LEVERAGE AND THE PERFORMANCE OF ELECTRIC UTILITIES: HOW FEEDBACK ASSUMPTIONS AFFECT POLICY CONCLUSIONS

James M. Lyneis
Pugh-Roberts Associates, Inc.

ABSTRACT

Many electric utilities have a heavily debt-laden capital structure. A number of factors have contributed to this situation, but chief among them is the theory that increased debt improves a corporation's earnings per share. This theory is derived from a relatively simple financial model which relates earnings per share, capital structure, interest costs, and income. Using a more comprehensive model, this paper shows that <u>reducing</u> debt as a percentage of capital structure can improve the interest coverage, earnings per share, and market price per share of electric utilities.

I. INTRODUCTION

Over the course of the seventies, the financial performance of many electric utilities deteriorated sharply. From a relatively healthy position in the late sixties, a number of factors combined to produce: capacity reserve margins higher than those required for target service reliability; equity returns well below those allowed by regulators (and below a level consistent with risk); a low percentage internal funds generation and increasing percentage of non-cash component of earnings; and resultant excessive reliance on external financing. These trends continued into the eighties. Many utilities found themselves with low interest coverage ratios, falling bond ratings, and stock selling below book value.

The causes of these problems were many: high inflation, especially in fuel prices; inadequate rate relief; and an unanticipated slowing in load growth. But while a utility could do little to control these external events, to what extent could it have changed management policies to improve its financial situation and position the company to weather further disadvantageous external events? As conditions change policies must be able to adapt. Yet it would appear that, particularly as regards capital structure policy, utilities have been sticking to the ways of the past.

Beginning in the mid-sixties, utilities reduced the amount of common equity in their capital structure from around 40 percent to 30-35 percent. In part, this reduction may have resulted from regulatory pressures to reduce rates by reducing the cost of financing. It may also have resulted from the general shift in financial strategy occurring during that time: assumptions that the government could control the business cycle, and thereby reduce risk, and the growth attitude of the decade and its philosophy of taking advantage of leverage. Utilities were perceived to be less risky than other industries, and therefore could take on more fixed-charge obligations. In addition, as the stock price of utilities fell below book value, they became increasingly unwilling to raise new equity.

The conditions of the eighties may warrant a change in capital structure policy. For example, Brooks and Harris argue for higher common equity ratios (Brooks and Harris, 1982). But will higher common equity ratios improve the utilities financial performance? If so, how can such a change in strategy best be implemented? These questions are addressed in this paper, using a strategic planning model set up to represent a hypothetical electric utility. (Experiments identical to those reported on here have also been conducted using the strategic planning model set up for real utilities. The conclusions are the same.)

As described below, the model provides a unique way of analyzing utility performance because it explicitly represents the interactions between the utility and various external agents -- consumers, investors, and regulators -- as they play themselves out over time. With these interactions represented, changes in policy or external conditions produce not only primary effects, but also secondary and tertiary effects which can counteract the primary effects. For example, an increase in debt as a percentage of capital lowers rates in the short-run below what they otherwise would have been. But lower rates stimulate demand, thereby necessitating greater use of expensive peaking capacity and eventually an increase in baseload capacity. These actions raise rates and offset the advantages of less debt. With a complete model of the utility, the full set of advantages and disadvantages of a policy change can be evaluated.

II. ANALYSIS APPROACH

STRUCTURE

The model consists of a series of sectors representing the major activities of a utility and its interaction with the external environment (customers, investors, regulators, general economy). These sectors are:

1. Demand Generation
2. Capacity Planning
3. Power Generation
4. Financial Planning
5. Accounting
6. Capital Markets
7. Regulation

The model represents the activities within these sectors at a relatively aggregate level of detail. It does not, for example, pinpoint the timings and magnitude of security issues. It does identify the order of magnitude of financing needs (+/- 5 percent), and more importantly shows the impact of alternative capital structures on utility performance.

Figure 1 highlights the key interactions among model sectors. An aggregate demand for electricity is calculated in the Demand Sector, based on exogenously specified growth rates, and on the price of electricity. Demand "drives" the Power Generation Sector and also is used as the basis for load forecasting in the Capacity Planning Sector. Capacity is ordered to meet the load forecast, subject to availability of funds. The Power Generation Sector provides power in response to demand, within the constraints of capacity available. The Accounting Sector determines the utility's financial performance, based on the amount of power delivered, rates, and various categories of costs. The Financial Planning Sector raises capital in response to the utility's financial performance and the requirements of the Capacity Planning Sector, and feeds information back concerning availability of funds. The Capital Markets Sector determines the cost of debt and equity capital based on utility financial performance. Finally, the Regulation Sector uses information about the utility's costs and its rate base to establish an aggregate rate for all customers.

Each model sector contains considerably more detail than that shown in Figure 1. For example, the demand sector allows separate price elasticities for several customer classes, the capacity sector represents multiple fuel types, and the accounting sector computes five distinct cost categories. In all, the model contains approximately 700 equations which describe the sectors, their interactions, and the external environment. (A more complete description of the model can be found in Geraghty and Lyneis, 1982; Lyneis and Geraghty, 1983; and Geraghty and Lyneis, 1984a).

In addition to the structural equations, the model contains assumptions about external trends, the strength of reactions by external agents (e.g. capital markets and regulators), and management policies. The structure together with the assumptions determine the time behaviour of variables in the model. Important assumptions are noted below. These assumptions are meant to be reasonable and representative of the utility industry.

EXTERNAL TRENDS

Assumptions regarding external trends fall into two categories: (1) factors affecting demand growth, and (2) cost inflation rates. Specific assumptions used in the base case simulation of the model are given in Figure 2: demand growth, exclusive of price changes, is expected to average 2.3 percent per year; price changes work through short- and long-term elasticities (additive effects) to change demand growth from the rates given above; inflation in utility costs is assumed to exceed general inflation rates.

REACTIONS BY EXTERNAL AGENTS

External agents determine three factors of importance to utilities: interest rates, stock price, and rates. How each is modeled is discussed below.

As given in Equation (1), the interest rate on new debt NINTR equals the sum of three components: a risk-free rate RFINT, inflation premium IFPD, and a risk-premium RPD.

Figure 1
KEY INTERACTIONS AMONG MODEL SECTORS

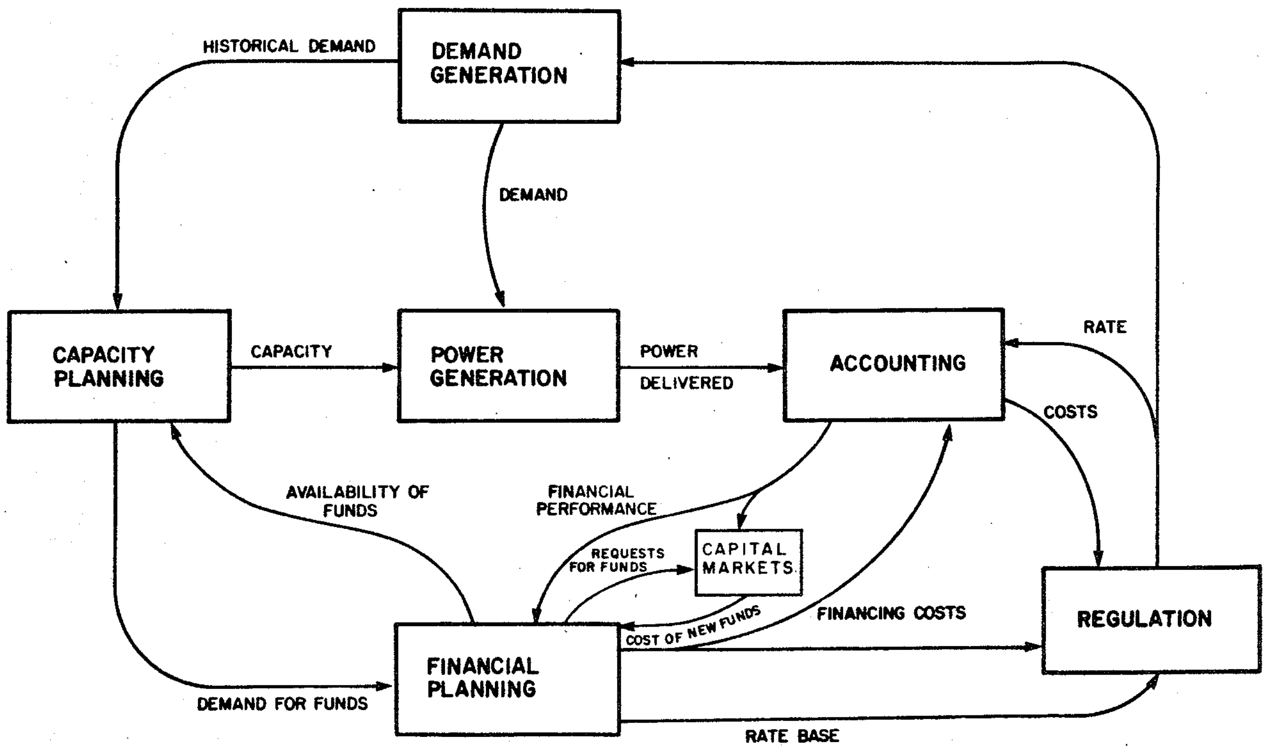


Figure 2
BASE CASE ASSUMPTIONS: EXTERNAL ENVIRONMENT

1. Demand Growth Rates Assuming Constant Real Prices and Real Income: 2.3% per annum

2. Price Elasticity: -1.0 for all customer classes

3. Inflation and Real Income:

   General Inflation Rate of 8% p.a. (actual CPI used 1980,1981)

