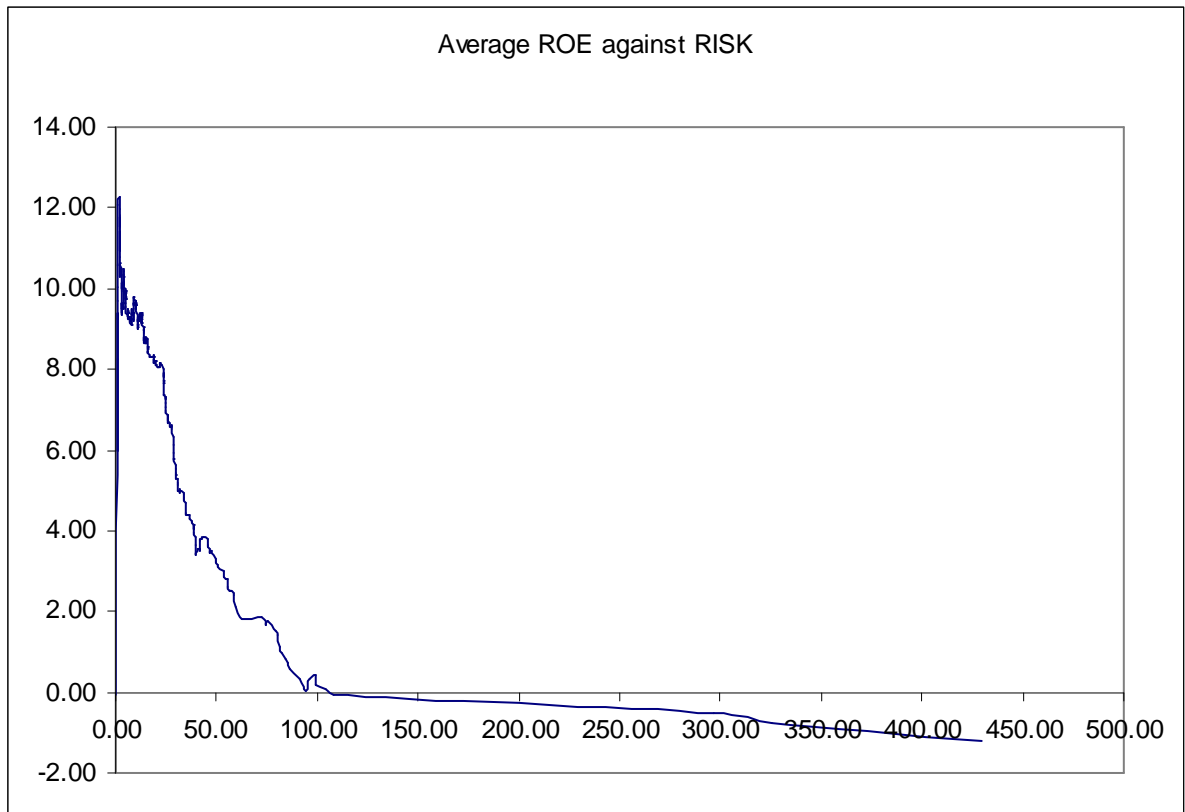
20

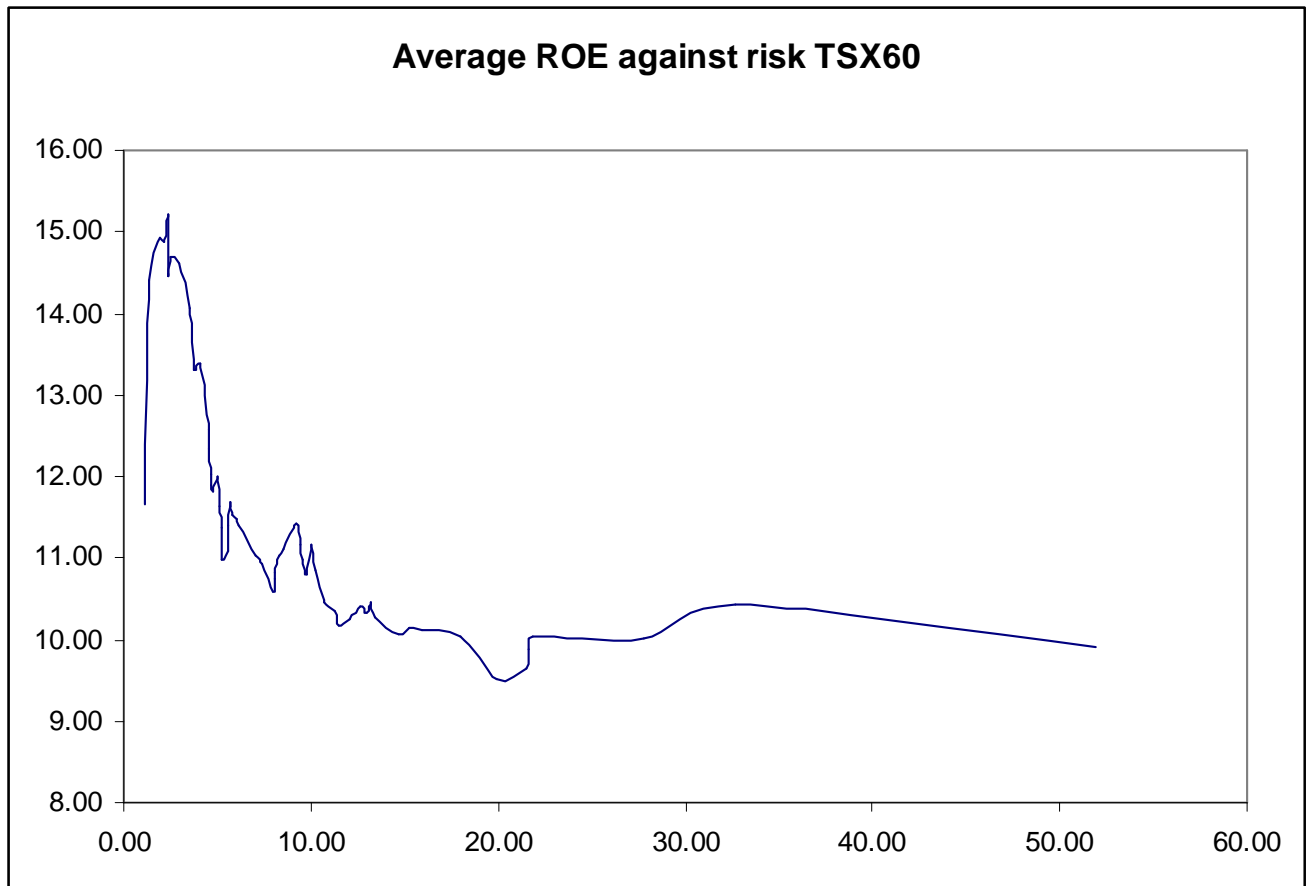
21 In my judgment the BCUC correctly addressed the long standing concerns expressed by myself
22 (along with the late Dr. Michael Berkowitz) and other witnesses that comparable earnings
23 estimates, as normally represented, are incompatible with economic theory and the legal
24 requirement to award a fair ROE.

³ Decision G-80-99, British Columbia Utilities Commission, August 26, 1999, pg. 15.

Average vs Marginal ROE







Schedule 4

<u>Placer Dome Inc.</u>	4.82	-4.03	-15.58	5.47	2.18	-17.09	-11.38	5.24	9.54	10.21	-9.67	
<u>Nortel Networks Corp</u>	13.11	14.9	17.44	-7.22	-1.72	-14.54	-147.47	-73.33	3.94	-2.43	-2.63	
<u>Celestica Inc.</u>	n/a	0	-2.44	-7.93	5.44	7.85	-1.33	-10.16	-6.91	-28.68	-2.18	
<u>Kinross Gold Corporat</u>	6.26	3.16	-21.57	-48.33	-42.02	-32.64	-13.36	-10.22	0.29	n/a	-1.13	
<u>Royal Bank of Canada</u>	16.43	17.49	19.03	18.3	15.72	19.36	16.47	15.96	16.89	15.88	0.08	17.15
<u>Canadian Tire Corpore</u>	10.18	10.39	11.44	13.04	11.2	10.56	11.53	11.87	12.84	13.61	0.10	14.41
<u>Bank of Montreal</u>	15.47	17.03	17.02	15.21	14.08	17.94	13.99	13.37	16.28	19.63	0.12	11.67
<u>The Bank of Nova Sco</u>	14.18	15.71	19.72	15.29	15.46	17.45	17.15	12.85	17.62	20.3	0.14	13.83
<u>Enbridge Inc.</u>	16.91	14.47	14.04	13.25	13.35	15.65	14.9	10.11	17.31	16.43	0.15	14.75
<u>Loblaw Companies Lin</u>	13.32	14.22	15.33	12.78	13.68	15.69	16.82	18.93	19.08	19.08	0.16	14.72
<u>National Bank of Cana</u>	11.03	14.29	14.02	12.14	14.66	15.22	16.47	8.22	16.3	18.59	0.21	14.96
<u>TransCanada Corpora</u>	13	12.33	11.25	7.04	7.42	8.44	10.89	11.93	12.15	14	0.22	14.81
<u>Magna International In</u>	21.78	15.75	20.86	11.63	11.03	13.45	12.34	10.66	10.99	13.38	0.29	14.25
<u>George Weston Limite</u>	12.87	15.09	14.48	32.33	14.02	17.42	18.47	18.27	19.45	14.72	0.32	14.24
<u>Suncor Energy Inc.</u>	13.97	15.75	16.84	12.88	9.72	15.21	13.79	23.54	27.76	23.34	0.33	14.62
<u>Canadian Imperial Bar</u>	12.85	16.73	17.72	10.5	10.02	20.75	16.39	5.22	19.15	19.3	0.34	14.89
<u>MDS Inc.</u>	10.33	12.87	13.93	11.14	13.71	11.65	6.01	8.09	5.04	4.65	0.36	14.89
<u>Cognos Incorporated</u>	25.94	37.62	37.19	35.67	26.89	23.78	4.86	20.6	17.3	23.44	0.40	14.46
<u>Manulife Financial Cor</u>	n/a	n/a	0	12.82	14.03	15.73	14.95	16.17	17.43	15.93	0.42	15.29
<u>Imperial Oil Limited</u>	8.64	15.01	18.93	12.94	13.51	32.42	28.43	25.1	30.61	33.92	0.42	15.16
<u>The Thomson Corpore</u>	22.66	14.18	12.63	8.77	6.36	8.2	8.67	7.21	9.49	9.08	0.45	15.61
<u>Precision Drilling Corp</u>	17.77	17.5	22.39	7.29	4.08	12.44	14.33	6.19	11.66	12.27	0.45	15.31
<u>Dofasco Inc.</u>	11.41	11.39	10.75	9.84	14.39	10.33	1.43	6.6	6.21	18.56	0.46	15.15
<u>EnCana Corporation</u>	10.98	15.26	13.16	5.68	12.24	29.36	32.23	13.71	21.34	17.28	0.48	14.86
<u>TransAlta Corporation</u>	14	13.24	12.84	16.41	4.88	8.14	7.23	2.31	8.67	5.97	0.49	14.98
<u>Canadian Natural Res</u>	9.95	12.1	9.77	4.76	12.63	30.62	19.71	13.04	25.62	20.91	0.51	14.70
<u>Alcan Inc.</u>	11.81	8.62	9.61	7.61	8.4	8.53	-0.03	4.32	2.98	2.33	0.59	14.76
<u>Brascan Corporation</u>	5.94	7.2	20.9	10.06	9.8	8.41	6.35	1.42	12.12	19.25	0.59	14.38
<u>Sun Life Financial Inc.</u>	n/a	n/a	n/a	0	2.84	10	12.23	9.14	9.06	11.84	0.59	14.20
<u>Petro-Canada</u>	6.49	7.28	8.04	2.42	5.81	20.59	18.73	17.98	24.73	21.35	0.60	13.93
<u>The Toronto-Dominion</u>	14.32	15.12	16.39	14.9	31.96	8.89	11.3	-1.36	8.55	18.41	0.61	13.91
<u>Canadian Pacific Railw</u>	n/a	n/a	n/a	0	2.1	15.89	12.25	15.21	11.29	10.79	0.64	13.91
<u>Nexen Inc.</u>	16.07	18.51	11.72	-8.42	3.87	34.68	24.44	19.24	24.51	29.52	0.72	13.75
<u>BCE Inc.</u>	6.89	10.47	14.38	44.93	38.14	4.99	14.79	13.6	15.31	12.34	0.75	13.88
<u>Quebecor World Inc.</u>	11.93	11.4	10.84	11.6	4.04	13.06	0.02	11.75	-3.16	5.05	0.75	14.01
<u>CP Ships Limited</u>	n/a	n/a	n/a	0	10.09	16.3	7.01	3.88	4.25	5.21	0.78	13.80
<u>Shoppers Drug Mart C</u>	n/a	n/a	n/a	n/a	0	2.45	1.96	13.76	14.96	15.77	0.91	13.57
<u>Abitibi-Consolidated In</u>	38.27	22.27	14.05	18	14.75	15.99	9.09	-1.48	6.11	-3.97	0.91	13.40
<u>Husky Energy Inc.</u>	n/a	n/a	n/a	0	69.23	21.85	15.5	15.96	23.29	16.27	0.94	13.39
<u>Cameco Corporation</u>	8.1	10.11	5.27	2.43	3.72	-4.71	3.1	2.51	10.06	12.73	0.95	13.68
<u>Biovail Corporation</u>	52.49	90.36	62.71	71.72	25.69	12.74	7.56	15.43	-3.19	4.02	0.96	13.44
<u>Agrium Inc.</u>	33.89	29.86	27.75	16.98	7.53	8.95	-7.08	-1.46	-4.04	27.43	1.09	14.01
<u>CAF Inc.</u>	36.66	29.45	27.81	25.16	25.28	31.94	27.58	19.14	8.04	-38.81	1.13	14.01
<u>Talisman Energy Inc.</u>	2.17	5.1	3.6	-11.76	5.6	24.26	19.31	11.45	20.82	13.36	1.14	14.15
<u>Fairmont Hotels & Res</u>	n/a	n/a	n/a	n/a	n/a	0	-0.91	6.84	3.44	9.75	1.18	14.03
<u>ATI Technologies Inc.</u>	14.26	20.45	26.93	56.58	33.96	-12.14	-7.49	-7.14	5.23	24.91	1.39	13.77
<u>TELUS Corporation</u>	n/a	n/a	n/a	0	8.14	8.61	-2.25	-3.58	4.95	8.28	1.53	13.82
<u>Potash Corporation of</u>	14.36	15.79	16.36	11.15	-18.66	9.96	5.91	2.57	-6.21	13.7	1.73	13.57
<u>Bombardier Inc.</u>	9.27	20.66	16.74	18.27	21.61	28.1	10.25	-21.49	-9.14	-5.45	1.79	13.40
<u>Domtar Inc.</u>	36.27	-8.56	1.91	5.07	9.59	15.47	7.16	5.69	-8.28	-2.08	2.09	13.30
<u>Teck Cominco Limited</u>	7.8	18.24	-12.22	-3.75	3.13	5.14	-0.99	1.18	5.93	19.89	2.16	13.14
<u>NOVA Chemicals Corp</u>	n/a	0	8.29	1.2	14.09	15.23	-10.24	-8.06	-0.07	15.82	2.44	12.96
<u>Canadian National Rai</u>	-43.97	5.29	14.52	2.83	12.11	13.58	11.86	8.7	11.2	18.76	3.27	12.77
<u>Cott Corporation</u>	-8.32	9.68	-0.22	-62.38	22.34	21.67	22.58	32.1	27.33	17.46	3.38	12.61
<u>Falconbridge Limited</u>	12.12	5.25	3.35	-0.47	4.28	7.1	-3.07	-23.58	0.49	20.69	4.38	12.52
<u>Barrick Gold Corporati</u>	10.5	6.76	-3.6	8.7	8.55	-21.35	6.1	4.15	2.63	-1.91	4.58	12.33
<u>Shaw Communication</u>	6.25	15.09	0.04	0.51	1.33	3.84	-6.6	-10.87	-3.33	2.03	8.56	12.12
<u>Inco Limited</u>	12.77	5.97	-0.52	-4.39	-0.12	9.69	6.04	-37.06	3.03	14.35	14.99	11.91
<u>Research In Motion Li</u>	0	0.2	0.57	6.15	5.07	-1.02	-3.2	-18.8	4.28	11.53	16.76	11.70
<u>Rogers Communicatio</u>	0	0	0	0	0	13.58	-32.34	17.65	8.19	-2.16	27.19	11.49

ROEs from 1995 until 2004 are in the columns from left to right, followed by the COV and average ROE for a sample of increasing COV firms.

