Tariff Development I: The Basic Ratemaking Process

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Briefing for the NARUC/INE Partnership

The Ratemaking Formula and Basic Components

What is “Cost of Service” Regulation?
In Cost of Service regulation, the regulator determines the Revenue Requirement—i.e., the “cost of service”—that reflects the total amount that must be collected in rates for the utility to recover its costs and earn a reasonable return.

Basic ratemaking formula:

\[
\text{Rate Base} \times \text{Allowed Rate of Return} + \text{Operating Expenses} = \text{Revenue Requirement}
\]

Basic Issues in Rate Proceedings
Regulated Rates are essentially made up of the following basic components:
- Recovery of reasonable and necessary expenses
- Return of investment through rate of return on invested capital
- Return on investment through recovery of depreciation expense

Basic COS Component: Operating Expenses
- Allowable Operating Expenses include operation and maintenance costs (O&M), depreciation, and all taxes, including income taxes.
- Note that interest expense is not included in “Operating Expenses” because it is taken into account in the rate-of-return element of the ratemaking formula

Basic COS Components: Rate Base and Rate of Return
- The Rate Base is the net amount of investment, funded by investors, in utility plant and other assets devoted to the rendering of utility service upon which a reasonable rate of return may be earned
- The Rate of Return is the percentage rate which the commission finds should be earned on the rate base in order to cover the cost of capital.
- The rate of return on invested capital is based upon the concept of the cost of capital—i.e., the compensation that investors require for exposing their capital to risk.
- For a given type of capital or financing instrument (for example: common equity, preferred stock, long term debt, etc.), the “cost” to a company when it issues that capital is the rate of return that investors require for similar investments with similar risk characteristics.
Test-Year Concepts

- Identification of test year
  - Historical test year – generally based on financial data for the most current 12 months for which information is available when rate application is prepared
  - Historical test year adjusted for known and measurable changes to develop test period
    - A signed new labor contract is a known & measurable change, while simply knowing that the contract will change in some way in the future is not.

Revenue Deficiency Calculation

- After the revenue requirement has been developed, the revenue deficiency can be determined
  
  Sales at current rates
  Less: Projected revenue requirement
  = Revenue excess or deficiency for the test period

Revenue Requirement Development

Public Utility Regulatory Act, Sec. 36.062—Consideration of Certain Expenses

- The regulatory authority may not consider for ratemaking purposes:
  - an expenditure for legislative advocacy (for example, lobbying);
  - funds expended in support of political or religious causes;
  - any expenditure that the regulatory authority finds to be unreasonable, unnecessary, or not in the public interest, such as salary levels, advertising expense, legal expense, civil penalty, fines.

Operating Revenues and Expenses

- Requirements for inclusion of costs in revenue requirement
  - Costs must be just and reasonable
  - Costs must be prudently incurred
  - Cost adjustments must be known and measurable
Is often a controversial revenue requirement component in general rate case proceedings. The major difference between book income and taxable income is the depreciation expense. Accelerated depreciation is used for income tax purposes while normal depreciation (based on the useful life of the plant) is used to set electricity rates.
Federal Income Tax Expense

- Accumulated Deferred Income Taxes (ADFIT), which reflects the amount of taxes that have been recovered through electricity rates but have not yet paid to the government.
- ADFIT represents a reserve for additional taxes to be paid in the future when the depreciation expense included in rates is less than that used for tax purposes.
- Because ADFIT represents amounts collected from ratepayers that are not immediately paid to the government by the utility, it is considered to be “cost-free capital.”

Taxes Other Than Income Taxes Expense

- Non-revenue-related taxes—taxes that are not dependent on or that do not change as a result of the utility’s revenues
  - Payroll taxes
  - Property taxes
  - Franchise taxes (may be based on various elements such as payroll, cost of goods sold, capitalization, etc.)

Simple Example of Revenue Requirement

REVENUE REQUIREMENT (COST OF SERVICE)

- Operations and Maintenance expense: $180
- Depreciation expense: 50
- Taxes other than income taxes: 5
- Federal Income Taxes: 25
- Return: 67
- Total Revenue Requirement: $327

Rate Base

- Represents the investor-supplied plant facilities and other investments required in supplying utility service to consumers
- Rate Base generally consists of the investment in net utility plant and other items, such as regulatory assets and working capital, devoted to the rendering of utility service and funded by investors upon which a fair return may be earned
- Typically, Rate Base excludes Construction Work in Progress (CWIP), non-utility property, and plant held for future use
- Deductions from rate base are made for investments in net utility plant and other assets funded by others, such as the government

