

**R-3807-2012**

**FAIR RETURN AND CAPITAL STRUCTURE FOR  
INTRAGAZ LIMITED PARTNERSHIP**

EVIDENCE OF

Laurence D. Booth

BEFORE THE

Regie de L'Energie

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1 **EXECUTIVE SUMMARY**

2 The Industrial Gas Users Association (IGU) has asked me to review the application by Intragaz  
3 Limited partners (Intragaz) for an allowed ROE of 11.75% on a 50% common equity ratio. In  
4 particular IGUA has asked me to recommend an allowed ROE and capital structure conditional  
5 on the Regie allowing cost of service regulation and a ten year contract for storage services  
6 between Gaz Metro and Intragaz.

7

8 My overall assessment is:

- 9 • Intragaz operates low risk storage facilities. S&P points out that the construction risk is  
10 greater than the operating risk for storage companies and Intragaz now has over a decade  
11 of experience without significant problems. I therefore see little operating risk and agree  
12 with S&P's assessment that the risk is less than (electricity) generating assets. This is  
13 particularly true of Intragaz' assets, since they are depleted gas reservoirs used only for  
14 peaking and seasonal load balancing. They are not the hub based (salt cavern) storage  
15 facilities that S&P rates as non-investment grade.
  
- 16 • In terms of regulation I would support the continuation of an avoided cost approach, since  
17 there is no economic reason why Gaz Metro's ratepayers should pay higher costs than the  
18 market cost of storage operations. However, if the Regie agrees with a move to cost of  
19 service regulation for public interest reasons, then it should recognise the inherent  
20 conflict of interest in terms of its ownership.
  
- 21 • I disagree with the use of a stand-alone approach for Intragaz, since its sole customer is  
22 also a 50% owner and Gaz Metro originally wanted these assets in its rate base.  
23 Consequently, the risk attached to these assets is largely determined by a part owner. I  
24 would therefore not recommend that the Regie view these assets as those of a small  
25 stand-alone utility that cannot raise normal financing. Any financial problems can be  
26 removed by a guarantee by Intragaz' owners or by direct financing from Gaz Metro.
  
- 27 • I recommend that Intragaz' storage asset have the same 46% equity ratio that Gaz Metro  
28 uses (common + preferred) since I regard these assets as indistinguishable from other Gaz  
29 metro utility assets.
  
- 30 • Up until Summer 2011, I (and most forecasters, including the equity market) expected  
31 strong economic growth and that the Bank of Canada would start increasing interest rates.  
32 In June 2011, for example, the Royal Bank of Canada was forecasting long Canada bond  
33 yields to be 4.55% by the end of 2012. However, this recovery to "average" has been  
34 delayed for at least 2 years due to the Euro crisis and continuing problems in the US,  
35 where the actions of the Federal Reserve in Operation Twist and its commitment to

1 keeping the Federal Funds rate at 0-0.25% until the end of 2014 have brought down  
2 global interest rates.

- 3 • While financial stress has disappeared from the system, corporate “A” spreads over  
4 government bond yields remain high at 180 bps mainly due to unusually low government  
5 bond yields. I have therefore been recommending a credit spread adjustment of 50% of  
6 the change in the credit spread from normal to my estimates. This adds approximately 40  
7 bps to simple CAPM estimates of the ROE, but should even out over the business cycle.
- 8 • However, the corporate credit spread adjustment does not adjust for the overall drop in  
9 bond yields since July 2011 and the introduction of Operation Twist by the US Federal  
10 Reserve Board. The introduction of quantitative easing to the tune of \$85 billion a month  
11 combined with flight out of the Eurozone leads me to judge that current long Canada  
12 bond yields are about 0.80% below where they should be for this stage in the business  
13 cycle.
- 14 • I judge the market risk premium to be 5.0% based on historic data, but academic experts,  
15 analysts and companies place it in a range 5.0-6.0% which I accept. This combined with  
16 my risk positioning of Canadian utilities (largely betas) in a range of 45-55% as risky as  
17 the market as a whole and my adjusted interest rate forecast lead to a risk premium based  
18 fair ROE for 2013 of **7.50%**.
- 19 • My analysis of DCF fair rates of returns confirms that current risk premium estimates are  
20 too low, since real bond yields are below any standard equilibrium level. This  
21 information supports my credit market and Operation Twist adjustments and provides  
22 corroborating estimates of the fair ROE.
- 23 • I would recommend an ROE adjustment model where the ROE adjusts by 75% of the  
24 forecast change in the long Canada bond yield and 50% of the change in the credit  
25 spread. This would be subject to a minimum forecast long Canada bond yield of 3.80%  
26 and my going in ROE recommendation. Similar models are in use by the Regie and OEB  
27 Alternatively for Intragaz I would recommend a fixed ROE of 8.25% for the life of any  
28 contract with Gaz Metro should one be approved.
- 29 • I would discount the use of estimates from the US since Moody’s and other rating reports  
30 indicate there is greater regulatory protection in Canada. As a result Canadian utilities  
31 obtained higher credit ratings than their US peers, even though they generally have lower  
32 allowed ROEs and higher common equity ratios.

33

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1 **I INTRODUCTION**

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

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

7 I have appeared before most of the major utility regulatory boards in Canada including the  
8 National Energy Board (NEB), the Canadian Radio-television Telecommunications Commission  
9 (CRTC), the Ontario Energy Board (OEB), the Regie de l'Energie (The Regie), the Alberta  
10 Utilities Commission (AUC), the Board of Commissioners of Newfoundland and a Labrador  
11 (NPUB), the Nova Scotia Energy and Utilities Review Board (NSURB) and the New Brunswick  
12 Energy & Utilities Board (NBPUB). I have also filed testimony before the Ontario Securities  
13 Commission and in a variety of civil suits pertaining to financial matters. I recently provided  
14 testimony on the fair ROE to the Regie in hearings involving both Gazifere and Gaz Metro.

15 **Q. PLEASE DESCRIBE THE PURPOSE OF YOUR TESTIMONY**

16 **A.** The Industrial Gas Users Association (IGU) has asked me to review the application by  
17 Intragaz Limited partners (Intragaz) for an allowed ROE of 11.75% on a 50% common equity  
18 ratio. In particular IGUA has asked me to recommend an allowed ROE and capital structure  
19 conditional on the Regie allowing cost of service regulation and a ten year contract for storage  
20 services between Gaz Metro and Intragaz,

21 **Q. HOW IS YOUR TESTIMONY STRUCTURED?**

22 **A.** Section 2 starts with a discussion of regulation and how these principles apply to  
23 Intragaz and the setting of fair (just) and reasonable rates. I also discuss Intragaz' specific  
24 business risks and why in my judgment it is not comparable to the non-investment grade storage  
25 facilities in the US. Section 3.0 then discusses the current financial and economic outlook and in  
26 particular the problems caused by the US Federal Reserve's Operation Twist, which has been a  
27 major factor in dropping long Canada bond yields below any "equilibrium" level. Section 4.0

1 then provides my risk premium and section 5.0 my DCF estimates, my fair ROE  
2 recommendations and a new ROE adjustment formula. Section 6.0 discusses the role of US  
3 estimates and comparables and concludes. Supporting materials are included in a series of  
4 appendices.

5

6

1 **2.0 INTRAGAZ' OPERATIONS AND REGULATION**

2 **Q. PLEASE DISCUSS YOUR UNDERSTANDING OF INTRAGAZ' OPERATIONS.**

3 **A.** Intragaz is a limited partnership with two owners: Gaz Metro Limited partnership and GDF  
4 Quebec, which is itself a subsidiary of GDF Suez a major global energy company with over  
5 200,000 employees worldwide. Intragaz operates two natural gas storage facilities in Quebec;  
6 these are both depleted reservoirs, which are the most natural way of storing natural gas. This is  
7 because these reservoirs simply reverse the extraction of natural gas into the storage of natural  
8 gas in rock formations that have been storing natural gas for millions of years. Intragaz' two  
9 facilities at Pointe du lac and Saint Flavien are currently the only two such depleted natural gas  
10 reservoirs in Quebec. The Pointe du lac facility near Trois Rivières is a shallow facility that is  
11 primarily used for peak shaving. This is short term load management which is often  
12 accomplished elsewhere by the use of propane or LNG Plants. In contrast, the Saint Flavien  
13 facility is much larger and primarily a seasonal use facility that stores gas in the summer months  
14 and then releases it during the heavy winter use periods.

15 **Q. HOW IS STORAGE REGULATED?**

16 **A.** This seems to depend on location and the state of local competition. Traditionally storage  
17 was often part of the rate base of the large natural gas pipelines, since it was part of their load  
18 balancing functions: both at the receiving and delivering end of the pipeline. Storage then  
19 allowed the average load of the pipeline to be increased such that the average operating costs are  
20 lower: in a broad sense the marginal cost of storage is then equal to the marginal cost of pipeline  
21 capacity. An over built pipeline connected to a highly volatile market then had less need for  
22 storage than a pipeline operating at close to maximum load. In the US FERC Order 636 opened  
23 up the interstate pipelines, an order which also included their storage facilities. As a result, the  
24 pipelines were required to offer storage facilities at cost. The bulk of the remainder of US storage  
25 facilities were owned by smaller pipelines and gas local distribution companies. Subsequently a  
26 small number of independent storage operators have developed as the US pipeline system has  
27 been opened up.

1 In Canada the major supply basin is the Western Canadian sedimentary basin (WCSB) so that  
2 with one major basin there is a smaller array of storage options and the solutions seem to depend  
3 on local competitive considerations. In Alberta and BC, for example, storage is mainly  
4 unregulated and sold at market based rates, since both provinces are part of the WCSB with a  
5 large array of gas plants and storage options.

6 In contrast, until recently in Ontario storage has been part of the rate base of both Union Gas and  
7 Enbridge Gas Distribution Inc (EGDI), which were the only Ontario gas storage operators.  
8 However, in its natural gas electricity interface review (EB-2005-0551) the OEB dealt with the  
9 problem that an increasing number of gas fired electric power plants in Ontario were being  
10 despatched on five minute warnings from the Independent Electricity System Operator (IESO).  
11 These plants then created a highly variable demand on gas consumption, and required reliable  
12 high-deliverable storage. The gas consumption profiles of these plants differs significantly from  
13 the relatively stable consumption profiles of residential, commercial and industrial users.

14 In reviewing the changing demands on gas storage the OEB refrained from regulating high  
15 deliverable storage aimed at servicing these gas fired electricity generation plants. It did this  
16 under section 29(1) of the OEB Act 1989 which stated:

17 “On an application or in a proceeding, the Board shall make a determination to refrain, in  
18 whole or in part, from exercising any power or duty under this Act if it finds as a question  
19 of fact that a licensee, person, product, class of products, service or class of services is, or  
20 will be, subject to competition sufficient to protect the public interest.”<sup>1</sup>

21 Consequently in Ontario the OEB only regulates existing in-franchise storage. New storage in-  
22 franchise, and ex-franchise storage is unregulated, since Dawn has developed into a major  
23 natural gas hub with a competitive market for storage involving Union and EGDI with their huge

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<sup>1</sup> This wording followed similar wording in the Telecommunications Act (1993) dealing with telephone service.

1 storage fields in Lambton County in South West Ontario,<sup>2</sup> as well storage in Michigan, New  
2 York and Pennsylvania.

3 My understanding is that in Quebec Intragaz developed the two storage facilities since the Regie  
4 denied Gaz Metro's original plan for developing these assets within its regulated rate base. Given  
5 the risks involved in developing gas storage facilities and the need to protect ratepayers, the  
6 Regie applied the avoided cost methodology, adjusted for other considerations such as the  
7 advantages to Gaz Metro and Quebec of having in-franchise storage facilities. Avoided costs are  
8 simply the cost of alternative service providers, so in this way the ratepayers are assured of only  
9 paying rates that are fair and reasonable.<sup>3</sup> In 2006 Intragaz asked to maintain the avoided cost  
10 methodology, since cost of service regulation was only appropriate when the activities are both  
11 well understood and under control. However, in its 2011 application Intragaz applied to the  
12 Regie for a switch from the avoided cost methodology to cost of service regulation, since the  
13 revenues from alternative cost were below its cost of service and were also becoming less  
14 predictable.

15 At that time Intragaz requested the Regie approve a 15 year contract with Gaz Metro and the  
16 same financial metrics as Gaz Metro: that is the Gaz Metro allowed ROE on a 46% equity ratio.<sup>4</sup>  
17 In essence this would have put Intragaz substantially back to where it would have been had Gaz  
18 Metro been allowed to develop the storage facilities initially. Further it would be consistent with  
19 Intragaz view that cost of service regulation is appropriate once the activities are well under  
20 stood and under control. If the Regie had accepted the proposal all the future commercial risks  
21 attached to storage, as well as the cost of all the past investments made by Intragaz, would have

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<sup>2</sup> Union's gas' storage facilities are depleted gas reservoirs with total capacity of over 240 bcf. The 20 fields link with several pipelines including Vector, Great lakes, CMS Panhandle, Michcon, Bluewater, the TransCanada Mainline and EGDI.

<sup>3</sup> The return on equity earned by Intragaz in these early years was very high.

<sup>4</sup> Gaz Metro has 38.5% common equity and 7.5% deemed preferred shares.

1 been shifted to Gaz Metro’s ratepayers.<sup>5</sup> Instead the Regie (D-2011-140) again used an avoided  
2 cost methodology.

3 In this application Intragaz is again requesting cost of service regulation, but has independent  
4 expert evidence supporting an 11.75% ROE on 50% common equity instead of the financial  
5 metrics of Gaz Metro.

6 **Q. WHY IS A UTILITY LIKE GAZ METRO REGULATED?**

7 **A.** I can illustrate the principles behind regulation by repeating some data from my July  
8 2007 evidence on Gaz Metro where I stated:

9 *“In 2006 Gaz Metro’s gross margin (AR2006, P57) was allocated as follows:*

	<i>\$ Million</i>
10	
11	<i>Gross Margin (distribution)</i> 485
12	<i>Operation and maintenance</i> 168
13	<i>Depreciation and amortisation</i> 117
14	<i>Interest</i> 73
15	<i>Income and taxes</i> 127
16	

17 *Of significance is that the financing costs (equity and debt) are largely fixed costs set and*  
18 *approved by the Regie, while depreciation and amortisations are not only a fixed cost but*  
19 *also a non-cash charge, largely reflecting prior investment. These costs are all known in*  
20 *advance and are independent of the demand for Gaz Metro’s distribution services.*  
21 *Moreover, operating and maintenance expenses are also period costs and again largely*  
22 *independent of operating demand. These costs largely increase due to annual wage*  
23 *increases approved by the Regie. Without getting into a detailed analysis of Gaz Metro’s*  
24 *cost structure, it is clear that most of its costs are “period” or fixed costs invariant to*  
25 *demand with very little variable or marginal costs.”*

26 The important feature is that the economics of a fixed cost “service” industry are such that a  
27 single firm usually survives in the market with the potential for abuse of its dominant position.

28 This dominant firm can then exploit its market power, where the presumption is that without  
29 regulation, the activities and prices of the dominant firm would be unreasonable. That is, the

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<sup>5</sup> This assumes that the Regie would have accepted Intragaz’ investments as the starting rate base.

1 monopoly service provider would charge prices that were too high and thus resources would be  
2 inefficiently allocated.

3 In this respect it is important to note that it is regulation that follows the underlying economics,  
4 not vice versa. Gaz Metro is regulated, since it is the dominant gas distributor in Quebec and can  
5 always lower prices to deter any possible new entrant that wanted to duplicate its distribution  
6 pipes even were such entry allowed. Changing the regulation does not, in and of itself, change  
7 the underlying economics or the dangers for the abuse of a dominant position. This economic  
8 imperative is reflected in the statutes under which regulated companies operate, and the idea that  
9 *firms are regulated to mimic the actions of a competitive firm and yet reap the scale economies*  
10 *of the natural monopolist.*

11 Although legal statutes differ marginally from one jurisdiction to another, they are similar to the  
12 regulations by which the Supreme Court of Canada came to determine a fair rate of return. In *BC*  
13 *Electric Railway Co Ltd., vs. the Public Utilities Commission of BC et al* ([1960] S.C.R. 837),  
14 the Supreme Court of Canada had to interpret the following statute:

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

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

1 articulated the “prudently and reasonably acquired” test in terms of the assets included in the rate  
2 base.

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

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

11 This definition is referred to as an opportunity cost, in that the fair return is what could be earned  
12 by investing in similar securities elsewhere; only if the owners of a utility earn their opportunity  
13 cost will the returns accruing to them be fair, i.e., they will neither reward the owners with  
14 excessive profits, nor ratepayers by charging prices below cost.

15 To any modern financial economist Mr. Justice Lamont’s definition of a fair rate of return as an  
16 opportunity cost means a risk adjusted discount rate or expected rate of return. For *Gaz Metro* in  
17 2007 I therefore recommended a fair ROE that would have resulted in fair and reasonable rates  
18 *below* those charged if *Gaz Metro* had been an unregulated monopolist. It is important to note  
19 that allowing a fair ROE and deemed capital structure for a regulated entity is designed to  
20 simulate the effects of competition and ensure that ratepayers are protected from unfair and  
21 unreasonable prices resulting from the exercise of market power.

22 **Q. HOW DOES THIS APPLY TO INTRAGAZ?**

23 **A.** The key point is that *Intragaz* does not have market power in the supply of storage  
24 facilities to *Gaz Metro*. My understanding is that under Section 49 of the *Regie Act* it has the  
25 power to set tolls for *Intragaz*’ service, but they must be fair and reasonable to customers, the  
26 regulated entity and be in the public interest. However, regulation does not necessarily mean cost  
27 of service regulation and the paramount motivation for regulation is to protect the customer. As  
28 mentioned previously the *OEB Act* allows forbearance, which essentially means the suspension  
29 of direct regulation. In the case of Ontario storage facilities, the *OEB* decided to regulate in-

1 franchise storage on a cost of service basis, but allow new services to be unregulated.<sup>6</sup> In this  
2 case the OEB followed the CRTC and the Telecommunications Act, where the CRTC decided  
3 that there was enough competition in the local and long distance telephone markets that it no  
4 longer made sense to regulate them using a cost of service methodology. The paramount  
5 criterion for the regulator is that entities are regulated since they have market power, once that  
6 market power is eroded and competition becomes viable there is no longer any public interest in  
7 cost of service regulation. Conversely, I find it difficult to see a public interest objective in taking  
8 a firm operating in a competitive market into cost of service regulation. Clearly, as a stand-alone  
9 entity this would not work since by definition cost of service regulation would be charging  
10 higher prices than exist in the competitive market and the company would lose revenues. It only  
11 works if the cost of service is included in the revenues of an affiliate, which is a dominant firm  
12 with market power and is itself regulated.

13 For Intragaz a requested revenue requirement of \$20 million I am informed is about 1/3 in excess  
14 of avoided cost of about \$15 million. If this cost of service revenue requirement is folded into  
15 Gaz Metro's rates it would have only a limited impact, yet Gaz Metro would be earning a higher  
16 ROE on more equity indirectly through its part ownership of Intragaz than on its direct  
17 investments in rate base, as well as reducing the uncertainty attached to recovering that  
18 investment. In my judgment if the Regie sees gains to a long term contract for Intragaz such that  
19 its revenues are recovered in Gaz Metro's rates as a "transportation by others (TBO)<sup>7</sup>" charge,  
20 then it should first reduce the starting rate base such that on its allowed ROE and common equity  
21 the revenue requirement is equivalent to avoided cost.

22 **Q. WHAT WOULD YOU REGARD AS REASONABLE FINANCIAL**  
23 **PARAMETERS?**

24 **A.** In 2008 the National Energy Board convened a hearing into TQM's cost of capital for  
25 2007 and 2008 (RH-1-2008). At that time I argued that the Mainline was risky as the emergence

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<sup>6</sup> The OEB seemed to want to spur the development of high-deliverable gas storage to meet the needs of the gas fired electricity generators.

<sup>7</sup> I use TBO generically to refer to any contract that passes a revenue requirement onto another party.