APPENDIX C

DISCOUNTED CASH FLOW ESTIMATES FOR US UTILITIES

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

$$9 \quad P_0 = \sum_{t=1}^{\infty} \frac{C_t}{(1+K)^t}$$

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

11
12 Once we estimate the stream of future cash inflows, we can equate them to the current price and
13 solve for the investor's required rate of return. For example, this is the standard way of valuing
14 bonds. At the end of every business day investment banks simply take the coupon payments on a
15 bond and its terminal value, and use the last trading value for the bond to solve the above
16 equation for the bond's "yield to maturity." This yield to maturity is then published in the
17 newspaper as an objective measure of the investors' required rate of return for a default free
18 security. I already use this DCF estimate as part of my risk premium estimates. However, we can
19 take this a stage further and estimate the DCF required return on equity directly using this same
20 procedure.

21
22 The expected equity cash flows are the future expected dividends. Unlike the stream of cash
23 flows on a bond the dividends are not contractual and are more difficult to forecast, particularly
24 for individual stocks. Consequently the DCF model is only used for low risk dividend paying
25 stocks or the market as a whole, where the expected dividends can be assumed to grow at some

1 long run average growth rate g . In this case, each dividend is expected to grow at the rate g , so
2 we can substitute $d_1 = d_0 * (1+g)$ into the valuation equation to get:

3

$$4 \quad P_0 = \frac{d_1}{K - g}$$

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

$$8 \quad K = \frac{d_1}{P_0} + g$$

9

10 which states that the investor's required rate of return can be estimated as the expected dividend
11 yield plus the expected growth rate in dividends. This is the direct analogy with the yield to
12 maturity on a bond.

13

14 Further it is straightforward to show that increased dividends have to come from increased future
15 earnings, which are generated by the firm retaining some of its current earnings for re-
16 investment. If we set X as the earnings per share and denote b as the fraction of earnings retained
17 within the firm, then $(1-b)X$ is the dividend and bX , the retained earnings. Provided the
18 assumptions of the DCF model hold, it is straightforward to show that dividends and earnings
19 will then grow at a long run growth rate estimated as the product of the firm's retention rate (b)
20 and its return on common equity (r). Note that while K is the return that investor's require, that is
21 the fair return, r is the actual return on equity the firm is expected to earn.

22

23 An example may help to make these assumptions clear. Suppose, as in Schedule 1, the firm's
24 book value per share is \$20 and its return on equity expected to be 12%. In this case, its earnings
25 per share are expected to be \$2.40 and with a 50% dividend payout rate, its dividends per share
26 and retained earnings are both expected to be \$1.20. Moreover, since \$1.20 has been retained
27 and reinvested within the firm, next period's book value per share increases to \$21.20. As a

1 result, the firm is expected to earn \$2.544 in the following year, i.e., 14.4 cents more. This
2 additional 14.4 cents comes from earning the 12% return on equity on the \$1.20 of retained
3 earnings. The increase in earnings per share, dividend per share and retained earnings is 6% each
4 year and is calculated directly as the product of the firm's return on equity of 12% and its
5 retention rate of 50%. Moreover, the value of the firm's common stock can be calculated from
6 equation (1), which also increases at this 6% rate, since only the dividend per share is expected to
7 change.

8
9 The importance of Schedule 1 is in showing some of the implications of the dividend growth
10 model. First, note that if the investor's fair rate of return is 10%, the stock price in Schedule 1 is
11 \$30, determined as the expected dividend of \$1.20 divided by the discount rate minus the growth
12 rate (or 0.04). This price exceeds the book value of \$20 by 50%. This is because the firm's return
13 on equity (r) is 12% and the investor's required or fair rate of return (K) is only 10%. This is the
14 reason why economists look at market-to-book ratios to infer the investor's opportunity cost. If
15 market-to-book ratios exceed one for a regulated company, most economists immediately assume
16 that the firm's return on equity exceeds the return required by stock holders, implying that the
17 regulator should lower the firm's allowed rate of return.

18
19 Second, it is the return on equity that drives the growth in both dividends per share and earnings
20 per share, provided that the dividend payout is constant. If the dividend payout is gradually
21 increased over time, then it is possible to manufacture a faster growth rate in dividends than
22 earnings per share, from the same underlying level of profitability.

23
24 For example, in Schedule 2 the same data is used as in Schedule 1 except that the dividend
25 payout starts at 50% and then increases by 2% per year. By the end of year 5 earnings per share
26 have only risen to \$2.99 instead of the \$3.03 in Schedule 1, because less money has been
27 reinvested within the firm. As a result, there is less capital to generate earnings. Thus the
28 earnings in Schedule 2 only grow at a 5.6% compound growth rate, down from the 6% of
29 Schedule 1. Conversely, since more of the earnings are being paid out as dividends, dividends per

1 share are up to \$1.73 instead of \$1.52. This is a 9.6% compound growth rate, rather than the 6%
2 in Schedule 1.

3
4 In the short-run, Schedule 2 demonstrates that the growth in dividends per share can be
5 artificially manipulated by increasing the dividend payout. This is not sustainable in the long run,
6 since the dividend payout cannot be increased indefinitely. Moreover, the manipulation can be
7 detected by performing the basic 'diagnostic' check of tracking the behaviour of the firm's
8 dividend payout over time, and the firm's return on equity. However, if the analyst is not aware of
9 the change in the dividend payout, estimating the fair rate of return by adding this manipulated
10 dividend growth rate to the expected dividend yield will overstate the investor's required rate of
11 return. It is important in this case to base the estimate of the investor's required rate of return on a
12 long run sustainable growth rate, estimated from the underlying growth in earnings and dividends
13 and the two components of growth.

14
15 The third implication of Schedule 1 is that the DCF estimate using the historic growth rate is
16 appropriate only when the assumptions of the model hold. This means that non-dividend paying
17 firms, firms with highly fluctuating earnings and dividends, and firms with non-constant
18 expected growth cannot be valued accurately using the formula. Usually these assumptions hold
19 for regulated utilities, so the DCF estimate is particularly appropriate for use in determining the
20 fair rate of return for a regulated utility. However, for non-regulated firms, these assumptions are
21 frequently violated. As a result, estimating the investor's required rate of return by using the
22 formula $K = d_1/P_0 + g$, is tenuous and subject to measurement error.

23
24 In Schedule 3 is data for US utilities from the Standard and Poors Analyst's handbook.¹ The basic
25 data includes dividends, earnings, book value per share, average market values and the return on
26 equity. From this it is possible to calculate several pieces of useful information. First, is the
27 average payout of dividends, which is in the fourth column and its inverse, the retention rate.
28 Clearly, utilities as low risk and low growth investments have relatively high payouts: in only
29 one of the 27 years is the payout less than 50% and the average payout is 71%. However, the

1 Equivalent data is not available for Canadian utilities

1 payout tends to increase during recessions, such as those of the early 1990s and 2000s when
2 earnings are depressed and dividends not cut proportionately. This produces some artificially
3 high numbers. In contrast to the average which is skewed by outliers the median is simply the
4 middle number, which indicates a payout rate of 66% and a retention rate of 34%.

5
6 The very high dividend payout means that the growth potential for these utilities is low, which
7 reduces the error in using the DCF model. We can estimate this growth rate by assuming that
8 each year the utility is expected to earn its current ROE in the future so that its earnings will
9 grow by the retention rate times this ROE. For example, in 1978 the retention rate was 36.87%
10 and the ROE 12.09% implying future earnings growth of 4.46%. This is the $g (B*ROE)$ in
11 column 7. For 1978 the dividend yield for the S&P Utilities was 8.24% (column 8), so that the
12 sum of the expected dividend yield plus this growth rate was 13.06%, which is the estimate of
13 the required rate of return in column 10. In 1978 the average long US Treasury yield was 8.41%
14 (10+ years) implying that the utility risk premium was 4.65%.

15
16 Column 11 gives the market to book ratio for these utilities, which in 1978 was 0.91, implying
17 that at that time the utilities were not expected to earn their fair rate of return. During this period
18 utilities were under significant pressure as inflation was rampant and most of these utilities were
19 on historic test years. This implied significant regulatory lag that exposed utilities to inflation
20 risk. Subsequently, two factors have largely removed this risk: the decline in inflation and the
21 adoption of forward test years. It is not obvious that utility risk premiums were adjusted
22 downwards as a result of the adoption of a forward test year or the removal of this risk. Notice
23 that the market to book ratio clearly started to increase in the mid 1980's as long US treasury
24 yields and expected inflation rates collapsed.

25
26 Over this whole period the average utility risk premium is 2.20% and the median 2.42%.
27 However, the br growth rate is sensitive to the actual earnings which affect the retention rate and
28 may not capture the full amount of growth expectations. To check for this the last two columns
29 estimate the utility risk premium with two alternative growth expectations. URP2 assumes that

1 the expected ROE is the long Treasury yield plus 4.0%, which avoids the problem of fluctuating
2 earned returns. URP3 also assumes that the retention rate is a constant 33%, instead of varying
3 period by period. In this way we avoid the problem of declining retention rates as earnings have
4 been squeezed. These assumptions tend to be conservative. URP3 assumes a higher ROE than
5 was often earned, while assuming a constant 33% retention rate allows both the higher dividend
6 yield that results from a higher payout without penalising growth expectations. Both of these
7 assumptions naturally increase the estimate of the average utility risk premium. The average
8 URP2 is 2.09% with a median value of 2.65% and the average URP3 is 1.97% with a median
9 value of 1.98%.

10

11 A final check on the reasonableness of the values is to note that the average (median) ROE for
12 the utilities over the while period was 11.75% (12.15) while the average (median) US treasury
13 yield was 7.97% (7.68%) so the excess return of the earned ROE over the Treasury yield was
14 3.78% (4.47%). Were investors happy with this? We can tell that they were, since the market to
15 book ratio averaged 1.43 (1.45). Consequently risk premiums of the order of 1.97%-2.65% for
16 US utilities over ten year US government bond yields seem reasonable. This range of risk
17 premiums would be higher than that needed for Canadian utilities, all else constant, since we
18 would estimate the risk premium over the 30 year Canada yield, which is normally higher than
19 the ten year yield.

SCHEDULE 1

<u>YEAR</u>	<u>BEGINNING BOOK VALUE PER SHARE</u>	<u>EARNINGS PER SHARE</u>	<u>DIVIDEND PER SHARE</u>	<u>RETENTIONS PER SHARE</u>
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

<u>YEAR</u>	<u>BEGINNING BOOK VALUE PER SHARE</u>	<u>EARNINGS PER SHARE</u>	<u>DIVIDENDS PER SHARE</u>	<u>RETENTIONS PER SHARE</u>
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%

S&P US Utility Data

	EPS	DPS	PAYOUT	RETAIN	ROE	g (B*ROE)	YIELD	US TSY	K	MB	URP	URP2	URP3
1978	6.7	4.23	63.13	36.87	12.09	4.46	8.24	8.41	13.06	0.91	4.65	4.78	3.72
1979	6.99	4.53	64.81	35.19	12.23	4.31	9.06	9.44	13.76	0.86	4.31	4.78	3.87
1980	7.25	4.8	66.21	33.79	12.38	4.18	9.87	11.46	14.47	0.82	3.01	4.15	3.34
1981	8.22	5.24	63.75	36.25	13.57	4.92	10.01	13.84	15.42	0.84	1.58	3.28	1.86
1982	8.42	5.52	65.56	34.44	13.38	4.61	9.86	13.91	14.92	0.88	1.01	2.72	1.65
1983	9.28	5.9	63.58	36.42	14.13	5.15	9.04	11.11	14.65	0.97	3.55	3.93	2.71
1984	10.11	6.33	62.61	37.39	14.19	5.31	9.08	12.44	14.87	0.93	2.43	3.35	1.84
1985	9.47	6.74	71.17	28.83	12.40	3.58	8.03	10.62	11.89	1.08	1.26	1.96	1.98
1986	10.08	7.03	69.74	30.26	12.73	3.85	6.56	7.68	10.67	1.33	2.99	2.65	2.49
1987	10.42	7.42	71.21	28.79	12.77	3.68	6.88	8.38	10.80	1.31	2.42	2.30	2.33
1988	10.07	4.65	46.18	53.82	12.00	6.46	4.31	8.85	11.05	1.27	2.20	2.68	-0.65
1989	10.41	7.88	75.70	24.30	12.15	2.95	5.89	8.50	9.02	1.55	0.52	0.61	1.23
1990	9.63	8.27	85.88	14.12	11.11	1.57	5.86	8.55	7.52	1.62	-1.03	-0.82	1.16
1991	8.65	8.43	97.46	2.54	10.03	0.26	5.84	7.86	6.11	1.69	-1.75	-1.70	1.62
1992	10.48	8.49	81.01	18.99	12.33	2.34	5.71	7.01	8.18	1.76	1.17	0.91	2.07
1993	9.87	6.49	65.75	34.25	9.99	3.42	5.34	5.87	8.95	2.07	3.07	3.03	2.49
1994	10.52	6.5	61.79	38.21	14.08	5.38	6.05	7.08	11.76	1.43	4.68	3.46	2.38
1995	10.58	6.48	61.25	38.75	13.77	5.34	5.74	6.58	11.38	1.44	4.80	3.50	2.40
1996	11.26	6.54	58.08	41.92	14.08	5.90	5.31	6.44	11.53	1.51	5.09	3.48	2.06
1997	9.29	6.48	69.75	30.25	11.31	3.42	4.94	6.35	8.53	1.59	2.17	1.87	1.73
1998	8.62	6.4	74.25	25.75	10.47	2.70	4.12	5.26	6.93	1.90	1.67	1.34	1.66
1999	9.02	6.22	68.96	31.04	10.98	3.41	4.09	5.64	7.64	1.85	2.00	1.56	1.36
2000	7.12	6.15	86.38	13.62	8.60	1.17	3.45	6.03	4.67	2.14	-1.36	-1.16	0.43
2001	9.79	5.22	53.32	46.68	11.84	5.53	3.02	5.02	8.71	2.10	3.69	2.34	0.69
2002	3.36	4.97	147.92	-47.92	4.40	-2.11	4.33	4.61	2.13	1.62	-2.48	-4.58	2.33
2003	5.97	4.27	71.52	28.48	8.44	2.40	4.16	4.02	6.67	1.45	2.65	2.53	2.57
2004	8.75	4.8	54.86	45.14	11.77	5.31	3.76	4.27	9.27	1.64	5.00	3.36	1.97
Average			71.18	28.82	11.75	3.68	6.24	7.97	10.17	1.43	2.20	2.09	1.97
Median			66.21	33.79	12.15	3.85	5.84	7.68	10.67	1.45	2.42	2.65	1.98

URP assumes actual br growth, URP2 assumes that the expected ROE is the Treasury yield plus 4.0% and URP3 also assumes retention at 33%. Source data is from Standard & Poors Analyst's Handbook 2005 and 2000 editions.

