



BULL  
HOUSSEER

Bull, Housser & Tupper LLP T 604.687.6575  
1800 – 510 West Georgia Street F 604.641.4949  
Vancouver, BC V6B 0M3 [www.bht.com](http://www.bht.com)

Reply Attention of: R. Brian Wallace, Q.C.  
Direct Phone: 604.641.4852  
Direct Fax: 604.646.2506  
E-Mail: [rbw@bht.com](mailto:rbw@bht.com)  
Our File: 15-4171  
Date: February 18, 2016

**VIA COMMISSION E-FILING SYSTEM**

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

Attention: Erica Hamilton, Commission Secretary

Dear Sirs/Mesdames:

**Re: FortisBC Energy Inc. (FEI) Common Equity Component and Return on Equity (ROE) for 2016 Association of Major Power Customers of BC (AMPC), British Columbia Old Age Pensioners' Organization et. al. and the Commercial Energy Consumers Association of British Columbia (Utility Customers) Information Responses of Dr. Booth to BC Utilities Commission and FEI Information Requests**

We are legal counsel to AMPC in this matter, and write on behalf of AMPC and the Utility Customers. Please find enclosed the Information Responses of Dr. Booth to the Information Requests of the BC Utilities Commission and FEI.

Please note that the spreadsheets referenced in information responses are available as attachments to the PDF documents. For ease of use, the references to spreadsheets in the information responses are clickable links that will open the attachments pane.

Please contact the undersigned if you have any questions.

Yours truly,

Bull, Housser & Tupper LLP

A handwritten signature in black ink that reads 'R. Brian Wallace'.

R. Brian Wallace, Q.C.

RBW/dnm/6546772

Encs

**FortisBC Energy Inc.**  
**Application for its Common Equity Component and Return on Equity for 2016**  
**Utility Customers' Evidence – Evidence of Dr. Laurence Booth**

---

**1.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 5, 59**  
**Automatic Adjustment Mechanism (AAM) formula**

On page 5 of his evidence, Dr. Booth notes that if the AAM formula were operational, the two factor model and Concentric's data would suggest a 0.37 percent decrease in FortisBC Energy Inc.'s (FEI) allowed return on equity (ROE) from 8.75 percent to 8.38 percent.

- 1.1 Does Dr. Booth agree that his assertion, as noted in the preamble to this question, is merely confirming the downward bias of the formula if the actual long Canada bond yield does not meet or exceed 3.8 percent? If Dr. Booth does not agree, please explain why not.
- 1.2 On page 59, Dr. Booth says that since the long Canada yield has yet to hit his 3.8 percent trigger, he would recommend 7.5 percent as a fair ROE as he had in 2012. Would Dr. Booth recommend a different trigger to the AAM formula based on the changes in the capital market since 2012?

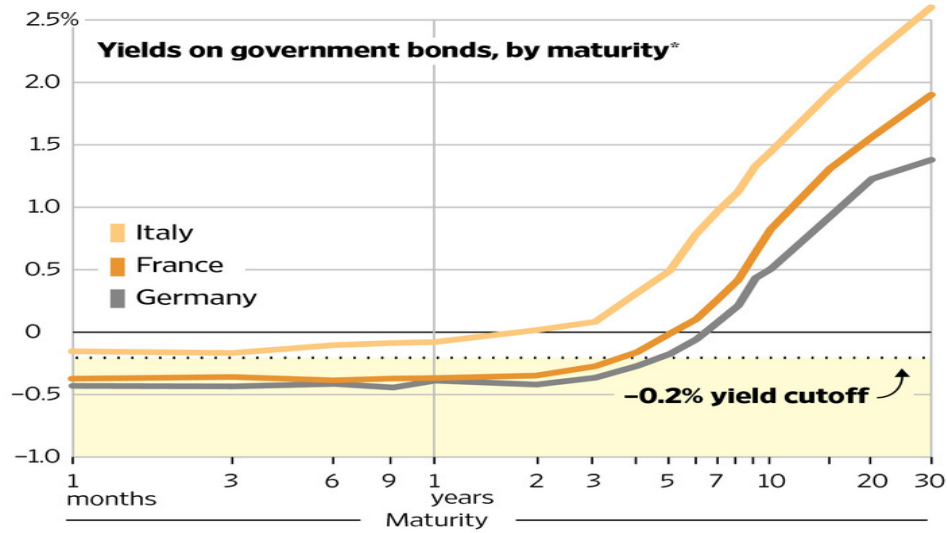
**Response:**

1.1 As far as Dr. Booth is aware he is the only witness to suggest a floor to the AAM. In his judgment the long Canada bond yield is not biased in the statistical sense, it is just not a good basis for determining equity costs at present. The passage is simply meant to indicate that absent Dr. Booth's judgment on the relevance of a floor, the Concentric survey evidence indicates that fair ROEs have dropped since 2013.

1.2 Dr. Booth's estimate of 3.8% is mainly a judgment call. After the BCUC hearing in 2013 he recommended a 4.0% trigger as there was more evidence of normalisation. He has reverted to 3.8% as interest rates have again retreated to extremely low levels. To some extent Dr. Booth judges the level of the trigger to be somewhat moot as he doubts that interest rates will reach a 3.8% trigger over the medium term. Recently, German and French bond yields have been negative out to the 5 year maturity segment with 30 year bonds less than 2.0%. Some of this is spilling over into other markets.

## Dividing Line

The ECB doesn't buy bonds yielding less than -0.2%, putting a large slice of the eurozone-debt market beyond its reach.



**2.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 1, 4, 20–22, 24, 41**  
**Artificially low Canada bond yields**

Dr. Booth submits on page 1 that the long Canada bond yield is currently artificially low and discusses on page 4 reasons for this including the US Federal Reserve Bank's purchases of US government and agency bonds: "This indicates that current long Canada bond yields are at least 1.30% too low. ... Further conditions in the bond market have become even looser than they were in 2012 as the massive amount of liquidity in global markets continues to increase, depressing bond yields."

2.1 Please define what is meant by "liquidity" in this context and how it depresses bond yields. Can the amount of liquidity be quantified?

With respect to the relationship between interest rates and bond prices, Dr. Booth says on page 20: "As we can see from the previous graph of interest rates the effect was a significant drop in long term Canada yields as investors hunted for higher yields in other markets than the US government bond market."

2.2 Please explain why a hunt for *higher* yields led to a *drop* in long-term Canada yields. Can the amount of the drop be quantified?

With respect to interest rates recovery, Dr. Booth says on page 21: "Although this bond purchase program has now ended there is still this \$3.5 trillion that is not in the market."

2.3 Please provide data on the amount of US bonds that remain in the market and a breakdown of the categories of investors or entities that own these bonds. Can Dr. Booth explain the motivations of these investors for purchasing and holding these bonds at yields which have apparently been depressed by the Federal Reserve Bank's (Fed) purchases and holdings? Is it reasonable to conclude that these investors view the low yields as being a fair return on a risk-adjusted basis? Are certain investors required to purchase and hold these bonds regardless of the yield?

Regarding the "search for yield," Dr. Booth says on page 22:

The following graphic comes from the Bank of Canada and indicates that almost 30% of the Canadian government bond market is now owned by non-residents. As non-residents have invested in the Canadian government bond market they have driven up market prices and driven down government bond yields far below where they would have been but for the massive bond buying programs elsewhere in the world.

2.4 Please provide a breakdown of the foreign and domestic categories of investors or entities that own these Canadian government bonds. Can Dr. Booth explain the motivations of these investors for purchasing and holding these bonds at yields which have apparently been depressed by the foreign purchasers? Is it reasonable to conclude that these investors view the low yields as being a fair return on a risk-adjusted basis? Are certain investors required to purchase and hold these bonds regardless of the yield?

On the long-term interest rates, Dr. Booth says: "What is important to note is that interest rates are not, and probably will not for the foreseeable future, be set by private investors. Instead, they are being set by what has been termed the 'global policy maker.'"<sup>1</sup> However, "If the current bond market yield of about 2.0% does increase to the 2.85% as forecast by RBC over the next year, then a bond market investor would lose on their investment."<sup>2</sup>

---

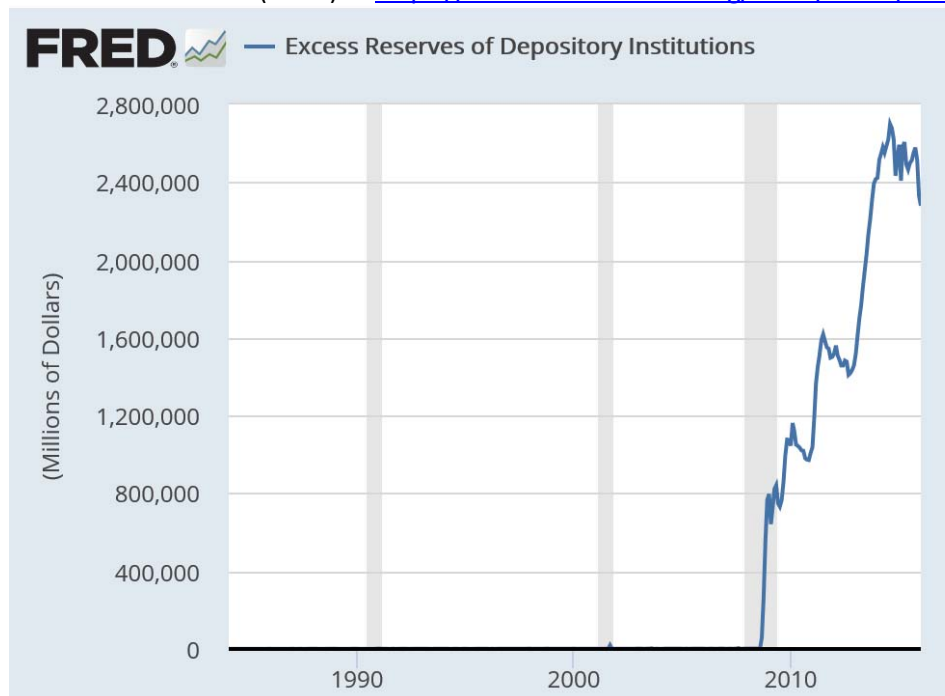
<sup>1</sup> Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 24.

<sup>2</sup> *Ibid.*, p. 41.

2.5 Please explain why private investors would continue to invest in bonds, and particularly long-term bonds, if the interest rates are lower than they would be if they were set by private investors.

**Response:**

2.1 Liquidity means holding wealth in short term marketable securities or what is defined as cash equivalents. One estimate is the amount of excess reserves held in the banking system. Banks would prefer to invest funds in loans, where the rate of return is higher, and minimise their holdings at the central bank where they get paid very low interest rate. In the US they are required to hold 10% in reserves in the Federal Reserve System, so holding “excess reserves” is a sign they have surplus money that could be invested, but for which there is no demand. The details of bank regulation of reserve requirements differs across countries but in the US the current level of excess reserves is about \$2.5 trillion. It is the existence of these excess reserves that has forced central banks in Europe and Japan to tax these reserves in the hope that they can force them into the financial system as loans. The latest example is Sweden that set its policy rate at -0.5%. The following graphic is from the Federal Reserve Economic Data bank (FRED) at <https://research.stlouisfed.org/fred2/series/EXCSRESNS>.



2.2 When investors in the US and Europe look at the low yields in their markets they search for higher risk adjusted returns elsewhere and some of this money spills over into Canada, increasing the demand for Canadian bonds. As a result, bond prices go up and yields go down.

