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Application No. 1606549

ALBERTA UTILITIES COMMISSION

PROCEEDING ID 833

2011 GENERIC COST OF CAPITAL

P R O C E E D I N G S

Volume 7

July 4, 2011

Edmonton, Alberta

L. BOOTH

Questioned by Mr. Lyttle

1 Canada and eastern United States wouldn't have had a huge
2 blackout for two or three days.

3 So there are problems attached to PBR. I know
4 it's the flavour of the month. But I'm not too sure in the
5 long run it's good to cut back on O&M.

6 Q. All right. Well, we're not here to look at the
7 specifics of PBR. I just wanted to ask you about what the
8 potential impacts on ROE are. I believe I have that answer
9 and that completes the questions I have, Mr. Chairman.

10 THE CHAIR: Thank you.

11 Commissioner Lyttle.

12 MR. LYTTLE: Yes, thank you.

13 MR. LYTTLE QUESTIONS THE WITNESS:

14 Q. Good afternoon, Dr. Booth.

15 A. Good afternoon.

16 Q. You've touched on a few of the different decisions
17 across Canada as far as what different utilities are getting
18 right now. Could you just sort of give us a framework of
19 where you see rates provincially and where we fit it in
20 currently with our placeholder, just on the Canada-wide
21 rates?

22 A. The five major hearings I was involved with, the BCUC
23 gave Terasen Gas, which is now FortisBC, I guess,
24 9.5 percent, asked them to bring in a new ROE mechanism,
25 which my understanding is they haven't done. And I don't

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Questioned by Mr. Lyttle

1 know whether they will do it. 9.5 percent looks pretty good.
2 So that's BCUC.

3 The Ontario Energy Board came in with this new
4 formula, 50 percent changes in long Canada -- forecast long
5 Canada yields, 50 percent change in spreads. Set the ROE at
6 9.75 percent, which I regard as beyond a fair and reasonable
7 rate of return because it actually exceeds most people's
8 forecast of the overall market, let alone a utility. So
9 those are two at the top end.

10 You've then got the Board of Commissioners in
11 Newfoundland and Labrador that gave 9 percent for
12 Newfoundland Power. And then as of this year they're back
13 down to their formula, just their straight formula, ROE
14 formula, and Newfoundland Power is now getting 8.38 percent.
15 So they have gone back to saying the ROE formula was useful
16 and have adopted it.

17 The Régie in a Gazifere decision last year, I
18 recommended the formula I'm recommending to you, and it was
19 adopted for Gazifere. And there's a decision -- there's a
20 hearing in Gaz Metro which will be underway at the end of
21 August, beginning of September. And I fully expect the Régie
22 to use the same formula as I'm recommending here because I
23 can't see how they will have accepted the formula for
24 Gazifere last year and then decide that they can't accept it
25 for Gaz Metro. So the Régie indicated that they wanted a

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Questioned by Mr. Lyttle

1 return to their formula and have now returned to their
2 formula with this tweak that I've added.

3 So I think you've got Newfoundland and Quebec
4 that have adopted ROE formulas. You've got OEB that's
5 rebased to a much higher rate of return. You've got the BCUC
6 on a fixed rate. And you're the fifth one.

7 Q. And where does the Régie number come in?

8 A. The Régie's number was for Gazifere, which is a tiny
9 utility owned by Consumers Gas/Enbridge Gas around Ottawa.
10 And if I remember correctly, the ROE was 9.1 percent, but
11 they've always had a high rate of return, the Gaz Metro,
12 because they're a small utility.

13 Gaz Metro, they set -- the benchmark rate of
14 return was 8.95 percent, and they added a premium for
15 Gaz Metro because Gaz Metro faces a large amount of risk from
16 Hydro Quebec simply because everybody -- not everybody, but a
17 lot of people in Quebec heat with electricity, and, as a
18 result, most of the demand for Gaz Metro comes from
19 industrial demand, and they've got a good penetration in new
20 housing, but most people in Quebec heat with electricity
21 because Hydro Quebec's rates are so low, which is a similar
22 problem in BC, which is where the lower mainland increasingly
23 it's all condominiums, and they use electricity.

24 So BC Gas -- sorry, Terasen Gas or Fortis Gas,
25 whatever it is now, is facing problems that -- given the

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Questioned by Mr. Lyttle

1 density in British Columbia, is facing significant
2 competitive pressure from electricity, and that was the basic
3 reason the BCUC gave it more equity and a high rate of
4 return.

5 So one of the criticisms I have is that
6 whenever you look at these numbers and you see somebody is on
7 this ROE or somebody is on this common equity ratio, you have
8 to look at them and say are these generic or is there a
9 reason for this? And there's almost always a reason why
10 there's a change in the ROE or change in the common equity
11 ratio.

12 So you can't just take FortisBC, the former
13 Terasen Gas, and say, "Look, we'll apply that," because the
14 situation is different, and you can't take the NEB's formula
15 for TQM different because the NEB decided TQM was integrated
16 with the Mainline and the Mainline was suffering huge drop in
17 throughput.

18 Q. Okay. Do you see -- I know you say you can't see it
19 generically. Do you see us as anything different? Lower
20 risk? Higher risk? I know you spotted some specific things
21 in there. I'm just saying how do you see Alberta in this
22 spread of rates that you've shown?

23 A. Alberta, I would say the closest is Quebec in terms of
24 the way you treated things in 2009. Both jurisdictions are
25 extremely protective towards the utility, as, in fact, most

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Questioned by Mr. Lyttle

1 jurisdictions in Canada are. But the fact is running pipe or
2 running those fat wires for a transmission or the thin wires
3 for distribution, the technology is basically the same.
4 Almost all the risk is regulation. It's how you treat the
5 utility, whether you completely protect them with deferral
6 accounts or full cost of service regulation, or you
7 deliberately expose them to some risk for whatever reason.

8 So when we look at bond ratings, and we look
9 at the risks, it's almost all regulation. And I would regard
10 every jurisdiction in Canada as being more favourable than
11 the typical jurisdiction in the United States.

12 I can't think of any jurisdiction in Canada
13 that has exposed their utility to any risk. And that's the
14 same for you as for the BCUC or the OEB, the Régie, and
15 everybody, which is why the rating agencies consistently say
16 Canada is a very protective jurisdiction, not like the United
17 States.

18 Q. Does the protection give us a better lower long-term
19 ROE, because if we -- I see the range from 8.3 to 9.75, and
20 some are outliers because of certain reasons, but if we were
21 to adopt your number, I think 8.15, and maybe if that was
22 fair for this period, would that lower rate be -- and my
23 understanding is that it would bring down the market value to
24 book value in these examples that we have before us as well,
25 and over the long term would that create an area of

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Questioned by Mr. Lyttle

1 suspicion? Would it be easy for these utilities to raise
2 money? Or would it be like shooting us in the foot in the
3 long run? I'm just trying to get your flavour of how that
4 would affect --

5 A. That's a very, very good question. If everybody was
6 doing exactly the same thing, it wouldn't have an impact.
7 I'm deeply concerned that an electric utility in Ontario is
8 getting close to 10 percent whereas Newfoundland Power is
9 getting 8.38 percent.

10 Up until the financial crisis we basically had
11 consensus in Canada. Everybody was on an adjustment
12 mechanism, only allowed rates of return within a very, very
13 tiny range. There wasn't any serious concern amongst the
14 analyst. Obviously they said we wish the rate of return was
15 higher. If you were a bondholder, obviously you want a
16 higher rate of return. It makes the bonds a little bit lower
17 risk.

18 But there weren't any obvious problems in
19 Canada until the financial crisis. Now, we do have a
20 significant problem. I don't honestly understand how we can
21 have a situation where Newfoundland Power gets 8.38 percent
22 and basically a wires company in Ontario gets I think
23 9.85 percent at the moment. That is entirely the result of
24 different reactions to regulators during 2009.

25 And I think the OEB is an outlier, and we have

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Questioned by Mr. Lyttle

1 to remind ourselves there that the private companies in
2 Ontario, basically Enbridge/Consumers Gas and Union Gas, are
3 on settlements, so they don't get the OEB formula. It's only
4 the publicly owned utilities, the municipalities, and those
5 owned by the province of Ontario. And I don't know whether
6 that led to the decision, but these are publicly owned assets
7 that are now getting a high rate of return, whereas the
8 privately owned utilities in Ontario are still getting the
9 old OEB formula, which is about 8.3, 8.4 percent, and they
10 willingly accepted that in a settlement.

11 Q. So is it more prudent for us to shoot somewhere in the
12 middle to attract the capital and yet to not punish
13 necessarily ratepayers by too high of a yield?

14 A. Okay, that's a very good question, another very good
15 question. There is always the temptation. I used to learn
16 this in one of the first economics classes, that when you've
17 sort of got two people on the television, one sort of
18 perfectly moderate person and they say, Well, we need someone
19 who opposes them, and they get some person way out in left
20 field, and you look at them both, and they're given equal
21 weight, and everyone seemed to think, Well, that's 50 percent
22 and that's 50 percent.

23 And I've talked about this many, many times
24 when I thought about putting in testimony. The fact is my
25 recommendations -- and I might get tarred frequently as being

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Questioned by Mr. Lyttle

1 a low-ball estimator. My recommendations are not low ball.

2 Why I like Fernandez's survey is because he
3 got 2,000-plus professionals, professors of finance, saying
4 the market risk premium is between 5 and 6 percent. I am not
5 low balling. I'm basically saying right in the middle of
6 what people are saying the market risk premium is. There's
7 no dispute in terms of long Canada bond yields. You can go
8 and talk to RBC or TD or anybody auditing the pension plans
9 about what a long-run rate of return is that keeps the
10 pension plans whole. I'm coming in with recommendations I
11 feel are straight down the middle.

12 If you then say, Well, look, there's Booth on
13 one side and there's somebody else and somebody else, let's
14 split the difference, it sort of leaves an incentive for me
15 to say, well, next time I should come in with 6 percent and
16 then if we saw it off in the middle, it will be right.

17 I can't do that. I can't come in and give
18 what I would regard as a low-ball estimate just in the hope
19 that you saw it off and you end up with a reasonable
20 estimate.

21 I think I've come up with a reasonable
22 recommendation. The utilities obviously aren't going to like
23 it. They're going to say it's low ball, but I think it's
24 entirely consistent with what the investment community is
25 saying, with what analysts are saying when they're asked for

L. BOOTH

Questioned by Mr. Lyttle

1 what the market risk premium is and what the historic record
2 is. There's nothing in my recommendation that's inconsistent
3 with either the facts or what's coming out of survey and
4 other information. So I don't believe you should saw it off.

5 Q. I just find it very interesting that all regulators have
6 this three-legged stool test and yet we have a range from
7 8.38 percent all the way to 9 and three-quarters and yet they
8 all -- it seems to be quite a wide range for fair return.

9 A. I think you're right. And I think the fact is they
10 should have put all the regulators in the room together and
11 they should have had one hearing right across Canada, but we
12 can't do that. But the fact is we had the results of this
13 financial crisis that was really a very, very, very severe
14 crisis. And reacting to that very, very severe crisis,
15 regulators have gone in different directions.

16 So I think if the financial crisis hadn't come
17 about, we would all still be on the ROE formula, which is why
18 the question of whether we're now beyond the crisis and back
19 to normal is so critically important. But after the
20 financial crisis, the Alberta utilities will be on 8.3,
21 8.4 percent.

22 Q. Thank you. Just one last question, just a different
23 area. I was the one that mentioned the other day about a
24 sixfold increase -- that's what AltaLink had in their GTA
25 just recently -- over the next five to six years. And then I



IN THE MATTER OF

**TERASEN GAS INC.
TERASEN GAS (VANCOUVER ISLAND) INC.
TERASEN GAS (WHISTLER) INC.**

AND

RETURN ON EQUITY AND CAPITAL STRUCTURE

DECISION

December 16, 2009

BEFORE:

**Anthony J. Pullman, Commissioner/Panel Chair
D.A. Cote, Commissioner
M.R. Harle, Commissioner**

Terasen states that TGI has outstanding PMMs totalling approximately \$275 million, which fall due in 2015/16 and that, while a determination has not been made, it is currently of the view that it may not be able to reissue the PMM's on maturity with the result that they will be refinanced with unsecured debentures. Since the PMM's are not subject to the issuance coverage test, while the unsecured debentures that refinance them would be, Terasen states that the refinancing of its PMM's on their maturity will lead to further constraints on the issuance coverage test.

Terasen provides Exhibit B-28, which discusses the coverage test and attaches a table which demonstrates that at 35 percent equity and an 8.43 percent ROE it would have difficulty in issuing \$100 million of unsecured debt in 2009. (Exhibit B-28)

Commission Determination

Based on the Commission's assessment of TGI's long-term business risk in its 2006 ROE Decision, the fact that TGI has no preferred shares in its capital structure, and a comparison with the other major natural gas LDCs in Canada, the Commission Panel considers that the equity ratio of TGI, remains in the range of 35 percent to 38 percent before considering the impact of any change in TGI's long-term business risk that has occurred since 2005.

The Commission Panel agrees with the Intervenors that all risks cited by Terasen existed in 2005 with the exception of the climate change related risks and those related to First Nations.

As for the existing risks, the Commission Panel does not see how TGI's ability to earn a return on or of its capital has been adversely affected since 2005. Although all Intervenors identify the competitive position of natural gas compared with electricity as one risk which has diminished since 2005, the Commission Panel considers that natural gas' competitive edge over electricity is dependent on too many significant variables, such as the level of the carbon tax, the volatility of natural gas prices and the impact of government policy on BC Hydro's rates, to be considered permanent.

As for concerns about the risks posed by First Nations, the Commission Panel agrees with Terasen that the risks did not exist in 2005, to the extent they are currently perceived, and that they constitute an increase in risk over natural gas LDCs operating in other provinces. The Commission Panel does not consider that the risks presently cast doubt over TGI's ability to earn a return on or of its capital.

The Commission Panel agrees with Terasen that the introduction of climate change legislation by the provincial government has created a level of uncertainty that did not exist in 2005 and that the change in government policy will quite probably cause potential customers not to opt for natural gas and persuade potential retrofitters to opt for electricity. In addition, the Commission Panel considers that the Nyboer Report presents a scenario that did not exist in 2005 under which the three Terasen utilities might not earn a return of their capital. The scenario that now exists is described in a publication of a reputable consulting group which appears to have the attention of policymakers.

As for the evidence that US natural gas LDCs have thicker equity ratios than their Canadian counterparts, the Commission Panel notes that no reasons for the difference were entered into evidence. The Commission Panel concludes that the difference between US and Canadian natural gas LDCs' equity ratios is not of itself determinative.

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

As it did in its 2006 ROE Decision, the Commission Panel requires TGI to file within 30 days of this Decision a document setting out how and when it will implement this change to its capital structure in compliance with the ring-fencing conditions approved by the Commission in its Order G-49-07.

**FAIR RETURN AND CAPITAL STRUCTURE FOR GAZ
METRO**

EVIDENCE OF

Laurence D. Booth

BEFORE THE
RÉGIE DE L'ÉNERGIE

July 2011

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EXECUTIVE SUMMARY

The following highlights the key points in my testimony:

- 1) Gaz Metro's business risk has continued to decline. The development of shale gas over the last few years is a game changer and even with record high inventories the price of natural gas has declined making it very competitive in all markets with both electricity and fuel oil. Longer term development of Quebec's shale gas reserves will only enhance this, but this is far enough away that I place no weight on it at present.
- 2) The Canadian economy has now recovered from the recession and is drawing down on the remaining space capacity so we can expect several years of above average growth. However, the world is still being buffeted by the sovereign debt crisis and the problem that many countries may not be able to repay the debt they borrowed to offset what could have been a repeat of the Great Depression.
- 3) While financial stress has almost disappeared from the system, corporate spreads over government bond yields remain high. At 150 bps they remain about 50 bps higher than normal. I therefore recommend the new ROE adjustment mechanism the Regie implemented for Gazifere last year, which adjusts the ROE for 75% of the change in expected long term Canada bond yields and 50% of the utility spread.
- 4) Estimates derived from US utilities cannot be used in Canada without adjustments for their generally higher risk and the higher current capital costs in the US market.
- 5) Consistent with the Consensus Economics forecast I anticipate an average 4.5% long term Canada (LTC) bond yield for 2012. I estimate the experienced market risk premium in Canada to be just over 5.0% versus 6.0% in the US (Appendix B). However, the reasonable range for the market risk premium based on a survey of finance professors, financial analysts and corporate executives is 5.0-6.0%. This produces an expected market return of about 10.0% or a real return of 8.0%.
- 6) I continue to judge the relative risk of a Canadian utility to be in a range of 0.45-0.55, however recent experience has been at the bottom of this range as they have demonstrated once again the defensive characteristics of utility stocks. Gaz Metro's higher business risk is reflected in its 7.5% deemed preferred share component.
- 7) I use a 0.50% flotation cost allowance, adding this to the estimates produces an ROE range of 7.50-8.70% and a recommended ROE of **8.10%** as follows:

	Low	High
Forecast LTC Yield	4.5	4.5
Market risk premium	5.0	6.0
Relative risk adjustment	0.45	0.55
Flotation cost	0.50	0.50
Spread Adjustment	0.25	0.40
Overall	7.50	8.70

I INTRODUCTION

Q. PLEASE DESCRIBE YOUR NAME, QUALIFICATIONS AND EXPERIENCE.

A. Laurence Booth is a professor of finance in the Rotman School of Management at the University of Toronto, where he holds the CIT Chair in Structured Finance. Dr. Booth has appeared before the Regie several times before and a detailed resume is filed as Appendix A. Further information and copies of working papers by Dr. Booth can be can be downloaded from his web site at the University of Toronto at <http://www.rotman.utoronto.ca/~booth>.