1 **APPENDIX D**

2

3 **INTERNATIONALISATION AND ITS IMPACT ON THE MARKET RISK PREMIUM**

4

5 **I: The Trend in International Investment**

6

7 We are much more aware of international investment opportunities now than say twenty years
8 ago. The world used to be characterized by currency restrictions, investment controls and very
9 limited international investing opportunities. Now most currencies are freely convertible,
10 investment restrictions have been removed and there has been an increase in the coverage of
11 international stocks among investment advisors. This latter coverage has been enhanced by
12 international collaboration between investment banks and the growth of some major international
13 investment banks.

14

15 These changes have been mirrored in Canada's international investment position. In Schedule 1
16 is a graph of the inbound and outbound investment in Canada by both direct foreign investment
17 (FDI) and investment in stocks (portfolio investment). FDI consists of investment by
18 corporations in foreign assets, whereas portfolio investment is investment by institutions and
19 individuals in foreign securities. In both cases, the investment involves claims on foreign income,
20 but only FDI involves control. For both series investment has been deflated by dividing through
21 by nominal gross domestic product (GDP). The data is that tracked by Statistics Canada since
22 1990. Several conclusions are obvious:

23

- 24 • There has been increasing international investment both in and out of Canada
25 since 1990;
- 26 • FDI is significantly more important than portfolio investment, normally of the
27 order of 2-3X as large;
- 28 • The importance of foreign portfolio investment has increased proportionately
29 more than FDI,
- 30 • All values for international investment both in and out of Canada have fallen off
31 from the peaks in the early 2000s.

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

The data underlying schedule 1 clearly indicate that Canadians are investing more abroad. With the removal of the 30% restriction on foreign investment in tax advantaged pension plans (including RRSPS) this trend should increase despite the drop off from the highs of two or three years ago. However, it is of interest to see where this investment has gone. Schedule 2 graphs the share of outward investment going to the US and elsewhere, whereas the graph in Schedule 3 tracks the inward share from the US. Again there are several conclusions:

- For outward investment just fifteen years ago over 60% of FDI and 80% of Canadian portfolio investment was going to the US;
- The trend over the last fifteen years, however, has been for the US to lose its share of outward Canadian investment;
- By 2005 the US share of Canadian outward portfolio investment was barely 50%, whereas the US FDI share had dropped significantly below 50%;
- For inward investment the picture is completely different; the US remains by far the dominant investor with 65% of inward FDI and 90% of portfolio investment in Canadian stocks.

The picture that emerges from looking at the composition of Canadian FDI and portfolio investment in stocks is that Canadian investors have diversified away quite dramatically from the reliance on the US that was typical as recently as fifteen years go. If an external risk return yardstick is relevant it is clear from the data that this is no longer the US. However, what is clear is that the internationalisation of the world's capital markets is affecting Canadian investors.

II: The Impact of Internationalisation on the Required Rate of Return

If markets are increasingly becoming global, or international, the key question is: how is the risk return trade-off and the market risk premium affected? To understand this we have to understand

1 that there are several effects at work.¹ First, prices are determined by a different set of investors,
2 it is no longer purely Canadian investors that are determining the prices of Canadian securities
3 and vice versa for the US and elsewhere. Cohn and Pringle show that for normal utility functions
4 describing investor behaviour the price of risk will fall as markets become more integrated.
5 Second, all stocks become less risky. This is because purely domestic factors get diversified away
6 in an international portfolio and as a result, the total market risk is smaller.² This means, for
7 example, that if a cabinet minister resigns in disgrace in the UK and the UK market is off 3%, an
8 internationally diversified portfolio would be much less affected. This is a domestic risk that
9 would be priced in a domestic portfolio, but not an internationally diversified portfolio. In the
10 limit, as portfolios become internationally diversified, they become much less risky. Finally, the
11 systematic component of risk should also fall as markets become more international. As a result,
12 holding everything else constant, the market risk premium for an internationally diversified
13 portfolio is much smaller than for the same securities held by their respective domestic investors
14 alone.

15

16 Cohn and Pringle summarise the above three components with the statement (page 111)

17

18 “These two effects both operate in the direction of reducing the required return $E(R_t)$ and
19 concomitantly raising the price of individual securities.

20

21 Further they conclude (page 116)

22 “The relatively high ex post returns provided by internationally diversified
23 portfolios of securities may well be related to market imperfections. If current restrictions
24 on international capital flows, to say nothing of other market imperfections, were
25 removed, returns on internationally diversified portfolios would be expected to decline
26 relative to the risk-free rate of interest. More importantly, the equilibrium rate of
27 exchange of risk and return should decline for most countries, non-diversifiable risk
28 should decline for most projects, and the resulting reduction in the risk premium

1 1 R. Cohn and J. Pringle, “Imperfections in International Financial Markets: Implications for Risk and the Cost of Capital to Firms,” *Journal of Finance*, March 1973, pp 59-66, is the classic reference.

2 B. Solnick, “The Advantages of International Diversification”, *Financial Analyst’s Journal*, July-August 1974, showed that an internationally diversified portfolio was about half as risky as a simple US diversified portfolio.

1 component of the cost of capital to firms should improve the efficiency of real capital
2 allocation.”

3
4 As the quote from Cohn and Pringle indicates financial theory tells us that investors should
5 diversify internationally. The reason for this is **not** that returns are necessarily higher, since the
6 returns are themselves determined by investors buying the shares. Instead the motivation is that
7 the risks are lower. The action of investors diversifying internationally will then push up share
8 prices, causing higher short run returns, but once the new higher level of stock prices is
9 determined equilibrium expected returns are then lower. This is the same phenomenon that
10 occurs when market interest rates fall. In this case, the returns to higher coupon bonds goes up,
11 until their price increases, such that their expected returns are lower to reflect the lower market
12 interest rates.

13
14 It is important to note that financial theory indicates that risk premiums *decline* as portfolios are
15 internationally diversified: they do not increase. In particular, as Canadian and foreign investors
16 diversify internationally, there is no reason to believe that the Canadian risk premium will
17 increase. In fact, except for pathological cases, this is flatly contradicted by financial theory.
18 Further, the above conclusions point out that the evidence on the realised US market risk
19 premium is also biased high, since US investors will no longer have to bear a large part of the US
20 market risk, since it is unique to the US. Consequently this risk will be diversified away in an
21 internationally diversified portfolio causing US risk premiums to fall.³ Because capital markets
22 are becoming more diversified internationally, it follows that the market risk premium in the
23 future will be lower than the historic estimates from any and all national markets.

24
25 An example may help the above intuition. The expected return on the market as a whole is
26 determined by the capital market line:

$$E(R_m) = R_F + MPR\sigma^2$$

³ There is also an obvious “survivor bias” to U.S. equity returns, since the emergence of the U.S. as the dominant superpower was no means expected at the time that most U.S. data series start.

1
2 where the expected return on the market is equal to the risk free rate plus the market price of risk
3 (*MPR*) times the variance of the market portfolio. In contrast to the pricing of securities, the
4 relevant measure of risk for the market as a whole is the variance of its rate of return or its
5 dispersion. The market risk premium is then just the

$$E(R_m) - R_F = MPR * \sigma^2$$

6
7
8
9 or the market price of risk times the variance or risk of the overall market. As Cohn and Pringle
10 indicate the *MPR* should fall as markets become more global, but for convenience I will ignore
11 this.

12
13 For the US we can infer the average pricing of risk from the fact that since 1926 (Appendix F)
14 the realized market risk premium has been 6.61% and the standard deviation of the annual rates
15 of return 20.21%. Hence if these were the values that investors expected, the US market price of
16 risk was

$$MPR_{US} = \frac{E(R_m) - R_F}{\sigma^2} = \frac{.0661}{.04844} = 1.62$$

17
18
19
20 If we use the same data for Canada we get

$$MPR_{CAN} = \frac{E(R_m) - R_F}{\sigma^2} = \frac{.05}{.03474} = 1.44$$

21
22
23
24 The above estimates indicate that the realized market risk premium in Canada has been lower
25 than we would expect simply from the lower risk of the Canadian market or conversely that the
26 Canadian market price of risk has been lower. There are good reasons for this result due mainly
27 to the known institutional features in Canada and the fact that the size of the US market risk
28 premium is one of the most celebrated “puzzles” in financial economics. However, For

1 convenience I will assume that the true market price of risk is 1.5 and that the actual estimates
2 simply reflect estimation error.

3
4 If we assume that the Canadian and US markets are completely segmented and then suddenly
5 open up and become integrated, we can solve for what might happen to the market risk
6 premium.⁴ We can then determine a new risk premium for Canada as follows:

$$\text{WorldMRP} * \beta_C$$

7
8
9
10 For the world market risk premium we can estimate the variance of the new combined US-
11 Canada capital market:

$$\sigma^2 = \left(\frac{V_{US}}{V_C + V_{US}} \right)^2 0.2021^2 + \left(\frac{V_C}{V_C + V_{US}} \right)^2 0.1864^2 + 2 * \rho * \left(\frac{V_{US}}{V_C + V_{US}} \right) \left(\frac{V_C}{V_C + V_{US}} \right) 0.2021 * 0.1864$$

12
13
14
15 This is simply the variance of a portfolio of two securities with correlation ρ .

16
17 If we assume the correlation between the US and Canadian markets is 0.85 and the values of the
18 US and Canadian markets are 10 to 1 based on approximate GDP and size differences, then the
19 variance of the new integrated market portfolio is 19.2%. If the new market price of risk stays at
20 1.5 then the new world market risk premium is 5.95%.

21
22 As might be expected by merging the US and Canadian markets, with a constant market price of
23 risk the new market risk premium is in between the US 6.61% and the Canadian 5.0%, with the
24 US market assumed to be ten times larger the new average is closer to the US than the Canadian
25 value. However, what is not obvious is the impact of the correlation coefficient. If the markets
26 are perfectly correlated, because for example the underlying real economies are already
27 integrated and both stock markets respond to the same phenomena, even if segmented, then the

4 Obviously this is a simplification since there have always been capital flows between the US and Canada

1 market risk premium would be 6.1%. In contrast if the markets are totally uncorrelated then the
2 new risk premium would be 5.2%. Clearly the less correlated the two markets then the lower the
3 market risk premium of the new integrated market.

4
5 In Schedule 4 is a graph of the correlation coefficient estimated over the prior ten year market
6 returns for the US and Canada.⁵ What is clear is that the US and Canadian markets used to be
7 very highly correlated. A correlation coefficient of 0.90, as was common up until the early 1970s,
8 indicates that to all extents and purposes the markets were perfectly correlated, since the residual
9 is basically estimation error. It is for this reason that standard investment advice was to diversify
10 in markets other than the US! After the oil price shocks of the early 1970s this perfect
11 correlation between the US and Canadian equity markets started to break down and there has
12 subsequently been a long downward trend in the correlation between the two markets, punctuated
13 by periodic declines such as the huge decline in the late 1990s due largely to the internet bubble.
14 Going forward it is difficult to see why the correlation coefficient would increase; I will therefore
15 use a value of 0.60. This would put the integrated market risk premium at 5.7%, lower than that
16 in the US but higher than that in Canada.

17
18 For the risk premium on the Canadian market we need the Canadian beta with respect to this new
19 integrated market risk premium. This can be calculated as

20
21
$$\beta = \left(\frac{V_C}{V_C + V_{US}} \right) + \left(\frac{V_{US}}{V_C + V_{US}} \right) \rho * \frac{\sigma_C}{\sigma_W}$$

22
23 Where the first value is the weight on the Canadian market, assumed to be (1/11), and the second
24 that on the US, assumed to be (10/11).⁶ The intuition of the new beta is simply that the first term
25 indicates the exposure to the Canadian part of the new market index and the second is the
26 exposure to the US part. Using the previous values for the risk of the Canadian and world

5 The correlation is based on non foreign exchange adjusted returns, adding in exchange fluctuations would tend to lower the correlation coefficient.

6 This also assumes that these weights do not change, that is the values of the US and Canadian markets

1 markets the Canadian market beta is 0.61 and the Canadian market risk premium $0.61 \times 5.7\%$ or
2 3.50%, for a decrease of 1.50%. Similarly the US beta with respect to the new integrated market
3 is much higher at 0.96, since most of the new market is US, but due to the decline in the
4 integrated market risk premium the US market risk premium also declines to 5.52%.

5
6 The above example highlights the key theoretical result that market risk premiums normally
7 decline when markets are integrated. How much the market risk premium is affected depends on
8 the relative risk in the two markets and how correlated they are. In the extreme case where the
9 Canadian and US markets are uncorrelated, then the Canadian market risk premium drops to
10 0.50% since it is merging with a much bigger market that behaves differently so most of the
11 unique Canadian market risk is diversified away. Conversely in the pathological case where the
12 markets are perfectly correlated, the Canadian market risk premium increases to 5.7% since the
13 Canadian market risk is now with respect to a riskier index.

