1 **Q.   At page 34 of this evidence Mr. Coyne states that he has *"concerns with the***

2 ***ability of CAPM to produce reasonable results without adjustments for the current***

3 ***market environment" and further that he "attempted to compensate for these concerns***

4 ***by using forward-looking inputs, including a forecasted Canadian risk free rate, an***

5 ***MRP that combines both Canadian and US. market inputs, including both historic and***

6 ***forward-looking estimates, and the adjusted beta coefficient for the Canadian and US,***

7 ***proxy companies".* Please provide Dr. Booth's opinion as to whether each of the**

8 **adjustments made by Mr. Coyne in his analysis is appropriate to adjust for current**

9 **market conditions.**

10

11 A.   There is a fine line between applying economic reasoning to the data to make

12 adjustments and having a number in mind and then making adjustments to get to that

13 number. Dr. Booth judges the correct approach to be the one that he has always followed:

14

15	*First,*	Analyse current market conditions to assess whether there is
16		anything unusual;
17	*Second,*	Let the data say what it says;
18	*Third,*	Consider applying economic reasoning to adjust historic data to
19		reflect current market conditions;
20	*Finally,*	Show the order of magnitude of any adjustments, so the regulator
21		can make a decision on the basis of both fact and expert judgment.

22

23 In terms of Mr. Coyne's adjustments, Dr. Booth sympathizes with the intent of some,

24 since like Mr. Coyne he judges current long Canada bond yields to be too low for

25 unadjusted risk premium or CAPM analysis. However, he makes the following

26 observations:

1   1)   Current long Canada bond yields are now under 2.0% (February 29, 2016)

2   and have dropped 0.40% in the last three months. We can extract a market

3   forecast of the expected 30 year-long Canada bond yield simply by using

4   arbitrage conditions, since investing in a 31 year bond is essentially the

5   same as investing in a one year bond and then investing the proceeds next

6   year in a 30 year bond. Essentially, the increase in the 30 year bond yield

7   expected by the market is the difference between the 31 year bond yield

8   and the one year bond yield averaged over 30 years. For example and to

9   keep the math simple, if the 31 year bond yield was 2.0% and the one year

10   0.5% the difference of 1.5% has to be picked up in the increased 30 year

11   yield next year. So spread over 30 years it means an increase of 0.05% a

12   year (1.5/30) so that the 30 year yield next year is expected to be 2.05%.

13

14   The math is actually slightly more complicated than this example shows,

15   but the current market based forecast of the long Canada bond yield for

16   the test year is under 2.0%. This simply illustrates the fact that economic

17   forecasters do not buy bonds and that those that do do not believe the

18   economists' forecasts. The Board seemed to accept this idea when it based

19   its original ROE formula on the actual, not the forecast bond yield. Mr.

20   Coyne's use of an interest rate forecast beyond the test year simply over-

21   estimates the long Canada bond yield appropriate for NP's forecast

22   average test year.

23

24   2)   In terms of the market risk premium there are two adjustments Mr. Coyne

25   makes that Dr. Booth regards as inappropriate

26   a.   The historic market risk premium estimates are total equity market

27   returns minus what Mr. Coyne calls "income returns," which are

28   actually bond yields. The equivalent equity market income return

1

2   would be if the stock market falls 12% but you receive 2% in

3   dividends, then you say you earned an income return of 2%. While

4   that part may be "technically" true, you can't ignore the capital

5   loss, which is why we estimate the total return of -10%. Anything

6   else is misleading. Consistency required that you subtract total

7   bond returns from total equity returns or bond income returns from

8   equity income returns. NP's witness in 2012 Ms. McShane

9   switched from using total returns to income returns sometime over

10   the last ten years, but at least in her testimony (Table 9 below) she

11   provided both so the Board could see the magnitude of her upward

12   adjustment to the historic market risk premium which was about

13   0.8-1.0%.