Dr. Booth has appeared before most of the major utility regulatory boards in Canada including the National Energy Board, the CRTC, the Ontario Energy Board (OEB), the Regie De L'Énergie and the BC and Alberta Utility Commissions (BCUC and AUC). He has also filed testimony before the Ontario Securities Commission and in a variety of civil suits pertaining to financial matters.

Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY

A. The Industrial Gas Users Association (IGUA) has asked me to review Gaz Metro's application and associated evidence and to offer an opinion as to a fair rate of return and appropriate capital structure for Gaz Metro.

Q. HOW IS YOUR TESTIMONY STRUCTURED?

A. I have now been involved in 3 Gaz Metro ROE cases in five years, each time Gaz Metro has presented a different ROE witness. In 2007 Gaz Metro presented Dr. Stephane Chretien whose recommendations were based on the "innovative" Fama-French model, in 2009 Drs. Kolbe and Vilbert presented recommendations based on the "innovative" ATWACC model and now Dr. Morin has recommendations based on traditional ROE testimony. However, despite the significant amount of ROE testimony placed before the Regie, the allowed ROE and capital structure have not significantly changed and the Regie has not changed its previous rulings. Although my understanding is that one panel of a regulatory board can not bind another, I will first review the major decisions that the Regie has made since I will in part structure my evidence around these decisions.

1. Gaz Metro's overall risk is higher than that of the benchmark Canadian utility (D-2007-16) due to the composition of its customer base and competition from Hydro Quebec; offset in part by the more extensive use of deferral accounts and the impact of performance based regulation. This assessment was confirmed in D-2009-156 when the Regie decided that this risk had not materially changed since 2007. (D-2009-156, paragraphs 278-282)
2. Bondholders and unit holders (GMLP) have similar perceptions of the risk of the long run recovery of capital and this can be assessed in part by examining the reports of the rating agencies. (D-2009-156, paragraph 279)
3. The Regie found that the comparability of US and Canadian regulatory, institutional, economic and financial environments was inconclusive. (D-2009-156, paragraph 294-295)
4. In estimating the fair ROE the Regie placed primary reliance on the CAPM (D-2009-156, paragraph 238), but due to the financial crisis felt that some weight should be placed on other models (D-2009-156, paragraph 240) and also added a premium due to the impact of the crisis (D-2009-156, paragraph 263)
5. The Regie decided that it should take a medium to long term view in estimating the market risk premium and the use of long term averages was consistent with this (D-2009-156, paragraph 255) and that the market risk premium prior to the crisis was in the range 5.50-5.75% (D-2009-156, paragraph 252)
6. However due to the financial crisis the Regie increased its estimate of the market risk premium by 0.50-1.0% (D-2009-156, paragraph 263).
7. In terms of a benchmark distributor's risk, the Regie decided that betas adjust toward their own mean in D-2003-93 and confirmed this in D-2007-116 and again in D-2009-156, paragraph 269 and set Gaz Metro's beta at 0.50-0.55.
8. The Regie found that its automatic ROE adjustment model had given valid results in the past as well as streamlining the regulatory process and renewed it for 2011 for Gaz Metro. Subsequently in a Gazifere decision (D-2010-147, paragraph 149) the Regie adjusted its ROE formula by adding a 50% adjustment to utility bond spreads over equivalent maturity long Canada bond yields.
9. In applying its new ROE formula (8 above) the Regie decided that utility and generic A spreads did not move together and in setting the base spread at 1.50% pointed out that the spread adjustment added 0.30% to the ROE over normal conditions.

I agree with almost all these decisions, although I judge the allowed ROE to be at the top of a reasonable range and would recommend that it be lowered. In this respect I would note that the Board of Commissioners of Newfoundland and Labrador recently returned Newfoundland Power (NP) to its ROE adjustment mechanism and allowed an ROE of 8.38% (PU32-2010) for 2011, while it regards NP as an average risk utility with an "A" bond rating. Further I would caution that while I still judge Gaz Metro to be of higher risk than the benchmark Canadian utility two factors need to be kept in mind:

1. The Regie allows Gaz Metro a 7.5% deemed preferred share component in the capital structure. Deeming does not increase risk the way that an actual issue of preferred shares does, so implicitly Gaz Metro has significantly more common equity than the typical Canadian gas distribution utility and I would regard this as the offset to its higher business risk.
2. There is a change in the distribution of gas to Gaz Metro. The development of shale gas is a “game changer” and Dawn is emerging as a major hub. I would not recommend any changes at the moment, but when and if Quebec’s shale gas reserves get developed this can only be to the benefit of Gaz Metro in reducing its long term risk of capital recovery.

While I agree with almost all the decisions of the Regie, Dr. Morin clearly does not. Dr. Morin’s evidence is primarily based on estimates from US local distribution companies (LDCs) and there is no substantive analysis demonstrating that either these companies are equivalent in risk to Gaz Metro or that the US and Canadian capital markets are at the same stage in the business cycle with similar fair rates of return. Further Dr. Morin uses an excessively high estimate of the market risk premium that does not seem to be based on the impact of the financial crisis, but just seems to be high and uses adjusted betas where the adjustment is toward 1.0 and not the utility mean. Since Dr. Morin’s evidence does not address the prior decisions of the Regie, I am forced to repeat some of the same analysis that I have previously presented.

In presenting my evidence I first review some recent regulatory decisions to understand how other Canadian regulators reacted to the impact of the financial crisis. Then I discuss current economic and capital market conditions, since the fair ROE and capital structure stem from the ability of a utility to raise capital to finance operations, which varies with the economy and capital market conditions. Moreover in Canada the legal definition of a fair rate of return stemmed from “changed conditions in the money market” so it is normal to discuss how conditions have changed since the last regulatory decision. In this respect I note that there is no similar discussion in Dr. Morin’s testimony.

I then discuss the relative riskiness of utilities in Canada and my estimate of the market risk premium. This evidence is based on both the historic evidence as well as the results of surveys of a large number of professors of finance, financial analysts and corporate executives. I also

2.3 *L'application du deuxième membre de la formule de la référence (iv) peut faire augmenter ou diminuer le taux de rendement dépendamment si les écarts de crédit sont plus élevés ou plus faibles que la valeur retenue initialement de l'indice Bloomberg par la Régie. À la référence (i), vous indiquez que la valeur de l'indice est présentement à 150 points de base. Est-ce que votre recommandation de réduire de 50 à 100 points de base l'ordonnée à l'origine, afin de diminuer le taux de rendement, est dépendante de ce que sera la valeur de l'indice Bloomberg au moment de l'audience. Veuillez expliquer.*

Réponse :

No. Dr. Booth's recommended ROE formula would be as in 2.2 above, but the Regie should set the fair ROE for Gaz Metro based on its decision as to the forecast long Canada bond yield and the credit spread at the time of its decision. For example if the Regie decides that a fair ROE is 8.75% based on a forecast long Canada yield of 4.0% and a credit spread of 1.40%, then the starting ROE formula would be:

$$\text{ROE} = 8.75\% + 0,75 * (\text{POCL}_t - 4,00\%) + 0,5 * (\text{ECSR}_t - 1,4\%)$$

2.4 *Veuillez concilier votre recommandation de la référence (ii) d'accorder à Gaz Métro un taux de rendement de 8,1 % qui inclut un « spread ajustement » et votre recommandation, à la référence (iii), de réduire de 50 à 100 points de base l'ordonnée à l'origine afin de diminuer le taux de rendement et ainsi appliquer la nouvelle formule citée en référence (iv).*

Réponse :

Dr. Booth's recommendation for a 50-100 bps reduction is based on Gaz Metro's existing allowed ROE, which Dr. Booth regards as being close to the top of a reasonable range. This would reduce it to closer to the mid-point of his estimate of the fair ROE. Hopefully the answers to 2.2 and 2.3 have clarified this.

3. **Références :** (i) Pièce C-ACIG-0015, page 2 ;
 (ii) Décision D-90-75, 19 décembre 1990, page 7.

Préambule

(i) *« I) Gaz Metro's business risk has continued to decline. The development of shale gas over the last few years is a game changer and even with record high inventories the price of natural gas has declined making it very competitive in all markets with both electricity and fuel oil. Longer term development of Quebec's shale gas reserves will only enhance this, but this is far enough away that I place no weight on it at present.*

6) *I continue to judge the relative risk of a Canadian utility to be in a range of 0.45-0.55, however recent experience has been at the bottom of this range as they have demonstrated once again the defensive characteristics of utility stocks. Gaz Metro's higher business risk is reflected in its 7.5 % deemed preferred share component. »*

(ii) « 2.1.2) *Conclusion de la Régie*

La Régie est d'avis que la structure de capital proposée pour la société GMi représente des changements mineurs par rapport à la structure actuelle de GMi. Elle constate qu'au niveau des actions privilégiées, la requérante propose de fixer de façon permanente le ratio de 7,5 % de la structure de capital (GMi 4, doc. 2) et que la rémunération soit au taux actuel jusqu'à leur remplacement simulé selon l'échéancier actuel et au taux courant pour la suite.

La Régie constate aussi que les actionnaires se sont engagés à assumer tous les frais résultant de la mise en place de cette structure de capital.

Elle constate également l'assurance donnée par les agences de crédit que le coût de la dette ne sera pas modifié par rapport au coût actuel, selon le témoin Gervais. Toutefois, advenant une hausse du coût du capital, cette hausse sera imputée aux sociétaires.

Pour ces raisons, la Régie approuve la proposition de la requérante quant à la structure de capital de la Société GMi. »

Demandes :

3.1 *Depuis la décision D-90-75, la structure de capital présumée incluant un ratio de 7,5 % d'actions privilégiées fixé de façon permanente n'a pas été changée. Veuillez élaborer et expliquer davantage votre opinion, citée en référence (i), que la compensation du risque d'affaire supérieur de Gaz Métro est reflétée par le ratio de 7,5 % d'actions privilégiées dans la structure de capital présumée.*

Réponse :

In Dr. Booth's judgment Gaz Metro is riskier than Enbridge Gas Distribution Inc and Union Gas which both have 36% common equity and a small preferred share component where there actually are dividend payments that have to be made. As a result he would recommend either a higher ROE or a higher common equity component to offset this higher risk. Generally Dr. Booth prefers that higher business risk be offset by lower financial risk leaving the overall risk constant, so different utilities can be awarded the same ROE. This is because business risk changes only slowly so that the capital structure can be set and left constant for long periods of time. The 36% common equity ratio for EGDI, for example, has not been materially changed for over two decades. This means that the fair ROE can then be determined by "generic" factors in the capital market and an adjustment mechanism used, while business risk can be analysed only infrequently.

In the case of Gaz Metro, the 7.5% preferred share component is deemed and does not represent an increase in financial risk to the common shareholder. That is, there are no preferred share dividends that have to be paid prior to a dividend to the common shareholder. To all intents and purposes, Gaz Metro has a 46% common equity component at a cost equal to a weighted average of its allowed ROE and preferred share cost. In Dr. Booth's judgment, the additional 10% common equity component over Union and EGDI offsets Gaz Metro's higher business risk so that also allowing a higher ROE amounts to double counting. Consequently Dr. Booth does not recommend a premium to his estimate of a fair ROE for a benchmark utility.

4. **Référence :** Pièce C-ACIG-0015, page 6.

Préambule :

« It is also informative that S&P (2010 bond rating) views GMLP's financial risk profile as "intermediate" but the financial risk has become more aggressive. The debt ratio referred to for 2009 was 71 %. However, S&P points out that the trust deed governing the first mortgage bonds restricts non-regulated energy assets to 10 % and the non-consolidated debt ratio to 65 %. Either way this debt restriction of 65 % and a consolidated debt ratio of 71% is much higher than the current deemed ratios of 38.5 % common and 7.5% preferred equity for the Quebec assets or a debt ratio of 54 %. The clear implication is that the Quebec gas distribution assets could support a significant increase in their deemed debt ratio without impairing S&P's A bond rating. I therefore see no justification for an increase in the common equity ratio. »

Demande :

4.1 *Dans votre preuve, citée en référence, vous indiquez que la dette présumée de Gaz Métro pourrait augmenter significativement sans que S&P ne change sa cote de crédit. Étant donné que le coût de la dette consolidée est le coût appliqué dans les activités réglementées de distribution de gaz au Québec, quel serait selon vous la cote de crédit que pourrait attribuer S&P et quel serait l'impact sur le coût de la dette si la structure de capital réelle de Gaz Métro consolidée reflétait la structure de capital présumée des activités réglementées de distribution de gaz au Québec soit 38,5 % d'avoir propre et 7,5 % d'actions privilégiées. Veuillez quantifier et expliquer votre raisonnement et vos hypothèses le cas échéant.*

Réponse :

Credit ratings become progressively more difficult to "improve" as they get higher, that, is going from BBB+ to A- is easier than going from A+ to AA-, similarly the spread benefits get smaller and smaller. Most AA rated credits are financial institutions which need a higher credit rating not for the cost reason, so much as the financial access reason. Gaz Metro's credit rating is also boosted by the fact they are first mortgage bonds, whereas many Canadian utilities now issue

BUSINESS RISK AND CAPITAL STRUCTURE FOR UNION GAS

EB-2011-0210

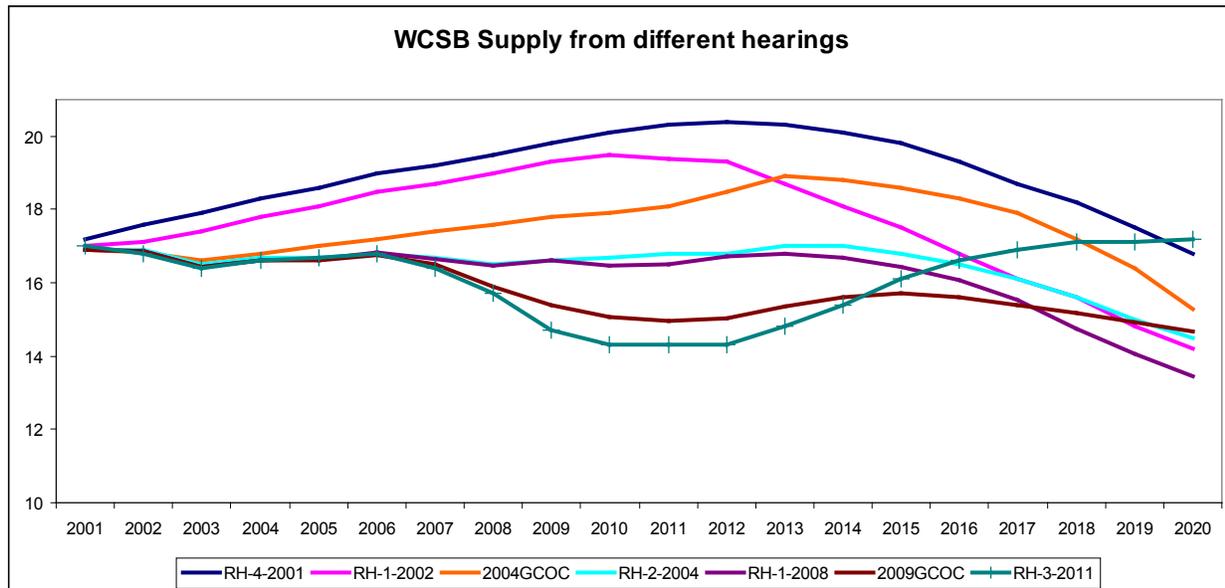
Evidence of

Laurence D. Booth

Before the

Ontario Energy Board

May 2012



1

2 The starting point is RH-4-2001 (Mainline hearing) when questions surrounding whether
 3 WCSB supply would expand sufficiently to fill the Mainline became a concern. Clearly supply
 4 forecasts were consistently downgraded in RH-1-2002, which was a Mainline depreciation
 5 hearing, and the AUC's generic cost of capital hearing (where NGTL was a participant), but
 6 the WCSB supply was still forecast to increase. This changed in RH-2-2004 (Mainline hearing)
 7 when supply was forecast to be flat through 2014 before declining, with a similar forecast in
 8 RH-1-2008 (TQM hearing).