14
15 When we add in the tendency for the market price of risk to also fall on the integration of
16 markets, it is clear that financial theory indicates that the Canadian market risk premium falls as
17 Canadians invest abroad and capital markets become globalised. Except in pathological cases *it*
18 *runs counter to financial theory to increase the Canadian market risk premium to account for*
19 *the gains that Canadians realise by investing internationally*. It is more appropriate to reduce
20 both the Canadian and the U.S. market risk premium estimates to account for international
21 diversification.

22 23 **III Actual Market Integration**

24
25 The prior discussion is a stylised discussion of what happens when capital markets become
26 globalised and more integrated. However, I place no emphasis on this discussion except to point
27 out the obvious fact that market risk premiums tend to fall as markets get more integrated and not
28 increase, and that the historic results from both the US and Canada over estimate current risk
29 premiums. This last point is even stronger than what the prior discussion would indicate, since

change in the same proportion.

1 Canadians are diversifying into markets other than the US, where the correlation is even lower
2 than with the US market. Consequently the effect of declining market risk premiums is even
3 stronger.

4
5 However, in my judgment markets will never become completely integrated just as they have
6 never been completely segmented. The true description is that the Canadian market has been and
7 will continue to be partially segmented. This is because Canadian stocks will always remain the
8 cornerstone of any Canadian portfolio for several reasons:

- 9
- 10 i. First, most investment portfolios are for retirement purposes and will normally
11 involve Canadian dollar living expenses. Consequently, foreign stocks are
12 inherently riskier, since they involve additional foreign exchange risk. The recent
13 increase in the value of the Canadian dollar, for example, has hurt investors
14 investing in the US;
 - 15 ii. Second, the direct purchase of foreign securities involves relying on foreign
16 securities law, since the Ontario Securities Commission, for example, only
17 regulates information flows to securities sold to residents of Ontario.
 - 18 iii. Third, the purchase of foreign securities is generally more expensive, since
19 transactions costs, brokerage fees etc, are generally higher since trades frequently
20 go through a domestic and a foreign broker.
 - 21 iv. Fourth, evaluating foreign securities is inherently more complex since accounting
22 standards differ across countries: one dollar earnings per share or a 10% return on
23 equity can mean a variety of different things, depending on whether it is for a
24 German, American or Canadian company.⁷ As a result, it is very difficult to work
25 out whether Manulife, for example, is more profitable than Metropolitan Life.⁸
 - 26 v. Finally, there are a variety of legal and tax impediments to foreign investing and
27 there is always the lingering fear that foreign investors will be treated differently
28 than local investors in the event of serious financial troubles.

29

⁷ For example in Manulife's initial public offering in the fall of 1999, its Canadian dollar earnings, according to Canadian generally accepted accounting principles (GAAP), were about 50% higher than its Canadian dollar earnings calculated according to US. GAAP.

⁸ This difference in GAAP also explains why US return on equity data cannot be easily compared with that for Canadian companies, unless there is reconciliation for the differences in GAAP.

1 The above barriers are getting smaller. Cross listing of securities, the creation of ADRs
2 (American Depository Receipts), multilateral jurisdictional disclosure (MJDS) in terms of issue
3 procedures, the normalisation of international accounting standards, and the acceptance of
4 foreign disclosure rules for domestic sale of securities have all served to weaken the barriers to
5 international investment. However, other tax restrictions remain, and are unlikely to be reduced
6 any time soon, since they are frequently enshrined in bilateral tax treaties that take years to
7 negotiate. The result is that the Canadian market will always be partially segmented from world
8 markets.

9 This means that Canadian investors look to foreign securities simply to fill the “holes” in their
10 Canadian stock portfolios. As is well known, the TSE300 is heavily weighted towards resource
11 stocks (and more recently technology stocks through Nortel), which reflects their importance in
12 the Canadian economy, and is correspondingly under-weighted in other areas. Canadian investors
13 therefore should seek out the stocks for which there are no good domestic substitutes. It may
14 make more sense to buy a Merck than a US pipeline or utility stock. This is because we have
15 several first tier Canadian utility and pipeline stocks, but we have relatively few quality
16 pharmaceutical stocks. When we add in tax preferences, Canadian investors should be investing
17 in the tax advantaged stocks of firms that represent economic activity not available in Canada.⁹

18
19 The chief tax impediments are withholding taxes and the impact of the dividend tax credit
20 system. As investment income flows across national boundaries there are usually taxes levied “at
21 the border” in lieu of the income taxes that would have been paid if the foreign investor had been
22 a resident. These withholding taxes differ according to the bilateral tax treaty and whether the
23 income is dividends or interest. As a result, it makes sense for foreign investors to buy capital
24 gains, rather than dividend oriented stocks. This conclusion is particularly relevant for
25 Canadians, since the federal government allows a dividend tax credit for dividends paid by
26 Canadian companies to partially compensate for the double taxation of equity income at both the

⁹ Tax advantaged primarily means high dividend paying stocks. These arguments were first made by Laurence Booth, “The Dividend Tax Credit and Canadian Ownership Objectives” *Canadian Journal of Economics*, May 1987.

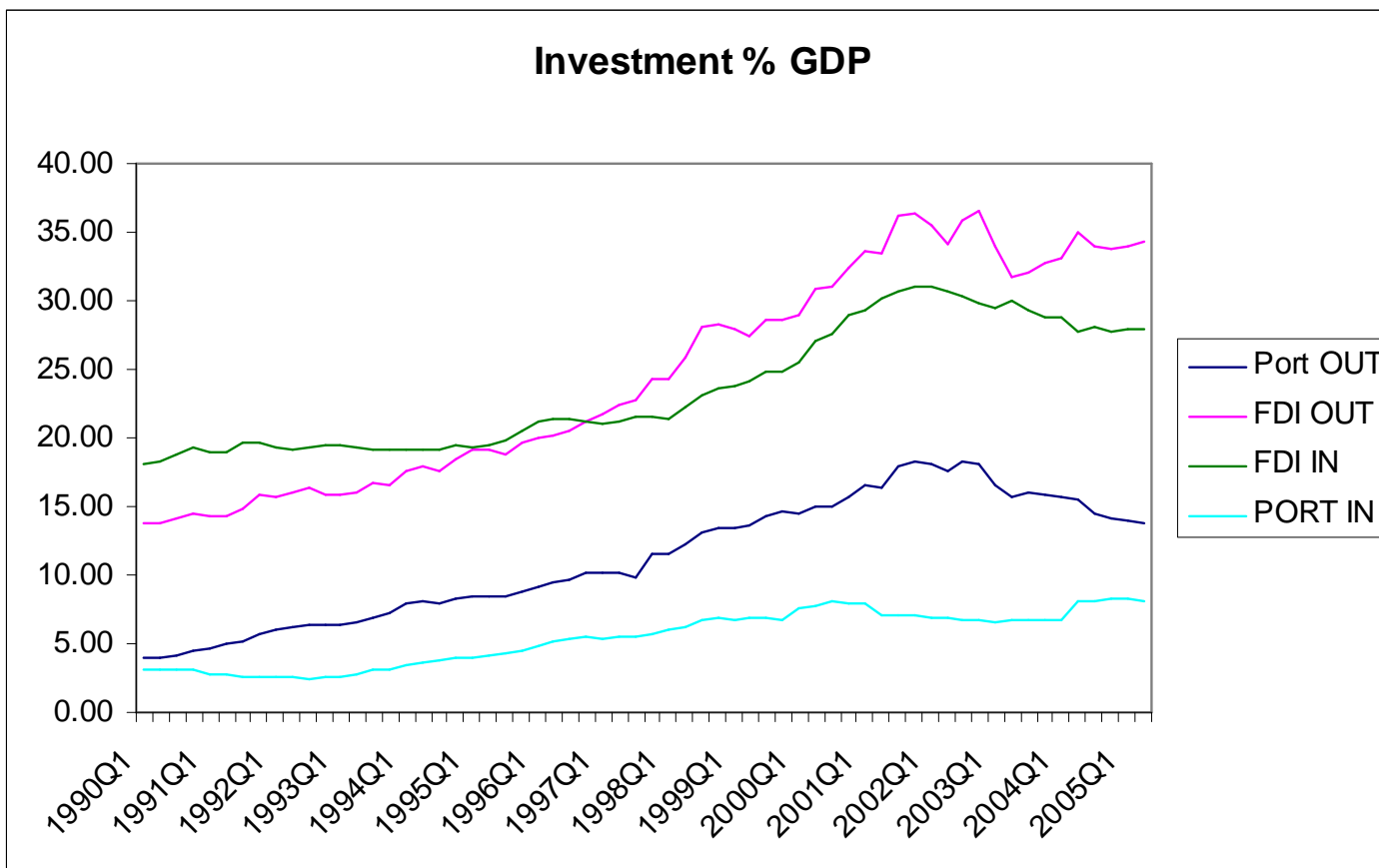
1 corporate and individual level.

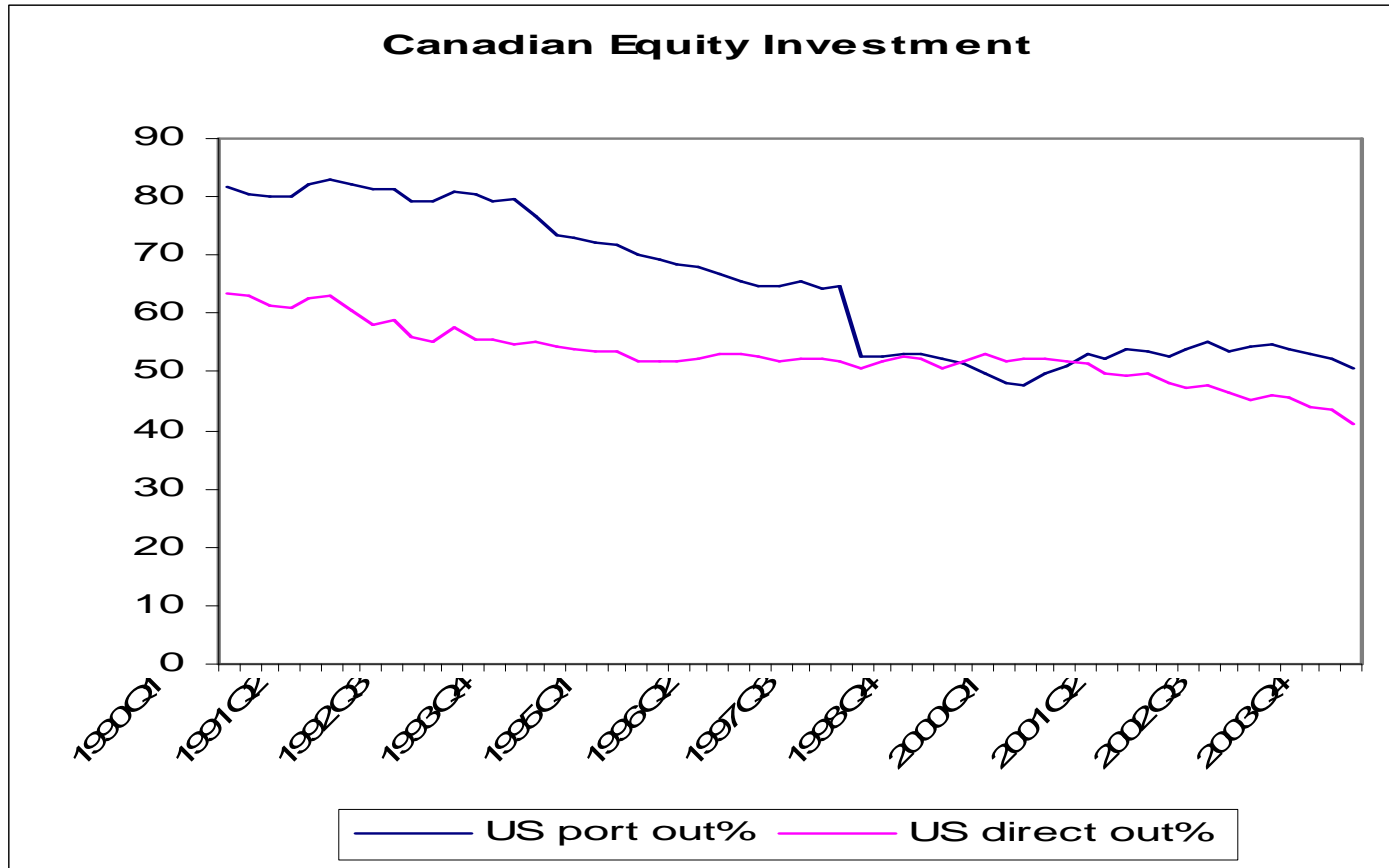
2

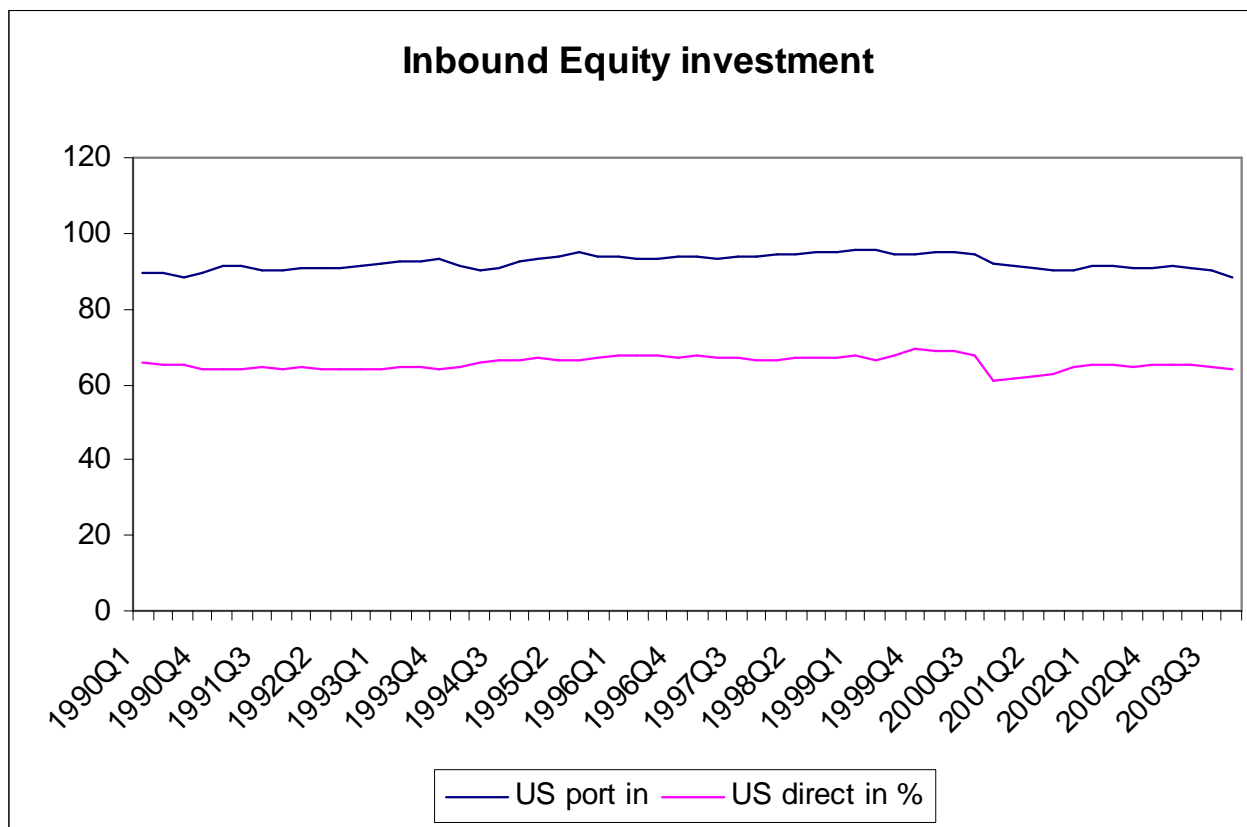
3 Schedule 5 gives a table that indicates the different composition of the Canadian versus the world
4 market portfolio as of March 2000 estimated by Morgan Stanley. Of interest is that utilities at
5 that time made up 2.0% of the TSE300, 2.5% of the US index and 3.5% of the world index. This
6 provides no indication that investors in Canada would sell Canadian utilities to buy foreign
7 securities, quite the opposite since the Canadian market is marginally short of utilities. It is more
8 likely that they would sell media stocks and banks, since there is a surplus of these stocks in
9 Canada.