   Increment in Utility Costs from General Rate -

	Increment 1983-1990	Increment After 1990
Capacity Cost	+1%	+1%
Oil Cost	+1.5%	+1.5%
Nuclear Fuel Cost	+7%	-1%
Coal Cost	+0.5%	+0.5%
O&M Cost	+1%	+1%
General Taxes	+1%	+1%

4. Regulation:
   - Assuming stable inflation rate, regulators will allow a real return on equity consistent with risk level by 1990 (assumed to be 8%).
   - Regulatory Delay of 1 year.
   - No forward test year or CWIP.
   - Rates based on actual capital structure.

NINTR = RFINT+IFPD+RPD (1)

NINTR - New Interest Rate (fraction/year)
IFPD - Inflation Premium for Debt (fraction/year)
RFINT - Risk-free Interest Rate (fraction/year)
RPD - Risk Premium for Debt (fraction/year)

The risk-free rate is assumed to equal a constant 2.5 percent; the inflation premium is simply a one-year average of the inflation rate. The risk premium for debt is modeled as a function of interest coverage, since interest coverage is a key factor in utility bond ratings, and is also a reasonable proxy for other risk indicators. The interest coverage used is a weighted average of coverage including and excluding allowance for funds used during construction (AFUDC). Risk premium rises as weighted interest coverage falls using a relationship fitted to the historical data of utilities modeled in earlier work.

Investors in utility stock are assumed to value it much like debt, that is, by a dividend yield. As indicated in equations (2) and (3) below, market price per share MPS equals dividends per share DIVPS divided by net stock discount rate NSDR, where NSDR equals the sum of a risk-free interest rate RFINT, an inflation premium IFPD (same premium as for debt), a risk-premium for equity RPE, and the negative of anticipated growth in dividends per share AGDPS.

MPS = DIVPS/NSDR (2)

NSDR = RFINT+IFPD+RPE-AGDPS (3)

MPS - Market Price Per Share ($/share)
DIVPS - Dividends Per Share ($/year/share)
NSDR - Net Stock Discount Rate (fraction/year)
RFINT - Risk-Free Interest Rate (fraction/year)
IFPD - Inflation Premium for Debt (fraction/year)
RPE - Risk-premium for Equity (fraction/year)
AGDPS - Anticipated Growth in Dividends Per Share (fraction/year)

The risk-free rate and inflation premium of debt are the same as that used in determining the new interest rate.

The risk premium of equity is a function of interest coverage (same coverage as for risk premium of debt). It is assumed that most utility stockholders view their stocks as near-debt, and interest coverage is a reasonable indicator of the risk of being paid dividends. In the model, risk-premium rises when interest coverage falls using a relationship fitted to the historical data of utilities modeled in earlier work.

Anticipated growth is assumed to equal historical rates of dividend growth, as calculated by the model, over the last several years. The higher the growth rate, the lower the denominator of (2). The above stock valuation model gives a good fit to the historical stock prices of utilities modeled in earlier work.

The rate set by the regulatory body for this hypothetical utility is the sum of three components: (1) fuel cost adjustment; (2) other costs; and (3) return on rate base. Changes in fuel costs are passed through with a three-month lag; the latter two components must be approved in a regulatory proceeding. The delay in granting a new rate is set at a constant one year. There is no forward test year nor CWIP allowed.

The allowed rate of return is the sum of the allowed debt, preferred, and equity returns, weighted by their actual percentage of the capital structure. Debt and preferred returns are based on actual charges paid; the allowed return on equity is the sum of a real return and an inflation adjustment, which is a function of a five-year average of the inflation rate. Historically, allowed returns on equity have not kept pace with inflation such that real returns have fallen. There are two possible explanations for this: (1) regulators have been slow in recognizing the permanence of high rates of inflation; and (2) regulators have responded to consumer pressures and allowed real returns to fall, even though they accept the high inflation rates as "persisting". Either way, the model represents both of these explanations by basing the allowed return on equity on an average of inflation.

MANAGEMENT POLICY VARIABLES

The two important areas of management policy relevant to a strategic planning model are capacity expansion policy and financing policy. Figure 3 lists the key elements of the hypothetical utility's policies. Policies in the model state how utility management (and for that matter investors and regulators) respond to changing conditions. They are an integral part of the feedback structure of the model.

III. BASE CASE PROJECTION OF FINANCIAL PERFORMANCE

The Base Case is simply a simulation from 1980 to 2005 which is produced assuming a continuation of present management and regulatory practices, and likely assumptions regarding the evolution of external trends. It is a look at the likely future performance of a hypothetical electric utility.

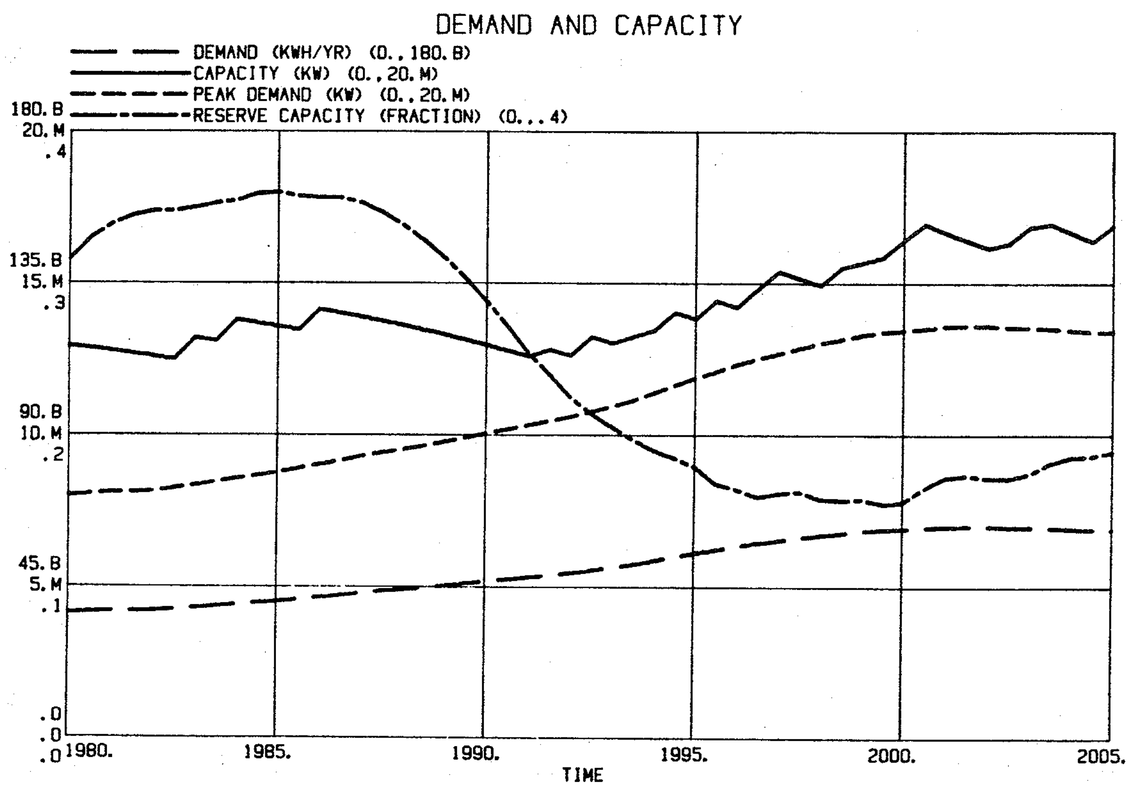
Figures 4 through 10 show the projected Base Case performance of the hypothetical coal-based electric utility from 1980 to 2005. Figure 4 shows the trends in capacity, peak load, power delivered, and reserve margin. Time runs across the bottom axis; the scales for the variables plotted are given along the vertical axis (in the scales, "T" stands for thousands, "M" for millions, and "B" for billions).