1 of Dawn as a natural gas hub allowed TQM shippers to source gas from Dawn rather than  
2 directly from the Mainline. As a result, I indicated that a case could be made that TQM was the  
3 new low risk mainline gas pipeline since it was not tied to the WCSB. The NEB rejected my  
4 conclusion since it felt that the bulk of the gas flowing through Dawn onto TQM was still WCSB  
5 gas and as a result TQM's supply risk had increased. The NEB awarded TQM an ATWACC, but  
6 the key result was that it translated into an ROE of 9.70% on 40% common equity. Subsequently  
7 all of the mainline pipelines either owned by TransCanada or exporting gas from the WCSB  
8 negotiated settlements for a 9.70% ROE on 40% common equity.

9 This year before the NEB in a current TransCanada Mainline case I pointed out that the TQM  
10 award was really a Mainline award, since TQM's cost of service is included as a TBO in the  
11 Mainline's cost of service. In fact, shortly after the NEB award the AUC awarded a generic ROE  
12 of 9.0% to the utilities it regulates and I indicated that the additional 0.70% could be regarded as  
13 the incremental Mainline risk premium. No-one disagreed with either of these conclusions. In  
14 fact the Chairman of the NEB specifically asked me how I would allocate the 0.70% additional  
15 ROE risk premium to Mainline risk factors.

16 Similarly in 2011 before the Alberta Utilities Commission I was asked to make  
17 recommendations for ATCO Pipeline's fair ROE and common equity ratio. I pointed out at that  
18 time that ATCO Pipeline's revenue requirement was going to be included as a TBO charge in  
19 NGTL's cost of service for the new Alberta System. I therefore recommended the same common  
20 equity ratio the predecessor of the AUC allowed mainline transmission companies. The AUC  
21 accepted the basic integration with NGTL, but allowed ATCO Pipelines an ROE of 8.75% on  
22 38% common equity.

23 The important point from both these examples is that the TBOs turned TQM's risk into that of  
24 the Mainline and ATCO Pipeline's risk into that of NGTL.<sup>8</sup> In TQM's case the TBO can be  
25 terminated whereas for ATCO Pipelines it cannot, but a ten year contract between Gaz Metro  
26 and Intragaz is very similar to that between TQM and the Mainline, since in both cases the  
27 TBOed entity is partially owned by the other party. I would therefore regard Intragaz' starting

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<sup>8</sup> Note the AUC no longer regulates NGTL as it has passed into NEB regulation.

1 position in 2011 of requesting Gaz Metro’s allowed ROE on 46% equity as being consistent with  
2 these other TBO arrangements, once the rate base is adjusted.

3 **Q. BUT ISN’T STORAGE A LOT RISKIER THAN GAZ METRO’S OTHER**  
4 **ASSETS?**

5 **A.** Not necessarily. There are three main types of natural gas storage facilities; depleted  
6 reservoirs; aquifers and salt caverns. As well, there are two types of risks: initial construction  
7 risk and operating risk.

8 *Salt cavern storage* is created by injecting water into salt caverns and extracting the brine (water  
9 and salt) which is then sold to third parties. The cavern can then be used to store natural gas. Salt  
10 cavern storage can achieve higher pressures and can cycle more gas over short periods of time,  
11 that is, withdrawal rates are faster.<sup>9</sup> As S&P explains this also means they are more suitable for  
12 arbitraging supply/demand shocks caused by macro-economic and other factors, where gas needs  
13 high deliverability. They are also suitable for meeting the immediacy needs of gas generating  
14 power plants as noted in the OEB report (EB-2005-0551). Of note is that the two cases that Dr.  
15 Gaske refers to as having construction problems were both salt cavern storage facilities.<sup>10</sup>

16 *Aquifer* storage facilities are similar to *depleted gas reservoirs* but here natural gas is injected  
17 into the aquifer and the gas progressively replaces the water. Depleted gas reservoirs are simply  
18 gas fields that are no longer producing, so that gas is injected into them for storage replacing the  
19 gas that has been removed. In both cases these types of facilities have larger storage capacity but  
20 generally lower withdrawal rates. As a result, they are more useful for managing traditional  
21 seasonal gas usage variation.

22 In terms of operating risks, it is generally acknowledged that construction risk “weighs more  
23 heavily on the initial credit profile” (S&P December 23, 2008) than does operating risk. S&P  
24 goes on to rate the operating risk of gas storage as tending to be lower than assets like power

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<sup>9</sup> Standard and Poors, US natural gas storage owner face uncertainty as the Sector copes with volatile prices and demand, December 23, 2008.

<sup>10</sup> These were Liberty Gas Storage and Avoco, Dr. Gaske’s testimony page 28.

1 generation. Dr. Gaske does mention the risk of “gas migration” that the gas simply disappears.  
2 He references Transcontinental Gas’s Hester storage filed, which was abandoned after they  
3 failed to control gas migration. However, this is not a risk factor for Intragaz since as the GRB  
4 report<sup>11</sup> points out (page 27) Gaz Metro owns the gas at the Pointe du lac facility which is a  
5 depleted field in an aquifer. In contrast, the Saint Flavien facility is a deep depleted reservoir and  
6 Intragaz owns the gas. GRB concludes (page 40)

7 *“GRB and Sproule have conducted a through review of the assets and a review of*  
8 *operational data and confirm the usefulness of the assets as noted in sections 3 and 5.*  
9 *The twenty one (21) years of operation at PDL and thirteen (13) years of operation at*  
10 *Saint Flavien has been documented by cumulative equipment run time hours,*  
11 *maintenance reports, and a historical injection and withdrawal database.”*

12 There is no hint here of gas migration or any particular operational concerns.

13 **Q WHAT ABOUT THE VOLATILITY OF STORAGE REVENUES?**

14 **A.** Storage revenues come from two basic sources: *seasonal* and what might be termed  
15 *temporal* arbitrage.

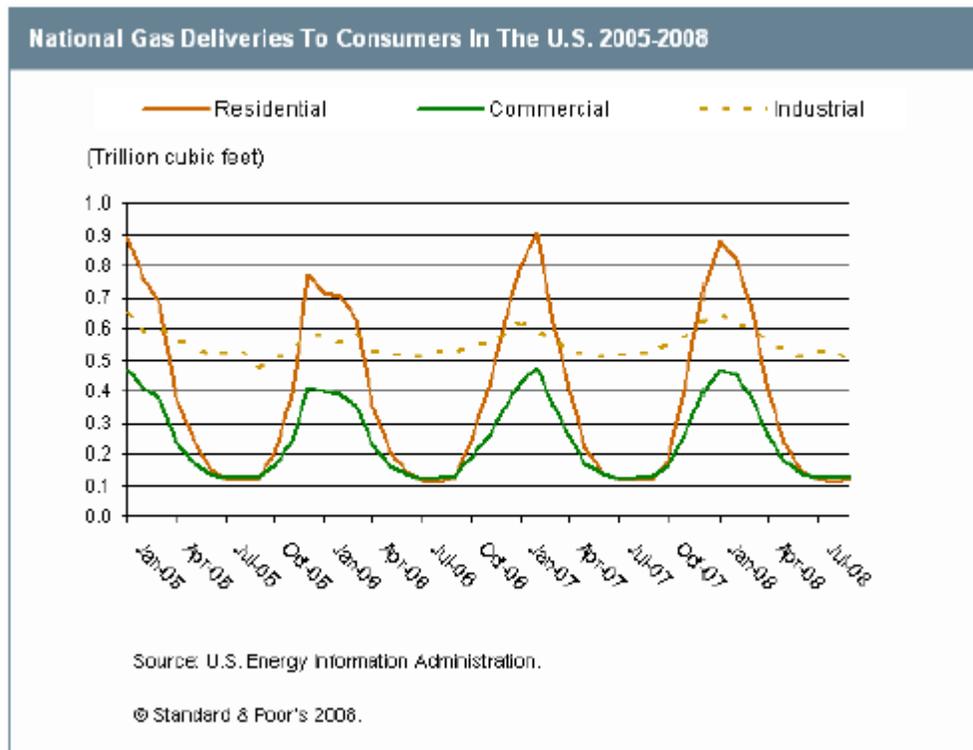
16 Arbitrage basically comes from buying and selling the same commodity at different prices.  
17 Suppose for example that the current price of a commodity is \$1 but the expectation is that in a  
18 year’s time the price will be \$2. If it costs \$0.50 to store and finance the purchase then there is an  
19 arbitrage opportunity, someone can buy for \$1 store and deliver it in the future for a cost of \$1.50  
20 versus the expected \$2 price and make a profit. Technically, this is not arbitrage unless the \$2  
21 price can be locked in by a futures or forward contract.

22 Low risk seasonal arbitrage justifies traditional storage operations. The following graph comes  
23 from S&P (December 2008). The important point is the very predictable seasonal to natural gas  
24 deliveries. Without storage and/or excess pipeline capacity this would lead to a significant  
25 seasonal variation in natural gas prices. Storage is one way of arbitraging the differences to  
26 reduce natural gas price volatility. S&P refers to this seasonal as providing the “intrinsic” value

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<sup>11</sup> Intragaz asset usefulness analysis report, GRB Engineering Ltd.

1 of storage and specifically points out that large capacity, low turn storage facilities are best suited  
2 for this type of storage, such as depleted reservoirs and aquifers.



3  
4 The second type of storage arbitrage is what I referred to as temporal arbitrage. S&P refers to  
5 this as “extrinsic” value and its value stems from high volatility caused by external events such  
6 as imbalances across pipelines, macro-economic shocks and external factors like hurricanes that  
7 cause prices to change rapidly. In these cases, high pressure salt cavern storage is more valuable  
8 since natural gas can be injected and withdrawn more rapidly. S&P specifically refers to higher  
9 turn storage facilities attached to hubs as being riskier since they rely on arbitraging price  
10 differences across different systems. They point out, for example, that this type of gas wheeling  
11 relies on volatility for their profits so that storage facilities with a high exposure to “hub  
12 services” get lower credit ratings.

13 For this reason S&P rated Bob Cat gas storage non-investment grade at B+ and SG resources  
14 slightly higher at BB. Of note is that in answer to my IR# 6.6 Dr. Gaske provided the following  
15 description of non-investment grade gas storage operations in the US:

Storage Facility	Location	Market
Port Barre Investments LLC (d/b/a Bobcat Gas Storage)	St. Landry Parish, Louisiana	Competitive
SG Resources Mississippi LLC	Greene County, Mississippi	Competitive
Pine Prairie Energy Center LLC	Evangeline Parish, Louisiana	Competitive

1  
2 What is important is that two of these are specifically noted by S&P as involving hub services,  
3 that is, they are storage facilities at natural gas hubs. As Dr. Gaske notes they, plus the other non-  
4 investment grade storage facility, operate in competitive markets and would be involved in  
5 temporal arbitrage demand. In answer to my IR # 6.7 the latter two were noted to be independent  
6 storage operators, while Bobcat is part of Spectra Energy.

7 **Q. SO WHAT IS THE ASSESMENT ON INTRAGAZ' STORAGE?**

8 **A.** Unless there are hidden problems not revealed by GBR's analysis, Intragaz' storage is  
9 traditional depleted reservoir storage that involves the least construction and operational risk,  
10 since it is used for seasonal demand management. In answer to my IR #6.2, Dr. Gaske provided  
11 the following data on injections and withdrawal rates into the two storage facilities.

Year	Pointe-du-Lac (*10 <sup>9</sup> m <sup>3</sup> )		Saint-Flavien (*10 <sup>9</sup> m <sup>3</sup> )	
	Injected	Withdrawn	Injected	Withdrawn
2000	56 129	55 654	70 158	43 488
2001	14 622	12 126	82 200	52 559
2002	35 161	34 723	93 181	76 809
2003	43 916	43 685	109 388	86 422
2004	29 449	29 381	108 667	97 465
2005	33 399	32 429	119 953	113 559
2006	13 298	11 906	117 876	97 854
2007	40 745	42 980	111 519	121 996
2008	30 670	26 307	121 124	121 637
2009	31 596	33 572	113 828	116 296
2010	27 502	24 567	120 368	119 433
2011	28 867	28 843	120 254	122 413
2012 (including Nov. 4)	21 883	20 119	101 782	78 794

12

1 The Point du lac facility clearly shows approximate equal injections and withdrawals each year  
2 as a peaking facility, whereas the Saint Flavien facility shows the initial injection of cushion gas  
3 and then the impact of weather induced demand.

4 What is important for Intragaz is that it is not providing hub services and instead both facilities  
5 are devoted to traditional seasonal and peaking services to Gaz Metro. As low risk depleted  
6 reservoirs that have been operating without any significant problems for over a decade, the only  
7 risks are operational and as S&P notes this would place them as lower risk than generating  
8 assets.

9 **Q WHAT ABOUT THE FACT THAT THE CONTRACT POSSIBLY ONLY**  
10 **COVERS TEN YEARS?**

11 **A.** Ten years is a long time. In answer to my IR 6.1, Dr. Gaske provided the forecast net  
12 income to Intragaz' shareholders with his recommended financial parameters. The forecast is  
13 below. The top line is the rate base starting in 2013 at \$108.6 million and then declining by about  
14 \$3.4 million a year. The declining rate base reflects the lack of significant new capital  
15 expenditures to maintain the facilities. With a declining rate base Intragaz is by definition lower  
16 risk than a growth utility, since it is generating free cash flow each year (net income plus change  
17 in declining rate base).<sup>12</sup> The second row is the change in the rate base that I derived, where the  
18 first year is the average since there was no data for 2012. Approximately \$3.4 million a year is  
19 the forecast depreciation. This is conservative since the asset's tax depreciation is probably  
20 higher than what appears to be straight line depreciation. The third row has the equity at Dr.  
21 Gaske's recommended 50% and then the equity return is Dr. Gaske's recommended ROE of  
22 11.75% applied to the equity component of rate base. The cash flow to the equity holders is the  
23 sum of the equity return plus half the change in rate base labelled as depreciation.<sup>13</sup> To find the  
24 present value of the cash flows from years one to ten I simply discounted these at Dr. Gaske's

---

<sup>12</sup> This is also why these types of assets are often structured as limited partnership, or previously income trusts: the free cash flow generates a cash flow yield greater than the dividend yield on regular stocks or investment grade bonds.

<sup>13</sup> It is only half as they only finance half the rate base; the other half would normally go to principal payments on the debt.

1 fair ROE of 11.75%. The sum is \$42 million which is 75% of the starting 2012 equity rate base,  
 2 which was assumed to be \$56 million.<sup>14</sup> If Gaz Metro signs a fifteen year contract then the  
 3 present value of the cash flows to Intragaz increase to \$49 million or 87% of the starting equity  
 4 book value.

	2013	2014	2015	2016	\$1,000 2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Rate base	108571	105103	101652	98188	94711	91225	87737	84274	80892	77657	74222	70787	67352	63918	60483
Change in rate Base	3435	3468	3451	3464	3478	3486	3488	3463	3382	3235	3435	3435	3435	3435	3435
Equity	54285	52551	50826	49094	47355	45612	43868	42137	40446	38829	37111	35394	33676	31959	30241
ROE	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175	0.1175
Equity Return	6379	6175	5972	5769	5564	5359	5155	4951	4752	4562	4361	4159	3957	3755	3553
Depreciation	1717	1734	1725	1732	1739	1743	1744	1732	1691	1618	1717	1717	1717	1717	1717

5  
 6 This analysis indicates that with a ten or fifteen year contract with Gaz Metro fully 75-87% of  
 7 the value of the equity investment is covered by the contract, leaving 13-25% of the equity  
 8 investment at risk beyond the contract period. In contrast Dr. Gaske suggests in his answer that  
 9 72% of the rate base is at risk beyond year ten, while arithmetically correct this violates the basic  
 10 principle of the time value of money and how securities are valued.<sup>15</sup>

11 Further in 2011 Intragaz requested Gaz Metro's allowed ROE on 46% equity rather than 11.75%  
 12 on 50% common equity. Assuming that there has been no change in Intragaz' risk in the  
 13 subsequent period we can discount the cash flows at a lower number. For simplicity I use the  
 14 AUC 8.75% allowed ROE since I will develop my own recommendations later. Discounting the  
 15 cash flows at 8.75% generates a present value of \$47.5 million for the ten year contract and  
 16 \$57.2 million for the fifteen year contract which represents 85% and 102% of the value of the  
 17 equity investment. I conclude from this analysis that if the Regie does in fact allow Intragaz cost  
 18 of service regulation and a long term contract, then if it awards Intragaz Dr. Gaske's  
 19 recommended financial parameters there is negligible risk beyond a ten year contract period. De  
 20 facto the shareholders will have got almost all the value of their investment out before the  
 21 contract terminates.

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<sup>14</sup> This is the 2013 equity plus half the assumed change in rate base of \$3.435 million. In answer to IGUA IR #1 the average 2012 rate base is given as \$116 million.

<sup>15</sup> Note I have used equity rate base, but with a constant 50% equity ratio the same logic applies to the rate base.

1 **Q. IS THE CONSTANT 50% EQUITY ASSUMPTION VALID?**

2 **A.** This is the data provided by Dr. Gaske in answer to my IR # 6.1. It would be appropriate  
3 for a company with normal debt that is rolling over and a starting equity equal to that in the rate  
4 base. However, Intragaz is a relatively small company with a declining rate base and small  
5 companies have less access to financial markets than a company the size of Gaz Metro. With a  
6 rate base of about \$112 million in 2012 Intragaz is largely restricted to the private placement  
7 market and bank debt. These types of lenders would be concerned about having debt outstanding  
8 beyond the period of Gaz Metro's contract, since Gaz Metro is Intragaz' only customer. As  
9 Intragaz is not at a pipeline hub, it is difficult to envisage an alternative use for the storage  
10 facilities should Gaz Metro not renew the contract.

11 My understanding (Intragaz-1, Doc-2 Annex 3.1.3) is that Intragaz hopes to borrow \$75 million  
12 with annual sinking fund payments of \$6 million a year and a bullet payment at year 10 of \$15  
13 million backed by the cushion gas in the Saint Flavien storage facilities as security. The interest  
14 rate on this loan would be about 5.75%. Currently long term "A" rated public market debt is  
15 yielding about 4.0% and BBB almost 5.0%, so 5.75% for ten year amortizing ten year debt  
16 backed by Gaz Metro seems high. However, with this \$75 million in debt the amount of debt  
17 outstanding will decrease faster than the depreciation cash flows, so the equity ratio will not be a  
18 constant 50%.<sup>16</sup> At the end of year ten the repayment of the debt would mean the debt  
19 outstanding would decline to \$15 million, which is earmarked to be paid off by the cushion gas  
20 should Gaz Metro not renew the contract. With a rate base of \$77.7 million, this means a year ten  
21 debt ratio of 19%.

22 This has both positive and negative features as far as Intragaz shareholder risk. The positive is  
23 that the shareholders can immediately cash out some of their investment in Intragaz. In essence  
24 with \$75 million in debt there is an immediate cash out,<sup>17</sup> then the cash flows each year are more

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<sup>16</sup> Normally debt is structured such that the depreciation is matched to the principal payments on the debt, but if this is done for Intragaz there would be too much debt outstanding at the end of ten years to be paid off by the cushion gas should the facilities have no further use.

<sup>17</sup> In answer to IGUA IR #1 the debt is listed at \$27 million in 2012, so all else constant this would mean a maximum \$48 million cash out.

1 limited as equity cash flows are used to retire debt and then at year ten the shareholders own a  
2 larger share of the rate base. If Gaz Metro renews the storage contract they can then refinance the  
3 company and again cash out their equity. If Gaz Metro does not renew the contract then the  
4 Intragaz shareholders are at risk. However, I regard this risk as very low.

5 **Q. DOES THIS MEAN GREATER RISK FOR INTRAGAZ?**

6 **A.** Not really since Intragaz' risk is largely under the control of Gaz Metro and the Regie has  
7 already decided it is useful for Gaz Metro to have in-franchise storage. Further theoretically the  
8 useful life should affect the depreciation rate, such that at the end of the asset's useful life the  
9 book value is zero. The National Energy Board recognized this in setting the Mainline's  
10 depreciation rate in 2002 (RH-1-2002) based on a 25 year useful life. If Gaz Metro genuinely  
11 feels that Intragaz' assets have no useful life beyond year ten then they should be depreciated at a  
12 faster rate. If on the other hand it judges there to be a continuing need for both peaking and  
13 seasonal storage then it should sign a longer contract, which would allow the debt to be  
14 amortized over a longer period. Notably the Gannet Fleming depreciation study<sup>18</sup> on page II-8  
15 indicated that the normal useful life for storage assets similar to those of Intragaz is 50 years, but  
16 given the unique features of Saint Flavien they recommended the continued use of a 40 year life,  
17 regardless this is much longer than ten years. I would assume that Gannet Fleming in coming to  
18 this judgement discussed the issue with both Gaz Metro and Intragaz.

