

**BEFORE THE
ALBERTA UTILITIES COMMISSION**

**REBUTTAL EVIDENCE
OF
BENTE VILLADSEN**

**FOR
ALTAGAS UTILITIES INC
ENMAX POWER CORPORATION
FORTISALBERTA INC
THE ATCO UTILITIES**

2016 Generic Cost of Capital

Proceeding ID No. 20622

May 12, 2016

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1 market expectations, with what has been approved elsewhere and with maintaining an
2 A range credit rating. I continue to believe that the Utilities face a cost of equity in
3 the range of 9.5-10.5 percent with a point estimate of 10.25 percent and that a
4 reasonable benchmark for the equity thickness is as described in my written evidence,
5 Figure 30, which as a benchmark finds that 40 percent equity is reasonable for
6 electric distribution utilities that pay taxes.

7 Second, my findings can be summarized as follows:

8 Impact of the Capital Market Environment on Expected Equity Returns

- 9 • All experts acknowledge that the yield spread is higher than usual,
10 which indicates that the premium investors require to hold equity
11 rather than risk-free assets has increased
- 12 • As demonstrated by Mr. Buttke in response to Dr. Booth, preferred
13 spreads are elevated, which is evidence that the premium investors
14 require to hold equity rather than risk-free instruments is elevated.
15 Relative to the release of the 2013 GCOC the increase in preferred
16 spread is about 100-200 basis points for an increase in utility ROE in
17 excess of 100-200 basis points.
- 18 • Mr. Thygesen's does not provide reliable evidence that forecasted
19 interest rates are systematically upward biased and his claim is not
20 supported by research or data. Therefore, forecasted interest rates are
21 appropriate for use in this proceeding.
- 22 • Contrary to some claims, I do not believe interest rates will remain low
23 for an extended period and believe that rates will increase over time,
24 so that a forecasted risk-free rate is appropriate.
- 25 • Mr. Thygesen's discussion of current market conditions indicates that
26 he believes that past and current stock price levels predict future
27 returns, which is contrary to empirical evidence well-documented in
28 the finance literature.

29 Regulatory Precedents

- 30 • Dr. Booth lists a number of Alberta Utilities Commission "settled
31 issues." However, his list of issues is selective and in many cases, his
32 characterization of the issues as "settled" is taken out of context. For
33 example, while the Commission has stated it found the CAPM useful,

1 it has also acknowledged its limitations. Similarly, in discussing some
2 of the specific methods (e.g., DCF implementation), Dr. Booth fails to
3 include a discussion of the evidence presented to the Commission.
4 Some of the evidence on this record addresses specifically the
5 Commission's concerns.

6 Estimation Methods

- 7 • The CAPM estimates presented by the interveners are downward
8 biased since
 - 9 ○ Dr. Booth's and Dr. Cleary's implementation of the CAPM
10 relies on an MERP that fails to recognize the elevated yield and
11 preferred spread as well as lingering market uncertainty. It
12 therefore downward biases the cost of equity estimate.
 - 13 ○ The beta estimates relied upon by Dr. Booth and Dr. Cleary are
14 outdated and statistically inferior to weekly betas.
- 15 • The DCF estimates presented by interveners suffers from several
16 problems:
 - 17 ○ The implementations by Dr. Booth and Dr. Cleary fail to
18 recognize that shareholders receive cash not only through
19 dividends but also through share buybacks. This is especially
20 vital when applying the DCF model to the market as a whole,
21 where many S&P/TSX or S&P 500 companies use buybacks.
22 This downward biases the DCF estimate of the market return.
 - 23 ○ The implementation of sustainable growth rates (based on
24 historical accounting ratios) fails to recognize the impact of
25 share issuances and thereby downward biases the DCF-based
26 ROE estimate
 - 27 ○ Dr. Booth's discussion of analysts' optimism bias fails to
28 recognize that recent literature has found that if optimism bias
29 is present, then the degree depends on a host of factors, with
30 the utility industry having characteristics that lead to low or no
31 bias
- 32 • Dr. Cleary's bond yield plus risk premium suffers from two flaws that
33 downward biases the estimate:
 - 34 ○ Dr. Cleary uses the yield on A rated utility bonds as of January
35 2016 and that may be lower than the expected 2016-17 yield

- 1 ○ No evidence for the risk premium of 2-3 percent was provided
- 2 and this fails to recognize the inverse relationship between
- 3 yield and risk premiums.
- 4 • Dr. Booth's use of pension funds' forecasted return are downward
- 5 biased
- 6 ○ The Commission has in the past recognized that such returns
- 7 are conservative
- 8 ○ The limited sources provided by Dr. Booth relies on the a DCF
- 9 model which does not use cash flow that accrue to shareholders
- 10 • The discussion by Dr. Booth and Mr. Thygesen fails to recognize
- 11 pension fund managers' may match assets holdings to the liability
- 12 profile and their incentive to ensure the fund remains fully-funded
- 13 based on actuarial calculations

14 Credit Metrics

- 15 • I strongly advise against applying the lowest possible credit ratio
- 16 benchmarks to determine the capital structure. Doing so affords no
- 17 cushion for the utilities and fails to recognize that, for example, the
- 18 FFO to debt ratio of 11.1-14.3 percent is a *minimum range*.
- 19 • Flaws in the credit ratio analysis of Mr. Stauf lead him to
- 20 underestimate the equity ratio that is needed to maintain credit metrics
- 21 at levels appropriate for an A range rating.

22 Incorrect / Misguided Capital Structure

- 23 • Dr. Booth and Mr. Stauf incorrectly treat preferred equity as debt,
- 24 while credit rating agencies clearly consider preferred a hybrid
- 25 security that is generally counted 50-100 percent as equity.
- 26 Consequently, their claim that (for example) Fortis Inc. is financed
- 27 with 35 percent equity is misleading, since the equity ratio for credit
- 28 metric purposes is 40 percent.

29 Additions to or Subtractions from the Equity Ratio

- 30 • Contrary to Mr. Stauf's recommendation, I do not find that adding or
- 31 subtracting percentage points for specific issues is good policy at this
- 32 time. Instead, I suggest that all risk factors need to be evaluated to get
- 33 the equity ratio right if relative adjustments are to be made.

- 1 • To address the specific questions, I find, contrary to Mr. Stauff, that
2 the 2 percent adder for tax exempt entities continues to be conservative
3 as such entities have higher earnings volatility would have a lower
4 EBIT coverage ratio without an equity adder.
- 5 • A 2 percent reduction in the transmission entities' equity percentage
6 does not have merit as (i) it would be necessary to evaluate aspects
7 other than capex and (ii) although in the process of tapering, the capex
8 program is ongoing.

9 The remainder of my evidence is organized as follows. Section II responds to Dr.
10 Booth's, Dr. Cleary's, and Mr. Thygesen's discussion of the interaction of capital
11 markets and the expected return on equity. This section also discusses what Dr.
12 Booth has labeled "settled issues." Section III responds to the evidence presented by
13 Dr. Booth, Dr. Cleary, and Mr. Thygesen regarding the estimation of the cost of
14 equity. Section IV responds to the capital structure recommendations presented in the
15 evidence of Dr. Booth, Dr. Cleary, and Mr. Stauff.

16 **II. CAPITAL MARKETS AND REGULATORY PRECEDENTS**

17 **A. IMPACT OF THE CAPITAL MARKET ENVIRONMENT ON EXPECTED EQUITY** 18 **RETURNS**

19 **1. Interest Rates and Bond Yields**

20 Q4. What are your reactions to Mr. Thygesen's comments on the risk-free rate of interest
21 in Canada?

22 A4. Mr. Thygesen relies on sparse historical forecast in a limited time period surrounding
23 the great financial crisis and ensuing global recession to argue that Consensus
24 Forecasts reflect a "systemic [sic] bias or error" and therefore should not be relied on
25 to determine the risk-free rate in this proceeding.² However, Mr. Thygesen falls far
26 short of conclusively demonstrating a consistent systematic upward bias in the
27 Consensus Forecasts projections of 10-year Canadian government bond yields. Many
28 of the forecasts he cites as over-predicting the actual yields that prevailed in 2010-

² Thygesen Evidence, paragraph 14.

1 2014 were made before the financial crisis or during the early part of the ensuing
2 recession. Does Mr. Thygesen mean to suggest that failing to anticipate the crisis, the
3 severity of the recession, or the slowness of the recovery constitute evidence of bias?
4 If so, he is at best selecting a superficial interpretation of the definition I provided in
5 response to his information request, which characterized bias as the tendency to “on
6 *average* under or over-predict the *most likely* eventual outcome” [emphasis added],
7 not as the tendency to under or over-predict the eventual *realized* outcome.

8 To be unbiased, a forecast must reflect the average of all possible outcomes, weighted
9 by their probabilities of occurring. (This is referred to as the “expected value” in
10 statistics.) The possible outcomes may take on a range of values, and their
11 probabilities of occurring must be estimated at the time of the forecast. The eventual
12 realized outcome (i.e., the outcome that actually comes to pass) may not match the
13 ex-ante expected value—indeed it may reflect a low probability event from the
14 perspective of the forecaster. However, just because a forecast is not accurate does
15 not mean it is biased.

16 Mr. Thygesen has not provided evidence that Consensus Forecasts systematically
17 over-weight high end outcomes (i.e., larger increases or smaller decreases) in
18 projecting bond yields. Rather, he has simply documented a sparse sample of recent
19 instances in which both economic forecasters and financial markets had failed to fully
20 appreciate (in advance) the severity and persistence of the negative effects on global
21 economies and capital markets associated with the financial crisis and its aftermath.
22 In this matter, I agree with Mr. Buttke.³

23 Q5. Are you aware of any academic evidence related to the question of bias in interest
24 rate forecasts?

25 A5. While Mr. Thygesen relies on a narrow sample to assert that Consensus Forecasts
26 consistently over-predicts actual government bond yields, academic analyses of
27 economic forecasts of government bond yields more generally have found that any

³ Rebuttal Evidence of Mr. Robert Buttke (“Buttke Rebuttal”), Section III.

1 “bias” in forecasts is not consistently upward or downward, but rather towards the
2 status quo. In other words, economic forecasters place too much weight on yields
3 prevailing at the time they are predicting future yields. Under the “status quo bias”
4 hypothesis, forecasts will tend to over-predict actual yields when yields are
5 decreasing (as they have done recently) and under-predict yields when yields are
6 increasing. In a study published in the *Journal of Applied Finance and Banking*,
7 Gubdaydullina, Hein, and Spiwoks studied forecasts of interest rates from the
8 Consensus Forecasts surveys for 12 industrial countries from 1989 to 2009—a much
9 larger sample than that used by Mr. Thygesen. They found that, on average, the
10 forecasted *change* in interest rates was much smaller than the eventual realized
11 change. In other words, the forecasts were too close to the prevailing interest rate at
12 the time the forecast was made.⁴ Put differently, they did not find a systematic
13 upward or downward bias, but rather that forecasts systematically under estimated the
14 pace of change.

15 Federal Reserve Researchers Hafer and Hein found evidence of a similar pattern of
16 status-quo bias in the forecasting of U.S. T-Bills.⁵ Figure 1 reproduces a chart from
17 their paper comparing 3-month out forecasts of T-bill rates to the corresponding
18 actual rates during the period 1977-1987. The results showed that survey forecasts
19 (the dotted line in the figure) consistently “lagged” the actuals—under-predicting
20 when yields were rising and over-predicting when yields were falling.⁶ However,
21 there is not compelling evidence in the chart that the forecasts are nearly always too
22 high or nearly always too low.⁷

⁴ Gubaydullima, Hein, Spiwoks. “The status quo bias of bond market analysts.” *Journal of Applied Finance and Banking*. 1.1 (2011)

⁵ R.W. Hafer and S.E. Hein. “Comparing Futures and Survey Forecasts of Near-Term Treasury Bill Rates.” *Federal Reserve Bank of St. Louis Review*. May/June, (1989), 33-42 (“Hafer and Hein”).

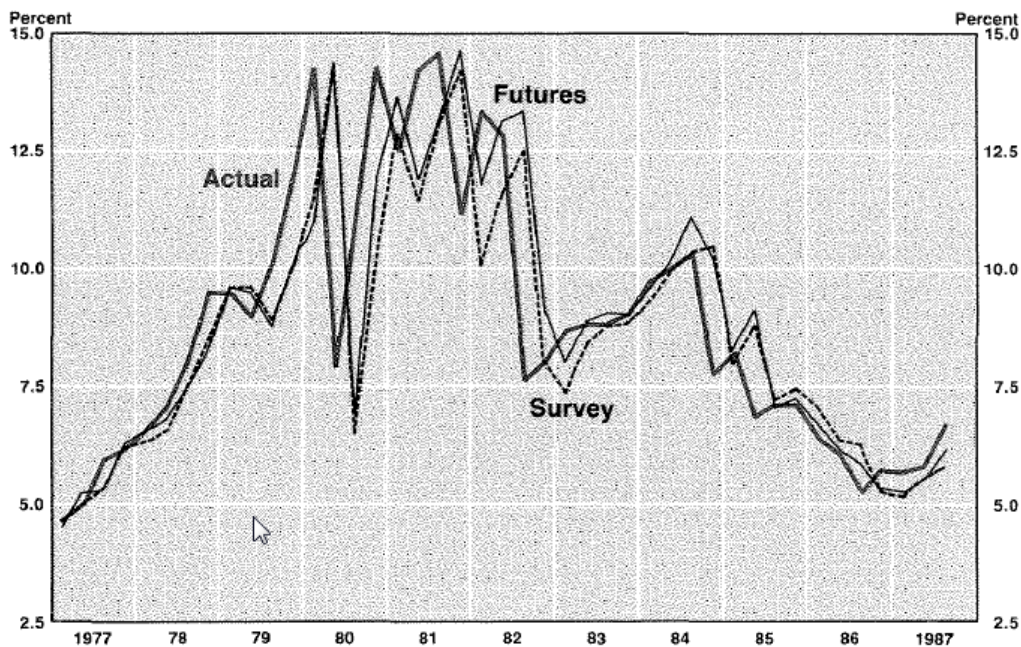
⁶ Note that the Hafer and Hein paper also evaluated exchange-traded interest rate futures contracts to see whether the collective expectations of market participants served as a more accurate predictor of eventual realized yields. As shown in Figure 1, the futures exhibited the same tendency to lag the actuals as the survey forecasts.

⁷ Note also that Hafer and Hein performed the same analysis for a six month forecast horizon, and found a similar pattern, with a longer lag, consistent with forecasters and futures markets placing too much weight on the status quo. See Figure 2 on p. 36 of Hafer and Hein.

Figure 1: Figure from “Comparing Futures and Survey Forecasts of Near-Term Treasury Bill Rates”

T-Bill, Futures and Survey Forecasts

Forecast Horizon: Three Months



Source: R.W. Hafer and S.E. Hein. “Comparing Futures and Survey Forecasts of Near-Term Treasury Bill Rates.”

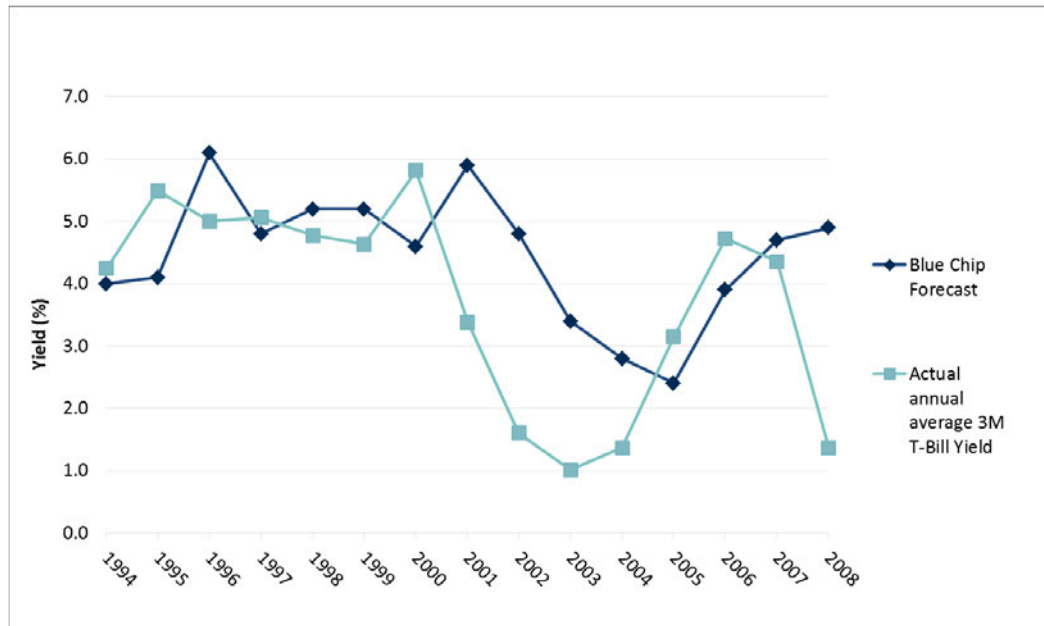
1 Q6. Have you investigated this hypothesis for any other periods?

2 A6. Yes. Further examination of economic survey forecasts for U.S. T-bill yields shows
3 additional support for the status-quo bias found by Hafer, Hein, Gubaydullima, and
4 Spiwox. Every month, Blue Chip Economic Indicators provides “consensus”
5 prediction of three-month U.S. T-bill yields for the upcoming year based on a survey
6 of economic forecasters. Figure 2 below shows forecasts that were made in March of
7 the prior year, as well as the averages of actual three-month U.S. T-bill yields over
8 the years being forecast.

9 The relationship between the forecasts and actual rates is consistent with the results of
10 the studies discussed above. Figure 2 shows that forecasters often would have been
11 correct had actual rates followed their trends up to the time of the forecast. For
12 example, in 1999, actual yields had been gradually but steadily declining for the last
13 five years. If that trend had continued in 2000, the Blue Chip forecast of 4.6 percent
14 would have been approximately correct. Instead, actual rates increased from 1999 to

1 2000, such that the 4.6 percent forecast significantly under-predicted the average
2 actual yields in 2000 (5.8 percent). Similarly, after rates had risen from 1999 to 2000,
3 forecasters predicted that rates would increase slightly in 2001, forecasting a three-
4 month T-bill yield of 5.9 percent. Instead, rates fell to an average of 3.39 percent in
5 2001, resulting in an over-prediction of average actual yields.

Figure 2: Blue Chip Forecasts of 3M T-Bill Yields vs. Actual 3M T-Bills



Sources: Blue Chip Economic Indicators and Federal Reserve Economic Database (“FRED”).
See BV Workpaper R01.

6 Q7. How is the empirical evidence on “status quo bias” relevant to this proceeding?

7 A7. Accounting for a less selective historical sample than the one Mr. Thygesen analyzed
8 reveals that forecasts of interest rates based on surveys of economic experts are not
9 systemically upwardly biased. Rather, Figure 1 and Figure 2 shows that forecast
10 errors go in both directions. Realized rates can be either over or under-forecasted,
11 depending on the current trend of interest rates. Periods of over-forecasting tend to
12 align with periods of decreasing interest rates, while periods of under-forecasting tend
13 to align with increasing interest rates. This suggests that when interest rates do rise
14 from their current low levels, the Commission should perhaps expect forecasters to
15 underestimate the rate of increase.

1 Mr. Thygesen’s results only show consistent over-prediction of Consensus Forecasts
2 bond yield forecasts as an artifact of the period he chose: one in which interest rates
3 Canadian government bond yields declined steadily (and at times steeply) following
4 the onset of the crisis.⁸ Therefore, I recommend the Commission place no weight on
5 Mr. Thygesen’s selective analysis and unsupported assertion that Consensus
6 Forecasts must be viewed as upwardly biased “until [it] routinely, or at least more
7 frequently starts under and over-forecasting rates.”⁹

8 Q8. What is your response to Mr. Thygesen’s and Dr. Booth’s assertions that forward
9 interest rates are better predictors of future bond yields than economic forecasts?

10 A8. Dr. Booth states that interpreting forward interest rates using “unbiased expectations
11 (UBE) theory” constitutes “a market interest rate forecast that has been more accurate
12 than the economic forecasters have for the last several years.”¹⁰ However, he
13 provides no support of any kind for his assertion that it has been more accurate.

14 Similarly, Mr. Thygesen asserts that interest rate “forecasts” based on the forward
15 curve have recently been more accurate (“less biased” in his opinion) than Consensus
16 Forecasts.¹¹ However, his sole evidence for this claim depends on three forward rates
17 that he “assumes” are for June 30 of 2015; he subtracts a term premium from these
18 rates and compares to the actual 10-year bond yield for that month.¹² Clearly, it is
19 impossible to draw statistically meaningful conclusions based on a sample of three
20 data points, especially when they all relate to the same “actual” date.

21 I also note that the paper by Hafer and Hein found that “the accuracy of the six-
22 month-ahead futures and survey forecasts is comparable”¹³ and goes on to conclude

⁸ See Figure 2 in my Written Evidence. Also note in Figure 2 above the substantial over-prediction by Blue Chip of T-bill rates in 2008, reflecting the unanticipated on-set of the financial crisis: this is the *start* of the period sampled by Mr. Thygesen.

⁹ Thygesen Evidence, paragraph 14.

¹⁰ Booth CAPP Evidence, paragraph 57.

¹¹ Thygesen Evidence, paragraphs 7-8.

¹² *Ibid.*, paragraphs 5-6 and table on page 6.

¹³ Hafer and Hein, p. 37.

1 that the results “generally support the perception that forecasts are unbiased
2 predictors of future rates,” and that “futures market forecasts of near-term interest rate
3 usually are as accurate as those produced by professional forecasters.”¹⁴ However, the
4 authors are careful to contrast exchange-traded *futures* with forward interest rates,
5 stating

6 This conclusion about market efficiency contrasts sharply with that found for
7 the forward market. Previous evidence has shown that the Treasury bill
8 forward rate does not incorporate all of the information contained in the same
9 survey considered here. Such a conclusion, along with the evidence
10 presented in this paper, is consistent with the belief that there is a time
11 varying premium in the forward rate that apparently is absent in the Treasury
12 bill futures rate.¹⁵

13 Mr. Thygesen has provided no evidence that contradicts this academic finding. In my
14 opinion, therefore, Mr. Thygesen’s statements about forward rates deserve no weight.

15 Q9. What is your reaction to Mr. Thygesen’s and Dr. Booth’s views on how long-term
16 interest rates are determined and likelihood of those rates remaining low?

17 A9. Mr. Thygesen and Dr. Booth both express the view that interest rates and government
18 bond yields are likely to remain at or near their current levels in the near term.¹⁶
19 However, their stated reasons for holding this belief are diametrically opposed. Dr.
20 Booth argues that the actions of central banks are paramount in determining the level
21 of interest rates:

22 What is important to note is that interest rates are not, and probably will not,
23 for the foreseeable future, be set by private investors. Instead, they are being
24 set by what has been termed the “global policy maker.”¹⁷

25 In contrast, Mr. Thygesen voices skepticism about the ability of central banks to “set”
26 rates:

27 It is not clear, given the low forecasts of Canadian GDP growth and low oil
28 prices that the Bank of Canada can raise interest rates. ... With Japan and

¹⁴ Hafer and Hein, p. 41.

¹⁵ *Ibid.*, p. 41.

¹⁶ Thygesen Evidence, paragraph 27; Booth CAPP Evidence, paragraph 61.

¹⁷ Booth CAPP Evidence, paragraph 56. See also the response to Booth-Utilities-2016Apr12-006.

1 Europe continuing to ease it is not clear if or whether the Federal Reserve
2 can raise interest rates. Although there has been ongoing speculation over the
3 past year about hiking rates the Federal Reserve only did so minimally when
4 it finally did increase rates.¹⁸

5 To summarize, Dr. Booth seems to be suggesting interest rates are unlikely to
6 increase because the “global policy maker” will maintain quantitative easing
7 programs and/or other accommodative monetary policies. Meanwhile, Mr.
8 Thygesen’s statements seems more consistent with the view that central banks are
9 *incapable* of pushing rates upward through tighter policy—rendered so by forces in
10 the global economy.