2.3 The general estimate is that around 25-50% of the government bond market in the US, UK, Japan and Eurozone is now, or soon will be, owned by the central bank. Until these bond purchase programs began, monetary policy worked through buying and selling short term not long term securities. Some investors will always hold government bonds, such as other central banks for reserve reasons; financial institutions like insurance companies that use them to hedge their liabilities and bond funds. As well, there will be some very conservative or very pessimistic investors who judge the return to be fair given the risk of alternative investments. However, for taxable Canadian investors holding 30-year government bonds yielding 2% means an after tax yield of 1%, when inflation is expected to average 2% implying a -1% a year return. Dr. Booth does not have investor composition data for

government bond markets.

2.4 Dr. Booth does not have any investor composition data except the data provided by the Bank of Canada in his evidence.

2.5 For the reasons set out in 2.3 above. The marginal buyer of these bonds is the global policy maker, aka the central banks. Even in the UK, the Bank of England, which has ended its own bond buying program, reinvests the proceeds as government bonds mature. However, it does not buy more than 50% of any new issue. Once you consider central bank buying and other “captive” buyers the proportion of “active” investors is much smaller than would exist without these programs.

**3.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 8, 9; Exhibit A2-3, The Brattle Group, Survey of Cost of Capital Practices in Canada Report (The Brattle Group Report), pp. 99–100 Fair and reasonable rates and capital structure decision**

Dr. Booth states on page 8 that most statutes allow the regulatory authority to examine all factors which enter into the rates to ensure that the rates are “fair and reasonable.” He further opines that this includes the firm’s capital structure decision and states that “to allow the regulated utility to freely determine its capital structure will inevitably lead to rates that are unfair and unreasonable, otherwise the management of the regulated firm is not fulfilling its fiduciary duties to act in the best interests of its stockholders.”

On pages 99 to 100, The Brattle Group Report describes the decision by the National Energy Board (NEB) to allow a pipeline company, Trans Québec & Maritimes (TQM) Pipelines, an After-Tax Weighted-Average Cost of Capital (ATWACC) to appropriate rate of return on rate base rather than allowing TQM an ROE and a deemed capital structure.

- 3.1 Is Dr. Booth aware of the NEB’s TQM decision in 2008 on ATWACC? If not, please comment on The Brattle Group Report description of the RH-1-2008 Decision.<sup>3</sup>
- 3.2 To the best of Dr. Booth’s knowledge, to what extent does the NEB decision on TQM lead to rates that are unfair and unreasonable?

**Response:**

3.1 & 3.2 Dr. Booth is aware of that report and participated in the TQM hearing. Dr. Booth would also note that the Brattle group participated in that hearing on behalf TQM and has recommended an ATWACC approach in numerous hearings, so they are not a disinterested party. The TQM decision itself was unique in that there were no significant embedded debt cost problems, which otherwise cause problems for the ATWACC approach. In a subsequent hearing before the NEB for the TransCanada Mainline (RH-3-2011) the same Brattle group witnesses recommended an ATWACC with an embedded debt cost adjustment, which vitiated the ATWACC approach. Further, even in the TQM decision the NEB referenced the equivalent “ROE on equity rate base” results for the traditional approach. The NEB decision was commonly interpreted as an ROE of 9.7% on 40% common equity, since 40% common equity is TransCanada’s target common equity ratio and that same result has been negotiated and settled for other pipelines in the TransCanada group.

Dr. Booth also participated in an Enbridge Line 9 NEB hearing (RH-1-2010) that was settled, where Enbridge did not request an ATWACC approach and instead requested a traditional decision and an automatic ROE adjustment formula similar to the BCUC’s, except for the 3.8% floor. If that decision had not been settled, the NEB could not have imposed an ATWACC since no party proposed it and there was no evidentiary basis for it.

Dr. Booth would further note that ATWACC has specifically been rejected in Alberta where in a TransAlta decision, the Alberta Energy and Utilities Board stated (U99099, page 303)

*“In essence, a regulated company’s earnings are driven by the portion of the original cost rate base deemed to be financed by common equity. This fact results in a fundamental disconnect to the theory that market capitalization ratios, which have deviated significantly from book capitalization ratios, reflect the appropriate financial risk necessary to determine a fair*

---

<sup>3</sup> Exhibit A2-3, The Brattle Group, Survey of Cost of Capital Practices in Canada Report, May 31, 2012, p. 103.

*composite return to be applied to the original cost rate base of a pure play regulated utility. This is because the earnings of a pure play regulated utility are governed by and driven by the regulated return allowed on book equity. In other words, it is the book equity that reflects the appropriate financial risk necessary to determine a fair composite return for a pure play regulated utility.”*

And further that

*“The Board would be derelict in its statutory responsibilities to recognize market capitalization ratios that are derived from a market value capitalization that deviates.”*

The Alberta EUB further stated (U99099, page 301)

*“the Board considers that beta and the cost of equity do not change to the extent necessary for an ATWACC, determined from market capitalization weights, to remain constant when applied to the book capitalization for a pure play regulated utility. The increase required to the cost of equity to achieve a constant ATWACC would be excessive and violate the fair return standard.”*

Dr. Booth has never seen such a strong rejection of witness evidence as represented in the preceding passages.

Further the Regie in a Gaz Metroplaitain decision after the NEB decision said the following about the same Brattle Group witnesses use of ATWACC. (D-2009-156)

*(228) Given the numerous difficulties posed by applying the ATWACC based on market values, the Regie concludes that establishing capital structures based on book values and using the traditional approaches based on hearing expert witnesses as to the optimal debt/equity proportions to retain is a proven route that is compatible with the establishment of a reasonable return on the basis of the distributor’s rate structure.*

*(229) Consequently, the Regie does not accept the After Tax Weighted Average Cost of Capital (ATWACC) approach based on market values as a reference approach for determining the reasonable return on Gaz Metro’s rate base.*

Dr. Booth will acknowledge that ATWACC can lead to fair and reasonable rates where, as mentioned above, it was the NEB’s judgment that in TQM the awarded ATWACC meant a 9.7% ROE on 40% common equity. What ultimately matters is that rates are fair and reasonable. However, as he stated before the NEB in RH-3-2011 if we end up confirming that ATWACC is fair and reasonable by checking the “ROE on equity rate base”, what is the point of using ATWACC?



**4.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 22, 23; Exhibit B-1, Appendix B, Direct Testimony of Mr. James M. Coyne, pp. 17, 41 Forecast long Canada bond yield**

The table on page 23 presents the January 8, 2015 Royal Bank of Canada (RBC) forecast. The table shows that for the 30-year Canada bond, the forecast for 16Q1 is 2.25 and for 16Q4, the forecast is 2.85. Dr. Booth describes the RBC forecast as aggressive compared to the general consensus. According to Dr. Booth's Evidence, the December 2015 Consensus Economics places the average for the over ten year bond forecast yield three months out at 1.80 percent and for one year out at 2.2 percent.

4.1 Is Dr. Booth referring to the 2.85 RBC forecast compared to the implied 2.32 Consensus Economics forecast as aggressive? Does Dr. Booth have a more current RBC forecast than the one dated January 8, 2015?

In his Direct Testimony, Mr. Coyne presented the long-term forecast for 10-year government bond yields from Consensus Forecasts dated April 13, 2015 in Table 2 of his evidence. Would Dr. Booth please comment on the following?

4.2 The Consensus Forecasts dated April 13, 2015 yields at 2.1 percent (2016) and 3.2 percent (2017). Can this be reconciled to Dr. Booth's description of the December 2015 Consensus Economics report which forecasts 1.80 percent for 10-year bond yield three months out and 2.2 percent for the year bond one year out?

4.3 Does Dr. Booth agree that his estimate of the current spread from Schedule 2 between 30-year (2.07 percent) and 10-year (1.32 percent) bond (which is 0.75) can be reconciled with the average historical spread between 10-year and 30-year government bond yields of 71 basis points (bps) in Canada and 69 bps for the US, adopted by Mr. Coyne in Table 4 of his evidence?

**Response:**

4.1 Dr. Booth judges RBC to be optimistic in their interest rate forecasts, since they have a macro economic model that has been predicting higher long term Canada bond yields for several years. RBC's current (Feb 11, 2016) forecast is below

4



Interest rate outlook												
%, end of period												
	Actuals				Forecast							
	15Q1	15Q2	15Q3	15Q4	16Q1	16Q2	16Q3	16Q4	17Q1	17Q2	17Q3	17Q4
<b>Canada</b>												
Overnight	0.75	0.75	0.50	0.50	0.50	0.50	0.50	0.50	0.75	1.00	1.25	1.75
Three-month	0.55	0.58	0.43	0.51	0.40	0.40	0.50	0.60	0.85	1.10	1.35	1.80
Two-year	0.50	0.48	0.52	0.48	0.40	0.50	0.65	1.00	1.30	1.60	1.95	2.45
Five-year	0.77	0.82	0.80	0.73	0.60	0.80	1.05	1.35	1.70	2.00	2.35	2.70
10-year	1.36	1.69	1.43	1.40	1.20	1.50	1.65	2.00	2.35	2.60	2.80	3.05
30-year	1.98	2.31	2.20	2.15	1.85	2.25	2.40	2.70	2.95	3.05	3.20	3.35
<b>United States</b>												
Fed funds**	0.25	0.25	0.25	0.50	0.50	0.75	1.00	1.25	1.50	1.75	2.25	2.75
Three-month	0.04	0.03	0.00	0.17	0.20	0.40	0.45	0.70	1.00	1.30	1.90	2.45
Two-year	0.56	0.64	0.64	1.05	0.85	1.10	1.25	1.60	1.90	2.20	2.60	2.95
Five-year	1.37	1.64	1.37	1.76	1.30	1.60	1.75	2.15	2.40	2.65	2.95	3.20
10-year	1.93	2.35	2.04	2.27	1.85	2.10	2.15	2.55	2.80	3.00	3.25	3.40

4.2 Dr. Booth would have no problem with that as the Consensus forecast at that time and would note that as now the forecasts indicated increasing interest rates that have yet to materialize.

4.3 Yes. Dr. Booth would have no problem with that observation.

**5.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 27, 28  
Current long Canada rate and Canadian BBB bond yields**

On page 27, Dr. Booth describes that at the time of his evidence for the BCUC Generic Cost of Capital (GCOC) proceeding, the long Canada rate was 2.41 percent and the generic “A” yield was 4.16 percent, whereas “currently with a long Canada rate of 2.01 per cent the yield on generic A bonds is 3.91 per cent or 0.25 per cent lower.” [Emphasis added]

5.1 Schedule 2 indicates that the long Canada bond yield is 2.07 percent. Please confirm that the current long Canada rate is 2.07 percent rather than 2.01 percent.

Dr. Booth presented a chart on page 28 depicting the US and Canadian BBB rated debt for the period January 2012 to June 2015. The comparison is for *generic* BBB bond in Canada with the yield on Moody’s BBB *utility* bond. He concluded that the financing cost (cost of capital) to Canadian utilities is significantly lower than for US utilities.

5.2 Does Dr. Booth agree that the chart on page 28 shows that the Canada and US yield difference is not obvious until mid-2013? Is Dr. Booth able to explain if the lower financing cost in Canada is a relatively recent phenomenon (i.e., a change in the capital market since 2012 or whether it is structural)?

