



SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, BC CANADA V6Z 2N3
TELEPHONE: (604) 660-4700
BC TOLL FREE: 1-800-663-1385
FACSIMILE: (604) 660-1102

Log. No. 39204

ERICA HAMILTON
COMMISSION SECRETARY
Commission.Secretary@bcuc.com
web site: <http://www.bcuc.com>

VIA EMAIL

October 9, 2012

BRITISH COLUMBIA UTILITIES COMMISSION
GENERIC COST OF CAPITAL PROCEEDING EXHIBIT A2-25

To: All Registered Parties
(*BCUC-GCOC*)

Re: British Columbia Utilities Commission
Project No. 3698660/G-20-12
Generic Cost of Capital Proceeding

Commission staff submits the following document for the record in this proceeding:

Canadian Transportation Agency – Risk-free rate determination

Yours truly,

Erica Hamilton

/dg
Attachment

Decision No. 425-R-2011

December 9, 2011

REVIEW of the methodology used by the Canadian Transportation Agency to determine the cost of capital for federally-regulated railway companies.

File No.:

T 6275-17

ISSUES RELATED TO ELEMENTS OF THE CAPM METHODOLOGY

Issue 9: Risk-free rate

Estimating the forward-looking risk-free rate

[305] Along with selection of the appropriate debt instrument, consideration was given to the specific observations that may form the estimate of a risk-free rate. The Agency annually determines three different cost of equity estimates for each Class 1 railway company: 1) for the determination of the revenue caps for the transportation of western grain, 2) for interswitching rate development, and 3) for all other regulatory purposes. With the exception of the risk-free rate of return, all of the elements necessary for the development of all three cost of capital rates are those determined annually in the cost of capital rate for the transportation of western grain.

[306] For both the western grain and interswitching determinations, where the cost of equity is determined prospectively, the Agency must forecast the risk-free rate for a future period. These are unlike the determinations for all other regulatory purposes, where the cost of equity is determined retrospectively and the actual risk-free rate for the past period can be determined directly from published data. To estimate the risk-free rates to be used in the prospective estimates of cost of equity for the western grain revenue cap and for interswitching, the options are to use either currently published yields or forecasted yields.

[307] With the first approach, a current observed risk-free rate is used as a proxy for the risk-free rate in the future period for which it is applied, on the assumption that the current observed rate would be a good representation of what the rate will be in the near future. The current Agency practice is to monitor the daily rates over a defined period preceding the determination and select a rate from within that period that, in the judgement of the Agency, best reflects the potential interest rate over the prospective period. Alternatively, the prospective rate may be estimated as the average of daily rates over a fixed period preceding the determination. The

fixed period approach reduces the application of judgemental factors and allows for greater transparency. Agency analysis of these two approaches indicates that there are minor differences between the flexible and fixed-period rates in individual years, but that over time the two approaches provide very similar risk-free rates.

[308] With respect to a forecasted yield approach, a standard methodology, accepted in finance theory for forecasting the interest rate in a future period is the so-called "forward rate" method. Under certain assumptions, the forward rate is considered to represent the market's consensus of future interest rate expectations. It is calculated from the zero coupon bond yield curve published by the Bank of Canada (also known as the spot rate curve), using a standard method of calculation based on arbitrage theory, as described in *Fixed Income Analysis for the Chartered Financial Analyst Program* by Frank J. Fabozzi.

[309] The three methodologies for forecasting the risk-free rate were compared with respect to the western grain revenue cap cost of capital determination. Using Government of Canada 3-5 year marketable bonds, the average of the daily yields assessed and selected from a flexible period preceding the crop year, an average of the daily yields for the month of January preceding the crop year, and the forward rate covering the crop year period were compared with the actual bond yields for the specific crop year, as published by the Bank of Canada.

[310] From this comparison of the three methodologies, as set out in Exhibit 7, the Agency notes the following. Using the current rate to forecast the risk-free rate generally provides closer approximation to the actual risk-free rate than using the forward rate, with an average deviation of 0.17 basis points of the current rate from the actual rate as compared to an average deviation of 0.69 basis points for the forward rate. The results also show that on average the rates averaged over a fixed January period perform the same as the rates averaged over a flexible selection period. Similar results were obtained using the Government of Canada 1-3 year and 10+ year marketable bonds as the debt instruments.

Issue 9: Agency conclusion

[313] The Agency finds that yields from a mid-term debt instrument, specifically marketable government bonds with maturities in the range of three to five years, produce an acceptable balance of responsiveness and stability. This approach also provides a greater degree of theoretical correctness than the one currently in place. Therefore, determining that it best meets its criteria, the Agency will adopt the use of Government of Canada 3-5 year marketable bond yields as its proxy for the risk-free rate applied in the CAPM calculation for determining the Canadian cost of common equity rate. In the case of its determination of the U.S. cost of equity, the Agency will use U.S. Government Treasury 3-year and 5-year marketable bonds to develop separate cost of equity estimates and take the simple average of the two.

[314] With respect to the forward-looking risk-free rate in the Canadian CAPM, for determining the cost of capital rate for the transportation of western grain, the Agency will rely on the average of daily yield observations of Government of Canada 3-5 year marketable bonds for the month of January immediately preceding the crop year, as published by the Bank of Canada. For the cost of capital rate for the development of interswitching costs and rates, the Agency will rely on the average of daily yield observations for the month of September immediately preceding the interswitching year, as published by the Bank of Canada. For the cost of capital rate for other regulatory purposes, the value used will be based on the average yield for the calendar year for which the determination is being made, as published by the Bank of Canada.

[315] For the U.S. CAPM, two distinct forward looking risk-free rates will be determined using the yields on U.S. Government Treasury 3-year and 5-year marketable bonds. For determining the cost of capital rate for the transportation of western grain, separate averages will be calculated of daily yield observations on U.S. Government Treasury 3-year and 5-year marketable bonds for the month of January immediately preceding the crop year, as published by the Federal Reserve. For the cost of capital for the development of interswitching costs and rates, the averages of daily yield observations for the month of September immediately preceding the interswitching year, as published by the Federal Reserve will be taken. For the cost of capital rate for other regulatory purposes, the values will be based on the average yields for the calendar year for which the determination is being made, as published by the Federal Reserve.