9 This situation has changed since 2009 due to the emergence of shale gas as a "game changer".
 10 The most important change is that shale gas has changed the supply position of the WCSB,
 11 since western Canada has vast reserves of non-conventional gas that is now economic to
 12 produce and is forecast to offset the decline in conventional gas. The following is a table
 13 prepared by TransCanada of the ultimate potential of the WCSB.¹⁷ This was prepared for a
 14 Board hearing into the implications of the change in supply for central Canada and its impact

¹⁷ TransCanada Pipelines, Assessment and Implications of Natural Gas Supply Developments for the Ontario Market, Ontario Energy Board EB-2010-0199, November 2, 2010, page 14.

1 on the existing infrastructure. The main implication is that non-conventional supplies have
 2 essentially more than doubled the remaining supply potential of the WCSB.

Figure 6: Ultimate Potential of the WCSB

	Cumulative Production TCF	Remaining Potential TCF	Ultimate Potential TCF
WCSB Conventional ¹	168	109	277
WCSB CBM ¹	1.0	55	56
Montney Shale Hybrid ²	0.1	30 – 50	30 – 50
Horn River Shale ²	negligible	40 – 100	40 – 100
WCSB Total	169	234 – 314	403 – 483

¹ Source: ERCB & Gas Potential Committee

² Source: TransCanada

3
 4 Until quite recently the prevailing view was that the WCSB was entering a period of decline as
 5 conventional supplies had peaked. However the dramatic increase in potential unconventional
 6 supplies, both coal bed methane, shale and tight gas has reversed this assessment with a
 7 dramatic increase in the resource potential. TransCanada now forecasts that these
 8 unconventional supplies will dramatically impact total production from the WCSB, where the
 9 growth in Horn River and Montney supply will offset the decline in conventional production to
 10 keep total production at around 16 BCF a day.¹⁸ The following graph comes from page 16 of
 11 TransCanada's submission to the Board.

¹⁸ TransCanada Pipelines, Assessment and Implications of Natural Gas Supply Developments for the Ontario Market, Ontario Energy Board EB-2010-0199, November 2, 2010.

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Application No. 1606549

ALBERTA UTILITIES COMMISSION

PROCEEDING ID 833

2011 GENERIC COST OF CAPITAL

P R O C E E D I N G S

Volume 7

July 4, 2011

Edmonton, Alberta

L. BOOTH

Examination in chief by Mr. Manning

1 Two years later, and as I've discussed in my
2 prefiled material, I've been proven correct in terms of the
3 recovery in Canada. And we have recovered all the lost jobs
4 due to the recession, and there is no stress in the financial
5 system. However, the situation in the US is still weak as
6 they grapple with enormous debt and deficit problems with no
7 consensus on the obvious remedies of higher taxes, lower
8 government spending, or higher inflation.

9 In contrast, Europe is reducing fiscal
10 stimulus through higher taxes and lower government spending
11 and is further along in solving their debt and deficit
12 problems. However, there is palpable nervousness in the bond
13 markets due to the possible defaults of Greece and Ireland so
14 that Canada is seen as a safe harbour, pushing down
15 Government of Canada bond yields.

16 The result is that while Canada is recovering,
17 even without much support from our major trading partner, the
18 United States, corporate spreads remain wider than they
19 should be at this stage of the recovery. On this basis I've
20 recommended a fair ROE of 8.15 percent and that the AUC
21 revert to its original ROE formula with an additional
22 adjustment of 50 percent to changes in corporate bond
23 spreads.

24 Even though my forecast long-term Canada bond
25 yield is only 0.25 percent higher than in 2009, my ROE



IN THE MATTER OF

**FORTISBC ENERGY INC. AND
FORTISBC ENERGY (VANCOUVER ISLAND) INC.
2011-2014 PRICE RISK MANAGEMENT PLAN**

REASONS FOR DECISION

July 12, 2011

BEFORE:

D.A. Cote, Panel Chair / Commissioner
L.A. O'Hara, Commissioner
N.E. MacMurchy, Commissioner

The need for competitiveness speaks to the FEU position that it is in the customer's best interest that natural gas prices continue to be competitive with other energy options, principally electricity. FEU has outlined a scenario where there will be customer migration from natural gas to electricity if the competitive picture were to shift in favour of electricity. This in turn will lead to increased delivery rates and possibly result in an increase in electricity rates depending upon the reasons behind the change and the magnitude of customer migration. An interpretation of this is the customer is expected to fund the cost of a hedging program to mitigate what can best be described as a competitive business risk rather than a price risk with the ultimate effect being a stabilization of delivery costs. The Commission Panel is of the view that a Return on Investment (ROE) Hearing is a more appropriate forum for evaluating business risks and notes that in the most recent proceeding, FEU received a substantial increase in the level of ROE to compensate for increased business risk. The question arises as to why then is the gas customer being expected to bear the cost of the risks for which FEU is already compensated for within its approved rate of return. The Panel's answer is they should not.

Perhaps the more important consideration lies in the concept of competitiveness itself. The Commission Panel views the commodity price as just one of many elements affected by market forces which in concert determine the competitive position of natural gas relative to electricity and other energy sources. In addition, the Utilities must consider factors related to delivery costs as well as those affecting the cost of electricity itself. Considering only the commodity price and ignoring the potential for responding to competitive threats more broadly is in our view an inadequate response. This is especially important given FEU's admission outlined in Section 4.1.1 that well run hedging programs assist in dealing with competitiveness in the near term hedging horizon only. The Panel notes that a hedging program does not really deal with the issue of competition and the variability of the market but merely puts off the inevitable. A further consideration is that while an elimination of the gap between electricity and natural gas rates may occur over the long term, there is little to indicate this will occur over the nearer term covered by the hedging horizon.

The lack of rigorous analysis examining the hedging option against other options to mitigate competitive risk is also a concern to the Panel. This matter was queried in BCUC IR 1.2.1 where FEU was asked to "provide a detailed analysis on the risk issue, criteria that addresses the issue, the various alternatives, the pros and cons of the alternatives and the reasoning for the preferred alternative that best mitigates the risk." BCOAPO comments that this question was an opportunity to present the PRMP in a way "...that could demonstrate the appropriateness of the Proposal in terms of delivering ratepayer value for hedging dollars." BCOAPO further comments that FEU failed to seize this opportunity, a sentiment with which the Panel agrees. (BCOAPO Final Submission, p. 8) A comprehensive review such as that requested would have resulted in a more robust discussion of the competitiveness risk and outlined a broader range of alternatives.

Further, in determining the merits of an objective related to the competition with electricity, the Commission Panel believes it appropriate to consider the British Columbia's Energy Objectives as set out in the *CEA*, specifically objective (h) which is "to encourage the switching from one kind of energy source or use to another that decreases greenhouse gas emissions in British Columbia." (*CEA*, Part 1, 2(h)) It should be noted that the *CEA* objective (c) contemplates that at least 93 percent of the electricity in British Columbia be generated from clean or renewable resources. In this proceeding FEU has asserted that the PRMP can, in the short term, mitigate the impact of government policies that impact the competitiveness of natural gas to other energy forms or shape public perception that reduces the demand for natural gas. (Exhibit B-3, BCUC 1.11.1.1) The Panel's position is that it is not in the public interest to have a PRMP objective designed to mitigate the impact of an objective of government policy.

In summary, the Commission Panel bases its finding that the objective related to competitiveness of natural gas with other energy sources (principally electricity) is inappropriate for the following reasons:

- issues related to business risk have complexities beyond those of natural gas commodity cost and are more appropriately dealt with in the context of a ROE Hearing;
- in the long run the demand for gas versus electricity will not be driven by a PRMP but will be driven by market forces;

Appendix H

THE REGULATORY FRAMEWORK AND BUSINESS RISK

RISK

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

$$P_0 = \frac{ROE * BVPS * (1 - b)}{K - g}$$

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

Of the different sources of risk, normally the focus is on a firm's *business* risk, its *financial* risk, and its *investment* risk. For regulated utilities a fourth dimension is added, namely its *regulatory* risk. In terms of the above equation the firm's accounting return on equity (**ROE**) captures the business, financial and regulatory risk, which together I term income risk, whereas all the other factors are reflected in investment risk. Investment risk is the way in which investors react to the income risk and other macroeconomic variables like interest rates, inflation and GDP growth rates. The regulator can only directly affect the shareholder's income risk, since by definition investment risk is determined in the capital market. The bulk of the risk faced by investors in Canadian utility share is actually investment risk beyond the control of the regulator.

Business risk is the risk that originates from the firm's underlying "real" operations. These risks are the typical risks stemming from uncertainty in the demand for the firm's product resulting, for example, from changes in the economy, the actions of competitors, and the possibility of

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

1 In determining the appropriate common equity ratio for a utility the National Energy Board in its
2 RH-2-94 decision stated (Decision page 24)

3 “The Board is of the view that the determination of a pipeline’s capital structure starts
4 with an analysis of its business risk. This approach takes root in financial theory and has
5 been supported by the expert witnesses in this hearing. Other factors such as financing
6 requirements, the pipeline’s size and its ability to access various financial markets are
7 also given some weight in order to portray, as accurately as possible, a complete picture
8 of the risks facing a pipeline ”

9 Similarly the AEUB (forerunner of the Alberta Utilities Commission) stated (Generic Cost of
10 Capital Decision page 35)

11 “To determine the appropriate equity ratio for each Applicant, the Board will consider the
12 evidence and, where applicable, the experts’ views and rationales in each of the following
13 topic areas:

- 14 1. The business risk of each utility sector and Applicant;
- 15 2. The Board’s last-approved equity ratio for each Applicant (where applicable);
- 16 3. Comparable awards by regulators in other jurisdictions;
- 17 4. Interest coverage ratio analysis; and
- 18 5. Bond rating analysis.”

19

20 This approach of the AEUB seems to be substantially the same as the approach used by the
21 NEB: financial leverage follows on an initial discussion of business risk.

22

23 **BUSINESS RISK AND CAPITAL STRUCTURE**

24 The business risk of a utility entails a short run and a long run dimension. I generally refer to
25 these two dimensions as uncertainty surrounding the return *on* capital versus the uncertainty
26 surrounding the return *of* capital. The return of capital is the firm’s ROE, so short run uncertainty
27 is represented by variability in a firm’s ROE. Capital is then returned through the depreciation
28 charge as assets wear out or depreciate. As a result in the short run a failure to earn the allowed
29 ROE shows up before any problems in return of capital, since depreciation is deducted prior to

1 determining the firm's actual ROE. That is, if a firm earns its allowed ROE by definition there is
2 no short run problem in the return of capital. In the longer run it is possible for the underlying
3 industry economics to cast doubt on the viability of the utility calling into question both the
4 return of capital and the return on capital. However, it is important to realise that problems in the
5 return on capital occur before any problems in the return of capital.

6 Often the business risk analysis presented by a utility is "qualitative." I have read the evidence of
7 many company witnesses that involve elaborate discussion of the many possible ways in which a
8 utility can be harmed. However, risk generically is the probability of incurring harm and harm in
9 a financial sense is losing money. Consequently I put great emphasis on the historic ability of a
10 utility to earn its allowed ROE. In the short run this ability is where "the rubber meets the road"
11 and as mentioned above longer run problems have to first manifest themselves in terms of a short
12 run problem in a utility earning its allowed ROE.

13 In Schedule 1 is a table of earned vs allowed ROEs for the pipelines that are part of TransCanada
14 Corporation from their annual surveillance reports and answers to information requests.⁶ There is
15 a minor distinction between full cost of service pipelines regulated by the National Energy Board
16 and those regulated on a forward test year basis. Foothills, for example, bills its shippers for its
17 full costs and usually exactly earns its allowed ROE, to the extent that until very recently it only
18 reported one number in its surveillance reports to the NEB. However, for the last three years
19 Foothills has been under incentives that have allowed it to suddenly find costs savings and over-
20 earn its allowed ROE by about 0.50%. The TransCanada BC system (formerly ANG and now
21 integrated with Foothills) is regulated on a similar basis to Foothills and also has a long history
22 of earning its allowed ROE, but under earned in 2001, 2003 and 2006. However, in none of these
23 years was the under earning due to operational problems. Consequently, I have always regarded
24 Foothills and the TransCanada BC System as the lowest risk regulated entities in Canada, since
25 there is very little income risk from their regulated operations. With very little business risk, both
26 these pipelines can finance with large amounts of debt, in fact prior to RH-2-94 they were

⁶ The answer to information request CAPP-NGTL 25g in the AUC Generic hearing June 2009 provides the results since 1994.

1 financed with less than 30% common equity with the balance conventional debt. After 1994 they
2 were had 30% common equity and more recently 36% as a result of settlement agreements with
3 the shippers.

4 Unlike these two pipelines the TransCanada Mainline and TQ&M are regulated on a forward test
5 year basis. This leaves the companies exposed to forecasting risk where the actual revenues and
6 expenses may deviate from those expected and included in the revenue requirement. However,
7 the use of deferral accounts and long term contracting with shippers that pay fixed demand
8 charges, regardless of whether or not they ship, significantly reduces this forecasting risk. The
9 result is that both the TransCanada Mainline and TQ&M consistently over-earn their allowed
10 ROEs. Over this period the Mainline only failed to earn its allowed ROE once and on average
11 over-earned by 0.25%, whereas TQ&M over-earned by 0.35% and never once failed to earn its
12 allowed return.

13 In Schedule 2 is similar data for Union Gas, EGDI, Terasen Gas (TGI), Gaz Metro (GMI) and
14 ATCO Gas. This data was provided by Ms. McShane in CA-NP-28 and confirmed by TGI in
15 JIESC/ BCOAPO/CEC-TGI-64 except that for Gaz Metro which was provided by the company
16 in answer to IR 21.3 of the Regie D’Energie. Note that the latter answer provides different data
17 to Ms. McShane, since she includes the effect of incentives in the allowed ROE, which is thus
18 over stated. This can be easily be confirmed by comparing the allowed ROEs across the different
19 gas utilities. The data for Union and EGDI is based on weather normalised ROE’s, since these
20 utilities are not allowed deferral accounts for variances due to weather. In contrast, TGI and GMI
21 are both allowed comprehensive weather normalization accounts with TGI’s being particularly
22 comprehensive. Of note is that TGI’s “over-earning” is similar to that of the TransCanada
23 Mainline.⁷ In contrast Union and EGDI do not have as many deferral accounts and over-earned
24 to a much higher degree than the TransCanada Mainline or TGI, let alone the full cost of service
25 pipelines. GMI’s situation is different. It exactly earned its allowed ROE until the Regie allowed
26 it a series of incentive awards that have subsequently allowed it to over earn.

⁷ Since 1998 TGI’s actual ROE is after earnings sharing.

1 If risk is the possibility of incurring harm or a loss, the insight from the data in Schedules 1 and 2
2 is that regulated utilities in Canada have very little risk. It is also interesting that the degree of
3 over earning decreases with the use of deferral accounts. The full cost of service pipes can be
4 regarded as having 100% protection, since they neither over nor under-earn except if allowed
5 “incentives.” The Mainline and TQ&M have limited room to improve their earnings, since so
6 many of their revenues and expenses are fixed. Similarly TGI, with comprehensive deferral
7 accounts, looks a lot like the NEB forward test year pipes in having little room to over-earn. In
8 contrast, the two Ontario LDCs with fewer deferral accounts have over-earned the most followed
9 by GMI with its incentive regulation. However, none of these utilities have experienced anything
10 that can be described as business risk over these time periods.

11 It is also interesting to contrast the general utility performance with the utility holding companies
12 (UHC) that actually face the market. Schedule 4 shows the annual earned ROEs and the
13 estimated variability of the ROE over the period 1993-2008 for the major utility holding
14 companies (UHCs) and pure play utilities in Canada. The ten utilities include the eight main
15 public UHCs in Canada as well as the TransCanada Mainline and Foothills and Terasen for
16 historic reasons. Foothills was added since it is regulated on a cost of service basis where under
17 or over collection is periodically trued up so that Foothills normally earns its cost of service. The
18 TransCanada Mainline was added since its ROE has not been as affected by negotiated
19 settlements.