**Response:**

5.1 There are a variety of long Canada bond yields! In Schedule 2 Dr. Booth uses the current Bank of Canada benchmark bonds as well as the traditional groupings such as “over ten.” However, the Bank of Canada does not provide corporate yield data, for this Dr. Booth relies on the former Scotia Capital data that at one time they provided free in their Handbook of Debt Market Indices. He now updates this data from Datastream and for consistency uses the same source for the average long Canada yield data as for the corporate data. This is the source for what Dr. Booth calls his generic spreads, rather than the utility spreads from Bloomberg.

5.2 The lower values for the BBB bond yield in Canada were more obvious prior to the financial crisis but it was not until the last three years, since January 2013, that these lower values have again materialised. It has to be remembered that these are indexes of bonds with a particular rating, so they contain BBB+, BBB and BBB- and these types of bonds tend to be more sensitive to economic conditions. So it is difficult to speculate on what is driving this without going back and looking at the composition of the indexes over time. However, prior to the decline in the spread between the Canadian and US government bond yields that started in the early 2000’s, Canadian BBB bonds unambiguously had higher yields than those in the US, since the base long Canada bond yields were higher.

**6.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 31, 32  
General state of capital markets**

Dr. Booth describes a number of measures of stress of the financial systems. According to Dr. Booth, the Kansas City Financial Stress Index (KCFSI) shows that since 2012, GCOC market conditions have been easy but with the ending of Quantitative Easing (QE)<sup>3</sup>, conditions in the US have tightened somewhat as markets returned to average or “normal” conditions.

Dr. Booth also describes the Bank of Canada financial conditions stress index and the Bank’s survey results from senior lending officers to reflect their assessment of the lending conditions to Canadian non-financial firms. According to Dr. Booth, the chart reproduced on page 32 of his evidence shows tightening credit market conditions during the financial crisis and the loose conditions thereafter with a gradual return to normal pricing and credit conditions in 2015, similar to the indications from the KCFSI.

- 6.1 Where possible, please provide the numerical index (monthly or quarterly) of the KCFSI chart on page 30 from February 2011 to the present.
- 6.2 Where possible, please provide the index (monthly or quarterly) of the Canadian Financial Conditions Index chart on page 31 from the first quarter of 2011 to the present.
- 6.3 To the best of Dr. Booth’s knowledge, what is the frequency of the Bank of Canada survey from senior lending officers?
  - 6.3.1 Please provide the numerical index of the chart on page 32 beginning 2011 to the present.
  - 6.3.2 Does Dr. Booth accept that the chart shows the survey results as trending upward since 2015?

**Response:**

6.1 &

6.2 The data for all the series is provided as Booth Answer BCUC IR 6.1 6.2.xls.

6.3 The data is quarterly so Dr. Booth assumes this is the frequency of the survey.

6.3.1 Provided in answer to 6.1.

6.3.2 Yes. Lending conditions are returning to average, plus there is no question that conditions in the oil and gas market is causing lending officers to review their books. CIBC recently stress tested their loan portfolio for \$30 oil and indicated they could lose \$750 million over three years if oil stays at \$30 a barrel. So Dr. Booth would expect lending officers to be particularly careful with loans to the oil and gas sector.

**7.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 13, 15, 33**  
**Current market conditions**

On page 13, Dr. Booth states:

We can see the strong increase in commodity prices that started in 2002 as China started to seriously industrialize. The Great Recession in the United States in 2009 caused these prices to collapse, but they quickly recovered until the sharp sell-off in Summer 2014 as fears of a China slowdown proved correct. It is this drop in commodity prices that has severely affected Canada's resource sector and triggered a technical recession in 2015Q2.

Dr. Booth also notes that the Bank of Canada cut the overnight rate twice in early 2015 to the current level of 0.50 percent.

On page 15, Dr. Booth states that since the slowdown in China and the US recovery, [the Canadian dollar] dropped to under 71 cents at the start of 2016.

On page 33, Dr. Booth states that "The slowdown in China has deferred this [Canadian economic] growth forecast and caused serious problems in the resource sector."

- 7.1 In Dr. Booth's opinion, recognizing the current market conditions (i.e., drop in commodity prices, weak Canadian dollar and low interest rate), how would this affect investors' expected rate of return on their investments? Would investors demand a higher, lower or same required return?
- 7.2 Does Dr. Booth believe that the weakening Canadian dollar is a policy decision and that it will partially offset the impact of China's economic slowdown? If so, to what degree? If not, why not?
- 7.3 Does Dr. Booth believe that China's economic slowdown is the primary reason that led to the decrease in commodity prices? Please discuss the supply side of the commodity market (i.e., oil and natural gas markets).

**Response:**

7.1 Note there is a typo as Dr. Booth should have referred to the summer of 2015. Dr. Booth would judge that we are currently in a standard "flight to quality" as investors have panicked particularly over the last six weeks. This has caused government bond yields to fall and corporate bond yields to increase. As of February 16, 2016 the Scotia Capital long Canadian government bond yield had dropped to 1.86% and the generic A bond yield had increased to 3.96% so the credit spread was 2.1% or 0.20% higher than at the time he drafted his testimony. At the time of Dr. Booth's 2013 evidence the same Scotia Capital bond yields were: Canada 2.41% and A bonds 4.16%.

7.2 Dr. Booth takes the Bank of Canada at their word that they do not have a foreign exchange rate policy, so he does not judge it to be a policy decision. However, he suspects that many policy makers are happy to see more stimulus to Central Canada from a lower C\$ and less reliance on oil and gas as this was a theme of the recent Federal elections.

7.3 There are all sorts of conspiracy stories about oil, less so for commodities in general. Copper and coaking coal, for example, are closely tied to China's electrical and steel consumption. Oil is clearly related to the US shale oil industry as well as regional politics in the middle East and rivalry between Sunni Saudi Arabia and Shi-ite Iran. While Russia is pumping as much oil as it can in response to budget

problems brought on by sanctions. There are increasing LNG plants, but the natural gas market is still predominantly a North American market and not yet integrated into the Asian or European markets. As a result, North American prices are determined by the marginal producer which is shale gas.

**8.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 35  
BC market conditions**

On page 35, Dr. Booth states:

... Further the high house prices have stimulated housing starts as developers see strong profit potential in residential real estate. The result has been housing starts running at over 30,000 units. The combination of strong retail sales and housing starts has given BC the highest GDP growth rate in Canada with growth over 3.0% forecast for 2016.

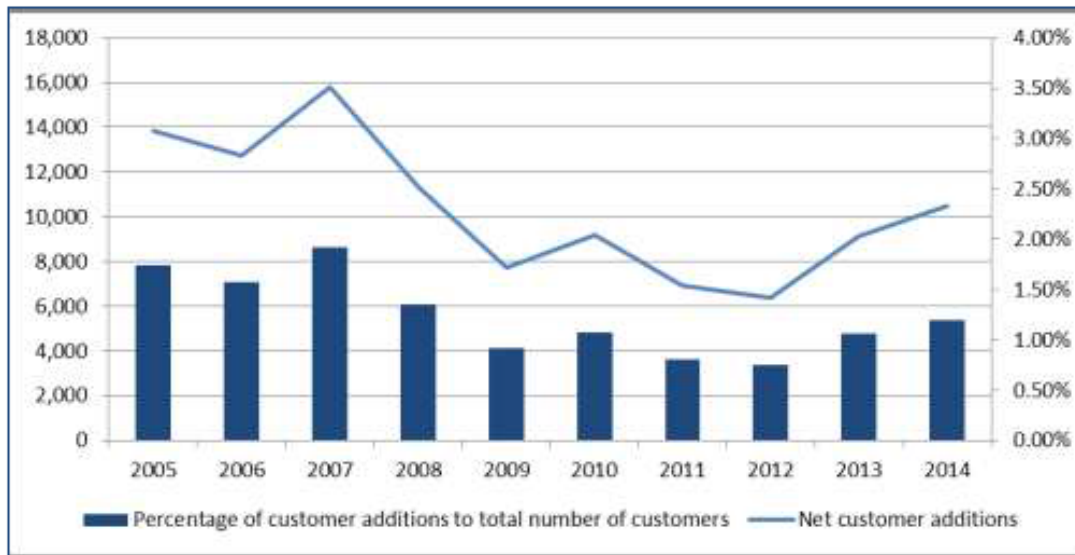
In terms of industry performance in BC there are mixed messages. On the one hand, the weakness in commodity prices, such as copper and coal, has led to temporary shut downs and severely affected major employers like Teck. On the other hand, the strong US growth and the weak C\$ have combined for strong demand for lumber exports to the US. Overall, the impact on BC exports has been minimal...

- 8.1 Does Dr. Booth believe that given the drop in commodity prices, can FEI and other gas distributor utilities in BC and other jurisdictions attract more customers and increase throughput in the natural gas system? Why or why not?
- 8.2 Does Dr. Booth view that strong retail sales and housing starts will benefit FEI and other utilities in BC? Why or why not?

**Response:**

8.1 Dr. Booth would expect FEI to attract new customers outside the Central Vancouver area as there is still demand for single family dwellings and there are few three bedroom condos or townhouses. However, he is not an expert in forecasting the BC housing market. Here he would point out that FEI continues to attract new customers as demonstrated by the following FEI graphic included in his testimony.

**Figure C-33: Amalgamated FEI's Residential Customer Additions**



8.2 Dr. Booth judges strong retail sales and housing starts to be a good thing for FEI and all utilities, certainly it is difficult to see how it hurts FEI? It is simply a reflection of a strong residential sector and that families are still growing in a normal manner needing new housing. He does not judge that this

materially affects FEI's risk, since it is mainly a forecasting problem. Provided FEI forecast new attachments reasonably accurately, then there is very little impact on its ability to earn its allowed ROE.



**9.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 34  
Stock market indexes**

Dr. Booth states on page 34 that despite the recent equity market weakness, general Canadian stock prices are still the same as they were in 2012/2013 and mainly reflect the impact of the resource sector. According to Dr. Booth, market conditions remain much as they were in 2012, very receptive to good credits like Canadian utilities.

