

## Final Colorado State Assessed Cost of Capital Tax Year 2011

### INTRODUCTION

The narrative describes the methods, sources and calculations for the 2011 Cost of Capital used by the Division of Property Taxation (DPT). The DPT develops a market cost of capital for each utility industry group or sub-group with similar risk characteristics using the band of investment method. The cost of capital for each source of capital (common equity, preferred stock and debt) is weighted according to its proportion in the market capital structure and combined to derive a weighted average cost of capital (WACC) for each industry. An example is shown below:

| Industry WACC<br>Band of Investment Formula   |
|---|
| Equity Rate x Percent Equity<br>+ Debt Rate x Percent Debt<br><u>+ Preferred Rate x Percent Preferred</u><br>= Industry Cost of Capital |

| Example   | Capital Structure |   |                          |              |
|-----------|-------------------|---|--------------------------|--------------|
|           | <u>Rate</u>       |   | <u>Percent</u>           |              |
| Equity    | 12%               | X | 60%                      | 7.20%        |
| Debt      | 7%                | X | 39%                      | 2.73%        |
| Preferred | 9%                | X | 1%                       | <u>0.09%</u> |
|           |                   |   | Industry Cost of Capital | 10.02%       |

The cost of capital is utilized as a zero growth capitalization rate to convert income into an indication of value. The capitalization rate and net operating income are forward looking by definition, but are heavily influenced by historic data through statute or practice. In spite of this, we must be aware of "...how important it is that the discount rate developed must be matched conceptually and empirically to the definition of economic income being discounted.<sup>1</sup>

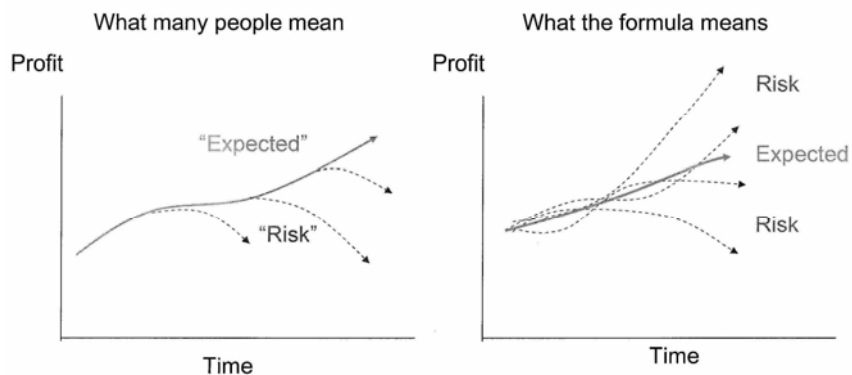
The discount rate must also reflect the risk associated with realizing the income being discounted. For a given level of expected prospective economic income (e.g., cash flow, dividends, accounting earnings, and the like), the lower the risk, the higher the present value, or conversely, the higher the risk, the lower the present value.<sup>2</sup> Risk in finance is viewed in terms of the variance in actual returns around the expected return.<sup>3</sup> The risk (variance) on any individual investment can be broken into firm-specific risk or market-wide risk. Risks that are company specific (diversifiable), are to be reflected in the cash flow forecast, not the capitalization rate.

<sup>1</sup> Shannon P. Pratt, Robert F. Reilly, Robert P. Schweihs. *Valuing a Business*, p 159 (4<sup>th</sup> ed. 2000).

<sup>2</sup> Ibid, p 161.

<sup>3</sup> Aswath Damodaran, "What is the risk free rate? A Search for the Basic Building Block," December 2008, p 4.

## Warning: Most people misunderstand "Expected."



<http://faculty.chicagobooth.edu/john.cochrane/research/Papers/Cost%20of%20Capital.ppt>

For a third year in a row, our traditional January 1<sup>st</sup> cost of capital inputs require close examination in isolation and collectively. While recent decades have had long "bull runs", business cycles are inevitable. Government monetary policy attempts to mitigate the extremes of the cycles. The economy is in a recovery phase, with capital costs expectedly lower than higher points in the business cycle, to stimulate the economy. Low cost of capital at the cycle bottom will benefit companies as existing debt is refinanced to "strengthen" balance sheets. The ex ante "long term" equity growth rate, which is actually analysts' consensus estimate of annual earnings growth rates over the next five years, is climbing again, following last year's bottoming out. This is because institutional (marginal) investors have moved back into the lower market risk basis to pursue investment yields acceptable to individual risk and return tolerances. For the same reason, equity DCF growth calculations will also run into questionable levels of sustainability outside of economically regulated industries. The ex post cost of equity is almost unchanged because its calculation includes data going back to 1926. This year, the income to be matched with the weighted average costs of capital will include two years of recessionary income.