11 In my opinion, neither of these views is accurate with respect to how interest rates are
12 determined. Central banks certainly *do* influence interest rates, as Mr. Thygesen’s
13 quote of former Fed Chairman Bernanke confirms:

14 The Fed’s actions determine the money supply and thus short-term interest
15 rates; it has no choice but to set the short-term interest rate *somewhere*.¹⁹

16 However, as Mr. Buttke explains, long-term interest rates—while influenced by the
17 influence of central banks on short-term rates and the supply of financial assets—are
18 ultimately determined in the market.²⁰ I agree with Mr. Buttke that the U.S. Federal
19 Reserve likely will manage monetary policy and the disposition of assets accumulated
20 during its quantitative easing cycles in response to economic activity and capital
21 market conditions. As economic conditions improve, central banks (including the
22 Fed) most likely will move away from quantitative easing and accommodative
23 monetary policy. As a result, interest rates are likely to rise above their current low
24 levels.

25 I am not convinced that interest rates will remain permanently low, either because (as
26 Mr. Thygesen argues) central banks are powerless to raise them or (as Dr. Booth

18 Thygesen Evidence, paragraph 21.

19 Thygesen Evidence, paragraph 18, quoting Ben S. Bernanke, March 30, 2015, “Why are interest rates so low?”

20 Buttke Rebuttal, Section III.

1 argues) because the they will act to keep them so. As I stated in response to CCA's
2 information request,

3 The prevailing yields on government bonds at a particular moment in time ...
4 represent the cost of risk-free debt at that moment. However, it is possible for
5 current yields on government bonds to underestimate (or overestimate) the
6 cost of risk-free borrowing in the future. This will be true if currently
7 prevailing market forces and/or monetary policies enacted by central banks
8 are not expected to prevail in the future.²¹

9 As Mr. Buttke explains in his Rebuttal Evidence, the current low interest rates are the
10 result of unprecedented actions by global policy makers interacting with investor
11 sentiment in global and North American capital markets.²² I agree with Mr. Buttke
12 that these policies and conditions are not likely to persist indefinitely. In this context
13 it is not surprising that—as *all* experts in this case acknowledge—Canadian interest
14 rates and long-term bond yields are forecast to rise above their current levels in the
15 near term.

16 Q10. Do you have other evidence to present concerning factors that can influence long-
17 term interest rates that would suggest that interest rates are likely to increase in the
18 near term?

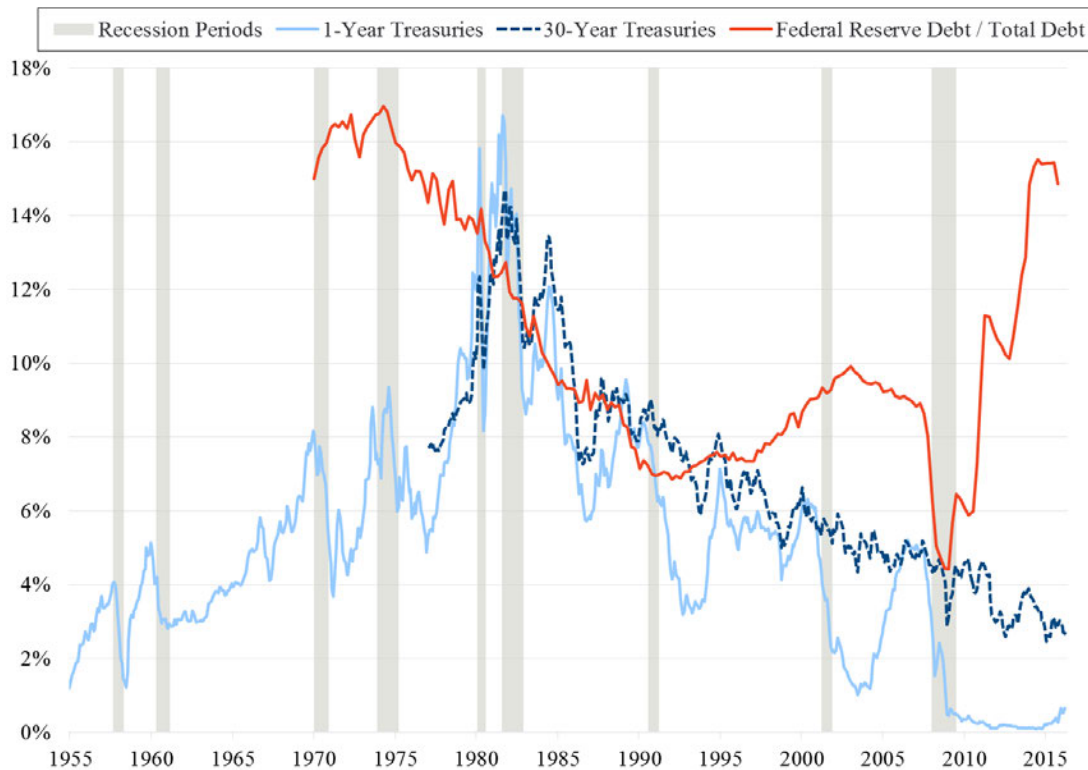
19 A10. I believe that our relative position in the business cycle after a recession and the
20 expectation that central bank holdings of debt will begin to decrease both are factors
21 that suggest interest rates will increase. Figure 3 below shows a time series of U.S.
22 interest rates overlaid on a timescale illustrating recessionary periods (shaded), as
23 well as the ratio of Federal Reserve Debt to Total Debt for the United States from
24 1995 to the present. Figure 3 shows that interest rates tend to decrease during a
25 recession and during the early part of the ensuing recovery, but then begin to rise
26 again. This is evident to different degrees for all of the recessions shown below,
27 except for the most recent recession following the global financial crisis in 2008 and
28 2009. During the long, slow recovery from this recession, rates have remained

²¹ Response to information request CCA-Villadsen-2016FEB18-002 (b). This is the same response that Mr. Thygesen quoted selectively in paragraph 17 of his Evidence.

²² Buttke Rebuttal Evidence, Section III.

1 depressed for longer than is usually the case. However, for all the economic
2 expansions pictured in Figure 3, interest rates have never failed to rise above their
3 “trough” prior to the next recession. While there is no guarantee the current recovery
4 will hold to form, I believe the historical pattern indicates that an interest rates will
5 begin to rise as the economy strengthens.

Figure 3: U.S. Government Interest Rates and U.S. Federal Reserve Debt Holdings as Share of Total Debt



Source: Federal Reserve Economic Database (FRED). See BV Workpaper R02.

6 One reason that U.S. interest rates have not increased following the 2008-2009
7 recession is the Federal Reserve’s quantitative easing programs and investors’
8 expectations regarding the impact on interest rates. From late 2008 to late 2014, the
9 Fed purchased unprecedented numbers of Treasury bonds and other financial assets
10 (including agency mortgage backed securities and other assets not traditionally
11 utilized for monetary policy) in order to keep interest rates low. The concentration of
12 government debt on the Federal Reserve’s balance sheet can be seen by the red line
13 on the chart that shows the Federal Reserve’s share of government debt jumping from

1 4 percent during the recession to over 15 percent. However, it is evident from the
2 right-most portion of the graph that the central bank's share of U.S. government debt
3 has begun to decline. As the Fed's influence on Treasury bond markets decreases,
4 yields are likely to rise.

5 Q11. Please summarize your conclusions regarding interest rates and bond yields.

6 A11. I do not believe that either Dr. Booth or Mr. Thygesen has presented any evidence
7 that Consensus Forecasts is a systematically upward biased predictor of future bond
8 yields, or that forward interest rates provide more accurate forecasts of those yields.
9 Neither Mr. Thygesen's reason for permanently lower rates due to the inability of
10 national banks to raise them nor Dr. Booth's contrasting view that national banks will
11 keep them lower than in the past is convincing. Ultimately, Dr. Booth, Dr. Cleary,
12 and Mr. Thygesen acknowledge that Canadian interest rates and long-term bond
13 yields are forecast to rise above their current levels in the near term.²³

14 **2. Mr. Thygesen's Comments on Negative Returns**

15 Q12. What is your reaction to Mr. Thygesen's statements regarding realized versus
16 expected stock market returns?

17 A12. Mr. Thygesen dedicates an entire section of his testimony (Section 6, entitled
18 "Continuously high forecast returns") to a disjointed and conceptually flawed
19 challenge to the fundamental notion that allowed returns should compensate for
20 expected returns based on the observation that ex-post actual stock market returns are
21 sometimes negative:

22 One of the issues is that the utilities continuously forecast high expected
23 returns and that it is the expected returns which should be paid. The difficulty
24 is that there are substantial times when ex-post returns are low or negative as
25 the chart below [Exhibit 82 of Mr. Hevert's Evidence] illustrates.

²³ Booth Evidence, p. 25, Cleary Evidence, p. 21; Thygesen Evidence pp. 7-8.

1 Mr. Thygesen’s argument displays fundamental misconceptions about what
2 determines the opportunity cost of capital and how capital markets respond to
3 investment decisions.

4 Q13. What is the first misconception in Mr. Thygesen’s argument?

5 A13. The central misconception at the heart of Mr. Thygesen’s argument is his mistaken
6 belief that ex-post realized stock returns should influence cost of capital estimation—
7 a belief for which he provides no support in the form of academic, empirical, or
8 practitioner evidence.

9 Fundamentally, the cost of capital represents an opportunity cost for investors; by
10 undertaking one particular investment, the investor foregoes the return they might
11 earn on some other investment of equivalent risk. At the time of the investment,
12 however, the returns (and risks) of such foregone opportunities are unknown. The
13 cost of capital therefore represents the *expected* return that a rational investor would
14 require to make them indifferent between investments that are *expected* to have
15 equivalent risk profiles.

16 Clearly, it is impossible to ever “know” these expectations. (Indeed, estimating them
17 is a major goal of this proceeding.) And importantly—as articulated above in the
18 context of interest rate forecasts—ex post realized returns are only point observations
19 from the distribution of outcomes that were possible at the time of the investment.
20 They will at times be lower and at other times higher than was expected ex ante. It is
21 therefore inappropriate to judge ex-ante expected returns based on a few observations
22 of ex-post returns.²⁴

²⁴ I note that it *can* be appropriate to consider *averages* of many ex-post realized returns over a long period. For example, this is how “unconditional” or “historical” estimates of the market equity risk premium are developed based on averages of realized annual ex-post returns—some high, some low or even negative—over the longest period of available high quality data.

1 Q14. How does Mr. Thygesen reveal this misconception?

2 A14. When asked an information request on the use of realized returns to judge expected
3 returns, I explained the concept via the analogy of a fair coin—pointing out that
4 though any given “trial” of 10 coin flips may result in more or fewer than 5 instances
5 of heads, that does not suggest that “5” is not the ex-ante expected value of the
6 experiment²⁵ Mr. Thygesen responded as follows:

7 The difficulty I have with the analogy is that it is a mechanical analogy. An
8 unbiased coin is not predictable so the [sic] Dr. Villadsen’s analogy is not
9 relevant to the utilities. Returns are different. There is generally a lower limit
10 to returns as infinite negative returns means a company goes bankrupt.
11 Infinite positive returns are similarly not positive. This is different from the
12 coin analogy in that infinite heads are possible albeit unlikely.

13 Secondly, there is no reason to change ones expectations on coin flips since
14 no variable change in the coin flipping environment. However in the
15 investment world things are continually changing.²⁶

16 Mr. Thygesen’s response entirely misses the point of the analogy. I did not suggest
17 that the stock market is like a fair coin in that the expected result never changes.
18 Rather, I explained that—as with a fair coin—it is not reasonable to judge ex-ante
19 expected stock returns based on a few ex-post observations of realized returns.

20 Mr. Thygesen states that “it is not [his] position that investment returns are
21 predictable.”²⁷ However, his evidence seems to contradict this:

22 With the S&P at or near record levels, it is difficult to see how forward
23 looking returns can be at the high end of the spectrum. Just as the return on a
24 bond is the inverse of the price (i.e., the higher the bond price, the lower the
25 return on the bond), so too, all else being equal a generally higher overall
26 stock market index should result in a lower future return.²⁸

27 This statement implies that Mr. Thygesen believes the stock market is “generally high
28 overall” and that returns will therefore be low (or negative?) going forward. The
29 implication of this statement is problematic, since high (or low) index levels—

²⁵ Response to information request CCA-Villadsen-2016FEB18-001 (d).

²⁶ Thygesen Evidence, paragraphs 75-76.

²⁷ Response to IR CCA-Utilities-2016 Apr 28-013(b).

²⁸ *Ibid.*, paragraph 73

1 resulting from past positive (or negative) returns—have been found not to have
2 predictive power over future returns.²⁹ To illustrate the point, Mr. Thygesen could
3 have noted at the start of 2013 that the S&P 500 was “at or near record levels.”
4 Presumably, he believed at that time—consistent with his statement above—that
5 returns would be low (or negative) going forward. However, the S&P500 index has
6 continued to earn positive returns since that time.³⁰

7 As Mr. Buttke has also noted, Mr. Thygesen makes an improper comparison of the
8 stock market to the mechanical relationship between the price of a bond and its yield
9 to maturity.³¹ The yield to maturity is perfectly predictable, since the face value of the
10 bond is known. By contrast, although Mr. Thygesen seems to disagree, financial
11 economics has shown that stock returns cannot be predicted based on the level of
12 current or past prices.³²

13 Q15. What is the second misconception in Mr. Thygesen’s argument?

14 A15. Mr. Thygesen manipulates my fair coin analogy into a straw man, stating

15 [T]here is no reason to change ones [sic] expectations on coin flips since no
16 variable [sic] change in the coin flipping environment. However, in the
17 investment world things are continually changing. ... Against this backdrop
18 one would not expect investors to continue to have the same expectations
19 year in and year out.³³

²⁹ See, for example, 2012 Ibbotson SBBI Valuation Yearbook, p. 58: “[T]here is no discernable pattern in the realized equity risk premium—it is virtually impossible to forecast next year’s realized risk premium based on the premium of the previous year.”

³⁰ See the chart in CCA’s response to IR CCA-Utilities-2016 Apr 28-013(a)

³¹ Buttke Evidence, Section IV.

³² See for example: Brealey, R. Myers, S., & Allen, F. (2008), *Principles of Corporate Finance* (9th ed.), pp. 355-359; Bodie, Z., Kane, A., & Marcus, A. (2011), *Investments* (9th ed.), pp. 343-345; Ross, S., Westerfield, R., Jaffe, J., & Roberts, G. (2003), *Corporate Finance* (3rd Canadian ed.), pp.364-67, 370-71; Booth, L. & Cleary, W.S. (2008), *Introduction to Corporate Finance*, pp. 390-391.

Note that the observation that stock returns are not predictable based on past prices is often called “weak form market efficiency,” and as cited by many textbooks was first documented in the seminal paper “The Analysis of Economic Time Series, Part I: Prices,” *Journal of Royal Statistical Society* 96 (1953).

³³ Thygesen Evidence, paragraph 76.

1 Though this statement is true, it is also totally irrelevant, as I have neither stated nor
2 suggested that investors have “the same expectations year in and year out.” More to
3 the point, however, the fact that investors *do* modify their expectations in response to
4 changing economic and capital market conditions undermines Mr. Thygesen’s entire
5 argument. As Mr. Thygesen acknowledges, investors *act* on changing expectations by
6 changing their investment decisions.³⁴ If they perceive an asset as offering a
7 particularly attractive return, demand for that asset will increase, causing its price to
8 rise. Conversely, if investors (in aggregate) expect an investment asset to lose value,
9 they will sell (or decline to buy) that asset, thereby causing its price to decrease until
10 it offers an attractive *expected* return. It is by this price-feedback mechanism that
11 stock markets reach equilibrium—an equilibrium at which stocks are priced so as to
12 return a *positive* risk-adjusted required return *in expectation*.

13 Q16. What about Mr. Thygesen’s discussion of negative interest rates?

14 A16. Mr. Thygesen makes much of the existence of central bank interest rates and
15 sovereign debt yields that are below zero in nominal terms.³⁵ He states that \$7 trillion
16 has been invested in negative-yielding debt instruments in Europe and elsewhere—a
17 fact that seems much less impressive when one recognizes that this constitutes
18 roughly 1 percent of the global pool of investment capital.³⁶ In emphasizing this
19 point, Mr. Thygesen misleadingly decontextualizes my response to an information
20 request that—based on its preamble—clearly referred to stock market returns. The
21 full text of my response to the question “If there is never a period when forecast
22 returns are negative, how do expected returns deal with or account for the actual
23 negative returns?”³⁷ was

³⁴ CCA response to IR CCA-Utilities-2016 Apr 28-013(d)

³⁵ Thygesen Evidence, paragraphs 78 – 83.

³⁶ See the 2012 Bain & Company report “A World Awash in Money: Capital Trends Through 2020”, which estimated that the amount of “total financial assets”—defined as “financial holdings of direct owners, as well as financial assets controlled by and held on the balance sheet of banks and other financial intermediaries”—in 2010 was approximately \$600 trillion.

³⁷ Information request CCA-Villadsen-2016FEB18-00 (b).

1 Dr. Villadsen does not accept that investors expect a negative return as
2 investors most likely would hold cash rather than assets with an expected
3 negative return. However, to be responsive, Dr. Villadsen observes that in a
4 cost of capital context, the terms “expect”, “expected”, and “expectation” are
5 used in the statistical sense: to imply a probability weighted average of all
6 possible outcomes. For example, when flipping a fair coin 10 times, one
7 would expect to record 5 heads. However, in conducting this experiment, one
8 might actual observe (or realize) any number of heads between 0 and 10. The
9 fact that some ex-post realizations of this experiment result in observations of
10 2, or 3, or 7, or even 10 heads instead of 5 does not mean that the ex-ante
11 expected value was something other than 5 heads out of 10. Similarly, the
12 fact that ex-post realized stock market returns in some periods were negative
13 does not necessarily mean that the ex-ante expected returns for those periods
14 were negative. In a cost of capital context, the realized market equity risk
15 premium has been positive in most years but certainly has been negative in
16 some years (e.g., 2008). **However, that does not mean that the expected
17 market equity risk premium is negative.** [Emphasis added]

18 Contrary to Mr. Thygesen’s unsupported assertion, I have no “concern”³⁸ about the
19 existence of negative central bank interest rates or short-term sovereign debt yields.
20 While such rates are largely unprecedented and provide further evidence of the
21 lingering impact of the financial crisis, the existence of negative interest rates on
22 European and Japanese sovereign debt definitely does *not* constitute evidence that
23 investors in North American *equities* expect negative returns from the stock market.

24 First of all, Mr. Thygesen has presented no evidence that negative interest rates exist
25 in North American markets. Second, his own graphs indicate that negative interest
26 rates are for terms far shorter than 30 years. Third, the Bloomberg “quick takes”
27 article cited by Mr. Thygesen itself acknowledges that it is mostly banks and other
28 large institutions—not retail investors—that are accepting the negative interest
29 rates.³⁹

30 These facts reveal Mr. Thygesen’s discussion of negative interest rates to be nothing
31 more than a straw man and a distraction. Even Mr. Thygesen must think so, since he
32 ultimately selects both a *positive* risk-free rate and a *positive* market equity risk
33 premium for his implementation of the CAPM. Though his process for selecting

³⁸ Thygesen Evidence, paragraph 82.

³⁹ <http://www.bloombergview.com/quicktake/negative-interest-rates>

1 CAPM parameters (i.e., “[u]sing the same factors as Decision 2191-D01-2015) shows
2 no consideration for current capital market conditions or expectations, it at least
3 reveals that Mr. Thygesen does not himself believe that “expected returns [should]
4 deal with or account for ... actual negative returns?”

5 Q17. Why would investors buy bonds with negative yields?

6 A17. A recent article in *The Economist* does an excellent job of summarizing the reasons,
7 which it groups into three categories:⁴⁰

- 8 • Some investors, such as central banks, commercial banks, insurance
9 companies, and pension funds *have* to own sovereign debt for various
10 practical and legal reasons that are independent of the expected return.
- 11 • Other investors *do* expect to earn positive returns on the debt of
12 foreign sovereigns despite the negative stated yields, due to currency
13 movements. Investors expecting price *deflation* might also expect a
14 positive real return from the negative yielding bonds.
- 15 • Finally, some negative yield bond purchasers fall into the category of
16 “anxious investors who prefer a small loss on government bonds to a
17 much bigger loss elsewhere.” As *The Economist* puts it, “[f]ear makes
18 government bonds appear a haven from turmoil, even when their
19 return is negative.”

20 In his response to an information request from the Commission, Mr. Thygesen
21 acknowledged several of these reasons, including the last one, noting that investors
22 might purchase negative yield bonds if their expectations for the economy are such
23 that “a return of capital rather than a return on capital is considered more
24 important.”⁴¹

25 Based on this explanation, the fact that there is demand for negative yielding
26 sovereign bonds suggests elevated risk aversion in capital markets, so that investors
27 required risk-premiums are also elevated.

⁴⁰ <http://www.economist.com/blogs/economist-explains/2016/02/economist-explains-6>

⁴¹ Mr. Thygesen’s response to IR CCA-AUC-2016APR28-005.

1 **3. Risk Premiums and Yield Spreads**

2 Q18. What is your opinion of Dr. Booth's estimate of the market equity risk premium?

3 A18. Dr. Booth estimates the market risk premium of common equities over long-term
4 Canada bonds at 5.0-6.0 percent.⁴² Dr. Booth claims that the "simple historic
5 Canadian market risk premium" is less than 5.0 percent. However, Duff & Phelps
6 indicates the historical average since 1935 is 5.7 percent,⁴³ while the survey evidence
7 cited by Dr. Booth reports an average Canadian market risk premium of 5.9 percent.⁴⁴

8 Dr. Booth mentions that Duff & Phelps 2016 Valuation Yearbook recently increased
9 its recommended market equity risk premium of 5.5 percent relative to a 4.0 percent
10 normalized bond yield.⁴⁵ He comments that this is "bang in the middle of [his]
11 normal range of 5.0-6.0%," but fails to acknowledge that 5.5 percent market equity
12 risk premium relative to a 4.0 percent normalized risk-free rate implies a 9.5 percent
13 expected market return.⁴⁶

14 Dr. Booth also cites a survey done by Professor Fernandez in 2008, which given the
15 timing of the global financial crises is arguably out-of-date for the current period.⁴⁷
16 Interestingly, the author of the survey cited by Dr. Booth no longer appears to find the
17 CAPM helpful as he recently authored an article entitled "CAPM: An Absurd
18 Model," which argues that

19 The CAPM is an absurd model because its assumptions and its
20 predictions/conclusions have no basis in the real world.⁴⁸

⁴² Booth CAPP Evidence, p. 46.

⁴³ *Duff and Phelps International Cost of Capital Handbook*, 2015, Exhibit 1-9.

⁴⁴ Booth CAPP Evidence, p. 48.

⁴⁵ Booth CAPP Evidence, paragraph 183, citing Duff & Phelps website:
<http://www.duffandphelps.com/insights/publications/cost-of-capital/duff-phelps-increases-recommended-us-equity-risk-premium-from-5-0-to-5-5>

⁴⁶ Duff & Phelps confirms this interpretation. See *Duff and Phelps 2016 Valuation Handbook Guide to Cost of Capital*, p. 3-40 and Exhibit 3.15.

⁴⁷ Booth CAPP Evidence, p. 47.

⁴⁸ Pablo Fernandez, "CAPM: An Absurd Model," IESE Business School, Spring 2015, p. 1.

1 Thus, Dr. Booth supports his market risk premium analysis in part based on a survey
2 conducted by an author who appears to not believe in the model for which he surveys
3 input parameters.