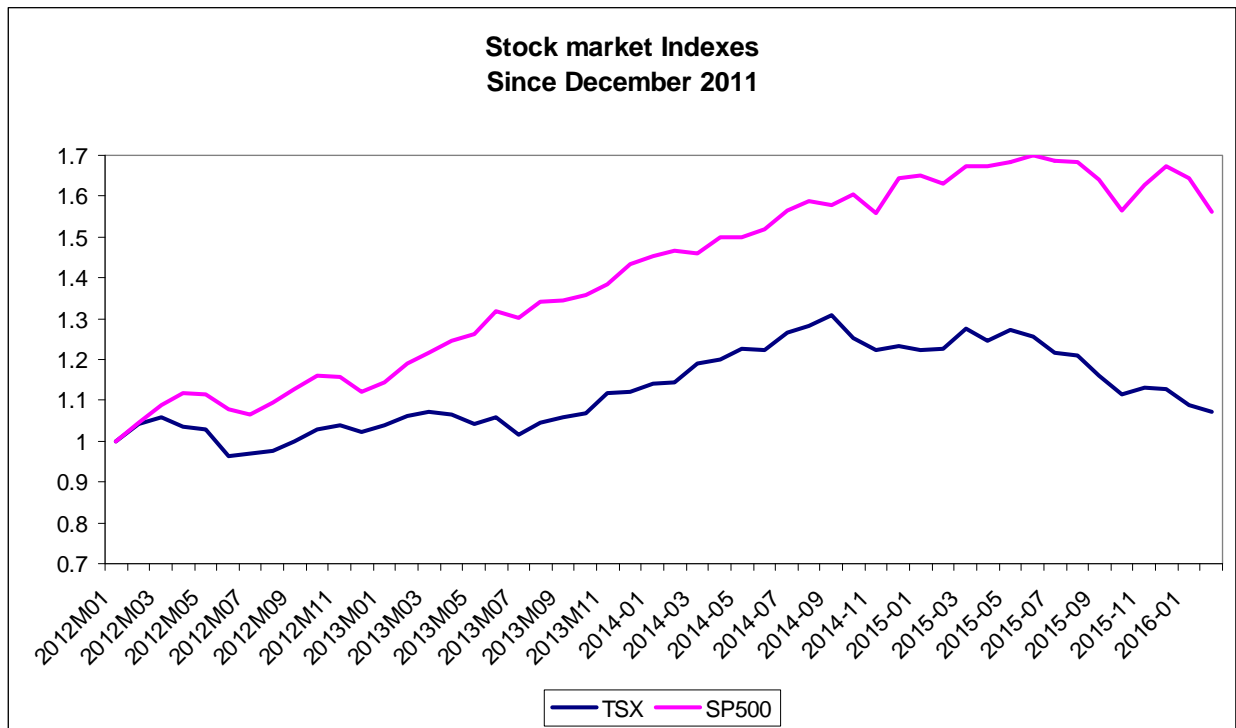
9.1 Please update the chart on page 34 showing Toronto Stock Exchange (TSX) and Standard and Poor’s 500 (SP500) indices to the present.

9.2 Please provide the data to the chart in tabular format.

**Response:**

9.1

&9.2 Data included as Booth Answer BCUC IR 9.1 9.2.xls. Note there was a data entry for January 2011 that has been corrected.



**10.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 36, 37, 56  
Estimating the fair ROE**

Dr. Booth states that currently, the Capital Asset Pricing Model (CAPM) remains the most important model used by a company in estimating their cost of equity capital. This statement was followed by results from a survey reported in the Journal of Financial Economics 2001. The chart at page 37 indicates that “investor expectations” are used by about 12 percent of companies.

10.1 Is Dr. Booth able to find other surveys more current than the one reported in 2001?

Dr. Booth notes at page 9 that the fair return is an opportunity cost and “is what could be earned by investing in similar securities elsewhere” and means a “risk adjusted discount rate.”

In commenting on the validity of discounted cash flow (DCF) and CAPM estimates, Dr. Booth says on page 56: “What is important is that there is another side to estimating the fair ROE and cost of equity capital. This is that **the required rate of return on the part of the investor (cost of equity capital) is also the expected rate of return.** Defined benefit pension funds need this expected rate of return to determine whether a fund is in deficit or surplus.” [Emphasis added]

10.2 Can Dr. Booth provide any evidence on the rate of return that investors directly indicate that they currently expect when investing in the Canadian equity markets and particularly in equities of companies similar in risk to FEI?

**Response:**

10.1 The only evidence Dr. Booth is aware of is the Fernandez survey, which includes their estimate of the overall market return and is explicitly a risk premium model. The problem is that survey data does not generally get published, since there is little new that is added. Dr. Booth has wondered why the annual Fernandez survey has not become proprietary since it is not “published” research.

10.2 FEI in answer to AMPC-FEI-1 provided reports from their consulting actuaries (Mercer and AON Hewitt) where Mercer’s survey forecast longer term (4 year to December 2018)) return expectations of 6.5% for private equity and 5.3% for infrastructure. These would seem to be the closest to utility return expectations. Further, Dr. Booth has the latest (December 2015) AON Hewitt forecast which has the Canadian market at 8.3% for a simple average 10 year return and 7.1% for the compound return. This survey also has the Canadian “low vol” expected simple average return at 7.1%. Low vol means “low volatility” or defensive stocks like utilities. Note the US low vol expected return is 6.7% and international stocks 6.9%. Dr. Booth regards these as very similar to his own estimates for FEI and a low risk benchmark Canadian utility. The AON Hewitt data follows.

<b>Asset Class</b>	<b>10-yr Average Annual Return</b>	<b>10-yr Compound Return</b>	<b>Average Annual Standard Deviation</b>	<b>Average Annual CTE 95%</b>
Canadian Equities	8.3%	7.1%	17.0%	-26.4%
Canadian Equities, Small Cap	9.3%	7.6%	20.3%	-32.3%
Canadian Equities, Low Vol	7.1%	6.3%	14.0%	-20.1%
U.S. Equities	7.6%	6.5%	15.9%	-24.0%
U.S. Equities, hedged	8.0%	6.6%	18.0%	-28.0%
U.S. Equities, Small/Mid Cap	8.4%	6.8%	20.1%	-29.0%
U.S. Equities, Small Cap	8.9%	7.0%	21.6%	-31.1%
U.S. Equities, Low Vol	6.7%	5.9%	13.4%	-18.8%
Int'l Equities	7.9%	6.9%	15.8%	-25.9%
Int'l Equities, hedged	8.0%	6.6%	18.0%	-31.0%
Int'l Equities, Small Cap	8.8%	7.4%	18.6%	-28.4%
Int'l Equities, Low Vol	5.9%	5.4%	10.4%	-16.5%
Global Equities	7.8%	6.9%	14.7%	-23.1%
Global Equities, hedged	8.0%	6.7%	17.3%	-28.3%
Global Equities, Small Cap	8.9%	7.6%	17.7%	-26.2%
Global Equities, Small Cap, hedged	9.2%	7.4%	20.9%	-31.9%
Global Equities, Low Vol	6.3%	5.8%	10.5%	-15.0%
All Country Index (ACWI)	8.2%	7.2%	15.0%	-23.2%
All Country Index (ACWI), partially hedged	8.3%	7.0%	17.5%	-28.2%
Emerging Markets	11.0%	8.3%	25.9%	-35.1%
Emerging Markets, Low Vol	7.9%	6.9%	15.7%	-22.9%

**11.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 39-41; Appendix B, Schedule 8 Estimating Market Risk Premium (MRP) over long Canada bond**

Dr. Booth's direct estimate of the Canadian market risk premium is under 5.0 percent and judges that the reasonable range to be 5.0 to 6.0 percent based on weights given to the US evidence.

- 11.1 In Appendix B of FEI's application, Mr. Coyne also estimated an MRP of 5.6 percent for Canada and 7.0 percent based on an ex-post analysis using arithmetic average of historical risk premia.<sup>4</sup> Does Dr. Booth have any comment on whether the difference between his estimates and Mr. Coyne's estimates are due to the time period chosen for Canada, treatment of outlier years, the methodology or any other factors?
- 11.2 On page 47 of FEI's Appendix B, Mr. Coyne also used a forward-looking risk premium (ex-ante) estimate based on determining the implied expected market return. Does Dr. Booth have any comment on: (i) the forward looking market risk premium method as one of the methods to estimate MRP; and (ii) the forecast 30-year bond yield of 3.68 percent as shown in Exhibit JMC-4 Schedule 1?<sup>5</sup>

**Response:**

11.1 Dr. Booth suspects that the difference is due to Mr. Coyne's use of bond yields instead of returns in his estimate. In cross examination of Ms. McShane in 2013 this was the main reason for the difference, where she admitted to changing from using bond returns to bond yields. Dr. Booth includes the data from the Canadian Institute of Actuaries following this IR answer. The picture of the data can be expanded by dragging the handles. The point is that you have to subtract bond returns from equity returns to estimate the market risk premium, which was what was done historically before the BCUC. Switching to using "income returns" which are not returns ignores the fact that the equity market reflects interest rate changes, whereas the bond return then does not.

11.2 Yes, in Dr. Booth's judgment neither are credible. Mr. Coyne's market risk premium estimate uses short term analyst expectations, which are known to be biased while the average growth rate estimate exceeds any plausible long run growth rate for the economy, so is not only inconsistent but violates the underlying assumption of the DCF model. That is, infinite growth rates cannot indefinitely exceed that of the economy. As Dr. Booth explains in his Appendix D, the constant growth model can be used for the overall economy or low risk stocks like utilities. It is inappropriate for all the firms in the TSX Composite index so the basic approach is incorrect.

Dr. Booth cannot accept 3.8% as a forecast long Canada bond yield for the test year. Further even with RBC's normally aggressive forecast it does not reach that level in their forecast by the end of 2017. Dr. Booth has become increasingly skeptical of economic forecasts that do not seem to adjust for the huge central bank bond holdings.

---

<sup>4</sup> Exhibit B-1, Appendix B, Evidence of Mr. James M. Coyne, pp. 45, 46.

<sup>5</sup> Exhibit B-1, Appendix B, Evidence of Mr. James M. Coyne, Exhibit JMC-4, Schedule 1.