Table 9

Period	Stock Return	Bond Total Returns	Bond Income Returns	Risk Premium Over Bond Total Returns	Risk Premium Over Bond Income Returns
Canada					
1924-2011	11.4%	6.6%	6.0%	4.8%	5.4%
1947-2011	11.8%	7.1%	6.7%	4.7%	5.0%
U.S.					
1926-2011	11.8%	6.1%	5.2%	5.6%	6.6%
1947-2011	12.3%	6.6%	5.9%	5.7%	6.4%

Source: Schedule 8.

14   b.   Mr. Coyne's estimate of the current market risk premium is based

15   on the constant growth model for all the individual firms in the

16   TSX composite using analyst growth forecasts for the constant

17   growth rate to infinity. This is inappropriate because:

1   i.   Most firms do not satisfy the requirements to use the

2   constant growth model and Mr. Coyne does not do the

3   normal diagnostic checks to see if they do;

4   ii.   Analyst growth rates are well known to be optimistic, that

5   is, biased high and this is nothing to do with the global

6   settlement referred to by Mr. Coyne, which was a case of

7   outright analyst fraud. The recent RBC playbook referred

8   to by Dr. Booth shows that this optimism bias is alive and

9   well, and accepted by market professionals, not just

10   academics;

11   iii.   Any resulting expected return estimate for the market as a

12   whole has to satisfy the "adding up" condition for the

13   economy as a whole, since corporate earnings cannot in

14   perpetuity grow faster than the economy;

15   iv.   Without explicitly ruling out insights from analyst growth

16   forecasts most boards place more weight on multi-stage

17   growth models that trim the growth rate to that of the

18   economy over time. Mr. Coyne does not do this for the

19   market risk premium estimates, although he does do it for

20   his direct DCF estimates.

21   v.   Mr. Coyne's regression model is mis-specified as it implies

22   that the market risk premium was hugely negative during

23   the financial crisis, which Dr. Booth regards as highly

24   unlikely.

25

26   3)   Mr. Coyne's recommended betas are much too high for several reasons:

1   a.   Mr. Coyne does not present historic estimates of betas over long
2   periods of time to allow the Board to make an assessment of
3   whether his current values are reasonable. That is, there is no basis
4   to assess his adjustments to his actual unadjusted or what he calls
5   "raw" beta estimates.

6   b.   Mr. Coyne adjusts actual betas towards the market mean of 1.0,
7   while there is no evidence that Canadian utility betas do in fact
8   trend towards 1.0. The only evidence that Dr. Booth is aware of is
9   that utility betas revert back to their long run mean, not 1.0. Mr.
10   Coyne does produce "industry adjusted" beta estimates in his 2015
11   evidence before the BCUC for FortisBC Energy Inc., (FEI) but has
12   decided not to present them to the Board.

JAMES M. COYNE
DIRECT TESTIMONY
PREPARED FOR FORTISBC ENERGY INC.

1   I recognize that the BCUC expressed some reservation regarding the reversion of beta to
2   the market mean in its 2013 GCOC Decision and adopted what it characterized as an
3   "intermediate beta".[70] I therefore provide an alternative specification of beta that reverts
4   to the midpoint of the market mean and an industry utility industry index.[71] Based on the
5   strength of the academic literature, practice before regulatory commissions on such
6   matters, and broader practice among financial analysts, I have relied on market-adjusted
7   betas for my primary analysis. I present the alternative CAPM as a point of reference in
8   the event the Commission determines that an alternative specification warrants any weight.
9   The betas used in my analyses are presented below:

10   **Table 6: Beta**

	Canadian Group	U.S. Group
Adjusted to Market Mean (Primary Analysis)	0.65	0.78
Adjusted to Average of Industry Average and Market Mean (Alternative Analysis)	0.57	0.67

13   c.   Mr. Coyne does not make any adjustments to his US beta estimates
14   for the fact that they are derived from US electric utilities that have
15   significant generation, which in some cases is nuclear. In other
16

1   recent testimony for transmission and distribution utilities he has

2   made a deduction for generation risk and used significantly lower

3   beta estimates than the ones he is currently presenting to the Board.