Figure 3
BASE CASE ASSUMPTIONS: UTILITY POLICIES

1. Capacity
   - Desired Reserve Margin - 20%
   - Desired Fuel Type - Only new coal plants after present construction, except for normal amounts of peaking capacity.
   - Construction Lead Times - 8 years for coal Baseload
     3 years for peaking
   - No significant investment in conservation or load management.

2. Financing
   - Desired Capital Structure - 50% Debt, 40% Common, 10% Preferred
   - Dividend Payout Objective - 75%

Figure 4



From 1980 to 2005 demand growth averages 2.2 percent, slightly below the growth rate of 2.3 percent in customers and usage per customer assuming constant prices. However, the rate of growth over the period is not at all smooth, whereas customer growth is. Both of these deviations are caused by variations in real price, as shown in Figure 5.

In the early eighties, prices are high relative to the levels of the seventies. Hence, price feedback effects on consumption are keeping demand nearly constant in spite of the 2.3 percent per year growth in customers and usage per customer assuming constant real prices. Reserve margins therefore continue to grow over the 1980 to 1985 period as construction started earlier is completed. Prices are high for two reasons: first, increases in fuel costs above the rate of inflation; and second, increases in fixed charges per KWH at the high reserve margins mean that the costs of unused capacity must be spread across a smaller base of power delivered.

As the utility perceives the slow load growth and high reserve margin, the construction program is reduced: in 1980, three plants were under construction; by 1985 only one is. This low level of construction is maintained until 1988.

With the reduced construction program, real prices are nearly flat from 1980 to 1988. Demand growth then acts to drive down reserve margins; as a result, fixed charges are spread over a larger KWH base. A fall in real prices between 1988 and 1993 then further stimulates demand growth -- during this period demand growth exceeds the rate inherent in customer growth.

In response to the renewed load growth and declining reserve margins, the utility once again gears up the construction program. But the unanticipated growth stimulated by falling real prices causes reserve margins to fall below the utility's 20 percent objective because of the long lead times of baseload plants. Peaking units are added, and margins improve after the year 2000.

The cost of fuel for the peaking units begins to drive up real prices. Increases in utility costs above general inflation and the arrival of new baseload units into the rate base continue the upward trend. As a result, price feedback effects cause demand to reach a peak and level off between 2000 and 2005 such that reserve margins approach 20 percent.

The financial performance of the utility is shown in the remaining exhibits. Figure 6 gives the behavior of return on equity and return on rate base. By assumption, the allowed return on equity increases to 16 percent (8 percent inflation plus 8 percent real return.) Realized returns, however, except for a brief period near 1990, average well below allowed. Returns fluctuate because of the discrete nature of rate cases: they rise immediately after a rate case, then deteriorate as inflation drives up costs while rates remain constant (except for fuel charge passthroughs), and as new plants are brought into service but regulatory lag delays their inclusion in the rate base. Returns are therefore the lowest when inflation is highest and when the most construction is occurring. Conversely, returns increase toward allowed when costs are falling and the construction program is low (as in the late eighties).

Figure 5

RATE AND CAPITAL EXPENDITURES IN CONSTANT 1982 DOLLARS

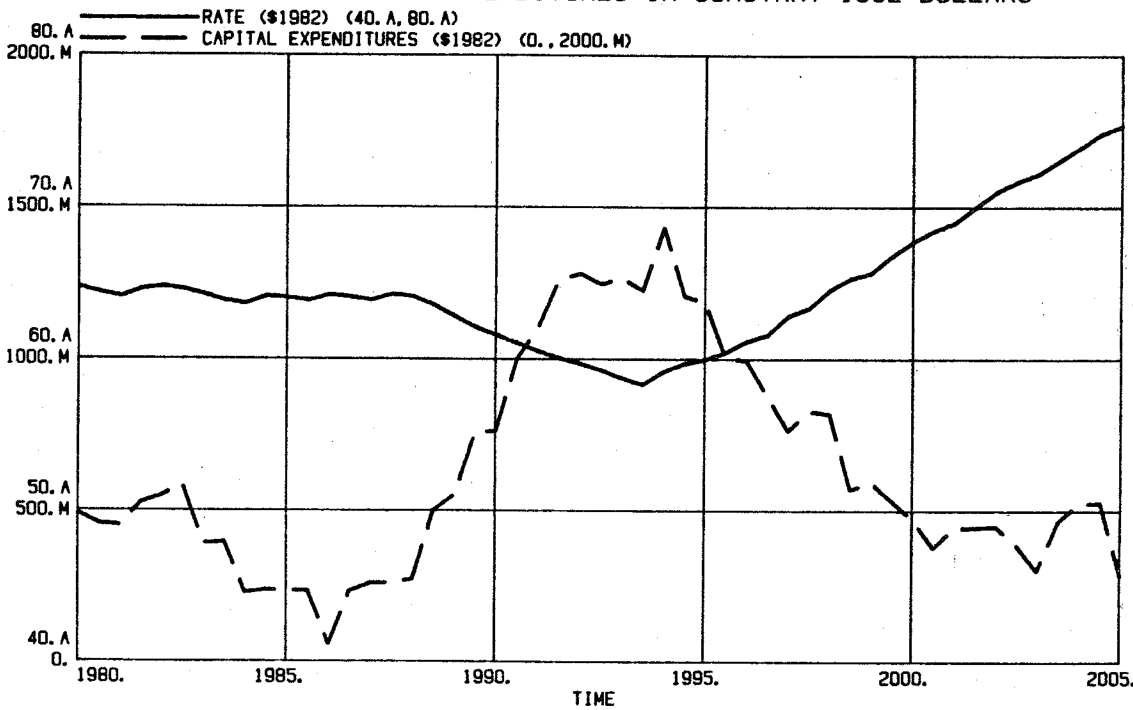


Figure 6

RETURN ON EQUITY

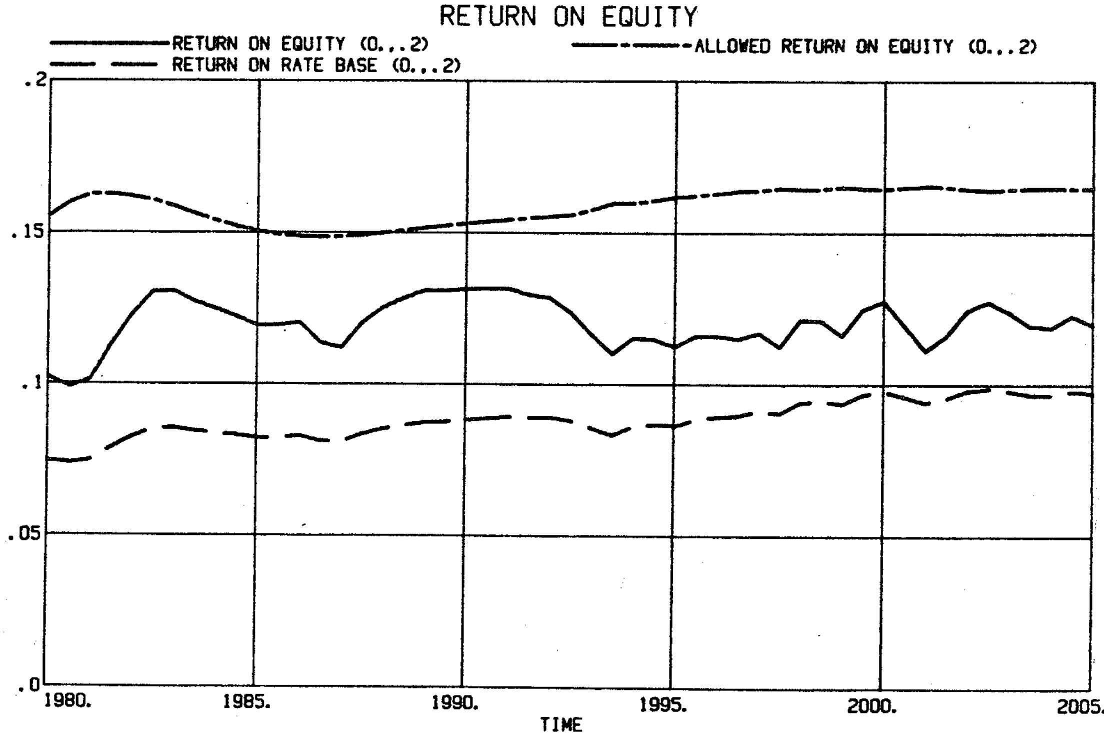


Figure 7 shows some 'per share' data for the utility. Earnings and dividends per share grow at rates averaging 4 percent per year from 1982 to 1992 as the reduced construction program, relative to internal funds flow, obviates the need for new equity, falling reserve margins improve equity returns, and then as AFUDC begins to grow again after 1987. But funding construction in the nineties requires new equity and flattens earnings and dividend growth, particularly when regulatory lag causes delays in converting AFUDC to return on rate base and expenses to revenue. During the eighties, AFUDC percentage of earnings falls to 25 percent, but rises to high levels in the late nineties because of the very high levels of construction work in progress relative to present assets.