4 Q19. What do you think of Dr. Cleary's "commonly used" 4-6 percent range for the
5 Canadian MERP and his choice to use a 6 percent MERP?

6 A19. Dr. Cleary mentions a "commonly used" 4-6 percent range for the Canadian MERP
7 but provides inadequate justification for this being typical.⁴⁹ His first justification is a
8 long-term average of 5.3 percent for the Canadian MERP from Dimson, Marsh, and
9 Staunton.⁵⁰ This estimate is problematic because it uses data before 1936 when
10 Ibbotson suggests Canadian data is only high quality starting in 1936.⁵¹ The Duff and
11 Phelps publication I cite in my initial report looks at an MERP from 1935 to 2014,
12 effectively fixing these problems, and finds an estimate of 5.7 percent, towards the
13 upper end of Dr. Cleary's estimate.⁵²

14 Furthermore, Dr. Cleary explains in his evidence that market uncertainty is above
15 average, during which he says the MERP can be elevated. He accounts for this by
16 electing to use 6 percent instead of 5 percent for the MERP from his 4 to 6 percent
17 range. This adjustment is based on the premise that 4 to 6 percent is a reasonable
18 range for the Canadian MERP. It also does not attempt to estimate how much market
19 uncertainty currently exists. Evidence shows that MERPs for Canada have been
20 elevated very significantly since the global financial crisis and ensuing recession
21 beginning in 2008, ranging from 8 percent to over 12 percent.⁵³ This is far above Dr.
22 Cleary's estimates. Dr. Cleary does not explain in his evidence why a one percent
23 adjustment is appropriate and why a larger adjustment is not merited based on this
24 evidence.

⁴⁹ Cleary Evidence, page 36.

⁵⁰ Cleary Evidence, page 36.

⁵¹ See *Duff and Phelps International Cost of Capital Handbook, 2015*, pp. 3-9.

⁵² Villadsen Evidence, page 44.

⁵³ Villadsen Evidence, Figure 5.

1 Finally, given evidence that Canadian and U.S. capital markets are integrated, it
2 would also make sense to give weight to the U.S. MERP when assessing the
3 appropriate return investors would require. Dr. Cleary does not address this. The U.S.
4 MERP using a long-term historical average is about 7 percent and I provided
5 evidence in my initial report that it is also elevated.⁵⁴

6 Q20. What do you think of Dr. Cleary's claim that "double digit 'nominal' returns are no
7 longer the norm for stocks" going forward?

8 A20. Dr. Cleary says that his return on equity estimate is reasonable "when compared to
9 expected long-term overall stock market returns in the 7-9%, when we consider the
10 low-risk nature of regulated utilities."⁵⁵ He goes on to say

11 It is important to recognize that overall stock market conditions have
12 changed over the last three decades and double digit "nominal" returns are no
13 longer the norm for stocks, given existing 2% long-run inflation
14 expectations. In other words, long-term nominal stock returns in the 7-9%
15 range are consistent with experienced long-term real stock returns of 6-7%.⁵⁶

16 Dr. Cleary seems to be asserting that lower inflation in recent decades (and expected
17 going forward) has contributed to expected long-term real stock returns of 6-7 percent
18 and associated expected nominal stock market returns in the 7-9 percent range.
19 However, Dr. Cleary's own evidence undermines this point. With reference to Table
20 6 in his evidence, he cites average Canadian stock market returns of 11.3 percent
21 from 1938 to 2015,⁵⁷ with average inflation of 3.8 percent over the same period. This
22 is consistent with long-term arithmetic average real stock market returns of 7.5
23 percent, which would be consistent with a 9.5 percent expected nominal return given
24 2 percent inflation expectations. As both of these numbers are outside Dr. Cleary's
25 ranges of expected real and nominal returns, his own evidence leads to a higher
26 expected return than the 7-9 percent he states.

⁵⁴ Villadsen Evidence, page 25, Figure 6.

⁵⁵ Cleary Evidence, p. 3.

⁵⁶ *Ibid.*

⁵⁷ Note that Dr. Cleary's calculations in his Exhibit J are actually for the period 1938-2014.

1 Given Dr. Cleary’s argument that lower inflation has driven changes in stock market
2 conditions over the last three decades, the Utilities requested that he provide stock
3 return and inflation data for that period (1986-2015) and confirm that the Bank of
4 Canada has maintained an inflation target of 1-3 percent since the 1990s. Dr. Cleary
5 complied, indicating that the 1-3 percent inflation target took effect in 1991 and
6 noting that the “[Canadian] CPI has averaged 1.98% since 1992.”⁵⁸ The data provided
7 by Dr. Cleary reveals that inflation did in fact decline noticeably from 1986-1991 to
8 1992, such that the average inflation since that time was in line with the “2% inflation
9 expectations” he relies on. I note, however, that according to the data provided by Dr.
10 Cleary, the average nominal stock return for 1992-2015 was 9.5 percent,
11 corresponding to average real returns of 7.5 percent.⁵⁹

12 Thus, using the low inflation period since the implementation of the Bank of
13 Canada’s 1-3 percent inflation target as a basis for expected returns yields an
14 expected nominal return of 9.5 percent, which again is higher than the range cited by
15 Dr. Cleary.

16 Q21. Is it your position that investors expect real returns of 7.5 percent and nominal returns
17 of 9.5 percent going forward?

18 A21. No. I merely bring up these historical averages to highlight that Dr. Cleary’s
19 argument is internally inconsistent and not supported by his own analysis.

20 While the long-term historical average Canadian stock returns cited by Dr. Cleary are
21 not totally inconsistent with the unconditional (historical) Canadian MERP estimate
22 of 5.7 percent calculated by Duff & Phelps that I rely on in my CAPM analysis, they
23 do not reflect elevated levels of risk aversion currently affecting financial markets.
24 This is why I also consider forward-looking estimates of the MERP and evidence

⁵⁸ IR response Cleary-Utilities-2016APR12-004(d).

⁵⁹ See BV Workpaper R03, with calculations based on Attachment A to Cleary-Utilities-004bc.

1 relating to elevated yield spreads in developing my CAPM inputs. The expected
2 market returns using the forecasted MERP is 10.6 percent.⁶⁰

3 Q22. What about Dr. Cleary's reporting of geometric mean historical results?

4 A22. While geometric means are useful for measuring historical performance (in the form
5 of compound annual returns), they are downward biased as estimates of expected
6 future returns. This is because they represent the average of a single ex-post
7 realization of the distribution of possible ex-ante expected returns, and as such do not
8 account for year-to-year variation around the expected value. Empirical evidence and
9 academic opinion supports the use of arithmetic averages (when using historical data)
10 or expectations (for forward-looking models) as the most appropriate forecasts of
11 expected returns.⁶¹ Additionally, the Commission and its predecessor, as well as Dr.
12 Booth, have recognized that near-term expected returns should be calculated on an
13 arithmetic rather than geometric basis.⁶² Therefore, Dr. Cleary's geometric averages
14 deserve no weight.

15 Q23. What are your comments on the evidence presented by Dr. Cleary on yield spreads
16 and debt yield levels for utility bonds?

17 A23. In my Written Evidence I argued that an increased spread between long-term A range
18 rated utility debt and government bond yields were evidence of elevated risk
19 premiums that affect the return on equity.⁶³ All of the intervenor experts acknowledge
20 that yield spreads have increased since the last GCOC proceeding in 2013. Dr. Cleary
21 shows in Figure 3 of his evidence that the spread has increased significantly since
22 2007. While he acknowledges this "slightly heightened risk aversion" and includes a

⁶⁰ See Villadsen Written Evidence, Sections III and IV.C, with input scenarios summarized in Figure 13, p. 50.

⁶¹ See for example, Morin, R.A., *New Regulatory Finance*, Public Utilities Report, Inc., 2006, Appendix 4A, which summarizes the theoretical, empirical, practical, and academic evidence on this issue. See also Duff & Phelps 2016 Valuation Handbook, p. 3-29 and footnotes 3.56 and 3.57.

⁶² See Alberta EUB Decision 2004-052, p. 19, AUC Decision 2191-D01-2015, paragraph 237. See also Booth CAPP Evidence, paragraphs 168 and 169.

⁶³ Villadsen Evidence, pages 19-21.

1 50 basis points adjustment for it in his max and best CAPM estimate,⁶⁴ he discounts it
2 by emphasizing that the cost of debt has decreased over this period and that “much of
3 this increased spread is due to liquidity problems.”⁶⁵ This argument is flawed and
4 inadequately supported.

5 First, the “level” of the cost of debt is irrelevant to this point; the spread is what is
6 relevant to assess risk premiums and their impact on estimating return on equity.
7 Second, while it is true that liquidity issues can increase yield spreads, Dr. Cleary
8 overstates its importance at the present time. The paper by Garcia and Yang that Dr.
9 Cleary cites was published in 2009 and the results apply *specifically to the credit*
10 *crisis of 2007-2008*, where it would be expected that liquidity issues to increase yields
11 spreads.⁶⁶ However, Dr. Cleary provides no evidence that these liquidity issues
12 continued after the paper was published in early 2009. There is no reason to believe
13 that substantial liquidity challenges exist in high quality utility debt markets in the
14 current economic environment. Rather, as I explained in Appendix B to my Written
15 Evidence,⁶⁷ the elevation in the yield spread is best explained in terms of elevated
16 risk aversion among investors, causing them to demand higher risk premiums when
17 purchasing riskier corporate bonds instead of risk-free government bonds. The higher
18 risk premium results in a higher cost of equity.

19 Q24. Is Dr. Cleary’s 50 basis point adjustment adequate to account for the increased risk
20 premiums indicated by the yield spread?

21 A24. No, a 50 basis point adjustment is too small to account for the almost full percentage
22 point of elevation in the yield spread. Indeed, even if one were to attribute less than
23 the full amount of the elevation to increased risk aversion, it would be necessary to
24 account for the low beta of corporate debt. For example, if the stock market on

⁶⁴ Cleary Evidence, pages 39-40.

⁶⁵ Cleary Evidence, page 39.

⁶⁶ A. Garcia and J. Yang, “Understanding Corporate Bond Spreads Using Credit Default Swaps,” Bank of Canada Review, Autumn 2009, page 30.

⁶⁷ Appendix B to the Written Evidence of Dr. Villadsen, pages 18-19.

1 average (beta of 1) is roughly 4 times riskier than A rated utility bonds (i.e., assuming
2 a conservatively very high beta of 0.25), then according to the risk-return relationship
3 posited by the CAPM, the elevation in the MERP would have to be 4 times the
4 portion of yield spread elevation attributable to increased risk aversion.⁶⁸

5 Q25. Does Dr. Booth provide a similar treatment of elevated yield spreads?

6 A25. Yes. In paragraph 138 of his CAPP Evidence, Dr. Booth estimates that the yield
7 spread between 30-year Canadian government bonds and equivalent maturity A range
8 rated utility bonds is “about 1.00% more than the typical average for the business
9 cycle.” This estimate of the yield spread elevation is slightly higher than my own.
10 However, Dr. Booth adds only 50 basis points to his CAPM estimates, which he
11 regards as “converting the CAPM into a conditional CAPM.”⁶⁹ He then notes that
12 “the credit spread adjustment of 0.50 percent is equivalent to increasing the market
13 risk premium by 1.00 percent at the mid-point of [his] beta range of 0.45-0.55.”⁷⁰

14 While Dr. Booth’s 1.0 percentage point adjustment to the MERP is higher than Dr.
15 Cleary’s 50 basis point adjustment, for the reasons stated above it is still too small to
16 adequately capture the elevated risk aversion and consequent elevated required risk
17 premiums implied by the elevated yield spread. Additionally, I will show below that
18 Dr. Booth’s 0.45-0.55 range for beta is unreliable and unreasonably low given more
19 recent market evidence. My initial Written Evidence showed that when betas are
20 appropriately measured, adjusted, and unlevered and relevered to account for the
21 impact of financial leverage, the range for β (beta) is nearer to 0.70-0.90, with the
22 Canadian sample at the upper end of that range. That means that even if a 1.0
23 percentage point adjustment to the MERP were adequate—which it is not—Dr.
24 Booth’s 50 basis point “conditional CAPM” adjustment is too low.

⁶⁸ *Ibid.*, page 19.

⁶⁹ Booth CAPP Evidence, paragraph 138.

⁷⁰ *Ibid.*, paragraph 140.

1 Q26. Is there other evidence that the required equity return is higher than in the past?

2 A26. Yes. As shown in the Buttke Evidence, the spread on preferred shares have widened
3 by 100-200 basis points since the release of the 2013 GCOC decision.⁷¹ Just as an
4 increase in the bond yield spread indicates an increase in the MERP, so does an
5 increase in the preferred spread. Bondholders receive payment ahead of preferred
6 shareholders, which in turn receive payment ahead of equity owners. This rank order
7 generally means that the risk premium that common equity shareholders require is
8 higher than that of preferred shareholders, which in turn is higher than that of the
9 bondholders.

10 It is possible to measure the spread between risk-free securities and utility bonds as
11 well as between risk-free securities and preferred but the required equity return has to
12 be estimated. Therefore, just like an increase in the spread between utility bond
13 yields and risk-free bond yields indicates that the required equity premium over risk-
14 free yield has increased so does an increase in the preferred spread. As discussed in
15 Appendix B to my written evidence the magnitude of the increase can be
16 approximated by the inverse of the beta on the instrument used as a proxy (increase in
17 MERP \approx (increase in preferred spread)/Preferred Beta).⁷² As the preferred beta
18 undoubtedly is less than the equity beta, the increase in the required equity return has
19 to be larger than the increase in the preferred spread, so 100-200 basis points is the
20 bare minimum, and likely an underestimate of the appropriate adjustment to the
21 MERP. For example, if the preferred beta were 0.4, then an increase of 100 - 200
22 basis points in the preferred spread would indicate an increase in the MERP of 250 -
23 500 basis points. Thus, if the equity beta is 0.65, the increase in the cost of equity is
24 162.5 to 325 basis points (0.65×250 and 0.65×500 , respectively).⁷³

25 As Mr. Buttke points out, in addition to an increase in the spread on preferred equity
26 issuance, non-bank preferred equity has since about September 2015 often been

⁷¹ Buttke Rebuttal Section VII.

⁷² See Villadsen Evidence, Appendix B, Section II.B.2, pp. 18-19 for a discussion in the context of the yield spread for corporate debt.

⁷³ See Villadsen Evidence, Appendix B, Section II.B.2.

1 issued with a dividend floor.⁷⁴ The presence of a floor reduces the downside risk for
2 preferred equity holders and indicates that regardless of developments in government
3 bond rates, preferred equity holders do not accept returns below a certain level.

4 **B. REGULATORY PRECEDENTS**

5 Q27. What issues does the Booth Evidence claim have been settled?

6 A27. The Booth Evidence states that a number of issues have been settled in prior decisions
7 by the Commission. Specifically, these issues pertain to (a) the interaction of the
8 Canadian and U.S. market, (b) the CAPM, (c) the DCF, (d) other estimation methods,
9 benchmarks or the implementation of the methods, (e) how capital structure is set,
10 and (f) flotation costs. Below I discuss these in turn except the flotation cost issue,
11 because all witnesses used 0.50 percent. Dr. Booth also comments on the precedents
12 regarding the similarities and differences in regulatory regime in Canada and the U.S.
13 This issue is addressed in Section III of Dr. Carpenter's rebuttal evidence.

14 **1. Interaction of Canadian and U.S. Markets**

15 Q28. What precedents does the Booth Evidence cite on the interaction of the Canadian and
16 U.S. markets?

17 A28. The Booth Evidence lists the following as a precedent:

18 The AUC decided that Alberta utilities largely finance within Canada and that
19 Canadian markets are partially segmented from those in the United States. (2009,
20 paragraph 130).⁷⁵

21 Looking at the cited paragraph, the Commission first acknowledges an increased
22 ability for Canadians to invest abroad and then a degree of home bias due to exchange
23 rate risk and tax differences between the two countries. The first point is consistent
24 with the data presented in Figure 7 of my written evidence, which shows an increase
25 in the direct investments by Canadians abroad and especially in North America. As
26 the Booth Evidence acknowledges:

⁷⁴ Buttke Rebuttal Section VII.

⁷⁵ Booth CAPP Evidence p. 7. The references in parentheses are to the Commission's Decision 2009-216.

1 The AUC decided that information on capital market returns on US utilities was
2 useful since investors do have alternatives; (2009, paragraph 136).⁷⁶

3 More to the point is the Commission statement in the same decision that

4 *Alberta regulated utilities must, on a risk-adjusted basis, compete for their*
5 *capital requirements with alternative investments of comparable risk across*
6 *North America. Therefore, U.S. information on U.S. utility returns is relevant to a*
7 *determination of the fair return for Alberta regulated utilities.* If Alberta utilities
8 must compete for investment across North America, the returns available to
9 investors must be competitive enough to attract capital in order to ensure their
10 financial integrity as a going concern.⁷⁷ [emphasis added]

11 Thus, past decisions indicate an acknowledgement that Alberta-based utilities
12 compete for capital across the border and increasingly so as the Canadian direct
13 investments abroad are increasing.

14 2. Model Specific Issues: CAPM and DCF

15 Q29. What CAPM issues do you address?

16 A29. I address following four topics: (i) reliance on the CAPM, (ii) how changes in credit
17 spreads are addressed, (iii) beta estimates, (iv) the applicability of the ECAPM.

18 Q30. Please address the reliance on the CAPM.

19 A30. The Booth CAPP Evidence states that the AUC has “confirmed that it felt [the
20 CAPM] was theoretically sound and a useful tool.”⁷⁸ While the statement regarding
21 the CAPM is accurate, it is also true that the Commission has recognized that “the
22 applicability of CAPM has limitations.” This recognition is consistent with the
23 academic literature, where substantial work has been dedicated to studying how well
24 the CAPM fits empirical data or deriving more elaborate models such as the Fama-
25 French model.⁷⁹

⁷⁶ Booth CAPP Evidence p. 7. The references in parentheses are to the Commission’s Decision 2009-216.

⁷⁷ Decision 2009-216, paragraph 135.

⁷⁸ Booth CAPP Evidence, p. 8 citing Decision 2191-D01-2015, paragraph 72.

⁷⁹ For a discussion of the pros and cons of the CAPM and alternatives, see, for example, Section IV.C of my written evidence discussing one such model: the Empirical CAPM.

1 The 2015 GCOC Decision further stated that

2 The Commission agrees with the view of Ms. McShane and the Alberta Utilities
3 that the *benchmark generic ROE should be established on the results of multiple*
4 *tests*, as “each of the tests has its own strengths and weaknesses” and “no single
5 test can pinpoint the fair return.”⁸⁰ [Emphasis added, footnotes omitted]

6 Thus, past decisions indicate that the Commission has looked to multiple tests – one
7 of which is the CAPM.

8 Q31. What does Dr. Booth claim is settled regarding credit spreads?

9 A31. The Booth CAPP Evidence states that “the AUC indicated that it would adjust the
10 market risk premium for changes in credit spreads etc. rather than directly adjust for
11 this separately.”⁸¹ The Commission statement was that

12 The Commission considers that it is preferable to base the risk-free estimate
13 on the observed and expected long-term government bond rates, and account
14 for any residual credit spread concerns by way of an adjustment to the MERP
15 estimate ...⁸²

16 Thus, the decision regarding adjustments to the MERP estimate is fairly broad. It is
17 important to recognize that credit spread concerns affect the MERP by a multiple of
18 the “residual credit spread.” As explained in Appendix B, pp. 18-19 of my written
19 evidence, a credit spread that is 0.80 percent above the norm would result in an
20 increase in the MERP of 0.80 percent divided by the bond beta (for example, $0.80\% /$
21 $.25 = 3.2\%$), which is substantially higher than the direct credit spread concern
22 (0.80%).

23 Q32. What do you address regarding beta estimates?

24 A32. The Booth CAPP Evidence states that the Commission did not accept adjusted betas
25 in its 2009 decision, but modified its position to accept a wider range in 2015.⁸³
26 Importantly, in Decision 2191-D01-2015, the Commission was mindful that:

⁸⁰ Decision 2191-D01-2015, paragraph 271.

⁸¹ Booth CAPP Evidence, p. 8 citing Decision 2191-D01-2015.

⁸² Decision 2191-D01-2015, paragraph 92.

⁸³ Booth CAPP Evidence p. 8.

1 ...betas calculated using historical data may be poor predictors of an
2 investor's required or expected return. The Commission also understands
3 that, as one possible solution to this problem, equity market practitioners may
4 use adjusted betas, which, according to some academic research, are better
5 predictors of returns than "raw" betas (i.e., betas calculated using historical
6 data).⁸⁴ [Footnotes omitted]

7 Based on the evidence in the 2013 Generic Cost of Capital proceeding, the
8 Commission accepted a range of beta estimates from 0.5 to 0.65.⁸⁵ Since the time that
9 evidence in the 2013 Generic Cost of Capital proceeding was developed, Canadian
10 utility betas have increased as evidenced by, for example, Figure 11 in my written
11 evidence.⁸⁶

12 Q33. Please comment on what Booth considers the precedents for ECAPM.

13 A33. The Booth Evidence cites the Commission's 2004 decision

14 the use of long-term Canada bond yields largely adjusts for the tendency of
15 CAPM, when based on short-term interest rates, to under estimate the
16 required returns for lower risk companies. Therefore, the Board will only
17 place limited weight on the results of the ECAPM model.⁸⁷

18 I searched the more recent decisions for 2009, 2011, and 2013 and found no reference
19 to the ECAPM, so the decision cited by the Booth Evidence pre-dates the financial
20 crisis and this Commission. Further, I note that the evidence presented in by initial
21 Written Evidence, Appendix B, Figure A-4 shows that the average ECAPM
22 adjustment factor is about 4 percent, so if the use of a long-term interest rate accounts
23 for about 1.7 percent (calculated as the difference between the long-term government
24 bond and the treasury bill yield),⁸⁸ then a residual ECAPM adjustment of
25 approximately 2.3 percent remains consistent when using the long-term government
26 bond. My ECAPM implementation uses an adjustment factor of 1.5 percent, which

⁸⁴ Decision 2191-D01-2015, paragraph 129.

⁸⁵ Decision 2191-D01-2015, paragraph 131.

⁸⁶ I note that Figure 11 in my written evidence tracks the betas of market value weighted averages of the utility companies in my sample and such that no one company is driving the results.

⁸⁷ Booth CAPP Evidence p. 9. Dr. Booth cites the Alberta Energy and Utilities Board's Decision 2004-052 p. 22.

⁸⁸ As of December 2015 the yield on Canadian long-term benchmark bonds was 2.2 percent, while yield on 3-month bills was 0.5 percent for a spread of 1.7 percent. Source: Bank of Canada.

1 well below the bounds indicated by research. Thus, even when I take the use of the
2 long-term bond yield into account, my adjustment is consistent with the factor found
3 in empirical research and therefore conservative.

4 Q34. Which precedents does the Booth Evidence claim for DCF estimates?

5 A34. The Booth Evidence first comments that the Commission in Decision 2009-216 found
6 estimates from only two Canadian utilities and U.S. multi-stage estimates useful, but
7 acknowledges that Decision 2191-D01-2015 was “broader in accepting a variety of
8 growth estimates,” while “being mindful of analysts optimism” and “that long run
9 growth rates equal to GDP may be ambitious.”⁸⁹

10 Q35. What comments do you have on these statements?

11 A35. First, back in 2009, the Commission was “concerned that many of the proxy
12 companies used by the experts in their DCF analyses are holding companies that are
13 engaged in significant unregulated activities and is also concerned with the potential
14 upward bias in analysts’ growth estimates.”⁹⁰ Importantly, some of the DCF results
15 discussed in 2009 were based on **all** *Value Line* electric or natural gas companies,
16 which include a mix of highly regulated and less regulated companies, whereas the
17 DCF results in my written evidence arise from a group of companies that are selected
18 to be highly regulated. Second, in its most recent decision, the Commission discussed
19 the use of forward looking analysts’ growth rates and historic (sustainable) growth
20 rates and concluded that

21 each method described by the various experts presents with its own mixture
22 of strengths and weaknesses. For example, analysts’ forecasts of growth rates
23 are forward-looking and aim to expressly account for events expected in the
24 future.⁹¹

⁸⁹ Booth CAPP Evidence p. 8. Dr. Booth cites Decision 2009-216 paragraph 273 and Decision 2191-D01-2016 paragraphs 180 and 41.