20 Of note is that although I use variability as indicative of risk for utilities, it is not a measure of
21 business risk since it reflects both the impact of financial leverage and also the change in the
22 allowed ROE. For example if the allowed ROE is changed for a utility, and as a result its earned
23 ROE also changes, this can not be regarded as risk since the variability is not coming from the
24 firm’s operations but simply regulatory changes. However, several points are important: first for
25 TransCanada Corporation (TCPL) the holding company has twice the variability of the regulated
26 Mainline. This is what we would expect as TransCanada’s unregulated operations have
27 traditionally been much riskier. Second both Foothills and the TransCanada Mainline have less
28 variability than any of the public UHCs, which confirms the fact that risk measures taken from
29 these publicly traded UHCs over states the risk of regulated utility operations.

1 The final column is the previously discussed ROE for Corporate Canada. This ROE reflects all
2 corporate activity in Canada and thus the effect of owning a small piece of everything. As such
3 it reflects full diversification of risk across all Canadian corporations. Previously I used
4 representative ROEs from the biggest companies in Canada, but many of these are quite risky, so
5 comparing a regulated utility to say Rogers Communication, Nortel, or RIM produces estimates
6 of only 10-20% as risky as the typical TSX60 firm. More importantly such a comparison ignores
7 the fact that individuals hold diversified portfolios and the measure of risk is relative to a
8 diversified portfolio. For these reasons I use the variability in the Corporate Canada ROE as a
9 benchmark even though this overstates the risk of a Canadian utility relative to an individual
10 firm.

11 In the last row but one is the standard deviation of each utility's ROE divided by that of
12 Corporate Canada. So for example CU Ltd's ROE has a standard deviation of 1.21 over this
13 period, divided by that of Corporate Canada of 2.68 gives a relative risk ranking of 0.45. This
14 means that CU LTD's ROE is only 45% as variable as that of Corporate Canada as a whole.
15 Looking across the range of UHC and utilities we see that the TransCanada Mainline and
16 Foothills as the purest utilities have about 40% of the risk of Corporate Canada. At the other
17 extreme TransAlta has the highest variability at 1.76, which is what we would expect given that
18 it has divested itself of most of its ROE regulated assets. The other relative risky operations are
19 PNG, which is generally regarded as the riskiest utility in Canada, Enbridge and TransCanada
20 Corporation. Overall the relative risk ranking makes broad sense with the purest UHCs, like
21 CUL, Emera and Fortis having relative risk rankings closer to that of the two purely regulated
22 operations.

23 However, this analysis misses a very important fact. This is that the performance of the UHCs
24 tends to occur at different stages of the business cycle than that of Corporate Canada as a whole.
25 Note that there were serious recessions/slowdowns in the early 1990s and 2000s when Corporate
26 Canada earned sub par ROEs. However, the earnings of the UHCs scarcely skipped a beat and
27 some like CUL and GMI had record high ROEs. What this indicates is that we need to take into
28 account when the high and low ROEs occur. This is because UHCs are widely regarded as
29 defensive stocks that do just as well in a recession and thus act as a "safe harbour." To measure

1 this I estimate their ROE beta, which is the sensitivity of their ROE to that of Corporate Canada.
2 This ROE beta is estimated in the same way as for their stock market betas and is in the last row
3 in Schedule 4. This beta indicates that for the purest regulated utilities the ROE betas are
4 negative! The negative beta indicates that utility earnings are not sensitive to the business cycle, which is
5 why they are defensive and low risk.

6 It is clear from this analysis that utilities invariably earn their allowed ROE; that they have less
7 variability than the diversified group representing corporate Canada as a whole; and their
8 earnings are contra cyclical. All of which is another way of saying they are low risk. This
9 indicates that there is minimal short run risk facing Canadian utilities. Moreover the increasing
10 use of deferral accounts and the removal of the merchant function are also factors decreasing the
11 typical utility's future short run risk.

12 **TGI'S BUSINESS RISK**

13 It is an interesting question to ask why none of these Canadian utilities have suffered any
14 material risk over the last 14 years or so, when in frequent rate hearings utility witnesses
15 expound in great detail about the risks they are exposed to? In my judgement the reason for the
16 gap between the risks posed by utility witnesses and the reality that none have yet to materialise
17 is that in practise these risks are shifted forward onto ratepayers. This is due to the regulatory
18 dynamic in Canada of frequent rate hearings and reviews with the effect of protecting the utility
19 from almost all aspects of its underlying business risk.

20 The low risk assessment for is due to two major factors: basic business economics and
21 regulation. In terms of *basic economics* what is important is the variability of TGI's revenues
22 and its cost breakdown. This is indicated by the following from TGI's 2008 Annual Report:

23

24

25

Schedule 1

Earned vs Allowed NEB Pipelines

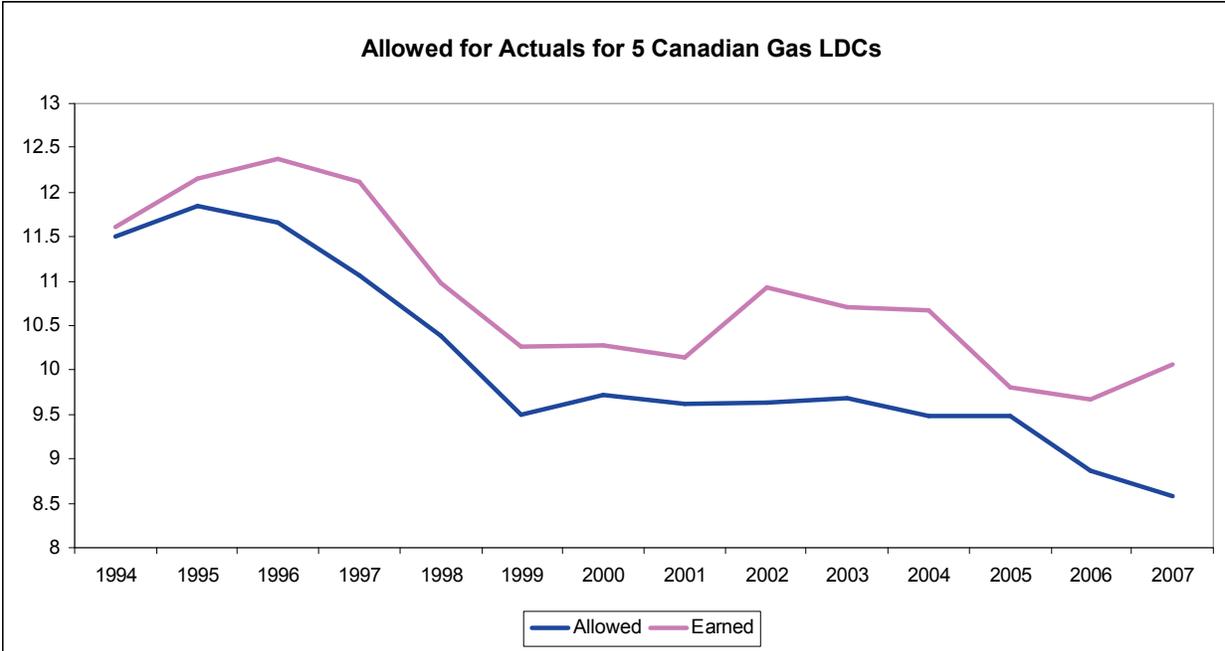
	Mainline		Foothills		TCPL BC (ANG)			TQM	A spread
	Allowed	Actual	Allowed	Actual	Allowed	Actual	Allowed	Actual	
1990	13.25	13.34	14.25	14.25	13.25	13.25	13.75	14.87	122
1991	13.5	13.65	14.25	14.25	13.38	13.38	13.75	13.94	110
1992	13.25	13.43	13.83	13.83	13.43	13.43	13.75	13.97	117
1993	12.25	12.31	11.73	11.73	12.08	12.08	12.25	12.5	107
1994	11.25	11.16	11.5	11.5	12	12	12.25	12.55	76
1995	12.25	12.56	12.25	12.25	12.25	12.25	12.25	12.65	70
1996	11.25	11.83	11.25	11.25	11.25	11.25	11.25	11.83	52
1997	10.67	11.15	10.67	10.67	10.67	10.67	10.67	10.94	54
1998	10.21	10.63	10.21	10.21	10.21	10.21	10.21	10.32	87
1999	9.58	9.64	9.58	9.58	9.58	9.58	9.58	9.94	98
2000	9.9	9.99	9.9	9.9	9.9	9.9	9.9	9.96	151
2001	9.61	9.72	9.61	9.61	9.61	6.86	9.61	10.21	129
2002	9.53	9.95	9.53	9.53	9.53	9.53	9.53	9.8	126
2003	9.79	10.18	9.79	9.79	9.79	8.21	9.79	10.21	97.37
2004	9.56	9.83	9.56	9.56	9.56	9.56	9.56	9.84	95.2
2005	9.46	9.66	9.46	10.14	9.46	9.46	9.46	9.92	100.1
2006	8.88	8.92	8.88	9.53	8.88	8.47	8.88	8.99	102.5
2007	8.46	9.13	8.46	8.89	8.46		8.46	8.74	127.17
Average	10.70	10.95	10.82	10.92	10.74	10.59	10.83	11.18	315.03
ovrearn		0.25		0.10		-0.14		0.35	

Schedule 2

Earned vs Allowed Gas LDCs

	EGDI		UNION		Terasen		GMI		ATCO Gas		
	Allowed	Actual	Allowed	Actual	Allowed	Actual	Allowed	Actual			
1990	13.25	13.60	13.50	13.40				14.25	14.25		
1991	13.13	13.29	13.50	12.50				14.25	14.25		
1992	13.13	13.40	13.00	13.70	12.25	9.06		14	14		
1993	12.30	14.43	12.50	14.30	na	11.91		12.5	12.5		
1994	11.60	12.49	11.75	12.14	10.65	9.73		12	12.04		
1995	11.65	12.66	11.75	12.12	12.00	12.03		12	11.78		
1996	11.88	13.14	11.75	12.52	11.00	11.80		12	12.04		
1997	11.50	13.00	11.00	12.28	10.25	11.27		11.5	11.9		
1998	10.30	11.97	10.44	11.14	10.00	9.70		10.75	11.09		
1999	9.51	10.77	9.61	10.10	9.25	9.97		9.64	10.22		
2000	9.73	10.83	9.95	10.11	9.50	10.12		9.72	10.06		
2001	9.54	10.03	9.95	11.45	9.25	9.31		9.6	10.38	9.75	9.58
2002	9.66	11.81	9.95	12.38	9.13	10.03		9.67	10.67	9.75	9.77
2003	9.69	9.74	9.95	12.08	9.42	10.23		9.89	10.82	9.50	10.68
2004	9.69	10.66	9.62	11.51	9.15	9.31		9.45	11.47	9.50	10.42
2005	9.57	9.46	9.62	10.99	9.03	10.09		9.69	10.51	9.50	8.00
2006	8.74	8.86	8.89	10.28	8.80	9.82		8.95	9.66	8.93	9.74
2007	8.39	9.78	8.54		8.37	9.55		9.05	9.91	8.51	11.02
Average	10.74	11.66	10.85	11.94	9.87	10.25		11.05	11.53	9.35	9.89
Overearn		0.93		1.09		0.38			0.48		0.54

Schedule 3



Schedule 4

Earned UHC ROEs

	CU Ltd	Emera	Enbridge	Fortis	GMI	PNG	Terasen	TransAlta	TCPL	Mainline	Foothills	Canada
1993	13.37	12.02	17.53	11.84	19.29	12.92	10.82	16.00	14.01	12.31	11.73	3.81
1994	13.71	11.90	9.59	10.71	19.73	13.44	7.24	15.10	12.86	11.16	11.5	6.7
1995	14.12	11.55	16.91	10.74	19.50	11.77	8.51	14.00	13.20	12.56	12.25	9.77
1996	14.86	10.59	14.47	9.61	19.91	13.32	17.59	13.24	12.33	11.83	11.25	10.35
1997	14.87	10.56	14.04	9.43	18.91	13.32	8.34	12.84	11.25	11.15	10.67	10.93
1998	14.75	9.47	13.25	7.16	19.11	10.14	12.09	16.41	7.04	10.63	10.21	8.78
1999	14.54	10.83	13.35	8.56	17.66	10.79	13.35	4.88	7.42	9.64	9.58	9.88
2000	15.44	10.88	15.65	9.71	17.93	9.75	15.16	8.14	8.44	9.99	9.9	10.93
2001	14.96	10.58	14.90	12.25	17.45	7.50	10.26	7.23	10.89	10.01	9.61	7.42
2002	17.56	6.65	10.11	12.24	18.91	5.94	9.59	2.31	11.93	9.95	9.53	5.67
2003	13.71	9.77	17.31	12.28	18.05	7.59		8.67	12.80	10.18	9.79	9.64
2004	15.19	9.80	16.43	11.25	18.21	6.97		5.97	15.49	10.18	9.56	11.63
2005	12.24	9.03	13.90	12.39	16.94	8.34		7.45	17.56	9.66	9.46	12.71
2006	14.24	9.07	14.26	11.83	15.80	5.86		1.81	14.10	8.92	8.88	14.18
2007	15.96	10.93	14.53	9.96	13.31	5.00		13.07	13.99	9.13	8.46	12.04
2008	15.67	9.92	22.69	8.68	16.57	6.79		9.77	12.70		8.71	10.38
STDEV	1.21	1.32	3.04	1.59	1.71	2.97	3.28	4.72	2.80	1.10	1.12	2.69
Ratio	0.45	0.49	1.13	0.59	0.64	1.11	1.22	1.76	1.04	0.41	0.42	
Beta	-0.05	-0.07	0.20	-0.08	-0.36	-0.40	0.43	-0.57	0.23	-0.22	-0.21	

Ratio is the simple ratio of the standard deviation of the UHC ROE to that of Corporate Canada

Beta is the regression coefficient of the Utility ROE against that of Corporate Canada.

Société en commandite Gaz Métro
Cause tarifaire 2012, R-3752-2011

Question :

- 18.6** Veuillez fournir pour chaque société canadienne de la référence (iii) et pour chaque société américaine de la référence (ii), les rendements autorisés et les rendements réalisés et ce pour la période de 1990 à 2010 pour les actifs réglementés de distribution de gaz naturel uniquement. Veuillez fournir vos références détaillées.

Réponse :

Dr. Morin does not possess such detailed information as it is well outside the scope of his testimony, and nor did Dr. Morin rely on such information to arrive at his recommendation.

Question :

- 18.7** Veuillez fournir les rendements de l'avoir propre de base autorisés et les bonifications autorisées ainsi que les rendements totaux réalisés par Gaz Métro de 1990 à 2010.