10

11 These effects have a direct impact on utilities. Why would a Canadian investor, for example, sell
12 Canadian utilities buy shares in a US utility, when they can buy shares in a Canadian one, be
13 protected by the OSC's disclosure rules, make direct comparisons of its financial statements with
14 other Canadian firms and receive a significant tax advantage as well? In my view the continued
15 relaxation of international investment barriers will lead to the diversification of Canadian
16 investment portfolios, but this will not lead to significant selling pressure on tax advantaged
17 Canadian stocks, like utilities. As a result, I can see almost no impact of international
18 diversification trends for the utility and pipeline sector's fair ROE except for the tendency for the
19 overall market risk premium to decline.







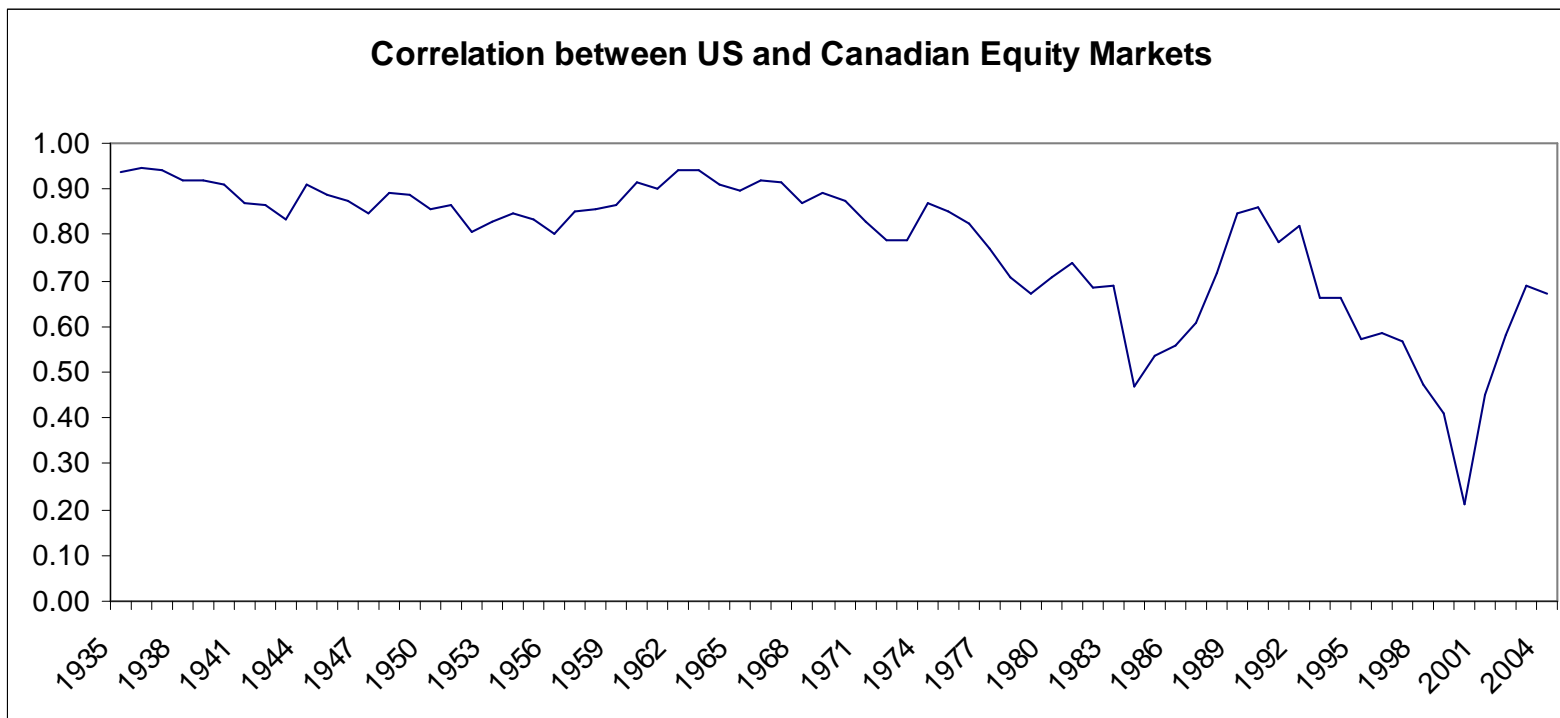


Table 1: Morgan Stanley Industry Composition
(March 2000) (Percentage of total market value)

	Canada	U.S.A.	Europe	Far East	ACWT
Energy	7.3	4.6	7.3	0.3	4.9
Materials	7.1	2.6	3.7	4.5	4.0
Capital Goods	3.7	8.0	4.9	8.7	6.8
Commercial Services	0.1	1.2	1.0	1.7	1.1
Transportation	1.8	0.7	1.4	3.3	1.3
Autos	0.6	1.4	1.9	9.5	2.7
Consumer Durables	0	0.8	1.9	10.1	2.5
Hotels & Restaurants	0	0.9	0.9	0.7	0.8
Media	10.4	5.0	3.4	1.2	4.1
Retail	0.4	6.1	1.7	2.0	3.8
Food & Drug: Retail	1.0	0.8	1.7	0	1.0
Food, Beverage & Tobacco	0.3	2.7	3.7	2.2	3.0
Household & Personal	0.1	1.6	0.8	1.0	1.2
Health Care	0.4	1.6	0.4	0.7	1.0
Pharmaceuticals	0	7.4	8.1	4.3	6.6
Banks	9.5	4.7	11.7	10.1	8.2
Diversified Financials	1.0	4.5	1.7	7.8	4.0
Insurance	0.3	2.8	6.8	0.7	3.7
Real Estate	0	0.2	0.6	3.1	0.8
Software	0.1	11.0	2.5	3.7	6.7
Tech Hardware	36.7	22.3	9.0	14.3	16.8
Telecommunications	17.3	6.5	19.4	7.7	11.6
Utilities	2.0	2.5	5.3	2.5	3.5

APPENDIX E

ESTIMATION OF THE MARKET RISK PREMIUM

1 **Introduction**

2

3 In this appendix I estimate the market risk premium by examining realised rates of return on different
4 broad classes of securities over long periods of time.¹ The reason for doing this is that if the
5 underlying relationship generating these returns has remained reasonably constant then these realised
6 returns can be used as a forecast of the market's future requirements. The differences between these
7 returns can then be used as an estimate of the market risk premium. In analysing the actual data,
8 however, we first need to be aware of some methodological problems, since raw data by itself is of
9 little use. The three methodological problems we will discuss are 1) estimation procedures, 2) the
10 relevant time period and 3) the rationality of the estimates.

11

12 **Estimation Procedures.**

13

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

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>

1 calculated as $(1/1)^{1/2}$ which is 1, indicating a zero rate of return. This gives the common sense
2 solution that if you started and finished with \$1,000, then your rate of return is zero.

3
4 Both the arithmetic and compound rates of return are normally calculated when evaluating
5 investments. If we need the best estimate of *next* period's rate of return, this is the arithmetic return.
6 If we need the best estimate of the return over several periods, the arithmetic return becomes less
7 useful and more emphasis is placed on the compound return. If we want the best estimate of the
8 annual rate of return earned over a long period of time, this is the compound rate of return, since this
9 indicates the long run expected change in wealth. Moreover, if we ignore intervening periods, then
10 the arithmetic return over a very long period is the compound rate of return, that is, the difference
11 between the arithmetic and compound returns is essentially the definition of the period over which
12 the investment is held.

13
14 What causes the two rates of return to differ is the uncertainty in the per period arithmetic rates of
15 return. If the arithmetic rate of return is constant, then both rates of return are identical. However, the
16 more uncertain the arithmetic rate of return, the larger the discrepancy between the two estimates.
17 For instantaneous rates of return the following equation approximately describes their relationship:

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

18
19 In the previous example, there is a large amount of uncertainty, that is, high variance (var), so that
20 the difference between the arithmetic return and the geometric return is very large. Moreover, as we
21 estimate over a longer and longer period, the estimated compound rate of return earned on an
22 investment approaches that of the compound return. In estimating the market risk premium, we
23 believe that the correct time period for calculating arithmetic rates of return is a **one**-year holding
24 period. The reason for this is primarily because most regulated firms are regulated on the basis of
25 annual rates of return and rates are almost always expressed as annual percentages.

26
27 In addition to the arithmetic and compound rates of return we also estimate the arithmetic rate of

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

6 7 **(B) Time period**

8
9 There is a problem in estimating the market risk premium over a short period of time, since the stage
10 in the business cycle will bias the results. For example, if the period is restricted to end in a bull
11 market, the recent realised returns will be high, raising the overall realised risk premium. This
12 'business cycle' problem is well known in comparable earnings tests, but it is also evident in realised
13 risk premium tests. In particular, it makes the use of the compound rate of return estimated over short
14 periods suspect. This timing problem is also evident in analysing bond returns, since bond returns
15 vary inversely with interest rates. This means that estimating a bond return over a period when
16 interest rates have been increasing tends to understate the bond investor's expected rate of return.
17 This is because the realised rate of return will be lower than expected, because of the losses caused
18 by increasing interest rates. This in turn will overstate any estimate of the market risk premium.
19 Conversely, estimating bond returns over a period of declining interest rates will have the reverse
20 effect, as capital gains will cause the realised rate of return to exceed that expected. It is important
21 therefore, to capture a full interest rate cycle; otherwise realised rates of return may not be valid
22 predictors of the market risk premium

23
24 In Schedule 1 are the results of a study of realised Canadian risk premiums over the longest time
25 period for which there is data available. The data is taken from an annual "Report on Canadian
26 Economic Statistics, 1924-2004," March 2005, compiled on behalf of the Canadian Institute of
27 Actuaries. Over the entire period 1924-2004 an investment in equities would have earned an average
28 total rate of return of 10.40% using the OLS estimate, **10.05%** using the geometric mean estimate,
29 and **11.65%** using the arithmetic return estimate. The corresponding return estimates for the long

1 Canada bond are **5.40%**, **6.10%** and **6.44%**, producing corresponding **market risk premium**
2 **estimates of 5.00%, 3.96% and 5.21%**.

3
4 Note, that the standard deviations for the equity and Canada bond returns were 18.40% and 8.19%
5 respectively, indicating the higher average risk of equities than bonds. Consequently, there is a larger
6 difference between the arithmetic and geometric returns for equities than bonds. For example half
7 the equity return variance (of 0.184^2 or 3.38%) is 1.69%, which is approximately the 1.60%
8 difference between the arithmetic (11.65%) and geometric (10.05%) returns. For bonds in contrast
9 half the variance is 0.34%, which is also the 0.34% difference between the arithmetic and geometric
10 bond returns.

11
12 From this data alone one would conclude that over annual investment horizons equities outperform
13 Canada bonds by 5.00-5.21%, but that as the time period lengthens this out-performance drops to
14 3.96%, which is the risk premium someone would have earned by buying in 1923 and selling at the
15 end of 2004

16
17 To determine whether or not these realised risk premium estimates are **unbiased**, we can graph the
18 yields on 91 day Treasury Bills, long Canadas and the CPI inflation rate. From the graph in Schedule
19 2 we can see that the yields on T. Bills and long Canadas were very stable from 1936, despite an
20 extremely volatile inflation rate. During this period fixed income investors were not able to adjust
21 their yields since interest rates were effectively controlled. Then about 1950, yields started to trend
22 upwards with the rate of inflation, as well as becoming more volatile, as the bond market was
23 decontrolled. Interest rates then peaked in the early 1980s before beginning a long period of
24 declining rates that ended in the mid 1990s.

25
26 What the graph vividly shows is that the behaviour of interest rates has not been constant over the
27 full period 1924-2004. For this reason, Schedule 1 also includes rate of return estimates for two sub-
28 periods from 1924-1956 and for 1957-2004. For the earlier period the market risk premium estimate
29 is 4.66%, 6.82% and 8.85% for the OLS, geometric and arithmetic returns respectively. For 1957-

1 2004 the corresponding estimates are 1.95%, 1.97% and 2.70%, indicating a significant difference
2 over the two periods. Also note that the standard deviation of the equity series declined from 21.25%
3 for the earlier period to 15.92% for the latter period, indicating the maturing of the Canadian equity
4 market, as it became less reliant on a small number of stocks. In contrast, the standard deviation of
5 the long Canada returns increased from 5.20% to 10.31%, indicating the dramatic post war increase
6 in volatility in the long-term bond market.

7
8 The graph of interest rates and the data in Schedule 1 indicate that the period prior to 1956 is
9 different from that after 1956. Estimates will always be slightly different from one period to another
10 simply because of estimation errors. However, the differences in the sub periods in Schedule 1 seem
11 to be too large to be simply due to these types of problems. If instead they are due to underlying
12 structural reasons, drawing inferences from the data prior to 1956 will lead to estimates that do not
13 reflect current market conditions. There are several very good reasons why the relationship between
14 equity and bond returns, and the market risk premium, has changed since the 1924-1956 period.

