Preparing for a Competitive Environment -- The Prospects for America's Electric Utilities

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Abstract

America's vertically integrated electric utilities will soon face the prospect of direct competition. Initially, this will occur at the "upstream" side of their business to provide the supply of electric power to the utility's system. Later, the "downstream", retail side of the business will open up, especially for large industrial and commercial customers. After many years as a monopoly with essentially cost-plus pricing, competition will pose a significant threat to these high-cost utilities. Fortunately, unlike previously deregulated industries, electric utilities have a number of years in which to prepare themselves for competition, and the experience of their forerunners to guide their preparation. This paper first presents an analysis of the outlook for a typical, but hypothetical, electric utility in the face of such competition, and then examines a range of options for preparing for a competitive environment. These analyses show that the difference in present value to shareholders between successful and unsuccessful strategies can be as much as $150 million (20%) over a 10-year period, and $1 billion (40%) over a 25-year period.

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Introduction

America's electric utilities for the first time face the prospect of direct competition. This has already occurred at the generation level (those utilities that need new capacity are seeking competitive bids, rather than simply building the capacity themselves as in prior times), and at the wholesale level (a number of municipalities have put contracts out to competitive bid, and traditional suppliers have in many cases lost those bids). In addition, by the mid- to late-nineties, the existing utility's retail service monopoly for large customers, if not for all customers, will likely be rescinded. As a result, other suppliers will be able to compete to provide power to the utility's customers, and "wheel" that power over the utility's transmission and distribution system for a price. Eventually, utilities are likely to be de-regulated and forced to set competitive prices.

Generation competition threatens the traditional earnings model of the electric utility. Under that model, guaranteed returns on investments to meet demand growth generally assured reasonable growth in earnings and dividends. But without those investments, where is earnings growth to come from?

Wholesale and retail competition threaten more than earnings growth. The difficulties posed by the introduction of retail competition arise in part from the typical starting condition of the regulated monopoly:

1. The historical requirement to serve all customers on demand (the "universal service obligation"), in exchange for protection from competition and assurance of an adequate rate of return on investment;
2. Cross-subsidization of customer classes (usually benefiting residential customers);
3. Uncompetitive cost structures, service, and customer relations, nurtured by years of monopolistic protection;
4. Payment of high levels of dividends to shareholders who have come to expect bond-like returns; and
5. Significant excess capacity, which contributes to high costs and prices and raises the possibility of a destructive price war.

Under these conditions, competitors can easily come in and "cream skim" the utility's customers, thereby causing the former monopoly to lose sizable, and generally high-profit, customers. This leaves the utility with a significant dilemma: if it raises prices to the remaining customers (to make up the lost revenues), it risks losing even more customers to competitors (eliminating any hope of being completely deregulated); but if it holds the line or even cuts prices, profits will suffer unless costs are also reduced.

Fortunately, electric utilities have several transition years in which to prepare for competition and mitigate or avoid this dilemma. The key strategic need of these utilities is determining the right mix and order of the many possible actions open to it, including: downsizing; investing to improve service; mergers and/or acquisitions; becoming an aggressive competitor in another utility's service territory; and investing in new technologies, products, and markets "on the other side of the meter."

This paper discusses the performance of a typical regulated electric utility in the face of the likely competitive environment, and the consequences for the utility's future viability of alternative strategies during the transition period. The analyses are based on a system dynamics model of a typical electric utility described by Lyneis (1993 and 1984).

The Potential Problems: Slow Earnings Growth and "Stranded" Investment

Historically, America's electric utilities have been regulated, vertically integrated monopolies. Utilities have invested in capacity to meet the projected needs of customers, and regulators have

allowed the utility to set rates (prices) based on costs and a reasonable rate of return on assets. Except in times of increasing inflation and nuclear construction problems, this "cost-plus" approach has provided reliable earnings and dividend growth to the utility's investors. This approach has also generally provided reliable power to businesses and consumers, albeit at increasingly uncompetitive cost, and often with low or deteriorating levels of service and customer relations.

As a point of reference, Figures 1 and 2 show the evolution of a typical, hypothetical utility's performance assuming that this historical regulatory and "non-competitive" structure remains in place. Capital expenditures are made to keep plants and transmission operating efficiently, extend their life, and satisfy increasing load growth (via contracts through a subsidiary company), thereby increasing the utility's "rate base" (assets). Regulators allow the utility to earn a fair return on equity, and therefore earnings per share grow with the rate base increases. Even with a sluggish economy and continued excess capacity over the next decade, the utility experiences modest revenue and earnings growth.