Réponse :

	Taux de rendement de base	Taux de rendement autorisé	Taux de rendement réalisé
1990	14,25 %	14,25 %	14,25 %
1991	14,25 %	14,25 %	14,25 %
1992	14,00 %	14,00 %	14,00 %
1993	12,50 %	12,50 %	12,50 %
1994	12,00 %	12,00 %	12,04 %
1995	12,00 %	12,00 %	11,78 %
1996	12,00 %	12,00 %	12,04 %
1997	11,50 %	11,50 %	11,90 %
1998	10,75 %	10,75 %	11,09 %
1999	9,64 %	9,64 %	10,22 %
2000	9,72 %	9,72 %	10,06 %
2001	9,60 %	10,38 %	9,60 %
2002	9,67 %	9,69 %	10,67 %
2003	9,89 %	10,34 %	10,82 %
2004	9,45 %	10,96 %	11,47 %
2005	9,69 %	11,64 %	10,51 %
2006	8,95 %	9,33 %	9,66 %
2007	8,73 %	9,57 %	9,90 %
2008	9,05 %	9,52 %	10,45 %
2009	8,76 %	8,94 %	9,90 %
2010	9,20 %	9,20 %	10,30 %
2011	9,09 %	9,09 %	N/D

Filed: 2012-05-04

EB-2011-0210

J.E-2-12-9

Attachment 1**Return on Equity (Regulated)**

Line No (a)	Year (b)	Common Equity % (c)	Board Approved (in rates) (d)	Benchmark (used for Earnings Sharing) (e)	Actual		Based on Normal Weather		CGO			
					After Earnings Sharing (f)	Before Earnings Sharing (g)	After Earnings Sharing (h)	Before Earnings Sharing (i)	Board Approved (in rates) (j)	Actual After Earnings Sharing (k)	Based on Normal Weather (l)	
1	1990	29.0	13.75		13.30		13.80			13.50	12.28	14.15
2	1991	29.0	13.50		10.70		13.40			13.75	10.73	12.06
3	1992	29.0	13.50		11.50		12.50			13.50	15.72	15.55
4	1993	29.0	13.00		14.00		13.70			12.50	14.13	13.07
5	1994	29.0	12.50		15.30		14.30			11.85	12.14	12.37
6	1995	29.0	11.75		10.95		12.14			12.13	13.00	12.40
7	Cal 1995	29.0	11.75		12.17		12.12					
8	1996	29.0	11.75		13.47		12.52			12.13	11.53	10.37
9	1997	34.0	11.00		12.19		12.26			11.25	13.92	13.41
10	1998	34.0	10.44		8.03		11.14					
11	1999	35.0	9.61		8.76		10.10					
12	2000	35.0	9.95		10.62		10.11					
13	2001	35.0	9.95	9.66	9.30	9.30	11.45					
14	2002	35.0	9.95	9.62	10.75	10.75	12.36					
15	2003	35.0	9.95	9.37	11.98	12.75	12.08					
16	2004	35.0	9.62	9.62	11.37	11.37	11.50					
17	2005	35.0	9.62	9.63	10.80	11.50	10.99					
18	2006	35.0	9.62	8.89	8.48	9.24	10.26					
19	2007	36.0	8.54	8.54	9.99	9.99	10.43		10.43			
20	2008	36.0	8.54	8.81	11.46	13.35	11.43		12.97			
21	2009	36.0	8.54	8.47	10.85	11.22	10.64		11.02			
22	2010	36.0	8.54	8.54	10.72	10.91	11.21		11.59			
23	2011	36.0	8.54	8.10	10.65	11.57	10.67		11.77			

RÉGIE DE L'ÉNERGIE

DEMANDE DE MODIFIER LES TARIFS DE
SOCIÉTÉ EN COMMANDITE GAZ MÉTRO
À COMPTER DU 1^{er} OCTOBRE 2011

DOSSIER : R-3752-2011
Phase 2

RÉGISSEURS : M. GILLES BOULIANNE, président
Me MARC TURGEON
M. JEAN-FRANÇOIS VIAU

AUDIENCE DU 16 SEPTEMBRE 2011

VOLUME 7

CLAUDE MORIN
Sténographe officiel

R-3752-2011
16 septembre 2011

PANEL ACIG-FCEI
Cross-examination
Me Éric Dunberry

- 38 -

Me ÉRIC DUNBERRY :

Monsieur le Président, je vais reformuler ma question.

Me GUY SARAULT :

Je pense que c'est de l'acharnement.

Me ÉRIC DUNBERRY :

Monsieur le Président, je vais reformuler ma question.

- Q. [71] Mr. Booth, Dr. Booth, would you agree with me that the DCF, or in French IFM, is a model accepted by Canadian and American regulators as being an acceptable model for purposes, as other are, I would add, but that the DCF model is a model accepted by Canadian and American regulators, in the context of rate case years?
- A. I would go even further than that -- the Discounted Cash Flow is one of the two basic models for estimating fair rates of return. We teach it in class, and it's widely used. As I indicated yesterday, ten to twelve percent (10 - 12%) of chief financial officers in the United States do place reliance upon the Discounted Cash Flow model.
- Q. [72] Okay, so we've established...
- A. It is extensively used in the United States, it has not been extensively used in Canada, and as far as

R-3752-2011
16 septembre 2011

PANEL ACIG-FCEI
Cross-examination
Me Éric Dunberry

- 39 -

I am aware, no regulator has put any weight on the DCF prior to the BC Utilities Commission decision in two thousand and nine (2009), mainly because the number of peer utilities in Canada where you can use the DCF model is almost zero. And, in fact, the Ontario Energy Board made decisions repeatedly, said it would like to use the DCF but the fact is we don't have any peer utilities to use it against.

Q. [73] Okay, so we've just established that the DCF is an acceptable model?

A. Yes.

Q. [74] My next question will be -- using the DCF as an acceptable model, if the DCF produces acceptable results, would you agree with me then that a regulator would, as the Régie said, take it into account, because you have two things that you've mentioned, an acceptable model, producing acceptable results; in that set of circumstances, when two conditions are met, would you agree with me that the results, as the Régie said, must be taken into account?

A. I... you keep forcing me... "must be taken into account", I can't tell the Régie what they have to take into account. What I can tell the Régie is that the Discounted Cash Flow model is a legitimate

BRITISH COLUMBIA UTILITIES COMMISSION
IN THE MATTER OF THE UTILITIES COMMISSION ACT
S.B.C. 1996, CHAPTER 473

and

An Application by

**Terasen Gas Inc. ("TGI"), Terasen Gas (Vancouver
Island) Inc. ("TGVI"), and Terasen Gas (Whistler) Inc.
("TGW") (collectively the "Terasen Utilities") for Return
on Equity and Capital Structure**

Vancouver, B.C.
October 1, 2009

PROCEEDINGS AT HEARING

BEFORE:

A. J. Pullman,	Chairperson
D.A. Cote,	Commissioner
M.R. Harle,	Commissioner

VOLUME 5

1 it obviously in regulatory hearings.

2 MR. JOHNSON: Q: No, I appreciate that. But the

3 research that is done is on use of the treasury bill

4 rate, is that right?

5 MR. BOOTH: A: That's correct. 30-day return on the 90-

6 day --

7 MR. JOHNSON: Q: And that research sort of universally

8 shows that the return that investors require from low-

9 risk stocks, as measured by beta, their required

10 return is higher than the model would suggest.

11 MR. BOOTH: A: It was predominate research in the '60s

12 and '70s, correct.

13 MR. JOHNSON: Q: And when we talked about this in 2005,

14 Dr. Booth, I referred you to what you regarded as

15 authoritative or well-known text, *Financial Theory and*

16 *Corporate Policy* by Copeland and Weston.

17 MR. BOOTH: A: That's correct. I used that when I

18 taught the PhD course the last time.

19 MR. JOHNSON: Q: And I gave you a copy of this extract

20 through your counsel earlier. It's a cover page and

21 pages 193 and 194 and there's also a couple of pages

22 of transcript from 2005.

23 MR. BOOTH: A: Yes.

24 MR. JOHNSON: Q: Could that be marked please? Exhibit

25 B?

26 MR. FULTON: B-21.

1 MR. JOHNSON: B-21.

2 THE CHAIRPERSON: Certainly, Mr. Johnson.

3 THE HEARING OFFICER: Marked B-21.

4 (PAGES 193 AND 194 FROM *FINANCIAL THEORY AND CORPORATE*
5 *POLICY* BY COPELAND AND WESTON WITH ATTACHED TRANSCRIPT
6 PAGES 795 AND 796 FROM 2005, MARKED EXHIBIT B-21)

7 MR. JOHNSON: Q: And at page 194, that's the third page
8 in, at the top of the page it says

9 "The CAPM is developed in a hypothetical
10 world where all the following assumptions
11 are made about investors and the
12 opportunities set..."

13 And there is a list of items of there.

14 MR. BOOTH: A: Yes. That's if it is derived using
15 objective maximization of utility functions and
16 looking at investor equilibrium.

17 MR. JOHNSON: Q: Okay. But it is developed in a
18 hypothetical world and it assumes things like all
19 investors can borrow at the risk-free rate.

20 MR. BOOTH: A: There's two ways of deriving it. One is
21 to derive it in a set of individual investors
22 maximizing their expected utility by choosing a risk-
23 free asset and investment in risky securities, which
24 is what these assumptions refer to, and there's a
25 second way of deriving it which is assuming that it's
26 a single factor in a multi-factor model. And for that

1 you don't rely upon these assumptions about investors.

2 MR. JOHNSON: Q: Okay. Now, I also within Exhibit B-21

3 was two pages of a transcript from 2005, Dr. Booth,

4 our discussion there where I referred you to the note

5 on page -- the quotation from *Peanuts* on page 193 of

6 the Copeland and Weston and asked you if agreed with

7 the quotation, which was to the effect that it's a

8 theory that can't be proved one way or the other. And

9 you said yes, that was absolutely true. And I assume

10 you continue to be of that view?

11 MR. BOOTH: A: That is true. It is very difficult to

12 find any good theory that's been disproved by

13 empirical evidence.

14 MR. JOHNSON: Q: And I just should correct an item in

15 the transcript there. On page 795 of the transcript

16 you'll see that I corrected at line 23 a word

17 "specifics". I think it should have been

18 "statistics".

19 MR. BOOTH: A: I don't think it should have been

20 "immortals" three lines up either.

21 MR. JOHNSON: Q: And I was going to say in line --

22 well, I thought perhaps they were talking about you,

23 Dr. Booth.

24 MR. BOOTH: A: Ah, I wish.

25 MR. JOHNSON: Q: I think it should be "asset-priced

26 models", correct?

1 MR. BOOTH: A: I think that sounds a lot better.

2 MR. JOHNSON: Q: And over on page 796, Dr. Booth, I
3 think you just said what you said now, that you can't
4 really prove this model or disprove it.

5 MR. BOOTH: A: That's true. And it's why we are still
6 looking at these models and testing them after 40
7 years. If we could test them and say that they are
8 undeniably true, then people wouldn't be still doing
9 research on them. And since this period, I've
10 actually got a paper looking at empirical asset
11 pricing models that's doing the rounds of the journals
12 at the moment.

13 MR. JOHNSON: Q: Oh, good. Well, I'm sure we will
14 hear about it in some future evidence, Dr. Booth. Or
15 some will. Perhaps not me.

16 **Proceeding Time 8:48 a.m. T05**

17 MR. BOOTH: A: I thought you were immortal as well.

18 MR. JOHNSON: Q: Ah, you're making me feel good. I
19 only thought that when I was 20.

20 I'd like to refer you to Terasen Gas 29,
21 the IR 29 again. And in the response, and I think
22 we've -- excuse me, I think we've already covered
23 that.

24 I'd like to refer you to a paper you -- I
25 believe you're the author of, that was on your website
26 or is on your website, Dr. Booth, entitled "Capital

Financial Theory and Corporate Policy / THIRD EDITION

THOMAS E. COPELAND

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University of California at Los Angeles*

*Firm Consultant, Finance
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7

Lucy: "I've just come up with the perfect theory. It's my theory that Beethoven would have written even better music if he had been married."

Schroeder: "What's so perfect about that theory?"

Lucy: "It can't be proved one way or the other!"

Charles Schulz, *Peanuts*, 1976

Market Equilibrium: CAPM and APT

A. INTRODUCTION

The greater portion of this chapter is devoted to extending the concept of market equilibrium in order to determine the market price for risk and the appropriate measure of risk for a single asset. One economic model used to solve this problem was developed almost simultaneously by Sharpe [1963, 1964], and Treynor [1961], while Mossin [1966], Lintner [1965b, 1969], and Black [1972] developed it further. The first model we will discuss is usually referred to as the *capital asset pricing model* (CAPM). It will show that the equilibrium rates of return on all risky assets are a function of their covariance with the market portfolio. A second important equilibrium pricing model, called the *arbitrage pricing theory* (APT), was developed by Ross [1976]. It is similar to the CAPM in that it is also an equilibrium asset pricing model. The return on any risky asset is seen to be a linear combination of various common factors that affect asset returns. It is more general than the CAPM because it allows numerous factors to explain the equilibrium return on a risky asset. However, it is in the same spirit as the CAPM. In fact, the CAPM can be shown to be a special case of the APT.

The organization of the chapter is to first develop the CAPM and its extensions, then to summarize the empirical evidence relating to its validity. Thereafter the APT will be developed and empirical evidence on it will be described. We begin with a list of the assumptions that were first used to derive the CAPM.

194 MARKET EQUILIBRIUM: CAPM AND APT

The CAPM is developed in a hypothetical world where the following assumptions are made about investors and the opportunity set:

1. Investors are risk-averse individuals who maximize the expected utility of their end-of-period wealth.
2. Investors are price takers and have homogeneous expectations about asset returns that have a joint normal distribution.
3. There exists a risk-free asset such that investors may borrow or lend unlimited amounts at the risk-free rate.
4. The quantities of assets are fixed. Also, all assets are marketable and perfectly divisible.
5. Asset markets are frictionless and information is costless and simultaneously available to all investors.
6. There are no market imperfections such as taxes, regulations, or restrictions on short selling.

Many of these assumptions have been discussed earlier. However, it is worthwhile to discuss some of their implications. For example, if markets are frictionless, the borrowing rate equals the lending rate, and we are able to develop a linear efficient set called the Capital Market Line [Fig. 6.17 and Eq. (6.34)]. If all assets are divisible and marketable, we exclude the possibility of human capital as we usually think of it. In other words, slavery is allowed in the model. We are all able to sell (not rent for wages) various portions of our human capital (e.g., typing ability or reading ability) to other investors at market prices. Another important assumption is that investors have homogeneous beliefs. They all make decisions based on an identical opportunity set. In other words, no one can be fooled because everyone has the same information at the same time. Also, since all investors maximize the expected utility of their end-of-period wealth, the model is implicitly a one-period model.

Although not all these assumptions conform to reality, they are simplifications that permit the development of the CAPM, which is extremely useful for financial decision making because it quantifies and prices risk. Most of the restrictive assumptions will be relaxed later on.

B. THE EFFICIENCY OF THE MARKET PORTFOLIO

Proof of the CAPM requires that in equilibrium the market portfolio must be an efficient portfolio. It must lie on the upper half of the minimum variance opportunity set graphed in Fig. 7.1. One way to establish its efficiency is to argue that so long as investors have homogeneous expectations, they will all perceive the same minimum variance opportunity set.¹ Even without a risk-free asset, they will all select efficient portfolios regardless of their individual risk tolerances. As shown in Fig. 7.1, individ-

¹ For a more rigorous proof of the efficiency of the market portfolio see Fama [1976, Chapter 8].

1 that returns on real estate haven't been high in
2 recent years.

3 DR. BOOTH: A: On average. But as we know, on average
4 people can drown in a stream of depth six inches.
5 It's the variability that matters.

6 MR. JOHNSON: Q: If I could ask you to turn to page 193
7 of the Copeland Weston and I'll ask you if you agree
8 with something, Dr. Booth.

9 "LUCY: I've just come up with a perfect
10 theory. It's my theory that Beethoven would
11 have written even better music if he had
12 been married.

13 SCHROEDER: What's so perfect about that
14 theory?

15 LUCY: It can't be proved one way or the
16 other."

17 Do you agree with that, Dr. Booth?

18 DR. BOOTH: A: Absolutely true. There has been
19 enormous empirical tests of asset price immortals over
20 the last 40 years. In fact, I've got -- amongst my
21 junior colleagues I've got two very, very, very good
22 econometricians, which are economists that are expert
23 in ^{statistics} ~~specifics~~. They have developed --

24 MR. JOHNSON: Q: Those are the things I don't
25 understand.

26 DR. BOOTH: A: That's okay, I don't understand them

1 either. But they are very very powerful statistical
2 tests but they basically can't prove anything. The
3 statistics we have and are very very difficult to
4 prove the central proposition of the capital asset
5 pricing model, which is the market portfolio is
6 efficient. And if it's not an efficient portfolio,
7 most of the tests of the capital asset pricing model
8 are without power. So there's been 40 years' worth of
9 empirical tests and it's still no resolution of the
10 validity of the model.

11 MR. JOHNSON: Q: Turning then to my second most
12 favourite subject, beta, and that as I understand it
13 is the volatility of a stock in a portfolio relative
14 to the market. Is that --

15 DR. BOOTH: A: That's correct.

16 MR. JOHNSON: Q: Okay. And page 38 of your evidence,
17 Dr. Booth, line 23 down towards the bottom of the
18 page.

19 DR. BOOTH: A: Yes.

20 MR. JOHNSON: Q: You say:

21 "Moreover, since investors rarely hold
22 single instruments, they are interested in
23 how the risk of their overall portfolio
24 changes as a result of holding a particular
25 security. This measure of risk is called
26 the securities beta coefficient."

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IN THE MATTER OF THE UTILITIES COMMISSION ACT
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A. J. Pullman,	Chairperson
D.A. Cote,	Commissioner
M.R. Harle,	Commissioner

VOLUME 5

1 Market Developments in the Post-October 1987 Period: A
2 Canadian Perspective".

3 MR. BOOTH: A: Yes, I have that.

4 MR. JOHNSON: Q: You have that.

5 And if that could be marked, it's the cover
6 page and pages -- the first page, which is an
7 abstract, and then pages 17 and 18 of the document, if
8 that could be marked as Exhibit B-22, I believe.