15 16 **(1) Evolution of Canadian Monetary Policy**

17
18 Prior to the early 1950's interest rates were controlled to stimulate the economy and did not vary very
19 much, partly because the Canadian markets were very illiquid. It was not until the 1953-4 reforms
20 introduced by the Bank of Canada, that an active secondary market in shorter-term Canada bonds
21 even developed. Prior to that period the tools of Canadian monetary policy were primitive. It is quite
22 obvious from the graph in Schedule 2 that the long Canada yield pattern changed in the early 1950's,
23 as these changes in the Canadian markets were introduced. After being stable at around 3% from
24 1936-1955, long yields, in particular, started edging upwards.

25
26 Note also that since the reforms of 1953-4, the volatility of yields has increased. Part of the reason
27 for this is that in the earlier period the realised rate of inflation was between 1.40% - 1.85%, whereas
28 in the latter period it was 4.20% - 5.13%. Fixed income securities are more sensitive to inflation,
29 since their coupons by definition are fixed. As a result their real return varies with the level of

1 inflation. The volatility of inflation and the changed nature of monetary policy is most evident in the
2 behaviour of Treasury bill yields. The yield on 91 day T. Bills became increasingly volatile after the
3 1953-4 reforms, reaching record highs of over 20% for a short period in 1981. This increase in
4 Treasury Bill return volatility from 0.57% in the earlier period to 3.89% in the latter period mirrors
5 that of long Canadas, where the variability increased from 5.20% to 10.31%. Essentially, between
6 these two periods the risk of investing in long Canadas doubled.

7
8 From 1950 until 1981 the trend in long Canada yields was upwards. This means that investors in
9 long Canada bonds suffered losses as the prices of their existing bonds (with low interest rates)
10 dropped in comparison to the newer bonds being issued at ever increasing yields. As a result, the
11 returns from holding long Canada bonds **understated** what investors expected to earn, causing
12 biased high estimates of the market risk premium. This overestimation peaked in 1981 as losses from
13 holding long Canada bonds peaked. After that point, long Canada yields decreased causing huge
14 capital gains. As a result, the investor's expected return for long Canada bonds is **overstated** by
15 looking at realised returns, which causes a downward bias to the estimated market risk premium.
16 Noticeably, the nominal returns on equities have been very similar between the two sub-periods
17 despite significant changes in the fixed income market. Actual returns of 8.80%, 10.84% and 13.00%
18 for the OLS, GM and AM estimates for the 1924-1956 period are not too dissimilar to the returns of
19 10.37%, 9.51% and 10.72% for 1957-2004.

21 (2) Canadian Equity Market Data.

22
23 If long Canada yields are affected by the reforms of 1953-4, the equity market data is also of doubtful
24 validity prior to 1956, since before that time there is **no** consistent Canadian equity market data. The
25 CIA data comes from splicing together the following series:

26			
27	(1)	1924-1946	Urquhart & Buckley "Corporate Composites"
28	(2)	1946-1956	TSE Corporates
29	(3)	1956-1995	TSE300
30			

31 The Urquhart and Buckley series does not include all Canadian companies or sectors and does not

1 include dividend data. Dividend yields for 1926-1933, for example, are obtained by taking US
2 dividend yields from the S&P Index and subtracting 0.17% based on a yield difference existing
3 between 1956-1965! The only consistent data is that produced by the TSE, which has pushed its
4 TSE300 (now the TSX Composite) index back to 1956. Splicing these series together is the best that
5 can be done in the circumstances, however it is not ideal and some skepticism of the quality of the
6 data prior to 1956 is in order.

7

8 Additionally, for some time it has been government policy to Canadianise the ownership of Canadian
9 industry. This policy has been muted of late as foreign ownership has been allowed to increase, but
10 there has still been an increase in the number of Canadian firms for Canadians to invest in. This plus
11 the natural maturing of the Canadian economy has resulted in a more diversified equity market,
12 which has decreased the overall riskiness of the Canadian equity market since the 1930's. Note again
13 that the equity returns have decreased in volatility from 21.25% to 16.24%. Also some sectors that
14 are now very important such as the oil and gas sector and the pipelines barely existed prior to the late
15 1940's.

16

17 These changes have clearly affected the relative returns on debt and equity securities. They have also
18 affected their relative riskiness. One way of looking at the relative riskiness of equity versus debt
19 securities is to look at the variability of the equity return divided by that on long Canadas. This is
20 shown in the graph in Schedule 3, where variability is measured as the standard deviation of returns
21 over the prior ten-year period. In the earlier periods, equities were four or five times as risky as
22 bonds, since from the earlier graph of interest rates we know that bond yields and thus bond prices
23 were quite stable. However, by the end of the period equities were only slightly more risky. For the
24 ten-year period ending 2004, TSX Composite equities had a return variability only about half as
25 risky again as that of the long Canada bond. This dramatic change in the relative riskiness of equities
26 versus bonds means that the estimates drawn from the entire period are unlikely to represent current
27 market conditions.

28

29

1 **(C) Rationality of the estimates**

2
3 In the above estimates, the "market risk premium" is estimated as the difference between the
4 estimated return on equities and that on long Canada bonds over a particular period. An alternative is
5 to estimate it each year. This is what has been done in the graph in Schedule 4. Starting in 1924-1928
6 the realised market risk premium was estimated using each of the three techniques and then updated
7 each year with the new data. The instability in the 1920s is evident: the estimates are very high, since
8 the equity market performed so well, and then in the 1930s it declines precipitously as a result of the
9 great stock market crash. However, it stabilises by the late 1950s, before beginning its long gradual
10 decrease as a result of the structural changes referred to above. Note that since over eighty years of
11 data are now available, the impact of any one-year is very small and the market risk premium is
12 "stuck" around 5.0%. However, it is apparent that the realised market risk premium has been
13 **declining** almost continuously since the mid 1960's. The main reason for this is that as more data
14 becomes available the importance of the prewar period in the calculations gets smaller and smaller.

15
16 An alternative to the above approach is to work backwards. That is, start in the five-year period
17 2000-2004 and then go back in time. This is what is in the graph in Schedule 5. Note that whereas
18 the previous graph always includes the period 1924-1928, this graph always includes the period
19 2000-2004. Due to the severe bear market that started in the middle of 2000 the earned risk premium
20 over this starting period 2000-2004 has been -4.12%. Moreover these poor years always stay with us
21 as we work back through time and add in progressively older data. Even over the last ten years
22 equities have performed have only earned 0.24% more than the bond market. However, this is not
23 because the equity return of 11.16% was low, in fact overall it was a good ten years for the equity
24 market. The reason was simply that interest rates declined and 10.92 was a great return from the
25 bond market. As we go back in time we remove the effect of this drop in interest rates and include
26 data from the earlier periods when interest rates were rising and bond market returns were below
27 expectations. When we get back to the early 1950's we finally get the market risk premium above
28 4.0%. **However, note we have to go back to well before the personal experience of current**
29 **market professionals and investors to find data supporting a market risk premium over 4.0%.**

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28

Changes in the Market Risk Premium

In Schedule 6 is the earned risk premium (using arithmetic returns) for various holding periods. If we look at the last row we have the earned risk premium for various start dates finishing in 2004, this is essentially a subset of the data graphed in Schedule 5. Note for example, that the most recent ten-year period has an earned risk premium of 0.24%, as this period goes back successively by adding an extra ten years of data the earned risk premium drops to -1.02% and then increases until for the fifty year period 1954-2004 it reaches 3.50% and then finally gets to 5.23%. Note also that bond returns reached their nadir in 1981 when interest rates peaked. If we go along the row for 1984, we see that the earned risk premium was generally high for periods ending in 1984. Again this was simply due to interest rates increasing and consequently bond returns being unambiguously lower than expected. It is not appropriate to simply "pick" estimates from this matrix of earned returns without understanding what caused them.

However, the fact that estimates of the market risk premium do change over time indicates that some adjustments are in order. In my judgement the riskiness of the equity market is relatively stable. In fact, going back as far as 1871, there is substantial evidence that the real return on US equities has been constant at just under 9.0%.² However, there is *no* support for the assumption that either bond market risk or average bond market returns have been constant. As Schedule 1 shows, from 1924-1956, there was very little movement in nominal interest rates, as monetary policy was subordinate to fiscal policy. As a result, the standard deviation of annual bond market returns was only 5.20%. In contrast from 1956-2004, 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.*

However, what is crucial for the investor is whether this risk is diversifiable. That is: is the bond

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

1 market beta positive? In Appendix F I show that bond market betas in both the US and Canada
2 have been very large, particularly during the period since 1991, when governments had severe
3 financing problems and flooded the market with Canada bonds. This indicates that both the bond
4 and equity markets have been partly moved by a common factor: interest rates. This is why
5 adding long Canada bonds to an equity portfolio during the 1990's did not reduce portfolio risk to
6 the extent that it did in the 1950's. It also explains why adding an “average” risk premium to a
7 long Canada yield that had increased substantially due to this risk produced excessive estimates
8 of the fair rate of return throughout the late 1980s and much of the 1990s.

9
10 Essentially, with a “risky” long Canada bond we are estimating the market risk premium as the
11 expected return difference between two risky securities. If both the Canada bond (C) and an
12 equity security (j) are priced by the Capital Asset Pricing Model, the required or “fair” return on
13 each is as follows:

$$E(R_j) = R_F + MRP\beta_j$$

$$E(R_C) = R_F + MRP\beta_C$$

14
15
16
17 For both the return is expected to be equal to the risk free (R_F) rate plus the market risk premium
18 (MRP) times the relevant beta coefficient. The “market” risk premium of the equity market
19 relative to long Canada bonds is then simply

$$E(R_j) - E(R_C) = MRP(\beta_j - \beta_C)$$

20
21
22 What this means is that even if an individual security's risk is unchanged, its risk premium over
23 the long Canada bond will get smaller as the long Canada bond itself gets riskier.

24
25 In Appendix F, I show how the beta on the long Canada bond was close to zero until the
26 estimation period 1987-1991; since then it has been positive, peaking in 1995-6 at about 0.60. It
27 was this increase in bond market risk that caused risk premiums to shrink throughout the 1990's.
28 In fact it is quite clear that with a Canada bond beta of say 0.60, a low risk utility in the mid
29 1990s, with a similar beta, did not require a risk premium at all. This conclusion was reinforced

1 by the observation that the Canada bond income (interest) is fully taxed, whereas the utility
2 income would predominantly come as dividend income, which is preferred by every single
3 taxable investor in Canada.

4
5 In Schedule 7 are the results of a regression analysis of the real Canada bond yield against
6 various independent variables. The real Canada yield is defined as the nominal yield reported by
7 the Canadian Institute of Actuaries minus the average CPI rate of inflation, calculated as the
8 average of the current, past and forward year rates of inflation. The regression model explains
9 86% of the variation in real Canada yields, and four variables are highly significant. The two
10 “dummy” variables represent unique periods of intervention in the financial markets. Dum1 is for
11 the years from 1940-1951, which were the "war" years, when interest rates were controlled. The
12 coefficient indicates that government controls reduced real Canada yields by about 5.4% below
13 what they would otherwise have been. This of course was the objective of the war-time controls.
14 Similarly, Dum2 is for the years 1972-1980, which were the oil crisis years, when huge amounts
15 of "petrodollars" were recycled from the suddenly rich OPEC countries back to western capital
16 markets, where they essentially depressed real yields. The sign on Dum2 indicates that, but for
17 this recycling, real yields would have been about 3.7% higher. These dummy variables are
18 included because during these two periods real yields were depressed by special “international”
19 factors.

20
21 The remaining two independent variables capture the risk and endemic problem of financing
22 government expenditures. Risk is the standard deviation of the return on the long Canada bond
23 over the preceding ten years. In earlier periods when monetary policy was not used, interest rates
24 barely moved and the returns on long Canada bonds were very stable. As a result the risk of
25 investing in them was very low. Through time the investment risk attached to long Canadas has
26 increased. The coefficient on the bond risk variable indicates that for every 1% increase in
27 volatility, real Canada yields increased by about 23 basis points. That is, the effective 5%
28 increase in the standard deviation of bond market returns between the two periods 1924-1956 and
29 1957-2004 has been associated with about a 115 basis point increase in real Canada yields

1 between these two periods. This is the extra risk premium required by investors to compensate
2 for the higher risk attached to investing in long Canada bonds. *Absent any increase in equity*
3 *market risk, the result is a 115 basis point reduction in the market risk premium between the*
4 *two periods.* This is why the earlier data from 1924-1956 is of such dubious validity.

5
6 The deficit variable is the total amount of government lending (from all levels of government) as
7 a percentage of the gross domestic product. As governments increasingly ran deficits, this figure
8 became a very large negative number, indicating increased government borrowing. For 1992, the
9 number was about -9.1%, a record peacetime high, indicating that government net borrowing was
10 9.1% of GDP and was flooding the markets with Canada bonds. For 1997, this deficit turned into
11 a surplus, which increased every year until 2000 when the surplus hit almost 3.0% of GDP. For
12 the last few years the surplus has eroded as governments have returned to increased spending and
13 debt and “deficit” concerns have waned. The coefficient in the model indicates that for every 1%
14 increase in the aggregate government deficit, real Canada yields have increased by about 27 basis
15 points. That is, increased government borrowing by competing for funds has driven up real
16 interest rates. At the peak of the government's financing problems in 1992 a 9% deficit was
17 adding almost 2.5% to the real Canada yield. When these two effects are added together it is easy
18 to see why there was very little "extra" risk for equities over bonds in the early 1990s.

19
20 The effect of increased interest rate risk and government “over borrowing” are clearly two sides
21 of the same coin. Their effect was to crowd the bond market with risky long Canada bonds that
22 could only be sold at premium interest rates, frequently to non-residents. This driving up of
23 Canada bond yields reduced the spread between Canada bond yields and equity required rates of
24 return and hence the market risk premium. It is this deficit and risk phenomenon in the
25 government bond market that created the narrowing market risk premium, and the large Canada
26 bond betas in the mid 1990's.