Criteria for Inclusion of Cost in Rate Base

- “Used and useful” concept – only plant currently providing or capable of providing utility service to customers is included in rate base
- “Prudent investment” concept – only plant prudently purchased or constructed is includable in rate base
- Construction of nuclear generation plants in 1980s led to state commission prudence reviews of construction management and costs associated with construction of nuclear facilities
- In some cases, these prudence reviews led to disallowance of plant costs for ratemaking purposes
Rate Base Components

- **Plant in service**
  - Largest component of a company’s rate base
  - Generally, one of the least controversial aspects of a rate proceeding unless the prudence of construction is an issue or excess capacity is at issue
- **Accumulated depreciation**
  - Typically not a controversial component of rate base unless depreciation rates or study is an issue in rate proceeding

Regulatory Assets/Liabilities

- **Regulatory Assets**
  - Regulators can provide reasonable assurance regarding the existence of an asset if:
    - The regulator intends to provide for specific recovery of an incurred cost rather than provide for expected levels of similar future costs
    - Examples of regulatory assets include: unrecovered fuel, rate case expenditures; storm-damage costs
- **Regulatory Liabilities**
  - Regulators may impose a liability on an enterprise. Examples of reasons for which a liability may be imposed include:
    - Refunds or credits to customers
    - Gains on sale of regulated assets may be deferred and amortized to decrease future rates

Other Rate Base Components

- **Fuel inventories consisting of gas in storage, coal, and nuclear fuel inventories**
- **Materials and supplies and prepayments**—commission rules allow inclusion of a 13-month average balance in rate base
- **Construction Work in Progress (CWIP)**
  - Typically not included in rate base unless required to maintain financial integrity of the utility company
  - Allowance for Funds Using Construction (AFUDC) is a non-cash reporting item accrued until such time as CWIP is closed and transferred to Plant in Service account
  - Cash Working Capital—the average amount of capital provided by investors, over and above the investment in plant and other specific rate base components, to bridge the gap or lag between the time expenditures are required to provide services and the time payment is received for such services

Rate Base Deduction – Accumulated Deferred Federal Income Taxes

- **Accumulated Deferred Federal Income Taxes (ADFIT)**—represents the deferred federal income taxes resulting from tax normalization and is considered a source of interest-free funds (i.e., cost-free capital) provided by the U.S. Treasury to the utility
- **Because ADFIT balances are considered to be cost-free capital, they are deducted from the return-earning rate base**
Rate of Return

What is meant by the phrase “allowed rate of return”? In the utility industry, the phrase “allowed rate of return” is generally synonymous with “the cost of capital.” It refers to the rate of return on rate base required to recover the utility’s costs of each capital source.

- Cost of debt
- Cost of preferred stock
- Cost of common equity
- The total dollar amount of return, or earnings, is calculated by multiplying the allowed rate of return by the utility’s total dollar amount of rate base
- The allowed rate of return can be considered as the rate of return that is permitted, but not guaranteed.

Legal criteria established by the two court cases:
- A utility’s allowed Rate of Return should be sufficient to maintain its financial integrity
- Return should enable utility to attract additional capital on reasonable terms
- Return should be equal to that earned by other companies with comparable risks

Because holders of debt and preferred stock have a senior (higher priority) claim on the assets of a company in comparison to the shareholders of common equity, the costs of debt and preferred stock, reflecting the lower risk of non-recovery by investors, are typically lower than the cost of common equity. (Tax considerations also play a role in the relative costs of capital instruments.)

Whereas the costs of debt and preferred stock are directly observable because they are set by contractual obligations and fixed, the determination of the costs for these two sources of capital is typically not controversial.

The cost of common equity is not directly observable, however, and therefore must be estimated using financial theory and assumptions about growth and investors’ rate-of-return expectations. Expert witnesses typically provide extensive testimony and analyses on these issues in rate case proceedings.

Because of the subjectivity involved in estimating investor’s required rate of return on common equity, it is often one of the most controversial issues in utility rate cases.
Several approaches are predominantly used in estimating the cost of equity:

- **Discounted Cash Flow (DCF) method**
  - Considers certain aspects (such as growth and dividends) of investors' expectations regarding future earnings.

- **Capital Asset Pricing Model (CAPM)**
  - A well-known theoretical technique that attempts to measure the return expected by investors for a specific stock based on the risk assigned to that stock relative to the overall market.

- **Bond yield risk differential method**
  - Indicates the cost of equity by comparing the current returns on bonds and stocks and then determining the risk premium associated with a common equity position.

