

Calculating the Cost of Capital for LDCs in Ontario

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Current Methodology

- The LDCs have been divided to into four groups based only on the size of the regulated rate base
- Adjustment for differences in business risks among the groups is reflected through a deemed capital structure
- All the LDCs were allowed the same return on equity regardless of their size
 - The initial after-tax, return on equity (ROE) was set at 9.88%

Current Methodology: Capital Structure

- Small: Rate base < \$100 M
 - Debt/equity: 50%/50%
- Medium small: Rate base -- \$100 M to \$250 M
 - Debt/equity: 55%/45%
- Medium large: Rate base -- \$250 M to \$1 B
 - Debt/equity: 60%/40%
- Large: Rate base > \$1 B
 - Debt/equity: 65%/35%

Current Methodology: ROE

- All the LDCs were allowed the same after-tax return on equity of 9.88%
- ROE was derived by adding an equity risk premium (**ERP**) of 3.80% to the forecast yield on 30-year Canada bonds (as of 1999)
- The ERP was derived as a weighted average of premiums by three tests:
 - the equity risk premium test;
 - the discounted cash flow test; and
 - the comparable earnings test

Current Methodology: Updating

- The ROE would change each year by 0.75 times the annual change in the 30-year Canada bond yield
- Applying this formula to the 2005 year-end bond rates produces a ROE of 8.65%

Suggested Methodology: CAPM

- In competitive markets, investors who hold a risky asset must be compensated for the risk they bear
- In the absence of compensation they would have no incentive to prefer risky assets over the risk free asset
- This compensation is presented in the form of additional expected rate of return over the risk free rate – the risk premium

Suggested Methodology: CAPM

- The risk of an asset is measured by its beta
- The beta of an asset measures the sensitivity of the expected rate of return of a risky asset to the expected rate of return of the “market”
- The “market” is usually represented by an index which captures the market, such as the S&P/TSX Index and its expected rate of return is denoted by $E(R_m)$

Suggested Methodology: CAPM

- Risk Premium = $\beta \cdot (E(R_m) - R_f)$
- Expected ROE = $R_f + \text{Risk Premium}$
- Expected ROE = $R_f + \beta \cdot (E(R_m) - R_f)$
- The risk premium of a public company can be estimated by regressing a firm's rate of return, implicit in market prices, on the rate of return of the market

Why CAPM

- The CAPM is used by other regulatory bodies (e.g., Australia, UK) to establish a risk premium for equity holders
- It is an objective market-based approach that relates to actual conditions in financial markets
- It has a strong theoretical foundation in the academic finance literature
- It is widely adopted in financial markets
- Major stock exchanges provide estimates for betas for all companies listed on the exchanges
- The CAPM is subject to fewer errors relative to the other two methods which require estimates of future cash flows and their likelihoods
- Implementing the CAPM is relatively simple and requires use of data that are readily available