In summary, the weighted average cost of capital is down, but not to the extent that a "fix" is needed beyond the possible modification of capital structure percentages, or consideration of an equity DCF calculation.

### INDUSTRY SPECIFIC CHANGES

#### Independent Power Producers (IPPs)

For 2011, we have uncoupled the rate with electrics. The DPT made this change for this year based on several factors:

- ❖ Generation Facilities being long on energy (excess is available).
- ❖ Change in business climate with Xcel owning and controlling new plants.
- ❖ Effects of the Great Recession with demand decreasing.
- ❖ 540 MW of Energy with no renewal on its Power Purchase Agreements ending in 2013.

In the past, we used the term Affiliated Power Producers for the renewable and non-renewable electrical generation facilities that are contracted to sell power through power purchase agreements to regulated utilities. We have gone back to the term Independent Power Producers or IPPs. For 2011, the Affiliated Power Producers is no longer descriptive

of this industry. Thus, we uncoupled the rate with the electrics and moved back to the industry terminology of IPPs.

In the future, we will be looking at this annually to determine the appropriateness of whether the IPPs should be coupled with electrics. If electricity become short and in higher demand to where there is a strong need for the Independent power producers' energy, these factors may become coupled, again.

## Fluid Pipelines

Starting in the 2011 year, we have used Master Limited Partnerships (MLPs) to be our guideline companies for fluid pipelines. The pipeline industry has moved in the direction of changing its corporate structure to MLPs. This is most pronounced in the fluid pipeline industry. For the equity component, we have stayed with the 50 – 50 weighting on DCF to Cap M. The Colorado Revised Statutes, § 39-4-102 (c), direct us to use historic income for our income approach to value:

*(c) Its gross and net operating revenues during a reasonable period not to exceed the most recent five-year period, capitalized at indicative rates.*

With Colorado restricted to using historical information, the FERC policy of using 100 percent DCF is not appropriate for ad valorem tax purposes for Colorado. The company's DCF rates are inflated with high growth rates on several companies that simply cannot be maintained. This seemed to offset the low betas for the industry.

For 2012, we may consider placing some weight on a direct cap method. We will be inviting industry to a meeting in fall to discuss this prior to making any determination on making such a change.

## INDUSTRY GROUPINGS

The industry groupings are airline, electric, railroad, telecommunication, and pipeline. The industry groups are further subdivided to reflect different markets.

- The airline industry group will be valued again this year without an estimate of the cost of capital.
- Electric companies are divided into electric utilities (includes both major and rural) and independent power producers.
- The railroad industry includes both major and short-line or regional carriers.
- The telephone (telecommunications) industry is divided into:
  - Local exchange companies, long distance providers, and inter-exchange companies
  - Rural telephone companies
  - Mobile telephone companies
  - Pipeline industry is divided into distribution, fluid, and transmission.
  - Telephone resellers including VOIP providers

Our only realization of telecommunications convergence, as companies provide multiple services, has been to place some companies in more than one industry sub-group.

## INDUSTRY DATA

We used the on line *Value Line Investment Survey* (Value Line) grouping for all industries published. Stock dates were from 1/4/2011, and the publication closest to the year end was utilized. Some companies in the Value Line industry group were excluded because their activities are not representative of the Colorado utility companies. Within the included companies, non-typical (outlier) factors were closely examined to ascertain whether the impact from any outliers could skew its application in the final market cost of capital rate.

## INDUSTRY CAPITAL STRUCTURE

A representative capital structure is developed using the market value of equity and the book values of long-term debt and preferred stock. Using Value Line, the market value of equity is calculated by multiplying the number of shares of actual year-end stock outstanding by the listed recent stock price.