## **Report**

# **Report on Canadian Economic Statistics 1924-2014**

## **Final Release**

**June 2015**

Document 215053

*Ce document est disponible en français*

*© 2015 Canadian Institute of Actuaries*

TABLES 1A, 1B, 1C, 1D  
BASIC VARIABLES - SINGLE YEAR CHANGES: YEAR-END TO YEAR-END

YEAR	TABLE 1A: NOMINAL ANNUAL PERCENTAGE RATES OF CHANGE/RETURN								
	CONSUMER PRICE INDEX	CANADA COMMON STOCKS	CANADA LONG BONDS	CONVENTIONAL MORTGAGE INDEX	91 DAY T-BILLS	REAL RETURN BONDS	U.S. COMMON STOCKS IN CANADIAN \$	GDP PER EMPLOYED	WAGE AND SALARY INDEX
1923	0.00								
1924	-1.09	11.28	7.84					1.86	0.11
1925	2.20	28.74	8.17					4.36	-0.22
1926	-1.08	24.42	5.39					3.81	1.41
1927	-1.08	44.92	10.19					4.86	1.72
1928	1.10	32.92	0.56					2.89	1.48
1929	2.17	-11.60	2.34					-1.37	1.18
1930	-6.38	-30.90	9.26					-10.47	-1.38
1931	-10.23	-32.96	-4.97					-15.81	-5.26
1932	-7.59	-12.92	12.37					-11.02	-6.12
1933	-2.74	51.63	7.37					-1.30	-2.08
1934	1.41	20.26	19.66		0.64			6.05	1.90
1935	2.78	30.63	0.83		1.17			8.41	2.98
1936	1.95	25.35	11.12		0.89			5.76	4.64
1937	4.00	-15.83	-0.58		0.71			4.40	5.21
1938	-2.56	5.13	5.63		0.62		34.42	3.50	1.68
1939	2.63	0.19	-2.98		0.70		8.46	11.24	2.13
1940	5.13	-19.13	8.68		0.79		-9.95	19.22	6.63
1941	6.10	1.93	3.80		0.89		-11.70	20.12	7.12
1942	3.45	13.99	3.08		0.54		21.08	12.66	7.49
1943	2.22	19.67	3.88		0.45		25.59	6.82	8.49
1944	-2.17	13.47	3.16		0.39		19.60	4.11	2.01
1945	2.22	36.05	5.18		0.37		36.09	-2.85	0.98
1946	5.43	-1.50	6.02		0.39		-16.45	1.82	6.28
1947	14.43	0.34	3.17		0.41		5.27	11.72	11.06
1948	5.01	12.13	-2.38		0.41		5.08	13.47	8.95
1949	0.83	22.61	4.85		0.48		29.78	4.25	6.08
1950	5.74	48.43	2.12		0.54		24.63	13.32	6.83
1951	10.85	24.04	-3.13		0.77		21.35	8.78	9.56
1952	-1.40	-0.42	1.99	5.18	1.05		11.96	12.84	7.22
1953	0.00	2.16	3.64	2.08	1.66		-0.75	5.18	4.17
1954	0.00	39.05	9.99	7.48	1.83		81.37	0.34	5.01
1955	0.71	27.80	-0.34	6.73	1.46		35.64	7.60	4.47
1956	2.82	13.22	-3.63	-2.42	2.91		2.43	8.65	5.48
1957	2.05	-20.58	5.89	3.23	3.86		-9.20	0.49	4.51
1958	2.68	31.26	-8.69	8.86	2.16		41.33	8.53	3.97
1959	1.21	4.59	-4.43	1.75	4.78		10.36	2.74	3.77
1960	1.29	1.78	7.10	10.32	3.82		3.76	1.80	3.24
1961	0.00	32.75	9.78	7.12	2.89		34.59	3.19	3.11
1962	1.51	-7.09	3.05	7.12	4.05		-5.81	6.52	1.53
1963	1.88	16.60	4.24	7.12	3.66		23.05	4.16	4.08
1964	1.84	28.43	6.97	7.12	3.80		16.82	4.51	4.77
1965	3.01	6.68	0.96	2.59	4.03		12.50	7.42	6.48
1966	3.51	-7.07	1.55	1.58	5.14		-9.43	6.78	5.47
1967	3.95	18.09	-2.20	2.21	4.42		23.94	5.04	6.78
1968	4.85	12.45	-0.80	2.97	6.47		10.26	7.85	7.23
1969	4.69	-0.81	-2.01	-3.15	7.43		-8.33	7.63	6.32
1970	1.00	-3.87	21.98	11.87	6.87		-1.55	5.01	8.90
1971	4.93	8.01	11.55	13.90	3.75		12.22	7.83	10.67
1972	5.16	27.38	1.11	8.52	3.55		16.62	9.20	7.74
1973	9.38	0.27	1.71	6.07	5.46		-14.53	13.80	6.88
1974	12.65	-25.93	-1.69	4.50	8.23		-27.20	13.25	13.36
1975	9.42	18.48	2.82	12.20	7.96		40.76	11.04	14.42
1976	5.63	11.02	19.02	14.21	5.44		24.18	10.29	11.20
1977	9.40	10.71	5.97	14.62	7.86		-0.25	9.37	9.04
1978	8.60	29.72	1.29	6.84	8.93		14.41	7.06	6.41
1979	9.76	44.77	-2.62	5.66	12.54		17.25	10.07	8.60
1980	11.06	30.13	2.06	8.10	13.71		35.39	9.77	11.45
1981	12.12	-10.25	-3.02	9.98	20.38		-5.91	10.68	11.41
1982	9.27	5.54	42.93	25.15	15.25		26.93	9.05	9.54
1983	4.59	35.49	5.60	20.46	9.86		23.26	6.75	7.69
1984	3.72	-2.39	15.09	12.36	11.95		12.37	5.95	3.10
1985	4.40	25.07	25.26	16.72	9.77		39.65	4.57	3.99
1986	4.21	8.95	17.54	13.34	9.47		17.63	1.74	2.73
1987	4.13	5.88	0.45	10.26	8.46		-0.40	7.13	4.60
1988	3.88	11.08	10.45	10.12	9.77		6.67	6.12	4.19
1989	5.26	21.37	16.29	13.06	12.91		27.86	3.99	5.00
1990	4.99	-14.80	3.34	10.63	13.98		-3.20	3.27	4.68
1991	3.75	12.02	24.43	21.56	9.57		23.96	2.96	4.34
1992	2.17	-1.43	13.07	11.25	6.45	3.46		15.55	3.47
1993	1.65	32.55	22.88	15.66	5.27	19.33		15.10	3.47
1994	0.23	-0.18	-10.46	-0.15	5.33	-13.24		5.71	3.74
1995	1.74	14.53	26.28	16.47	7.43	13.21		35.71	2.77
1996	2.16	28.35	14.29	13.80	4.48	10.55		22.27	3.86
1997	0.78	14.98	17.45	7.19	3.30	3.00		39.72	2.06
1998	1.00	-1.58	14.13	7.73	4.81	4.55		38.99	0.96
1999	2.63	31.71	-7.15	2.10	4.83	5.94		15.63	5.88
2000	3.20	7.41	13.64	9.36	5.63	14.90		-6.07	6.51
2001	0.72	-12.57	3.52	11.94	4.13	-2.88		-8.70	-0.20
2002	3.80	-12.44	10.09	7.60	2.55	11.85		-23.00	3.78
2003	2.08	26.72	8.06	7.82	2.93	13.85		8.34	2.04
2004	2.13	14.48	8.46	7.15	2.25	17.24		2.97	6.20
2005	2.05	24.13	15.05	6.08	2.87	17.58		-0.09	6.04
2006	1.67	17.26	3.22	4.70	4.05	-4.86		15.00	0.97
2007	2.38	9.83	3.30	3.11	4.33	-1.40		-8.22	3.81
2008	1.16	-33.00	13.65	8.84	2.74	2.32		-22.47	0.34
2009	1.32	35.05	-4.26	10.93	0.41	15.08		8.01	1.04
2010	2.85	17.61	11.45	6.03	0.54	13.97		9.97	3.58
2011	2.30	-8.71	18.79	5.04	0.95	21.04		3.74	5.40
2012	0.83	7.19	4.55	5.14	0.98	3.97		12.13	0.43
2013	1.24	12.99	-8.56	3.97	0.97	-18.98		42.33	3.25
2014	1.47	10.55	15.47	5.87	0.52	18.90		23.24	2.77

Sources: Statistics Canada CANSIM Series © Copyright 2015. All Rights Reserved.

Source: TSX © Copyright 2015. TSX Inc. All Rights Reserved.

Source: Standard & Poor's, a division of The McGraw-Hill Companies, Inc. © Copyright 2015. All Rights Reserved.

This table gives rates of change/return on Canadian stocks, bonds, mortgages and Treasury bills and on U.S. stocks on a market basis assuming purchase on Dec. 31 of the previous year and sale on Dec. 31 of the current year, including reinvested dividends, coupons or payments. Also given are the CPI, a productivity index (GDP/employed) and rates of wage and salary increases. Details are given in Appendix C. U.S. stock returns are derived in Table 5. Values in bold are revised estimates.

**12.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 42  
Adjustments to the CAPM**

Dr. Booth makes adjustments to the simple CAPM to make it conditional on the state of the economy and to adjust for the abnormally low Canada bond yields resulting from the rampant bond buying programs by central banks.

12.1 Please discuss if the fair ROE could also be depressed by the central bank bond buying to the extent that that it is an opportunity cost that depends on other available returns and a risk adjusted return.

**Response:**

12.0 Dr. Booth would judge that to be correct but the problem is that without the adjustments Dr. Booth has made for credit and preferred share spreads, risk premium models assume that all required rates of return move in unison. However, it is clear that the bond buying by central banks has had a differential impact on government bonds versus corporate bonds and preferred shares. He therefore would accept an impact on low risk utility shares but less than on preferred shares, and even less than on A bond yields and much less on government bond yields. That is, there is a ripple effect on all securities since they are all to some degree substitutes, but the impact gets smaller as the risk increases and the security is less like a government bond.

**13.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 43, 44  
Credit spread adjustment**

Dr. Booth states on page 43 that in a series of hearings into the fair rate of return in the period after the financial crisis, several utility tribunals used the credit spread to adjust CAPM estimate. On page 44, Dr. Booth says that over a normal business cycle, this adjustment should average out to zero as capital market conditions fluctuate around average levels and that this adjustment was incorporated into ROE adjustment models adopted by the Ontario Energy Board, Regie and the BCUC.

- 13.1 Would Dr. Booth please confirm that the credit spread adjustment he refers to is only for the AAM formula which was implemented (but never triggered) in the BCUC GCOC Stage 1 Decision<sup>6</sup> and that he was not referring to a credit spread adjustment to the CAPM based estimate of ROE in the GCOC Stage 1 Decision in the manner of the Alberta Utilities Commission decision in 2009?
- 13.2 Please provide the reference to the data showing “A” spreads at 1.91 percent or 91 bps more than the typical average for the business cycle, which Dr. Booth takes to be 1 percent. If there is no reference, please provide the relevant data.
- 13.3 Please explain the choice of 0.45 percent addition to account for the credit market effect to the MRP estimates.
- 13.4 Please provide the data for the “Preferred and A Shares” chart on page 47 in tabular format.

**Response:**

13.1 Correct.

13.2

& 13.4 Provided as Booth Answer to BCUC IR 13.2 13.4.xls

13.3 Dr. Booth provided extensive evidence for this in his 2013 evidence but did not repeat it since the BCUC adopted it in the ROE AAM. It is repeated below for completeness.

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

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

Since then research at the Bank of Canada has helped to disentangle the liquidity from the pure default risk components in the corporate spread. Garcia and Yang<sup>7</sup> looked at Canadian US\$ issuers in the US market, where credit default swaps were traded. They had to look in the US market, since there is no data within Canada. However, for these Canadian, investment grade, US\$ issuers, investors could purchase credit default swaps to insure against default. Further, since the liquidity risk is minimal in

---

<sup>6</sup> British Columbia Utilities Commission Generic Cost of Capital Stage 1 (GCOC Stage 1), Decision dated May 10, 2013, Order G-75-13.

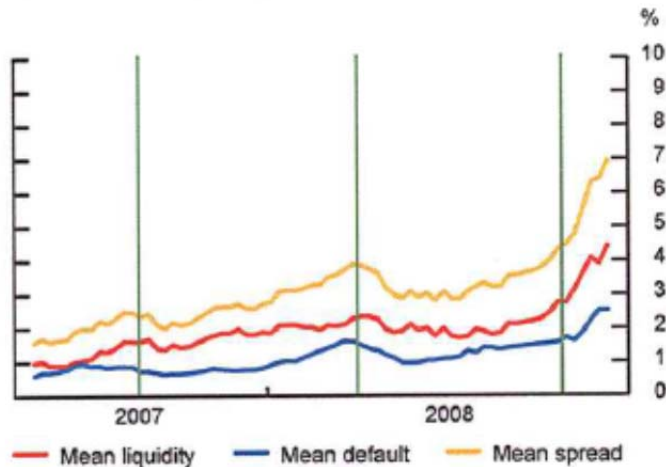
<sup>7</sup> A. Garcia and J. Yang, “Understanding Corporate Bond Spreads Using Credit Default Swaps,” Bank of Canada Review, Autumn 2009



credit default swaps, by comparing these spreads with conventional yield spreads, they were able to disentangle the two components. The graph that follows provides their key result.