For a brief time near 1990, market price per share equals book value per share (Figure 8). A reduction in interest rates, dividend growth, and a reduction in risk premium all act to stimulate market price. The reduction in risk occurs because, with the reduced construction, interest coverage improves dramatically (see Figure 9) and earnings quality improves (reduction in AFUDC percentage, Figure 7). But the improvement is short-lived. Once construction resumes, a downward capital-markets spiral causes financial performance to rapidly deteriorate: financing construction reduces interest coverage and earnings growth; as these fall the cost of additional financing increases; performance further deteriorates with the next round of financing. The spiral is broken only when performance falls to such a low level that baseload construction outlays must be limited. As a result, the utility in 2005 is using more than 'normal' peaking generation.

Finally, Figure 10 shows the capital structure of theutility and internal financing. During the late eighties, internal funds are sufficient to cover all construction expenditures. No new debt is issued except that needed to cover retirements. Extra growth in retained earnings reduces debt percentage of total capital. But once construction resumes, internal financing adequacy falls sharply, and debt percentage of capital once again increases.

IV. CAPITAL STRUCTURE AND FINANCIAL PERFORMANCE

To test the effects of changes in utility capital structure on financial performance, simulation experiments were performed in which the utility financed new requirements to achieve first more debt (70% of capital, versus 50% in Base Case), and then less debt (30% of capital).

EFFECT OF LEVERAGE WITH BASE CASE ASSUMPTIONS

Figures 11 through 15 show the effect of leverage on utility financial performance. Changes in leverage have the expected effect on interest coverage: less debt substantially improves coverage (it reaches the 6.0 range, off the plotting scale); more debt reduces coverage. Figure 12 shows that leverage has an unanticipated effect on earnings per share. Moving toward less debt initially lowers earnings per share as more shares are needed to finance construction and replace debt retirements. Over the longer term, however, because the changes in capital structure raise prices and reduce demand