27
28 **If we are to look at the straight statistical evidence the Canadian market risk premium has**
29 **been about 5.0% over the longest available period and about 2.0-2.70% since 1956.** This

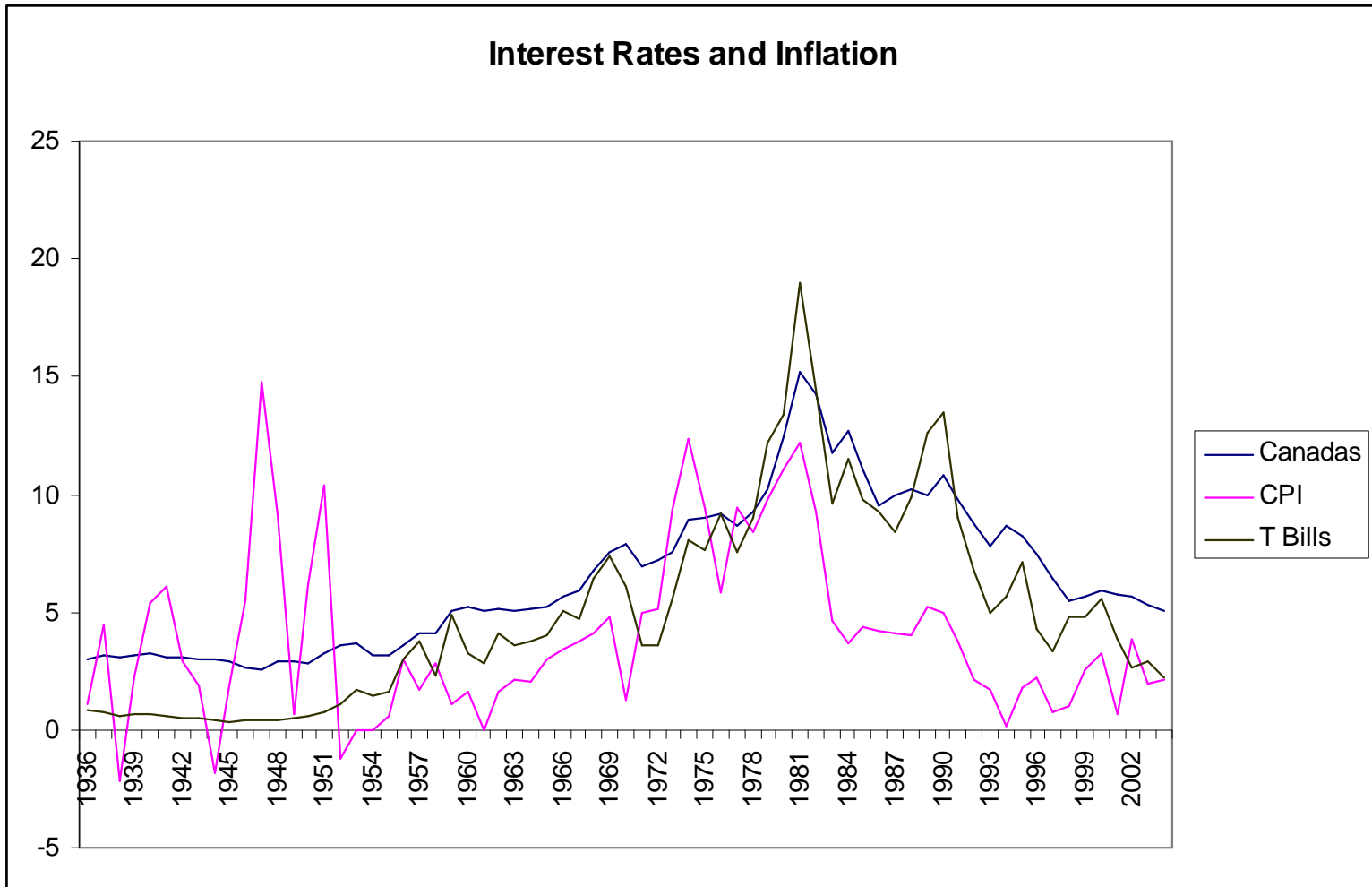
1 seeming decline in the market risk premium has largely been caused by a doubling of the return
2 from investing in long Canada bonds. However, it is my professional judgement that much of the
3 risk of investing in long Canada bonds has now dissipated relative to the early 1990s. The
4 importance of monetary policy means that long Canada bonds will never again be as low risk as
5 they were prior to 1956, but the renewed sense of fiscal responsibility implies that it is unlikely
6 that we will see government deficits of 9.0% of GDP again. With a current small surplus and
7 reduced bond market risk going forward I **therefore discount some of the experience since**
8 **1956 and recommend a market risk premium estimate of 4.50%.**

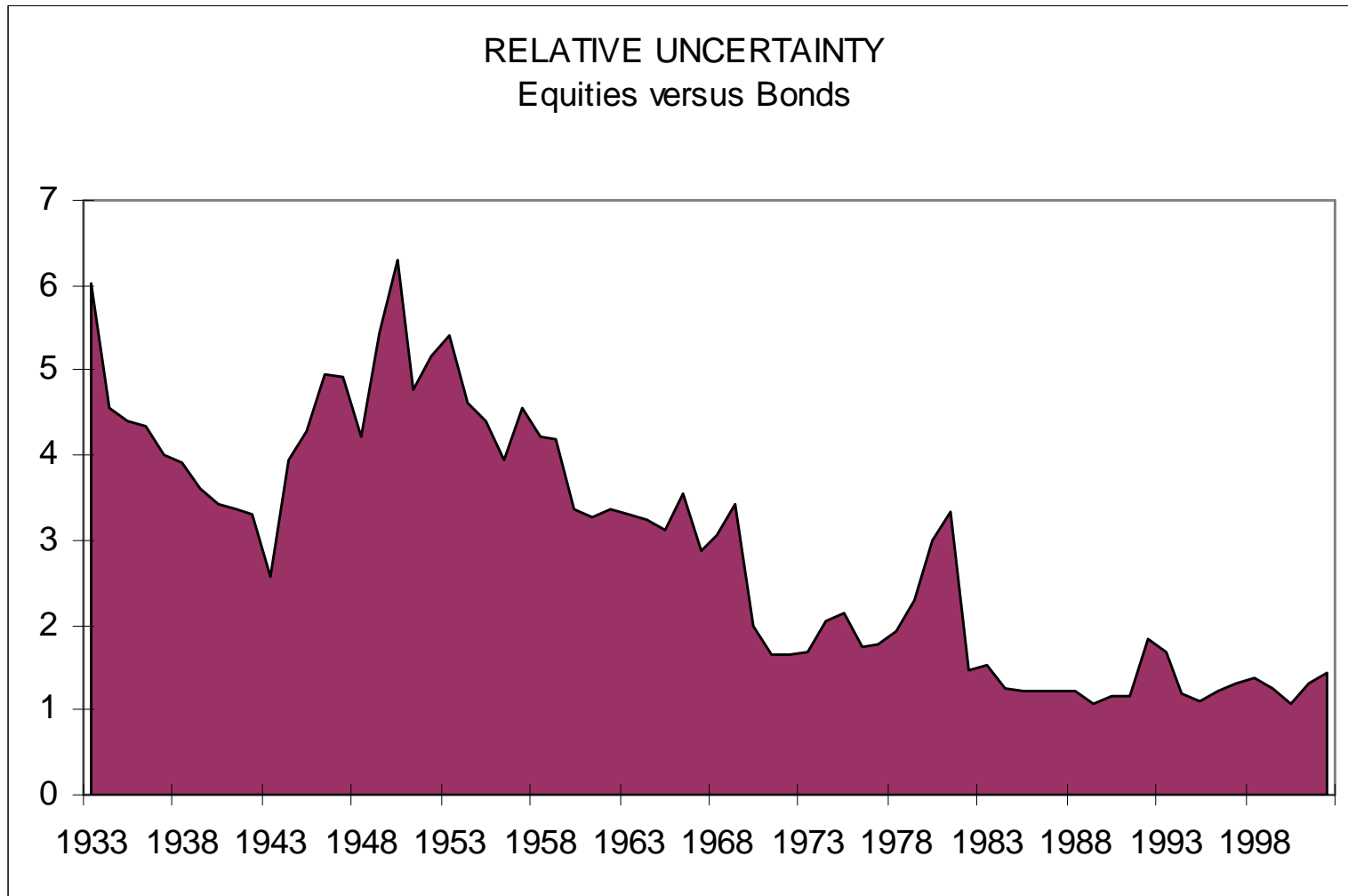
ESTIMATED ANNUAL RETURNS¹

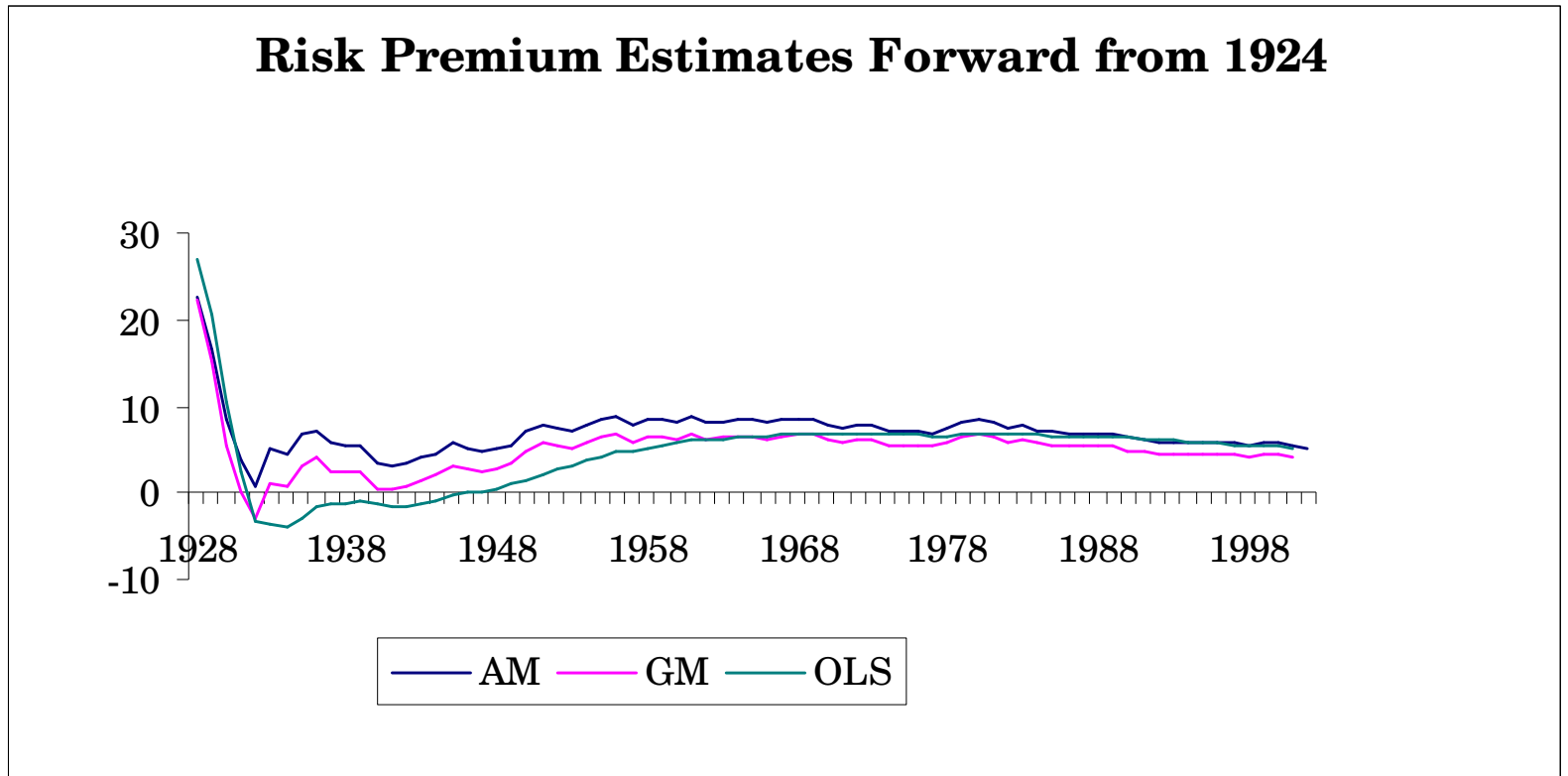
	OLS Estimate ²	Arithmetic Mean	Geometric Mean	Standard Deviation
1924-2004				
CPI	3.85	3.13	3.05	4.17
Long Canadas	5.40	6.44	6.10	8.19
Equities	10.40	11.05	10.05	18.40
Treasury Bills	5.73	4.99	4.90	4.31
Excess Return over Bonds	<u>5.00</u>	<u>5.21</u>	<u>3.96</u>	
1924-1956				
CPI	1.85	1.51	1.40	4.83
Long Canadas	4.13	4.15	4.02	5.20
Equities	8.80	13.00	10.84	21.25
Treasury Bills	0.68	0.84	0.84	0.57
Excess Return over Bonds	<u>4.66</u>	<u>8.85</u>	<u>6.81</u>	
1957-2004				
CPI	5.13	4.25	4.20	3.18
Long Canada	8.42	8.01	7.55	10.31
Equities	10.37	10.72	9.51	15.92
Treasury Bills	8.18	6.98	6.91	3.89
Excess Return over bonds	<u>1.95</u>	<u>2.70</u>	<u>1.97</u>	

1. Using data from the Canadian Institute of Actuaries, "Report on Canadian Economic Statistics" March 2005.

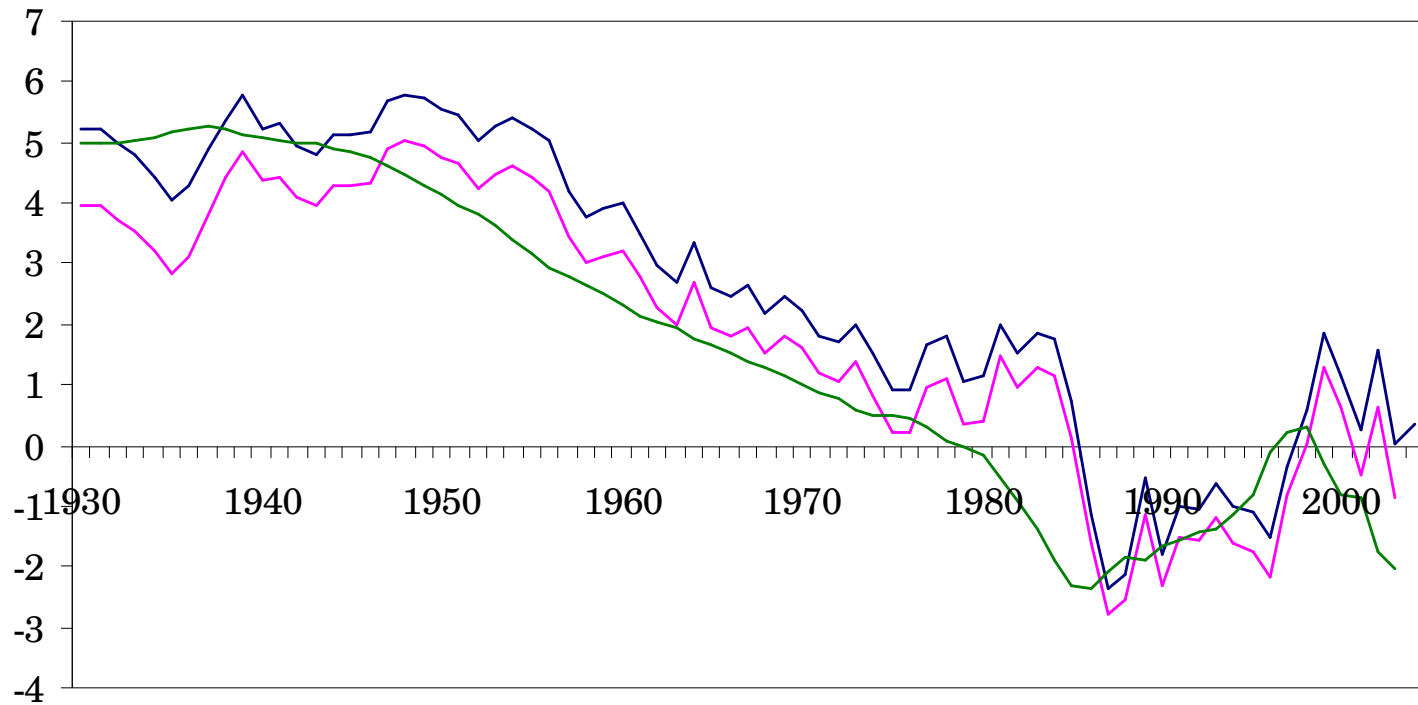
2. OLS stands for the ordinary least squares regression estimate of the growth rate







Market Risk Premium Estimates Back From 2004



— AM — GM — OLS

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 2.23% arithmetic risk premium investing from 1964-2004.

