Financial Risks Faced by Regulated Utilities: Implications for the Cost of Capital and Ratemaking Policies

Law Seminars International

Current Utility Rate Case Issues and Strategies

Jonathan A. Lesser, Ph.D.

February 8, 2008

BATES WHITE

Agenda

- Overview
- Setting the cost of capital for regulated electric utilities: theory and reality
- Business and financial risks faced by utilities
  - Risks of generation investment
  - Risks of long-term power contracts
- Emerging market and regulatory challenges
  - Incentive regulation
  - Environmental regulations affecting fossil fuel development
  - Politically driven intervention in electric markets
- Strategies for electric utilities

BATES WHITE

BATES WHITE



Setting the cost of capital: theory and reality

The cost of capital: introduction

- Utilities face numerous business and financial risks
  - Some risks can be observed directly, e.g., building new generation, signing long-term purchase contracts
  - Some risks arise because of regulatory and other nonmarket uncertainties
- Challenge: The rate of return utility investors "require" to take these risks cannot be observed directly
  - Therefore, that return must be estimated using some type of proxy measures
- When state commissions and FERC determine allowed rates of return and overall weighted average cost of capital (WACC), they typically consider two things:
  - Capital structure (what is an appropriate mix of debt and equity)
    - The cost of debt is typically (but not always) not controversial
  - "Zone of reasonableness," within which the return on equity can be set
    - Setting that zone is based on judgment and a variety of models and inputs
    - Determining where in that zone the return of equity is set is also a matter of judgment (as well as politics!)

BATES WHITE

The cost of capital: legal underpinnings

- Legal history and why it is important
  - Setting the costs of capital began (albeit indirectly) with the "fair value doctrine" set out in *Smyth v. Ames* [169 U.S. 466 (1898)]
  - Unfortunately, "fair value" was circular: it was whatever regulators determined and eventually abandoned
    - In *Bluefield* [*Bluefield Water Works & Imp. Co. v. Public Service Comm'n,* 262 U.S. 679 (1923)], the Supreme Court set out a list of factors to consider when establishing a "fair" rate of return
    - Key statement: "A public utility is entitled … to earn a return … equal to that … on investments in other business undertakings which are attended by corresponding risks and uncertainties … The return should be reasonably sufficient to assure … financial soundness of the utility and … adequate to maintain and support its credit …"
  - In that same year, Justice Brandeis eviscerated the "fair value" doctrine in his dissent in *Southwestern Bell* [*Missouri ex rel. Southwestern Bell Tel Co. v. Missouri Pub. Serv. Comm'n*, 262 U.S. 276 (1923)]
  - Ultimately, in *Hope Natural Gas*, the Court adopted an end-results "comparative" risk assessment [*Federal Power Comm'n v. Hope Natural Gas* 320 U.S. 591 (1944)]
    - Today, "comparative risk" is typically called "comparable risk"
    - It is <u>the key</u> to setting the cost of capital

BATES WHITE

What does "comparable risk" really mean?

- Because of ongoing market changes, establishing comparable risk involves making predictions in certain areas
  - General financial markets (e.g., interest rates, bond spreads, market performance, etc.)
  - Industry conditions (e.g., potential greenhouse gas regulations that will affect the cost and risk of building new generation; renewable portfolio standards, etc.)
- Comparable risk also requires establishing attributes that define "comparability"
  - The problem is that every utility is unique (location, size, generating mix, customers, regulatory climate, etc.)
  - It is difficult to determine the appropriate trade-off between "comparability" and having enough firms to establish a "zone of reasonableness"
    - Example: Hawaiian Electric is a distribution utility with a large commercial banking subsidiary. Is it comparable to other electric utilities?

BATES WHITE

Methods to establish and measure comparability

- Developing a set of "comps" requires a number of practical steps
  1. Determine an appropriate peer group of firms, using one of two different methods
     - Arbitrarily, by using qualitative and quantitative measures (e.g., annual revenues, credit rating, generation mix, Value Line "safety" ratings, etc.)
     - Statistically, by using a technique called "cluster analysis" (still requires selecting the appropriate financial variables with which to determine appropriate "clusters")
  2. Apply one or more methods to estimate the cost of equity for the comparable firms selected
     - Discounted cash flow (DCF)
     - Capital Asset Pricing Model (CAPM)
     - Risk Premium

     Note: it is important to adjust for differences in capital structure, because leverage affects equity risk
  3. Select a ROE value within the estimated "zone of reasonableness"
     - Setting an individual utility's ROE depends on cap structure and the specific business/financial risks identified for the utility, relative to the comparable firms
     - This is where "reality" hits