19 The upshot of these remarks is that I would expect the debt to be periodically refinanced, since  
20 the main problem is simply the amortization of the debt. In particular, I note an inherent conflict  
21 of interest with cost of service regulation when Gaz Metro is both an owner in Intragaz and its  
22 sole customer. The conflict of interest is simply that as the sole customer, Gaz Metro can sign  
23 only a short term contract, which makes Intragaz look "risky" due to the lack of financing,  
24 leading to a higher ROE and common equity ratio under cost of service regulation, which  
25 benefits Gaz Metro as part owner! I would therefore recommend that the Regie ignore any  
26 financing "problems" facing Intragaz if it decides to allow cost of service regulation. Instead, I  
27 would recommend that either Gaz Metro and GDF Quebec guarantee the debt of Intragaz, or that

---

<sup>18</sup> Gannet Fleming, Depreciation Study, June 6, 2012)

1 Gaz Metro itself finance Intragaz on the same terms that it itself borrows at. The latter option is  
2 the standard approach taken by many utility holding companies in Canada for their 100% owned  
3 affiliates.

4 **Q WHAT ARE YOUR CONCLUSIONS ON INTRAGAZ' RISKS?**

5 **A.** It is difficult to apply standard stand-alone analysis to Intragaz, since it is asking for a  
6 revenue requirement that exceeds avoided cost. It therefore has to be considered in conjunction  
7 with the fact that its owner is in part Gaz Metro, which is also its sole customer, while Gaz Metro  
8 originally asked for these assets to be in rate base. Critical features are then:

- 9 \* The assets are mature depleted natural gas reservoirs that have been operating  
10 without any significant problems for over a decade;
- 11 \* The storage assets do not provide hub services and instead simply provide  
12 conventional peaking and seasonal balancing services to its part owner;
- 13 \* The Regie has decided that these assets are important for Quebec since they  
14 provide in-franchise storage;
- 15 \* Gannet Fleming has confirmed a 40 year useful life.

16 I would therefore judge Intragaz' risk to be even lower risk than the generic "lower than  
17 generating assets" description applied by S&P to operating storage assets. Further through a ten  
18 year TBO the risks are essentially transferred to Gaz Metro's rate payers, so there is minimal risk  
19 to the shareholders. The only utility in Canada that has major generating assets, in addition to  
20 transportation and distribution assets, is Nova Scotia Power Inc. (NSPI) and recently (September  
21 13, 2012) NSPI settled on a 37.5% common equity ratio and 9.0% ROE.<sup>19</sup> I therefore would  
22 regard Intragaz assets as now virtually indistinguishable from other assets in Gaz Metro's rate  
23 base and would recommend the same 38.5% common equity ratio. Since Gaz Metro has a  
24 deemed 7.5% preferred share component I would allow 46% common equity for Intragaz which  
25 allows a minor increase over Gaz Metro.

26

27

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<sup>19</sup> The old West Kootenay Power now owned by Fortis has extremely low risk hydro generating assets.

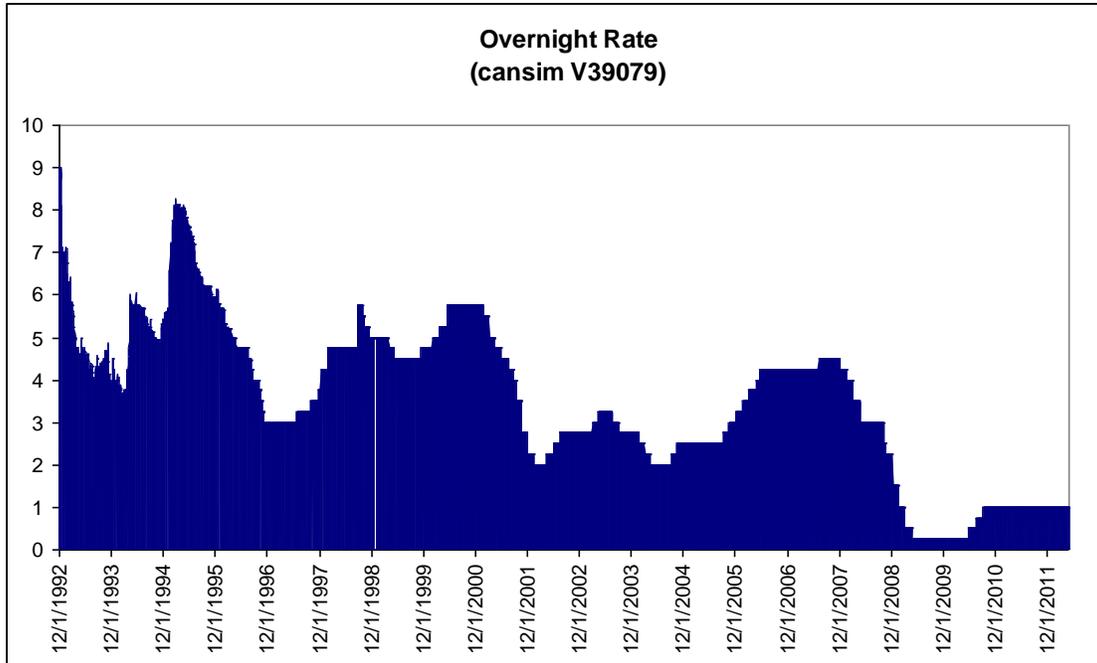


1 **3.0 FINANCIAL AND ECONOMIC OULOOK**

2 **Q. WHAT ARE CAPITAL MARKET CONDITIONS AT PRESENT?**

3 **A.** Basic macroeconomic data since 1987 is provided as background in Schedule 1. Into 2008  
4 we had good economic growth and for a time the unemployment rate was actually below the  
5 natural or non-accelerating inflation rate of unemployment (NAIRU) of 6.0%. Consumer  
6 spending was strong as low interest rates supported the purchase of consumer durables and new  
7 housing as starts exceeded 200,000 for the sixth year in a row. The strong investment position in  
8 Canada was partly due to a dramatic improvement in Canada's terms of trade as commodity  
9 prices increased. This created a perception that Canada was again a "petro," or at least a "raw  
10 materials" based, economy as commodity prices reached record highs in summer 2008. This  
11 perception allied to the continuing strength of the current account surplus running at 1.0% of  
12 GDP, resulted in a strengthening Canadian dollar and incipient inflationary pressures. The result  
13 was that starting in September 2005 the Bank of Canada increased its overnight rate from 2.5%  
14 to reduce the stimulus being injected into the economy.

15 The following graph shows the impact of this tighter monetary policy, just before the first signs  
16 of the financial crisis appeared. Throughout 2006 and up until December 2007, the Bank of  
17 Canada set the target rate to try and slow down the economy and reduce inflationary pressures.  
18 Of importance is that consistent with a 2% inflation target the overnight rate should be at least  
19 3.0%; so 4.5% up until December 2007 was restrictive. The Bank pays interest on deposits that  
20 the chartered banks keep with it at 0.25% less than the overnight rate and the banks can borrow  
21 at 0.25% more than the overnight rate; a rate that is called the Bank Rate. Bank Prime is then  
22 about 2.0% more than the overnight rate. Consequently up until December 2007 the Bank was  
23 actively trying to increase borrowing costs to slow interest sensitive demand. This policy stance  
24 was reversed due to the impact of the sub-prime mortgage mess coming out of the United States.



1

2 The above graph shows that the Bank conservatively lowered the overnight rate to 3.0% in May  
 3 2008 where it kept it throughout the summer. It was then forced to dramatically cut the overnight  
 4 rate to 0.25% in response to the financial crisis triggered by the failure of Lehman Brothers.  
 5 0.25% is defacto the lowest rate that the Bank can set the overnight rate, since otherwise it would  
 6 mean negative deposit rates for the settlement balances the chartered banks keep with it.

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

12 In particular, the Bank of Canada and the Federal Government were increasingly worried that at  
 13 1.0% the overnight rate would encourage too much personal borrowing and lead to levels of  
 14 indebtedness which might have negative implications when rates returned to their normal level.  
 15 They were, and still are, very worried about a housing bubble in Toronto and Vancouver<sup>20</sup> where

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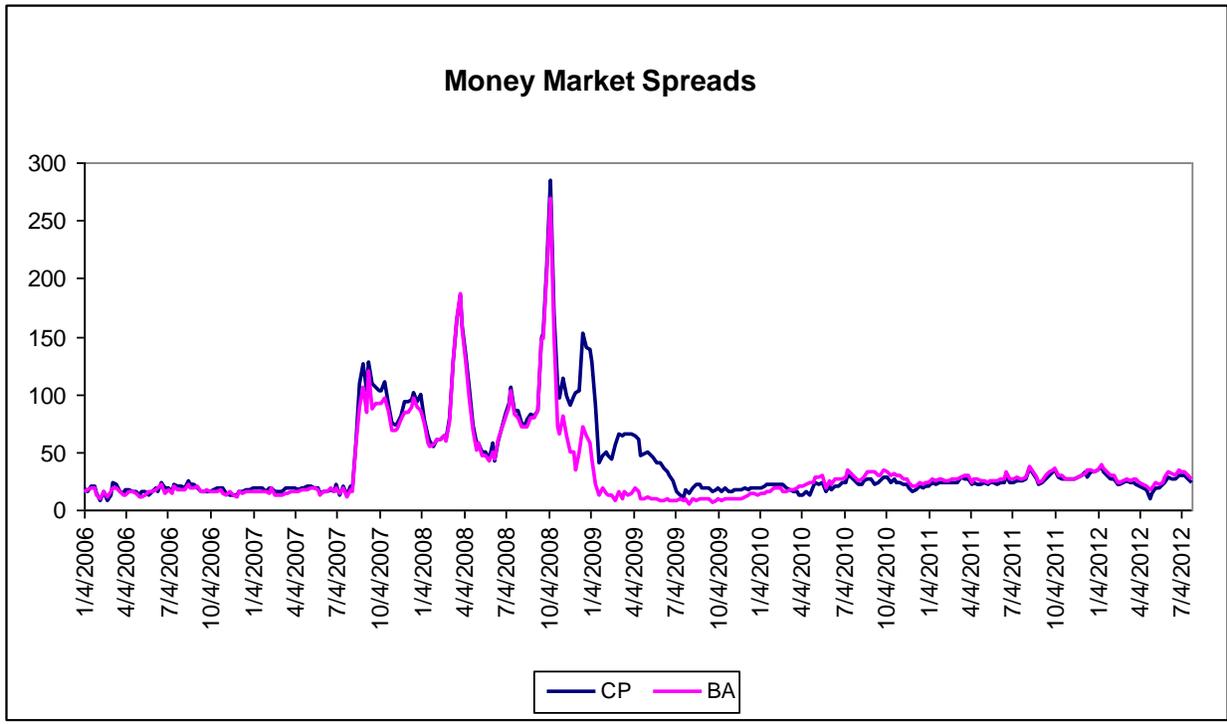
<sup>20</sup> In April 2012 housing starts increased by 14.0% to an annualized pace of 244,900 indicating a very strong housing market in Canada.

1 house prices increased strongly in response to both lower interest rates and a stronger economy.  
2 In response on July 8, 2012 the Federal Government announced a third round of tightening in the  
3 mortgage market by restricting amortisation periods to 25 years, reducing the maximum amount  
4 that can be borrowed to 80% of appraised value for home equity lines of credit, capping  
5 household debt ratios and limiting CMHC insurance to homes with a purchase price less than \$1  
6 million. Currently they have also moved responsibility for Canadian Mortgage and Housing  
7 Corporation (CMHC) to the Department of Finance, as it will now be subject to OSFI  
8 supervision. The problem is that such is the level of mortgage demand in Canada that CMHC is  
9 bumping up against its \$600 billion insurance limit.

10 The conundrum faced by the Federal Government is that while it wants to stimulate the economy  
11 by maintaining lower interest rates, it does not want a US style debt-fuelled housing bubble,  
12 while the levels of personal indebtedness in Canada now exceed those in both the United States  
13 and the United Kingdom. The additional problem is that the Canadian economy is not an island  
14 and increasingly the Bank of Canada is concerned about the transfer of events from the Eurozone  
15 and the US into Canada. On January 26, 2012 the Federal Reserve announced that it would keep  
16 the US equivalent of the overnight rate, the Federal Funds rate, at 0.0-0.25% until at least the end  
17 of 2014, a promise renewed on August 1, 2012, that is, basically the next three years. The  
18 assumption is that in the face of rock bottom US interest rates the Bank of Canada will keep the  
19 overnight rate at 1.0%, otherwise the Canadian dollar will appreciate hurting manufacturing in  
20 central Canada. That it is external events triggering monetary policy in Canada is clear from the  
21 following graph of the spread between the yield on 91 day Treasury Bills (TB) and those on  
22 Bankers Acceptances (BA) and Commercial paper (CP).

23 Treasury Bill yields are close to the rate that the chartered banks get from their deposits at the  
24 Bank of Canada when they have excess cash. In contrast, the Bankers' Acceptance rate is the rate  
25 the market requires on short term investments in the main chartered banks, whereas the  
26 Commercial Paper rate is the rate that large Canadian companies with the best credit rating can  
27 get by issuing notes in the money market. As a result the spreads between these two private rates

1 and that on Treasury Bills is indicative of the state of the short term lending market<sup>21</sup> and the  
2 willingness of large investors to lend to the banks and very low risk, stable, Canadian companies



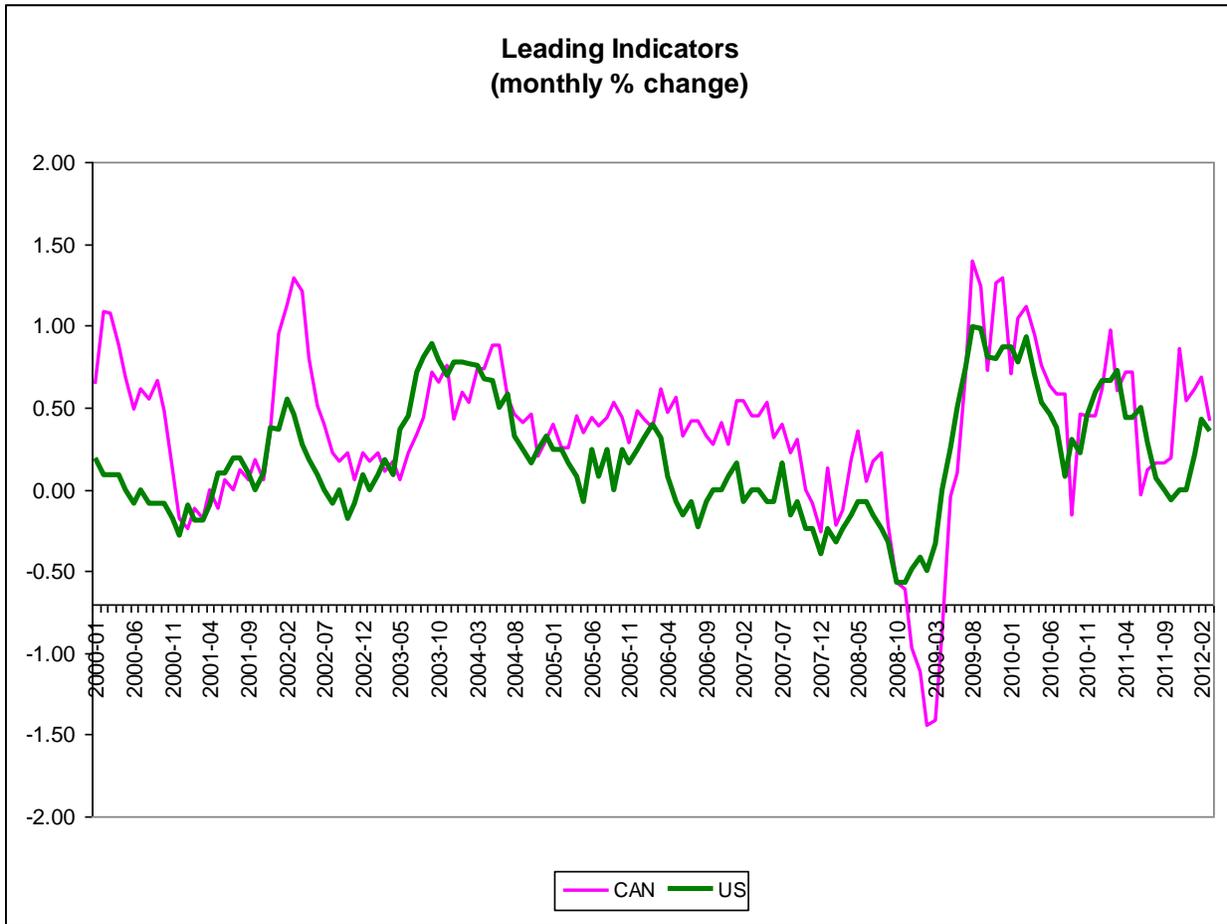
3  
4 Before discussing these spreads, it is important to note that investors in the money market are  
5 mainly “parking” their money, rather than investing, since their main concern is security of  
6 principal. Consequently with any hint of default the market seizes up. This happens periodically  
7 in the CP market as seemingly low risk institutions default and investors panic and refuse to roll  
8 over CP for fear of further losses and an inability to distinguish between good and bad risks. For  
9 example for the last 20 years, the money market has been very quiet with spreads at 10-20 basis  
10 points. This changed in July 2007 with the US sub-prime problems spilling over into Canada,  
11 where we can see the large spike and again with the Bear Stearns bailout in March 2008. This  
12 got much worse in September 2008 as Lehman Brothers failed and contagion hit the world’s  
13 financial markets and spreads in the Canadian money market went close to 3.0%.

---

<sup>21</sup> The main banks are generally rated R-1 (Mid) equivalent to an AA bond rating while CP is a mixture of R-1 (Mid) and R-1 (low), which means down to A.

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

10 The improvement in the financial sector has impacted the real economy. The following chart is  
11 of the monthly % change in the Leading Indicators in both the US and Canada since 2000.