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

Synthetic zero-coupon 5-year bond



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

Source: Bank of Canada estimates

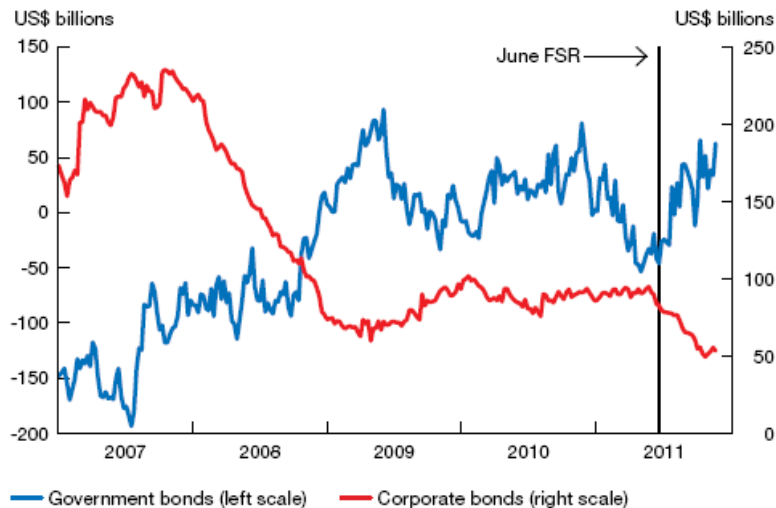
The average (mean) overall spread increased from under 200 basis points (bps) in 2007 to 700 bps at the peak of the crisis. However, the vast bulk of this increase was due to liquidity effects, where the spread increased from 100 bps to over 400 bps. In contrast, the pure default risk component increased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

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

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

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

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



Source: Bloomberg

Last observation: 23 November 20

The graph clearly shows the decline in inventory of corporate bonds held by investment dealers in the US since the financial crisis as well as the latest sharp drop off in 2011 Q3 and Q4, which again has been associated with increasing corporate credit spreads.<sup>8</sup>

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

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

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

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

<sup>8</sup> This liquidity may be further reduced by the Dodd-Frank Act which will restrict proprietary trading and may indirectly affect market making.

**14.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 40; Appendix C, pp. 5–7; Exhibit B-10, Response to BCUC IR No. 2, Question 48.1.1  
Beta coefficients of utilities**

On page 40, Dr. Booth says that the recent history of Canadian utilities is of beta coefficients in an approximate range of 0.30-0.45 with the higher estimate representing their beta estimate post the financial crisis and internet bubble. Dr. Booth also adjusted his beta estimates using the Blume adjustment methodology toward the grand mean of 0.50 and concludes that it makes very little difference.

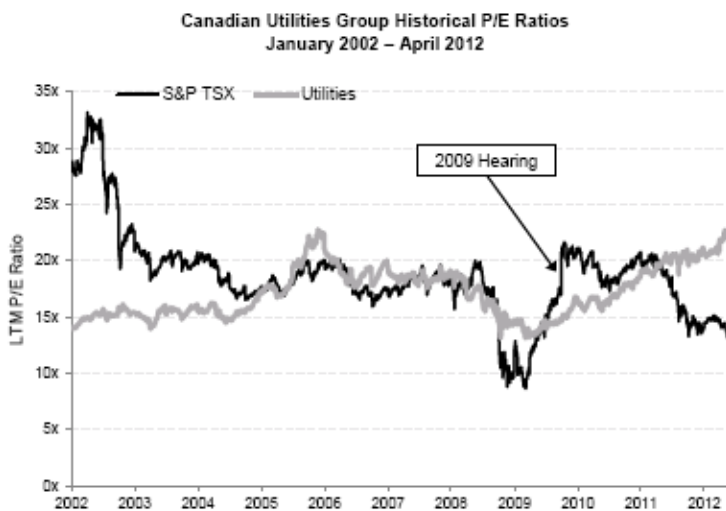
In Appendix C on page 5, Dr. Booth provides his judgment that interest sensitivity of the utilities has caused them to trade based on their defensive or income characteristics for the last several years. He therefore expects some tendency for their betas to revert back to their long run average level; i.e., for regulated firms about 0.45-0.55.

In FEI’s response to BCUC IR 48.1.1, Mr. Coyne presented his analysis and concluded that there was no meaningful change in utility stock behaviour during recessionary times, relative to the broader market. Mr. Coyne further said that even though utility stocks are considered defensive, there is not compelling evidence that utility stocks outperform the market during recessionary periods, and vice versa.

14.1 Does Dr. Booth consider Mr. Coyne’s findings to contradict his judgment that the betas for utilities will revert back to their long run average level? Please discuss.

**Response:**

14.1 Dr Booth finds it difficult to reconcile Mr. Coyne’s remarks with the advice of finance professionals that utilities are defensive stocks and Maureen Howe’s remarks that they act like convertibles, where in down markets they trade on their dividend yields. Also in the 2012/3 hearing the following graphic was provided that is now in Dr. Booth’s Appendix C. The graph indicates that whereas the PE multiple of the TSX utilities was lower than the TSX before 2005, the very low interest rates supported the valuation of dividend rich utilities, so that their PE ratios increased. This observation is consistent with Maureen Howe’s observation that with low interest rates utilities trade on their “bond or fixed income” value.



**15.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 42–43  
Chicago Board of Exchange (CBOE) volatility index (VIX)**

On page 42, Dr. Booth shows the CBOE VIX from 2004 through 2016. Dr. Booth states that “[t]he average value of the VIX over the period 2004-2015 was 19.4%, close to the average from stock market data back to 1926.”

15.1 Please provide the average VIX value over the period: (i) 2009–2012; and (ii) 2012–2015. Please comment whether market volatility has increased, decreased or stayed relative the same since the BCUC GCOC Stage 2 proceeding.

**Response:**

15.0 From January 2009 until December 2012 the average level for the VIX was 24.02%. From January 2013 until December 2015 it was 15.03%. Volatility has clearly decreased since the 2009-2012 period included the end of the financial crisis which bottomed on February 9, 2009 and the Euro Crisis period of 2011. Until Summer 2015 markets have been remarkable calm.

**16.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 41, 50; Appendix B, p. 10; Appendix D, p. 6 Current market risk premium and Fernandez Survey**

On page 41, Dr. Booth resubmitted his evidence with the following figure: "... If this is added to a ~~2.12~~2.75% consensus forecast for the average long term Canadian bond yield for 2016..."

On page 50, Dr. Booth says that "with forecast long Canada bond yields at 2.12% for 2016, this implies a current market risk premium of over 6.38-6.88%, which is in excess of both the historic evidence in Canada and the judgment of the respondents to Fernandez' survey."

- 16.1 Please confirm that pages 50 and 56 of Exhibit C7-1-1 should be updated and the conclusion should be changed.
- 16.2 Please confirm that the implied current market risk premium, when updated, is within the Fernandez survey results.
- 16.3 Please confirm, or otherwise clarify, that any corrections to the long Canada bond yields figure does not affect Dr. Booth's DCF calculations and results as bond yields not used in the DCF calculations.
  - 16.3.1 Please confirm, or otherwise clarify, that the long Canada bond yield referenced in Appendix D, page 6, line 16, should read 2.75 percent instead of 2.12 percent.

**Response:**

- 16.1 Apologies for that oversight, but the section on page 50 should read

*"With forecast long Canada bond yields at 2.75% for 2016, this implies a current market risk premium of 5.75% -6.25%, which is in excess of the historic evidence in Canada and the at the top of the range of the respondents to Fernandez' survey."*

The section on page 52 uses the current yield not expected yield and fortuitously the yield at that time (V122501 October 2015) was 2.12%. So any change is not material.

- 16.2 See above in answer to 16.1
- 16.3 Confirmed.
  - 16.3.1 No, that was the current long Canada bond yield for the end of October 2015.

**17.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 52, 53  
Dividend and long Canada bond yields**

On page 52, Dr. Booth notes that the current period is quite unusual since dividend yields on the TSX are higher than the long Canada bond yield. On page 53, Dr. Booth explains the difference between the two yields over time as mainly the gradual increase and decrease in the Consumer Price Index (CPI) inflation rate over the period since 1956.

17.1 Please provide a table showing the dividend yields, long Canada bond yields and CPI (semi-annually) from 1956 to the present.

**Response:**

17.1 Data provided in Booth Answer BCUC IR 17.1.xls. The CPI is year over year. All data is for January and July of each year.

**18.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 52–53; Appendix D, p. 11  
DCF model**

On page 52, Dr. Booth provides the formula for the DCF model:

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

On page 52, Dr. Booth also states:

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

On page 53, Dr. Booth equates the CAPM and DCF as follows:

$$DCF - CAPM = \frac{d_1}{P} - R_F = MRP - g$$

Or in words, the directly observable spread between the long Canada bond yield and the TSX dividend yield is equal to the long run dividend growth rate minus the market risk premium. [Emphasis added]

In appendix D, Dr. Booth discusses the dividend payout ratio and the retention rate. For example, Dr. Booth on page 11 in Appendix D states that “[t]o estimate the future growth rate I can assume that each year the utility is expected to earn its current ROE, so that its earnings will grow by the retention rate times this ROE.”

- 18.1 Please clarify why Dr. Booth views that the forecast dividend yield can be estimated with very little error when it is a function of the current dividend yield and the long run growth rate, or:  $d_1 = d_0 * (1 + g)$ .
- 18.2 Dr. Booth appears to use a 3.50 percent real growth rate throughout the DCF analysis. Please discuss and provide the basis to use a 3.50 percent real growth rate. Has Dr. Booth considered different growth rates? If so, why were they rejected? If not, why not?
  - 18.2.1 Are there any merits to consider using a multi-stage DCF model? Please discuss whether Dr. Booth has considered other forms of DCF models.
- 18.3 Please clarify if Dr. Booth is using “long run growth rate” and “long run dividend growth rate” interchangeably. If so, why must the growth rate in the DCF equation be based on dividends? Please explain.
- 18.4 Based on the dividend payout ratio, retention rate and the growth rate, would it be reasonable to say that there is an inverse relationship between the forecast dividend yield and forecast growth rate? If so, does this inverse relationship lead to an endogeneity problem in the DCF model?
- 18.5 With respect to the conceptual equivalence between the CAPM and DCF, does Dr. Booth agree that the forecast dividend yield, or  $d_1/P$ , is driven by the equity market whereas the risk free

rate, or  $R_f$ , is based on the bond market? Thus, fundamentally the two methodologies should differ. Please clarify.

**Response:**

18.1 The impact of growth on the dividend yield is much smaller than the growth rate itself. Suppose the dividend yield is 5% and the growth rate 5% so the expected return is 10.25% ( $1.05 * 1.05$ ), for simplicity. If the growth rate is really either 4% or 6% with equal probability the variability of the expected dividend yield is only 5.2% - 5.3% or 0.1%, whereas the variability of the growth rate is 4%-6% or 2%.

18.2 3.5% is an approximation to the real growth rate over this long period of time and is consistent with the other parameters. Varying it does not change the basic relationship which the analysis illustrates since all it does is move it up or down by the same real growth rate. Using a multi-stage growth model may produce better results, but it then needs short run growth forecasts, which are not available.

18.3 Dr. Booth uses long run growth rate for both dividends and GDP, but the causal link is from GDP to dividends; otherwise the dividends as a share of GDP would show a secular change, that is, constantly increasing or decreasing as share of GDP.

18.4 Generally there is an inverse relationship, in that high dividend yields can be caused by low growth expectations and vice versa. Essentially the market price which determines the dividend yield is a function of long run growth expectations. However, the market price is also a function of uncertainty which then also affects the dividend yield. The DCF model is trying to capture how the investor reacts to a stream of future cash flows given the market price which is itself a function of those cash flows.

18.5 No, as this question assumes the absence of links between the bond and equity market. Note that the experience of the period since the financial crisis has been one of central bank intervention in the bond market which some have claimed is directly aimed at supporting the equity market and the economy through a "wealth effect." Qualifying that is the fact that the bond market is also affected by what is commonly referred to as the "preferred habitat" hypothesis that simply states that parts of the capital market are segmented as suggested by the question. However, this implies the absence of arbitrage and hedge funds.