9 THE HEARING OFFICER: B-22.

10 (PAPER BY DR. BOOTH ENTITLED "CAPITAL MARKET
11 DEVELOPMENTS IN THE POST-OCTOBER 1987 PERIOD: A
12 CANADIAN PERSPECTIVE," MARKED EXHIBIT B-22)

13 MR. JOHNSON: Q: And you are one of the authors of that
14 paper?

15 MR. BOOTH: A: That's correct.

16 MR. JOHNSON: Q: And Table 5, which is on page 17,
17 shows equity returns -- shows that equity returns in
18 general display low correlation with bond returns. Is
19 that correct?

20 MR. BOOTH: A: That's correct. And that was over the
21 whole period. My guess is that that correlation is
22 even lower in more recent periods.

23 MR. JOHNSON: Q: And it also shows that Canadian and
24 U.S. bond returns are highly correlated. Correct?

25 MR. BOOTH: A: Yes.

26 MR. JOHNSON: Q: And that Canadian and U.S. stock

1 returns are highly correlated.

2 MR. BOOTH: A: Over this whole overall period? .74 is
3 a reasonably high correlation, yes.

4 MR. JOHNSON: Q: Thank you.

5 MR. BOOTH: A: It's very similar to the overall global
6 index, the Morgan Stanley Capital International, for
7 Europe, Africa and Far East -- Europe, Asia and Far
8 East.

9 MR. JOHNSON: Q: Thank you. As your evidence
10 discusses, the CAPM makes use of beta as the
11 measurement of risk. Is that correct?

12 MR. BOOTH: A: That's correct.

13 MR. JOHNSON: Q: And in fact beta is the sole risk
14 factor taken into account in the capital asset pricing
15 model?

16 MR. BOOTH: A: In the capital asset pricing model, yes.

17 MR. JOHNSON: Q: Okay. We have discussed this issue on
18 two previous occasions, Dr. Booth. You can pull out
19 my pink and green chart there. You recognize this, do
20 you?

21 MR. BOOTH: A: Yes, it looks exactly the same as it did
22 in 1993.

23 MR. JOHNSON: Q: '94.

24 MR. BOOTH: A: Oh, okay, '94.

25 MR. JOHNSON: Q: Well, that's because it is, Dr. Booth,
26 and it's the same as it was in 2005 as well. And

1 attached to it are some transcript pages which related
2 to our discussion back in 2005. You have -- you were
3 given these, some -- a couple of days ago.

4 MR. BOOTH: A: That's correct.

5 MR. JOHNSON: If those could be marked as Exhibit B-23?

6 THE HEARING OFFICER: Marked B-23.

7 (COLOURED GRAPH, WITH PAGES 790 TO 804 FROM TGI-TGVI
8 ROE HEARING, NOVEMBER 17, 2005, VOLUME 5, MARKED
9 EXHIBIT B-23)

10 MR. JOHNSON: Q: And I'll save some time here, Dr.

11 Booth. If I asked you the same questions that are in
12 the transcript that's attached to Exhibit B-23, would
13 you give me the same answers?

14 MR. BOOTH: A: Yes.

15 MR. JOHNSON: Q: Thank you. Now, in the exchange in
16 those transcript pages, you agreed that if a stock had
17 a negative beta, and in the -- i.e., that it moved in
18 the opposite direction as the market as a whole, then
19 under the capital asset pricing model the investor's
20 required return on that stock should be less than the
21 risk-free rate, correct?

22 MR. BOOTH: A: That's correct. If it's -- if you know
23 that the stock's got a negative beta, then if in fact
24 it's perfectly negatively correlated, then you can
25 perfectly hedge market risk, and that's the basis of
26 the whole derivatives market.

1 MR. JOHNSON: Q: And on this cover page of Exhibit B-
2 23, the pink line was to be -- represent the market,
3 and the green line represented a hypothetical stock,
4 individual stock, that had a beta of negative 1.

5 MR. BOOTH: A: Well, it's -- I don't know about the
6 beta, but this indicates perfect negative correlation.

7 MR. JOHNSON: Q: Okay.

8 MR. BOOTH: A: The beta is the correlation scaled by
9 the standard deviation of the market and the security.
10 What this indicates is, if you have perfect negative
11 correlation, you buy the market, and then you buy this
12 stock. If you have an equally weighted portfolio,
13 every time the market goes up, the stock goes down.
14 And every time the market goes down, the stock goes
15 up. So the result is you are perfectly hedged and
16 there's no risk. Exactly like building a risk-free
17 asset.

18 In fact, we use this to create what we call
19 synthetic securities, like a synthetic risk-free rate.

20 **Proceeding Time 8:53 a.m. T6**

21 MR. JOHNSON: Q: And in this case the CAPM would say
22 that the stock that followed the green line, the
23 investor's return on that stock would be less than the
24 risk-free rate. The investors required return on that
25 stock would be less than the risk-free rate.

26 MR. BOOTH: A: That's correct. So if it's perfectly

1 negatively correlated, you've got the exact opposite.
2 It's a like a short position in the stock market. So
3 if you've got a positive risk premium in the stock
4 market, you've got a negative risk premium for the
5 stock. So when you add them together they completely
6 offset each other.

7 MR. JOHNSON: Q: And when we talked about this on two
8 previous occasions, Dr. Booth, you referred to Home
9 Stake Mining and you said that stocks like the Green
10 Line, trying to find them is like trying to find the
11 Holy Grail.

12 MR. BOOTH: A: Well, that's true. It's very difficult
13 to find stocks that persistently have perfectly
14 negative correlation or even negative correlation.

15 MR. JOHNSON: Q: Can I ask you to turn to page 38 of
16 your evidence, Dr. Booth. And at the top of page 38
17 there's a table in which you set out various Canadian
18 utility holding companies, or Canadian utility
19 companies.

20 MR. BOOTH: A: Yes.

21 MR. JOHNSON: Q: And the table shows the beta values
22 for those companies over a period from 1985 to 2008.

23 MR. BOOTH: A: They do.

24 MR. JOHNSON: Q: And the table shows, if I understand
25 it correctly, that some of the beta values in the
26 table are negative.

1 MR. BOOTH: A: That's correct.

2 MR. JOHNSON: Q: For Enbridge, TransCanada, Amera and
3 also one instance for the utility group as a whole.

4 MR. BOOTH: A: That's correct.

5 MR. JOHNSON: Q: Does that mean we've found the Holy
6 Grail?

7 MR. BOOTH: A: No. It just means to say that when you
8 estimate something over a particular time period, in
9 this case these are five-year holding periods, you are
10 estimating whatever happened over that time period.
11 And sometimes, as in this case, we have a -- as I
12 discussed in my testimony, we have a stock market
13 driven by Nortel and JDS Uniphase. They went up, they
14 took the Canadian market with them because they were
15 at one time 40 percent of the value of the Canadian
16 market, and utilities didn't move with the market.
17 And then when they came in the early 2000s, utilities
18 didn't come down. So for that specific period of time
19 there was negative correlation.

20 But whenever we look at these betas, what
21 we are interested in is the forward, the expected
22 beta, the expected movements in the market and these
23 are just historical patterns for particular stocks.
24 And as I say in my testimony, I don't put any weight
25 -- or I wouldn't say I wouldn't put any weight. I do
26 not bind myself to a particular time period and a

1 particular pattern of stock prices or betas. Because
2 that's assuming that that pattern exactly repeats
3 itself in the future. And a quick glance at this
4 indicates that doesn't happen.

5 MR. JOHNSON: Q: So you don't suggest that companies
6 that have negative betas should receive a return less
7 than the risk-free rate.

8 MR. BOOTH: A: If you can tell me that those negative
9 betas would persist into the future, and we knew that
10 for certain without any estimation error, then I would
11 say that in the capital market people would assign
12 negative rates of return, or very low rates of return
13 to those stocks, possibly less than the risk-free
14 rate.

15 But in practice, going forward, I don't
16 believe that the betas of Amera, for example, or
17 Enbridge in the future will have negative betas
18 because that presumes they would go through a scenario
19 like the internet bubble and the Nortel and the JDS
20 Uniphase, the sort of scenario we went through in the
21 late '90s into the early 2000s, that that would happen
22 again.

23 MR. JOHNSON: Q: The capital asset pricing model would
24 suggest that these companies that have negative betas,
25 that the investors required return associated with
26 them is less than the risk-free rate.

1 MR. BOOTH: A: No.

2 MR. JOHNSON: Q: No?

3 MR. BOOTH: A: No. You are confusing experience with
4 what's happened and saying well, what happened
5 obviously was expected by investors. And that's not
6 true. I don't know about your portfolio, but my
7 portfolio took a hammering last year, and if I knew
8 that was going to happen, I wouldn't have been in the
9 equity market. But I didn't know it was going happen.
10 Exactly the same, the investors that bought these
11 stocks and got negative betas, they didn't expect
12 Nortel and Uniphase, JDS Uniphase to take the stock
13 market up and then collapse. And they didn't expect
14 that negative beta. It's what happened in the stock
15 market under a particular economic and financial
16 situation. And you only would ascribed that to the
17 future if you believe the future is going to actually
18 replicate the past.

19 And what we have here are a series of
20 empirical estimates of relationships at different
21 points in time under different economic and financial
22 situations. Only if you believe at each point in time
23 that that was exactly what the investors expected
24 would you then say that's what the CAPM would predict.

25 **Proceeding Time 8:58 a.m. T07**

26 MR. JOHNSON: Q: Okay. I'll come back to that page in

1 just a moment, Dr. Booth, so perhaps you could just
2 keep your hand there on the page, but turn to page 47
3 for a moment.

4 THE CHAIRPERSON: Sorry, Mr. Johnson, I missed that
5 reference. Could you please --

6 MR. JOHNSON: Page 47 of the evidence.

7 THE CHAIRPERSON: Dr. Booth's evidence.

8 MR. JOHNSON: Q: Dr. Booth's evidence, at line 6. You
9 refer there to Pacific Northern Gas, and you say
10 Pacific Northern Gas -- you regard Pacific Northern
11 Gas as the riskiest Canadian utility?

12 MR. BOOTH: A: Yes.

13 MR. JOHNSON: Q: Okay. And now if we go back to page
14 38 --

15 MR. BOOTH: A: Yes.

16 MR. JOHNSON: Q: -- you'll see that PNG, Pacific
17 Northern Gas, is one of the companies listed. And if
18 we go back 10 years or so, PNG had a beta of around
19 .5.

20 MR. BOOTH: A: That's correct.

21 MR. JOHNSON: Q: But in the recent years, the last
22 couple of years, it's trended down to .2.

23 MR. BOOTH: A: That's correct.

24 MR. JOHNSON: Q: So the capital asset -- if I just
25 looked at the betas as indicated on your page 38, the
26 capital asset pricing model is saying that PNG has

1 become less risky. Right?

2 MR. BOOTH: A: No. The --

3 MR. JOHNSON: Q: That's -- the beta is the measurement
4 of risk in the capital asset pricing model, correct?

5 MR. BOOTH: A: That's correct. But it's the full pass
6 --

7 MR. JOHNSON: Q: And a lower beta means less risky.

8 MR. BOOTH: A: That's correct. And the beta that we
9 use in the capital asset pricing model is our
10 expectation of what's going to happen in the future.
11 And what you've got here are the ex-post, or the after
12 the fact -- what actually happened. And whenever you
13 look at what actually happened, you have to say,
14 "Well, this is what happened over this time period.
15 This is a beta of .2 or a beta of .45, or a beta of
16 .48, whatever the number is." Then you have to
17 understand it.

18 As I think I said four years ago, possibly
19 even 14 years ago, if you're just interested in the
20 statistics, hire a statistician, because estimating
21 these betas is just a simple regression model that's
22 very, very easy to do. The value-added that an
23 economist or a finance professor brings is
24 understanding what generated those statistics. And I
25 don't rely upon any of these individual betas for my
26 recommendations. I look at the overall sample, the

1 DR. BOOTH: A: I estimate betas, but as you're probably
2 aware, I don't use the most recent betas anyway.

3 MR. JOHNSON: Q: I'd like you to refer to something
4 else I dredged up, Dr. Booth.

5 DR. BOOTH: A: Dredged up sounds a bit strange.

6 MR. JOHNSON: Q: Dredged up.

7 MR. WALLACE: Mr. Chairman, I don't recall seeing this
8 witness aid before, but I have a feeling that Dr.
9 Booth will be able to understand it fairly quickly.

10 MR. JOHNSON: I think Dr. Booth has actually seen it
11 before.

12 MR. WALLACE: Actually, when I say I haven't seen it
13 before, I haven't seen it before in the context of
14 this proceeding. I have a rough idea that I may have
15 seen something very similar. Probably about five to
16 ten years ago.

17 MR. JOHNSON: I think you saw exactly, identical
18 document 11 years ago, Mr. Wallace.

19 MR. WALLACE: I'm beginning to wonder if Mr. Johnson
20 shouldn't have just got up and said ten years ago or
21 five years ago I asked you these questions and if I
22 asked them again today would you give the same
23 answers.

24 MR. JOHNSON: They get better with age, just like good
25 wine.

26 Q: I don't know if you recall this or not, Dr.

1 Booth, but this was a homemade chart I made when I
2 first cross-examined you some years ago to try to help
3 me understand beta. And the pink line at the top of
4 the page is intended to represent the market as a
5 whole and the green coloured line at the -- lower on
6 the page is intended to represent an individual stock.

7 DR. BOOTH: A: Do I have a copy of it? I don't seem to
8 have a copy.

9 MR. JOHNSON: Q: Sorry. Perhaps while we're handing
10 it out we should mark it as an exhibit.

11 THE HEARING OFFICER: B-22.

12 MR. JOHNSON: B-22.

13 (COLOURED GRAPH MARKED AS EXHIBIT B-22)

14 MR. JOHNSON: Q: Sorry about that, Dr. Booth. And it
15 was -- the green line is intended to be a mirror image
16 of the pink line, you see that?

17 DR. BOOTH: A: Would be an example of a stock with a
18 beta of minus one.

19 MR. JOHNSON: Q: Right. That's what you told me last
20 time too.

21 DR. BOOTH: A: Good. Actually, I should have said a
22 correlation of minus one.

23 MR. JOHNSON: Q: And you, I think, indicated that
24 there were very few of these stocks around, but
25 occasionally they show up, and I think you referred me
26 to Homestake Mining?

1 DR. BOOTH: A: My memory is pretty good, because I was
2 going to refer you to Homestake Mining again.

3 MR. JOHNSON: Q: All right.

4 DR. BOOTH: A: The text books of 10 - 15 years ago
5 mention Homestake Mining because they had a negative
6 beta, but the no longer mention it because he doesn't
7 have a negative beta any more.

8 MR. JOHNSON: Q: Well, that's probably more than ten
9 years ago, because that's what you told me 11 years
10 ago, Dr. Booth.

11 DR. BOOTH: A: Consistency is a virtue.

12 MR. JOHNSON: Q: Right. And in this example, which
13 I'm just using to help us understand the theory, the
14 individual stock that's shown in green has the same --
15 is intended to have the same variation, volatility as
16 the market, but in the opposite direction and that's
17 why it has a beta of minus one.

18 DR. BOOTH: A: That's correct.

19 MR. JOHNSON: Q: And if I understand the capital asset
20 pricing model, the model would say that the individual
21 stock should receive a return -- or investor's
22 required return, let's put it that way. The
23 investor's required return for the individual stock
24 would be lower than the risk-free rate.

25 DR. BOOTH: A: That's correct.

26 **Proceeding Time 3:55 p.m. T22A**

1 MR. JOHNSON: Q: Right. And so even though the stock
2 has the same volatility as the market, you'd say that
3 you should get a rate lower than the rate on
4 government bonds.

5 DR. BOOTH: A: That's correct.

6 MR. JOHNSON: Q: And the reason for that is that the
7 capital asset pricing model relates to portfolios.
8 It's what it's measuring is how the volatility of a
9 particular stock affects the overall volatility of a
10 portfolio of stocks.

11 DR. BOOTH: A: That's correct.

12 MR. JOHNSON: Q: And so an individual investor in the
13 shares of the company whose stock is displayed in
14 green, you say that investor would have a -- require a
15 very low return because this stock happens to go up
16 when the market goes down and vice versa.

17 DR. BOOTH: A: Yeah, in this case it's a perfect hedge.
18 What you've got is stock in green perfectly hedges the
19 market portfolio, so that if you buy enough of the
20 green stock, you remove all risk. So it's exactly the
21 same as buying insurance or buying a hedging
22 portfolio.

23 MR. JOHNSON: Q: And when you are developing your
24 return, recommended return for Terasen Gas, you're
25 developing it solely on the basis of a model which
26 says you should look at the -- you should determine

1 the return of that -- return that that company earns
2 on its assets, on the basis of how that stock might
3 affect somebody holding a portfolio of stocks.