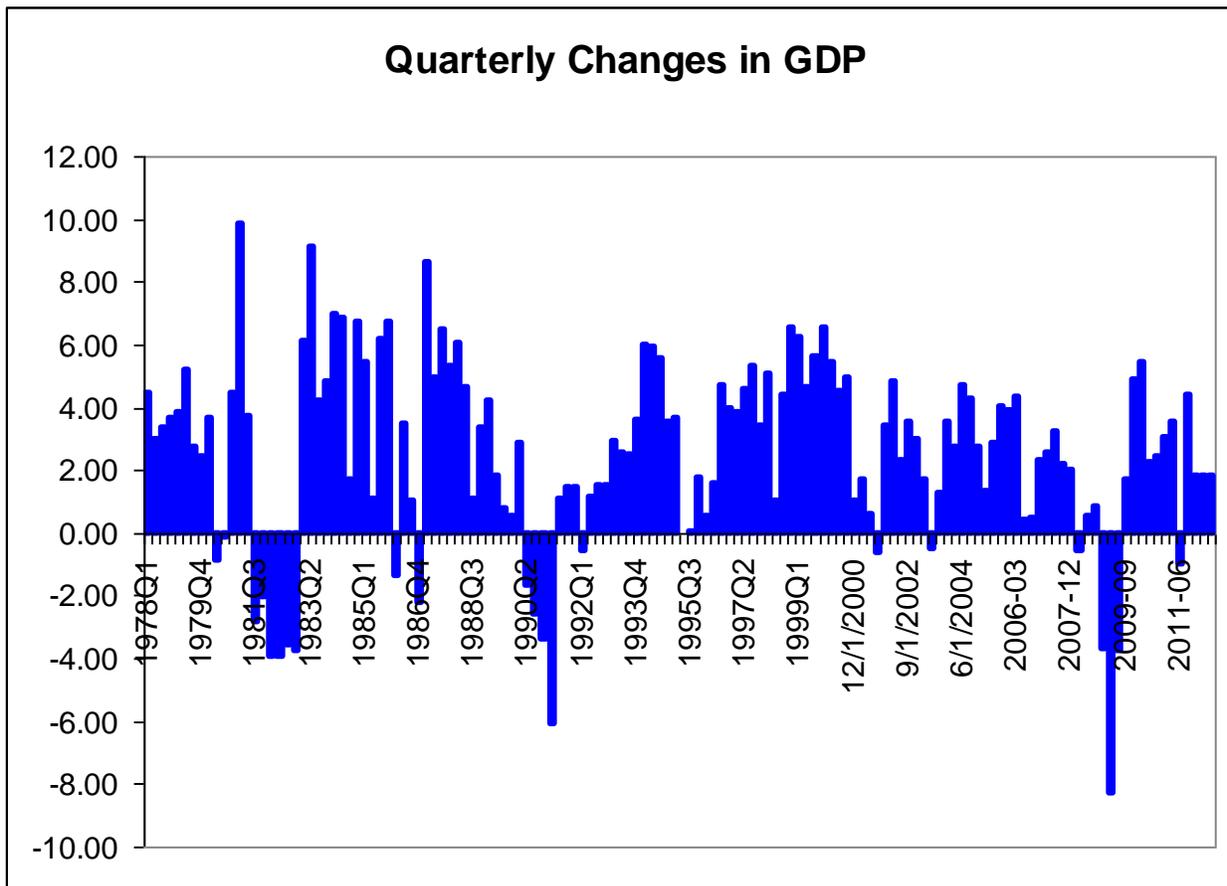


12

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

8 **Q. HOW DOES THIS COMPARE TO GDP?**

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

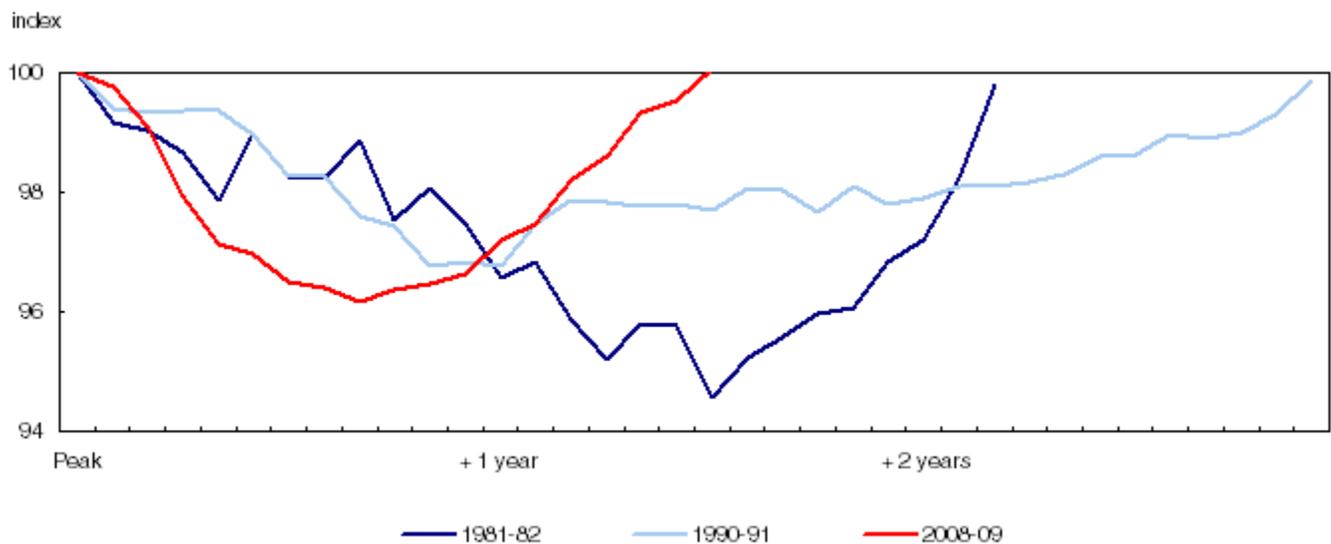


10

11 The start date reflects the need to capture the previous recessions to gauge the impact of the  
 12 severity of the recent recession. These annualised quarterly changes are quite volatile ranging  
 13 from a minimum of -7.3% to a maximum of 9.9% with a median change of about 3.00%. During

1 the 1981 recession GDP dropped by 3.92%, whereas in the severe restructuring recession of the  
 2 early 1990s the drop was over several quarters with a maximum of 6.08%. Note that in the early  
 3 2000's after the internet bubble burst, Canada did not have a recession, unlike the United States.  
 4 In contrast, while quarterly growth was basically flat into late 2008, it declined precipitously in  
 5 2008Q4; 2009Q1 was then very bad with the largest decline since 1961 of 7.29%,<sup>22</sup> before  
 6 moderating in 2009Q2 with a sharp snap back 2009Q3 into 2010Q1. 2010Q2 saw some  
 7 weakness in economic growth as the quick gains dropped off, but then quarterly growth  
 8 continued throughout 2010 and into 2011, despite weakness in 2011Q2 caused by supply  
 9 disruptions from Japan. Real growth averaged 2.46% in 2011 and this growth has now continued  
 10 into 2012, although 2012Q2 indicated a drop off in the real quarterly growth rate to 1.8%<sup>1</sup> which  
 11 is expected to have continued into 2012 Q3.

12 Given the volatility of quarterly changes in GDP, it is useful to look at the changes from the start  
 13 of a recession, indexed at 100, to see how severe and how long the recession lasted. Statistics  
 14 Canada did this in the following chart.<sup>23</sup>



15  
 16 Notably the recession of the early 1990s was the longest, since Canada was adjusting to the Free  
 17 Trade Agreement, as well as a normal cyclical downturn, but not as severe. In contrast the

<sup>22</sup> The current version of the GDP accounts start in 1961.

<sup>23</sup> Philip Cross “How did the 2008-2010 recession and recovery compare with previous cycles?”  
<http://www.statcan.gc.ca/pub/11-010-x/2011001/part-partie3-eng.htm>, chart 3.2

1 recession of 1981-2 was more severe, but ended more quickly than that in the early 1990s. By  
2 any comparison the recession of 2008-9 was both shorter and milder. The Statistics Canada  
3 analyst concluded

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

8 It is also useful to contrast this with the experience in the US, where the following graph from  
9 DBRS provides a “jobs” analysis for the US and Canada.<sup>24</sup> Similar to the Statistics Canada  
10 graph, it shows that the Canadian economy had recovered and returned to creating employment.  
11 In stark contrast, the US economy was still “sputtering” and failing to replace the jobs lost during  
12 the recession, let alone creating the new jobs required for an expanding labour market. As DBRS  
13 notes the US unemployment rate will probably remain above the “normal” rate for the  
14 “foreseeable future.”

**Net Jobs in Canada versus the United States (January 2008 to December 2010)**



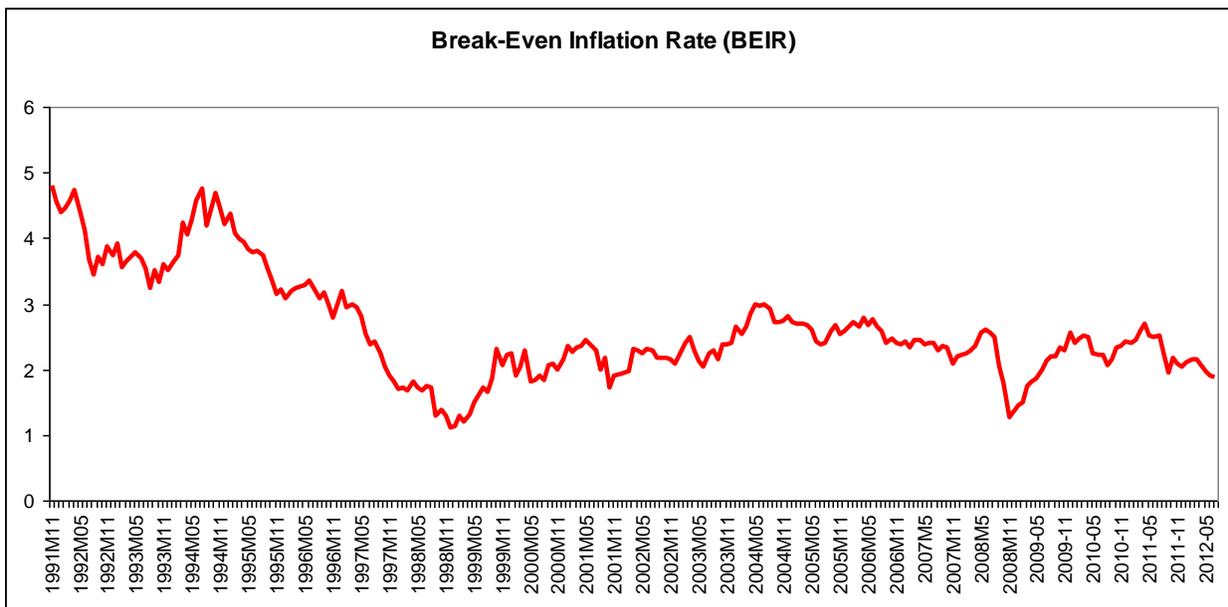
15  
16 The above two graphs make it clear that what characterised the 2008-9 recession in Canada was  
17 not its severity, or length, but simply the speed with which events unfolded. Further the  
18 experience of the Canadian economy is in marked contrast to the serious problems in the United  
19 States.

<sup>24</sup> DBRS, Corporate 2010 Year in Review and 2011 Outlook, January 2011.

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

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

9 Since 1991, the Federal Government has been issuing two types of bonds: a nominal bond where  
10 the interest rate is fixed and a real return bond, which guarantees the investor protection from  
11 inflation. The difference between the nominal yield and the yield on the real-return bond is called  
12 the break-even inflation rate (BEIR), since if actual inflation is higher than this after the fact you  
13 would have been better off in the real bond and vice versa. Consequently the BEIR is often taken  
14 as one measure of the market's inflationary expectations. The following graphs the BEIR (as a  
15 %) since 1991.



16

17 We can clearly see the collapse in inflationary expectations in the late 1990's as the market  
18 finally believed the Federal Government's intentions not to inflate its way out of its deficit

1 problems. Since then the BEIR has been slightly above the middle of the Bank of Canada's  
2 operating range for inflation of 2.0%, but never above the 3.0% upper limit set by the Bank. We  
3 can also see the impact of the traumatic events of 2008Q3 when the BEIR dropped from its  
4 "normal" level of just above 2.0% to 1.26% in November 2008.<sup>25</sup> During this period the fears of  
5 a deep recession and deflation were so strong that the BEIR essentially halved in the space of a  
6 few months. Since these deflationary fears have subsided and economic growth has got back on  
7 track the BEIR has moved back to its normal level hovering around 2.0%, but currently sits just  
8 below that at 1.89% as the economy's real growth rate has marginally dropped off. So consistent  
9 with the BEI I would expect long run inflation at the Bank of Canada's target rate of 2.0%

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

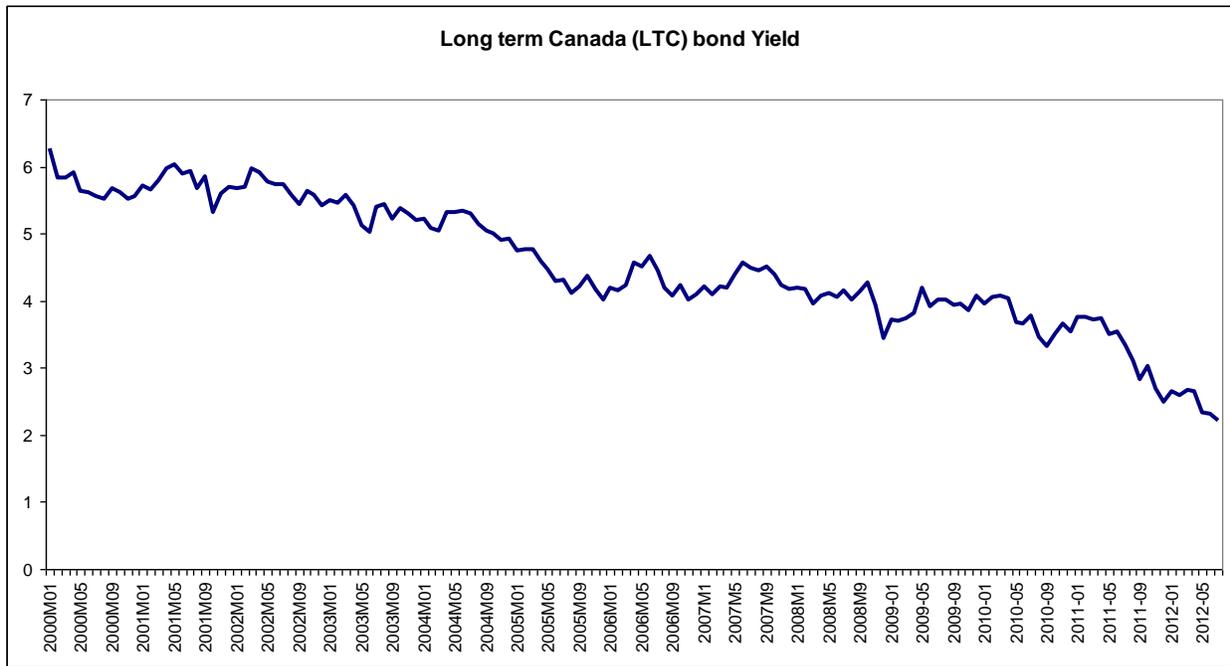
12 Schedule 2 provides data on the full range of interest rates across the broad maturity spectrum as  
13 of the end of October 2012. What is evident is that interest rates for long maturity instruments  
14 are higher than for short dated bonds. This is referred to as a 'normal' or positively sloped yield  
15 curve. Typically the maturity spread, or the yield difference between the long Canada bond and  
16 91 day Treasury Bills, is about 1.25%, but currently it is slightly higher. This spread has  
17 decreased recently since although the Bank of Canada is still keeping short term interest rates  
18 low to enhance the recovery, long term rates have also come down due to the actions of the  
19 Federal Reserve in the US, which I will discuss later.

20 Normally yields on long term Canada (LTC) bonds are not as affected by current monetary  
21 policy, since monetary policy works on the overnight rate and its influence weakens as the  
22 maturity of the bond increases. However, the current experience is not normal. The following  
23 graph shows that the LTC yield stayed at about 4.5% from 2005 until December 2007, when the  
24 Bank of Canada started to cut interest rates after which it stayed at around 4.0% until November  
25 2008 when it dropped by 0.50%, as the market began to understand the severity of the recession  
26 and its implication for inflation. However, as these fears receded the LTC yield recovered to the  
27 4.0% level it was at immediately prior to the financial crisis and the expectation in 2009/10 was

---

<sup>25</sup> The average BEIR since Canada returned to a budgetary surplus is 2.23%.

1 that long Canada bond yields would increase as the economy recovered. However, in 2010 Q3  
2 long term interest rates started to fall and this fall accelerated into Q4 2011 and has continued  
3 into 2012. Currently LTC yields are at 2.41% and barely compensate an investor for the  
4 purchasing power loss caused by 2% inflation let alone the tax bite on the nominal 2.41%  
5 interest. So for a taxable investor current LTC yields represent a negative real rate of return.



6  
7 Starting in 2010Q2, the markets became increasingly concerned that the deficit financing by  
8 governments that spurred aggregate demand and prevented a global depression had in turn  
9 increased the debt levels of many developed countries to the point where some might not be able  
10 to repay their debts. These concerns were particularly acute for the PIIGS (Portugal, Ireland,  
11 Italy, Greece and Spain or more politely the GIIPS), who in adopting the Euro as a single  
12 currency lost the power to devalue their currency to stimulate demand.

13 The crisis started with Greece which had consistently fudged its budget numbers. This was of no  
14 great concern until the recession layered a normal cyclical deficit on top of the Greek structural  
15 deficit. The IMF and EU agreed to a 110 billion Euro rescue plan for Greece on May, 2, 2010  
16 and followed this up with a general 750 billion Euro rescue plan to finance other EU countries  
17 with deficit problems that had adopted the Euro. After Greece was bailed out concern switched  
18 to Ireland which had incurred a huge liability to guarantee the liabilities of all the Irish banks.

1 Ireland faced increasing pressure until finally on November 28, 2010 Ireland agreed to an 85  
2 billion Euro bailout, most of it allocated to restructure its banking system. After Ireland pressure  
3 switched to Portugal, when on April 18, 2011 the Portuguese government fell and announced it  
4 would seek support from the EU and IMF and reached a deal on May 4, 2011 for \$111 billion in  
5 short term support. Since Portugal's rescue package, attention has shifted to Italy with the fall of  
6 Berlusconi's government on November 25, 2011 and the installation of a government of  
7 technocrats under Mario Monti and further austerity cuts.

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

20 **Q. WHAT ARE THE PROBLEMS IN THE US?**

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

1 increase in welfare and unemployment payments that automatically cause deficits to increase  
 2 during recessions. Consequently, the average deficit jumped to 9.0% of GDP and then  
 3 marginally declined in 2010<sup>26</sup> and 2011 and is forecast to drop more in 2012. The following is a  
 4 table derived from tables from the IMF.<sup>27</sup>

Government Deficits % of GDP

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

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

13 In the US on August 5, 2011 S&P downgraded the bond rating of the United States from AAA to  
 14 AA+ due to the lack of will on the part of President Obama and Congress in dealing with the US  
 15 government’s soaring debt problems and the wrangling over increasing the US government’s  
 16 borrowing cap. What is important is that the US deficit in 2011 at 9.6% of GDP is much higher  
 17 than that of either Portugal or Greece. Additionally there is the problem that the US “counts”  
 18 differently to Europe. In the US the official public debt number is only for the debt held by the

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<sup>26</sup> Excluding Ireland the average deficit is 7.8% and Ireland’s is skewed by the huge one-time cost it incurred in bailing out its banks.

<sup>27</sup> IMF, Fiscal Monitor May, November 2010, September 2011; 2011 and 2012 are forecasts.

1 public and ignores debt held both internally by, for example, social security, and the debt of the  
2 individual states. If the US used the European definition of public debt its official figure of 62%  
3 of GDP would jump to 92%, the same as that for Portugal. Similarly, if the US deficit were  
4 measured the same as that for European countries, its deficit would be 10.6% of GDP, basically  
5 twice that of Portugal! The upshot is that while Portugal is rated BBB- by S&P and facing a  
6 crisis as non-residents will only roll over its external debt at exorbitant rates, the US has a larger  
7 deficit and the same amount of public debt and yet currently faces no refinancing problems.<sup>28</sup>

8 Eventually Congress did increase the US government's borrowing limit and a default was  
9 forestalled, but only at the cost of a commitment to set up a super committee to achieve deficit  
10 reduction targets with mandatory changes kicking in if there were no agreement. On November  
11 21, 2011 the super committee abandoned further attempts to achieve a consensus indicating the  
12 deep ideological rifts in the US Congress. With Congress unable to achieve any fiscal initiatives  
13 the "heavy lifting" has been left to the Federal Reserve, which on September 21, 2011  
14 announced a new "Operation Twist." The objective of "Operation Twist" is simply to spend  
15 \$400 billion buying US government long term bonds to drive interest rates down and help US  
16 mortgage refinancing and thus kick-start the US housing market. Since the US has pledged to  
17 keep short term rates where they are at the moment, the effect is "quantitative easing" at the long  
18 end of the yield curve. On June 19, 2012 the Fed indicated it would continue Operation Twist  
19 beyond its original June 30 deadline, which has further prolonged the drop in long term interest  
20 rates.