Figure 1. Base Case Capital Expenditures and Rate Base

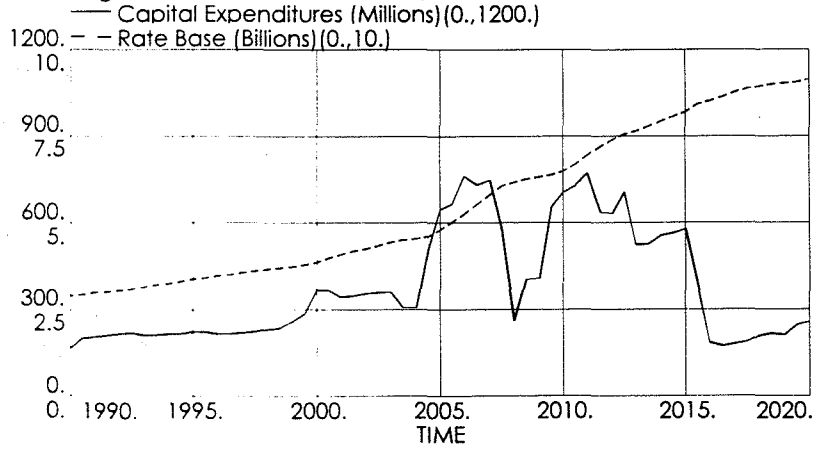
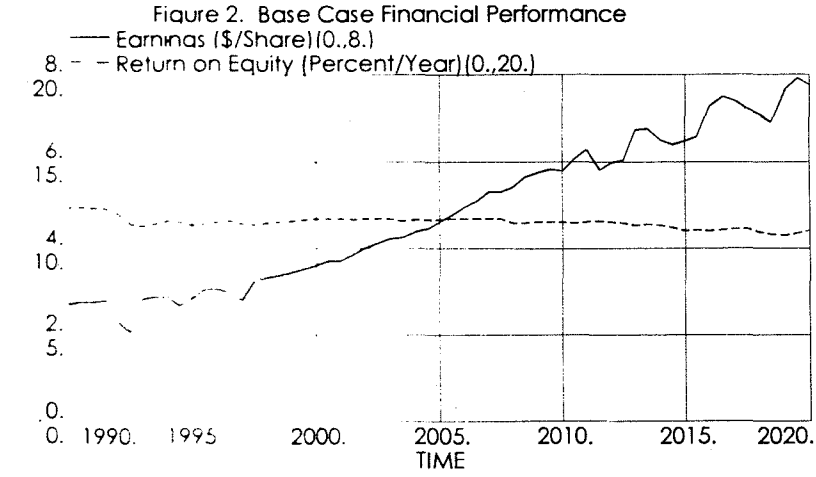


Figure 2. Base Case Financial Performance



This cozy relationship between utility and regulators is threatened by competition. Generation competition undermines the utility's earnings model: add capacity to meet projected demand growth, and be assured of the necessary growth in earnings (and dividends) as a return on that investment. Generation competition requires a utility to put its future supply needs out to competitive bid, and purchase power from the lowest bidder. While the utility can bid for these generation contracts through a subsidiary company as in the "Base Case," most utilities have not been cost-competitive with alternative sources of supply (e.g., independent power producers). Without investment in future generation, assets will not increase and earnings will not grow. As old assets are

retired and replaced by purchased power, earnings could even decline. While the utility will still need to grow its distribution and transmission assets, this is not likely to offset the decline in generation.

Figures 3 and 4 show how the utilities financial performance changes in the face of competitive generation where it is not competitive for supply contracts (labeled"GENCOMP" in the figures). With lower capital expenditures, the utility's rate base stops growing (Figure 3) and earnings growth is substantially slowed (Figure 4).