⁹⁰ Decision 2009-216, paragraph 269.

⁹¹ Decision 2191-D01-2015, paragraph 180.

1 Consequently, the Commission considered both estimation methods.⁹² Third, in its
2 concern that analysts' forecasts might be too optimistic, the Commission cited Dr.
3 Booth's evidence, which in turn cited only one academic paper dating back to 2007.⁹³
4 Much research has been undertaken on analysts' forecasts since then and, as I noted
5 in the appendix to my written evidence, some recent research indicates that analysts'
6 bias may be a problem of the past or specific to stocks that are difficult to value, have
7 high volatility, or are generally less transparent.⁹⁴ These are not characteristics of
8 utilities. Therefore, it is important to recognize the nuances across industries and
9 analysts regarding concerns about optimistic forecasts. Section III.B below provides a
10 summary of more recent research into whether analyst forecasts display bias.

11 **3. Other Estimation Methods**

12 Q36. What other "settled issues" do you discuss?

13 A36. Dr. Booth lists that (i) a forward looking estimate of the stock market return was
14 useful, so that the DCF estimates for the market as a whole of 8.0-9.0 percent could
15 be viewed as an upper bound on the utility ROE⁹⁵ (ii) the AltaLink purchase indicated
16 the continuation of an ROE no higher than 8.75 percent,⁹⁶ (iii) pension forecasts of
17 equity returns were a valid indicator,⁹⁷ (iv) the value of the DCF based risk premium
18 test and historic based equity premium were not persuasive,⁹⁸ (v) no significant
19 weight was given to the bond-yield plus risk-premium approach,⁹⁹ (vi) the allowed
20 ROE from other Canadian regulators were relevant, but not those from foreign

⁹² *Ibid.*

⁹³ Decision 2191-D01-2015, footnote 229 cites to paragraphs 181-182 of Dr. Booth's Evidence for CAPP in that proceeding. Paragraphs 181-182 of the Booth Evidence cite only Easton and Summers, "Effect of Analyst's Optimism on Estimates of the Expected Rate of Return Implied by Earnings Forecasts," Journal of Accounting Research, 45-5, December 2007.

⁹⁴ Villadsen Evidence, Appendix B, pp. 28-29.

⁹⁵ Booth CAPP Evidence p. 8, citing the 2009 Decision Section 5.10 and the 2013 Decision paragraph 184.

⁹⁶ Booth CAPP Evidence p. 8, citing Decision 2011-474, paragraph 223.

⁹⁷ Booth CAPP Evidence p. 8, citing Decision 2004-052.

⁹⁸ Booth CAPP Evidence p. 8, citing Decision.

⁹⁹ Booth CAPP Evidence p. 8, citing Decision 2191-D01-2015.

1 jurisdictions.¹⁰⁰ I do not discuss the claim that (vii) the value of the DCF based risk
2 premium test and historic based equity premium were not persuasive¹⁰¹ or (viii)
3 comparable earnings are inconsistent with the fair return standard,^{102,103} because no
4 evidence using these methods has been put on the record.

5 First, based on the DCF evidence put forward in the 2013 GCOC, the Commission
6 found a return on the market of 9.0 percent and concluded that the

7 ROE estimates for the market as a whole may be viewed as the upper bound
8 of the fair ROE for regulated utilities, given that the average utility company
9 is typically less risky than the average company in the market.¹⁰⁴

10 Three aspects of this quote merits commentary. First, the estimates presented to the
11 Commission in the 2013 GCOC were based on the Gordon growth model, developed
12 in the 1950s,¹⁰⁵ which considers dividends only as a source of cash distributions to
13 shareholders. Recent evidence shows that cash distributions to S&P/TSX
14 shareholders come in the form of share buybacks that result in a buyback yield of
15 about 1.5 percent (see Figure 14), so that the Gordon growth model at the present
16 time underestimates the market return on equity by about 1.5 percent for this
17 reason.¹⁰⁶ In addition, I note that the Gordon growth model does take real option
18 value into account, so to the extent that shareholders consider option values, the
19 estimates are understated. Further, the S&P / TSX index in aggregate has an equity
20 percentage of about 58 percent¹⁰⁷ while Alberta-based utilities are deemed 36-42

¹⁰⁰ Booth CAPP Evidence p. 8, citing Decision 2011-474 and the Commission's July 13, 2013 letter.

¹⁰¹ Booth CAPP Evidence p. 8, citing Decision 2191-D01-2015, paragraphs 242 and 247.

¹⁰² Booth CAPP Evidence p. 8, citing the 2009 Decision, paragraph 281 and Appendix of the Commission's July 13, 2013 letter

¹⁰³ I did not file evidence using these methods.

¹⁰⁴ Decision 2191-D01-2015, paragraph 184.

¹⁰⁵ Myron J. Gordon, "Dividends, Earnings and Stock Prices," *Review of Economics and Statistics*, vol 41, 1959, pp. 99-105.

¹⁰⁶ See Section III.B below for a detailed discussion of this.

¹⁰⁷ Data for TSX members was downloaded and aggregated from S&P's Capital IQ. The equity percentage uses the market value of equity and the book value of debt, where debt is long-term debt and the current portion of long term debt. The S&P500 has a 77 percent equity percentage calculated in an analogous way. See BV Workpaper R04.

1 percent, so that they have substantially more financial risk. Therefore, the return on
2 the S&P/TSX and the Utilities' required return cannot directly be compared.

3 Second, in its consideration of the ROE indications of the AltaLink transaction, the
4 Commission was cautious stating that "an examination of a given company's P/B
5 ratio in isolation is unlikely to provide a foundation for definite conclusions regarding
6 the establishment of a specific ROE for regulatory purposes."¹⁰⁸

7 Further, in making the comments referenced by Dr. Booth, the Commission did not
8 conclude that 8.75 percent was an upper bound on the allowed ROE but rather that it
9 was one of several factors that gave the Commission comfort in its decision.¹⁰⁹ Thus,
10 it inaccurate to say the 8.75 percent was set as an upper bound due to the AltaLink
11 acquisition.

12 Third, while the Commission has found forecast pension returns on equity a valid
13 indication, the Commission has noted that such returns potentially are conservative
14 and that forecasts by pension fund managers tend to be rather conservative.¹¹⁰ I
15 discuss the use of pension fund returns and the forecasts of pension fund managers in
16 more detail in Section III.D.

17 Regarding the use of allowed returns in other jurisdictions, I observe the following.
18 As discussed in my written evidence pp. 59-60, the Commission has in past decisions
19 had concerns that evidence based on the allowed ROE in other jurisdictions (a) may
20 have occurred during a different interest environment or (b) that some of the
21 presented ROEs were the result of settlements.¹¹¹ Consequently, the data I presented
22 took the interest rate into effect and excluded settlements. I respectfully submit that
23 the data takes the Commission's concerns into account, are observable by investors

¹⁰⁸ Decision 2191-D01-2015, paragraph 221.

¹⁰⁹ Decision 2191-D01-2015, paragraph 222-223.

¹¹⁰ Decision 2191-D01-2015, paragraph 234.

¹¹¹ See, for example, Decision 2011-474, p. 20.

1 and inform their investment decisions. Therefore, the modified data explicitly
2 addresses the Commission's concerns.

3 **4. Deemed Capital Structure**

4 Q37. What do you address in this section?

5 A37. First, I address the discussion of how selected Canadian regulators have set equity
6 ratios.¹¹² Second, I address the misplaced use of prior decisions from 2004 and
7 2009.¹¹³ Third, I address Mr. Stauff's misunderstanding of how U.S. regulators set
8 capital structure.^{114,115}

9 Q38. Please discuss the use of selected Canadian regulators capital structure
10 determinations.

11 A38. Dr. Booth states that the Québec Régie "has not changed Gas Metro's common equity
12 ratio in recent memory" and that the British Columbia Utilities Commission (BCUC)
13 has concluded that "38.50% [equity] was within the upper end of the range for
14 comparators," yet the BCUC concluded that the 38.5 percent was "reasonable on a
15 comparative basis."¹¹⁶ Further, Gaz Métro Limited Partnership has a regulatory
16 capital structure of 38.5 percent, so that apparently the utility started at a higher level
17 than ATCO Gas, which currently has less equity at 38 percent. As is shown in
18 Workpaper 09 to the Villadsen Evidence the average and median equity percentage
19 among Canadian natural gas entities is 40.0 percent and 39.25 percent equity,
20 respectively.¹¹⁷ I note that the median ignores both high and low outliers and
21 therefore is not driven by any one company. Thus, if the equity ratio of ATCO Gas is

¹¹² Booth Calgary Evidence p. 11.

¹¹³ Booth Calgary Evidence p. 8.

¹¹⁴ Stauff Evidence p. 9.

¹¹⁵ As Dr. Booth does not appear to rely on his cite to AEUB decision U99099, I do not address the cite.
Booth Evidence p. 9.

¹¹⁶ Booth Calgary Evidence p. 11 and p. 12. See also BCUC, "Generic Cost of Capital Proceeding (Stage I): Decision," May 10, 2013, p. 54.

¹¹⁷ BV Workpaper 09 also shows that the average and median equity ratio for Canadian electric utilities is 38.5% and 40.0%, respectively.

1 compared to that of the average or median Canadian gas utility, it is currently slightly
2 below the average – just as the benchmark equity percentage is below the average in
3 Canada.¹¹⁸

4 Q39. What is misplaced in the use of the 2004 / 2009 decisions?

5 A39. Dr. Booth states that

6 the AUC noted that the approach it adopted in 2004 of “adopting a common
7 ROE and adjusting for differences in risk by adjusting capital structures
8 recognizes the impact of leverage on the cost of equity and adjusts for
9 differing investment risks.”¹¹⁹

10 Dr. Booth’s framing of the quotation fails to acknowledge that the 2004 decision
11 recognized that a “utility-specific adjustment to the common ROE” might be needed
12 in exceptional circumstances.¹²⁰

13 Regarding the statements of Mr. Stauff (p. 9, line 14-17), it is factually incorrect that
14 U.S. regulators “often determine utility capital structures to be used for rate-making
15 purposes by simply accepting whatever actual capital structure the utility in question
16 has, if it is publicly traded, or alternatively the actual capital structure of its nearest
17 publicly traded parent company.” U.S. regulators commonly use the regulated entity’s
18 actual capital structure – traded or not, but it is always part of the regulatory decision.

19 III. ESTIMATION METHODS

20 A. THE CAPM

21 Q40. What is your opinion of Dr. Cleary’s recommended range for a risk free rate between
22 2.0 percent and 2.6 percent?

23 A40. Dr. Cleary claims that he arrived at 2.0-2.6 percent as a reasonable range for the risk
24 free rate by following “the approach used by the Commission as described in
25 paragraph 93 of page 19 of its 2013 GCOC Decision.” However, Dr. Cleary uses a

¹¹⁸ Villadsen Evidence, Figure 21 and BV Workpaper 09.

¹¹⁹ Booth CAPP Evidence p. 9 citing Decision 2009-216 paragraph 217.

¹²⁰ Decision 2004-052, p. 14.

1 different method to calculate the lower bound of this range in 2016 than the method
2 used by the Commission in 2013. In 2013, the Commission accepted 2.8 percent to be
3 a reasonable lower bound estimate for the risk-free rate. Dr. Cleary estimated this
4 lower bound by taking an average of yields on 30-year Canadian government bonds
5 in 2013. In his evidence filed for the 2016 proceedings, Dr. Cleary uses the February
6 2016 yield on a 30-year Canadian government bond to arrive at a lower bound of 2.0
7 percent. Unlike in 2014, the 2016 GCOC proceeding will not be able to benefit from
8 perfect hindsight when determining a reasonable range for the risk free rate.
9 Therefore Dr. Cleary's estimation of the lower bound for the risk-free rate cannot be
10 entirely consistent with the method used by the Commission in 2013. It would be
11 more consistent with the Commission's method used in 2013 to estimate the lower
12 bound of the risk-free rate by calculating the average yield on a 30-year Canadian
13 government bond for 2015. Using this method results in an estimate of the lower
14 bound of 2.1 percent. This would shift the midpoint of Dr. Cleary's range for the risk
15 free rate from 2.3 percent to 2.4 percent.

16 Q41. What is your opinion on Dr. Cleary's CAPM estimate range, Dr. Cleary's final
17 estimate of 6 percent, and Dr. Booth's low estimates for the return on equity?

18 A41. Dr. Cleary recommends a range of 4.15 percent to 7.5 percent for the return on equity
19 based on the CAPM method, with a best estimate of 6.0 percent. The lower part of
20 Dr. Cleary's range does not reflect any risk premium over the cost of debt, which is
21 not only illogical but also inconsistent with Dr. Cleary's written evidence as Dr.
22 Cleary specifies in preparing his "Bond Yield Plus Risk Premium" estimates that
23 Canadian regulated utilities should have a risk premium over debt in the 2-3 percent
24 range, recommending a best estimate of 2.5 percent.¹²¹ Dr. Cleary also states that A
25 range rated Canadian utility yields currently sit at around 4 percent. This puts his best
26 estimate for the return on equity of 6 percent at a 2 percent premium over Canadian
27 utility debt yields, which is the lower bound of his appropriate range of risk

¹²¹ Cleary Evidence, page 55.

1 premium.¹²² Therefore, the lower half of his CAPM estimate range has a risk
 2 premium that is below what Dr. Cleary himself considers a suitable risk premium for
 3 equity over debt.

4 For example, Dr. Cleary’s minimum of his return on equity range from the CAPM
 5 method is 4.15 percent. As seen in my Written Evidence, yields for Canadian A and
 6 BBB-rated debt is 4.04 percent and 4.36 percent respectively. Dr. Cleary’s estimate
 7 represents no risk premium or even a negative risk premium over debt, which is
 8 implausible based on financial theory.

9 Dr. Booth also provides DCF estimates that are clearly unsupportable by financial
 10 theory in this way. In estimating the return on equity using the DCF method for
 11 individual entities, he adjusts his estimates to account for several perceived errors in
 12 the estimation methodology. However, his results for several companies fall at or
 13 very close to Canadian utility debt yields. As seen in Figure 5 below, the estimates for
 14 WGL, Piedmont, Northwest Natural Gas, and New Jersey Resources fall below the 2
 15 percent maturity premium recommended by Dr. Cleary. In addition, his estimate for
 16 Northwest Natural Gas has virtually no risk premium at all.

Figure 4: Comparison of Booth DCF Results to Canadian Utility Debt Yields

	ROE [a]	Debt Rating [b]	Canadian Utility Debt Yield [c]	Implied Risk Premium [d]
Booth DCF				
Vectren	7.49%	A-	4.04%	3.45%
WGL	5.82%	A+	4.04%	1.78%
Piedmont	4.64%	A	4.04%	0.60%
Northwest	4.07%	A+	4.04%	0.03%
New Jersey Resources	4.90%	A	4.04%	0.86%
Laclede	6.36%	A-	4.04%	2.32%
ATMOS	7.17%	A-	4.04%	3.13%
South West Gas	6.39%	BBB+	4.36%	2.03%

Note: See BV Workpaper R05 for sources and calculations.

¹²² Cleary Evidence, page 40.

1 Q42. What is your opinion on Dr. Booth and Dr. Cleary's recent monthly beta estimates in
2 context of the CAPM?

3 A42. Dr. Booth says that "In my 2014 testimony, I assessed the then 'recent' beta estimates
4 for Canadian and low risk US utilities at about 0.30. This assessment has not changed
5 materially since then."¹²³ Dr. Cleary, similarly, finds that recent data suggests betas
6 below 0.45 that he then uses to justify his lower bound on beta of 0.30.¹²⁴ The
7 monthly beta estimates of Dr. Booth and Dr. Cleary based on recent data do not
8 support their estimation range for betas of 0.45 to 0.55¹²⁵ or 0.65¹²⁶ they claim as
9 reasonable and are unrealistically low, leading to their reliance in large part on long-
10 term average historical betas. Dr. Booth estimates Canadian utility betas with a
11 variety of different index measures and averages of individual company measures,
12 none of which (other than those from Yahoo Finance) as of the end of 2015 reach his
13 lower bound of 0.45. At some points the betas included by Dr. Booth are below zero,
14 which would be entirely unreasonable.¹²⁷ Dr. Booth acknowledges this, arguing that
15 "[c]urrently, utility betas are very low, but that simply reflects their interest rate
16 sensitivity and the fact that their high dividends cause them to behave like convertible
17 bonds in weak markets."¹²⁸ He goes on to explain that the drop in utility betas after
18 the financial crisis is similar to the drop in utility betas in the early 2000s in that it is
19 driven by unusual market conditions.¹²⁹

20 Similarly, Dr. Cleary admits that "current betas are below the lower bound of this
21 [0.45 to 0.65] range."¹³⁰ In addition, Cleary's average estimate for beta for the
22 Canadian Utilities in February 2016 was on average about 0.20.¹³¹

¹²³ Booth CAPP Evidence, page 50.

¹²⁴ Cleary Evidence, pages 36, 38.

¹²⁵ Booth CAPP Evidence, page 57.

¹²⁶ Cleary Evidence, page 36.

¹²⁷ Booth CAPP Evidence, page 53.

¹²⁸ Booth CAPP Evidence, page 3.

¹²⁹ Booth CAPP Evidence, page 51.

¹³⁰ Cleary Evidence, page 36.

¹³¹ Cleary Evidence, page 38, Table 8.

1 Furthermore, these recent monthly beta estimates in the context of the CAPM lead to
 2 erroneous results. If Dr. Cleary and Dr. Booth used these monthly beta estimates
 3 with their minimum range assumptions for the risk-free rate, MRP, and spread
 4 adjustment, their results for the return on equity imply risk premiums over the yield
 5 on Canadian A and BBB-rated utility debt far less than 2.5 percent Cleary says is
 6 reasonable, if not being less than the return on debt altogether. Neither Dr. Cleary nor
 7 Dr. Booth attempt to reconcile the inconsistencies between their recommended cost of
 8 equity and their recent beta estimates.

Figure 5: CAPM ROE Estimates Using Intervener Inputs With Contemporaneous Beta Estimates

	Minimum Risk Free Rate	Beta	Minimum MRP	Spread Adjustment	Financial Flexibility Adjustment	Implied RoE	Implied Risk Premium over 4.0% Debt Yield
Booth Estimate	2.25%	0.28	5.00%	0.00%	0.50%	4.15%	0.15%
Cleary Estimate							
Fortis	2.00%	0.03	5.50%	0.00%	0.50%	2.67%	-1.34%
Emera	2.00%	0.02	5.50%	0.00%	0.50%	2.61%	-1.39%
TransAlta Corp	2.00%	0.46	5.50%	0.00%	0.50%	5.03%	1.03%
Northland Power	2.00%	0.09	5.50%	0.00%	0.50%	3.00%	-1.01%
Algonquin Power	2.00%	0.23	5.50%	0.00%	0.50%	3.77%	-0.24%
ATCO Utilities	2.00%	0.39	5.50%	0.00%	0.50%	4.65%	0.65%
Canadian Utilities	2.00%	0.05	5.50%	0.00%	0.50%	2.78%	-1.23%
Enbridge	2.00%	0.22	5.50%	0.00%	0.50%	3.71%	-0.29%
TransCanada Corp	2.00%	0.36	5.50%	0.00%	0.50%	4.48%	0.48%
Average						3.63%	-0.37%
Average excl. TransAlta and Northland						3.52%	-0.48%
Average (Fortis, Emera, Enbridge, TransCanada)						3.37%	-0.63%

Note: See BV Workpaper R05 for sources and calculations.

9 Q43. What is the difference between weekly and monthly betas?

10 A43. Beta measures the sensitivity of a company's or portfolio's returns to returns on the
 11 market. The difference between weekly and monthly betas is the frequency with
 12 which the returns are measured. If week-to-week total returns are used, there will be
 13 156 data points over a 3-year estimation window (or 260 over a 5-year window) used
 14 to calculate the beta coefficient. In contrast, if returns are measured as the cash return
 15 (e.g., dividend) plus capital appreciation from one month to the next, only 60 data
 16 points will be used to calculate beta over a 5-year window. While 60 data points is
 17 generally sufficient to provide a statistically meaningful estimate, a sample of this
 18 size does allow "noise" (i.e., random variation) in the data to exert more influence

1 compared to a larger sample of weekly returns. This creates the potential—but by no
2 means a guarantee—that weekly returns can deliver more precise beta estimates than
3 monthly returns.¹³²

4 Q44. Is it any more “correct” to estimate monthly betas as done by Dr. Booth and Dr.
5 Cleary than to estimate weekly betas such as those you relied upon in your evidence?

6 A44. No, monthly and weekly betas do not inherently lead to different estimates of beta,
7 and in most circumstances both monthly and weekly betas are acceptable for
8 estimating a company’s beta. For example, Bloomberg by default calculates adjusted
9 betas on a weekly basis over a two-year period, but allows users to calculate betas
10 based on either weekly or monthly returns.¹³³ Dr. Booth and Dr. Cleary acknowledge
11 in their corporate finance textbook that both monthly and weekly betas are sometimes
12 used as do other finance textbooks.¹³⁴ In addition, monthly and weekly betas for
13 Canadian utilities have historically given comparable results when estimated over the
14 same time period length. To illustrate this, in Figure 7 I have reproduced two of Dr.
15 Booth’s figures from his evidence, showing unadjusted betas calculated using both
16 monthly and weekly returns for the utility sub index of the TSX and Dr. Booth’s
17 sample of “major” Canadian utility holding companies.¹³⁵

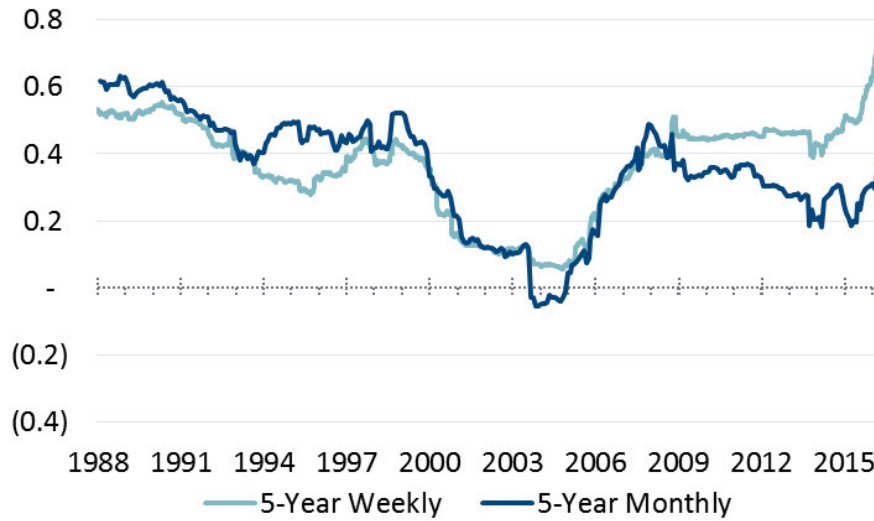
¹³² Of course, it would be possible to get a larger sample of monthly returns by expanding the estimation window, but this has the generally undesirable effect of introducing data quite far removed from the moment at which one is trying to measure systematic risk.

¹³³ See field description for the “EQY_BETA” Bloomberg field.