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

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<sup>28</sup> See the Economist, "America's Pollyanna Principle", April 30, 2011 for a discussion

1 **Q. WHAT IS YOUR FORECAST FOR THE LONG CANADA BOND YIELD FOR**  
 2 **2013?**

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

**Table 3: Summary of the base-case projection for Canada<sup>a</sup>**

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

a. Figures in parentheses are from the base-case projection in the April 2012 Monetary Policy Report.

b. Assumptions for the prices of West Texas Intermediate and Brent crude oil (US\$ per barrel), based on an average of futures contracts over the two weeks ending 13 July 2012

5  
 6 The Bank forecasts real GDP growth at approximately 2.1% year over year for 2012, down from  
 7 the 2.4% forecast in April as it recognises the slowdown in the economy. It then forecasts a pick  
 8 up to 2.3% in 2013 and 2.4% in 2014, which is close to what the Bank of Canada regards as the  
 9 economy's long run potential. This is similar to the Consensus Economics (July 2012) forecast  
 10 of real growth of 2.1% for 2012 and 2.3% 2013. In contrast the Royal Bank of Canada is slightly  
 11 more bullish forecasting 2.3% real growth for 2012 and 2.6% for 2013. Similarly the Bank of  
 12 Canada forecasts that core inflation will stay at approximately the middle of its range of 2.0% for  
 13 2012/3 while total CPI inflation will be very slightly lower. The Consensus Economics inflation  
 14 forecast for 2012 and 2013 is at 1.9% and 2.0% respectively. While the Bank of Canada does not  
 15 forecast interest rates, I see no significant difference in the Bank's overall forecast for the  
 16 economy versus that of the Consensus or my own.

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

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

	<u>10Q2</u>	<u>10Q3</u>	<u>10Q4</u>	<u>11Q1</u>	<u>11Q2</u>	<u>11Q3</u>	<u>11Q4</u>	<u>12Q1</u>	<u>12Q2</u>	<u>12Q3</u>	<u>12Q4</u>
<b>Canada</b>											
Overnight	0.50	1.00	1.00	1.00	1.00	1.25	1.75	2.25	2.50	2.75	3.00
Three-month	0.50	0.88	0.97	1.10	1.20	1.70	2.15	2.40	2.65	2.90	3.15
Two-year	1.39	1.40	1.71	1.85	1.75	2.15	2.40	2.80	3.00	3.35	3.75
Five-year	2.32	2.04	2.46	2.65	2.50	3.00	3.30	3.50	3.65	3.85	4.05
10-year	3.08	2.75	3.16	3.25	3.25	3.50	3.80	3.95	4.05	4.15	4.15
30-year	3.65	3.34	3.55	3.80	3.75	4.00	4.30	4.45	4.50	4.50	4.55
<b>United States</b>											
Fed funds	0 to 0.25	0.50	1.00	1.50							
Three-month	0.18	0.16	0.12	0.15	0.20	0.20	0.25	0.35	0.65	1.25	1.70
Two-year	0.61	0.44	0.61	0.70	0.80	0.90	1.10	1.25	1.60	2.00	2.50
Five-year	1.79	1.27	2.01	2.10	2.00	2.30	2.60	2.80	3.05	3.40	3.75
10-year	2.97	2.48	3.30	3.45	3.25	3.65	4.00	4.15	4.25	4.45	4.50
30-year	3.91	3.67	4.34	4.50	4.55	4.60	4.85	4.90	4.95	5.00	5.05
<b>United Kingdom</b>											

5  
 6 RBC saw the 30 year LTC rate increasing to 4.55% by the end of 2012 so that the maturity  
 7 spread between short term Treasury Bills and LTC yields would drop from the then current  
 8 2.52% to 1.55%. The RBC forecast last summer put Canada almost “back to normal” by the end  
 9 of 2012.

10 However, the current (October 5, 2012) RBC interest rate forecast has the US Federal Funds rate  
 11 at 0.0-0.13% out to 2013Q4 and the 30 year long US Treasury bond yield increasing from 2.83%  
 12 as of 2012Q3 to 3.95%. Consequently RBC sees the US 30 year yield as over 1.0% lower than  
 13 their forecast of June 2011. For Canada, RBC is forecasting that the overnight rate will start  
 14 increasing in 2012Q4 and reach 2.0% by 2013Q4, while the LTC yield will increase from  
 15 2.323% to 3.10%. In this case the forecast LTC yield is almost 1.50% lower than in June 2011. It  
 16 is quite clear that the Euro crisis and problems in the US have caused RBC’s “back to normal”  
 17 forecast of the Summer of 2011 to be put off, almost indefinitely.

18 The RBC forecast for Canada is more optimistic than that of the (September) Consensus that  
 19 puts the ten year Canada bond yield at 1.80% three months out and 2.2% twelve months out, so  
 20 adding the current 0.59% spread for the 30 year bond implies a forecast LTC yield of barely

1 2.80%. The RBC forecast was after the decision of the US Federal Reserve on September 13,  
2 2012 to introduce a third round of quantitative easing (QE). The announcement had three  
3 components:

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

8 In total the Fed is committed to an indefinite purchase every month of \$85 billion of long dated  
9 securities to drive down long term interest rates and inject cash into the US economy through its  
10 bond buying program. This is unprecedented in the history of US monetary policy and will  
11 continue as long as there is need, that is, until the US unemployment rate comes back to closer to  
12 its natural non-accelerating inflation rate of unemployment (NAIRU) of 5.2%.

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

## 17 **Q. WHAT ABOUT THE US?**

18 **A.** What is clear from the above discussion is that the US, Europe and Canada are all on  
19 different trajectories. The European countries are retrenching to lower both their debt and deficits  
20 relative to GDP and as a result face probably two years of slower growth as this fiscal stimulus is  
21 removed from their economies. In contrast, the US is still pursuing a highly stimulative policy of  
22 deficit financing with very low interest rates. However, this cannot go on indefinitely; eventually  
23 the US has to get to grips with its financial problems. Until it does the US is highly dependent on  
24 the impact of Operation Twist and further quantitative easing by the Federal Reserve.<sup>29</sup>

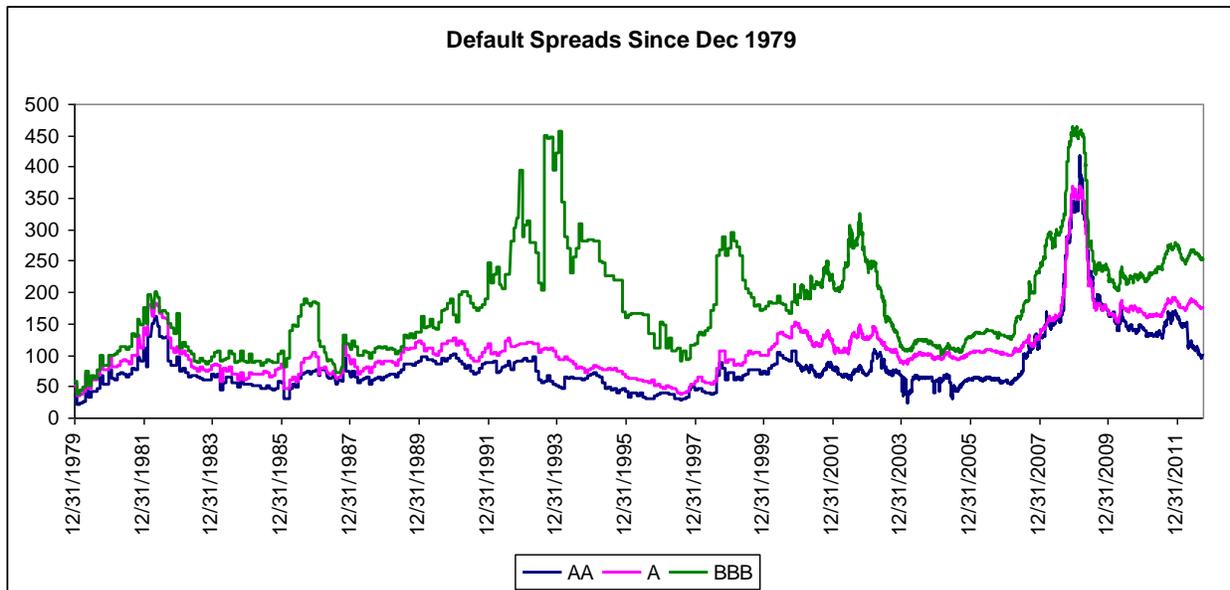
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<sup>29</sup> If all the tax cuts expire on schedule the US is facing a fiscal cliff that is forecast to reduce US GDP by about 2.5% over what it would otherwise have been

1 Of importance is that currently long term US government interest rates (Treasuries) are yielding  
2 0.50% more than equivalent maturity long Canada bonds, despite the impact of Operation Twist.  
3 Further RBC is forecasting that this gap will not narrow appreciably over the next two years, so  
4 that at the end of 2014 the gap will still be 0.85%.

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

6 **A.** The following graphs the generic yield or default, spreads between corporate and  
7 government bonds of the same maturity using the AA, A, and BBB indexes maintained  
8 originally by Scotia Capital markets.<sup>30</sup>



9  
10 Corporate bonds have default risk since companies can run into financial difficulty whereas  
11 governments borrowing in their own currency like Canada cannot.<sup>31</sup> These yield spreads usually  
12 behave in a predictable manner. In a recession as the risk of bankruptcy increases investors sell  
13 off default-risky corporate debt and their liquidity drops. As a result their bond prices fall and

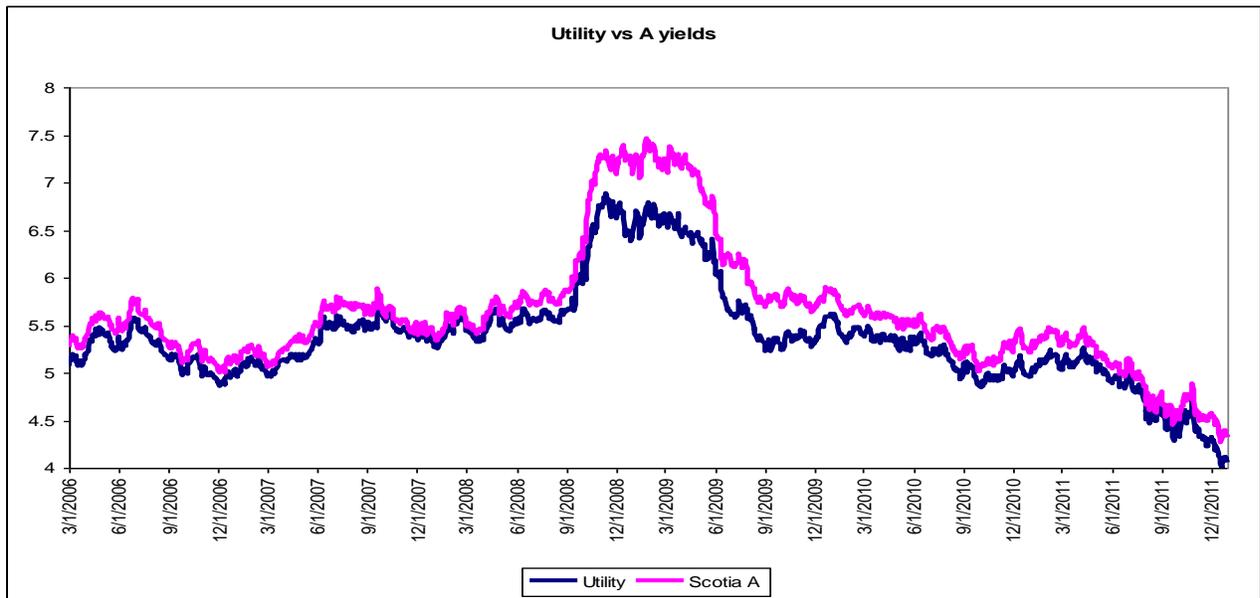
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<sup>30</sup> The most recent data is from Datastream, which updates original data from Scotia Capital's Handbook of Debt Market Indices.

<sup>31</sup> This assumes they simply print more money to pay off their debts. The US can do this, but it was the behaviour of Tea Party members in Congress arguing that the US should default that so frightened global investors in 2011.

1 their yields increase relative to the long Canada bond yield causing a wider spread. Conversely  
2 as the economy recovers and this risk recedes the spread narrows. We can see this clearly in the  
3 high spreads during the long recession of the early 1990s, the panic of the Asian crisis and the  
4 bursting of the Internet Bubble and in particular the financial crisis of 2008-9. Note also that  
5 usually the spread increases most for the BBB bond which is the riskiest. The exception to this  
6 general rule was during the last financial crisis when the spreads for even A and AA bonds  
7 widened dramatically as liquidity in the market dried up as many banks ceased making a market  
8 in corporate bonds except on an agency basis.<sup>32</sup>

9 It is also important to distinguish between generic “A” and utility spreads. In the Ontario Energy  
10 Board report on the cost of capital<sup>33</sup> the OEB decided to re-set the ROE based on changes in both  
11 the long Canada bond yield and the utility bond yield using a series maintained by Bloomberg  
12 (C29530Y). The following graphs the corporate credit spread based on the yields from the Scotia  
13 Capital “A” bond index and the Bloomberg utility series.



14

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<sup>32</sup> Agency trades do not require capital, whereas normally banks hold an inventory and trade out of inventory for clients.

<sup>33</sup> EB-2009-0084

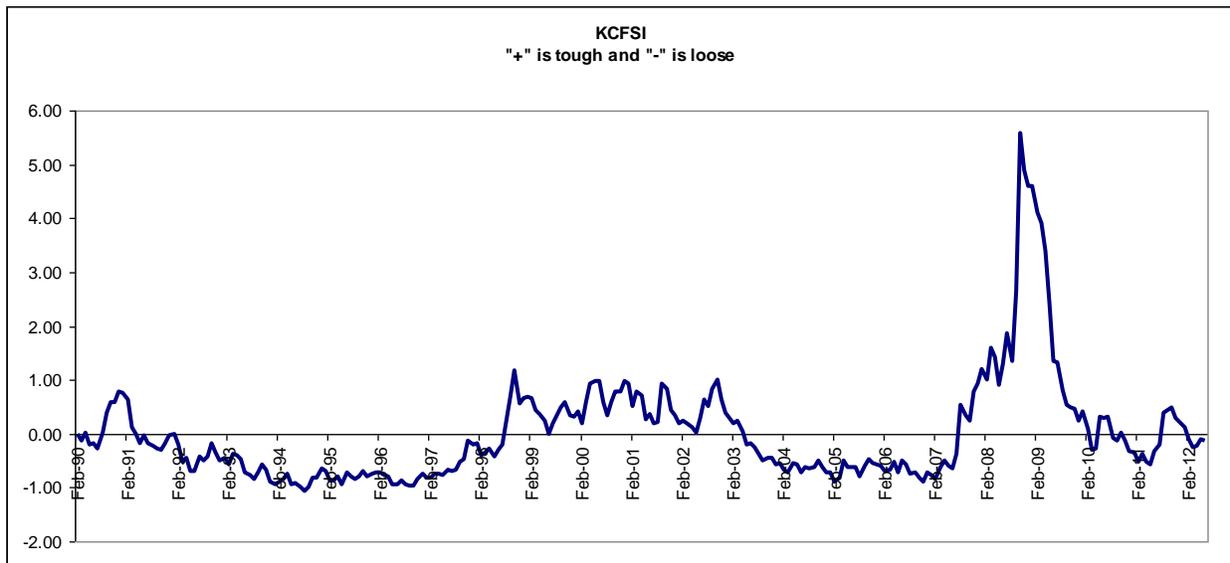
1 What is important to note is that utility yields were consistently lower than the generic A yields  
2 as the financial crisis started to emerge and remained so until the recent collapse in bond yields.  
3 This is consistent with the experience of the FortisBC Energy bond yields.

4 This behaviour of yield spreads is not unusual. In fact, in previous testimony I have noted that  
5 during the prolonged recession in 1992-1994 the same phenomenon was observed using the  
6 CBRS utility and non-utility spreads.<sup>34</sup> This behaviour points to the fact that the market does  
7 recognise that utilities are lower risk than equivalently rated bonds when the “going gets tough”,  
8 that is, that utility bonds are really lower risk than their actual ratings indicate.

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

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

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



16

---

<sup>34</sup> CBRS was the Canadian Bond Rating Service which was taken over by S&P.

1 This index is designed to capture a variety of financial indicators in addition to the two which I  
2 have traditionally focussed on, which are the spreads between corporate and government yields,  
3 both the short term spreads in the money market and longer term spreads in the bond market. The  
4 additional indicators include the volatility index, the state of bank share prices, and the behaviour  
5 of stock and bond returns. When the KCFSI is above 0 it indicates that capital markets are under  
6 stress; similarly when it is below 0 it indicates relatively easy, “stress-free” capital market  
7 conditions. The value of the KCFSI is simply that it captures in one number the impact of a  
8 variety of capital market indicators.<sup>35</sup>

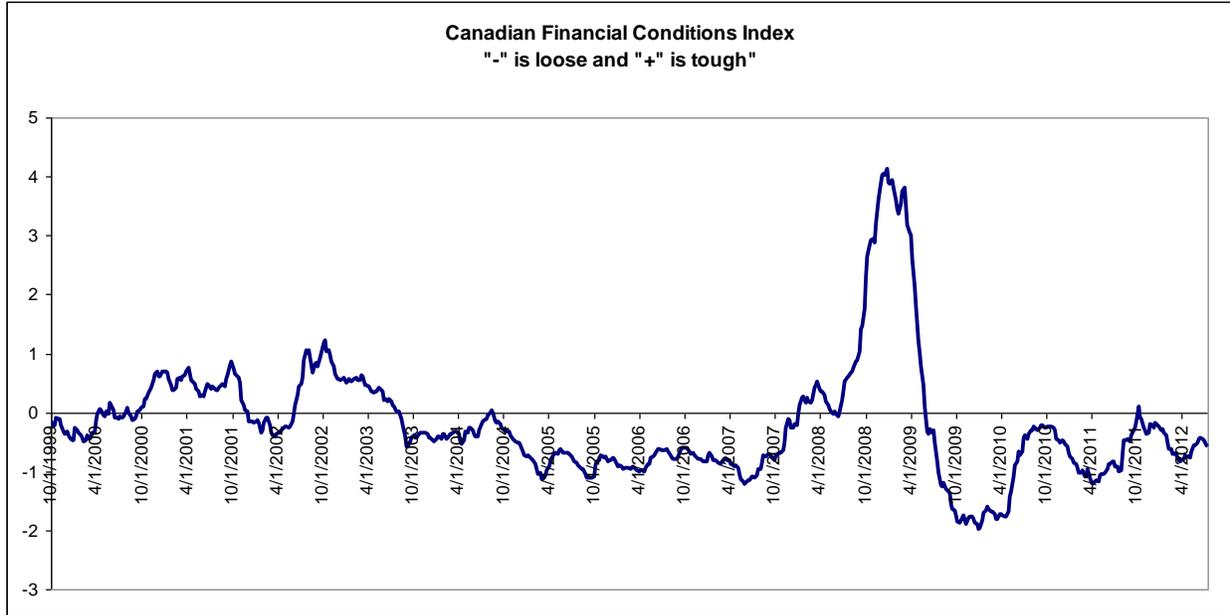
9 The major insight of the KCFSI is that it emphasises the enormous pressures in the US financial  
10 system during the financial crisis. Unlike the internet bubble crash in 2001 the crisis in 2008/9  
11 struck at the very core of the US financial system, which is the banking system, where liquidity,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

16 The work by the Kansas City Fed follows pioneering work done by researchers at the Bank of  
17 Canada who developed a simpler financial conditions stress index,<sup>36</sup> which is graphed below.

---

<sup>35</sup> Technically it captures the common element in all these indicators by using principal components analysis.

<sup>36</sup> The Bank of Canada index is actually the inverse of this, I multiplied it through by -1 to get the same interpretation as for the KCFSI



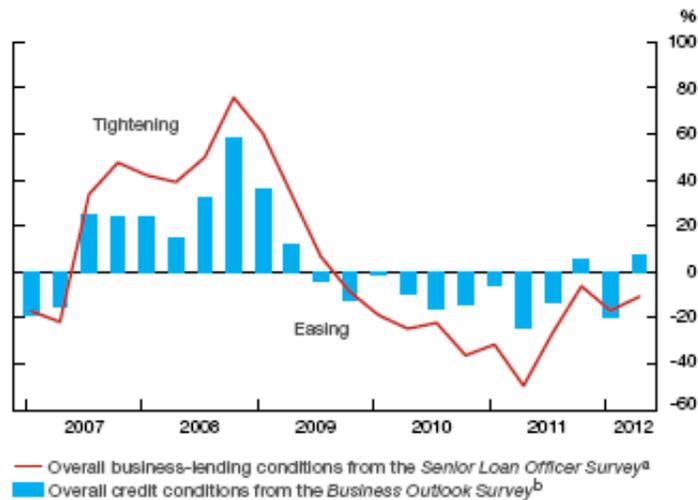
1

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

5 The performance of the Canadian Financial Conditions index mirrors the assessment of the Bank  
 6 of Canada in its Financial System Review (December 2011), where it indicated that credit  
 7 conditions were little changed in Canada in Q3 2011. The graph below supports that assessment  
 8 with recent data from the Monetary Policy Report (July 2012) showing that credit conditions for  
 9 Canadian firms remain relative easy.

