COMMON VALUATION ISSUES CONCERNING THE INCOME APPROACH

(DISCOUNTED CASH FLOW ANALYSIS)

Overview

- Failure to recognize that as a regulated Investor-Owned Utility, revenues and stream of annual net cash flows will be regulated on rate base/rate of return model

- Discount rate

- Annual Revenues

- Original Cost vs. Reproduction New Cost as basis for depreciation

- Annual Tax vs. Book Depreciation

- Structure and number annual periods in a model

- Estimation of Terminal Values

Recognition That The Value Company Will Be A Regulated Utility

- Typical business valuations do not consider the financial and cash flow aspects of regulated entities such that assumptions that may be utilized for an unregulated business may not apply in valuing regulated businesses.

  - Remembering that a regulated utility's net cash flows are a direct function of its rate base (primarily plant investment).

    Revenue Requirement (Future Revenues) = cash O&M + depreciation + interest + equity return on rate base + income taxes

    Assuming there is no positive or negative net cash flow associated with cash O&M, a utility's net cash flow is a direct function of its net plant in service which includes depreciation, interest, equity return, and income taxes.

  - The following slides present common issues relating to the failure to recognize the regulated nature of public utilities and how it should relate to valuations under the income approach.

Appropriate Discount Rate

- It is generally recognized that for discounted cash flow analyses, the appropriate discount rate is the utility's cost of capital.

- We have observed several situations in which reasonable capital costs are not utilized for valuation purposes including:

  - Market value capital structures between debt and equity resulting in high equity ratios;

  - Returns on equity much lower than those utilized by Commission or those that could be considered reasonable; and,

  - Understated costs of debt.

Annual Revenue Assumptions

- Invariably, valuation analysts have made arbitrary assumptions regarding annual revenues without recognition of the fact that as a utility, annual revenues are a function of its cost of service discussed previously.

- As a check of reasonableness, one can calculate each year's net operating income (as a result of other inputs) and then reasonably estimate net plant (if not rate base). This will provide a proxy for the rate of return on investment (rate base if you will).

  - We have found some analysts' revenue forecasts tend to be within a range of reasonableness while others are unrealistically high.

Original Cost vs. Reproduction Cost Basis for Depreciation

- Some valuation analysts have elected to use their calculated cost of reproduction new (as used in the cost approach) as the basis for depreciation expense within the income approach.

    - This can and will cause an upward bias in each period's net cash flows and results in a self-fulfilling prophecy to inflate the overall valuation.

Annual Tax vs. Book Depreciation

- Some valuation analysts utilize book depreciation in estimating annual cash flows while a few have properly recognized tax depreciation is more appropriate for cash flow purposes.

  - However, if tax depreciation is used, the analyst must recognize the reversal tax over book depreciation in future years.

  - To be correct, if tax depreciation is used instead of book depreciation, this should be considered within the analysis in evaluating the expected revenue stream.

Structure and Number of Annual Periods in a Model

- Water and Wastewater utilities' plant investments have relatively long service lives (35 to up to 75 years).

- Most DCF models used for valuations are much abbreviated with only 13 to 20 years of annual cash flows modeled.

- In part to reflect the remaining life of plant investments beyond the number of years modeled, "terminal values" are commonly employed.

Estimation of Terminal Values

- The most common (and inappropriate) method used to estimate terminal values is to apply the last model year's cash flow to "capitalization" rate where:

  Capitalization rate is equal to a firm's cost of capital minus its growth rate.

  This is derived from the well-known Myron Gordon DCF model used for estimating cost of equity which has its basic form of:

  $P = D/(k-G)$,

  which can be written as a factor of:

  cap rate = $1/(k-G)$

- Under the capitalization approach, net cash flows are assumed to grow at a constant annual growth rate (G) in perpetuity without significant reinvestment of existing plant.

- We have found that the use of capitalization rates as applied by valuation analysts are mathematically impossible given the assumptions used by these analysts for annual depreciation and capital expenditures. That is, invariably, valuation experts have assumed that annual cash depreciation levels are greater than the level of annual capital expenditures.

  The following slide shows an example of how and why this is mathematically impossible.

(1) Revenue	**$1,000,000**
(2) Cash O&M Expenses	**$600,000**
(3) Depreciation	**$300,000**
(4) Earnings Before Interest & Taxes	**$100,000**
(5) Income Taxes	**$35,000**
(6) Net Operating Income	**$65,000**
(7) Capital Expenditures	**$100,000**
(8) Change in Working Capital	**$10,000**
(9) Net Cash Flow: (6) + (3) - (7) - (8)	**$255,000**

Notice depreciation (3) on existing plant in last year is significantly greater than capital expenditures (7) to replace plant. It would be mathematically impossible to sustain a positive level of growth in perpetuity when depletion of plant investment is greater than the replenishment of such plant.