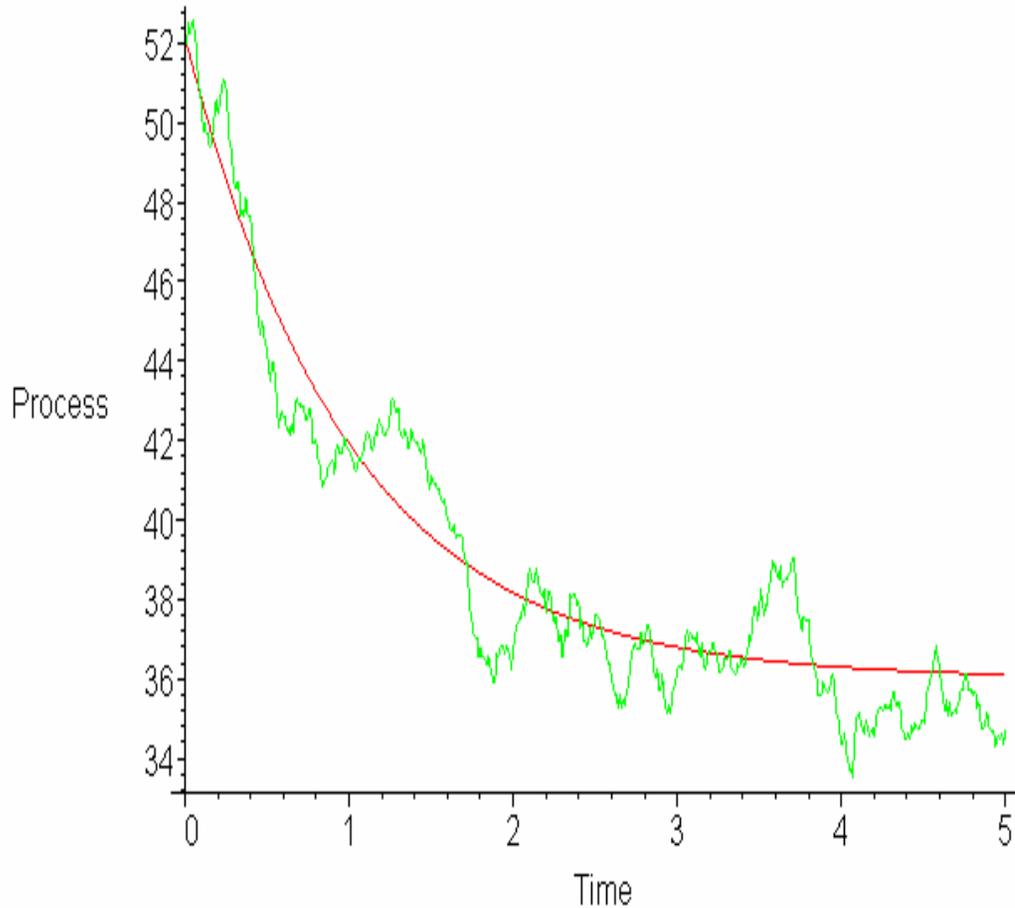
Suggested Methodology: Risk Free Rate

- It seems reasonable that the spot rate should not be used as the risk free rate
 - Since it is not a fair representation of the rate to prevail over the next review period
- The decision should therefore be forward and historical rates
 - The forward rate as it is a good estimate of the spot rate that will prevail in the future
 - Some historical average of forward (or spot) rates or a longer term rate, guided by the mean reverting process since it can be considered as an average of the short term rates