Actual capital structure weighting has shifted away from equity with the recent stock market decline. Where dramatic shifts occurred, we made an expectation of an industry effort at “rebalancing” capital structure, but not implying the use of “optimal” or “targeted” capital structures. The adjustments to capital structure are not listed here, but can be determined in the final three lines of the industry groupings in the Excel file.

Preferred stock was specifically excluded in the calculations of all industry types except the electric industry. Except for the electric industry, the effects of any preferred stock on capital structure were added to the equity capital structure percentage. Refer to the **COST OF PREFERRED STOCK** section below for additional information about our consideration of preferred stock.

## COST OF DEBT

The cost of debt is obtained from *Mergent Bond Record* (Moody’s) and *Standard and Poor’s Bond Guide* (Standard and Poor’s) or Bloomberg. The appropriate rates are incorporated for each company. If both Moody’s and Standard and Poor’s (Bloomberg) ratings are available, the two are averaged for the debt rate. For those companies where no rate is available, an average of the available rates within the industry for both Moody’s and Standard and Poor’s (Bloomberg) is utilized. If only one rate is available from either source, the missing rating is either derived from the average of that rating agency’s group, or imputed with the equivalent rating. We relied on the year-end information for the bond rating.

Neither service provides year-end 2010 bond yields for speculative bond rates. Using both Standard and Poor’s End of Year 2010 Bond Guide and the Mergent’s January 2011 Bond Guide, we gathered and stratified these bond instruments and calculated the yield to maturity. These rates were used to establish the debt rate for companies having more speculative ratings.

## COST OF PREFERRED STOCK

For 2011, preferred stock average rate was calculated only for the electric industry category. The cost of preferred stock is obtained from Moody’s. Since electric companies typically have preferred stock, the median preferred stock rate is incorporated in the electric company

capitalization rate calculation. If unavailable from Moody's, we imputed the medium grade Baa rate.

## **COST OF EQUITY $K_e$**

The DPT used both the Discounted Cash Flow (DCF) model and the Capital Asset Pricing Model (CAPM) to derive a cost of equity. The Risk Premium (RP) method to calculate the cost of equity was not utilized for the following reason:

- The Risk Premium (RP) method is broadly general and has application in diversified companies in various industries. For capitalization rate calculation purposes, most estimates of common equity cost require a closer fit to the specific company in a non-diversified utilities industry. CAPM is essentially the Risk Premium method with a beta refinement attempting to remove diversifiable risk. The fundamental idea remains that there's no reason to expect a reward just for bearing risk (being undiversified).<sup>4</sup>

## **Discounted Cash Flow (DCF)**

The expected growth rate is the estimated future growth to earnings as presented in Value Line. The dividend yield is also shown in Value Line. The averages of the expected growth rate, the dividend yield, and the equity rate are shown on the average lines.

## **Capital Asset Pricing Model (CAPM)**

The CAPM is also a measure of the equity rate. The return consists of three components; the beta selection, the ex post (historical) and ex ante (forward looking) add-on for equity risk, and the risk free rate. The final CAPM rate is the average of the ex post and ex ante estimated cost of equity.

**Beta Selection:** Beta is the variable in the CAPM that measures an asset's level of systematic risk. A stock with a beta of 1 is equal in risk to the overall market index, and thus will provide investors with an expected return equal to that of the market index. Stocks with betas greater or less than 1.0 have risk levels and expected returns that are respectively higher or lower than that of the market index. The source used in this year's study is Value Line. The Value Line beta is derived from a regression analysis of the relationship between weekly percentage changes in the New York Stock Exchange Index over a period of five years. In case of short price histories, a smaller time period is used, but two years is the minimum.

**Risk Free Rate:** Historically, the Division has used year-end data from the Federal Reserve. The year end Long-Term Risk Free Rate, from the Federal Reserve Bulletin, 20-year Treasury bond yields with a constant maturity is 4.13%. We have relied on the year-end constant maturity of 4.13% as the risk free rate.

**Ex Ante Cost of Equity (Expected Future Rate of Return on the S & P 500):** The use of an ex-ante CAPM model requires an estimate of the expected future rate of return on the market portfolio. Dividends are expected to grow at the same rate as projected earnings.

$$k_M = \frac{D_0(1+g)}{P_0} + g$$

<sup>4</sup> Revisiting the Capital Asset Pricing Model, *Dow Jones Asset Manager*, May/June 1998, pp. 20-28, <http://www.stanford.edu/~wfsjarpe/art/djam/djam.htm>.