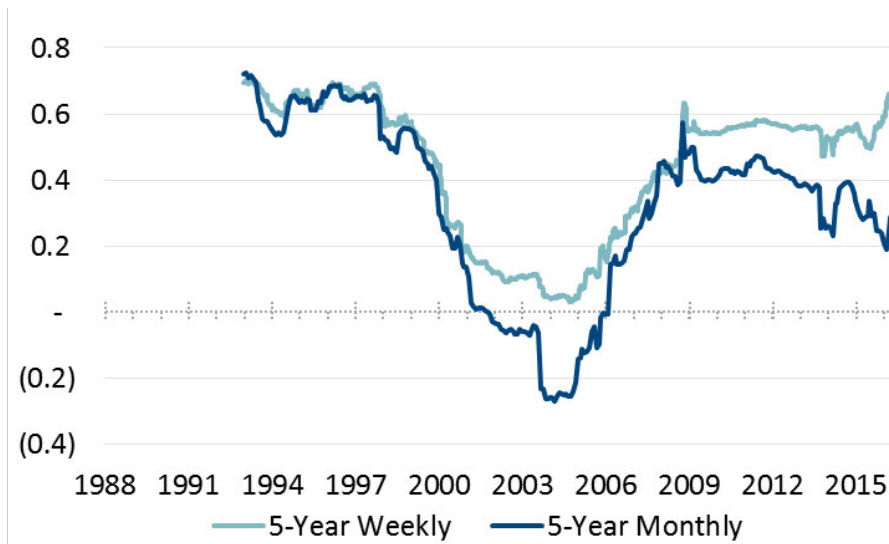
¹³⁴ “Typically betas for securities are estimated by using 60 months of monthly returns, but sometimes 52 weekly returns are used.” See Booth, Laurence, Cleary, W. Sean, and Drake, Pamela Paterson, *Corporate Finance: Financial Management in a Global Environment* (Hoboken, NJ: Wiley, 2014) (“Booth, Cleary, and Drake”), p. 339. See also the response to CAPP-Villadsen-2016FEB18-005 (b).

¹³⁵ Data obtained from Bloomberg. My results in this section consistently show unadjusted betas for proper comparison with Dr. Booth’s results. However, based on academic evidence presented in my initial Written Evidence and the associated Appendix, I believe that the use of adjusted betas is more accurate and appropriate when estimating the cost of capital.

Figure 6: Comparison of Historic 5-Year Monthly and Weekly Betas¹³⁶
Panel A: Simple Average of Booth’s Major Canadian Utility Holding Companies



Panel B: Utility Sub Index for the S&P TSX



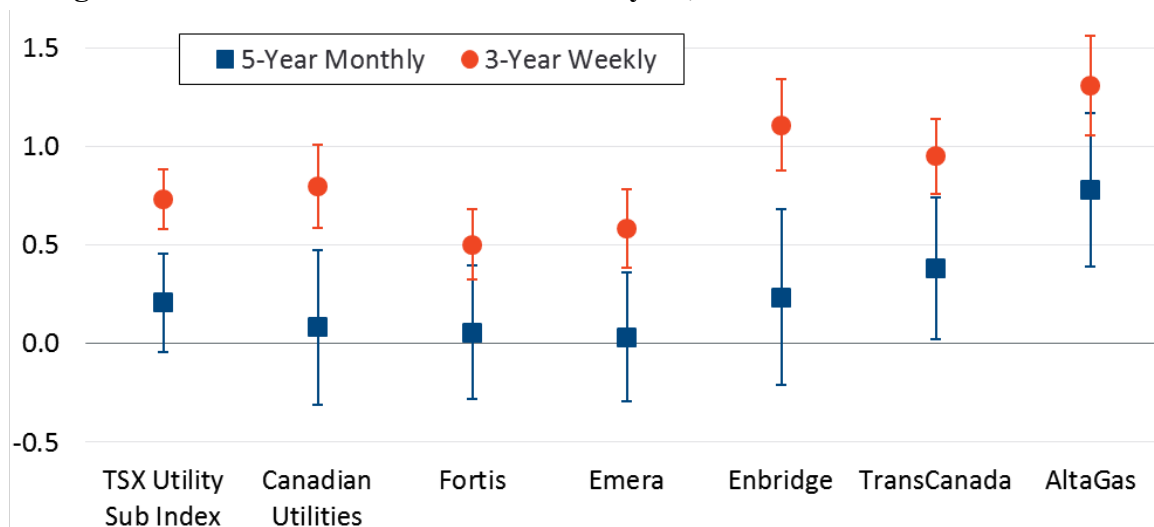
Source: BV Workpaper R06.

¹³⁶ The lower (5-Year Weekly) beta line from 1993 through the late 1990s in Panel A is the simple average of weekly betas for the companies in Dr. Booth’s analysis. The drop is driven by unusual return data for Pacific Northern Gas, which has some gaps in its time series of weekly returns. This unusual data may lead Pacific Northern Gas to have negative weekly betas, which pull down the average.

1 Q45. In the recent period, particularly as of the beginning of 2016, do weekly or monthly
 2 betas provide more meaningful and reliable estimates of beta?

3 A45. While both monthly and weekly betas are generally acceptable, Dr. Booth and Dr.
 4 Cleary fail to recognize that monthly betas for the majority of the Canadian utilities
 5 have become unreliable following the global financial crisis. Figure 8 shows
 6 unadjusted betas for Dr. Booth’s utility sub index for the TSX and my Canadian
 7 sample companies calculated at the beginning of 2016 with three years of weekly
 8 returns and with five years of monthly returns. The bars in the figure represent the 95
 9 percent confidence interval for each beta estimate. I also note that if a long period is
 10 considered, it appears that the beta estimates in the 1990s were at about 0.7, which is
 11 well above Dr. Cleary’s long-term average utility beta of 0.5 and his relied upon
 12 estimate of .45.¹³⁷ Thus, betas clearly change over time and (as can be seen in Figure
 13 7) have recently increased.

Figure 7: Raw Beta Estimates as of January 5th, 2015 with Confidence Intervals



Source: BV Workpaper R06.

14 The confidence intervals for the weekly estimates are much smaller than the monthly
 15 estimates even with only three years of data, indicating that the weekly beta estimates
 16 are quite precise while the monthly estimates of beta are subject to much more
 17 uncertainty. For example, the monthly beta for Enbridge could reasonably fall

¹³⁷ Cleary Evidence p. 38-39.

1 anywhere between -0.21 to 0.68, giving a nearly 0.90 range for beta with very little
2 precision. This makes the point estimate for Enbridge in the middle of that range
3 unreliable. This is also evident in the r-squared for the regression of utility returns on
4 total market returns that is used to estimate beta, which averages 31 percent for the
5 weekly betas and only 5 percent for the monthly betas.¹³⁸

6 In addition, the monthly confidence intervals for many of the utilities include zero,
7 which in a statistical sense means that one cannot claim that the beta is non-zero with
8 a high level of certainty. In non-statistical terms, this means that the betas estimated
9 for the majority of the Canadian companies using monthly return data are
10 indistinguishable from zero, which highlights the imprecision of the estimates and
11 suggests that the monthly beta estimates are not reliable in this particular scenario.¹³⁹

12 The fact that monthly beta estimates used by Dr. Booth and Dr. Cleary are
13 statistically insignificant or have unusually low r-squared values shows that these
14 pieces of evidence, to the extent that they are used to argue that betas are currently
15 low or have decreased since the last GCOC proceeding, should not be relied upon.

16 Q46. Can you please provide greater detail as to why monthly betas are not reliable and
17 suffer from such imprecision?

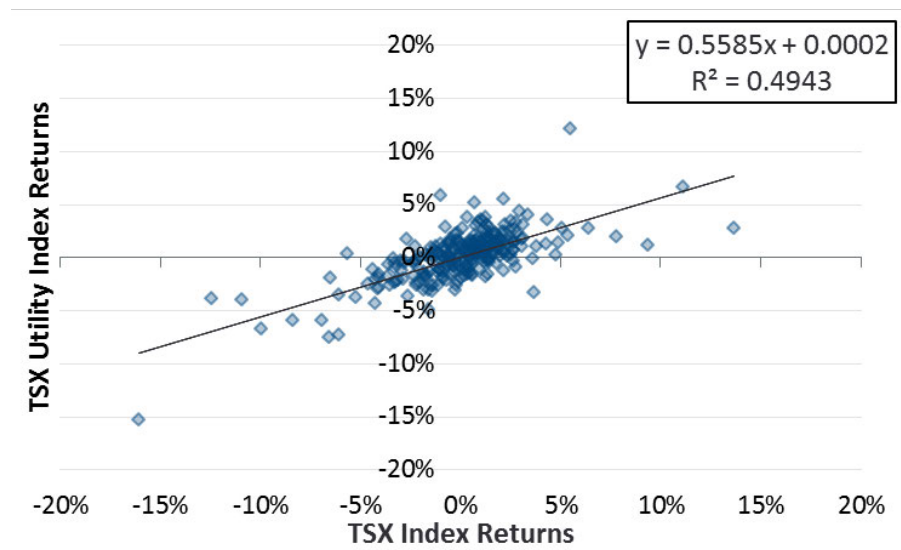
18 A46. From the financial crisis through early 2016, scatterplots for monthly and weekly beta
19 estimates show why monthly betas are so low and statistically insignificant whereas
20 weekly betas are not. In Figure 9, the scatterplots of weekly and monthly TSX and
21 TSX Utility Index returns that Dr. Booth relied upon are shown from July 2008
22 through June 2013 in addition to their best fit line, the slope of which represents the
23 beta coefficient unadjusted. Points that fall far to the left in each figure correspond to
24 either the global financial crisis or the sovereign debt crisis in the summer of 2011.
25 The weekly data lie closer to its best fit line than the monthly data, which is reflected
26 by the weekly data having a much higher R-squared. This shows that during these 5

¹³⁸ BV Workpaper R06.

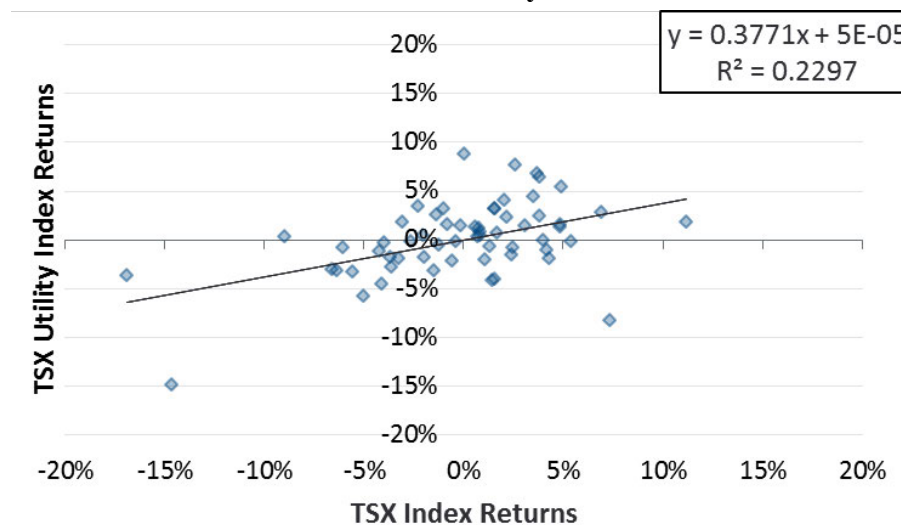
¹³⁹ The results above are comparable for weekly betas over 5 years.

1 years of abnormal market conditions and market volatility, the linear regression of
2 monthly utility returns on monthly market returns provided a weak fit to the data. By
3 contrast, the weekly returns gave a much stronger signal, with less random departures
4 from the linear relationship. Looking at comparable scatterplots for many individual
5 Canadian utility holding companies shows similar results.¹⁴⁰

Figure 8: Scatterplot for 5-Year Weekly and Monthly Betas: End of June 2013
Panel A: Weekly Betas



Panel B: Monthly Betas



Source: BV Workpaper R06.

¹⁴⁰ Included in BV Workpaper R06.

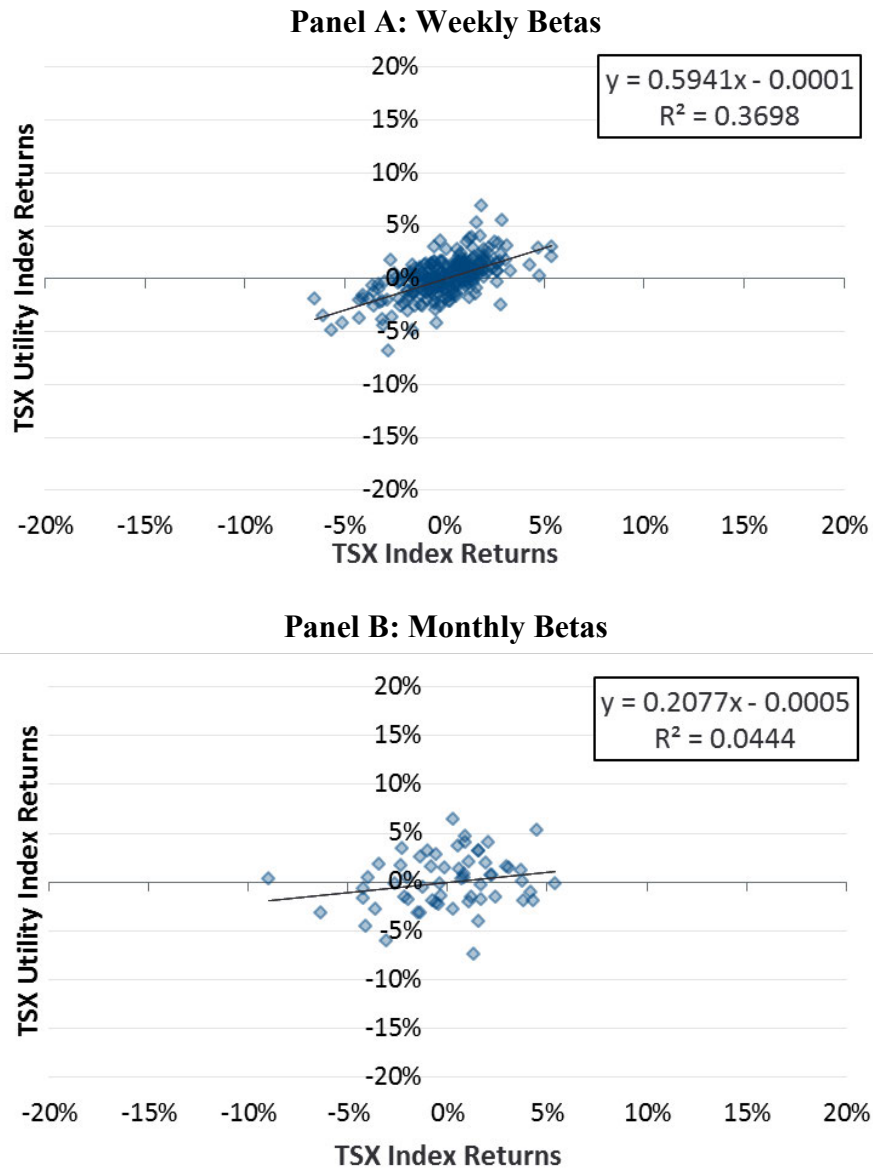
1 Q47. What about the most recent estimates of beta?

2 A47. The contrast between weekly and monthly beta estimates is even more distinct in
3 early 2016, even though many of the most distortive events of the global financial
4 crisis have rolled out of the estimation window, as shown in Figure 10. It is clear to
5 see that the monthly and weekly returns are much less volatile than for the 5 years
6 ending June 2013, but the monthly data still implies a low beta with an even worse fit.
7 With an r-squared of just 4.4 percent, it is no surprise that the monthly beta estimate
8 implies “no correlation” between the returns and is not significant. What is also
9 notable is that the standard deviation for the TSX Utility monthly returns (2.75%) is
10 also comparable to that of the TSX Index generally (2.78%), debunking the
11 possibility that the beta is low because utility returns weren’t very volatile.

12 The scatterplots for individual companies like Canadian Utilities, Enbridge, and
13 Fortis are even more striking, and also show that the impact of unusual market
14 conditions on the monthly estimates is strong.¹⁴¹ Because weekly betas are estimated
15 with many more observations, they are less sensitive to market volatility in a certain
16 period.

¹⁴¹ See BV Workpaper R06.

Figure 9: Scatterplot for 5-Year Weekly and Monthly Betas: End of December 2015



Source: BV Workpaper R06.

- 1 Q48. Do the overall levels of weekly betas during the aftermath of the global financial
2 crisis through the current day make sense?
- 3 A48. The weekly betas perform quite well in the current market conditions to predict
4 systematic risk in a meaningful way. As demonstrated in Figure 7, the weekly beta
5 results are quite consistent with Dr. Booth and Dr. Cleary's own prior evidence
6 showing unadjusted betas for Canadian utilities between 0.45 to 0.65 based on
7 measurements from the mid-1980s and 1990s, and with their support for using betas

1 in that range in recent GCOC proceedings since the onset of the crisis. And as shown
2 in Figure 8, Figure 9, and Figure 10, the weekly betas have been much more precise
3 and provided better fits to the data since the onset of the crisis. Therefore, I believe
4 that at this time for Canadian utilities, weekly betas are superior to monthly betas for
5 measuring systematic risk.

6 Q49. What do current beta estimates say about Canadian utilities' systematic risk?

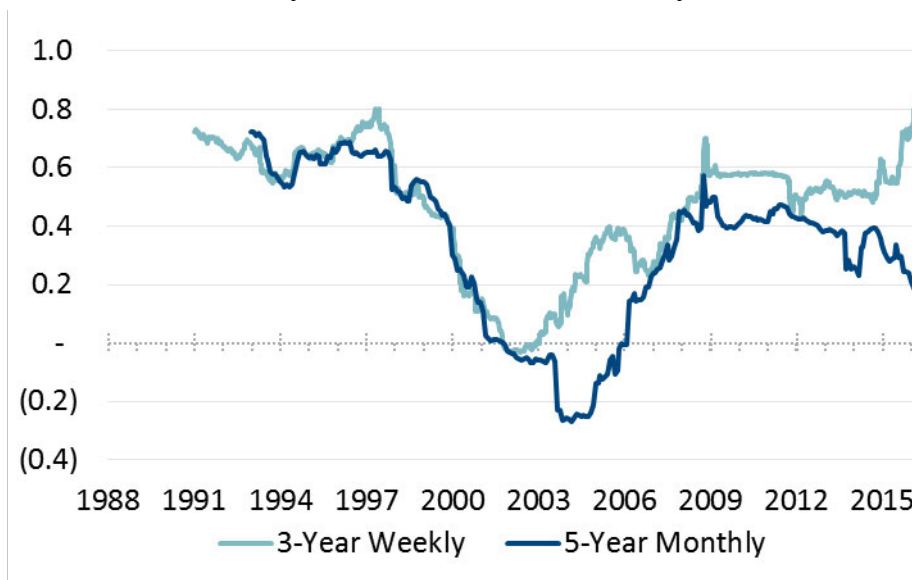
7 A49. In Figure 11 below, I show the equivalent to Panel B from Figure 7 with 3-year
8 weekly betas comparable to those in my initial evidence but for Dr. Booth's TSX
9 Utility Index and unadjusted.¹⁴² They are more consistent estimates during the
10 volatility of the global financial crisis and its aftermath that are not implausibly low
11 like the monthly betas. There is a striking final trend through April 2016. For the TSX
12 Utility Index that Dr. Booth himself suggested should be relied upon, weekly beta
13 estimates have risen dramatically. This realization, which confirms the evidence I
14 provided using portfolio betas in my initial evidence,¹⁴³ is decisive evidence that
15 systematic risk has increased since the last GCOC proceeding to high but not
16 unprecedented levels. This has not been the case for U.S. utilities, as shown in my
17 initial evidence.¹⁴⁴

¹⁴² Note that while I perform estimates using the TSX Utility sub index for comparison with Dr. Booth's results, I do not necessarily agree with the use of the TSX Utility Index to estimate Canadian Utility systematic risk. This is because the index is composed of a variety of companies including renewable energy companies, independent power producers, and utilities that for various reasons I chose not to include in my sample. However, its main components should be the largest utilities that are included in my Canadian sample.

¹⁴³ Villadsen Evidence, page 47.

¹⁴⁴ *Ibid.*.

Figure 10: S&P TSX Utility Sub Index: 5-Year Monthly and 3-Year Weekly Betas



Source: BV Workpaper R06.

1 Q50. Do you believe that Dr. Booth’s concept of a “grand mean” for utility betas is useful
2 for predicting current systematic risk?

3 A50. The idea that utility betas would be mean reverting or have a “grand mean” that Dr.
4 Booth mentions is interesting in theory but irrelevant in practice. As Drs. Booth and
5 Cleary acknowledge in their co-authored textbook, “Betas change through time as the
6 risk of the underlying asset or portfolio changes.”¹⁴⁵ While Dr. Booth and Dr. Cleary
7 then argue in their textbook that this is more relevant to individual assets, one cannot
8 expect that the risk of an industry over 20 years would remain the same.

9 Some reasons that systematic business risk can change over time are highlighted in
10 the written evidence and rebuttal evidence of Dr. Carpenter.¹⁴⁶ In addition, Dr. Booth
11 points out in his evidence that “risk can increase or decrease, not because of any
12 change in a particular security, but because of changes in the overall portfolio where
13 the most important portfolio is the overall market portfolio as this is the benchmark
14 for evaluating investment funds.”¹⁴⁷ Therefore, the idea of a grand mean is an

¹⁴⁵ Booth, Cleary, and Drake, p. 339.

¹⁴⁶ Carpenter Written Evidence, Carpenter Rebuttal.

¹⁴⁷ Booth CAPP Evidence, p. 51.

1 attempt to use vastly out of date information to justify a beta estimate that may no
2 longer apply. Instead, it is preferable to rely on estimates of the systematic risk for
3 utilities that are based on the current environment and use the more reliable weekly
4 betas. The results of my analysis here and in my initial written evidence clearly
5 demonstrate that betas have increased substantially over the last year or two.

6 To the extent that Dr. Booth believes in a “grand mean” for beta in the 0.45 to 0.55
7 range, the following results should not be surprising to him after the impact of the
8 global financial crisis has dropped out of beta estimates. The weekly beta results are
9 far more consistent with his “grand mean” than the monthly betas he estimates. In
10 addition, the recent higher betas are comparable to those during the 1990s, a period
11 where Dr. Booth believed that betas were at reasonable levels and atypical market
12 distortions were not apparent.

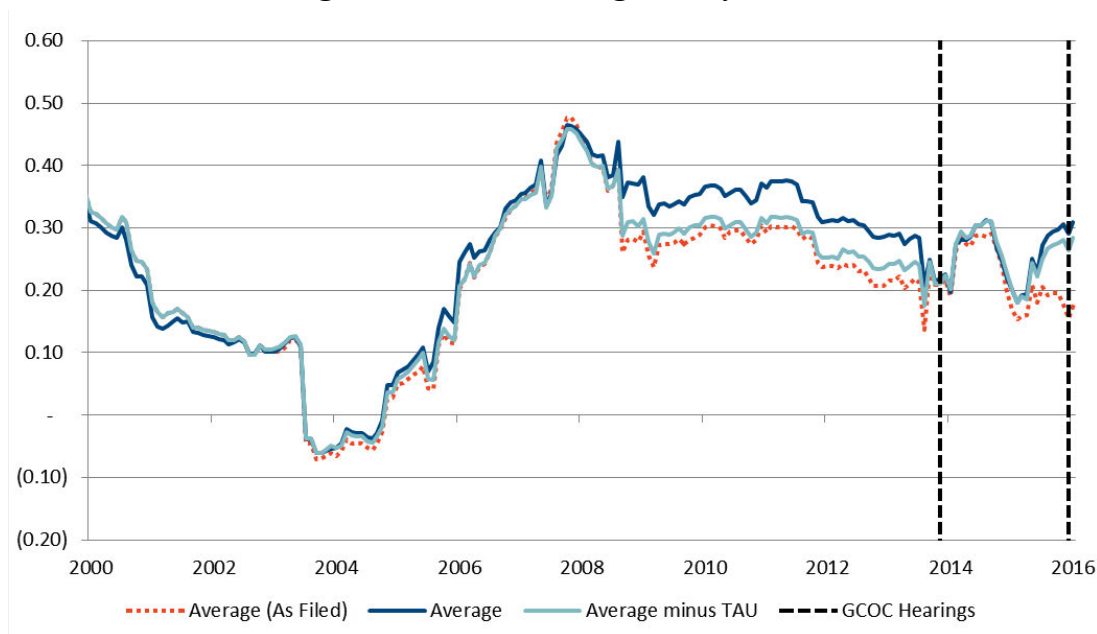
13 Q51. Despite their dependence on 5-year monthly betas does any intervenor evidence
14 support your claim that betas are increasing, particularly since the 2013 GCOC?