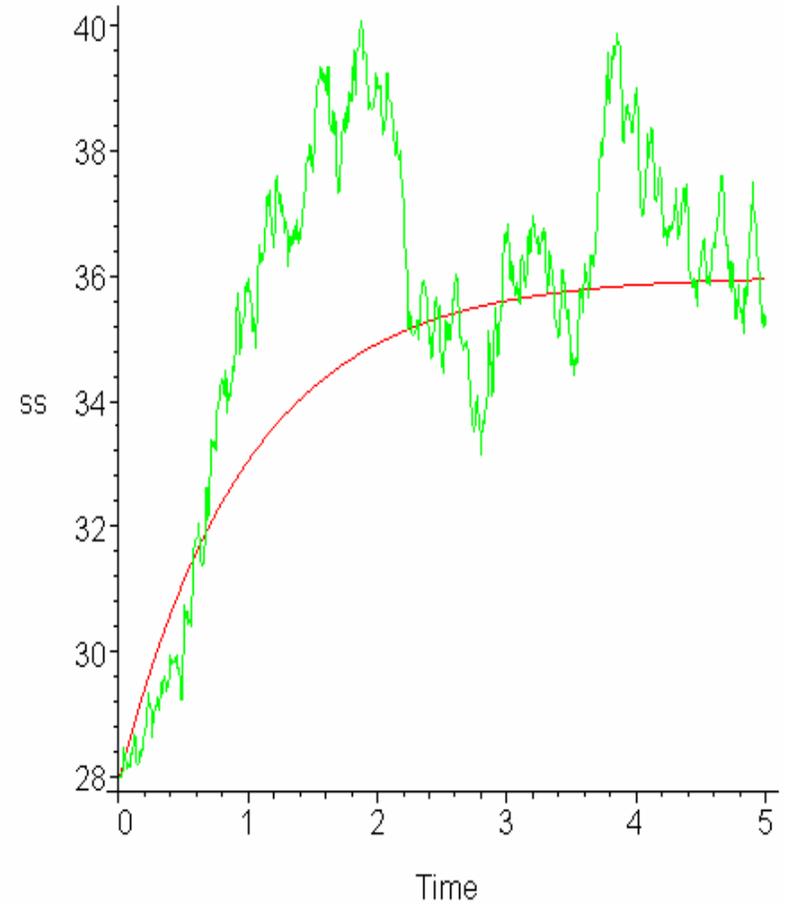
The Risk Free Rate

Mean Reverting Process

Deterministic Process (red), Stochastic Process (green)

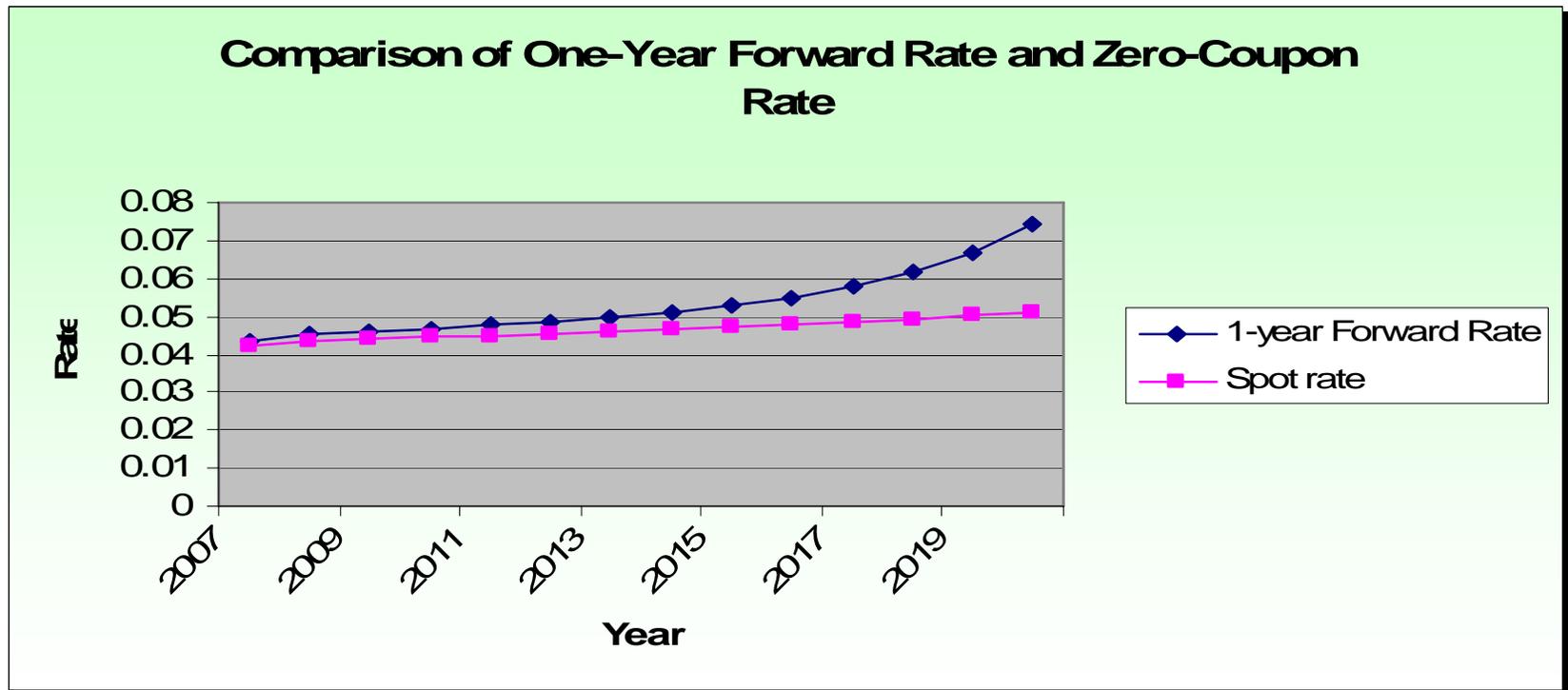


Deterministic Process (red), Stochastic Process (green)