Figure 3. Capital Expenditures and Rate Base

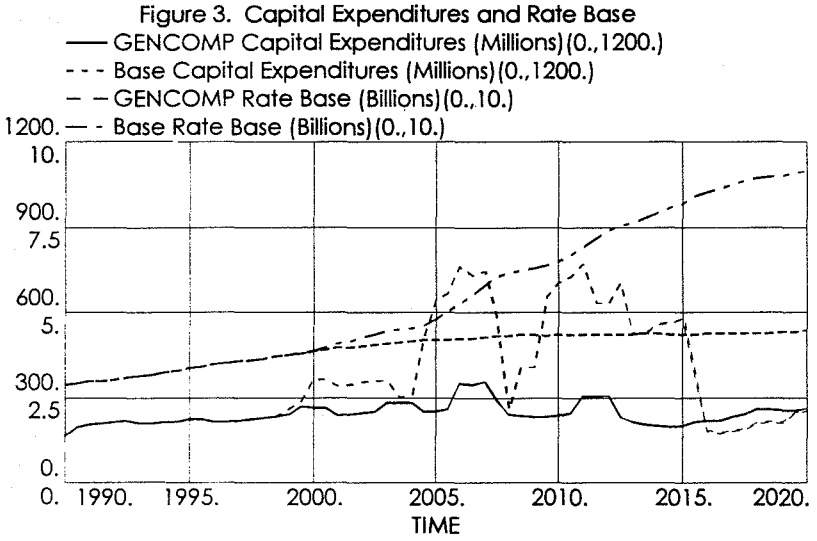
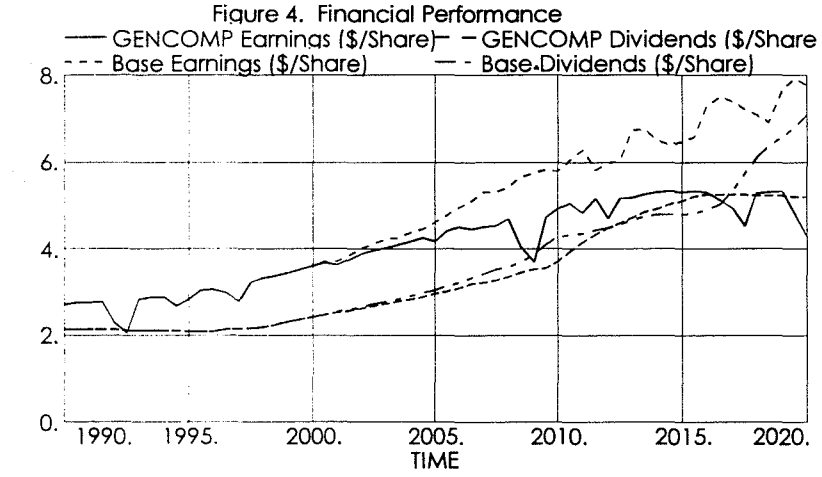


Figure 4. Financial Performance



Because the utility has significant excess cash flow, dividends continue to increase for awhile and even reach Base Case levels. Eventually, however, dividends bump up against the flat earnings ceiling. This is the utilities long-term problem; it is more of a"psychological difficulty" (earnings decline) than a "life-threatening illness" (bankruptcy).

On the other hand, retail competition (i.e., allowing multiple utilities and independent power producers to provide electrical service via special contracts to large commercial and industrial customers) is a very real short- to mid-term threat to a utility's viability. For the purposes of illustration, we created the following scenario:

The Retail Wheeling Scenario

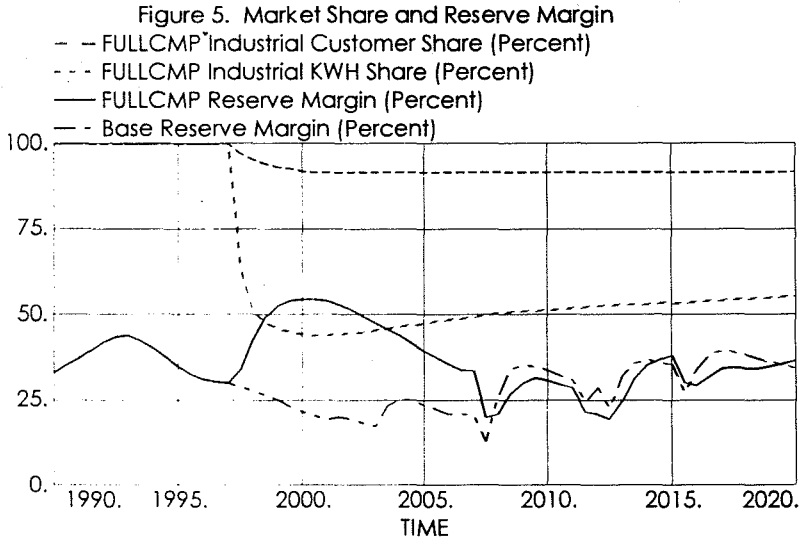
The retail market for electricity supply is opened to competition at the start of 1997. Utility's competitors are assumed to offer power to its largest industrial and commercial customers:

- At a 10% discount off Utility's 1997 price, escalating at 0.7% above the general inflation rate
- For a period of 10 years (reflecting the likely period of surplus capacity)
- The competitor must pay Utility to wheel the energy across its system

In order to avoid hurting remaining customers and to put some cost pressures on Utility, regulators adopt a strategy of holding allowed price increases on the non-fuel component of rates to the rate of inflation (assumed to be 4% per year). Fuel price increases are passed through at cost.

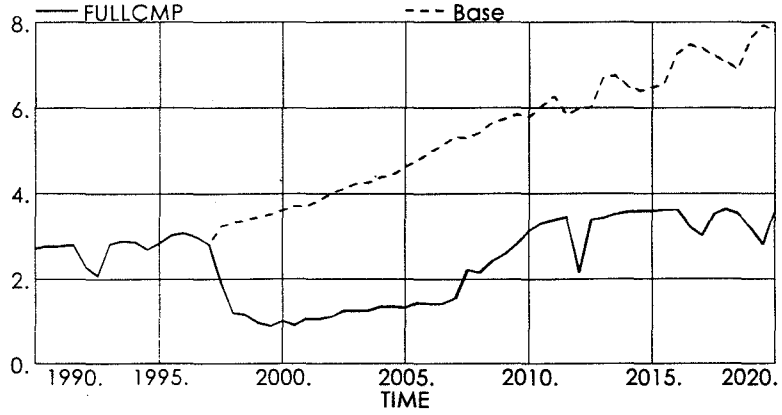
Absent any response, the utility's performance under the retail wheeling scenario deteriorates substantially. As shown in Figure 5 (labeled "FULLCMP" in the figures, which includes both generation competition and retail competition), Utility's share of industrial customers within its current service territory declines by about 10%, with a loss of nearly half of industrial energy sales because the most intensive user will likely be those targeted by competitors (the corresponding loss of commercial customers is approximately 1%, and 25% of energy). This produces a substantial increase in reserve capacity, with a corresponding increase in unit (kwH) costs.

Figure 5. Market Share and Reserve Margin



Because regulators are assumed to allow prices to increase only at the rate of inflation, investment is "stranded" in the sense that returns are less than costs. As a result, the Utility's profitability and earnings drop dramatically, and only begin to recover after 2007 as reserve margins improve and unit costs fall (see Figure 6). However, earnings then bump up against the limit imposed by the requirement to buy power and not build to increase rate base. Significant external financing is required to cover operations and remaining capital expenditures. Retail competition adds the threat of near-term bankruptcy to the long-term earnings stagnation of generation competition. These simulation results clearly show the need for decisive action on the part of the utility. What are the options? They fall into three basic categories: (1) Regulatory Bail-out; (2) Downsizing and/or Consolidating via Merger or Acquisition; and (3) Investing for the Future. We will examine the consequences of each of these in turn.

Figure 6. Earnings Per Share ($/Share)



The Consequences of Alternative Utility Actions

Regulatory Bail-Out

Regulatory bail-out is the easiest extension from the current regulatory model, and the one that many utilities are likely to hope for (at least before they see these results!). It assumes that there will always be a class of customers that are too small to be served by competitors, and in exchange for serving them the utility should be allowed to recover all of its reasonable costs and earn a fair return on all its assets. Therefore, regulators should allow the utility to raise its prices at whatever rate is required to achieve this. In its extreme, this policy assumes full cost-of-service rate recovery, which includes stranded investment.

Figures 7 and 8 show the results of a number of simulation experiments in which the cap on annual rate increases is progressively removed (labeled "REG1" and "REG2" in the figures), until the cap is completely removed ("REG3"). These results indicate that, the more prices are increased:

- the more market share is lost (Figure 7), and the more prices need to be increased to remaining customers (Figure 8);
- elasticity effects on demand produce even greater loss of "share;"
- only if prices are completely unconstrained (REG3) would the utility's earnings avoid a drop (Figure 9);
- while not included in these analyses, price increases of this magnitude would likely prompt small customers to band together and move to competitors; and,
- eventually, a "death spiral," in which increasing prices cause further customer losses until the utility goes bankrupt, potentially develops.