- $k_M$  = The expected future rate of return on the market portfolio (S & P 500).  
 $D_0$  = \$22.73, year-end dividend yield, source: Standard and Poors.com.  
 $P_0$  = \$1,130.68, annual average monthly closing price of the S & P 500, source: <http://finance.yahoo.com/indexes/>  
 $g$  = 11.01 %, analysts' long-term (5 year) projected S & P 500 earnings growth rate (company equity weighted average), December 31, 2011, source: amalgamation of industry reports.  
 $\frac{D_0}{P_0}$  = The "current" dividend yield.

|       |   |  |   |         |
|-------|---|--|---|---------|
| $k_M$ | = | $\frac{\$22.73 (1+.1101)}{\$1,130.68}$ | + | $.1101$ |
| $k_M$ | = | 13.24 %                                |   |         |

The final estimated expected rate of return on the S & P 500 used in an ex ante CAPM model is 13.24 percent.

The 13.24 percent includes expected equity risk premium which must be identified for application of the Beta factor. The risk free rate is deducted from the forward-looking equity risk premium. The risk free rate of return is the month-end daily average long-term Treasury Bond Yield as of December 31, 2010. The result is an ex ante cost of equity risk premium of 9.11 percent (13.24 percent – 4.13 percent).

| Cost of Capital           | Risk Free Rate | Beta                      | Equity Risk Premium (ERP) =<br>Expected Return on the Market ( $R_m$ )<br>Less Risk Free Rate ( $R_f$ ) |
|---------------------------|----------------|---------------------------|---|
| $K_e =$                   | $R_f +$        | B                         | $(R_m - R_f)$   |
|                           | 4.13 +         | B                         | $(13.24 - 4.13)$  |
| <b><math>K_e =</math></b> | <b>4.13 +</b>  | <b><math>\beta</math></b> | <b>9.11%</b>  |

**Ex Post Cost of Equity:** According to the *Risk Premium over Time Report: 2011*, Key Variables in Estimating the Cost of Capital, published by Ibbotson Associates, the equity risk premium as of the end of 2010 is 6.7 percent for the January 1, 2011, lien date. This is the difference between historical arithmetic mean total returns of large company stocks (11.9%) and long-term government bonds between 1926 and 2010 (5.2%).

The formula for the ex-post CAPM is:

| <b>Cost of Capital</b>    | <b>Risk Free Rate</b> | <b>Beta</b>               | <b>Equity Risk Premium (ERP)<br/>1926-2010<br/>Return on Large Company Stocks<br/>Less Long Term Government Bonds</b> |
|---------------------------|-----------------------|---------------------------|---|
| $K_e =$                   | 4.13 +                | B                         | (11.9 – 5.2)  |
| <b><math>K_e =</math></b> | <b>4.13 +</b>         | <b><math>\beta</math></b> | <b>6.7%</b>   |

## CONCLUSION

All of the referenced rates are shown on the summary statistics page of the capitalization rate studies for each industry.

The factors for the WACC for each industry are shown on the COST OF CAPITAL CALCULATION line. The cost of capital rate for the industry is based on the following formula:

|                                      |
|--------------------------------------|
| Equity Rate x Percent Equity         |
| + Debt Rate x Percent Debt           |
| + Preferred Rate x Percent Preferred |
| = Industry Cap Rate                  |

Based on a 2007 study completed by the Division, we will not include flotation costs as part of the capitalization rate.

## 2011 EQUALIZATION FACTOR

Pursuant to Colorado statute 39-4-102 (3)(b), C.R.S., the Division has completed the 2011 public utility equalization factor calculation. For 2011, the equalization factor is 99 percent. A copy of the equalization factor study can be found at the Division's website at [http://dola.colorado.gov/dpt/state\\_assessed/index.htm](http://dola.colorado.gov/dpt/state_assessed/index.htm)

## ASSESSED VALUE

Assessed value is 29 percent of the Colorado actual value.

g:\dpt-grp\sap\2011 cap rate\