Figure 7

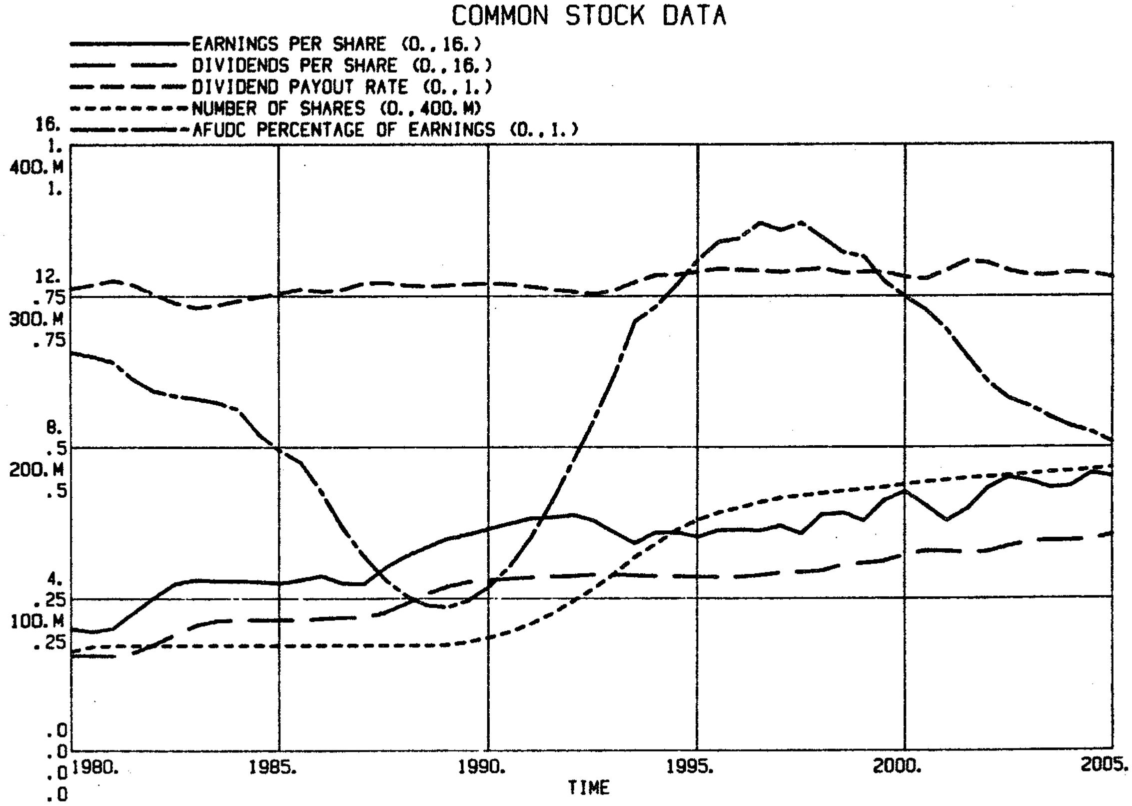


Figure 8

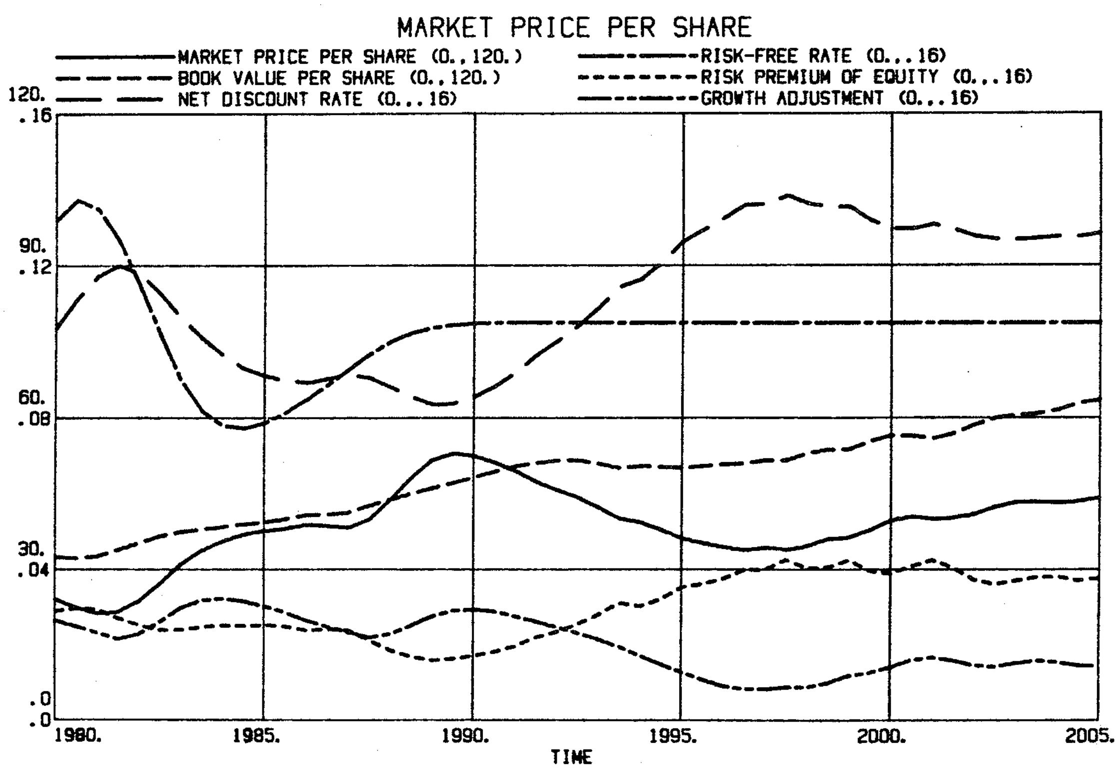


Figure 9

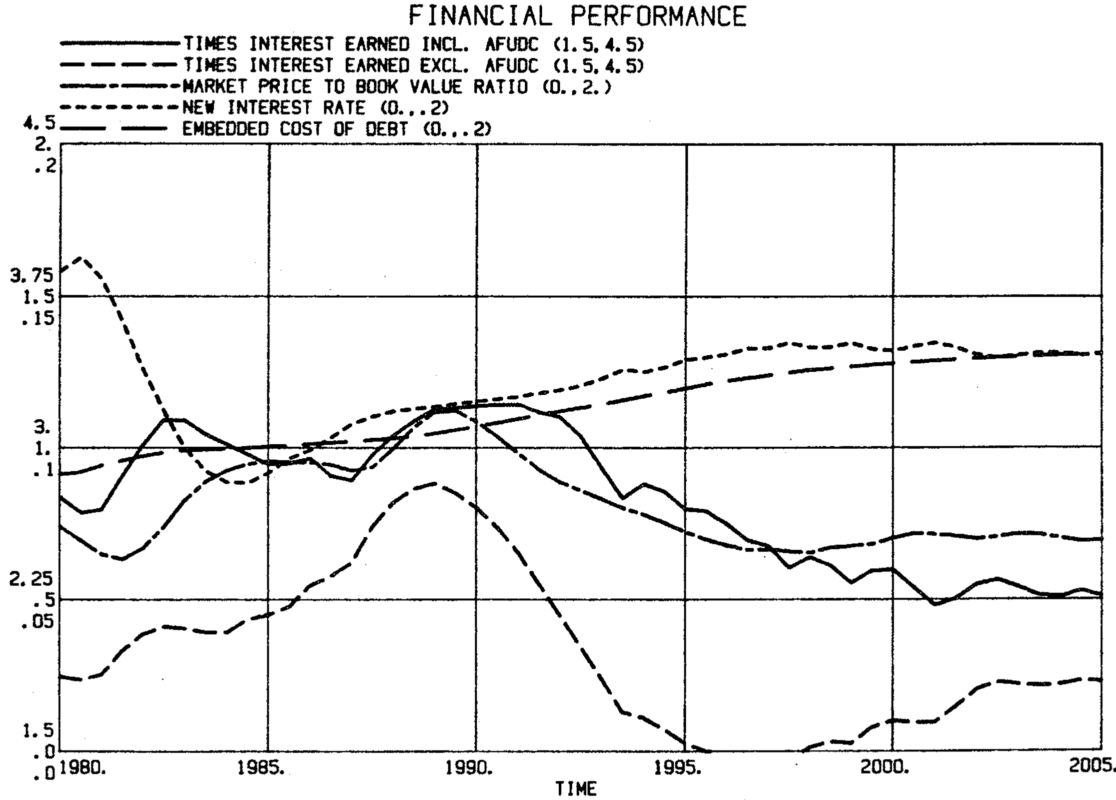


Figure 10

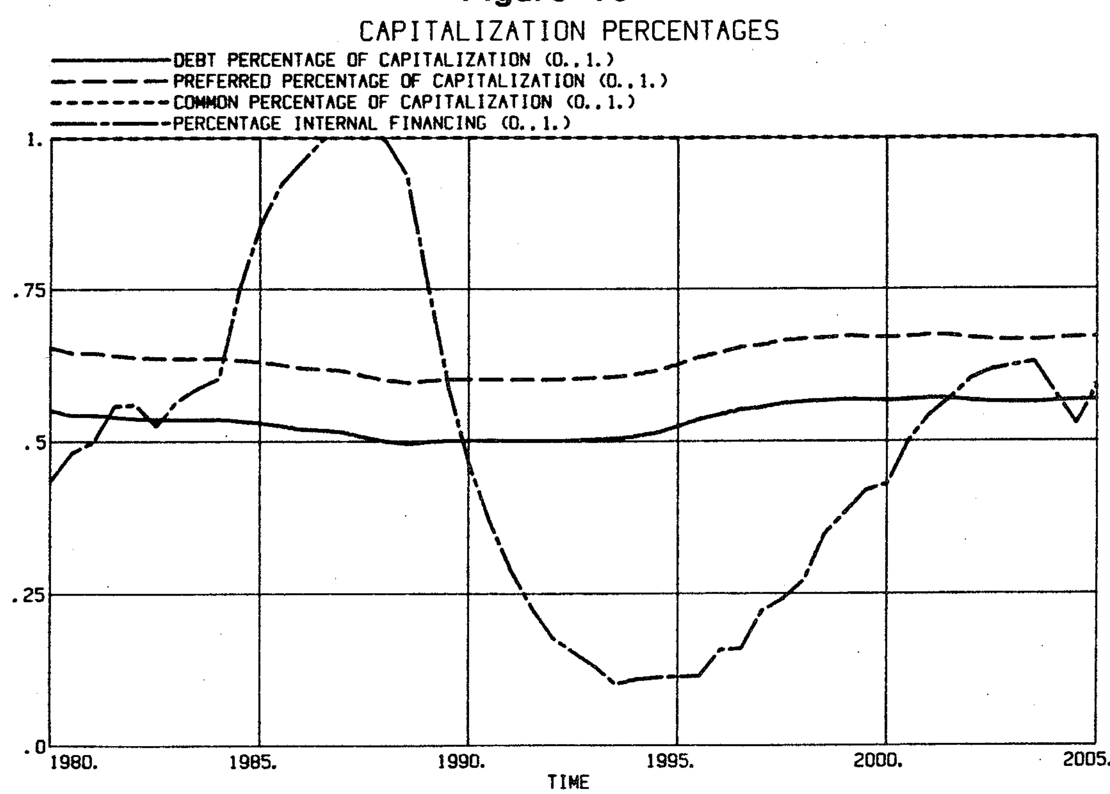


Figure 11
COMPARISON OF INTEREST COVERAGE -- BASE CASE

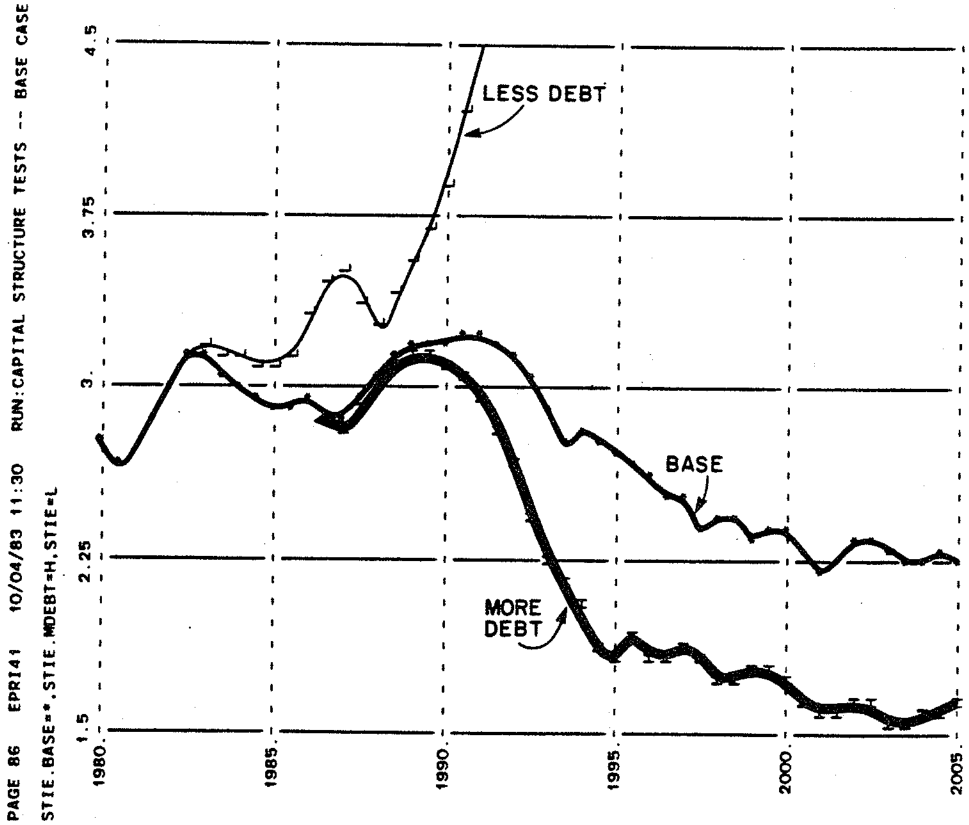


Figure 12
COMPARISON OF EARNINGS PER SHARE -- BASE CASE

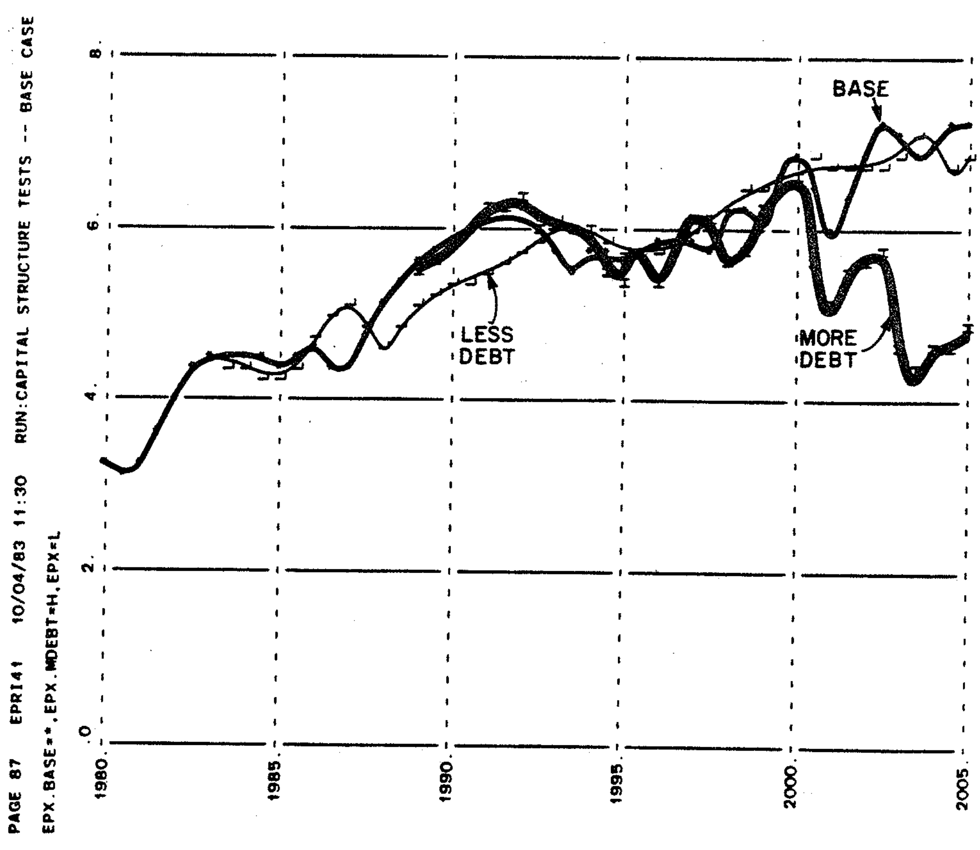


Figure 13
COMPARISON OF PRICE IN 1982 DOLLARS -- BASE CASE

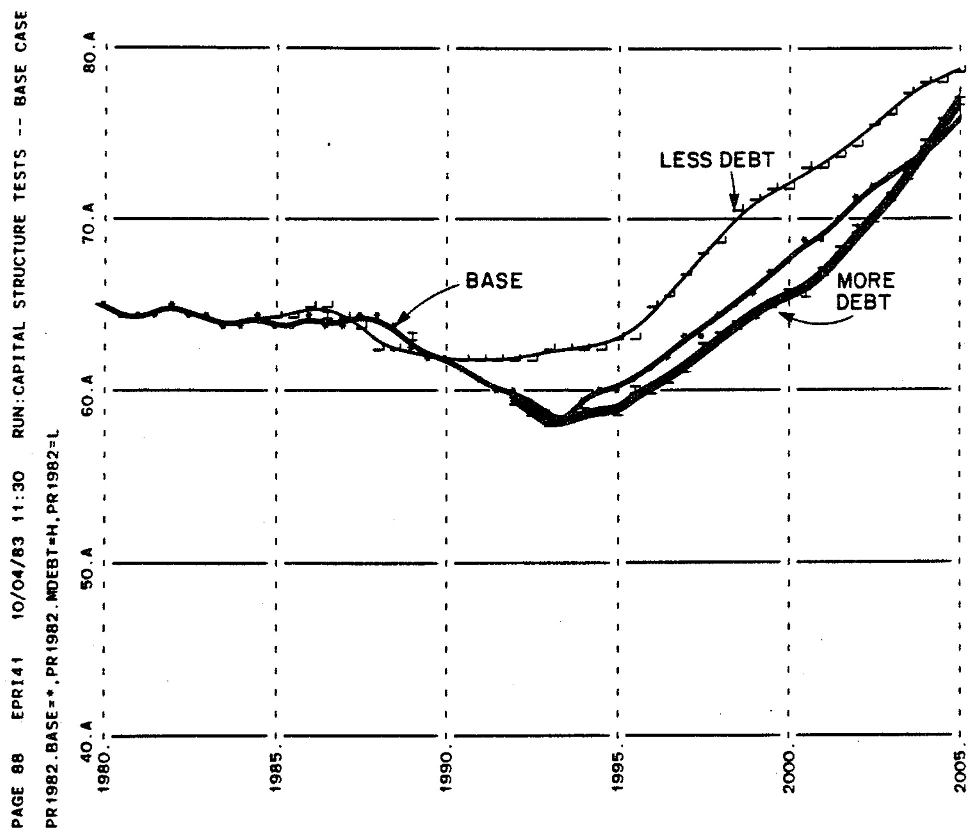
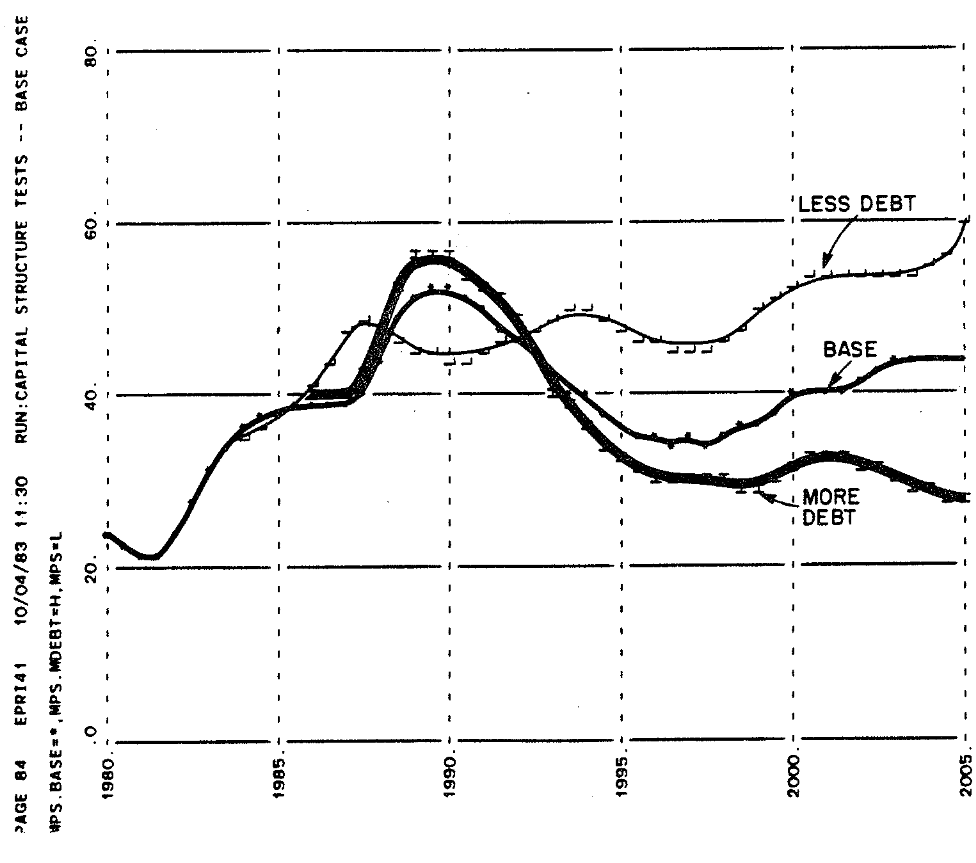


Figure 14
COMPARISON OF MARKET PRICE PER SHARE -- BASE CASE



growth (see Figure 13), the construction program is reduced below the levels required with higher debt percentages. As a result, fewer shares are needed, and earnings per share improves to equal or exceed the levels achieved with higher debt ratios. Because of this secondary effect (increase in prices and reduction in demand), the primary effect of more equity in the capital structure on earnings per share is reversed. Similarly, the primary effect of more debt is reversed over the long term. The higher the debt ratio, the lower prices, the higher demand, the more financing required, the lower earnings per share.