Figure 7. Industrial Market Share (Percent)

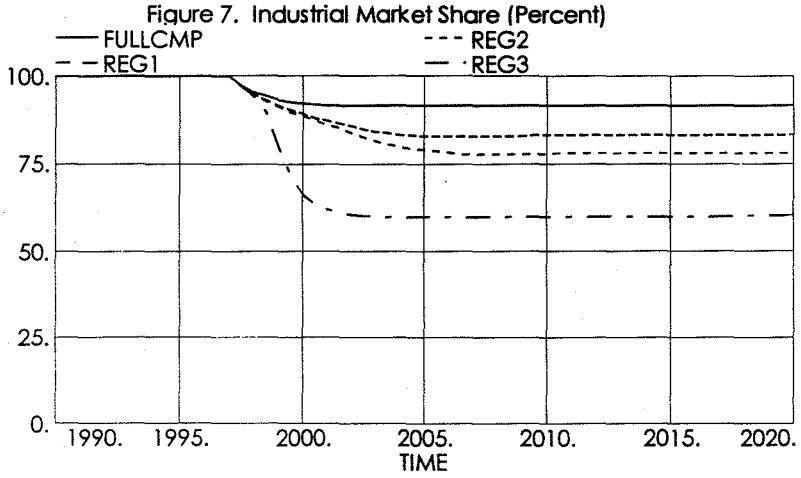


Figure 8. Price (Cents Per kWh)

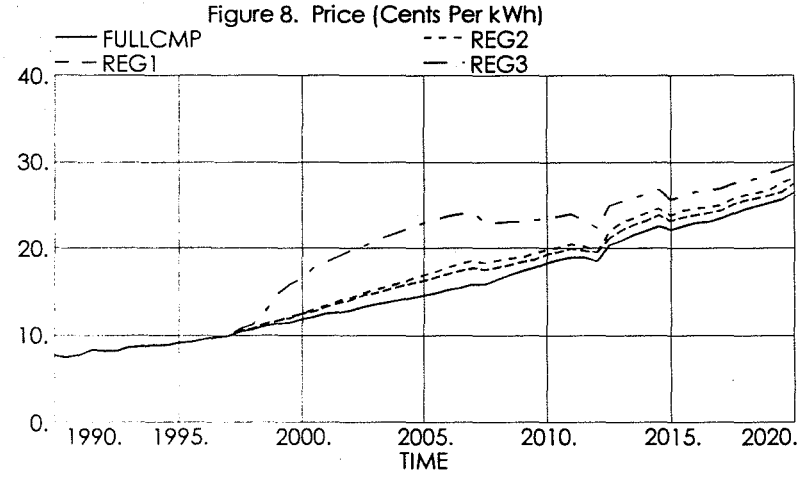
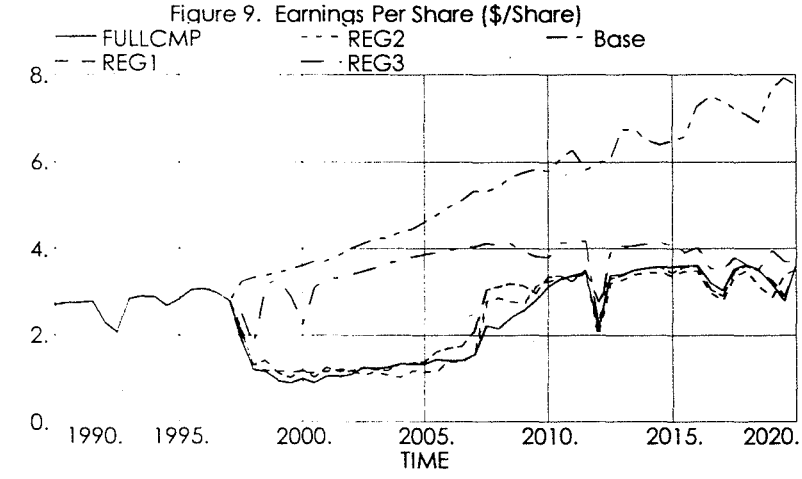


Figure 9. Earnings Per Share ($/Share)



In all likelihood, regulators would awaken at some point, and preclude further price increases. The utility would be worse off than had the bail-out not started, because by then its customer base would have shrunk considerably. It is because of these concerns that most regulators do not view "bailout" as a viable option.