	1924	1934	1944	1954	1964	1974	1984	1994
1934	4.72							
1944	4.50	4.27						
1954	8.12	9.82	7.68					
1964	8.64	9.94	12.77	10.18				
1974	7.18	7.79	8.96	5.76	1.33			
1984	7.31	7.83	8.72	6.51	5.36	8.00		
1994	5.94	6.15	6.52	4.31	2.35	2.86	-2.27	
2004	5.23	5.30	5.48	3.50	1.83	1.99	-1.02	0.24

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:

	<u>Coefficient</u>	<u>T-Statistic</u>
Constant:	1.41	
Risk: standard deviation of return on long bond index for prior ten years.	0.23	4.72
Deficit: aggregate government lending as a % of GDP.	-0.27	-8.47
Dum1: dummy variable for years 1940-51	-5.36	-12.43
Dum2: dummy variable for years 1972-80	-3.64	- 8.65
Adjusted R ² of the regression Sixty-nine years of data 1936-2004	86%	

APPENDIX F

US MARKET RISK PREMIUM ESTIMATES

1 The main source of data on the U.S. market risk premium comes from the seminal work of
2 Ibbotson and Sinquefeld, who calculated holding period return data from December 1925 for
3 common equities, long term government bonds, treasury bills, and the consumer price index. For
4 our purposes we will calculate the risk premium of equities over long bonds in the same way as
5 in Appendix E. For comparison purposes, we will also present the equivalent Canadian
6 estimates. These estimates differ from those in Appendix E, since the time periods differ slightly.
7 Schedule 1 gives the estimates of the average realized excess return of equities over long bonds
8 for the overall period 1926-2004.¹

9

10 The central message from the data in Schedule 1 seems to be straightforward, US common
11 equities have on average earned between 10.43-12.39% and long Treasuries 4.78-5.78%,
12 depending on the estimation method. The excess return of common stocks over long term
13 government bonds has been in the range 6.41-6.61% for annual holding periods (OLS & AM),
14 declining to 5.03% as the holding period is lengthened (GM). For Canada, the results are almost
15 identical to those in Appendix E, with the excess return of Canadian equities over long Canadas
16 in the 5.00-5.01% range for annual holding periods declining to 3.73% as the holding period
17 lengthens.

18

19 Note that based on annual holding periods the US realised equity risk premium is higher than the
20 Canadian equivalent. Given the "higher" quality of the US data as well as the volatility of the
21 estimates, many put greater faith in the US estimates, even for the Canadian market. This is also

¹ Data for 1926-1995 are the Ibbotson and Sinquefeld data from the CRSP data files with 1996-2002 data updated manually with data from FRED (Federal Reserve Economic Database: data base <http://www.stls.frb.org/fred>) and the Citibase data base.

1 frequently justified by the doubt expressed at the “higher risk”² Canadian market having a lower
2 realized market risk premium, as well as the increasing integration between the two capital
3 markets, which “presumably” will move Canada closer to the US experience.

4
5 However, the difference between the US and Canadian arithmetic mean risk premiums for the
6 overall period of 1.60% (6.61%-5.01%) is split between a difference in the average equity return
7 of 0.95% and a difference in the average government bond return of 0.66%, that is approximately
8 2:1 equity versus bond markets. The difference between the equity market returns can partly be
9 explained by the effects of Canadian government policy to deliberately segment the Canadian
10 equity market from that in the US,³ as well as by the historically lower risk of the Canadian
11 market. The difference in the returns on Canadian and US government bonds in turn reflects the
12 pivotal role of the US government bond market in the world capital market and the observation
13 that the Canadian market has had to react to that in the US during an era of significant
14 government financing problems.

15
16 The difference in the average realised returns between the US and Canada is consistent with
17 known institutional differences, which are unlikely to completely disappear. The data does,
18 however, emphasise that the realised risk premium is just the difference between the realised
19 return on equities minus that on bonds. However, from Appendix E we know that a "break"
20 occurred in the capital markets in the mid 1950's. Although the exact dates are somewhat
21 arbitrary, there are good reasons for putting the split at 1956/7. First, changes in monetary policy
22 freeing up interest rates to reflect market movements started around then; second, at least in
23 Canada the availability of quality data begins in 1956 and finally the incidence of personal taxes
24 on investment income became much more important in the post war period.

² Note, however, that the standard deviation or variability of the S&P500 equity returns was 20.31% or 1.67% higher than that for the Canadian market. Over this whole period US equities were *more* risky than Canadian equities.

³ 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.

1 Schedule 2 gives the estimates for both the US and Canada for the two sub periods 1926-1956
2 and 1957-2004. For the earlier period the realised return on equities is around 9.0-13.0% with the
3 lower estimate coming from the least squares regression estimate that takes into account the
4 massive volatility in the equity market at the time of the Great Crash. US equity returns were
5 then largely the same in the latter period at 10.63-12.93% range. However, there was a
6 substantial decrease in equity market risk from 25% to 17.0%. It is not frequently recognised that
7 the reason the US data starts in 1926, rather than 1924 in Canada is simply because the original
8 authors of the data wanted a complete business cycle prior to the great stock market crash of
9 1929. As a result, the start date for the data is inherently biased, both in terms of volatility and
10 the average realised return estimates.⁴ In contrast, the realised return on the long US treasury
11 bond more than doubled from around 3.5% to around 7.00%. Similarly, the standard deviation
12 (variability) of the annual bond returns more than doubled, from 4.93% to 11.07%.

13
14 For Canada equity market returns were also essentially unchanged between the two periods. The
15 arithmetic return declined from 12.55% to 10.72%; the compound rate of return declined from
16 10.30 to 9.51%, while the least squares estimate increased from 8.90% to 10.37%. Similar to the
17 US, equity market, risk declined from 22% to 16.24%. In looking at equity market returns, the
18 major difference in terms of risk is that in the earlier period the US equity markets was riskier
19 than in Canada. Canadian equity returns have been lower in the more recent period, probably due
20 to the factors previously mentioned. Similar to the US, long Canada bond returns almost doubled
21 from about 4.0% to 8.0%, as the variability in the long Canada bond return also almost doubled
22 from 5.41% to 10.40%

23
24 The data in Schedule 2 is very important. First, it highlights the fact that the main reason for the
25 decline in the equity market risk premium is **not** to be found in the equity market. ***Equity market***
26 ***risk in both the U.S. and Canada has been less since 1956 than it was in the earlier period.***
27 This is what we would expect given the greater diversification opportunities available in modern

⁴ This is discussed in more detail in Laurence Booth, AEstimating the Equity Risk Premium and Equity Costs: New Ways of Looking at Old Data,@ Journal of Applied Corporate Finance, Spring 1999.

1 capital markets. Second, it points out that it is changes in the bond market that have caused the
2 equity market risk premium to decline. In both the U.S. and Canada bond market risk has
3 essentially doubled over these two long time periods. At the same time average bond market
4 returns have also doubled. This has significantly reduced the market risk premium, when
5 measured as the excess of the equity market return over the bond market return. Moreover it
6 points to the fact that the same factors have been at work in the US as in Canada.

7

8 Another way of looking at the data is in Schedule 3, which looks at what has caused the decline
9 in the market risk premium. In the U.S. the market risk premium has declined by 1.46-4.06%,
10 whereas in Canada the decline has been 2.96-5.85%. In Canada the evidence on the equity
11 market is more mixed, but in the US it is clear that equity market returns have remained quite
12 similar between the two periods. In contrast, for both the US and Canada average bond market
13 returns have increased significantly, by 3.53-3.94% in the US and 3.67-4.43% in Canada. As is to
14 be expected, bond market returns have increased marginally more in Canada as judged by all
15 three estimation techniques. The upshot from this analysis is that even if the equity market had
16 performed the same between these two periods the equity market risk premium would have fallen
17 by about 4.0% due to the increase in bond market returns and risk.

18

19 The graph in Schedule 4 gives the relative uncertainty of the equity market to the bond market for
20 both the US and Canada. In both cases uncertainty is measured by the standard deviation of
21 annual returns over the prior ten years. As is very clear, like Canada, the US equity market was
22 much more volatile than the bond market until the mid 1950s. Until then equity markets were
23 about four times as volatile as the bond market and frequently more. After the mid 1950's,
24 however, the increasing uncertainty in the bond market caused the differences in risk to become
25 less pronounced. For the last twenty years, since the early 1980s, the bond market has been
26 almost as risky as the equity market.

27

28 The graph in Schedule 5 gives the beta for the US and Canadian bond markets. In both cases the
29 betas are estimated using annual holding periods over the prior ten-year period, so that 1935

1 measures the bond beta from 1926-1935. Since interest rate risk has recently been much more
2 pronounced we would expect that the long-term bond market would begin to show some of the
3 same risk characteristics as the equity market, which it does. Note that until the 1970's bond
4 market betas could be safely ignored, since interest rate risk had little impact on the equity
5 market. However, bond market betas started to dramatically increase in the mid 1980's, reaching
6 a recent peak of about 0.57 for Canada and 0.70 for the US. Recently bond market betas⁵ have
7 declined significantly in both the US and Canada so that there is currently little evidence of
8 significant systematic risk premiums in bond returns. However, what is evident in the graph is
9 that adding bonds to an equity portfolio has not reduced overall portfolio risk in this second
10 period to the extent that it did in the earlier period: that is, bonds are no longer the low risk
11 securities they were fifty years ago.

12

13 The conclusion from examining US equity market data is that US equity returns continue to
14 marginally exceed those in Canada, with the recent excess probably reflecting Canadian tax
15 preferences and the lower risk nature of many Canadian companies. In contrast, Canadian bond
16 returns have exceeded those in the US as public sector borrowing has persistently forced
17 Canadian governments into the capital market. ***In both countries, realised market risk
18 premiums have declined significantly due to the large increase in bond market risk and bond
19 returns.***

20

21 For 1957-2004 the US market risk premium is 1.86-2.91% higher than in Canada. Of the
22 arithmetic return difference of 2.91%, 0.69% is due to higher bond market returns in Canada, and
23 2.21% higher equity market returns in the US. The bond market difference reflects the more
24 severe financing problems faced by the Canadian government. The lower Canadian equity returns
25 are primarily due to the institutional differences between the US and Canada. However, they may
26 also be due to the lower risk of the Canadian market. Even in the later period the standard

⁵ The bond market betas are based on a simple regression of the bond market return against the equity market return. Estimating the betas over five years of monthly data produces the same types of estimates, see J. Petit ACorporate Capital Costs, Journal of Applied Corporate Finance, Spring 1999 Figure 4.

1 deviation of the Canadian equity market returns is marginally lower than that of the US. Further
2 in Schedule 6 is the Canadian equity market beta from the point of view of a US investor. This
3 estimate of risk is that of a US investor adding Canadian securities to a diversified US portfolio.
4 Note that the Canadian equity market beta was generally around 0.80 until the late 1980's when it
5 increased to above 1.0 since then it has been declining. This has primarily been due to the
6 different growth paths of the US market during the tech boom and the performance of the
7 Canadian market around NAFTA inspired restructuring post 1989.

8

9 In summary, the US equity market risk premium has behaved much the same as the Canadian
10 one. Due to the increasing bond market risk, relative to the declining equity market risk, realised
11 equity risk premiums have shrunk dramatically. Even if equity market risk is assumed to be
12 constant, the increasing bond market risk will have reduced the equity risk premium by about
13 4.0%. When the marginal reduction in equity market risk is considered it is easy to see why
14 equities have earned less since 1956 than before. However, what is important is that the changed
15 monetary policy options since the mid 1950s are highly unlikely to be reversed so the record of
16 this latter period is more useful.

Annual Rate of Return Estimates 1926-2004						
U.S.				CANADA		
	S&P Equities	Long US Treasury	Excess Return	TSE Equities	Long Canadas	Excess Return
AM	12.39	5.78	6.61	11.44	6.44	5.00
GM	10.43	5.40	5.03	9.82	6.09	3.73
OLS	11.19	4.78	6.41	10.46	5.45	5.01
Volatility ¹	20.31	9.33		18.64	8.96	

1. Volatility is the standard deviation of the returns over the whole period.

Equities Over Long Term Bonds in the U.S. & Canada						
	S&P500 Equities	U.S. Treasuries	Excess Return	TSE Equities	Long Canadas	Excess Return
1926-1956						
AM	13.05	3.38	9.67	12.55	4.00	8.55
GM	10.11	3.27	6.84	10.30	3.87	6.42
OLS	8.98	3.46	5.52	8.90	3.99	4.91
Volatility ¹	24.88	4.93		22.09	5.41	
1957-2004						
AM	12.93	7.32	5.61	10.72	8.01	2.70
GM	10.63	6.50	3.83	9.51	7.54	1.97
OLS	11.31	7.25	4.06	10.37	8.42	1.95
Volatility	16.99	11.07		16.24	10.40	

1. Volatility is the standard deviation of the returns over the whole period.

<p style="text-align: center;">Factors Determining the Decline in the Market Risk Premium (Between 1926-56 & 1957-2004)</p>						
	Decline in U.S. Risk Premium	Equity Returns	Bond Returns	Decline in Canadian Risk Premium	Equity Returns	Bond Returns
AM	4.06	0.12	3.94	5.85	1.83	4.01
GM	3.01	-0.52	3.53	4.45	0.79	3.67
OLS	1.46	-2.33	3.79	2.96	-1.47	4.43

In both the US and Canada the decline in the realised risk premium has been due to much larger bond returns.