BATES WHITE

Determining the return on equity

- Numerous models to estimate ROE
  - Most common: discounted cash flow (DCF)
    - Based on the premise that a firm's stock price equals the present value of all future cash flows (dividends plus future price of stock)
  - Capital Asset Pricing Model (CAPM)
    - Popular and well-known financial model
    - Based on a firm's nondiversifiable risk and the relative correlation of its returns with the market
    - Single-factor model (beta)
  - Risk Premium model
    - Based on equity risk premiums (i.e., difference between market returns and bond yields)
  - Multi-factor models
    - Rarely used, but can overcome problems of the CAPM
    - Fama-French 3-factor model
    - Arbitrage Pricing Model

BATES WHITE

Theory vs. reality

- Since “comparable” cannot be measured directly, there is always debate regarding the “true” business and financial risks utilities face
  - Determining “comparable” firms requires trade-offs (“closeness” vs. sample size)
  - Estimating ROE requires models and inputs that have inherent uncertainty
    - What is the appropriate risk-free rate?
    - What is a “sustainable” earnings growth rate?
- Political pressure to hold rates down can also influence allowed returns
  - Rates are frozen; changes in market structure can occur
  - Regulators typically don’t like to authorize higher rates
  - Consumer advocates argue that regulated utilities face little, if any, risk
- Result: Setting the rate of return often has more to do with horse-trading than financial and economic theory

BATES WHITE

BATES WHITE



Business and financial risks faced by utilities

Build or buy? How investment and purchase decisions affect business and financial risk

- Building new generation
  - Risks of building new generation, especially large, baseload plants, can place significant financial stress on utilities
    - Cost overruns as a result of rapidly escalating raw material and equipment costs
    - Effects on capital structure as a result of greater financial leverage associated with issuing debt
    - Regulatory approvals (prudence and used-and-useful rulings)
    - Operating cost risk (increased fuel costs, lack of appropriate hedging strategies)
    - Transmission infrastructure risk that can affect the ability to wheel power and market prices for energy, capacity, and ancillary services
    - Non-market risks arising from changing environmental regulations that can increase operating costs, reduce output, or even force premature plant shutdowns
    - Changes in wholesale market structure

Build or buy? (cont.)

- Power purchase agreements (PPAs)
  - Risks of PPAs stem from two primary sources
    - Regulatory approvals (prudence and used-and-useful rulings)
    - Contractual performance risk (PPA structure, performance guarantees, etc.)
    - Financial risk (PPAs are treated the same as debt on a utility's balance sheet (called "debt equivalency")
  - In practice, financial ratings agencies like Standard & Poor's have "rules of thumb" to assess debt equivalency risk
    - However, those same agencies do not assign specific risk to utilities building generation
    - This creates an inherent financial bias against PPAs, even though the financial risk of building generation may be greater than that of signing a PPA
    - Relative risks need to evaluated empirically

BATES WHITE



Emerging market and regulatory challenges

Setting ROE under cost adjustment and incentive regulation schemes

- Without automatic cost adjustments, deferred costs can increase, increasing financial risk
  - Especially true when fuel prices are more volatile and trending upward rapidly
- Deferred costs are a form of "regulatory asset"
  - From a financial standpoint, regulatory assets may not be very valuable
  - If deferred costs increase too much, financial risks to investors increase
    - Coverage ratios decline (because the utility is not recovering all of its costs in a timely fashion)
    - Utility has to fund the underrecovery
    - Essentially, the utility is increasing its leverage, thus regulatory assets can be thought of as "debt equivalents"
    - Example: AFUDC issues associated with nuclear plant construction in the 1970s

BATES WHITE

Cost pass-through mechanisms

- Can be part of incentive schemes or COS regulation
- Are designed to allow utilities to recover costs they cannot influence
  - Example: Sierra Pacific Power cannot change the price of residual oil
- Most common pass-through mechanisms: fuel-cost adjustment clause
  - Rates are adjusted periodically to reflect changes in fuel costs (up or down)
  - Typically, adjustments are quarterly
    - Rate stability vs. regulatory lag
- Potential problems with some pass-through mechanisms
  - Lack of incentive for utilities to control or hedge costs
  - Disagreement over what is and is not “controllable”
  - Example: health insurance costs for utility employees
    - Utility argues it cannot affect rates charged by its insurer
    - Customers argue utility can increase copayments, switch to different types of insurance, etc.
  - Changing cost recovery rules midstream increases financial risk

Impacts of pass-through mechanisms on the cost of capital

- Impacts depend critically on how the mechanisms are designed
  - Typically lead to lower earnings volatility and less regulatory lag
  - Ideally, the change in earnings volatility should be estimated
- Some utilities have proposed (and received) adjustment mechanisms for the cost of equity itself
  - Example: Green Mountain Power's alternative regulation plan
  - Rate of return adjustment equal to 50% of the change in 10-year Treasury bond yields between adjustment periods (annually for ROE)
    - Basis: Equity returns vary in proportion to changes in bond yields, and market risk premium (Re – Rf) varies inversely with bond yields
    - Example: ROE = 10%. Bond yield increases by 1% (100 bp). Increase ROE by 50 bp to 10.5%
    - Problem: Adjustment mechanism is ad hoc (no basis for 50% value)