Downsizing and/or Consolidating via Merger or Acquisition

Following the lead of many recently de-regulated industries, electric utilities are likely to downsize their operations in order to reduce costs and become more competitive. Alternatively, consolidating can also reduce unit costs. How this downsizing/consolidation is achieved can have a significant impact on the long-term performance of the utility. The basic options are: (1) eliminating presumed "fat"; (2) investing in productivity improvements, such as new technologies, training, and process re-engineering; and (3) merging or acquiring neighboring utilities in order to consolidate and achieve economies of scale.

Eliminating presumed "fat" is the most appealing and seemingly easiest option -- just reduce operations, maintenance, and capital spending by enough to get your costs down to competitive levels. For example, reducing staff and related non-staff expenses by 30% beginning in 1994, results in a significant mid-term improvement in earnings relative to what happens under full competition if the utility took no action (see "CUTFAT" results in Figure 10). The reduction in unit costs allow the utility to reduce prices and avoid the loss of market share.

But what if these staff and capital expenditures are not really "fat," but are there because the utility's technologies, processes, and/or organization require them? Then these cuts will create longer-term problems: customer service deteriorates and backlogs of "deferred" maintenance build up. These backlogs eventually:

- Increase needed expenditures, often on an emergency basis;
- Adversely affect plant availability, system reliability, and quality of service; and
- Create longer term "costs" which more than offset the short-term savings

For example, in Figure 10 the simulation labeled "DOWNSZE" assumes that the utility has no fat in its workforce (only inefficient technologies and processes). As a result, reducing staff produces short-term improvements relative to FULLCMP. However, the improvement can not be maintained in the longer term, and earnings deteriorate, because expenses increase, customer service deteriorates (see for example, Figure 11), and unhappy regulators squeeze the utility's earnings.

Figure 10. Earnings Per Share ($/Share)

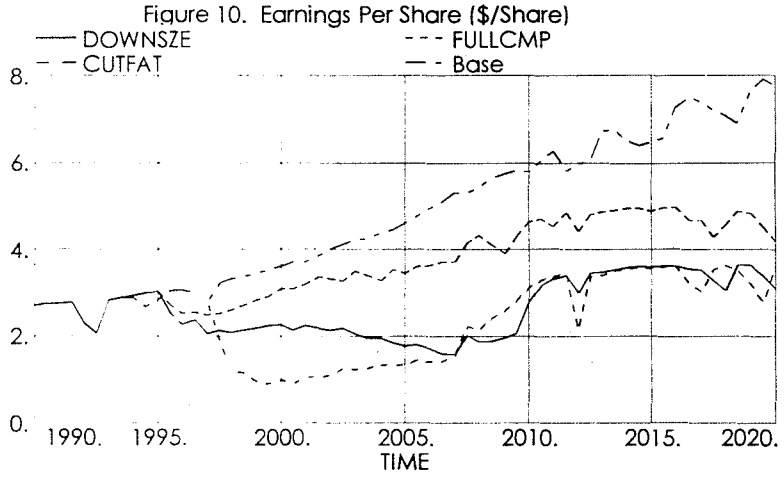
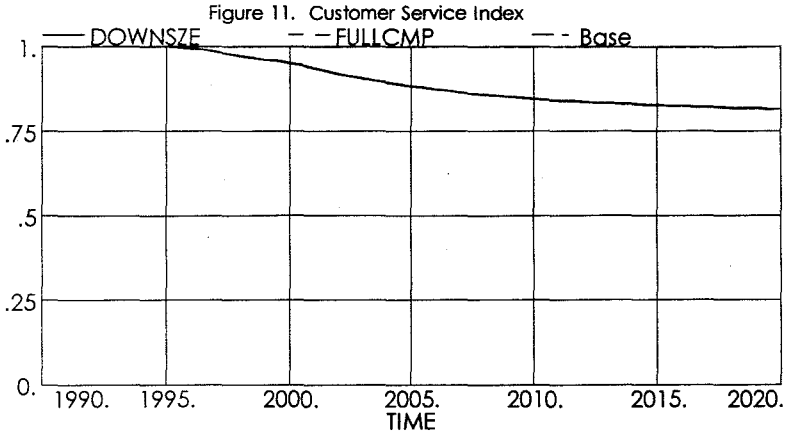
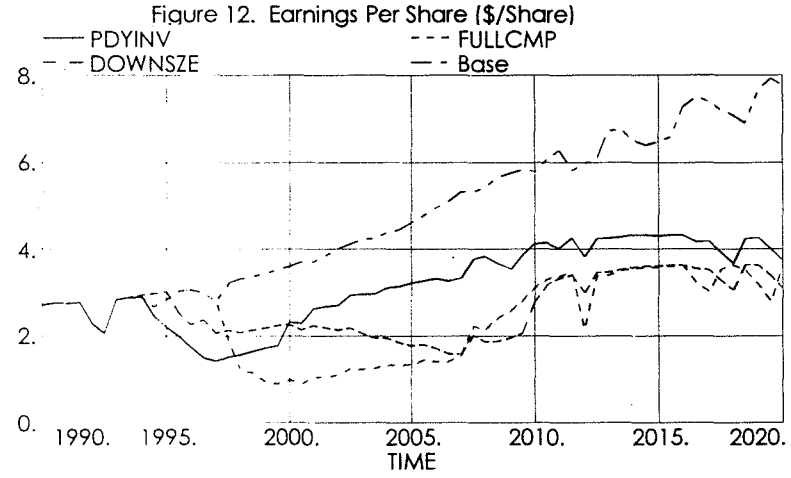