15 A51. To the extent that the monthly betas based on recent data are useful, Dr. Booth
16 provides evidence concurring that betas have increased since the last GCOC hearing
17 at the beginning of 2014. Below is a figure recreated from page 51 of Dr. Booth’s
18 Evidence, where the red dotted line represents Dr. Booth’s “Average” line. Contrary
19 to Dr. Booth’s description on page 53, the figure (as originally filed) was missing the
20 impact of Veresen,¹⁴⁸ so that when Veresen is included, the average beta increases
21 significantly.¹⁴⁹ What this shows is that since the last GCOC proceeding, betas for
22 Canadian utility companies have increased.

¹⁴⁸ See also the Response to Booth-Utilities-2016APR12-010 (f), where Dr. Booth recognizes his mistake and then truncates his graph range as compared to his CAPP Evidence on page 1. The truncation of the graph makes the increase in betas appear less substantial than it is.

¹⁴⁹ The correct relative positioning of the “Average” and “Average minus TAU” lines can also be seen in Dr. Booth’s previous testimony from the 2013 GCOC.

Figure 11: Booth Average Utility Betas



Source: BV Workpaper R06.

1 Q52. Are there other reasons why intervenor betas are unreliable?

2 A52. Neither Dr. Booth nor Dr. Cleary adjust their raw historical betas to make them better
3 predictors of systematic risk going forward. As I discussed in my written evidence,
4 empirical research has shown that the historical measure of a company's beta is not
5 the best predictor of what the company's systematic risk will be going forward.
6 Professor Blume applied an adjustment procedure to the historic measures of beta that
7 adjust for statistical sampling error and improved the beta measure.¹⁵⁰ Therefore, it is
8 appropriate to apply the Blume adjustment as many commercial providers do.

9 Dr. Booth and Dr. Cleary also do not consider the impact of financing on their betas
10 by unlevering and relevering them. It is standard in finance to estimate beta using
11 market data, which are unlevered assuming all assets are equity financed and then
12 relevered to the capital structure of the company or industry being considered.¹⁵¹

13 While the exact specification (e.g., the treatment of taxes and the bond beta) is subject

¹⁵⁰ Villadsen Evidence, Appendix B, pp. 19-20. See also the peer-reviewed article of Blume, M. E. (1971), "On the Assessment of Risk," *Journal of Finance*, 26, pp. 1-10.

¹⁵¹ Details are in my Written Evidence, Appendix B, Section IV.B.2.

1 to debate, the procedure is taught in virtually all finance textbooks,¹⁵² including the
2 undergraduate text co-authored by Dr. Booth and Dr. Cleary.¹⁵³ Since in this
3 proceeding, betas for the publicly traded sample companies are estimated for entities
4 with more equity than the Utilities, omitting the consideration of leverage biases Dr.
5 Booth's and Dr. Cleary's beta estimates downward.

6 **B. DCF MODELS**

7 **1. Market Level DCF Estimates**

8 Q53. What is your reaction to Dr. Booth's and Dr. Cleary's Dividend Discount Model
9 estimates of the expected market return.

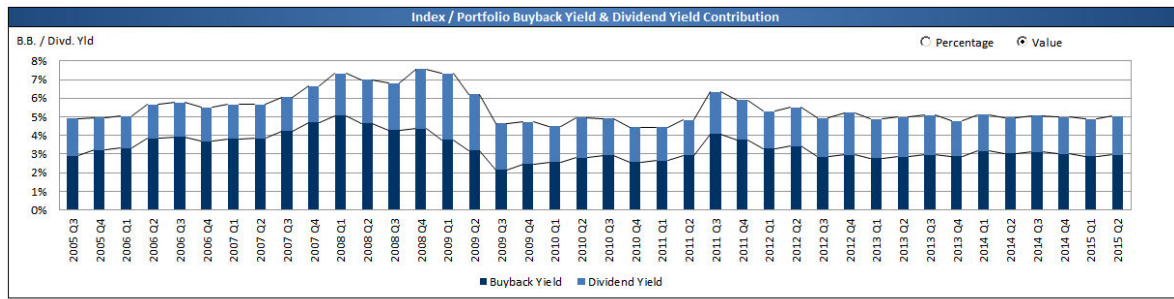
10 A53. Dr. Booth's and Dr. Cleary's DCF analyses are flawed in several ways. With respect
11 to their market-level analyses, one important flaw is that they fail to recognize the
12 growth in share repurchases.

13 When an earnings per share based growth rate is considered, it is important to
14 consider both dividends and share repurchases as ways in which investors receive
15 cash from the company. For example, Figure 13 below shows that for the S&P500
16 buybacks make up approximately 3 percentage points and dividends only 2
17 percentage points of the total payout yield for the index.

¹⁵² See for example: Brealey, R. Myers, S., & Allen, F. (2008), *Principles of Corporate Finance* (9th ed.), pp. 541-43; Berk, J & DeMarzo, P. (2011), *Corporate Finance* (2nd ed.), pp. 390-92, 464-65; Ross, S., Westerfield, R., Jaffe, J., & Roberts, G. (2003), *Corporate Finance* (3rd Canadian ed.), pp.492-95.

¹⁵³ Booth, Laurence & Cleary, W. Sean (2008), *Introduction to Corporate Finance* ("Booth and Cleary"), p. 838.

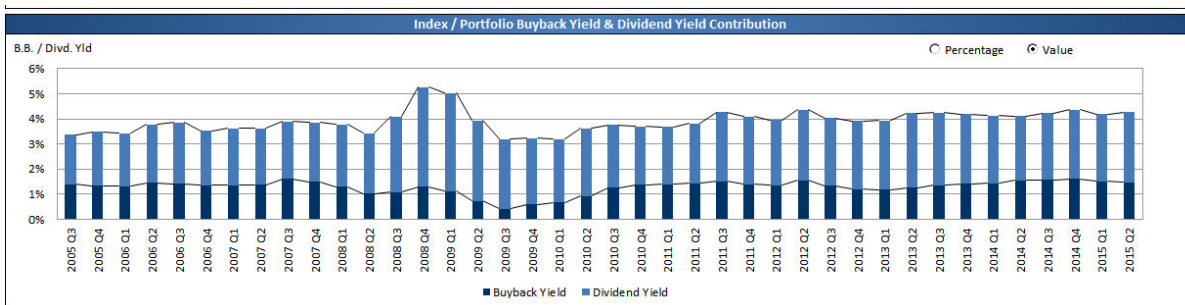
Figure 12: Dividends vs. Buybacks for the S&P 500 Index



Source: Bloomberg.

1 Buyback yields for the TSX are about 1.5 percent versus dividend yields of about 2.5
 2 percent. In doing their market-level DCF analyses, Dr. Cleary and Dr. Booth fail to
 3 consider the impact of share buybacks on their estimates. Considering these would
 4 increase their estimates of expected stock market returns.

Figure 13: Dividends vs. Buybacks for the TSX Index



Source: Bloomberg.

5 For the Utility industry, buybacks represent a smaller share of total yield compared to
 6 the broader stock markets, but are still important to consider.

7 Q54. What are your comments on Dr. Cleary’s single-stage estimation of the expected
 8 equity return for the market as a whole for 2016?

9 A54. Dr. Cleary estimates the expected equity return of the market in 2016 in two ways. He
 10 first estimates a constant-growth (single stage) dividend discount model (DDM). Dr.
 11 Cleary defines the constant-growth rate as the average rate of Canadian GDP growth
 12 from 1962-2014, adjusted for inflation. Dr. Cleary does not present evidence in
 13 support of his use of this time period. Furthermore, the use of long-term average GDP

1 growth rates implies that the past is prologue — future growth of dividends will not
2 necessarily follow the past growth of the economy.

3 Q55. What are your comments on Dr. Cleary's H-model estimation of the expected equity
4 return for the market as a whole in 2016?

5 A55. The H-model assumes that the growth rate will shift from a short term to a long term
6 stage. For the short term growth rate, Dr. Cleary uses Consensus Forecasts of
7 Canadian GDP growth in 2016-2017. The use of forecasted GDP growth rates for the
8 short term growth rate implicitly assumes that the stock market cannot grow any
9 faster than GDP in the short term. For the long term growth rate, Dr. Cleary uses the
10 long-term average growth rate of GDP. As mentioned in my discussion of Dr.
11 Cleary's single stage estimation for the market, just because GDP grew at a certain
12 rate over the last several decades does not mean that the stock market will grow at a
13 similar rate in the next several years.

14 Q56. Are you aware of any other multi-stage DCF estimates of expected equity returns for
15 the Canadian market that come from an independent source? If so, how does this
16 estimate differ from that of Dr. Cleary?

17 A56. Yes. Bloomberg estimates expected returns for the Canadian market for 2016 using a
18 multi-stage DCF model. For the short-term growth rate, instead of using sustainable
19 growth rates like Dr. Cleary, Bloomberg uses the growth rates of the companies'
20 forecasted earnings per share. For the long-term growth rate, like Dr. Cleary,
21 Bloomberg uses sustainable growth rates—albeit forward-looking ones calculated
22 assuming the achieved return on equity is equal to the cost of equity and using payout
23 ratios that taper toward a terminal payout ratio in the mature stage.¹⁵⁴ Yet even while
24 using similar dividend discount methodology to derive long term growth rates,
25 Bloomberg derived an implied expected return on the Canadian market for 2016 of
26 over 12 percent as of December 2015. This estimate is more than 3 percent higher

¹⁵⁴ See Bloomberg documentation included in IR response UCA-Utilities-2016FEB18-031 and the Attachment thereto.

1 than Dr. Cleary's estimate of 8.92 percent.¹⁵⁵ Thus a well-established commercial
2 provider of data estimates a much higher return than does Dr. Cleary's estimate even
3 after adding flotation costs for an equity market return of 9.4 percent.

4 **2. Individual Company DCF Estimates**

5 Q57. What are your comments on Dr. Cleary's single-stage estimation of the expected
6 equity return for Canadian utilities in 2016?

7 A57. For his single-stage growth rate, Dr. Cleary calculates a sustainable growth rate. The
8 sustainable growth rate has two components – growth based on retained earnings and
9 growth from new (net) equity issuance. Technically, the growth rate, g , is determined
10 as $g = b \times r + s \times v$, where b is the proportion of earnings that are retained in the
11 company, r is the expected rate of return on book equity, s is the percent of new
12 common equity expected to be issued and v is the equity accretion ratio. Dr. Cleary
13 leaves out the second term, $s \times v$. As s and v commonly are positive among utilities,
14 the absence of this term from Cleary's formula biases the cost of equity estimation
15 downward.¹⁵⁶ In short, by not including the growth from the issuance of new shares,
16 Dr. Cleary biases his results downward.

17 For his short term growth rates, Dr. Cleary calculates company-specific 2014
18 sustainable growth rates as he did with his single-stage estimation of returns for
19 Canadian utilities. For his long term growth rates, for each company, Dr. Cleary
20 calculates the historical average of yearly sustainable growth rates dating back to
21 2006. Dr. Cleary supports his use of historical averages of sustainable growth rates by
22 arguing that "growth rates estimated over a longer period of time are more
23 representative of those that can be expected in the long run."¹⁵⁷ However, Dr. Cleary
24 does not elaborate on why this is the case. For example, why is that historical average
25 sustainable growth rates would be better predictors of companies' growth than

¹⁵⁵ Cleary Evidence, p. 44.

¹⁵⁶ The FERC has in the past used this formula. See FERC Docket EL11-66-001.

¹⁵⁷ Cleary Evidence, page 49.

1 forecasted GDP growth rates? Dr. Cleary used forecasted GDP growth rates as his
2 short term growth rate in his multi-stage estimation of Canadian market returns. Yet
3 he somehow sees it unfit to use forecasted GDP growth rates in his H-model
4 estimation of Canadian utilities' returns. As a result, Dr. Cleary estimates an equity
5 market return of 9.1 percent¹⁵⁸ after adding 0.50 percent for flotation costs--a figure
6 that is biased downward for the reasons discussed above.

7 Q58. Please comment on the discussion in Dr. Booth's evidence that equity analysts'
8 forecasts of earnings growth are upwardly biased.

9 A58. As evidence of the bias, Dr. Booth cites a 2010 Globe and Mail article and a 2016
10 report from RBC Capital markets.¹⁵⁹ Importantly, these articles studies analysts'
11 potential forecast bias as they pertain to large companies in general (e.g., within the
12 S&P/TSX or S&P 500 indices) with no distinction between industries or other
13 characteristics. Recent empirical research has shown that the characteristics of
14 companies matter for the precision of analysts' forecasts.

15 As I discussed in Appendix B to my written evidence, empirical research has found
16 that if analyst bias is relevant, then analysts' optimism bias is primarily an issue for
17 smaller firms, firms with high volatility or turnover, younger firms and less
18 transparent firms.¹⁶⁰ Utilities do not fit these descriptions and hence are much less
19 prone to analyst bias than what is generally reported. In addition, firms with high
20 quality accounting auditors (measured as the largest 4 - 6 accounting firms)¹⁶¹
21 experience significantly less analyst bias.¹⁶² Among my sample companies, each and
22 every member of the Canadian and Gas LDC sample groups had their most recent
23 financial statements audited by the "Big" accounting firms. As utilities do not share

¹⁵⁸ Cleary Evidence, page 53

¹⁵⁹ Booth CAPP Evidence, paragraph 193 and "Boothpage83andSchedule12analystoptimism_0305.pdf".

¹⁶⁰ Villadsen Written Evidence, Appendix B, Section III.C.2.a.

¹⁶¹ Because the study used data for a number of years, the companies considered part of the largest group has changed over time. Today the group consists of Deloitte, E&Y, KPMG, and PwC.

¹⁶² Bruce K. Behn, Jong-Hag Choi, and Tony Kang, "Audit Quality and Properties of Analyst Earnings Forecast," *The Accounting Review* 83, 2008, 327-349.

1 any of the characteristics that tend to lead to substantial analysts forecast bias, it is not
2 possible to rely on generic research to determine whether there is any bias in utility
3 analysts' earnings forecasts. Utilities tend to be established, transparent firms with
4 high quality auditors and limited volatility. According to empirical research such
5 firms are less prone to this criticism than companies in general.

6 Q59. What do you conclude from the discussion above?

7 A59. Because neither Dr. Cleary nor Dr. Booth consider cash distributed to shareholders
8 other than dividends (such as share buybacks), their DCF estimates of the market
9 return is downward biased by the magnitude shown in Figure 13 and Figure 14 above.
10 Dr. Cleary's estimates further suffer from not recognizing that individual companies
11 or industries may grow at a faster or slower pace than the economy for some years.
12 Lastly, Dr. Booth's critique that analysts' forecasts are biased fails to consider the
13 specific nature of the utility industry and the fact that, if any analyst bias exists, then
14 such bias is linked to industry and firm characteristics, which do not pertain to
15 utilities. Thus, there is no evidence that analysts' growth forecasts for utilities are
16 biased.

17 C. BOND YIELD PLUS RISK PREMIUM

18 Q60. Does Dr. Cleary report a bond yield plus risk premium ROE?

19 A60. Yes. Dr. Cleary estimates a return on equity of 6-7 percent as the sum of the current
20 (February 2016) yield on A rated Canadian utility bonds plus a risk premium of 2-3
21 percent.¹⁶³ There are several problems with this approach. First, it is not clear that the
22 yield as of February 2016 will be relevant for the 2016-17 period for which the cost
23 of equity currently is being set, because bond yields are likely to increase. Second,
24 Dr. Cleary does not provide any analysis to support the range of 2-3 percent and fails
25 to recognize that the risk premium commonly increases as interest rates decline.^{164, 165}

¹⁶³ Cleary Evidence, p. 53-55.

¹⁶⁴ Morin, Roger A., *New Regulatory Finance*, Public Utilities Reports, Inc., 2006 pp. 128-129. See Villadsen Evidence, pp. 60-61 for an application to allowed risk premiums.

1 Because the allowed ROE that is being determined in this proceeding is expected to
2 be in effect during 2016 and 2017, the relevant bond yield will be the yield that is
3 expected during that period. The yield on 10-year government bonds is expected to
4 increase as is the yield on A range rated utility bonds. Therefore, using the current
5 yield leads to a downward bias in the estimated ROE.

6 With no support for the recommended range and no consideration of current
7 economic conditions, I recommend the Commission ignores this estimate.¹⁶⁶

8 **D. PENSION FUNDS AND SELECTIVE MARKET EVIDENCE**

9 Q61. What do you address in this section?

10 A61. First, I address Dr. Booth's and Mr. Thygesen's use of pension fund returns or
11 pension fund managers' statements as part of their evidence regarding the Utilities'
12 cost of equity. Second, I correct Mr. Thygesen's use of my evidence.

13 Q62. How do you respond to the interveners' use of pension fund returns and managers
14 forecast to determine the cost of equity in this case?

15 A62. While the Commission in the past has deemed pension fund returns indicative, the
16 Commission has also acknowledged that forecast pension returns on equity
17 investments are potentially conservative and geometric forecasts understate the cost
18 of equity.¹⁶⁷ It is therefore imperative that any use of such forecasts is evaluated
19 cautiously and be assigned limited weight. The Thygesen Evidence devotes
20 substantial space to discussing pension returns,¹⁶⁸ but provides no data or studies to
21 support its claims and should therefore be ignored. Further, Mr. Thygesen appears to

¹⁶⁵ Note that in IR response Cleary-Utilities-2016APR12-021(d), Dr. Cleary states that "the cost of the company's debt reflects changes in risk premiums through time, as reflected in the spread above government bond yields. Therefore, the 2.5% additional risk premium used by Dr. Cleary would not need to be adjusted through time..." This neglects the fact that equity is riskier than corporate debt, and therefore more responsive to changes in the broader market risk premium.

¹⁶⁶ I note that in my use of the risk premium model to estimate the cost of equity, I explicitly considered the interest rate environment at the time of the allowed ROE.

¹⁶⁷ Decision 2191-D01-2015, paragraphs 234 and 237.

¹⁶⁸ Thygesen Evidence pp. 36-40.

1 rely on the fact that some pension funds own utility stock as evidence that pension
2 fund returns are a proxy for utilities' required return; this does not follow. Simply
3 because a pension fund owns some utility stock does not mean that the return on the
4 pension fund's portfolio of asset is a proxy for utility returns. There is a significant
5 difference between owning utility stocks and having a portfolio of assets, as the
6 composition of these assets will determine their risk and return profile. Further, as
7 Mr. Thygesen acknowledged in response to data request, the fact that a portion of
8 pension funds' assets are invested in utilities is not inconsistent with the notion that
9 pension funds match their holdings to their liabilities.¹⁶⁹ Recent studies have
10 confirmed that pension plans have been de-risking their portfolios,¹⁷⁰ such that
11 portfolio returns will be more heavily weighted towards lower risk assets such as
12 bonds.

13 The Booth CAPP Evidence cites a report from Aon Hewitt¹⁷¹ as evidence of an
14 expected Canadian market return of 8.3 percent (7.6% for the U.S.).¹⁷² Looking at
15 how Aon Hewitt describes how they arrived at their estimates is revealing. First, the
16 report authors indicate they are using a DCF model to estimate the expected return
17 and rely on forecasted earnings, but do not reveal the source. Regardless of the
18 source of growth, the reliance on earnings rather than cash flow likely leads to a
19 downward bias in the estimates because it fails to account for the differences between
20 cash flow and earnings. For example, large tax depreciation increases cash flow but
21 not earnings and investors ultimately care about cash flow. Also, the timing of cash
22 distributions to shareholders may vary substantially due to, for example, share
23 buybacks, which are substantial in both the Canadian and U.S. market.

¹⁶⁹ The response to CCA-Utilities-2016 Apr 28-012 acknowledges this fact.

¹⁷⁰ Moody's, "CalPERS' de-risking plan does not shield California municipalities from pension asset investment performance," December 18, 2015. Available at:
https://www.moodys.com/research/Moodys-CalPERS-de-risking-plan-does-not-shield-California-municipalities--PR_341560

¹⁷¹ Submitted as "Boothpage73AonHewittJanuary2016_0297."

¹⁷² Booth CAPP Evidence pp. 71-73.

1 Second, Aon Hewitt states that the report is used for portfolio allocation, which
2 serves a different purpose than cost of equity estimation. For example, for portfolio
3 allocation purposes the relative return (at equivalent risk) is key. More generally,
4 pension managers' forecasts need to be cautiously reviewed as those forecasts may
5 reflect the expected return on the fund's portfolio rather than the market and, as the
6 Commission has acknowledged, potentially are downward biased due to expectation
7 management or actuarial conservatism (too high a discount rate / expected return
8 could lead the pension fund to become under-funded if the market underperforms the
9 expectation). This is particularly the case in the post financial crisis world. The
10 financial crisis led pension funds to recognize "that short-term volatility can have a
11 devastating impact on mature pension plans."¹⁷³

12 Pension funds had assumed ambitious market returns before the crisis and as a result
13 became underfunded when returns did not materialize. For example, public pension
14 funds went from being about 86 percent funded in 2007 to 72 percent funded in
15 2013.¹⁷⁴ When future liabilities are accounted for with more appropriate bond yields
16 this funding level is significantly less.¹⁷⁵ This could lead to several forms of bias
17 where pension funds are decreasing expected returns for their funds.

- 18 • Pension funds do not want to repeat their error in the financial crisis of
19 over predicting pension returns when there is already a significant lack
20 of pension funding that allows for less downside risk.
- 21 • Pension funds have begun to trend towards reducing their exposure to
22 short-run market volatility, or "de-risking," by pursuing safer assets
23 with lower effective returns, divesting from hedge funds, and finding
24 ways to hedge their risks.¹⁷⁶

¹⁷³ Krudy, Edward, "U.S. public pension funds slowly wake up to risk," Reuters, New York, October 22, 2015 ("Reuters 2015"), accessible at <http://www.reuters.com/article/us-usa-pensions-risk-idUSKCN0SG18320151022>.

¹⁷⁴ Public Fund Survey by the National Association of State Retirement Administrators, accessed at <http://www.nasra.org/publicfundsurvey>.

¹⁷⁵ Buttonwood, "The Pot is Half Full," *The Economist*, June 28, 2013.

¹⁷⁶ Reuters 2015.

1 Given these pressures to reduce pension return forecasts, it might suggest that to keep
2 their performance targets achievable, managers have an incentive to provide
3 conservatively low forecasts of market expectations. Otherwise there could be the
4 continued desire to fail to meet funding goals in unusual short-run market conditions,
5 and low market expectations are an implicit further justification to pursue “de-
6 risking” strategies.

7 Q63. Please comment on Mr. Thygesen’s statements about pension funds’ ownership of
8 utility equity.

9 A63. Mr. Thygesen in the response to CCA-Utilities-2016 Apr 28-012, pointed to a
10 pension fund’s partial ownership of Puget Sound as confirmation that my written
11 evidence discusses pension fund allocation. It does not. The response confuses the
12 allocation of a pension fund’s assets with the ownership of one specific utility. The
13 characterization is simply inaccurate, incomplete and without bearing on pension
14 fund’s allocation of funds or return requirements.