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

Balance of opinion



1

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

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

8 **A.** The Canadian equity market was severely impacted by events in the United States as  
9 were markets around the world. However, Canadian utility companies behaved exactly as you  
10 would expect: as low risk defensive investments they did not decline with the stock market as a  
11 whole. In Appendix C Schedules 5-7 are graphs of the prices for the six major publicly traded  
12 utilities against the TSX Composite index. What it demonstrates is that as utilities they exhibited  
13 their low risk stature by not being as responsive to general market risk. As of the end of 2011,  
14 relative to the previous five years, every utility was trading significantly above the TSX except  
15 for Valener, which is the old Gaz Metropolitan Limited Partnership units. The fact is any  
16 investor would have loved to hold a diversified portfolio of Canadian utilities through the last  
17 five years rather than the TSX Composite!

1 Further no utility in Canada was unable to raise capital on fair and reasonable terms during the  
2 financial crisis. Several of them raised shorter term debt financing, rather than long term  
3 financing, which is exactly what competitive non-regulated firms had to do, whose behavior they  
4 are regulated to mimic. On December 9, 2008 a story in the Calgary Herald<sup>37</sup> discussed the  
5 implications of the price of oil dropping from \$144US to \$50 and what it meant for oil and gas  
6 companies and pipelines. Hal Kvisle, CEO of TransCanada, noted that although it was more  
7 difficult to raise money TransCanada had just raised \$1.16 billion in an issue that was over-  
8 subscribed. Kvisle indicated that it underscored the attractiveness of infrastructure investments in  
9 troubled times. The article also noted that Enbridge had increased its dividend by 12 per cent and  
10 upped its 2009 earnings guidance by about 20 per cent.

11 Enbridge's CEO Pat Daniel said he's confident "the company can maintain 10 per cent earnings  
12 per share growth for at least the next five years, a testament to the *low-risk business model*  
13 (emphasis added) of pipelines in general." The article went on to state that "Enbridge has been  
14 one of the top performers on the TSX, losing only 1.7 per cent year-over-year compared to more  
15 than 41 per cent for the TSX main board and a whopping 56 per cent for the TSX's capped  
16 energy index since June." It further quoted Daniel as saying "I think that speaks to the low risk,  
17 steady predictable nature of our business, ....*People don't really realize it until you get into*  
18 *tough times like this.*" (emphasis added) The article went on to note that "Enbridge shares  
19 gained \$1.32, or three per cent, on the Toronto Stock Exchange on Monday to finish at \$39.50  
20 while Trans-Canada added 60 cents to close at \$33.90."

21 Although Pat Daniels stated that people don't realise how low risk Enbridge's business is, this is  
22 not true as the stock market clearly noticed. In my judgment, almost all the utilities demonstrated  
23 the low risk nature of their business throughout the financial crisis. This is not to say that they  
24 have no risk, the fact that they did move with the market indicates they do have market risk.

---

<sup>37</sup> Shaun Polczer, "Pipeline companies weather darkest hour; Executives say crisis worst in oil patch history" Calgary Herald, December 9, 2008.

1 **4.0 RISK PREMIUM ESTIMATES OF THE FAIR ROE**

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

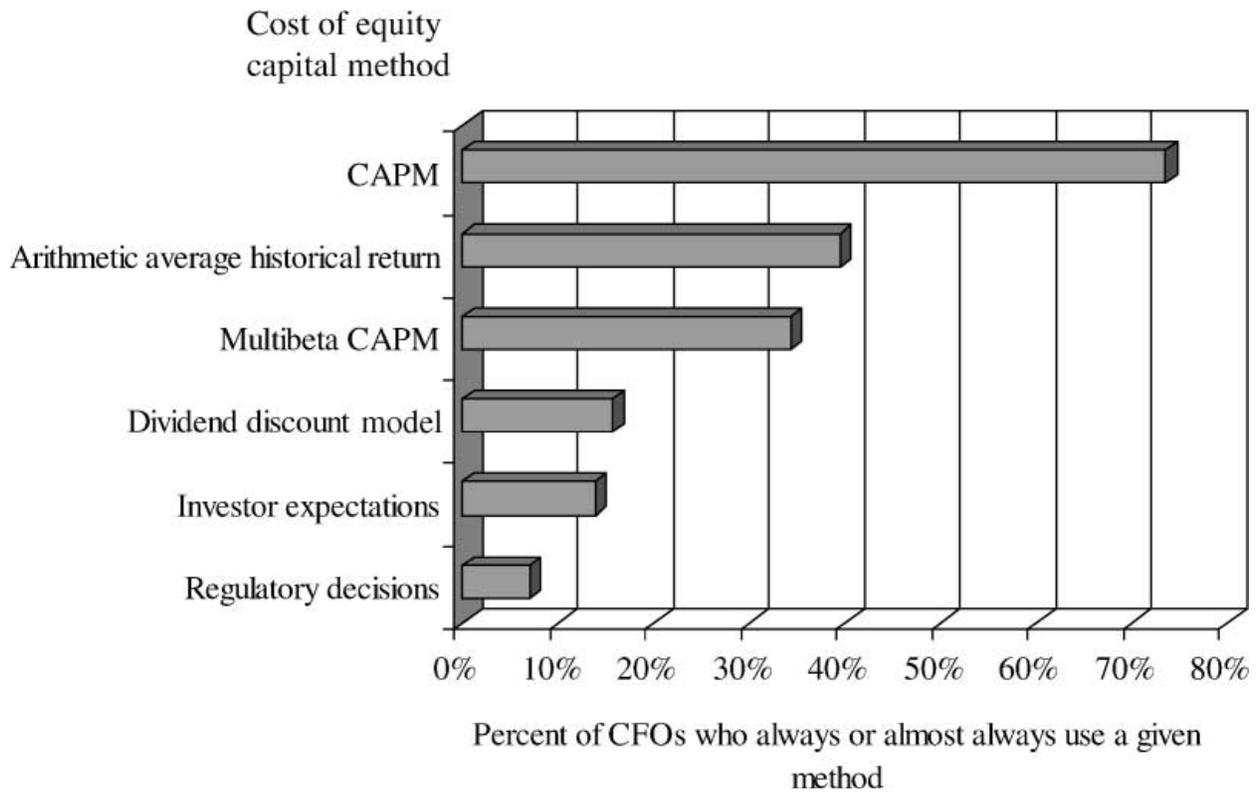
3 **A.** The capital asset pricing model or CAPM is the most common way of estimating the fair  
4 rate of return. It is a special form of risk premium model which simply says,

5 
$$K = R_F + MRP * \beta$$

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

13 Why the CAPM is so widely used is because it is intuitively correct. It captures two of the major  
14 "laws" of finance: the *time value* of money and the *risk value* of money. I will discuss the third  
15 law of finance the *tax value* of money later, but the time value of money is captured in the long  
16 Canada bond yield as the risk free rate. The risk value of money is captured in the market risk  
17 premium, which anchors an individual firm's risk. As long as the market risk premium is  
18 approximately correct the estimate will be in the right "ball-park." Where the CAPM normally  
19 gets controversial is in the beta coefficient; since risk is constantly changing so too are beta  
20 coefficients. This sometimes casts doubt on the model as people find it difficult to understand  
21 why betas change. Further it also makes testing the model incredibly difficult. However, the  
22 CAPM measures the right thing: which is how much does a security add to the risk of a  
23 diversified portfolio, which is the central idea of modern portfolio theory. It also reflects the fact  
24 that modern capital markets are dominated by large institutions that hold diversified portfolios.

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



1

2 70% of US CFOs use the CAPM and a further 30% use a multi-beta approach similar to the two  
 3 factor model I often use. Note in this respect that multi-beta models, while slightly more general,  
 4 don't alter the average rate of return which is anchored by the risk free rate and market risk  
 5 premium: all they do is generate slightly different estimates for individual firms.

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

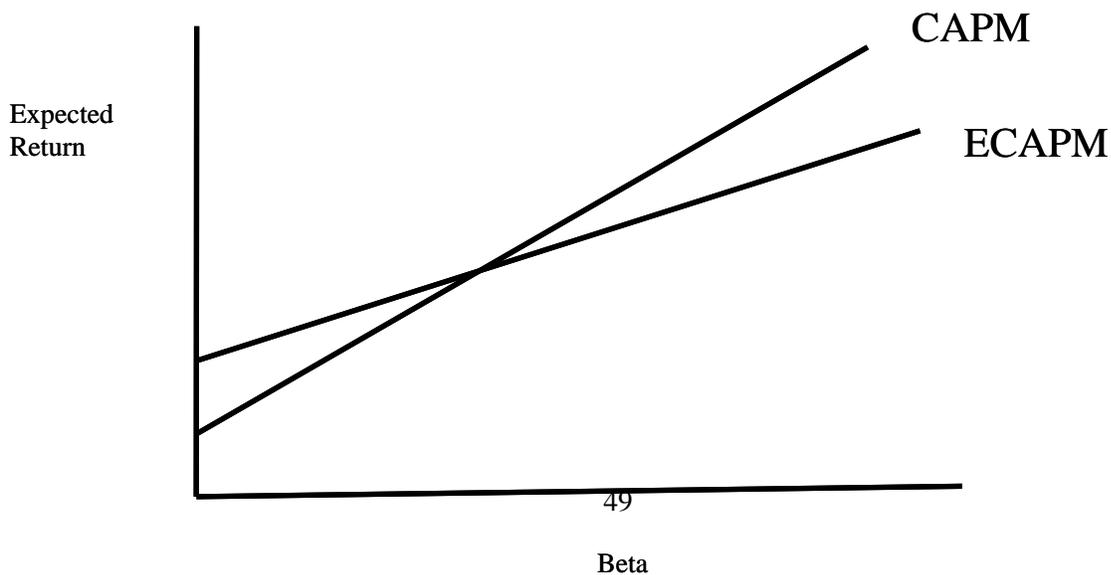
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10

11

12

13



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

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

15 The second problem is that these tests used actual betas and were simply mechanical: whatever  
16 was the beta over the previous five year period was used in the test as a forecast beta. This is not  
17 how betas have ever been used in a regulatory context. I have always used judgement in  
18 adjusting betas back to their average value, a practice accepted by many boards, whereas  
19 company witnesses in part adjust them using the Marshall Blume adjustment model appropriate  
20 for a typical or average stock.<sup>38</sup> I discuss this procedure in my Appendix C where I discuss  
21 relative risk adjustments, but the point is simply that the empirical tests that justify the ECAPM  
22 don't do this.

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

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<sup>38</sup> They often hide this by simply using other people's betas that they know have been adjusted in this way.

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

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

12 **Q. IS THERE ANY OTHER SUPPORT FOR THE CAPM?**

13 **A.** Yes. Levy and Roll have recently revisited the question of the empirical support for the  
14 CAPM. Richard Roll in a path breaking paper<sup>39</sup> pointed out that as long as the market portfolio is  
15 ex post efficient then by definition the CAPM will work in empirical tests and all securities will  
16 lie along a straight line relating returns to betas. In the Levy and Roll paper<sup>40</sup> they reverse  
17 engineer the tests and consider how much the sample parameters can vary to make sure the  
18 normal proxies for the market portfolio are efficient. Levy and Roll find that even slight  
19 variations, within the normal estimation bounds, make the proxies efficient. As they conclude:

20  
21 “This article shows that a small variation of the sample parameters, well within their  
22 estimation error bounds, can make a typical market proxy efficient. Thus, the empirically  
23 measured return parameters and the market portfolio weights are perfectly consistent with  
24 the CAPM using a typical proxy..... Hence, minor changes in estimation error reverse  
25 previous negative and disappointing findings for the CAPM.”  
26

---

<sup>39</sup> Richard Roll, “A Critique of the Asset Pricing Theory’s Tests: Part 1: On Past and Potential Testability of the Theory”, Journal of Financial Economics 4: 129-76, 1977.

<sup>40</sup> Moshe levy and Richard Roll, “The Market Portfolio May be Mean Variance Efficient After All,” Review of Financial Studies, 2010.

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

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

5 **A.** In Appendix B I estimate the market risk premium of common equities over long term  
6 Canada bonds at 5.0-6.0%. This estimate is drawn from the Canadian capital market history  
7 going back to 1924 so encompasses periods very similar to today, such as the bleak 1930s of  
8 slow growth and falling prices, as well as booms and serious inflation problems such as the  
9 1970's. While the Canadian data points to a market risk premium of under 5.0%, I give weight to  
10 the US evidence for two main reasons. First, most of the restrictions on keeping Canadian capital  
11 within Canada have been removed resulting in significant capital outflows and higher expected  
12 returns on Canadian investments. Second, Canadian governments have moved to a primary  
13 surplus on their budgets. The primary surplus is the actual surplus after stimulus expenditures  
14 and the impact of an economic slow-down have been removed. The result has been lower interest  
15 rates in Canada than the United States for the last five plus years, which has removed the historic  
16 bias of a smaller Canadian market risk premium over a higher and riskier Canadian government  
17 bond yield. Finally, I give significant weight to survey results by Professor Fernandez, who now  
18 annually surveys thousands of academics, financial analysts and corporate executives making  
19 investment decisions.

20 My Appendix C discusses relative risk adjustments or betas. The recent history of Canadian and  
21 low risk US utilities is of beta coefficients about 0.30-0.35 as they have withstood the impact of  
22 the financial crisis much better than the market as a whole, that is, the crisis demonstrated yet  
23 again the low risk nature of regulated utilities. These estimates are consistent with the price  
24 behaviour of Canadian regulated utilities and estimates by the Royal Bank of Canada. It is  
25 indisputable that as low risk investments the relative risk of Canadian utilities has been about  
26 0.30-0.35. However, any estimates reflect the time period over which they are estimated and  
27 once a unique event falls out of the estimation window it is no longer in the estimate. On a going  
28 forward basis I do not expect the US financial system to collapse again, as it did in 2008/9, and  
29 trigger a global meltdown. As a result, I believe that the relative risk of Canadian utilities will

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

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

8	Simple CAPM Estimates	2013
9	<b>Low end</b>	<b>5.75%</b>
10	<b>High end</b>	<b>6.80%</b>

11  
12 **Q. DO YOU USE THIS SIMPLE CAPM ESTIMATE FOR YOUR**  
13 **RECOMMENDATION?**

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

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

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

1  
2 If we look at the bottom of the range we can clearly see how the CAPM result was obtained: a  
3 4.23% LTC forecast yield plus a utility risk premium of 5.5% \* 0.50 or 275 bps to which a  
4 0.30% flotation cost allowance was added to get 7.28%. A similar approach was used to get the  
5 high end estimate of 8.06%. Ignoring the additional ROE for Gaz Metro's higher risk than the  
6 benchmark, the Regie estimated a CAPM fair ROE of 7.28%-8.06% based on a forecast long  
7 Canada bond yield very similar to my forecast for 2012 as of the Summer of 2011. The Regie  
8 then increased the range by 0.75% - 1.40% for

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

12 The AUC adopted a similar approach in its generic decision (Decision 2009-216, November 12,  
13 2009)

325. Based on the Commission's findings with respect to CAPM, the Commission found a reasonable range of CAPM results of 7.13 percent to 8.62 percent. However, given the Commission's observations with respect to the impacts of the financial crisis on the traditional relationships in the financial market, the Commission considers that these CAPM may be unreasonably low.

326. The Commission's analysis of the performance of high grade bonds relative to the risk free rate during the financial crisis, as explained in Section 5.7, reveals that the traditional spread between the long Canada bond yield and the yield on high grade bonds had increased to well above the traditional spread of one percent and by the close of the record in the proceeding had moved back to a spread of approximately 1.5 percent. As a result, the Commission concludes that the CAPM results likely underestimate the required market equity return by at least 50 basis points. Accordingly, the Commission has adjusted its CAPM results to arrive at a range of 7.63 percent to 9.12 percent.

1  
2 In arriving at their reasonable CAPM range of 7.13%-8.62% the AUC used similar values to the  
3 Regie: a market risk premium range of 5.00-5.75% and a relative risk (beta) coefficient of 0.50-  
4 0.63 and a forecast long Canada yield of 4.13-4.50%. Together with a 0.50% flotation allowance  
5 these result in a bottom-to-top range of 7.13-8.62%, which is slightly wider than the Regie's. In  
6 addition the AUC added an additional 0.50% to the ROE largely due to changes in yield spreads  
7 and its assessment that this "reasonable range" for the CAPM may be unreasonably low. The  
8 overall adjusted CAPM range was 7.63-9.12% and by considering the results from other models  
9 the AUC awarded an ROE of 9.0%.

10 In its 2009 decision, the Board of Commissioners of Newfoundland and Labrador also based its  
11 allowed ROE for Newfoundland Power on the CAPM. The Board used a 4.5% risk free rate, a  
12 6% market risk premium, a beta of 0.60 and a 0.50% flotation cost allowance for a CAPM fair  
13 return of 8.60%. The Board then decided that NP was an average risk Canadian utility and  
14 allowed a 9.0% ROE due to financial market conditions and NP's credit metrics.

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

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

17

1 To all intents and purposes this is very similar to that of the AUC, Regie, and the Board of  
2 Commissioners of Newfoundland and Labrador except for the relatively high risk assessment  
3 (beta) placed on Terasen Gas Inc. (TGI) of 0.60-0.66.

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

10 **Q. DO YOU AGREE WITH A CREDIT SPREAD ADJUSTMENT?**

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

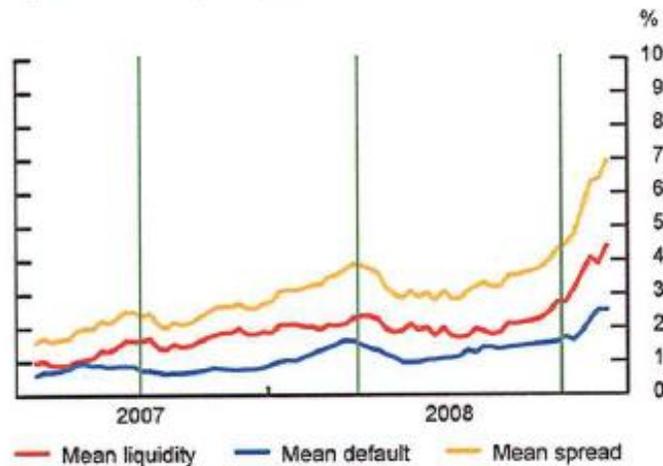
19 Since then research at the Bank of Canada has helped to disentangle the liquidity from the pure  
20 default risk components in the corporate spread. Garcia and Yang<sup>41</sup> looked at Canadian US\$  
21 issuers in the US market, where credit default swaps were traded. They had to look in the US  
22 market, since there is no data within Canada. However, for these Canadian, investment grade,  
23 US\$ issuers, investors could purchase credit default swaps to insure against default. Further,  
24 since the liquidity risk is minimal in credit default swaps, by comparing these spreads with  
25 conventional yield spreads, they were able to disentangle the two components. The graph that  
26 follows provides their key result.