Figure 11. Customer Service Index



Investing in productivity-improving technologies (e.g., automated meter reading, "squirrel-safe" transformers) and processes (consolidated handling of service, billing and other inquires) cost money and take time, and therefore are less appealing in the short-term. But they are essential to avoiding long-term problems. In order to remain viable in the long-term, these investments must be made, even if they reduce earnings in the short-term. For example, suppose the utility needed to invest $300 million over 3 years in order to achieve a 100% improvement in productivity. Figure 12 shows that while earnings are lower in theshort-term as a result of these investments (which are assumed to come out of the shareholders pockets), earnings improve in the longer-term as these investments reduce costs, allow lower prices, and prevent a loss of market share.

Figure 12. Earnings Per Share ($/Share)



Mergers and acquisitions are beneficial only if they provide real economies of scale, that is, the ability to serve more customers and provide the required power with fewer employees and with no degradation in customer service or system operation. Typically, a merger/acquisition does not save any money in the short-term and requires investments to facilitate the economies (especially in T&D, generation, and customer service systems). Therefore, while we have not simulated a hypothetical merger, it would be somewhat like that of investments in productivity-improving technologies. In addition, other potential benefits of a merger include: (1) a more robust fuel mix; (2) diversity of loads and non-coincident peaks; and (3) more political "clout" accompanying the larger size.

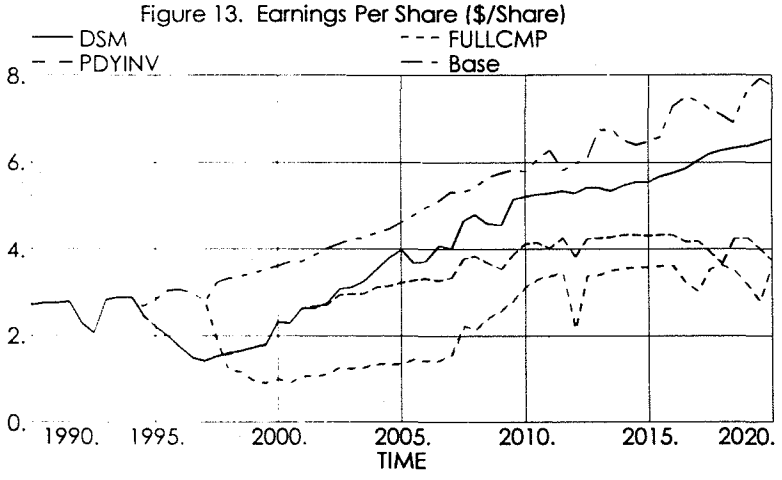
Investing for the Future

The actions above attempt to deal with the short-term problem of retail competition. The long-term difficulty of slow earnings growth can only be addressed through investments in other businesses. There are three basic options: (1) investments in new generation via a subsidiary company; (2) investments in energy services to the utility's existing customers (e.g., conservation, peak-load shifting, electric vehicles, heat pumps, etc.); and (3) investments in non-related businesses ("diversification"). Attempts by companies in a given industry to diversify into unrelated fields have rarely met with success. Investments in new generation via a subsidiary were ruled out above, but may become more feasible with significant reductions in utility costs. We will therefore use investments in energy services as a good example of a realistic option for an electric utility. As note by the Electric Power Research Institute (1993):