15 **E. ACHIEVED ROE AND PRICE-TO-BOOK RATIOS**

16 Q64. Have Dr. Booth and Dr. Cleary presented evidence related to the price-to-book ratios
17 of publicly traded companies?

18 A64. Yes. Dr. Cleary presents average price-to-book ratios for a sample of nine publicly
19 traded Canadian utility holding companies, and notes that they are all above 1.0.¹⁷⁷
20 He further argues—based on a rearrangement of the Dividend Discount Model
21 relying on restrictive growth rate assumptions—that this constitutes evidence that
22 realized ROEs have exceeded the cost of equity capital for Canadian utilities.¹⁷⁸

23 Dr. Booth considers a sample of 15 publicly-traded U.S. electric and gas utility
24 companies. He performs a regression of their achieved ROEs on their price-to-book
25 ratios, and—based on his assertion that “a regulated utility should have a market-to-

¹⁷⁷ Cleary Evidence, pages 58-59.

¹⁷⁸ Cleary Evidence, page 61.

1 book ratio of no more than 1.15”—uses his regression model to derive an estimate of
2 7.17 percent for the cost of equity.¹⁷⁹

3 Q65. Do you find Dr. Booth’s price-to-book ratio evidence convincing?

4 A65. No. Dr. Booth’s not only treats his regression results as evidence of a simple linear
5 relationship between achieved ROE and price-to-book ratio, but also suggests that it
6 has power to predict market expectations about ROE. Specifically, he asserts that
7 when a company’s achieved ROE is lower than what his regression model predicts
8 based on its price-to-book ratio, it must be because investors expect the ROE to
9 improve, and vice versa when achieved ROE exceeds that “predicted” by his
10 regression model.¹⁸⁰

11 The fact that price-to-book ratio is positively correlated with earned return on equity
12 is unsurprising, since as Dr. Booth points out, investors’ demand for a company’s
13 stock will increase as its earnings improve, all else equal. However, Dr. Booth’s
14 argument attributes too much predictive power to a regression model that—by his
15 own admission—explains only 46 percent of the variation in earned ROEs for his 15
16 company sample.¹⁸¹ Dr. Booth ignores other factors that may affect a company’s
17 price-to-book, such as the potential for merger and acquisition activity, or “option
18 value” associated with growth opportunities that may arise under certain market
19 circumstances. Indeed, the highest price-to-book ratio in Dr. Booth’s data (3.38 per
20 Booth CAPP Evidence, Schedule 15) is for Piedmont Natural Gas Company, Inc.
21 (“Piedmont”), which is an acquisition target of Duke Energy Corp (“Duke”), with an
22 announced deal value of \$6.5 billion as of October 2015—nearly 1.5 times
23 Piedmont’s 2015 Q3 market capitalization. Although it is not clear when Dr. Booth
24 pulled his data, it is highly likely that Piedmont’s market valuation reflects investors’
25 expectations of or reaction to the acquisition announcement, including expectations

¹⁷⁹ Booth CAPP Evidence, paragraphs 199-202.

¹⁸⁰ Booth CAPP Evidence, paragraph 201.

¹⁸¹ Booth CAPP Evidence, paragraph 200. Note that the adjusted R-squared and t-statistic Dr. Booth cites in paragraph 200 do not agree with the regression results reported in Schedule 14; the actual adjusted R-squared of his regression is 0.46.

1 for synergies from the merger and / or the possibility of tendering shares, and not
2 merely information about Piedmont's earned ROE. Duke's price-to-book ratio could
3 similarly be influenced by investors' reaction to the announced merger and
4 expectations regarding its implications.

5 Indeed, the entire premise of Dr. Booth's regression analysis is undermined by the
6 fundamental fact that it is market *expectations* about *future* events or returns that
7 influence price-to-book ratios, not historical earned ROEs. Dr. Booth implicitly
8 acknowledges this fact in discussing the data points that lie "off" his simple line plot,
9 but ignores it—among the 54 percent of the of the variability in price-to-book ratio
10 *not* explained by historical earned ROE—in drawing his conclusions.

11 Q66. Do you find Dr. Cleary's price-to-book ratio evidence convincing?

12 A66. No. Dr. Cleary's analysis is unconvincing for several reasons. First, it rests on a form
13 of the Dividend Discount Model that assumes constant perpetual dividend growth
14 equal to the historical earned ROE times the historical retention ratio.¹⁸² As discussed
15 in Section III.B, this "sustainable growth" formulation assumes that retained earnings
16 are the only source of equity capital and that historical average returns on equity are
17 predictive of returns on marginal equity investments. Additionally, Dr. Cleary's
18 DDM ignores alternative forms of distributions, such as stock repurchases, and does
19 not account for option value that may influence stock prices. All of these factors
20 complicate the "simple" relationship between earned ROE and price-to-book ratios
21 posited by Dr. Cleary, and help explain how a company's price-to-book ratio can
22 exceed 1.0 without its historical earned ROE exceeding its cost of equity.

23 With regard to Dr. Cleary's specific calculations, it is particularly difficult to believe
24 that the "current" price-to-book ratios of the Canadian utility holding companies in
25 his sample are fully explained by "the average 2006-2015 utility index ROE of

¹⁸² Cleary Evidence, page 61, lines 10-11 and footnote 21.

1 8.7%.”¹⁸³ The latter figure was apparently derived for companies in the TSX Utilities
2 Index, which has constituents beyond the nine companies for which Dr. Cleary
3 measured price-to-book ratios. These constituents include renewable energy
4 companies and independent power producers, whose earnings are clearly not
5 representative of utilities. Moreover, Dr. Cleary’s historical average ROE, calculated
6 over an arbitrarily chosen long-term period, is particularly ill-suited to forecast future
7 growth for Canadian utility companies, since it ignores new growth potential from
8 non-regulated businesses and expansion/acquisition activity, including international
9 investment. In my opinion, the mismatches among companies and time periods in Dr.
10 Cleary’s data render his analysis unreliable and uninformative about the adequacy of
11 earned ROEs for Canadian utility companies.¹⁸⁴

12 Q67. What has the Alberta Utilities Commission previously found with regard to the type
13 of price-to-book ratio evidence presented by Drs. Booth and Cleary?

14 A67. The Commission stated in the 2011 GCOC proceeding that it was “unable to derive
15 any useful information about the price-to-book ratios of stand-alone utilities from the
16 price-to-book ratios of utility holding companies.”¹⁸⁵ In the 2013 GCOC decision, the
17 Commission reiterated this position and explained that its concern related to the “dirty
18 window” problem associated with “interpreting market-to-book value ratios of
19 corporate shares where the subject company has significant unregulated activities in
20 addition to regulated operations.”¹⁸⁶ Clearly, this very concern applies to both the
21 U.S. companies employed in Dr. Booth’s regression analysis and the Canadian utility

¹⁸³ Cleary Evidence, Page 61. Note that it is not clear where Dr. Cleary got the “current average P/B ratios of 2.1, 2.3, and 2.5” that he “plugged in” to his DDM equation, since the February 2016 averages reported in his Table 15 range from 2.0 to 2.2. Nor is it clear how Dr. Cleary calculates the 8.7% average ROE, since the data underlying his Figure 16 (provided in Exhibit Z), show that the average annualized quarterly ROE from 2006 through 2015 Q3 was 8.0 percent.

¹⁸⁴ Interestingly, the finance textbooks co-authored by Dr. Booth and Dr. Cleary do not discuss the application of the price-to-book (or market-to-book) ratio as a method for estimating or making inferences about the cost of capital in the Chapters devoted to that topic. *See* Booth, Cleary, and Drake, Chapters 9 (“Asset Pricing”) and 14 (“Cost of Capital”). *See also* Booth and Cleary, Chapter 20 (“Cost of Capital”).

¹⁸⁵ AUC Decision 2011-474, paragraph 122.

¹⁸⁶ AUC Decision 2191-D01-2015, paragraphs 211-212.

1 holding companies in Dr. Cleary's analysis. The Commission is correct to recognize
2 that information about the price-to-book ratios of such companies does not provide
3 useful information about the relationship between allowed ROE and the cost of equity
4 for regulated utilities such as the Alberta utilities. Therefore, I recommend that the
5 Commission give no weight to Drs. Booth's and Cleary's arguments in this area.

6 Q68. Does Dr. Cleary attempt to draw conclusions about the relative riskiness of the
7 Alberta utilities from measurements of historical variability in earned ROE?

8 A68. Yes. Dr. Cleary computes coefficients of variation ("CV") of the annual achieved
9 book returns on equity from 2005-2014 for 11 Alberta utilities (Table 18), as well as
10 for 37 U.S. gas and electric utility companies (Table 21) and seven Canadian utility
11 companies (Table 23).¹⁸⁷ He then argues that the higher average and median
12 CV(ROE) for the U.S. companies compared to the Alberta utilities "[suggest] that the
13 U.S. utilities possess greater risk than Alberta utilities."¹⁸⁸ Dr. Cleary also draws a
14 similar conclusion comparing the publicly traded Canadian utility companies to the
15 Alberta utilities.

16 Q69. Do Dr. Cleary's conclusions have merit?

17 A69. No. I agree with Dr. Carpenter that an analysis based entirely on a very small
18 sampling of annual historic accounting earnings does not provide the market-based
19 perspective that is needed to assess uncertainty in expected returns.

20 Further, Dr. Cleary's comparison relies on long-term historical information to draw
21 conclusions about risk and return going forward. This is problematic when the
22 fundamental characteristics that affect returns (and variability of returns) may be
23 different in the future. Finance textbooks, including one co-authored by Drs. Cleary
24 and Booth, address this issue in the context of measuring risk through beta:

¹⁸⁷ Cleary Evidence, pages 69, 78-79, and 85-86. It is not clear why Dr. Cleary examines a different group of Canadian utility companies for this analysis compared to his DCF estimates and analysis of price-to-book ratios.

¹⁸⁸ Cleary Evidence, pages 78-80.

1 Estimating beta coefficients is tricky because we are interested in the extent
2 that an asset's returns move with the market over a future period. We
3 typically estimate beta coefficients by using historical data, which assumes
4 that what has happened in the past is a good predictor for the future.
5 Typically, betas for securities are estimated by using 60 months of monthly
6 returns, but sometimes 52 weekly returns are used. Betas change through
7 time as the risk of the underlying asset or portfolio changes. This is
8 particularly important for individual securities, for which betas can change
9 quite dramatically over relatively short periods.¹⁸⁹

10 In the context of this proceeding, the underlying assets and operations for the publicly
11 traded U.S. and Canadian utility companies considered by Dr. Cleary may have
12 changed substantially during the period Dr. Cleary studies¹⁹⁰

13 I also note that, the coefficient of variation of book ROE is simply not a good
14 measure of the type of risk that affects the cost of equity. It is a fundamental principle
15 of finance that (as Dr. Cleary, Dr. Booth, and their coauthor Dr. Pamela Peterson
16 Drake put it in their textbook) "rational investors are not compensated for unique or
17 diversifiable risk because it can be eliminated through diversification. This implies
18 that market risk is the appropriate measure of risk to determine the risk premium
19 required by investors for holding a risky security."¹⁹¹ In other words, the non-
20 diversifiable or systematic risk for which investors must be compensated is measured
21 relative to returns on the broader market portfolio, *i.e.*, in terms of a market beta (β).
22 For investors in the equity of a publicly-traded company, it is the sensitivity that
23 company's (market value based) stock returns to returns on the broader market that
24 affect the required risk-adjusted rate of return. By contrast, the total variability in
25 accounting returns on book equity is not informative for comparing systematic risk
26 from an investor's perspective.

¹⁸⁹ Booth, Cleary, and Drake, p. 339.

¹⁹⁰ For a detailed discussion of this analysis, see Carpenter Rebuttal Evidence, Section II.

¹⁹¹ Booth, Cleary, and Drake, p. 339.

1 Q70. Do you have any other comments concerning Dr. Cleary’s comparisons of historical
 2 variability in earned ROE?

3 A70. Yes. In addition to the conceptual flaws discussed above, Dr. Cleary’s analysis is
 4 misleading regarding the variability of achieved book ROEs for the Alberta utilities
 5 relative to my U.S. and Canadian proxy group companies. In my analysis, I find that
 6 the six companies in my U.S. Gas LDC sample in particular have a much lower
 7 coefficient of variation than the U.S. utilities in general, and that their returns are a bit
 8 higher on average. Compared to Cleary’s Canadian utilities in Table 23, they have a
 9 higher return on equity with lower coefficient of variation. When compared to Dr.
 10 Cleary’s data for the Alberta utilities, the average and median CV(ROE) for my U.S.
 11 Gas LDC sample are of similar magnitude. By Dr. Cleary’s logic, this would imply
 12 that U.S. Gas utilities are in fact quite comparable to the Alberta utilities, and the
 13 Alberta utilities earn significantly less than the U.S. Gas LDC sample companies. In
 14 addition, if I adapt Dr. Cleary’s analysis of Canadian companies to my Canadian
 15 proxy group (including data I sourced for Canadian Utilities Limited for which Dr.
 16 Cleary does not provide data) I find that the coefficient of variability of ROE is
 17 somewhat less than what Dr. Cleary reports.

Figure 14: Comparison of Utility ROE Level and Variation

	Cleary Tables 18, 21, and 23			Adapted to Villadsen Samples		
	Alberta Utilities	U.S. Utilities	Canadian Utilities	Gas Sample	Electric Sample	Canadian Sample
Average of Utility ROE						
Average	9.3%	10.7%	10.5%	11.3%	11.1%	13.1%
Median	9.5%	10.3%	11.3%	10.3%	10.4%	12.8%
Coefficient of Variation for Utility ROEs						
Average	0.17	0.36	0.38	0.19	0.34	0.28
Median	0.15	0.23	0.27	0.17	0.25	0.27

Source: Calculations in BV Workpaper R07 based on Cleary Evidence Exhibits AC, AG, and AI; data for CU Ltd. from S&P’s Research Insight (Compustat).

18 The fact that these relatively minor permutations and adaptations of Dr. Cleary’s
 19 analysis produce such different results strengthens my belief that the entire exercise is
 20 uninformative. Indeed, as Dr. Carpenter demonstrates in his rebuttal, making

1 relatively minor and reasonable modifications to certain assumptions, inputs, and
2 methods of Dr. Cleary's parallel analysis of variability in operating earnings (EBIT)
3 leads to substantial changes in the results.

4 Ultimately, Dr. Cleary's assertion that he has "*quantified*" the business and total
5 risk¹⁹² of the companies in his samples is not supported by the data. Because Dr.
6 Cleary's analysis fails to provide the kind of forward-looking, market-based analysis
7 that is needed to study the cost of equity, I recommend the analysis be given no
8 weight.

9 IV. CAPITAL STRUCTURE

10 Q71. What are your conclusions regarding capital structure?

11 A71. The key points I want to emphasize are that (i) I agree with the Commission's goal of
12 maintaining an A range rating for the Utilities, (ii) one-off adjustments are not
13 advisable, (iii) it is a dangerous policy to try to set the capital structure and ROE so
14 that it meets the minimum that would allow an A range rating, (iv) comparable
15 utilities have equity ratios in the 40-50 percent range, and (v) the reasons for granting
16 tax exempt entities a 2 percent equity adder continue to exist, so there is no reason to
17 change the policy. For these reasons I maintain my recommended equity ratios as
18 stated in Figure 30 of my written evidence. The recommendation here took a global
19 approach to determining the capital structure; including the prevailing market and
20 credit conditions. I discuss specific issues that have been raised in evidence or
21 information requests below.

22 A. CREDIT METRICS

23 Q72. Do you believe the credit metric thresholds traditionally used by the Commission are
24 adequate to ensure access to affordable debt capital for the Utilities?

25 A72. No. For the reasons stated in my direct evidence, I believe it is risky to target the
26 Utilities financial performance to the bare minimum credit metrics considered

¹⁹² Cleary Evidence, page 71 lines 10-12 and page78, lines 5-8.

1 consistent with an A range debt rating.¹⁹³ I believe a more appropriate regulatory
2 policy would target the middle of the ranges articulated by the credit rating agencies
3 and representative of Canadian utility operating companies. In my written evidence I
4 recommended the following minimum credit thresholds according to those criteria.¹⁹⁴

- 5 • EBIT Coverage of at least 2.5 times.
- 6 • FFO Interest Coverage of 3.5 to 4.0 times with the higher end being
7 preferable.
- 8 • FFO to Debt of at least 15 percent.¹⁹⁵

9 Q73. Have you nevertheless attempted to analyze the equity percentages for the Alberta
10 utilities that would be required to meet the Commission's minimum credit
11 benchmarks under the ROE recommendations of Dr. Booth and Dr. Cleary?

12 A73. In Figure 16 below, I present the minimum equity percentages required for a generic
13 Alberta utility, ATCO Gas, and ATCO Pipelines under the ROE recommendations of
14 Dr. Cleary and Dr. Booth. Dr. Cleary recommends an ROE of 7.0 percent for the
15 generic Alberta utility.¹⁹⁶ Using the Alberta utilities' 2014 Rule 005 filings, I
16 calculated the average embedded cost of debt, depreciation rate, and construction
17 work in progress rate for Alberta utilities. Using these averages, and Dr. Cleary's
18 recommended ROE of 7.0 percent, I determined that an equity ratio of approximately
19 37.5 percent would be required in order for a generic Alberta utility to meet the
20 Commission's credit benchmarks. I performed separate calculations for ATCO
21 Pipelines and ATCO Gas, using their own costs of debt, depreciation rates, and CWIP
22 rates from their 2014 Rule 005 Filings. Dr. Booth recommends an ROE of 7.5 percent
23 for ATCO Pipelines and ATCO Gas.¹⁹⁷ Under Dr. Booth's recommended ROE, 37.5

¹⁹³ Villadsen Evidence, pp. 69-70. The Buttke Rebuttal concurs (Q/A 71).

¹⁹⁴ Villadsen Evidence, pp. 72.

¹⁹⁵ I note that the Commission's threshold of 11.1%-14.3% for FFO to Debt reflects a range of minimum thresholds observed for Canadian utility companies at the time the benchmarks were established. By contrast, my recommended minimum of 15% is slightly below the average and median for Canadian utilities recently reported by DBRS. (See Figure 24 on page 71 of my Written Evidence.)

¹⁹⁶ Cleary Evidence, p. 2.

¹⁹⁷ Booth CAPP Evidence, p. 3.

1 percent equity would be required for ATCO Gas, while 38 percent equity would be
 2 required for ATCO Pipelines.

3 More importantly, Figure 16 also shows that—at the unreasonably low ROEs
 4 recommended by Drs. Cleary and Booth—a much larger equity percentage would be
 5 needed to meet my recommended credit benchmarks necessary to ensure continued
 6 access to affordable debt financing for the Utilities.

**Figure 15: Minimum Equity Percentage Required to Meet Credit Benchmark
 at Dr. Booth’s and Dr. Cleary’s Recommended ROEs**

Min. % Equity satisfying benchmarks suggested by:	A.U.C.	Dr. Villadsen
	[1]	[2]
Company		
Generic Alberta Utility [3]	37.5%	50.0%
Atco Gas [4]	37.5%	47.5%
Atco Pipelines [5]	38.0%	50.0%

Notes:

[1]: The minimum equity percentage required to meet the Commission's credit benchmarks of a 2.0x EBIT coverage, 3.0x FFO/Interest, and FFO/Debt of 11.1-14.3%.

[2]: The minimum equity percentage required to meet the credit benchmarks suggested by Dr. Villadsen of a 2.5x EBIT coverage, 3.5-4.5x FFO/Interest, and FFO/Debt of at least 15%.

[3]: 7.0% ROE recommended by Dr. Cleary.

[4]: 7.5% ROE recommended by Dr. Booth.

[5]: 7.5% ROE recommended by Dr. Booth.

Source: BV Workpaper R08.

7 Q74. Have you also reviewed Mr. Stauff’s analysis of the Commission’s minimum credit
 8 metric thresholds?

9 A74. I have, and while it is similar to my own analysis presented in my Written Evidence, I
 10 believe there is a conceptual flaw in Mr. Stauff’s calculations that causes him to
 11 inflate the credit metrics that would result from any specific set of financial
 12 parameters (i.e., allowed ROE and deemed capital structure, as well as CWIP rate,
 13 debt cost, and average depreciation rate). Additionally, I believe his assumed
 14 embedded cost of debt is not representative of that faced by the Utilities.

1 Q75. What is the conceptual flaw you identified in Mr. Stauff's analysis?

2 A75. Mr. Stauff calculates net income by multiplying the cost of equity by the equity
3 percentage. At the same time, Mr. Stauff calculates interest by multiplying the cost of
4 debt by the debt percentage and multiplies this quantity by one plus the construction
5 work in progress percentage. Including interest payments on only the debt portion of
6 CWIP implies that there exists a portion of CWIP that is financed by equity. If this
7 were the case, the company would earn the allowed ROE on the non-debt portion of
8 equity— but Mr. Stauff does not include an equity return on CWIP in his calculation
9 of net income. Mr. Stauff is correct not to include an equity return on CWIP in his
10 calculation of net income, since CWIP is separate from the rate base of a
11 representative Alberta utility. However, that implies that the company finances all
12 CWIP with debt. By including only a portion of the interest that would have to be
13 paid on CWIP in his calculation of interest coverage ratios, Mr. Stauff artificially
14 decreases the denominators, which inflates the ratios. Similarly, Mr. Stauff includes
15 only the debt ratio times the CWIP balance in debt for purposes of calculating the
16 FFO/Debt metric. This has the effect of understating the true debt and inflating the
17 metric for any assumed equity ratio and ROE.

18 Q76. Why do you believe Mr. Stauff's assumed cost of debt is not representative, and what
19 would be a better assumption?

20 A76. Mr. Stauff uses mid-year cost of debt from AltaLink, ATCO, FortisAlberta, AltaGas,
21 ENMAX, and EPCOR. He then weights the average and median costs of debt for
22 these companies based on each individual company's percentage of total 2014 mid-
23 year debt. This weighted average yields his assumed cost of debt of 4.8 percent. As I
24 argued in my written evidence, I believe it would be more accurate to exclude
25 ENMAX from this calculation.¹⁹⁸ The Commission has recognized that ENMAX's
26 embedded cost of debt is lower than that of the typical utility because of its access to
27 Alberta Capital Financing Authority Funds.¹⁹⁹ As I explained in my Written

¹⁹⁸ Villadsen Evidence, page 73, A.90.

¹⁹⁹ 2013 GCOC Decision, p.91.

1 Evidence, examining the mid-2014 embedded cost of debt for the ATCO companies,
 2 AUI, and FortisAlberta reveals a median of 5.22 percent and a mean of 5.26
 3 percent.²⁰⁰ Therefore, I use 5.2 percent as a representative cost of debt for the generic
 4 Alberta utility.

5 Q77. Have you quantified the impact of correcting these issues with Mr. Stauff's analysis?

6 A77. Yes. In Figure 17 below I present credit metrics calculated by myself and Mr. Stauff
 7 for a range of equity percentages. As discussed above, my calculations use a cost of
 8 debt of 5.2 percent, whereas Mr. Stauff uses a cost of debt of 4.8 percent. Both sets of
 9 calculations assume an 8.3 percent ROE. The bottom panel of the figure quantifies
 10 the degree of overestimation inherent in Mr. Stauff's credit metric calculations.