---

<sup>41</sup> A. Garcia and J. Yang, "Understanding Corporate Bond Spreads Using Credit Default Swaps," Bank of Canada Review, Autumn 2009

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

Synthetic zero-coupon 5-year bond



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

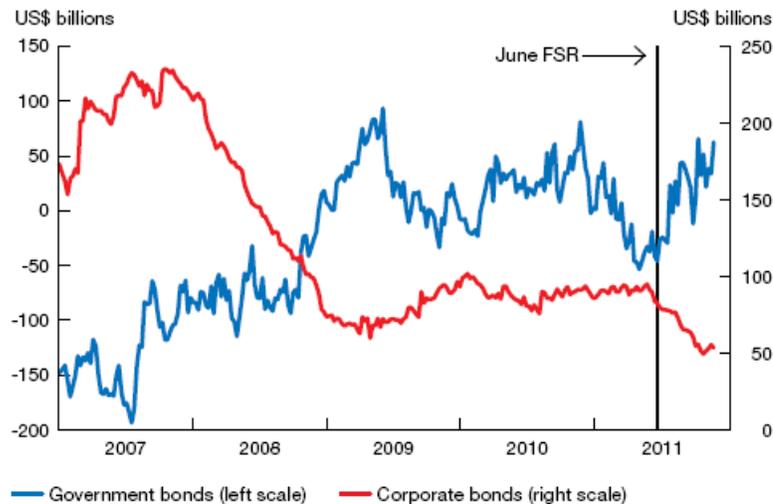
1  
2 The average (mean) overall spread increased from under 200 basis points (bps) in 2007 to 700  
3 bps at the peak of the crisis. However, the vast bulk of this increase was due to liquidity effects,  
4 where the spread increased from 100 bps to over 400 bps. In contrast, the pure default risk  
5 component increased from under 100 bps to about 250 bps. Garcia and Yang conclude (page 29)

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

8 Garcia and Yang go on to say that for non-investment grade bonds the result is reversed, that is,  
9 it is the pure default risk that dominates rather than the liquidity risk. Although it remains very  
10 difficult to disentangle the liquidity from the pure default risk components on corporate spreads,  
11 the Garcia and Yang results confirm the view that I expressed before boards in 2009 that there  
12 are factors in the bond market that affect corporate spreads that are *independent* of the equity  
13 market. As a result, it is incorrect to reward the equity holders with a 1:1 adjustment to changes  
14 in the spreads between utility and Government of Canada bonds, since equity holders are not  
15 affected by the regular liquidity changes in the bond market during a flight to quality.

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

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



Source: Bloomberg

Last observation: 23 November 20

- 3
- 4 The graph clearly shows the decline in inventory of corporate bonds held by investment dealers
- 5 in the US since the financial crisis as well as the latest sharp drop off in 2011 Q3 and Q4, which
- 6 again has been associated with increasing corporate credit spreads.<sup>42</sup>

7 Garcia and Yang show that 63% of the change in spreads between corporate and Government of  
 8 Canada yields is caused by changes in liquidity. These changes can be ignored as far as changing  
 9 the allowed ROE, since they do not affect equity holders as liquidity in the equity market  
 10 generally increases during a flight to quality. This leaves only 37% of the change in spreads due  
 11 to the pure default risk that may also affect the equity holders and thus the fair ROE. In my  
 12 judgment this supports the use of a 37% adjustment of the allowed ROE to changes in spreads  
 13 between utility and corporate bond yields. Given the imprecision of “37%” since 2010 I have  
 14 been recommending a 50% adjustment to changes in corporate (utility) yield spreads to pick up  
 15 this credit market effect.

<sup>42</sup> This liquidity may be further reduced by the Dodd-Frank Act which will restrict proprietary trading and may indirectly affect market making.

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

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

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

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

18 **A.** In Appendix B Schedule 6, I develop a model to explain the behaviour of the real yield  
19 on long Canada bonds, defined as the nominal yield minus the average of past, current and future  
20 CPI inflation. Ignoring the dummy variables for WW2 and the 1970s, when there was huge  
21 liquidity during the petro dollar recycling period, the model essentially says that the real LTC  
22 bond yield is 1.04% plus a premium based on bond market uncertainty and a premium based on  
23 the size of the government deficit. The model does well in explaining the very high yields when  
24 there was huge volatility in the bond market and Canada was running deficits approaching 10%  
25 of GDP. However, while we have seen bond market uncertainty go down, the aggregate deficit  
26 in Canada has gone from a surplus to almost 5% of GDP. Normally this would cause a flood of  
27 government debt pushing down prices and pushing up yields. Plugging numbers into the  
28 regression model would predict real long Canada yields of almost 4.0%, rather than the skimpy  
29 0.22% we actually see (2.22% long Canada yield minus 2.0% inflation) However, the flood of

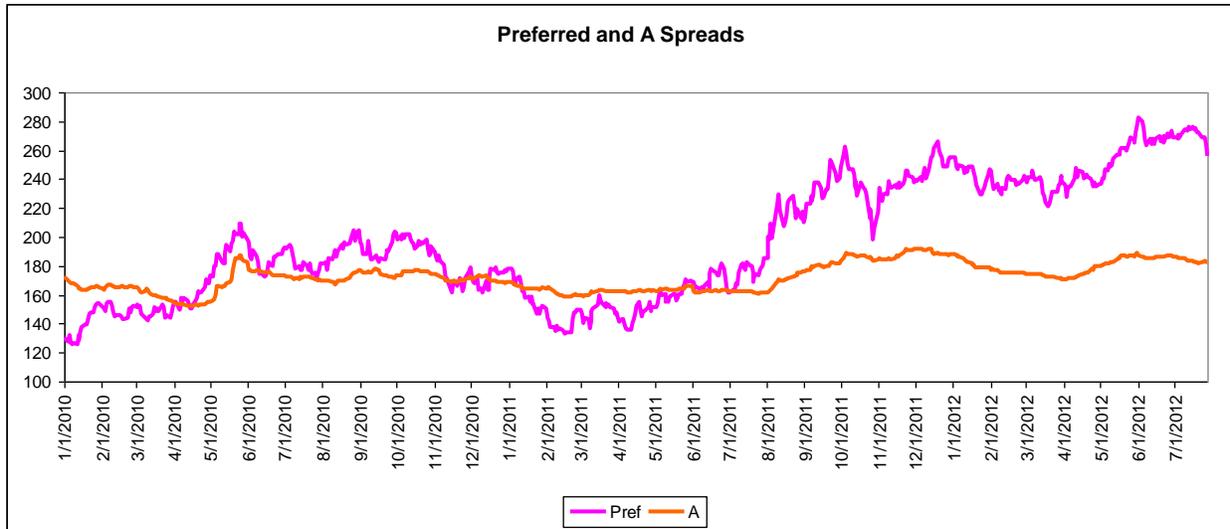
1 government debt is being bought in part by non-residents and my model's estimates are mainly  
2 derived from periods when the Canadian bond market was essentially segmented from the rest of  
3 the world. Although I would not base an estimate on this real yield model, it does indicate that  
4 current real Canada bond yields are not being made solely in Canada.

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

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

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





1

2 On January 1, 2010 long Canada bonds yielded 4.14%, utility bonds 5.59%, “A” bonds 5.86%

3 and TSX’s preferred share series 5.44%. So the spreads were 130 bps for the preferreds, 145 bps

4 for utility bonds and 172 bps for the generic “A” bonds. Compared to June 2004 these spreads

5 had increased; the preferred share spread from 14 bps to 130 bps and the “A” spread from 100

6 bps to 172 bps and the spread for the riskier preferreds had increased more than that for the “A”

7 bonds. The graph then indicates two things. First, the generic “A” and utility spreads moved in

8 tandem, but increased slightly over the long Canada bond. This is the change that the corporate

9 credit spread adjustment would pick up. Second, while the preferred yield spread moved in

10 tandem with the bond spreads until August 2011, after then the spread increased dramatically.

11 Another way of saying this is that by the end of December 2011 the preferred share yield had

12 dropped 0.44% to 5.0%, while the A and utility A bond yields had dropped by 1.54% from

13 5.59% to 4.05% (utility) and by 1.53% from 5.86% to 4.33% (generic “A”).

14 The implication of the change in yields over 2010 and 2011 is that after the Federal Reserve

15 embarked on Operation Twist to twist the US yield curve and lower the yield on long term US

16 government bonds, there was a direct effect in Canada. Moreover, this affected both the

17 government and to a lesser extent the corporate bond market, since yields on both came down

18 after September 2011. However, yields in the preferred share market did not come down to the

19 same degree causing the preferred share yield spread to widen. This is probably because

20 preferred shares are unattractive to foreign investors, since the dividends attract with-holding

21 taxes. Regardless the preferred share yield spread has increased from 130 bps over long Canada

1 bonds to 260, whereas the generic “A” spread has increased from 172 to 180bps. It is difficult to  
2 precisely estimate the impact of Operation Twist since the duration of these instruments differ,  
3 but I would place the “Operation Twist” impact on the Canadian bond market as approximately  
4 80 bps, which is approximately the spread increase of preferred yields over “A” bond yields  
5 since Summer 2011.

6 There are many problems with relying on a preferred share index, but clearly Canadian bond  
7 yields have been affected by the actions of the US Federal Reserve and as a result in my  
8 judgment are currently not as indicative as an opportunity cost for equity investors as normally.  
9 At the current point in time I would upwardly adjust my CAPM ROE estimate for 2013 by  
10 0.40% for the credit spread adjustment and by 0.80% for the impact of Operation Twist. In total I  
11 would add 1.20% to the simple CAPM estimates. This produces a fair ROE in the following  
12 range.

13	CAPM Estimates	2013
14	<b>Low end</b>	<b>6.95%</b>
15	<b>High end</b>	<b>8.00%</b>
16		

17 The estimates for 2014 may be marginally high since I am adding my 1.20% credit spread and  
18 Operation Twist adjustments while forecasting that the long Canada bond yield will increase  
19 from the current 2.2% to 4.0%. That is, by 2014 most of the impact of Operation Twist should  
20 have been removed and with this recovery in yields the default spread should revert back closer  
21 to normal.

22

1 **5.0 DCF ESTIMATES OF THE FAIR ROE**

2 **Q. WHAT ARE YOUR DCF ESTIMATES?**

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

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

17 
$$K = R_f + MRP * \beta$$

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

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

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

5 The classic Gordon growth model,<sup>43</sup> referred to as the DCF model in most testimony before  
6 regulatory bodies, is as follows:

7 
$$K = \frac{d_1}{P} + g$$

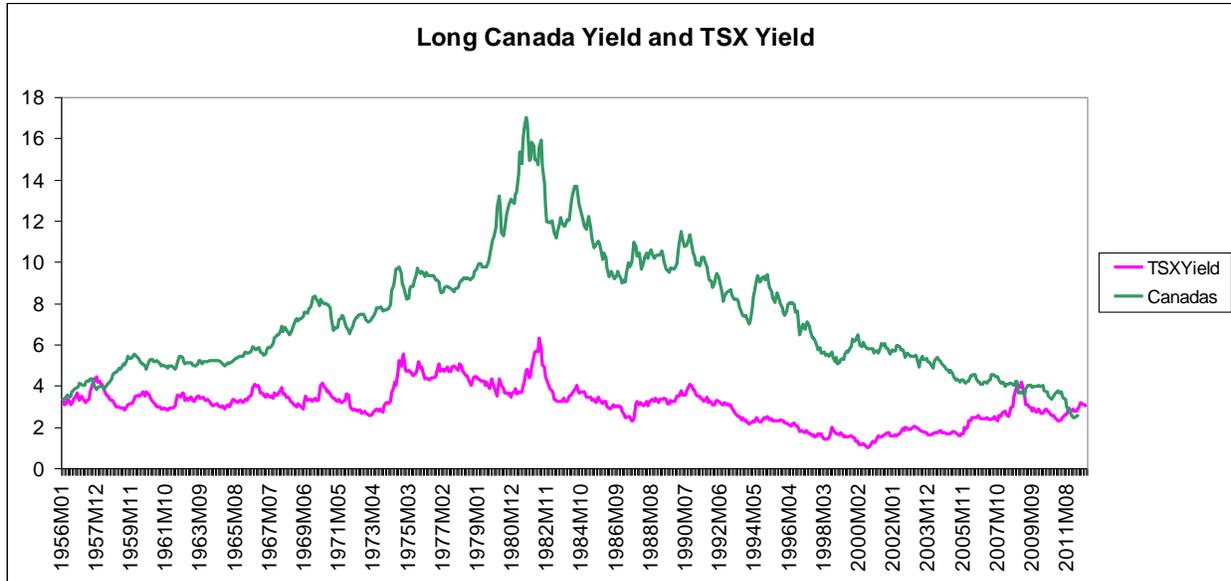
8 In words, the required rate of return is the forecast dividend yield plus the long run growth rate,  
9 since it is the long run growth rate in earnings and dividends that drives long run capital gains.  
10 Conceptually the DCF model and CAPM should give exactly the same values but, of course,  
11 since they approach it from a different perspective there is always estimation error. For the  
12 market as a whole the forecast dividend yield can be estimated with very little error, so the  
13 estimation error is with the forecast long run growth rate, which also is easier to estimate than for  
14 an individual stock. As a result, if the CAPM and DCF estimates differ significantly, then it is  
15 mainly due to the difficulty in estimating the growth rate in the DCF model and the risk premium  
16 in the CAPM.<sup>44</sup>

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

---

<sup>43</sup> Named after the late Professor Myron Gordon of the University of Toronto.

<sup>44</sup> Note since for the CAPM we are dealing with the market return the following analysis is general for any risk premium model



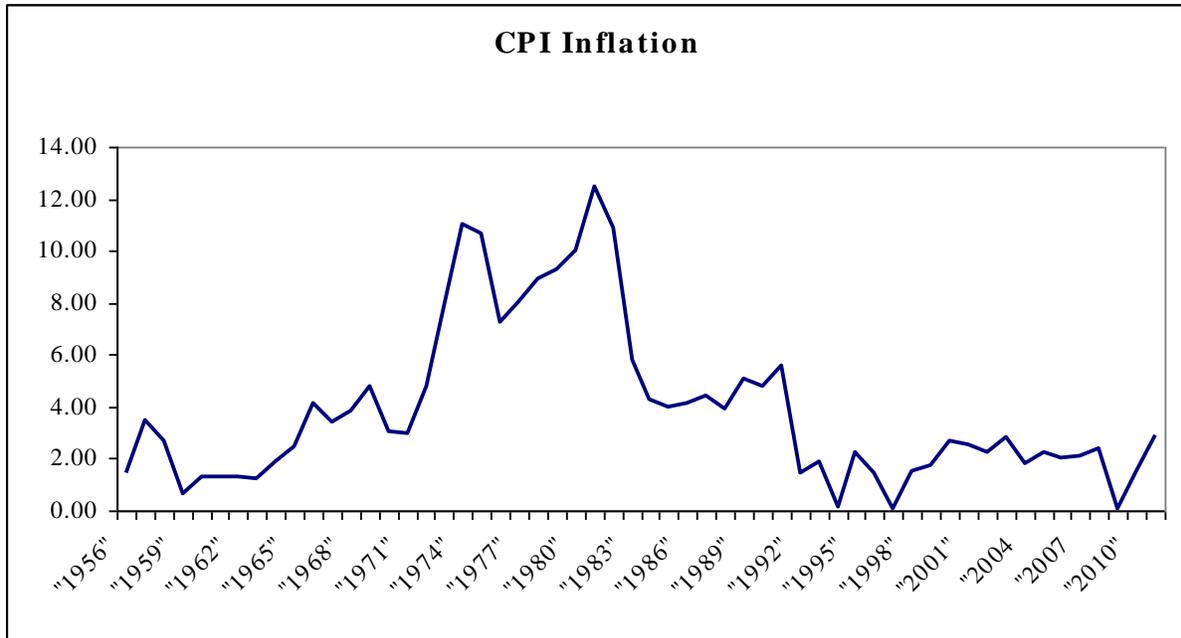
1

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

$$4 \quad CAPM - DCF = R_f - \frac{d_1}{P} = g - MRP$$

5 Or in words the directly observable spread between the long Canada bond yield and the TSX  
 6 dividend yield is equal to the long run dividend growth rate minus the market risk premium.

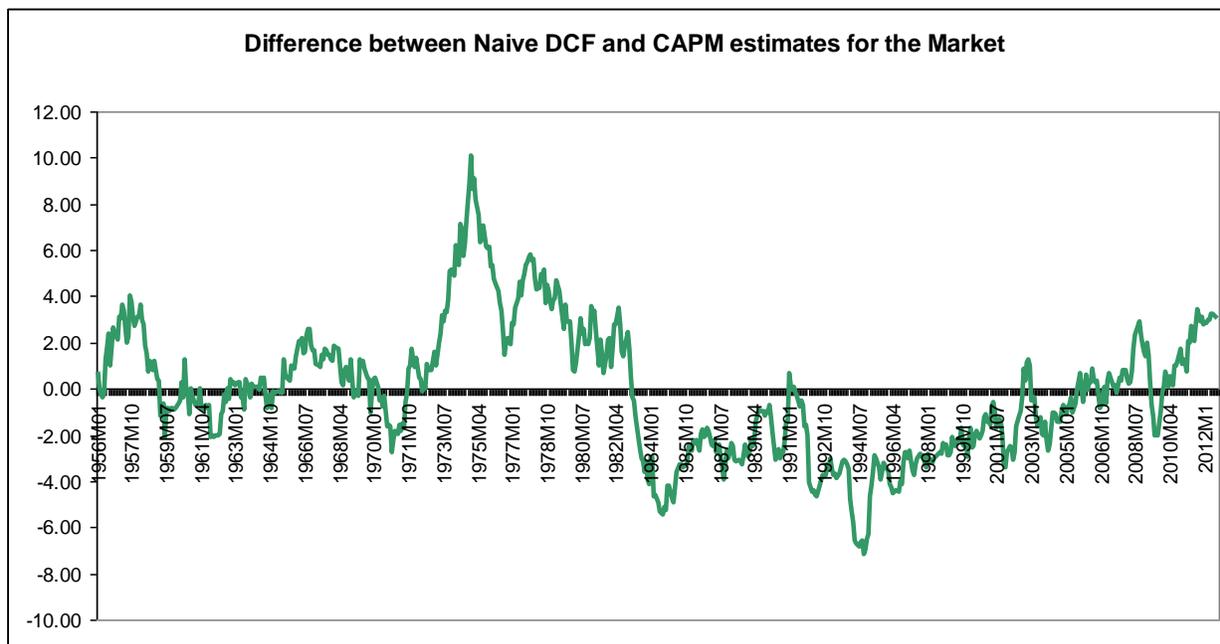
7 From the above graph we can see that there is generally a very large difference between the two  
 8 indicating that the expected growth rate was much higher than the market risk premium, which  
 9 would pull up the dividend yield to close to the long Canada bond yield. The reason for this was  
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



1

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

11 To see how robust this simple procedure is, the following graphs the difference between the two  
 12 estimates for every month since 1956. The graph indicates that the difference was very large  
 13 from the mid 1970's until the late 1990's. The reason for this difference is twofold. First, in the  
 14 1970s inflation was increasing and bond yields did not reflect this as investors simply did not  
 15 believe that the Bank of Canada and the Government would allow these high levels of inflation  
 16 to continue. This resulted in very low real yields on LTC bonds. As a result whereas the DCF  
 17 estimate directly captured the year over year inflation rate, the LTC yield did not leading to a  
 18 positive difference between the DCF and CAPM estimates.



1

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

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

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

1 growth rate the simple DCF estimate is 8.88%.<sup>45</sup> Similarly with the current long Canada yield of  
2 2.31% and a 3.5% market risk premium the simple CAPM estimate is 5.81%. As a result, there is  
3 currently a 3.07% difference when we subtract the CAPM estimate from the DCF estimate.  
4 Further note from the graph that this difference between the two has gradually gone from  
5 negative to positive over the last 15 years as long Canada bond yields have gone down. The  
6 reason for this is simply the fact that the real yield on the long Canada bond has dropped so that  
7 whereas we have year over year 2.31% inflation in the DCF model we only have an LTC yield of  
8 2.31% in the risk premium model or in this case a real yield of 0%.

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

14 **Q. WOULD YOU USE THESE ESTIMATES?**

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

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

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

---

<sup>45</sup> This is  $1.03 * 1.0231 + .035$

1 Economics produced its own analysis of the long run returns of the type needed in defined  
 2 benefit pension plans.<sup>46</sup>

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

3  
4

5 The important point is that the going forward risk premium for equities minus the 3.00% for  
 6 bonds is 4.00%. This is not the market risk premium, since adjustments need to be made but it is  
 7 certainly in the right ballpark.