These changes in earnings per share produce more significant changes in market price per share (Figure 14) and market-price-to-book-value ratio (Figure 15) when another secondary effect is considered. Because of the changes in interest coverage, the risk premium of equity falls substantially as debt percentage of capital is reduced. Therefore, relatively similar earnings per share (and dividend per share) streams produce much different market price per share patterns. With more equity in the capital structure, market price per share increases. This increase, in turn, reduces the number of shares needed to finance future construction, thereby further mitigating the impact of greater equity percentages.

In conclusion, taking the effect of leverage on the cost of financing and on prices into account, financial performance of electric utilities, in the present environment, is improved by lower debt ratios. The secondary effects of reduced risk premium and increased prices/reduced demand more than compensate for the increased equity percentage of capital.

EFFECT OF LEVERAGE ASSUMING NO CAPITAL MARKET IMPACT

Conventional wisdom would hold that greater leverage increases earnings per share, yet in the analysis above the opposite occurs -- the greater the leverage, the lower earnings and market price per share. Conventional wisdom, however, is based on a model which makes two assumptions which do not hold in the Base Case: (1) changes in leverage have no impact on the cost of financing; and (2) changes in leverage have no impact on price. In the next sections, we see how including these assumptions changes the conclusions.

Figures 16 and 17 show the effect of leverage on utility financial performance if the effects of interest coverage on interest rate and stock price are "removed" by setting the risk premiums of debt and of equity to a constant equal to their 1982 value. In other words, the cost of debt and of equity are assumed not to change with changes in interest coverage.

In this experiment, interest coverage behaves in much the same way as with the capital market impact switched in (see Figure 11), increasing with less debt and decreasing with more. However, without the capital market impact earnings per share increases somewhat the greater the leverage (Figure 16) because the changes in interest coverage do not affect the cost of capital and hence market price per share (Figure 17). In the short-term, less debt reduces earnings per share slightly because a greater number of shares must be issued to finance the construction program and replace debt retirements. (Note that increasing the amount of debt in the capital structure has very little short-term effect on earnings per share. This occurs because, during