Example of an empirically based adjustment factor

- Adjustment mechanism is as follows:

$$k = (\lambda R_{BBB} + (1-\lambda) R_{AAA}) + \beta (R_M - R_B)$$

  - R_{BBB} and R_{AAA} are yields on BBB- and AAA-rated corporate bonds, respectively
  - β is the utility stock beta
  - $(R_M - R_B)$ is the equity risk premium
    - Can be forward looking, historic, or a combination
  - λ is a weighting factor based on the utility's current bond rating
    - If AAA, $\lambda = 0$, if BBB, $\lambda = 1$
- The formula sets the utility ROE equal to the current bond yield (based on its credit rating) plus an equity risk premium based on the CAPM
  - Essentially, this formula is a risk-premium approach applied to the individual utility (rather than a comparable group) that links ROE directly to changes in corporate bond yields

BATES WHITE

Incentive regulation and the cost of capital

- Utilities and regulators are slowly moving towards incentive regulation, rather than traditional cost of service (COS) to set customer rates and utility returns
- Different types of incentive regulation schemes
  - Performance-based regulation (PBR)
  - Price caps and revenue caps
  - "Yardstick" competition
- Issues for setting utility ROE and WACC
  - Still need to establish a "baseline" ROE
  - Where that "baseline" ROE value is set depends on the incentive regulation structure

BATES WHITE

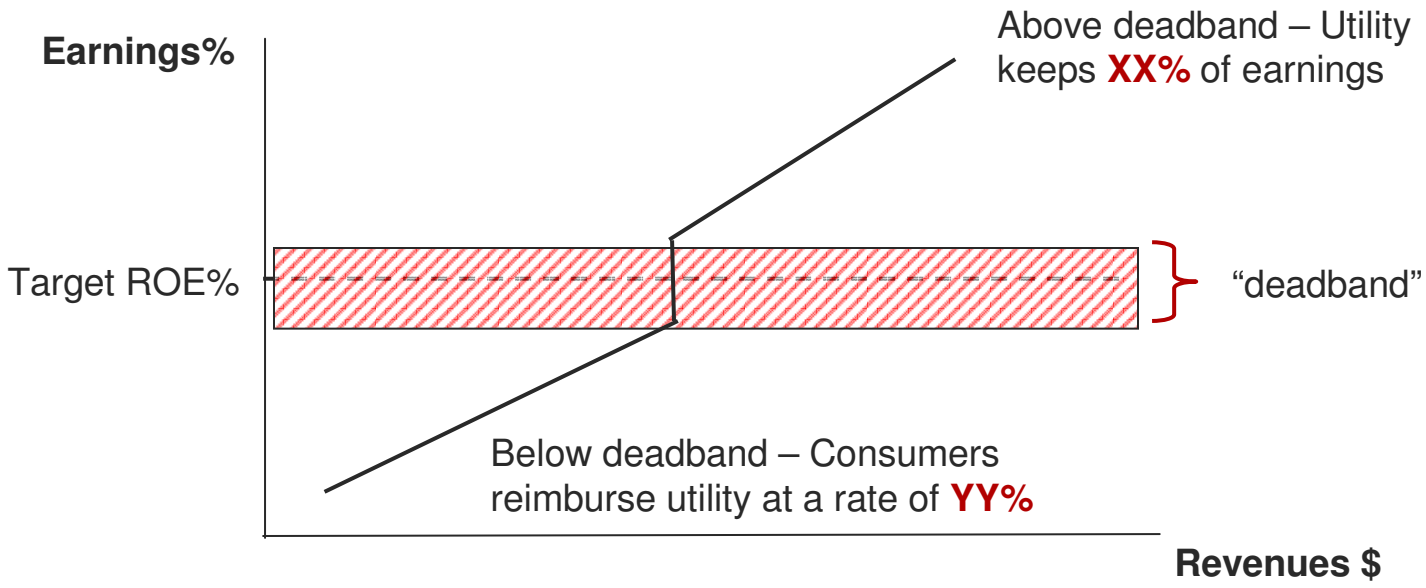
Cost adjustments under incentive regulation

- Typically applied to cover general cost increases, less allowances for productivity and service quality
  - RPI-X regulation
  - RPI is the measure of inflation
    - Can be based on either consumer prices or producer prices
  - X – "productivity factor"
    - X factor provides an incentive for a utility to improve its efficiency
    - Measuring productivity changes is difficult; best approach is to use "total factor productivity" analysis (see discussion in FOER, pp.188-192)
    - Regulators often use "arbitrary" values to set productivity factors, and sometimes include "stretch" factors on top of productivity
  - Q – "service quality factor"
    - Q-FACTOR addresses a concern of PBR, namely that utilities will improve productivity by cutting service quality
- How these factors are set will affect overall financial risk and therefore utility WACC

BATES WHITE

ROE and shared savings programs

- Provide incentives and risk management for consumers and utilities



Note: The share percentages **XX%** and **YY%** need not be the same. However, **XX%** must be high enough for the utility to have an incentive to reduce costs.