8 **Q. WHAT ADJUSTMENTS NEED TO BE MADE?**

9 **A.** As TD Economics notes its return forecast is for ten year geometric returns so they have to  
 10 be converted to arithmetic returns. To make this adjustment for very long returns we add half the  
 11 variance of the arithmetic return as explained in my Appendix B, with data in Schedule 8.  
 12 Historically the standard deviation of equity returns has been about 20% (0.20) so the variance is  
 13 0.04 and half this is 0.02 or 2.0%. Similarly, the volatility of the long Canada bond return has  
 14 been about 9% (0.09). I would suspect that this overstates the future volatility, since it is unlikely  
 15 we will see LTC yields at almost 20% again, but this means a variance of 0.0081 and half this is  
 16 0.4%. So converting these long run returns means an equity over bonds risk premium of 5.60%  
 17 as follows:

	Long run	1/2 the variance	Arithmetic
<hr/>			

<sup>46</sup> TD Economics, An Economic Perspective on long-term financial returns, available at

1	Equities	7.0%	2.0%	9.0%
2	Bonds:	3.00%	0.40%	3.40%

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

8 Note here that TD Economics equity market return is slightly higher than my own forecast of  
9 9.30%. However, a TD Economics market risk premium of 6.00% is consistent with my own  
10 range of 5.0-6.0% plus my Operation Twist adjustment of 0.80%, which moves my mid-point to  
11 6.30%.

12 **Q. WHAT ARE YOUR CONCLUSIONS ON THE FAIR ROE FOR A BENCHMARK**  
13 **UTILITY?**

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

17 **CAPM**

18	Base adjusted LTC forecast:	3.80%
19	Normal utility risk premium:	2.25%-3.30%
20	Credit spread adjustment:	0.40%
21	Issue costs:	0.50%
22	Fair ROE:	7.00-8.00%
23	Point estimate:	<b>7.50%</b>

24 **DCF:**

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

28 **Comparable earnings**

29	Market return:	9.28%
----	----------------	-------

1 **Q. HOW WOULD YOU REGULATE INTRAGAZ BEYOND 2013?**

2 **A.** As a small utility I would expect the Regie to regulate Intragaz infrequently.  
3 Consequently I would recommend either the use of an ROE adjustment mechanism or a fixed  
4 rate reviewable at the company or the Regie's discretion in the event of significant market  
5 changes.

6 **Q DO YOU RECOMMEND A SPECIFIC ROE FORMULA?**

1 **A.** Yes. I agree with the Regie’s decision on both Gazifere (2010) and Gaz Metro (2011) to  
2 use an enhanced ROE formula. In both cases these were based on the standard ROE adjustment  
3 model along with the credit risk adjustment that I discussed earlier. In the current circumstances  
4 this credit risk adjustment adds 0.40% to my ROE recommendations. Normally I do not  
5 recommend off ramps or limits to ROE formulae, since the utility can normally come in and  
6 request a review if it feels the formula is no longer giving fair and reasonable rates of return.  
7 However, for Intragaz I do not feel that such an approach is justified.

8 **Q. WHAT LIMITS DO YOU PROPOSE?**

9 **A.** Currently the long Canada bond yield is below any definition of an equilibrium rate of  
10 return and is largely being determined by “global policy makers” and not ordinary investors.  
11 Currently with a forecast 3.0% long Canada bond yield I am adding 0.80% for the impact of  
12 Operation Twist and the action of the major “global policy maker” which is the US Federal  
13 reserve. I therefore regard 3.80% as the lowest that a cyclically adjusted long Canada bond yield  
14 forecast should fall to. That is, anything below this I regard as not being the actions of private  
15 bond buyers but the actions of the global policy marker and as such are not directly relevant for  
16 the risk return trade-off. I would therefore recommend the use of a minimum long Canada bond  
17 forecast of 3.80% in conjunction with the ROE formula.

18 My recommended ROE formula is therefore as follows:

19 
$$\text{ROE} = 7.50 + 0.50 * (\text{Spread} - 1.80\%) + 0.75 * (\max(\text{Forecast LTC Yield}, 3.80\%) - 3.80\%)$$

20 In words the ROE is 7.50% and will change by 50% of the change in credit spread from 1.80%  
21 and increase by 75% of the change in the forecast LTC yield above 3.80%.

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

24 **A.** The genesis of the ROE formulae were that they were introduced in 1993/4 when the  
25 level of LTC yields was much higher than currently. Further the Government of Canada was  
26 confronted with a huge fiscal deficit and scepticism that it would reduce this by increasing taxes  
27 and/or cutting spending, so it introduced real return bonds to indicate its commitment. Since that

1 time the Government and the Bank of Canada have renewed their commitment to a 2.0%  
2 inflation target in a 1.0-3.0% range and I do not see a departure from this as likely in the  
3 foreseeable future. I would therefore regard a fixed ROE for a ten year period as a viable option.

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

12 In June 2004 the BMO data indicates that long Canada bond yields were at 5.34% when credit  
13 spreads were about average for the business cycle. Similarly in June 2011 RBC forecast that long  
14 Canada bond yields would be at 4.55% by the end of 2013 before the tsunami of events in 2011  
15 had an impact. I would judge the supply of long Canada bonds to slow down as the Government  
16 of Canada reduces its deficit to zero, so that rates might not reach the 5.34% level of June 2004. I  
17 would regard an equilibrium long Canada bond yield of about 5.00% as being reasonable. On  
18 this basis and without the need for an Operation Twist or credit market adjustment I would judge  
19 a benchmark fixed rate ROE for a ten year period to be approximately 8.25%.

20 As a realism check, in 2004 the forecast long Canada bond yield for 2005 was 5.50% and the  
21 allowed ROE according to the NEB formula was 9.46%. In 2005 for 2006 the forecast long  
22 Canada bond yield was 4.78% and the allowed ROE was 8.88%. At this time ROE formulae  
23 were regarded as giving fair and reasonable ROEs and there was no need for either a credit  
24 market or an Operation Twist adjustment. I would regard these NEB type formula ROEs as over  
25 estimating the fair ROE by about 0.75%, but they are a useful realism check.

26 The discussion of the yield curve in Section II indicates that interest rates are expected to  
27 increase in Canada so I expect the formula produced ROE to increase with these interest rates  
28 and average out to the fixed rate of 8.25% over the term of the ten year contract with Gaz Metro.

29

1 **6.0 US ESTIMATES**

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

3 **A.** The recommendations of US witnesses are almost always heavily based on the US  
4 utilities that they are most familiar with. Further I generally regard US estimates as biased high  
5 when applied to Canadian utilities for two reasons. First, US financial markets exhibit more risk  
6 than Canadian markets and have generated higher risk premia in the past. Second, although the  
7 principles of regulation are the same between the US and Canada, as is widely recognised the  
8 implementation is different. As a result, estimates from US utilities can only be used in Canada if  
9 significant adjustments are made.

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

11 **A.** Apart from the statistical evidence in Appendix B that the S&P500 index has exhibited  
12 more volatility than the TSX Composite, we have the fact that experts generally estimate the US  
13 market risk premium as higher than in Canada. Further the recent financial crisis highlights the  
14 on-going differences between the US and Canada. For example the US decision to let Lehman  
15 Brothers go into bankruptcy on September 14, 2008 triggered the financial melt-down and was a  
16 huge mistake. The result was frozen credit markets and a stock market collapse pushing the  
17 world into its first ever global crisis from which we have barely recovered even now over 3 ½  
18 years since it happened.

19 In all of this Canada was largely a bystander wondering how such disastrous and elementary  
20 mistakes could be made in the US. As Prime Minister Stephen Harper said at the G-20 summit<sup>47</sup>

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

24 With stronger regulation of its financial system Canada avoided the problems in the US. The  
25 Office for Superintendent of Financial Institutions (OSFI), for example requires 7% common

---

<sup>47</sup> Canwest news service, November 14, 2008

1 equity and 10% total capital for the Canadian banks, whereas the Bank for International  
2 Settlements requirements are for a minimum of 4% and 8% respectively. Further, the Canadian  
3 banks significantly exceed these minimums, with the Royal Bank of Canada, for example,  
4 recently at just under 10% for common equity and 13% for total capital.<sup>48</sup> OSFI has also  
5 enforced the latest Basel 2 standards that use more refined risk weights for different banking  
6 assets. In contrast, the US has yet to adopt Basel 2 for all its banks. These differences are  
7 symptomatic of basic cultural differences between the US and Canada.

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

16 These philosophical differences are now compounded by significant differences in  
17 macroeconomic financial conditions. Whereas the size of the Canadian deficit and the strength of  
18 the Canadian economy are much better than anticipated just a short while ago, the US continues  
19 to have problems and the size of its deficit raises significant long run inflationary concerns. This  
20 is reflected in higher long term US Treasury bond yields than their equivalents in Canada, higher  
21 borrowing costs and a strong C\$.

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

---

<sup>48</sup> I refer to tier 1 capital as common equity but it also included non-cumulative perpetual preferred shares.

1 A. Yes. Moody's is one of the two major US bond rating agencies and in a major review of  
2 its rating methodology<sup>49</sup> it cited three major factors that determined how it rated the  
3 supportiveness of regulation. These were (paraphrasing)

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

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

15 Moody's reviewed this report and issued a new one in August 2009.<sup>50</sup> The new Moody's report  
16 refines their assessment into four major areas where in the following table the % indicates the  
17 weights applied by Moody's:

18	• Regulatory framework:	25%
19	• Ability to recover costs and earn profits:	25%
20	• Diversification:	10%
21	• Financial strength and liquidity:	40%

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

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

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<sup>49</sup> Rating methodology: global regulated electric utilities, Moody's March 2005.

<sup>50</sup> Infrastructure Finance; Regulated Electric and Gas Utilities, August 2009.

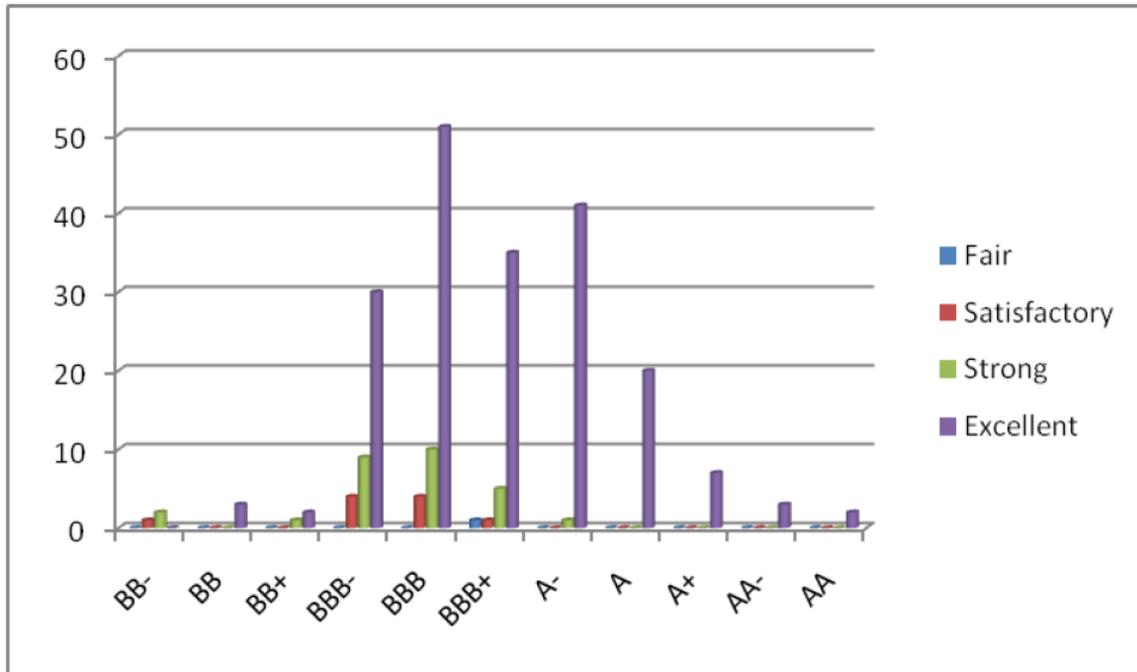
1 “Moody’s views the regulatory risk of US utilities as being higher in most cases than that  
2 of utilities located in some other developed countries, including Japan, Australia and  
3 Canada. The difference in risk reflects our view that individual state regulation is less  
4 predictable than national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

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

17 It is well recognized that the typical US utility has both a higher allowed ROE and more  
18 common equity than their Canadian counterpart. All else constant with these better financial  
19 parameters, if they have the same business risk they would have better bond ratings. However,  
20 this is not the case. In answer to an information request in the 2010 Line 9 hearing before the  
21 National Energy Board (IOL information request #197d) Ms. McShane provided the following  
22 histogram of US bond ratings and their respective business risk scores. The histogram provides  
23 the total number of US utilities in each rating class broken out according to their business risk  
24 ranking from Fair to Excellent. Two observations are apparent. First, many of the lower rated  
25 companies are also rated “excellent” in terms of business risk (even some with junk bond ratings,  
26 i.e., rated BB+ or lower) so this is not a main determinant of their bond rating. Second, and more  
27 important, the typical (modal or median) bond rating in the US is “BBB”, whereas for Canadian  
28 utilities where the mode and median is “A” and all would be A except for considerations of size  
29 and poorly rated parent holding companies.<sup>51</sup>

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<sup>51</sup> I use A and BBB generically without modifiers. S&P will not rate a sub higher than its parent unless it is ring fenced, that is, insulated from a raid by its poorly rated parent. Enron raided its subs to the tune of \$2 billion when the parent ran into trouble.



1

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

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

6 **A.** Yes. S&P has been concerned for some time that US regulators have not protected US  
 7 bond holders from corporate M&A activity and raids by poorly rated parent or holding  
 8 companies. This was a feature of the late 1990s when many local telephone companies either  
 9 took over or were taken over by Internet companies and were subsequently downgraded. In  
 10 response, S&P implemented a policy that the credit rating of a regulated telecom cannot be  
 11 higher than the credit rating of its parent. For non-telecom utilities S&P states that it<sup>52</sup>

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

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<sup>52</sup> S&P, Corporate Ratings Criteria, 2003, pages 44-45.

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

- 4 • separate incorporation of the sub
- 5 • independent directors
- 6 • minority ownership stakes
- 7 • regulatory oversight to insulate the subsidiary
- 8 • Restrictions on holding company cash management programs

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

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

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

17 This policy was reinforced by the problems surrounding Enron, where FERC was less  
18 forthcoming than expected in reining in the financial policies of US pipelines. After Enron  
19 siphoned off \$1.5 billion from its two natural gas pipelines, the FERC instituted a review of  
20 inter-affiliate transfers. Many expected FERC to impose minimum equity ratios of 30% and  
21 requirements such as maintaining an investment grade bond rating before the parent could  
22 manage the subsidiary’s cash. However, when the FERC announcement was made in November  
23 2003 it fell far short of S&P’s expectations. As S&P noted

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

30 It is clear from this comment from S&P that the business risk of a utility is only one factor in the  
31 bond rating. Further the combination of weak US regulatory oversight and ownership of a utility

1 within a diversified holding company with a weak bond rating dooms the utility to also have a  
2 weak bond rating *regardless* how strong its common equity ratio and how high its allowed ROE.

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

7 **Q. HAVE CANADIAN REGULATORS CONFIRMED THIS?**

8 **A.** Yes. The Board of Commissioners of Newfoundland and Labrador commented on Ms.  
9 McShane use of US “comparables” in 2009 and stated (decision page 17)

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

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*“NPI’s Baa1 issuer rating reflects the fact that the company’s operations are exclusively based  
in Canada, a jurisdiction where regulatory and business environments in general are relatively  
more supportive than those of other international jurisdictions such as the United States, in  
Moody’s view.” (Application, 1<sup>st</sup> Revision, Exhibit 4 - Moody’s Credit Opinion, August 3,  
2009)*

11 As the Board decision clearly states, it is not enough that US utilities be used simply because  
12 there are not enough Canadian ones available: comparables have to be the same to be used  
13 without any adjustment. Here the Board found “overwhelming” evidence that Ms. McShane’s  
14 sample of US utilities were riskier on almost every measure than NP, which it regarded as an  
15 average risk Canadian utility.

1 Also the BCUC (decision page 52) commented on Ms. McShane’s use of US comparables in  
2 2009 and while they felt they were useful, where no Canadian data was available, they also  
3 stated

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

4

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

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

9 The decision of the Board of Commissioners of Newfoundland and Labrador as well as the  
10 BCUC and the Regie indicate that a sample of US “comparables” cannot be used as a benchmark  
11 for a Canadian utility’s fair ROE without either significant evidence that the regulatory,  
12 institutional, economic and financial are the same or making significant adjustment.

13 **Q. DOES MOODY’S CONTINUE WITH THIS ASSESSMENT?**

14 **A.** Yes. The Newfoundland decision was in part based on Moody’s judgment of NPI. In  
15 Moody’s July 19, 2011 credit assessment on NPI Moody’s states

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

1 This assessment directly supports its view of lower risk in Canada than other jurisdictions  
2 (without explicitly stating the US this time) plus points out that the lower allowed ROE is offset  
3 by NPI's higher common equity ratio. The NPI credit rating confirms that Moody's continues to  
4 judge the regulatory protection in Canada as enhancing credit ratings above what they would  
5 otherwise be based solely on their financial metrics, ie., ratios like debt ratio and interest  
6 coverage ratio.

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

9 **A.** If the US market risk premium is 1.0% higher than in Canada, and US and Canadian  
10 utilities had equal relative risk coefficients of 0.50 then that would warrant a 0.50% difference in  
11 their ROEs. When this is added to a 0.50% higher forecasted long Treasury yield (compared to  
12 LTC Canada yield) then you have a 1.0% difference in the fair rate of return. If in addition the  
13 relative risk coefficient of a typical US utility is higher than the 0.50 mid-point I am using for a  
14 Canadian benchmark, then the difference in the fair ROE between Canadian and US utilities  
15 would be significantly greater than 1.0%. This assessment will vary over time but a 100 bps  
16 higher ROE for a US utility is certainly reasonable.

17 **Q PLEASE SUMMARISE YOUR RECOMMENDATIONS.**

18 **A.** I judge Intragaz as warranting a 46% common equity ratio, the same as Gaz Metro. I  
19 judge a fair ROE for a benchmark utility as being 7.50% for 2013 and would recommend an  
20 ROE adjustment model that adjusts by 50% of the change in utility credit spreads and 75% of the  
21 change in forecast LTC yields subject to a minimum forecast LTC yield of 3.80%. Alternatively  
22 I would recommend a fixed rate ROE of 8.25% for the term of the contract with Gaz Metro,  
23 should the Regie allow a ten year contract.

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

25 **A.** Yes.

SCHEDULE 1

	Unemployment	Real	CPI	T Bill	Canada	FX Rate	Average
	Rate	Growth	Inflation	Yield	Yield	US\$	ROE
1987	8.81	4.25	4.42	8.17	9.93	0.75	11.19
1988	7.77	4.97	3.94	9.42	10.23	0.81	9.7
1989	7.58	2.62	5.06	12.02	9.92	0.84	11.79
1990	8.16	0.19	4.81	12.81	10.81	0.86	7.48
1991	10.32	-2.09	5.61	8.83	9.81	0.87	3.53
1992	11.24	0.88	1.45	6.51	8.77	0.83	1.56
1993	11.42	2.34	1.90	4.93	7.88	0.78	3.69
1994	10.43	4.80	0.12	5.42	8.58	0.73	6.57
1995	9.54	2.81	2.22	6.98	8.35	0.73	9.55
1996	9.73	1.62	1.48	4.31	7.54	0.73	10.29
1997	9.16	4.23	1.69	3.21	6.47	0.72	10.86
1998	8.35	4.10	1.00	4.74	5.45	0.67	8.83
1999	7.58	5.53	1.75	4.70	5.68	0.67	9.82
2000	6.85	5.23	2.69	5.48	5.92	0.67	10.92
2001	7.23	1.78	2.52	3.85	5.79	0.67	7.41
2002	7.66	2.92	2.25	2.57	5.67	0.65	5.68
2003	7.61	1.88	2.80	2.87	5.29	0.72	9.64
2004	7.18	3.12	1.85	2.27	5.08	0.77	11.62
2005	6.77	2.85	2.21	2.71	4.41	0.83	12.7
2006	6.32	2.53	2.00	4.02	4.29	0.88	13.95
2007	6.03	2.50	2.14	4.17	4.32	0.94	12.86
2008	6.15	0.52	2.37	2.62	4.06	0.94	9.44
2009	8.23	-2.46	0.30	0.40	3.85	0.88	8.32
2010	7.99	3.05	1.78	0.50	3.71	0.97	10.75
2011	7.46	2.46	2.89	0.94	3.22	1.01	10.57
Cansim	V13682111	v1992067	v41690973	V122484	V122501	V37426	V634672/V634628

**CANADA BOND YIELDS**

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

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