- **Comparable earnings (not commonly used in Texas)**
  - Estimates the cost of equity by comparing the earned accounting returns (rather than expected market returns) of firms with comparable risk.

The earned rate of return is measurable only after an accounting period has passed; it is the rate of return that the utility actually earns on its invested capital. It should be adequate to cover all expenses and provide a reasonable return to shareholders.

Regulators aim at setting a utility’s rate of return on rate base at a level equal to the “cost of capital” expected by the utility’s investors. The United States Supreme Court has stated that a public utility return “should be adequate under efficient and economical management.”

Commission may reduce a utility’s rate of return as a penalty for what it considers imprudent management.

- Poor service quality
- Imprudent construction

Regulators may also consider the allowed rate of return as the utility’s “cost of capital” and may adjust it based on various factors.

The Weighted-Average (Overall) Rate of Return—An Illustration

<table>
<thead>
<tr>
<th>Example Utility</th>
<th>Source</th>
<th>Source Amount</th>
<th>Weighting</th>
<th>Source Cost</th>
<th>Weighted Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Debt</td>
<td>$500,000,000</td>
<td>50.00%</td>
<td>8.90%</td>
<td>4.00%</td>
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<tr>
<td>Preferred Stock</td>
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<td>10.00%</td>
<td>9.00%</td>
<td>0.90%</td>
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<tr>
<td>Common Stock</td>
<td>$400,000,000</td>
<td>40.00%</td>
<td>10.00%</td>
<td>4.00%</td>
<td></td>
</tr>
<tr>
<td>Totals</td>
<td>$1,000,000,000</td>
<td>100.00%</td>
<td>8.90%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The United States Supreme Court has stated that a public utility return “should be adequate under efficient and economical management.”

Cost-of-Service Calculation—Putting It All Together

<table>
<thead>
<tr>
<th>Term</th>
<th>Test Year</th>
<th>Adjustments</th>
<th>Allowed Level</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depreciation</td>
<td>$263</td>
<td>($57)</td>
<td>$206</td>
<td>13%</td>
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<tr>
<td>Taxes</td>
<td>$172</td>
<td>($13)</td>
<td>$159</td>
<td>10%</td>
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<tr>
<td>Other items</td>
<td>$6</td>
<td>$4</td>
<td>$10</td>
<td>1%</td>
</tr>
<tr>
<td>Return on Rate Base</td>
<td>$314</td>
<td>($50)</td>
<td>$267</td>
<td>17%</td>
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<tr>
<td>Totals</td>
<td>$1,905</td>
<td>($103)</td>
<td>$1,802</td>
<td>100%</td>
</tr>
</tbody>
</table>

*Rate Base $2,700 x Rate of Return 2.99%

Cost-of-Service Studies

The allowed rate of return is set by the regulatory authority in the determination of a utility’s cost of service; it is set prospectively and there is no guarantee that the utility will actually earn this rate of return.

The earned rate of return is measurable only after an accounting period has passed; it is the rate of return that the utility actually earns on its invested capital.

The earned rate of return can be affected by interest-rate changes, inflation, changes in accounting principles, changes in consumption, weather, and other factors, and can (will almost certainly) be more or less than the allowed rate of return.
Once a utility's Revenue Requirement is determined, the COS study is an analytical tool that assigns, or allocates, each relevant component of cost on an appropriate basis to determine the relative costs to serve various customer classes with similar end uses and demand.

Objective is to apportion the total utility costs among customer classes in a fair and equitable manner.

The “cost causer” is the rate payer or customer that receives the service and that causes the cost to be incurred.

The Cost of Service Study is a basic issue in rate proceedings.

Each of the cost components of the revenue requirement is allocated to customers using the following basic criteria:

- Similar customers are grouped in classes
- Costs are allocated to classes on the basis of how the costs are caused (i.e., driven by demand placed on the system, number of customers, etc.).
- Within each class, rates are then designed to recover the costs. How the rates are designed will affect customer differently based on how they use electricity.

Why Set Rates to Cost?

- Equity (fairness)
- Sends proper price signals to all customers
- Theoretical surrogate for competitive market forces

Reasons (Excuses?) For Not Setting Rates to Cost

- Gradualism
- Cost allocations are subject to judgment and imprecision
- Relative risk of classes may vary
- Provide assistance to low income customers

Subsidies are part of the Business and Regulatory Landscape!

Cost of Service

- Art?
  - Requires many assumptions
  - Results are highly sensitive
  - Subjective

Science?
  - Informed judgment
  - Reasonable range of outcomes
  - Objective