**19.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 51; Appendix D, p. 13  
DCF estimates of the fair ROE**

On page 51, Dr. Booth states that he has traditionally viewed his DCF estimates as “check” on his CAPM estimates and that the recent very low long Canada bond yields have forced him to re-evaluate this view and to look at what drives the difference between the DCF and simple CAPM estimates. On page 13 of Appendix D, Dr. Booth states that the DCF estimates for the market as a whole and the S&P utility indexes are more reliable than for individual companies due to the significant measure error attached to forecasting future growth rates.

Mr. Coyne, the expert witness for FEI, carried out DCF analyses for his Canadian and US proxy groups based on the constant growth rate model and multi-stage DCF model. He gave equal weight on the DCF and CAPM model as the basis for his recommended ROE for FEI.<sup>9</sup>

- 19.1 The GCOC Stage 1 Decision determined that equal weight should be given to the CAPM and DCF models. Would Dr. Booth please comment if the Commission should continue to place equal weights for the CAPM and DCF methodologies in this decision? Why or why not?
- 19.2 If the DCF methodology should be given weight, should different weights be given to the constant growth versus multi-stage models? Why or why not?
- 19.3 Should US and Canadian data in the estimation of CAPM and DCF estimates be given equal weight in the current proceeding? Why or why not?
- 19.4 To the best of Dr. Booth’s knowledge, what is the most widely accepted methodology in other jurisdictions in Canada? If both CAPM and DCF are accepted, what are the respective weights given?

**Response:**

19.1 Dr. Booth judges that in the current financial environment a 50:50 weight is reasonable.

19.2 Dr. Booth would place no weight on the constant growth DCF model when unadjusted analyst growth estimates are used. Like any model if the DCF model is correctly used it is useful.

19.3 Any risk premium model adjusts comparator securities for their different risk characteristics. US securities, as well as those from other markets, can be used as long as they are correctly adjusted for the differences in risk, inflation and currencies. The BCUC accepted this in 2009 as have other jurisdictions, the problem is when US witnesses use US estimates in a Canadian context without any adjustments.

19.4 To the best of Dr. Booth’s knowledge primary weight is placed on risk premium models with emphasis on the CAPM model. The Regie, the AUC and the Board of Commissioners of Newfoundland and Labrador, for example, do this. It is difficult to work out what the OEB does, since they have not had a litigated hearing since 2004 when they placed primary weight on the CAPM. The NEB used ATWACC, but the Brattle evidence that this was based on used CAPM and DCF evidence.

As far as Dr. Booth is aware no-one uses Comparable earnings testimony anymore and hasn’t since Ms. McShane’s testimony presented such evidence before the BCUC. DCF testimony has consistently been used by witnesses on behalf of the utilities since Dr. Booth first entered evidence with varying weights.

Most Boards do not explicitly weight evidence. They usually use CAPM and then adjust for the results from other models.

---

<sup>9</sup> Exhibit B-1, Appendix B, Evidence of Mr. James M. Coyne, p. 6.

**20.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 63  
AAM ROE setting period**

On page 63, Dr. Booth states that "... I am also happy for the BCUC to set a fixed rate for the period 2016-2018..."

20.1 Based on Dr. Booth's views that the 3.8 percent minimum for the long Canada bond yield may not be reached by the year 2018, he is suggesting a fixed rate of 7.5 percent for the period 2016-2018. Does this suggestion also imply that Dr. Booth believes an AAM ROE is redundant?

**Response:**

20.1 Dr. Booth is getting more pessimistic about future interest rate increases by the day! With increased bond buying activities spilling over around the world he doubts that interest rates will reach his 3.8% trigger over the next three years, so the relevance of the floor is currently moot. He continues to judge that the AAM is a useful regulatory device, but the concerns about the relevance of the long Canada bond yield for the fair ROE he expressed in 2013 are greater today.

**21.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 74, 75, 80  
Growth prospects as a risk factor**

Dr. Booth discusses residential capture rates as a risk factor on pages 74 and 75:

There is no denying that the Greater Vancouver area is condensing, the same as downtown Toronto, and that natural gas capture rates in this market are lower than for traditional single family dwellings. ... However, I do not regard this as a risk factor. FEI continues to capture 77% of the traditional single family and 59% of the semi-detached market, but it is inevitable that multiple dwellings are better served by electricity. More to the point it is difficult to see how this affects FEI's ability to earn its allowed ROE and it would only affect its long run risk if it increases its cost recovery risk. This in turn requires not that it fail to capture more new customers but that existing residential customers drop off the system at an increasing rate and there does not seem to be any evidence for this.

On page 80, Dr. Booth went on to describe FEI's growth prospects: "Further, I do not see slower growth prospects as a risk factor, since it does not affect the value or the risk of assets in place."

21.1 Please further discuss whether or not uncertainty regarding future growth and opportunities to invest in rate base should be considered a risk factor in determining a fair ROE. Do investors consider opportunities for growth to be a risk factor? Please discuss the economics and attractiveness of an opportunity to invest in growth at a regulated fair return versus in an unregulated context.

**Response:**

21.1 If the allowed ROE is fair it should reflect the cost of equity and the value of existing assets should have a market to book ratio of about 1.05. In this way the utility can sell equity, incur issue costs, and net out book value so there is no dilution. This principle also applies to new investment which also earns the same allowed ROE. As a result, growth per se has no impact since it is only valuable to the degree that it generates incremental value, that is the ROE is set too high. In finance we distinguish between a growth firm and a growing firm, where the former can invest at rate higher than its cost of equity whereas the latter cannot, even though by retaining earnings it can grow.

Growth per se can reduce a utility's risk is when it increases the scale of the rate base and allows the commodity it distributes to become more competitive. This is the case, for example, of the gas distributors in Nova Scotia and New Brunswick. To the contrary, significant growth in rate base is sometimes regarded as a risk factor, since it means significant financing and production risk, that is, the costs of building the new assets. Greenfield pipelines, for example, often get higher financial parameters if they assume the production risks of building the pipeline, Alliance Pipeline, for example, assumed these risks.

However, the general point is that if the ROE is fair, the utility shareholders should be largely indifferent to growth or lack thereof.

**22.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, pp. 68, 79, 83  
The use of credit metrics in determining a required equity ratio**

Dr. Booth submits that credit metrics are not the most important issue and notes that credit rating agencies have awarded an A rating to FEI even when its credit metrics have been low.

Dr. Booth notes on page 68 the factors and weights used by Moody's Investors Service (Moody's):

The report refines their assessment into four major areas as follows:

- Regulatory framework: 25%
- Ability to recover costs and earn profits: 25%
- Diversification: 10%
- Financial strength and liquidity: 40%

The weights in the last column are the percentage allocation to each of the four categories. Moody's states very clearly 'for a regulated utility the predictability and supportiveness of the regulatory framework in which it operates is a key credit consideration and the one that **differentiates the industry from most other corporate sectors.**' A quick glance at Moody's weights indicates that fully 50% of the weighting is based on the first two criteria which both reflect the supportiveness of the regulatory environment. [Emphasis added]

Dr. Booth provided a ranking of the regulatory jurisdictions across Canada by Concentric, which showed that all of the provinces ranked between 30 and 40 on their scale. Dr. Booth stated on page 67:

I don't necessarily agree with Concentric's analysis, since there is significant overlap in some of the categories and the ones that count are the ability of the utility to earn their allowed ROE and the treatment of stranded costs. However, I would agree with the general assessment that the BCUC is a very supportive regulator.

Dr. Booth indicated at page 79 that he continues to recommend the same 35 percent common equity ratio that he has traditionally recommended for both gas and electricity distribution companies.

Dr. Booth noted the importance of Moody's comments about utility's monopoly positions and the capacity and willingness of customers to pay their bills and stated on page 83: "I therefore judge regulation by targeting what the rating agencies say they want in one part of their analysis to the exclusion of the most important issues in other parts as being incorrect."

- 22.1 Please discuss Dr. Booth's views as to whether or not the various utility regulators across Canada all provide relatively strong and relatively similar regulatory frameworks and ability to recover costs and earn profits.
- 22.2 Please discuss the extent to which diversification is, or is not, a strong differentiating factor among the standalone regulated utilities in Canada that may be used as comparators.
- 22.3 To the extent that the regulatory framework and the ability to recover costs and earn profits were relatively similar among benchmark standalone utilities in Canada, could it then be concluded that financial strength and liquidity as measured by credit metrics and ratios would have merit as determinative factors in arriving at a credit rating?
- 22.4 Dr. Booth indicated that he was extremely reluctant to benchmark his recommendations against *guidelines* issued by rating agencies. Please discuss if there would be merit in benchmarking an equity ratio recommendation against rating agency *actual practice* in regards to utility credit

metrics and ratios.

- 22.5 Please discuss how and to what extent changing income tax rates, ROE levels and interest rates affect credit metrics and whether these changes should be taken into account in determining an appropriate equity ratio.

**Response:**

22.1 Dr. Booth's experience is that all regulators in Canada strive to protect "their" utility by, for example, allowing extensive deferral accounts. What is important is that regulators of Canadian utilities are mostly Canadians with similar backgrounds. He has not seen any willingness on their part to put the utility at risk.

22.2 Dr. Booth would judge very few of the regulated entities in Canada as being diversified. The most diversified would be the integrated electric utilities like Nova Scotia Power, which have generation, transmission and distribution activities. However, this is not a significant amount of diversification. In contrast, most of the US and Canadian utility holding companies are diversified across both industries and geography. FEI's ultimate parent for example, owns both gas and electric utilities and has operations in the Caribbean, Canada and the US.

22.3 Not completely. The regulatory framework reflects short term risk, but there is still long run risk. The actions of the NEB and the TransCanada Mainline as well as the BCUC and PNG indicates there are limits to what the regulator can do. As a result, the differences in the allowed ROE and common equity ratio will show up as different credit metrics which are then not determinative of differences in credit ratings. This is partly why US utilities with higher ROEs and more common equity generally have lower bond ratings than "similar" Canadian utilities.

22.4 Dr. Booth judges the fair return standard as requiring that investors be treated fairly and that the utility attract capital on reasonable terms. He does not judge that as meaning a particular credit rating. He judges that the regulator in assessing the fair return standard has much more information available to them in terms, for example, of the impact of performance based regulation than does the credit rating agency. As a result, there is no need to outsource the function of the regulator to institutions like S&P and Moodys that have also made significant errors and been subject to conflicts of interest that partly resulted in the financial crisis. This is also why the rating agencies put great stock by the quality and consistency of regulation. In Dr. Booth's judgment the most important causal link is from the regulator to the bond rating agency and not vice versa.

22.5 Higher tax rates, higher earned ROEs and lowed embedded interest costs increase the interest coverage ratio and usually the cash flow to debt ratio. They should not have any impact on what is fair and reasonable, except if in unusual circumstances it causes unavoidable financial problems and damages the financial integrity of the utility. This was a minor factor when high embedded interest costs affected the interest coverage ratio and prevented some utilities financing with their preferred long term unsecured debt financing since they were restricted by an interest coverage ratio of 2.0. With the decline interest rates and embedded debt costs this is no longer a factor.

**23.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, p. 86  
Equity ratio impact on equity versus debt Investors**

Dr. Booth states: "...the equity holder should not be awarded a higher common equity ratio or ROE due to issue problems in the bond market."