Share percentages also affect where Target ROE% is set.

BATES WHITE

Setting ROE under incentive regulation schemes (cont.)

- Common regulatory misconception: Under incentive regulation, target ROE must be set lower than under COS
  - Reason for this is the potential for a utility to earn more if it improves performance
  - Problem is that, while potential ROE can increase, it can also decrease, implying greater volatility
  - Investors will want higher expected ROE in exchange for exposure to greater volatility
- Implication: It is important to estimate and compare earnings volatility under a baseline COS regime and under the incentive regulation scheme

BATES WHITE

Environmental risk and ROE

- Changing environmental regulations pose risks for utilities
  - Long lead times for construction of fossil-fuel plants
  - Potential CO2 regulations or outright bans on coal-fired power plants
  - Lack of permanent nuclear waste storage site
  - Changing renewable portfolio standards
- Changing environmental regulations can affect prices and values
  - Wholesale market prices, as well as COS rates
  - Value of utility-owned generating assets
  - Value and performance of PPAs
    - Example: Utility A has a long-term PPA from coal plant generating owner B. What happens if B is prohibited from transmitting power to A (such as proposed by Nevada Senator Reid)
- Utility investors will require compensation for these risks
  - How much compensation is not clear, because risks are primarily "non-market"

BATES WHITE

Politically driven interventions in markets

- Politicians have inserted themselves into debates over industry structure, deregulation, and re-regulation
  - Transmission restrictions (e.g., Sen. Reid proposal)
  - Price cap extensions
  - Challenges to wholesale market operations (e.g., single-price auctions)
  - New IRP requirements ("integrated portfolio management")
  - Reopening of stranded cost determinations
  - Long-term PPA requirements
  - Government operated "power authorities"
- Regardless of the merit of these interventions, they create uncertainty for investors
  - Ironically, political intervention to reduce rates increases utility cost of capital and upward pressure on regulated rates
  - Intervention makes it more difficult for utilities to enter into long-term contracts

BATES WHITE

BATES WHITE



Strategies for electric utilities

What electric utilities can do to reduce their financial risk

- Avoid "unintended consequences"
  - Design comprehensive, empirically based alternate regulation schemes
  - Secure cost-adjustment mechanisms, but avoid ad hoc ROE adjustment mechanisms
    - May be beneficial in the short run, but detrimental in the long run
  - Develop more comprehensive risk management programs to address market and nonmarket risks
    - Problem, of course, is that risk management is not costless. Therefore, utilities need to determine prudent risk management approaches and regulators must be educated to understand those approaches
      - Cannot be "lose-lose" for the utility ("Why did you waste that money buying life insurance? After all, you didn't die.")
  - Design incentive schemes that align utility profitability with regulatory goals, such as increased energy efficiency

BATES WHITE

What electric utilities can do (cont.)

- Educate regulators
- Explain how well-intentioned policies by regulators may have financially devastating impacts on utilities
- Avoid continuous rules changes that create uncertainty and raise costs
- Obtain clear, up-front approvals for generation investments
  - Use comprehensive models that incorporate uncertainty
  - Avoid prudence and used-and-useful disputes

BATES WHITE

Financial Risks Faced by Regulated Utilities: Implications for the Cost of Capital and Ratemaking Policies

Law Seminars International

Current Utility Rate Case Issues and Strategies

Jonathan A. Lesser, Ph.D.

February 8, 2008

BATES WHITE

Bates White, LLC, Bates White is a consulting firm offering services in economics, finance, and business strategy to leading law firms, FORTUNE 500 companies, and government agencies. We provide our clients with a unique combination of quantitative and analytical expertise, and an understanding of business issues across a range of industries.

Jonathan A. Lesser, Ph.D., is a Partner with Bates White, LLC. Dr. Lesser has over 20 years of experience working for electric utilities, government, academia, and as an economic consultant. He has addressed and testified on major economic and regulatory policy issues affecting electric and natural gas utilities, including their structure and operations, cost allocation and rate design, capital investment decision strategies in the presence of market and regulatory risk, cost of capital, risk management, incentive regulation, and general regulatory policy. Dr. Lesser is the coauthor of *Fundamentals of Energy Regulation*, published in 2007 by Public Utilities Reports, Inc., and a contributing columnist to Natural Gas & Electricity.

For more information, please visit: http://www.bateswhite.com

BATES WHITE