Suggested Methodology: Risk Free Rate

- This is estimated utilizing the forward rate implied in the zero coupon curve
- The estimated rate, based on an average of 5, 10 and 15 year forward rates is 5.01%



Suggested Methodology: ROE

- ERP to be estimated using only the Capital Asset Pricing Model (**CAPM**)
- The risk premium of a public company can be estimated by regressing a firm's rate of return, implicit in market prices, on the rate of return of the market
- LDCs are not public companies – another way must be used

Suggested Methodology: ROE

- After-tax (unlevered) betas of a few proxy publicly traded (on the TSX) companies were collected
- The average (52 weeks) beta for the years 2004 and 2005 turns out to be 0.357
 - The average (60 months) beta is 0.2033
- The market return for the S&P/TSX index was 7.17% and 10.65% based on the past 5 years and 10 years, respectively

Suggested Methodology: ROE

- The risk premium (when $D=0$) is the estimate of the after-tax beta, times, the market return less the risk free rate, i.e., $\text{beta} \times [E(R_m) - R_f]$
- The market return (MRP) can vary between 2.16% and 5.64%
 - It seems that an average MRP of about 5% is commonly used by business valuers in Canada
- The overall after-tax ROE for the LDCs, when $D/E=0$, can vary between:
 - 5.78% and 7.02% based on the 52 week beta (0.357)
 - 5.45% and 6.16% based on the 60 month beta (0.203)

Suggested Methodology: ROE

- The overall after-tax ROE for the LDCs, when $D/E=1.5$ (debt comprise 60% of the capital structure, tax=36%), can vary between:
 - 6.52% and 8.956% based on the 52 week levered beta (0.892)
 - 5.87% and 7.25% based on the 60 month levered beta (0.508)

Suggested Methodology: Cost of Debt

- Separate rates for long-term and short-term debt
- LDCs that currently have outstanding third-party debt, will use the average rate of interest they are paying
- The average rate will be reset each year based on the expected average interest rate to be paid on the outstanding third-party debt in the coming year

Suggested Methodology: Cost of Debt

- Cost of debt for LDCs with no debt will be the risk free rate plus the average spread between a sample of “A/BBB” rated corporate bonds of 5, 10 and 20 year maturities and the corresponding Canada bonds
- The maximum allowable cost of short-term debt should be set annually as an average of interest rates of commercial paper issued by the same sample of companies

Suggested Methodology: Debt/Equity Ratio

- Total debt should include both short-term and long-term debt, following the practices of the credit rating agencies
- The academic literature has still not reached a definitive answer regarding the issue of the optimal debt-equity ratio
- Some authors suggest that the best way to choose this ratio is to mimic the average in the industry
- For an “A/BBB” rating on long-term debt instruments, a regulated utility can usually carry 60% to 70% debt on its balance sheet
 - This declines to the 50% to 60% range when the company is involved in more unregulated activities which are subject to greater instability, uncertainty, and business risk

Suggested Methodology: Debt-Equity Ratio

- Recommendations:
 - Two groupings of LDCs for the purpose of establishing the maximum total debt to total debt plus equity proportions
 - For all LDCs with a rate base, excluding working capital allowances of less than \$300 million, the maximum debt-equity split should be 50%/50%
 - For all LDCs with a rate base in excess of \$300 million, the maximum debt-equity split should be 60%/40%.
- If a LDC chooses a debt-equity split less than these maximums, then the actual proportions should be used in determining the WACC for the LDC and the resulting revenue requirements
- Limit the proportion of short-term debt in the capital structure to the same rate as the working capital allowance. Since short-term debt should be used to finance short-term assets, primarily working capital requirements

Suggested Methodology: Updating Mechanism

- There are two options for the annual updating of the ROE
- In option one, the risk premium would remain constant over the five-year period
 - The overall ROE would change in line with the annual changes in the risk free rate.
 - The change in the risk free rate incorporated in the ROE should not change on a one-for-one basis with the actual change in the risk free rate. A formula is suggested
- In option two, both the risk free rate and the risk premium are calculated each year