> *As utilities examine the trends shaping the industry, probably the most critical ingredient is assessing the implications of changing customer needs and requirements. Although electric supply issues are traditionally the focus of utilities, demand and customer strategies -- as in many other industries -- are playing a larger role in shaping upstream investment decisions. Much of this is a result of the emphasis on adding value to the customer. But emerging information and energy efficient technologies are also providing customers with potentially more options and choice over purchase.*

As an example, suppose that the utility aggressively invested in demand-side management activities ("DSM" -- e.g., conservation and peak-load shifting). This has the advantage of reducing the need for purchases of new generation in the future, and, if the utility owns the DSM assets, could allow earnings growth via a return on these assets or value-based pricing of energy cost savings. Specifically, suppose the utility begins investing in DSM assets in the late 1990's to achieve 25% of peak demand, in addition to the productivity investments discussed earlier (costs set to approximately equal cost of new generation). As illustrated in Figure 13, carefully timed investments will allow the utility to begin growing earnings again by substituting its own investments for purchases of power from other investors.

Figure 13. Earnings Per Share ($/Share)



The timing here is critical. Although efficient energy use (i.e., conservation) always makes sense from the customers perspective, during times of excess capacity utilities that charge for their conservation programs (either directly as an expense or via payments for"lost revenues") will cause their unit costs to increase. In the short-term, therefore, utilities need to target conservation at maximizing existing asset utilization, while delaying aggregate demand-reduction efforts until such demand growth would necessitate the need for additional supply (or to substitute for existing plant retirements).

Conclusions

The analyses in this paper clearly demonstrate that:

1. Relying on the regulators for a bailout is not a viable approach. Regulators are not likely to allow a utility to recover all lost revenue through higher rates. Therefore, lost customers means lower returns. Moreover, increasing prices to recoup even some of the lost revenues merely drive more customers to competitors. And with larger price increases, the utility risks having smaller customers band together into buying groups to get lower prices from competitors.
2. Significantly reducing the utility's cost base is an essential part of any long-term strategy. Some of this reduction can come from cutting "fat," but the utility must be very careful to avoid cutting beyond this point (without enabling investments in productivity, such as new technologies, training, and process re-engineering). Otherwise, the utility risks:
    - Adversely affecting plant availability, system reliability, and quality of service;
    - Increasing needed expenditures in the longer-term, often on an emergency basis; and
    - Losing good will with customers and regulators, with inevitable adverse consequences.
3. For aggressive and lower-cost utilities, adopting an "offensive" strategy to acquire new customers can improve performance, but also requires a careful balancing of the short-term benefits against the additional capacity required in the longer term.
4. Whatever the strategy, the utility must be proactive in preparing for competition*in order to avoid losing any market share*
    - The "hit" from a loss of market share significantly reduces earnings, dividends, and stock price, and requires a large infusion of debt to cover the short-term losses.
    - Longer-term recovery is then hindered by the high debt ratio and low stock price
5. Investing for the future in productivity enhancing technologies and processes, and in DSM, offers the possibility of both lower costs to consumers and reasonable and growing profits to the utility.
6. The "bottom line" difference between successful and unsuccessful strategies is significant. The difference in present value to shareholders between the successful "DSM" strategy and unsuccessful "Regulatory Bailout" strategy, in the face of full competition, can be as much as $150 million (20% improvement) over a 10-year period, and $1 billion (40% improvement) over a 25-year period.

Whatever the future brings, the monopolistic utility/regulatory structure is going to change. Utilities, unlike other deregulated industries, have an opportunity to seize the moment and take advantage of the time before deregulation becomes a reality. Whether or not deregulation occurs in the next few years, utilities will be well served by aggressively reducing costs, improving service and building better relationships with their customers. Those that do not will be acquisition targets or worse -- stripped of large, profitable customers.

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