4 DR. BOOTH: A: That's correct. Overwhelmingly the
5 market is dominated by investors who own more than one
6 stock. I mean, well over half the value of the stock
7 market is institutional which hold diversified
8 portfolios, and most individuals are recommended to
9 hold at 20 stocks.

10 MR. JOHNSON: Q: Thank you.

11 DR. BOOTH: A: The market pricing is based upon people
12 who hold diversified portfolios or they hold a mutual
13 fund that implicitly is a diversified portfolio.

14 And just to sort of -- I mean, looking at
15 this green line, I mean, all it's doing is saying that
16 this a stock that basically hedges the market
17 portfolio, so it's like buying a portfolio insurance,
18 which is no different from buying insurance on a house
19 or insurance on a car or anything else. You pay for
20 it because it reduces your exposure to risks. In this
21 case you invest in this stock knowing you're going to
22 get less than the risk-free rate because it reduces
23 your exposure to the market.

24 MR. JOHNSON: Q: So if we had a utility regulated by
25 this Commission whose stock performed as on the green
26 line, then you would be saying that that utility

1 should get a return on the assets it owns and the pipe
2 it has in the ground, that is lower than the risk-free
3 rate.

4 DR. BOOTH: A: I can't conceive of such circumstances
5 happening.

6 MR. JOHNSON: Q: But the theory, from the theory you're
7 advancing, that is what the -- that would be the
8 result.

9 DR. BOOTH: A: The theory -- not that I'm advancing.
10 The theory that was advanced that won a Nobel Prize is
11 that investors pay for risks that they cannot remove,
12 and as a result they pay for market risks because
13 holding a diversified portfolio of stocks exposes them
14 to broad movements in the market which they cannot
15 remove.

16 You're introducing a security here, which
17 as I mentioned 11 years ago there was one stock and I
18 didn't know whether it still happens now. It doesn't
19 happen. So the existence of the green line, it's like
20 trying to find the Holy Grail. I mean, it doesn't
21 exist in the capital market except with securities
22 that artificially created a hedge. But if this Holy
23 Grail materialized and this security did exist, and
24 its beta coefficient could be objectively measured
25 without any shadow of doubt that it was negative, then
26 the cap asset pricing model would indicate rate of

1 return less than the risk-free rate.

2 MR. JOHNSON: Q: And the capital asset pricing model
3 and the theory that we've just been talking about
4 underlies your recommendation to this Commission.

5 DR. BOOTH: A: That's correct, but as I mentioned, the
6 securities in practice don't exist.

7 **Proceeding Time 4:00 p.m. T23A**

8 MR. JOHNSON: Mr. Shairman it is 4 o'clock and I won't be
9 finished for a while.

10 THE CHAIRPERSON: We'll adjourn until tomorrow morning at
11 nine o'clock.

12 **(PROCEEDINGS ADJOURNED AT 4:01 P.M.)**

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BRITISH COLUMBIA UTILITIES COMMISSION
IN THE MATTER OF THE UTILITIES COMMISSION ACT
S.B.C. 1996, CHAPTER 473

and

An Application by

**Terasen Gas Inc. ("TGI"), Terasen Gas (Vancouver
Island) Inc. ("TGVI"), and Terasen Gas (Whistler) Inc.
("TGW") (collectively the "Terasen Utilities") for Return
on Equity and Capital Structure**

Vancouver, B.C.
October 1, 2009

PROCEEDINGS AT HEARING

BEFORE:

A. J. Pullman,	Chairperson
D.A. Cote,	Commissioner
M.R. Harle,	Commissioner

VOLUME 5

1 Internet bubble and now the credit crunch banking
2 bubble, that have basically had a huge impact on the
3 riskiness of stocks, particularly low-risk stocks.
4 Because low-risk stocks, by definition, don't move
5 very much when the market as a whole crashes. And
6 that's what we've seen over the last year. Utilities
7 haven't gone down very much, whereas the market has
8 crashed, which is why their beta coefficients have
9 gone down. This is exactly what we would expect in a
10 market that's volatile when utilities are not
11 volatile.

12 During the period in the mid-2000s when the
13 market wasn't as volatile, then utilities reverted, or
14 were reverting, to the range of .4 to .5.

15 MR. JOHNSON: Q: Let's move on, Dr. Booth. The capital
16 asset pricing model is based on a portfolio approach,
17 is that correct?

18 MR. BOOTH: A: That's right. It assumes that people
19 hold a diversified portfolio.

20 MR. JOHNSON: Q: And --

21 MR. BOOTH: A: And the risk is measured relative to
22 that portfolio.

23 MR. JOHNSON: Q: And if I look at page 35 of your
24 evidence, I think this is what you were saying, line
25 15, towards the end of that line.

26 "However, the CAPM measures the right thing,

1 which is, how much does a security add to
2 the risk of a diversified portfolio, which
3 is the central idea of modern portfolio
4 theory."

5 Correct?

6 MR. BOOTH: A: That's correct.

7 MR. JOHNSON: Q: And would you agree with me that CAPM
8 is not attempting to measure the inherent business
9 risk of the company whose shares are traded?

10 MR. BOOTH: A: It measures the risk from the point of
11 view of the investor, which reflects the business
12 risk, the financial risk, in the case of utilities the
13 impact of regulation; and, most importantly, how the
14 investors react to information about that stock and
15 about the market. And the overwhelming amount of risk
16 is not the underlying business risk, particularly for
17 utilities, it's capital market risk.

18 MR. JOHNSON: Q: Thank you. The capital asset pricing
19 model looks at market values of the shares, and how
20 those shares trade in the market, and how they -- the
21 value of those shares moves compared to the rest of
22 the market?

23 MR. BOOTH: A: Yes.

24 MR. JOHNSON: Q: It doesn't in any way relate to
25 historic book value of assets.

26 MR. BOOTH: A: No. It -- I mean, correct, it doesn't

1 measure -- relate to book values.

2 MR. JOHNSON: Q: Thank you.

3 MR. BOOTH: A: It relates to how the investors view the
4 underlying riskiness of their claim on those book
5 value of the assets.

6 **Proceeding Time 9:12 a.m. T10**

7 MR. JOHNSON: Q: When Terasen Gas invests, let's just
8 say -- well, I just want to get -- I'll go back for a
9 second. So the capital asset pricing model, it's
10 looking at how an investment adds or subtracts from
11 the overall risk of a diversified portfolio.

12 MR. BOOTH: A: That's correct.

13 MR. JOHNSON: Q: Okay. When Terasen Gas invests,
14 let's just say \$25 million in a pipeline project, does
15 Terasen Gas's investment of that \$25 million in a
16 pipeline project add to or subtract from the overall
17 risk of Terasen Gas's investment portfolio?

18 MR. BOOTH: A: It depends on where the pipeline is and
19 how it is regulated and a whole bunch of factors.

20 MR. JOHNSON: Q: Okay. Well let's just assume the
21 pipeline is in British Columbia, it's regulated by the
22 same commission, it's just part of it's integrated
23 transmission system.

24 MR. BOOTH: A: In that case it would have no impact on
25 its risk whatsoever. It may be some marginal impact
26 in terms of spreading fixed costs over more assets.

1 There may be some sort of reduction in the overall
2 margin and competitiveness in some way, but it would
3 be a very marginal impact.

4 MR. JOHNSON: Q: Thank you. Page 48 of your evidence,
5 lines 23 to 25.

6 MR. BOOTH: A: Yes.

7 MR. JOHNSON: Q: You say:

8 "Most of the decline in the market risk
9 premium has been caused not by a decline in
10 equity returns, but an increase in bond
11 market returns commensurate with their
12 increased risk."

13 And you are comparing there the older period to the
14 more recent period.

15 MR. BOOTH: A: That's correct.

16 MR. JOHNSON: Q: And so what's -- sort of broadly
17 speaking, what's happened in more recent years, Dr.
18 Booth, is bond market returns have been higher than
19 they were in the past.

20 MR. BOOTH: A: Much much higher.

21 MR. JOHNSON: Q: And stock market returns have remained
22 sort of relatively constant.

23 MR. BOOTH: A: Not over the last ten years. They
24 haven't been very good.

25 MR. JOHNSON: Q: I'm not talking about year to year but
26 over a longer period.

BRITISH COLUMBIA UTILITIES COMMISSION
IN THE MATTER OF THE UTILITIES COMMISSION ACT
S.B.C. 1996, CHAPTER 473

and

An Application by

**Terasen Gas Inc. ("TGI"), Terasen Gas (Vancouver
Island) Inc. ("TGVI"), and Terasen Gas (Whistler) Inc.
("TGW") (collectively the "Terasen Utilities") for Return
on Equity and Capital Structure**

Vancouver, B.C.
October 1, 2009

PROCEEDINGS AT HEARING

BEFORE:

A. J. Pullman,	Chairperson
D.A. Cote,	Commissioner
M.R. Harle,	Commissioner

VOLUME 5

1 protection of property rights in the Constitution.

2 MR. JOHNSON: Q: Thank me -- thank you for that
3 informative bit of evidence, Dr. Booth.

4 Will you agree with me that the Commission
5 sets the return on equity for a return on rate base of
6 the utility, it does not set market returns received
7 by investors?

8 MR. BOOTH: A: That's correct.

9 MR. JOHNSON: Q: And will you agree with me,
10 paraphrasing line 1 on that page -- or excuse me,
11 paraphrasing line 4 on that page, that the entities
12 regulated by this Commission, i.e., the utilities, are
13 interested in the rate of return on the historic book
14 value of their investment in pipe and other utility
15 assets?

16 MR. BOOTH: A: Yes, that generates the income that's
17 priced in the capital market, and the more income over
18 long periods of time, you would expect the stock price
19 to go up.

20 MR. JOHNSON: Thank you, Dr. Booth. That completes my
21 examination.

22 THE CHAIRPERSON: Thank you, Mr. Johnson.

23 Mr. Fulton, would you like to start now, or
24 would you like a 15-minute recess?

25 MR. FULTON: I'm in your hands, Mr. Chair. I can start
26 now. I'm going to be 20 minutes to half an hour.

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Application No. 1606549

ALBERTA UTILITIES COMMISSION

PROCEEDING ID 833

2011 GENERIC COST OF CAPITAL

P R O C E E D I N G S

Volume 7

July 4, 2011

Edmonton, Alberta

L. BOOTH

Cross-examination by Mr. Smith

1 A. Okay. Well, fine. These things change on a daily
2 basis, which is why we generally average over the month.

3 Q. Now, so the 145, then, is then minus -- where were we,
4 on page 79 -- .97; right?

5 A. Yeah.

6 Q. And that would -- I had a different number, sir, because
7 I worked it out to a more recent forecast which was just a
8 slight bit off.

9 So we would be looking at an adjustment of
10 .24, is that correct, if we did the arithmetic?

11 A. Yeah, 25 basis points or so.

12 Q. All right. Now, we've talked about the percentages, the
13 75 percent and the 50 percent, which I don't think we need to
14 go back to just for the mechanics here. You do refer on
15 paragraph 202 at page 81 to a minor tweak.

16 A. Yes.

17 Q. And is that the bonus that you used to account for the
18 fact that your CAPM model yields a somewhat low result?

19 A. Somewhat low? I wouldn't say it's a somewhat low
20 result. It's to account for the fact -- as I mentioned, over
21 the business cycle there is information in the behaviour of
22 corporate spreads, and the CAPM relies upon a market risk
23 premium, for example, estimated over long periods of time or,
24 in my case, estimates from survey responses as well as
25 historic evidence, and it's not very sensitive to market

L. BOOTH

Cross-examination by Mr. Smith

1 conditions.

2 So I'm perfectly happy to add this spread to
3 the existing formula because, as I've said many times, it
4 would cause the ROE to be more sensitive to business
5 conditions, but over the full business cycle, I would expect
6 it to average out to zero. So I would regard it as a minor
7 tweak.

8 It's something that the Régie wasn't happy
9 with but now seems to have -- because they've taken the view
10 that you should look at long run, but they've now accepted
11 this formula. And it's something that the OEB has accepted.

12 Q. So the CAPM by itself doesn't reflect the market
13 conditions that lead to the fact that you observe that
14 spreads are still marginally high, as you put it.

15 A. No, I would say that's not correct. I would say the
16 CAPM is a formula. It's a question of the estimates you put
17 into that formula.

18 And two years ago I looked at the historic
19 market risk premium and provided my estimates for 5 percent
20 market risk premium. That market risk premium is relying
21 upon long-run experience returns, and in some sense is a
22 long-run estimate that is not that sensitive to temporary
23 changes in the capital markets.

24 What this tweak does is basically make the
25 model more sensitive to capital market conditions, and it

L. BOOTH

Cross-examination by Mr. Smith

1 basically addresses some of the concerns raised by the
2 utilities.

3 Q. So you're saying that the CAPM that you've employed is
4 not sensitive to market returns, so you have to plug the
5 number with a tweak.

6 A. No, I didn't say that. I said the CAPM is a formula,
7 and it's a formula that basically accounts for two of the
8 three iron laws of finance: the time value of money, and the
9 risk value of money. It doesn't adjust for the tax value of
10 money, but it does adjust for two of the basic principles in
11 finance, but it's a formula. It's a question of the judgment
12 that goes into using that model.

13 And as I've said many times, and I say to my
14 students, if you've got a choice between a good model and bad
15 judgment and good judgment and a bad model, you should always
16 go with good judgment.

17 Q. To supplement a bad model.

18 A. No, but basically the models are descriptions of
19 reality. Reality is way more complicated than any model we
20 can come up with.

21 Q. Do you ever tell your students that if you get enough
22 exceptions to a rule, you define a new rule?

23 A. That's a good one. I have to think about that one. But
24 what we do tell our students is finance is not like
25 engineering where engineering, within relative accuracy, we

L. BOOTH**Cross-examination by Mr. Smith**

1 can work out the load of a bridge and know whether the bridge
2 is going to survive with a truck going over it.

3 Q. Where this CAPM bridge may not take you right to the
4 other side of the shore.

5 A. CAP Enbridge? Is that a slip of the tongue, Enbridge?

6 Q. No, I said the -- it was your slip of the tongue. I
7 said the CAPM bridge didn't make it to the other shore, so
8 you had to supplement it with something.

9 A. The CAPM is the cornerstone of finance in terms of
10 estimating the fair rate of return. It's used by everybody
11 in estimating fair rates of return. It's used by all of the
12 major finance people. So it's the best model we have, but
13 best model isn't a perfect model.

14 Q. Okay.

15 MR. SMITH: Mr. Chairman, is this a
16 convenient time for the break.

17 THE CHAIR: It's very convenient. Thank
18 you. It being now 10:40, we will come back at 10:55.

19 (ADJOURNMENT)

20 THE CHAIR: Please be seated.

21 Mr. Smith.

22 MR. SMITH: Thank you, sir.

23 THE CHAIR: Before you go on, you were
24 going to discuss whether there was going to be an undertaking
25 or whether there was going to be a correction or something?

L. BOOTH**Cross-examination by Mr. Smith**

1 I'm just asking so that I know if I should assign a --

2 MR. SMITH: Not yet. We're going to try
3 and come back at it.

4 THE CHAIR: Okay, very good.

5 Q. MR. SMITH: Now, when we broke, Dr. Booth,
6 we were talking about the fact that your CAPM model needed a
7 minor tweak to better track the changes in the market. Is
8 that fair?

9 A. I would say that my CAPM estimate needed a minor tweak.
10 I wouldn't say the CAPM needs a minor tweak.

11 Q. That's fine. Thank you. And would you agree that,
12 other things equal, wouldn't the need to make that tweak to
13 the model suggest that greater weight be placed on
14 alternative tests like DCF?

15 A. No, they need even bigger tweaks. They need enormous
16 tweaks. So the virtue about the CAPM is that it gets you in
17 the right ballpark, and it's very difficult to make huge
18 errors. Whereas DCF you can make huge errors very simply.

19 Q. Dr. Booth, as a general proposition would you expect the
20 allowed ROE to rise as the business cycle progresses from
21 trough to peak?

22 A. Yeah, I would -- normally you expect interest rates to
23 increase in a recovery because the demand for funds increase,
24 and as a result there's a movement out of bonds into
25 equities, and as a result, you get increasing interest rates.

L. BOOTH

Cross-examination by Mr. Smith

1 And increasing interest rates are the foundation for the fair
2 rate of return on the cost of equity.

3 Q. And you used in 2009 a forecast of 4 1/4 for long
4 Canadas; does that sound right?

5 A. That's correct.

6 Q. And now you're using 4 1/2 because as you said in the
7 opening statement we're further along in the cycle?

8 A. That's correct.

9 Q. And that is for 2011 --

10 A. 2012.

11 Q. That's for 2012?

12 A. Yes. I think I state specifically where I get that
13 forecast from.

14 Q. Where?

15 A. I think --

16 Q. If you wouldn't mind, sir.

17 A. I think, for example, in the update I include the RBC
18 forecast, which has the long Canada bond yield going to
19 4.55 percent by the end of 2012.