- 23.1 Please discuss whether the constraint on the minimum appropriate equity ratio is set primarily by the need to satisfy bond investors (and credit rating agency bond ratings) versus equity investors.
- 23.2 Please confirm that if the equity ratio is increased then the utility is required or expected to add additional equity.
- 23.3 If a higher equity ratio is determined to be required to provide a fair return to debt investors, please explain the relevance of any impact on equity investors.

**Response:**

23.1 The minimum constraints in a bond indenture are set by negotiation and convention. Many of these indenture provisions were set decades ago by predecessor companies (such as Inland Natural Gas) issuing securities in different types of capital markets. The bond investor will decide to buy a particular type of debt and require an interest rate based on their perception of the risk that the indenture places on them. The constraint will be different for mortgage debt versus signature (unsecured) debt. It will be agreed to by the equity investor if they want to issue that type of debt.

23.2 That depends on the regulator and the entity being regulated. Many Canadian utilities have non-regulated activities within the corporate structure. So the regulated entity may have say a 35% common equity ratio, while the non-regulated entity has say 30%. If the regulator increases the equity ratio to 40% the consolidated entity may just rearrange its existing capital structure without ever raising any new funds. For a standalone independent company increasing the common equity requires either they raise new equity or they retain more common equity until they reach their new target.

23.3 We have market signals of what return the debt holder demands, which is the current yield on the company's debt. Currently, almost all utility debt is trading at a premium to their book value due to the decline interest rates, so bond investors have earned higher rate of return than they expected. Dr. Booth has never seen a situation where the equity ratio or ROE has to be set unfairly in order to provide a fair return to bond investors. Generally the bond contract precludes an unfair return by setting constraints such as the interest coverage ratio or debt ratio restrictions.

**24.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, Appendix B, p. 3  
Market equity risk premium**

Dr. Booth states: "However, this graph illustrates why current market participants generally assess the risk premium of equities over bonds as much lower than 5.0%, since this is what they have experienced over the last 20-30 years."

24.1 Can Dr. Booth provide further evidence for the assertion that current market participants generally assess the risk premium of equities over bonds as much lower than 5.0 percent?

24.2 If current market participants generally assess the risk premium of equities over bonds as much lower than 5.0 percent, then should the awarded ROE directly reflect that expectation?

**Response:**

24.1 As Dr. Booth mentions "going back" you have to go back 35 years to even get a market risk premium over 2.0%, which is beyond the time horizon of most professionals. In terms of research rather than commentary, Dr. Booth was thinking of papers like Arnott and Ryan, "Death of the Risk Premium" Journal of Portfolio Management, Spring 2000, Antti Ilmanen, Expected Returns on Stocks and bonds, Journal of Portfolio Management, Winter 2003 and Earl Benson et al, "Stock returns and PE10," Journal of Portfolio Management, Fall 2011.

24.2 Dr. Booth places more weight on the actual expectations reflected in Fernandez survey and his own empirical research and judges a 5.0-6.0% range as being reasonable.

**25.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, Appendix C, p. 1**  
**Relative risk assessment**

On page 1 of Appendix C, Dr. Booth states that for the CAPM model, the only source of risk is market risk and that even with a two factor model where the risk free rate is often regarded as risky due to interest rate risk or the Fama-French three factor model, where size and the market to book ratio are additional sources of risk, the coefficient on the market is still the main measure of risk.

- 25.1 Please elaborate on the statements in the preamble to this question by providing a reference to the calibrated coefficients along with their accompanying standard errors. Please also include the time horizon of the data that Dr. Booth had considered.
- 25.2 Does Dr. Booth agree that the significance of the coefficients will change in the CAPM and Fama-French models depending on the date set used? Or do empirical tests show that the CAPM and Fama-French models hold in any circumstances?

**Response:**

25.1 Dr. Booth was referring to the study by Estrada where he provides that data at Schedule 3 of his main testimony. The coefficient on the market averages 0.99 for the CAPM estimator versus 0.95 for the market within the Fama-French 3 factor model, the change reflects the influence of the two additional independent variables. In contrast, the coefficients on the size and value coefficients are -.22 and 0.19. Estrada does not report the standard errors.

25.2 Empirical estimates can only estimate what happened over a particular time horizon so estimated coefficients from any model will vary with the data set. Fama-French generally use data back to 1926 and their estimates are on Ken French's web page. Their procedures are explained in Appendix C but after estimating the factor risks they then test the CAPM or Three Factor model to estimate the risk premiums over the subsequent period. Their overall assessment is then based on analyzing this time series of risk premiums, where each estimated set of risk premiums is treated as an estimate. Some of these sets of risk premium estimates will be negative and some positive, since they are estimates. This just reflects that any asset pricing model will only hold period by period if estimated rates of return are always exactly realized, but then that defeats the idea that we are estimating rates of return on risky securities.



**26.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, Appendix C, pp. 2, 3  
Utility Index Beta estimates**

Dr. Booth states that when estimating beta coefficients, going back over very long periods could fall into the risk of a firm or industry changing much more than the overall risk of the market.

- 26.1 Could Dr. Booth please explain or comment on the significance of choosing 1988 as the beginning time period to estimate betas (Schedule 1 and Schedule 2)?
- 26.2 Dr. Booth describes that at the peak of Nortel and JDS Uniphase, they were about 35 percent of the TSE Composite index. In the current (2014 to 2016) market, how many stocks contribute to 35 percent of the market? Is there an industry dominating the market value of the index?

**Response:**

26.1 That's the start data for the new TSX sub-indexes, the data prior to that reflected different industry composition.

26.2 Dr. Booth does not have that data, but the banks dominate the TSX and his judgment would be that collectively the financial sector is close to 35%

**27.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, Appendix C, pp. 6, 7  
Utility Index Beta estimates – Canada and US**

Dr. Booth considers that the average long run level for utilities is about 0.45 to 0.55.

For comparison purposes, Dr. Booth also estimated a group of sample US utilities based on data back to 1971, using the same methodology of monthly holding period returns over a five year time period updated monthly. The finding is average beta for the sample of Canadian firms at 0.29 versus 0.39 for the US firms since the passing of the internet bubble.

- 27.1 On page 8 in Appendix C, Dr. Booth compared his estimate of Canadian regulated betas of 0.27 with beta estimates reported by RBC, Yahoo and Google. Is the respective average and median figures of 0.25 to 0.27 considered comparable to the 0.29 quoted in the preamble to this question?
- 27.2 Please comment or explain why the US regulated betas at 0.60 (Schedule 6) is markedly different from the 0.39 quoted in the preamble.

**Response:**

27.1 The estimate on page 8 refers Dr. Booth's own estimates over a longer time period than the estimates compared with those for Google, Yahoo and RBC. His estimates are the latest over the most recent five-year period for which he has data.

27.2 The 0.60 estimate is Dr. Booth's estimate in the table on page 9 with the comparisons with Google, Yahoo and RBC. Dr. Booth places no weight on particular "point" estimates since they simply reflect the estimation window and events that occurred in that period. The objective is to assess a reasonable forward beta estimate not a backward estimator.

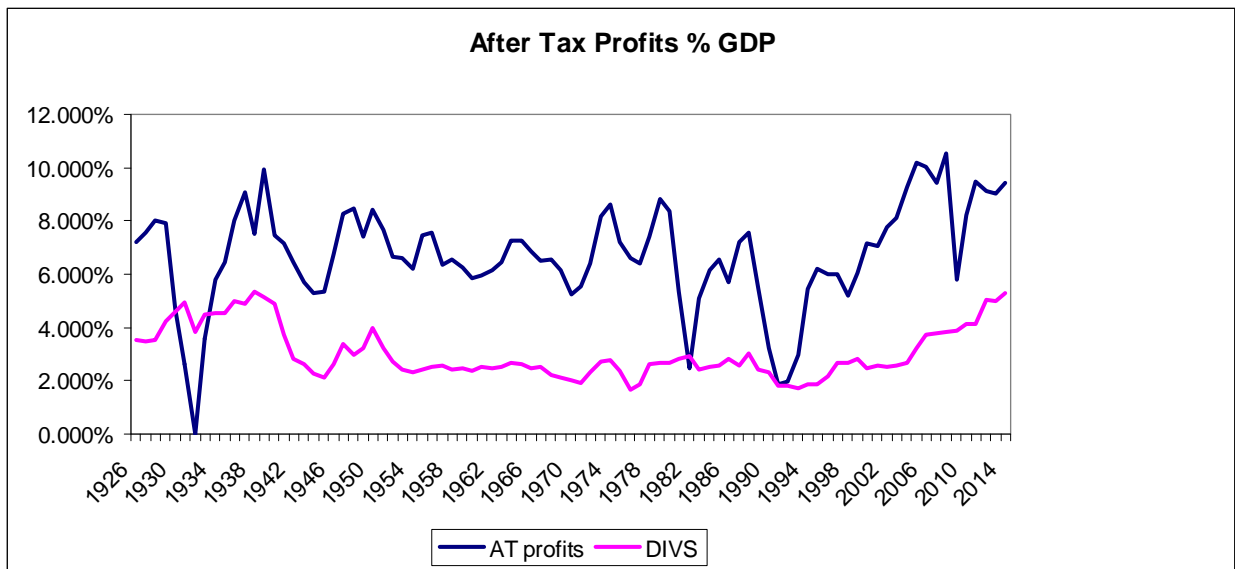
**28.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, Appendix D, Schedule 5 Dividend and long Canada bond yields**

Schedule 5 shows the after tax profits and dividends earned and paid in Canada by Canadian corporations.

28.1 Please provide legends to the chart for the two variables and the unit on the Y-axis.

**Response:**

The dark blue line indicates after tax profits and the lower pink line dividends. As the discussion indicates both are expressed as a percentage of GDP to normalize them across time. For convenience the graph is repeated below with the legend



**29.0 Reference: Exhibit C7-7-1, Revised Evidence of Dr. Booth, Appendix E, Alternative Models to the CAPM, p. 6 Risk free rate**

On page 6 of Appendix E, Dr. Booth states that he uses the yield on the long Canada bond because of its three advantages: (i) it is free of default risk; (ii) it normally has a zero beta with respect to equity markets; and (iii) it has minimal variance risk.

29.1 Schedule 1 in Appendix E presents the Canadian bond beta in a chart. Can Dr. Booth explain how the long Canada bond normally has a zero beta according to the chart?

29.2 Dr. Booth indicates that in the 1990s, he used a low market risk premium as measured over long Canada bond yields. What is Dr. Booth's current opinion with regards to the risk in long bond compared to low risk Canadian utilities?

**Response:**

29.1 That is Dr. Booth's judgment after "mentally" excluding the period of significant budgetary problems at the Federal level when long Canada bonds had a significant positive beta. More recently it has been around zero if not slightly negative reflecting the fact that bond values have gone up with lower interest rates. As Dr. Booth has testified on many occasions statistical estimates over particular horizons reflect what happened during that period.

29.2 In terms of the risk of the long Canada bond it contributes less to the risk of a diversified portfolio at present compared to the 1990's. However, when and if interest rates return to normal equilibrium levels there are potentially very large bond market losses that Dr. Booth does not judge to exist with utility shares. In this he agrees with the judgment of Maureen Howe that utility shares act like convertible bonds. In this sense Dr. Booth would judge utility shares to be less risky than long term Canada bonds. Dr. Booth agrees with the assessment that long term bonds currently offer return-free risk, and not a risk-free return.