Figure 16: Credit Metrics for Selected Capital Structures: Contrasting Stauff and Villadsen Calculations

Villadsen - 8.3% ROE, 5.2% Kd											
<i>Equity % of Cap Structure</i>	35%	36%	37%	38%	39%	40%	41%	42%	43%	44%	45%
EBIT Coverage Ratio [1]	2.09	2.14	2.19	2.24	2.29	2.35	2.40	2.46	2.52	2.58	2.64
FFO Interest Coverage [2]	3.17	3.23	3.28	3.34	3.40	3.46	3.52	3.59	3.66	3.73	3.80
FFO to Debt [3]	11.3%	11.6%	11.9%	12.2%	12.5%	12.8%	13.1%	13.5%	13.8%	14.2%	14.6%

Stauff - 8.3% ROE, 4.8% Kd											
<i>Equity % of Cap Structure</i>	35%	36%	37%	38%	39%	40%	41%	42%	43%	44%	45%
EBIT Coverage Ratio [1]	2.17	2.22	2.28	2.34	2.39	2.46	2.52	2.59	2.65	2.72	
FFO Interest Coverage [2]	3.37	3.43	3.49	3.56	3.63	3.70	3.78	3.86	3.94	4.02	
FFO to Debt [3]	11.6%	11.9%	12.2%	12.5%	12.9%	13.2%	13.6%	13.9%	14.3%	14.7%	

Stauff overestimation											
<i>Equity % of Cap Structure</i>	35%	36%	37%	38%	39%	40%	41%	42%	43%	44%	45%
EBIT Coverage Ratio [1]	0.07	0.08	0.09	0.09	0.10	0.11	0.12	0.13	0.14	0.15	
FFO Interest Coverage [2]	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	
FFO to Debt [3]	0.3%	0.3%	0.3%	0.4%	0.4%	0.4%	0.4%	0.5%	0.5%	0.5%	

Footnote:
 [1] EBIT Interest Coverage = EBIT / Interest
 [2] FFO Interest Coverage = (FFO + Interest)/Interest
 [3] FFO to Debt = FFO / Debt

Source: BV Workpaper R09.

11 As Figure 17 demonstrates, Mr. Stauff's lower cost of debt and his erroneous
 12 treatment of CWIP serve to inflate the coverage ratios at various equity percentages
 13 by approximately 0.1 to 0.3, and the FFO to Debt ratio by approximately 30 - 50 basis

²⁰⁰ Calculations are shown in BV Workpaper 11.

1 points. This underestimation weakens his argument that his recommended equity ratio
 2 is adequate.

3 Q78. Have you analyzed the impact of a utility’s taxable status on the minimum equity
 4 percentage required to meet the relevant EBIT coverage ratio targets?

5 A78. Owing to the recovery of taxes in rates, the larger a utility’s effective tax rate, the
 6 larger its EBIT (required to cover the tax liability). Therefore, as the utility’s tax rate
 7 increases, its EBIT coverage ratio increases. If a utility has non-taxable status (i.e., an
 8 effective tax rate of zero percent), it will have a lower EBIT coverage ratio than if it
 9 had a positive effective tax rate. Consequently, a greater equity percentage would be
 10 needed to elevate the utility’s EBIT coverage.

11 I have calculated the minimum equity percentages for which a generic Alberta utility
 12 would meet the Commission’s EBIT coverage benchmark of 2.0, as well as my
 13 recommended benchmark of 2.5. I assume an 8.3 percent ROE based on the
 14 Commission’s 2013 GCOC Decision, and I assume a representative cost of debt,
 15 depreciation rate, and CWIP rate for the Alberta utilities. The results are presented in
 16 Figure 18 below.

Figure 17: Impact of Non-taxability on Minimum Deemed Equity Percentage Required to Maintaining EBIT Coverage

	Minimum Deemed Equity Percentage for 2.0x EBIT Coverage	Minimum Deemed Equity Percentage for 2.5x EBIT Coverage
27% Tax Rate [1]	33%	43%
0% Tax Rate [2]	41%	51%
Equity Adder Required to Maintain EBIT Coverage at 0% Tax Rate [3]	8%	8%

Notes:

Input parameters for generic Alberta utility -- CWIP Rate: 5.0%; Deprec. Rate: 5.0%; Cost of Debt: 5.2% -- estimated based on 2014 Rule 005 Filings.

[3] = [2] - [1]

Source: BV Workpaper R10.

1 There are two key takeaways from this analysis. First, a generic non-taxable Alberta
2 utility would require a deemed equity percentage of at least 41 percent—one
3 percentage point higher than the base deemed equity percentage of 40 percent—to
4 meet even the Commission’s threshold EBIT coverage ratio of 2.0; the minimum
5 threshold to meet my recommended threshold is a full 10 percentage points higher
6 than that. Second, the adder required to restore a given EBIT coverage ratio when
7 moving from 27 percent to 0 percent tax rate is 8 percentage points, indicating that
8 the 2 percent adder granted to nontaxable entities in the past should at least be
9 maintained if not increased.

10 **B. INCORRECT / MISGUIDED CAPITAL STRUCTURE**

11 Q79. Do you believe that Mr. Stauff’s comments regarding “observed capital structures” on
12 pages 10 and 11 of his evidence provide an appropriate representation of the capital
13 structures of the companies in your Canadian sample and of the holding companies of
14 the Utilities?

15 A79. No, Mr. Stauff does not provide an appropriate representation. He states

16 “The parent entities of the ATCO Utilities, Fortis, and AltaLink all maintain
17 actual common equity ratios that are lower than the common equity ratios
18 that have been approved by the Commission for their operating subsidiaries
19 in Alberta... The managers of the parent companies of the ATCO Utilities,
20 Fortis, and AltaLink have all apparently concluded that actual common
21 equity ratios lower than the ratios approved by the Commission are optimal
22 for shareholders and adequate to maintain the financial integrity and
23 creditworthiness of the overall enterprise, while minimizing overall financing
24 costs.”²⁰¹

25 Mr. Stauff is asserting that these publicly traded entities operate with book value
26 common equity ratios substantially lower than the ratio approved by the Commission
27 for the Utilities. The implication is that the ability of the traded companies to
28 maintain their financial integrity and credit-worthiness is evidence that the

²⁰¹ Stauff Evidence, page 11.

1 Commission's deemed equity ratio is more than adequate to ensure the same for the
2 Utilities.

3 However, Mr. Stauff erroneously neglects to account for the significant levels of
4 preferred equity included in the book value capital structures of the referenced
5 publicly-traded companies. Preferred equity is a hybrid security that can take on
6 varying degrees of equity or debt character depending on the specific provisions of
7 the shares issued. As discussed below, credit rating agencies such as S&P and DBRS
8 generally attribute 50-100 percent common equity character to preferred shares when
9 analyzing a company's credit-worthiness, and it is these agencies and their ratings
10 that ultimately affect the terms of financing available to the Utilities. Therefore, it is
11 not reasonable for Mr. Stauff to treat preferred equity as 100 percent equivalent to
12 debt for purposes of this comparison. Credit metrics that affect access to debt capital
13 measure cash flow relative to total debt, so lumping preferred equity in with debt
14 biases these metrics upward.

15 Figure 19 reproduces the full table from my workpapers that Mr. Stauff excerpted in
16 his evidence.²⁰² As the figure shows, when preferred equity is considered alongside
17 common equity,²⁰³ the resulting ratios are not significantly below the Commission's
18 level. Assuming the preferred equity shares in question are essentially the same as
19 common equity shares, my Canadian sample on a book equity basis is 43.5 percent
20 equity on average, which is above that approved by the Commission. Even
21 categorizing only 50 percent of the preferred equity financing as common equity-like
22 results in book equity ratios that are very much in line with the Commission's deemed
23 equity ratios.²⁰⁴

²⁰² See Stauff Evidence, page 10, lines 5-13, excerpting BV Workpaper 06, sheet "Cap_Struct_Book".

²⁰³ This is labeled as "Q3 2015 Book Equity" in Figure 19.

²⁰⁴ As Mr. Stauff notes, the lowest book equity ratios in the sample belong to Enbridge, Inc. and TransCanada Corp. Although the majority of these companies' assets are dedicated to regulated activities, making them reasonably comparable to the Utilities in terms of business risk, they are diversified geographically and operationally, and are therefore not necessarily appropriate points of comparison for the Utilities when it comes to financing.

Figure 18: Book Value Capital Structures of the Utilities

Company	Q3 2015 Book Equity	Q3 2015 Pref. Equity	Q3 2015 Book Debt	Total
Canadian Utilities Ltd.	32%	12%	56%	100%
Fortis Inc	36%	8%	55%	100%
Emera Inc	40%	9%	50%	100%
TransCanada Corporation	33%	5%	63%	100%
Enbridge Inc	20%	11%	69%	100%
AltaGas Ltd.	44%	11%	46%	100%
Average	34.1%	9.4%	56.4%	100.0%

Source: BV Workpaper 06, Sheet “Cap_Struct_Book.”

1 Q80. Do you have any other comments with regard to Mr. Stauff’s discussion of public
 2 entity capital structures?

3 A80. Yes. First, unlike credit rating agencies such as Standard & Poor’s and DBRS, Mr.
 4 Stauff fails to recognize that preferred equity is a hybrid instrument with
 5 characteristics of debt and equity. Credit rating agencies generally consider 50-100
 6 percent of the preferred equity to function as common equity when performing credit
 7 analysis.²⁰⁵ I discuss this issue in more detail below.

8 Second, I note that the market-value equity ratios of the companies in my sample are
 9 higher than the book value ratios cited by Mr. Stauff. Creditworthiness is judged in
 10 part based on cash flows relative to measures of financial leverage, and at present the
 11 market values the expected cash flows generated by the assets of the Canadian sample
 12 above the original cost recorded on its books. Figure 20 below is from my
 13 workpapers supporting the cost of equity estimates presented in my Written Evidence.
 14 It reports the market value capital structures—both at the time of my analysis (“DCF
 15 Capital Structure”) and averaged over the preceding 3-year period—for the Canadian
 16 Sample (“3-Year Average Capital Structure”). This table demonstrates that market
 17 value leverage ratios of these companies, which determine the financial risk faced by

²⁰⁵ Standard & Poor’s Hybrid Capital Handbook: September 2008 Edition, and DBRS Criteria: Preferred Share and Hybrid Security Criteria for Corporate Issuers, January 2016.

1 their shareholders, reflect *less* leverage than what is inherent in the Commission’s
 2 approved equity ratio.

Figure 19: Villadsen Canadian Sample Market-Value Capital Structure Summary

Company	DCF Capital Structure			3-Year Average Capital Structure		
	Common Equity - Value Ratio	Preferred Equity - Value Ratio	Debt - Value Ratio	Common Equity - Value Ratio	Preferred Equity - Value Ratio	Debt - Value Ratio
	[1]	[2]	[3]	[4]	[5]	[6]
Canadian Utilities Ltd	44.8%	8.9%	46.4%	52.6%	7.6%	39.9%
Fortis Inc	40.5%	7.0%	52.5%	37.6%	7.3%	55.1%
Emera Inc	55.0%	6.2%	38.7%	49.1%	6.2%	44.7%
TransCanada Corporation	45.4%	3.5%	51.1%	52.2%	2.9%	44.9%
Enbridge Inc	43.8%	7.4%	48.8%	52.2%	7.3%	40.6%
AltaGas Ltd	50.8%	9.1%	40.1%	56.5%	6.6%	37.0%
Average	46.7%	7.0%	46.3%	50.0%	6.3%	43.7%

Source: BV Workpaper 06, Table No. BV-CAN-4.

3 Q81. Please comment on Mr. Stauff’s discussion of potentially adopting parent level capital
 4 structures.

5 A81. On page 12 of the Stauff Evidence, Mr. Stauff states

6 If the regulatory strategy of accepting the capital structure chosen by
 7 management at the publicly traded parent level were adopted by the
 8 Commission, the allowed equity ratios for the Alberta utilities would be
 9 lower than they are now. I am not suggesting that the Commission actually
 10 adopt that strategy, but this analysis shows that the currently approved equity
 11 ratios are not too low, and are probably higher than necessary.

12 It has been a long standing principle for the Commission to regulate utilities on a
 13 stand-alone basis.²⁰⁶ Mr. Stauff’s comments seem to suggest a deviation from that
 14 principle. There is no economic justification to deviate from this principle.

15 Q82. Does Dr. Booth make a similar point to Mr. Stauff’s regarding treatment of preferred
 16 equity?

17 A82. Yes. On page 4 of his CAPP Evidence, he states

18 In my judgement, there is minimal risk to the equity holders in ATCO
 19 Pipelines and I continue to recommend a 35% common equity ratio. As in

²⁰⁶ See, for example, Decision 2191-D01-2015, paragraph 420.

1 2014, I would point out the double leverage involved in several Alberta
2 utilities. Fortis finances Fortis Alberta with 35% common equity and 10%
3 preferred shares while it maintained an A- S&P bond rating, which it
4 described as “strong.”

5 This quote implies that 35 percent common equity with 10 percent preferred shares is
6 equivalent to Dr. Booth’s recommendation of 35 percent common equity and
7 (implicitly) 65 percent debt. As in Mr. Stauff’s analysis, Dr. Booth’s failure to
8 attribute common equity-like characteristics to the preferred shares constitutes a
9 substantial flaw in his argument. The credit rating agencies do not make this mistake.
10 According to Standard & Poor’s,

11 In their most common forms, hybrid capital instruments afford equity benefit
12 to issuers, in part, by having ongoing payment requirements that are more
13 flexible than interest payments associated with nondeferrable senior debt,
14 and by being contractually subordinated to such debt. Obviously, these
15 characteristics make the instruments more risky for investors than
16 nondeferrable debt. In assigning issue ratings to equity hybrids, we seek to
17 reflect the incremental risks associated with the issue in terms of payment
18 timeliness and principal recovery compared to nondeferrable debt. We
19 typically reflect these risks in our issue ratings on equity hybrids by
20 assigning them ratings that are lower than those on nondeferrable debt.²⁰⁷

21 In addition to rating hybrid issuances to reflect higher risk relative to true debt
22 instruments, S&P classifies hybrid instruments according to their debt and equity like
23 qualities and attributes them appropriately for purposes of credit analysis.
24 Specifically, for corporate issuers, it treats “minimal equity content” issues as though
25 they were debt and “high equity content” issues as though they were common equity,
26 but attributes “intermediate equity content” hybrids 50 percent to debt and 50 percent
27 to equity. S&P states,

28 This approach is followed in our analysis of capital structure, as well as of
29 cash flows and fixed-charge coverage. That is, for "minimal" equity content
30 instruments, all related dividend or interest payments (however defined
31 legally) are treated as a fixed charge; for "intermediate" equity content
32 instruments, 50% of the related payment is treated as a fixed charge and 50%
33 as the equivalent of a common dividend; and for "high" equity content
34 instruments, all related payments are treated as if they were the equivalent of
35 a common dividend—i.e., they are not included in fixed charges.²⁰⁸

²⁰⁷ Standard & Poor’s Hybrid Capital Handbook: September 2008 Edition.

²⁰⁸ *Ibid.*, pp. 20-21.

1 Thus, conservatively assuming that Fortis’s preferred shares are classified as
2 “intermediate” in terms of equity content, S&P would treat its capital structure—and
3 calculate cash flow to leverage and fixed charge coverage ratios—as though its
4 capitalization were 40 percent equity (= 35% *common equity* + 0.5 ×
5 10% *preferred*) and 60 percent debt, exactly in line with the Commission’s deemed
6 capital structure.

7 DBRS is even more explicit than S&P in acknowledging the equity character of
8 preferred shares. It states its policy as follows.

9 Preferred shares are normally less complicated than hybrids and, next to
10 common equity, typically hold the ranking as the most junior security.
11 Preferred shares are by, definition, equity and typically command a very high
12 level of equity weighting. Preferred shares generally attract a 100% equity
13 weighting, provided that DBRS is satisfied that the issuer has no intention to
14 eventually replace the preferred shares with debt. This acknowledges the key
15 features of the instrument such as permanence, the generally light terms (i.e.,
16 non-cumulative, contains no events of default or covenants) and the ability to
17 defer dividends despite typical reluctance among issuers to suspend them.

18 ...

19 Even when all of these factors are satisfied, DBRS may still assign little or
20 no equity treatment to a hybrid if an issuer uses such securities excessively.
21 Accordingly, irrespective of the equity weighing assigned to a specific
22 instrument, DBRS will treat as debt all incremental preferred shares and
23 hybrids that lead the ratio of preferred equity and hybrids to common equity
24 to exceed 20%.

25 ...

26 Where the amount of hybrids and preferred shares is material, DBRS will
27 make adjustments to some of its key leverage ratios such as debt-to-EBITDA
28 and cash flow-to-debt to reflect some of the flexibility contributed by these
29 instruments.²⁰⁹

30 So up to a certain threshold, DBRS performs its capital structure and credit ratio
31 analysis treating preferred shares as though they were common equity. In the Fortis
32 example cited by Dr. Booth, DBRS’s policy dictates attribution of the majority
33 (specifically 7 percentage points, since that represents 20 percent of the pure common
34 equity financing) to equity, and the rest to debt, for a capitalization of 42 percent

²⁰⁹ DBRS Criteria: Preferred Share and Hybrid Security Criteria for Corporate Issuers, January 2016, p. 8.

1 equity / 58 percent debt, reflecting slightly lower financial risk than is imposed by the
2 Commission's deemed structure.²¹⁰

3 Q83. Please summarize your thoughts on Mr. Stauff's and Dr. Booth's comparisons of
4 capital structures for publicly-traded utility holding companies.

5 A83. Mr. Stauff and Dr. Booth both ignore the presence of preferred equity in the capital
6 structures of the companies they compare resulting in an overstatement of the debt
7 ratio and an understatement of the equity ratio in the capital structure. As
8 demonstrated above, even a conservative attribution of equity character to these
9 highly subordinated hybrid securities reveals that the capitalization ratios of the
10 publicly-traded entities in my Canadian sample (including the parent companies of
11 some of the Utilities) are actually very much in line with those allowed by the
12 Commission for the Utilities.

13 **C. ADDITIONS TO OR SUBTRACTIONS FROM THE EQUITY RATIO**

14 Q84. What is your reaction to the specific modifications to the equity ratio that Mr. Stauff
15 has proposed?²¹¹

16 A84. First and foremost, I do not believe it is a meaningful exercise to add or subtract
17 percentage points to the equity ratio for the suggested specific issue at this point in
18 time. It is important to get the deemed equity ratio right, but the proposed
19 modifications may not be additive meaning that the addition of equity percentages for
20 two risk factors may get the overall risk wrong.

21 Second, I do not find the specific modifications in the Stauff Evidence compelling.
22 His proposals to (i) eliminate the 2 percent adder for non-taxable entities,²¹² (ii)

²¹⁰ This is confirmed according to DBRS's January 6, 2016 Rating Report on Fortis Inc., which notes the preferred treatment in a footnote to the consolidated debt-to-capitalization ratio of 58.2% as of September 30, 2015. (See page 9 of the report.)

²¹¹ Stauff Evidence pp. 50-58.

²¹² Stauff Evidence pp. 50-58.

1 reduce the equity ratio of ATCO Electric Transmission by 2 percent,²¹³ and (iii)
2 award ATCO Pipeline the same equity ratio as the electric transmission entities are
3 addresses below.²¹⁴

4 Q85. Please discuss the proposal to eliminate the 2 percent equity adder for tax exempt
5 entities.

6 A85. As Mr. Stauff acknowledges, the EBIT coverage ratio is lower for tax exempt entities
7 and earnings volatility is higher,²¹⁵ so that it is necessary to increase the equity ratio
8 to ensure the benchmark EBIT coverage ratio is met.

9 Mr. Stauff argues that the 2 percent adder is costly, lead to unusual circumstances
10 when a company faces a low tax rate and that credit metrics are better repaired using
11 a normalized or future income tax (FIT). I disagree for several reasons.

12 Customers benefit when a utility is tax exempt as they do not pay income taxes and
13 therefore face a lower bill than if they received service from an otherwise identical
14 utility. Further, while there are many arguments for and against flow-through vs.
15 FIT, transitioning from one system to another is non-trivial, so that such a change
16 should only be contemplated if it were expected to be in place for a longer period.

17 Importantly, I note that my written evidence shows that a tax exempt entity needs a
18 boost in the equity percentage of well over 7 percent to have an EBIT coverage ratio
19 that is comparable to that of a fully taxable entity.²¹⁶ Therefore, the 2 percent adder
20 that the Commission historically has relied upon is a very conservative estimate of
21 what is needed to repair the credit metric.

22 Q86. What are Mr. Stauff's proposals regarding other equity ratio modification?

23 A86. Mr. Stauff proposed to eliminate

²¹³ Stauff Evidence pp. 60-61.

²¹⁴ Stauff Evidence p. 61.

²¹⁵ Stauff Evidence p. 54 and pp. 55-56.

²¹⁶ Villadsen Evidence, p. 79.

1 the 2% equity ratio adds that were approved in the 2009 and 2011 GCOC
2 proceedings in connection with their [ATCO Electric Transmission and
3 AltaLink] large capital programs.²¹⁷

4 He also suggests a reduction of the spread between electric distribution and
5 transmission companies from 4 percent to 2 percent.²¹⁸ As I understand it the effect
6 of these two proposals is a reduction in ATCO Transmission's equity ratio by 2
7 percent. Mr. Stauff cites Dr. Cleary's EBIT volatility analysis as a source.²¹⁹ Mr.
8 Stauff further proposes to set ATCO Pipeline's equity ratio equal to that of an electric
9 transmission entity.²²⁰ If I understand this proposal correctly this would result in a
10 reduction in ATCO Pipeline's equity ratio by 3 percent.

11 Q87. How do you react?

12 A87. I disagree because adding and subtracting based on one-off issues is not the right
13 approach to determine the capital structure. It is the totality of the risk going forward
14 that needs to be considered, yet neither Mr. Stauff's discussion nor Dr. Cleary's
15 volatility analysis does so.²²¹ As Dr. Carpenter explained in his written evidence:

16 Business risk refers to the underlying risks inherent in a particular company's
17 operations. Although it is a somewhat subjective concept, and there is more
18 than one way of structuring an analysis of business risk, an approach that is
19 commonly taken is to consider five elements of business risk: supply risk,
20 demand (or market) risk, competitive risk, operating risk and regulatory
21 risk.²²²

22 Thus, the analysis fails to consider all aspects of the Utilities risk characteristics.
23 However, to be responsive to the Commission's questions, I note that the large capex
24 program is ongoing albeit at a lower rate and, for example, the magnitude of
25 Contributions in Aid of Construction has not been evaluated. I note that if I
26 understand the additions and subtractions correctly, Mr. Stauff is proposing 34

²¹⁷ Stauff Evidence p. 58.

²¹⁸ Stauff Evidence p. 59

²¹⁹ Stauff Evidence p. 60.

²²⁰ Stauff Evidence p. 61.

²²¹ Carpenter Rebuttal Evidence, Section II.B and III.A.

²²² Written Evidence of Paul R. Carpenter, p. 7.

1 percent equity for transmission entities, which would make these entities more
2 leveraged than all but one utility among those covered by DBRS in 2014.²²³

3 From an investor perspective, the risk and return of an investment is evaluated
4 relative to what is available on comparable investments. Mr. Stauff's proposal puts
5 the Utilities at a disadvantage as, for example, Hydro One, an Ontario-based electric
6 distribution and transmission utility, is allowed an equity ratio of 40 percent and an
7 allowed ROE of 9.3 percent.²²⁴

8 The discussion above is also applicable to ATCO Pipeline and ATCO Pipeline's
9 integration agreement with NOVA Gas that was known at the last GCOC.²²⁵ I also
10 refer to Dr. Carpenter's rebuttal evidence, which notes that risks may be increasing
11 rather than decreasing.²²⁶ Therefore, there is no reason to change the relative risk
12 positioning of the Utilities.

13 Q. Does this conclude your testimony?

14 A. Yes.

²²³ Villadsen Evidence, Workpaper 10 based on DBRS Industry Study Canadian Utilities Q3 2014, published January 2015.

²²⁴ Hydro One Limited, "Initial Public Offering," October 9, 2015, p. 10.

²²⁵ Decision 2191-D01-2015, paragraph 464.

²²⁶ Carpenter Rebuttal Evidence, Section IV.