20 Q. What page are you on, sir?

21 A. I'm just looking. Page 7.

22 Q. I'm there.

23 A. So if you look at the Canada, the 30-year, 2012 Quarter
24 4, 4.55 percent; Quarter 3, 4.5; Quarter 2, 4.5; Quarter 1,
25 4.45. So the RBC forecast for 2012 is basically 4.5 percent.

BRITISH COLUMBIA UTILITIES COMMISSION
IN THE MATTER OF THE UTILITIES COMMISSION ACT
S.B.C. 1996, CHAPTER 473

and

An Application by

**Terasen Gas Inc. ("TGI"), Terasen Gas (Vancouver
Island) Inc. ("TGVI"), and Terasen Gas (Whistler) Inc.
("TGW") (collectively the "Terasen Utilities") for Return
on Equity and Capital Structure**

Vancouver, B.C.
October 1, 2009

PROCEEDINGS AT HEARING

BEFORE:

A. J. Pullman,	Chairperson
D.A. Cote,	Commissioner
M.R. Harle,	Commissioner

VOLUME 5

1 **Proceeding Time 11:05 a.m. T28**

2 MR. JOHNSON: Q: I just have a couple of questions on
3 the Northwestern case, Dr. Booth. I think we can
4 agree, can we not, that it doesn't -- the board
5 decision that led to the Northwestern case didn't
6 relate to return on equity, it related to return on
7 rate base?

8 MR. BOOTH: A: I would accept that.

9 MR. JOHNSON: Q: You accepted that before.

10 MR. BOOTH: A: I mean -- well, sure, I haven't looked at
11 the case for a long time and I'm not a lawyer to
12 interpret what was going on in the case.

13 MR. JOHNSON: Q: And certainly the Northwestern case
14 doesn't in any way indicate that the capital asset
15 pricing model should be used. I mean, it didn't even
16 exist at the time.

17 MR. BOOTH: A: Exactly correct. The ideas of,
18 obviously, diversification have existed for eons. So
19 the basic principles are there, but nobody formulized
20 it in that way. The critical thing about the
21 Northwestern Utilities case is simply that they looked
22 to the money market, changed conditions in the money
23 market, and from my recollection they'd made a
24 decision without evidentiary support.

25 MR. JOHNSON: Q: Fair to say. And that was the issue
26 that went to the Supreme Court of Canada, whether or

1 not they could make the decision without sort of
2 testimony in front of it.

3 MR. BOOTH: A: Yes. So you do need experts.

4 MR. JOHNSON: Q: Comparable earnings, your Appendix B.

5 MR. BOOTH: A: Yes.

6 MR. JOHNSON: Q: And I'm just going to save a bit of
7 time here, Dr. Booth. I gave you or gave your
8 counsel a copy of an information request from four
9 years ago, number 70. Do you see that at the top? It
10 says --

11 MR. BOOTH: A: Yes.

12 MR. JOHNSON: Q: -- reference Appendix B. And there's
13 a number of questions there which relate to four of
14 the items that are listed on page 1 of your Appendix B
15 today, the same items.

16 MR. BOOTH: A: Yes.

17 MR. JOHNSON: Q: Do you see those?

18 MR. BOOTH: A: Yes, I see it.

19 MR. JOHNSON: Q: Okay, and rather than taking time
20 today, would you give the same answers to the
21 questions today as you gave?

22 MR. BOOTH: A: Yes.

23 MR. JOHNSON: Okay, could that be marked as the next
24 exhibit, then. B-27.

25 THE CHAIRPERSON: B-27, yes.

26 MR. JOHNSON: Thank you.

Application No. 1578571

ALBERTA UTILITIES COMMISSION

PROCEEDING ID 85

2009 GENERIC COST OF CAPITAL PROCEEDING

P R O C E E D I N G S

Volume 19

June 12, 2009

Alberta Utilities Commission Hearing Room
Calgary, Alberta

A. SAFIR, L. BOOTH, R. FAIRBAIRN

Cross-examination by Mr. Smith

1 government --

2 Q. When I put a question to you, sir, was the cost of
3 capital is higher today than it was a year ago. And what you
4 have said probably seven or eight times, now, is that spreads
5 have come down but you have never responded to the question:
6 Has the cost of capital increased from what it was a year ago
7 or not?

8 A. DR. BOOTH: I suspect that the cost of
9 capital has gone up from where it was a year ago and I've
10 said repeatedly the question is not whether it's gone up a
11 year or so ago, the question is whether or not the Alberta
12 ROE formula is fair.

12:01

13 And I've said repeatedly that the ROE formula
14 cannot be expected to be accurate 100 percent of the time on
15 a continuous basis.

16 My judgment is the formula continues to be
17 fair for the upcoming year, for 2010, given the way that the
18 financial markets are healing, the way that the economy is
19 recovering, I expect it to be delivering a fully fair ROE.

20 Was it fair in the sense that in the middle of
21 the crisis six months ago, nine months ago, the capital
22 markets were in a freeze? That's a question only a historian
23 could answer.

12:02

24 But right now, I would judge the overall
25 formula to be above a fair rate of return, marginally above

A. SAFIR, L. BOOTH, R. FAIRBAIRN**Cross-examination by Mr. Smith**

1 but within a zone of reasonableness, and I recommend that the
2 AUC continue with it.

3 Q. Do you agree with Dr. Kryzanowski's statement that any
4 sort of model is an abstraction of reality?

5 A. DR. BOOTH: Of course.

6 Q. And that the simpler the model the more it is an
7 abstraction?

8 A. DR. BOOTH: Yes.

9 Q. And the reality from the perspective of all the direct
10 market participants is that the cost of capital has been
11 going up while the GCOC continues to go down?

12:03

12 A. DR. BOOTH: No, that's your statement. You
13 said all market participants. I don't accept that. If it
14 was all market participants we wouldn't be seeing the huge
15 changes we're seeing in the capital markets.

16 Q. And the National Energy Board concluded that the formula
17 did not track the changes in the cost of capital in 2007 and
18 2008?

19 A. DR. BOOTH: And it concluded that my rate
20 of return recommendation was in the range that they
21 considered to be fair; and that was just three months ago.

12:03

22 My recommendation for TQM, they said, was fair
23 and reasonable and a proper reflection of what it should be
24 for a Canadian utility; and that hasn't changed.

25 Q. We can all read the decision, right?

Financial System Review

December 2012



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Financial System Review

December 2012

The Risk Assessment section is a product of the Governing Council of the Bank of Canada:
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This report includes data received up to 30 November 2012.

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Preface

The financial system makes an important contribution to the welfare of all Canadians, since the ability of households and firms to hold and transfer financial assets with confidence is one of the fundamental building blocks of our economy. A stable financial system contributes to broader economic growth and rising living standards. In this context, financial stability is defined as the resilience of the financial system to unanticipated adverse shocks, which enables the continued smooth functioning of the financial intermediation process.

As part of its commitment to promoting the economic and financial welfare of Canada, the Bank of Canada actively fosters a stable and efficient financial system. The Bank promotes this objective by providing central banking services, including various liquidity and lender-of-last-resort facilities; overseeing key domestic clearing and settlement systems; conducting and publishing analyses and research; and collaborating with various domestic and international policy-making bodies to develop policy. The Bank's contribution complements the efforts of other federal and provincial agencies, each of which brings unique expertise to this challenging area in the context of its own mandate.

The *Financial System Review* (FSR) is one avenue through which the Bank of Canada seeks to contribute to the longer-term resilience of the Canadian financial system. It brings together the Bank's ongoing work in monitoring developments in the system with a view to identifying potential risks to its overall soundness, as well as highlighting the efforts of the Bank, and other domestic and international regulatory authorities, to mitigate those risks. The focus of this FSR, therefore, is on providing an assessment of the downside risks rather than on the most likely future path for the financial system. The FSR also summarizes recent work by Bank of Canada staff on specific financial sector policies and on aspects of the financial system's structure and functioning. More generally, the FSR aims to promote informed public discussion on all aspects of the financial system.

Overview

This section of the *Financial System Review* (FSR) summarizes the judgment of the Bank of Canada's Governing Council on the main risks to the stability of the Canadian financial system and on the policy actions required to mitigate them.

Conditions in the international financial system remain challenging. A synchronous slowing in economic activity is taking place in both developed and emerging economies, and the outlook for growth remains modest. Although global financial conditions have improved since June, largely reflecting important announcements by major central banks and European authorities, the level of uncertainty is elevated. This reflects concerns about the underlying strength in the major economies, and whether policy-makers have the resolve to put in place a lasting solution to the crisis in the euro area and to address the impending "fiscal cliff" in the United States.

Despite the challenging global environment, Canada's financial system continues to be robust. The balance sheets of Canadian banks are healthy, and banks have retained access to low-cost funding across the term structure. Financial markets in Canada have been more stable than their global counterparts. Corporate leverage in Canada is at an all-time low and firms have good access to credit from both banks and capital markets. Nevertheless, the Canadian financial system continues to be vulnerable to a number of interrelated and mutually reinforcing risks.

The Governing Council judges that the risks to the stability of Canada's financial system remain high, as they were at the time of the June FSR. The sources of the key risks are similar to those highlighted in June,¹ and emanate primarily from the external environment (Table 1).

The most important risk continues to be the reintensification of the crisis in the euro area. This crisis has three interconnected elements: the potentially unsustainable fiscal trajectories of some peripheral countries; the weaknesses of the banking systems in those countries; and the underlying imbalances within the euro area. Modest and uneven global economic growth also represents a risk to the Canadian financial system. The risk is that the deficiency in global demand deepens or becomes more entrenched. This could be triggered in the near term by the fiscal cliff in the United States or, over the medium term, by disorderly fiscal consolidation in advanced economies or a lack of rotation of demand toward consumption in China and other surplus countries. Domestically, the primary financial stability concern relates

¹ The scope and characterization of some of the risks have changed relative to June. In particular, the global imbalances risk is no longer included in the key risks in Table 1, but is now incorporated in the risks related to deficient global demand and the low interest rate environment in major advanced economies. More details on these changes are given in the discussion of the various risks.

Table 1: Key risks to the stability of the Canadian financial system

Euro-area crisis	↔
Deficient global demand ^a	
Canadian household finances and the housing market	↔
Low interest rate environment in major advanced economies	↔
Overall level of risk	↔

a. Since this risk has been redefined, it is not comparable to the assessment in the June FSR.

Legend

Level of risk	Direction of risk (change since June FSR)
Very high	↑ Increased
High	↔ Unchanged
Elevated	↓ Decreased
Moderate	

to the high level of household indebtedness and elevated valuations in some segments of the housing market. These household imbalances could themselves be a trigger for financial system stress or they could amplify adverse economic shocks originating elsewhere. Finally, the low interest rate environment in major advanced economies represents another risk to the financial system, both in Canada and globally. This risk involves increased vulnerability for financial institutions with long-duration liabilities (e.g., life insurance companies and pension funds), and increased incentives for excessive risk taking in a search for yield, which could distort the pricing of both real and financial assets.

A realization of any of the key external risks would affect the Canadian financial system through three broad channels: trade, financial and confidence.² The **trade channel** would have an impact on the financial system through weaker international trade in goods and services. Shocks that weaken global economic growth would reduce the demand for Canadian exports and dampen economic activity, resulting in a deterioration of Canadian business and household balance sheets and impairing the credit quality of bank loan portfolios. The **financial channel** involves three main effects related to the interconnections between Canadian financial institutions and the global economy. First, these institutions could experience direct and/or indirect losses owing to their exposures in affected regions or sectors. Second, counterparty risks and contagion could drive up the cost of bank funding and create severe disruptions in its availability in some markets. This would weaken the balance sheets of Canadian financial institutions and could lead to tighter lending conditions for businesses and households. Third, financial stresses could trigger a broad-based retrenchment in risk taking, which could exacerbate other adverse impacts through the financial channel. Finally, there is the **confidence channel**, through which adverse shocks could cause a decline in consumer, business and investor confidence, leading to weaker domestic demand and tighter financial conditions. These three transmission channels, like the key risks, are closely linked and could be mutually reinforcing.

² The impact of the domestic household sector risk on the financial system would be transmitted through the financial and confidence channels.

Important steps have been taken since June to mitigate the key risks identified in **Table 1**. In particular, additional monetary policy stimulus announced by several central banks—including the U.S. Federal Reserve, the European Central Bank (ECB), the Bank of Japan and the Bank of England—will help support global economic growth. The actions taken by European authorities have reduced the near-term risk of a severe adverse event, resulting in a significant easing in financial conditions.

While these steps are important, further measures are needed. In the euro area, plans for establishing a single banking supervisor need to be supplemented with other critical elements of a banking union—namely, a framework for common deposit insurance and cross-border bank resolution. Further structural reforms are also necessary to narrow divergences in competitiveness within the euro area. In addition, work is needed to establish a closer fiscal union, including a fiscal transfer system and some form of mutualization of sovereign debt. In the United States, a clear and credible plan is required to address the fiscal cliff and the medium-term fiscal challenges.

In Canada, changes to the rules for government-backed insured mortgages and the introduction of mortgage underwriting guidelines³ are expected to support the long-term stability of the Canadian housing market and mitigate the risk of financial excesses. In the past six months, the growth of household credit has continued to moderate, sales of existing homes have declined and the growth in house prices has slowed. Nevertheless, there is a risk that the moderation in the housing market could prove transient, and that imbalances could remain elevated or build up further. To mitigate this risk, households should ensure that their borrowing is in line with their current and prospective ability to service their debt. Financial institutions must ensure that they have rigorous lending practices in place and are actively monitoring their risks, consistent with the mortgage underwriting guidelines from the Office of the Superintendent of Financial Institutions (OSFI). For their part, authorities will continue to carefully monitor the financial situation of the household sector and developments in the housing market.

The current environment should not be taken as an excuse to delay or dilute the global financial reform agenda. In particular, it is imperative that all jurisdictions fully and consistently implement Basel III rules. Canadian banks are expected to meet Basel III capital requirements by the beginning of 2013, which is the start of the phase-in period that extends to 2018. Establishing a resilient financial market infrastructure is also important to reduce the likelihood and consequences of future financial system turmoil. Good progress has been made on this front since June, both in Canada and internationally. In October, Canadian authorities announced that market participants can clear standardized over-the-counter derivatives using any central counterparty recognized by Canadian authorities, including global central counterparties. In addition, the Bank of Canada has adopted new international risk-management standards for its oversight of systemically important financial market infrastructures. At the international level, work has moved forward on ending “too big to fail” and strengthening the oversight and regulation of shadow banking activities.

³ The Office of the Superintendent of Financial Institutions published *Guideline B-20 Residential Mortgage Underwriting Practices and Procedures* in final form on 21 June 2012. These guidelines are available at <www.osfi-bsif.gc.ca/app/DocRepository/1/eng/guidelines/sound/guidelines/b20_e.pdf>. Changes to the rules for government-backed insured mortgages are outlined in Box 2 on page 24.

70. Reference: Appendix B, page 1, lines 18-25

Dr. Booth provides his views regarding basic problems with the earned rate of return.

- (a) Does Dr. Booth agree that the return on equity allowed by a regulatory commission for a public utility it regulates is “an accounting rate of return”? If the answer is no, please explain why Dr. Booth does not agree.
 - (b) Does Dr. Booth agree that the return on equity allowed by a regulatory commission for a public utility it regulates is “an average not a marginal rate of return”? If the answer is no, please explain why Dr. Booth does not agree.
 - (c) Does Dr. Booth agree that the return on equity allowed by a regulatory commission for a public utility it regulates “is earned on historic accounting book equity”? If the answer is no, please explain why Dr. Booth does not agree.
 - (d) Does Dr. Booth agree that the return on equity allowed by a regulatory commission for a public utility it regulates “is based on non-inflation adjusted numbers”? If the answer is no, please explain why Dr. Booth does not agree.
-

- a) It is both an accounting and an economic rate of return.
- b) Yes, it is unique to regulated firms that the allowed ROE is the same on every dollar invested, non-regulated competitive firms in contrast face a downward sloping IRR function that means that incremental investment invariably earns lower rates of return. This is one of the reasons why ROE regulated utilities are special.
- c) Yes.
- d) Yes, ROE regulated utilities are unique in that book values actually mean something in that they are the basis for the revenue requirement. Non-ROE regulated firms in contrast charge what the market will bear and the historic book value is not a factor in their pricing decisions.