Figure 15
COMPARISON OF MARKET-PRICE-TO-BOOK VALUE RATIO -- BASE CASE

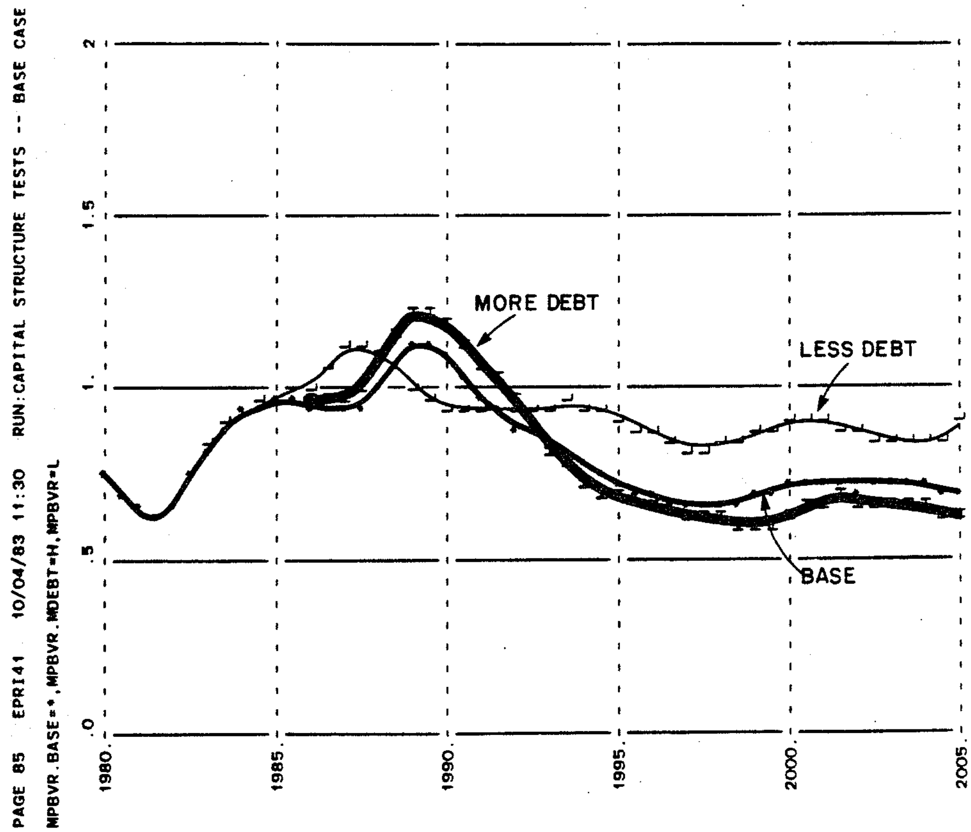


Figure 16
COMPARISON OF EARNINGS PER SHARE -- NO CAPITAL MARKET FEEDBACK

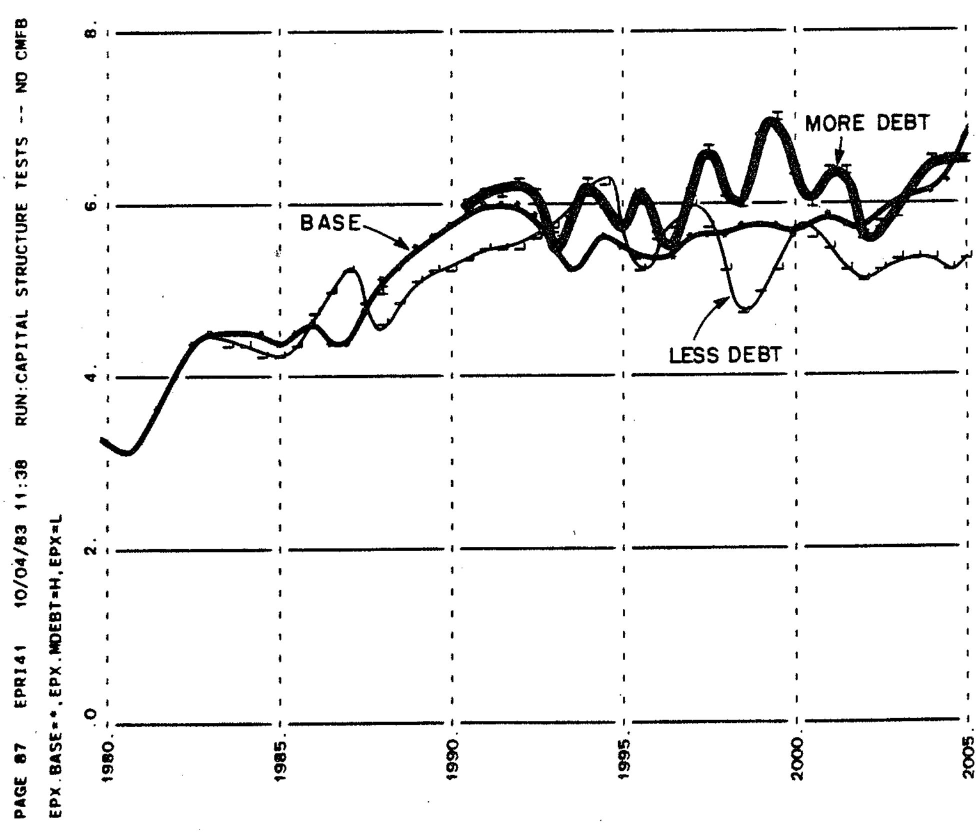


Figure 17

COMPARISON OF MARKET PRICE PER SHARE -- NO CAPITAL MARKET FEEDBACK

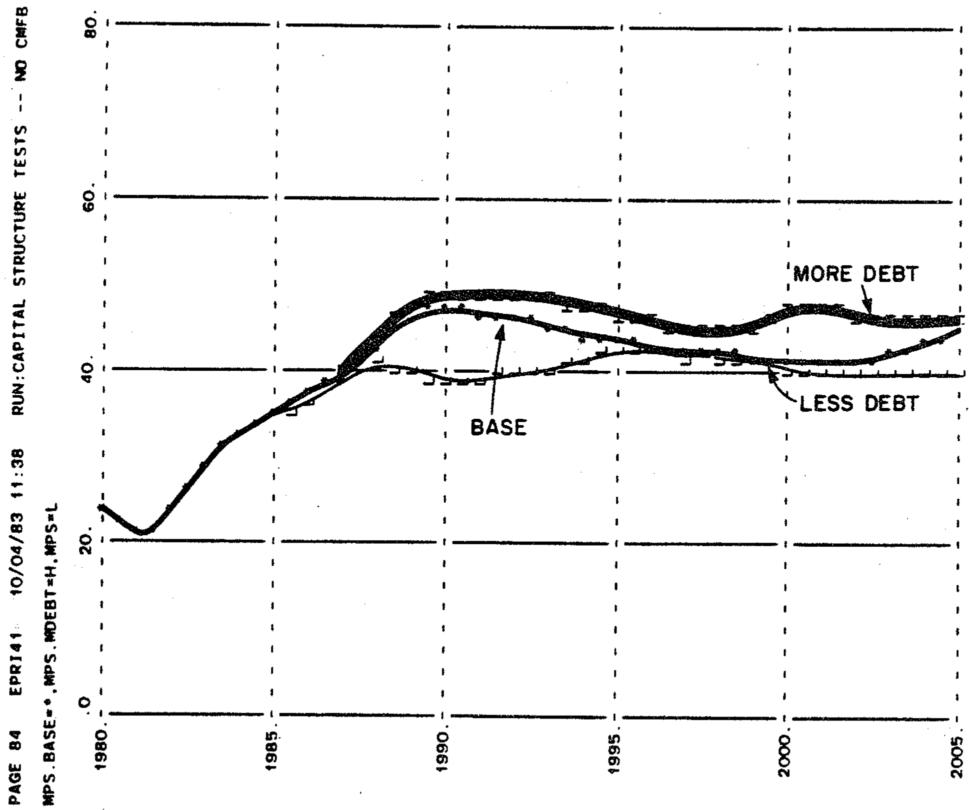
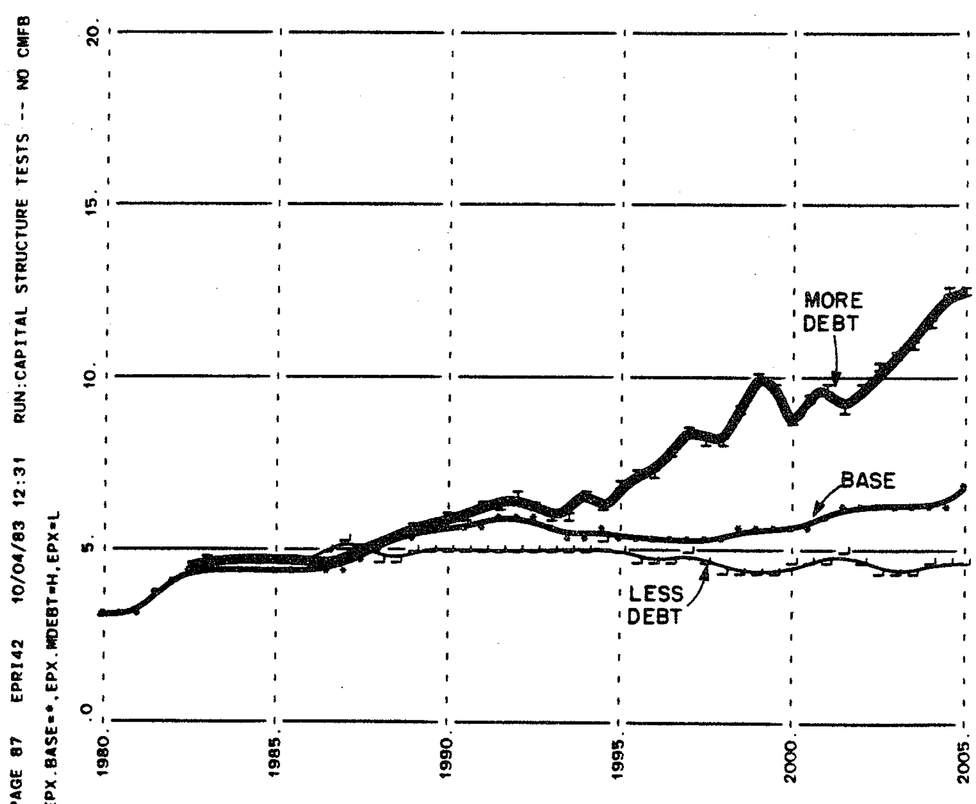


Figure 18

COMPARISON OF EARNINGS PER SHARE — NO CAPITAL MARKET FEEDBACK AND PRICES BASED ON ORIGINAL CAPITAL STRUCTURE



the period from 1983 to 1990, the utility is doing no external financing and therefore does not raise the debt percentage of capital until after 1990. The debt percentage is lowered, however, because new equity is used to replace debt as it retires.) In the longer term, the increase in price accompanying the movement toward less debt reduces demand which in turn reduces construction requirements (while the price reduction accompanying the movement toward more debt raises demand and construction requirements). But without the additional stimulus (or depressant) provided by changes in risk premium, market price per share is nearly the same at all debt ratios.

As a result, the changes in price, construction, and financing requirements are not enough to offset the greater equity requirements, such that earnings per share is slightly lower the greater the equity percentage of capital.

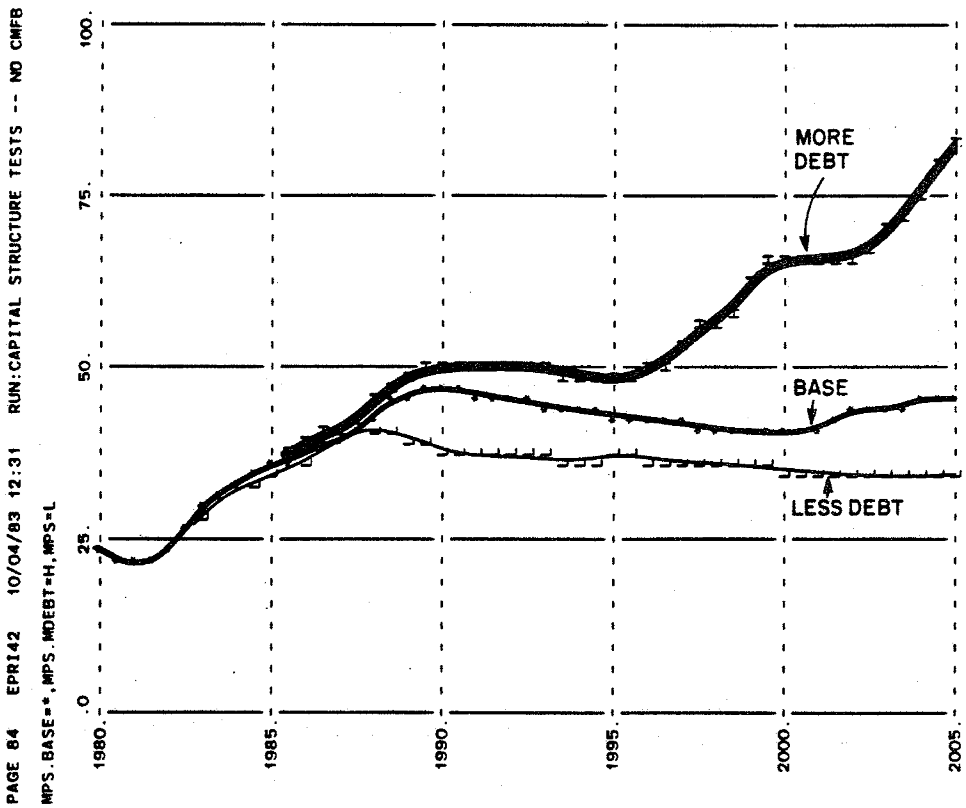
In conclusion, if one wants to assume that the degree of leverage has no effect on the cost of capital (here through changes in the risk premium associated with interest coverage), then changes in leverage have little impact on earnings or market price per share. The changes in price which accompany the changes in leverage cause demand, construction requirements, and number of shares issued to change in amounts which nearly compensate for the changed leverage ratios. It seems unreasonable to assume that changes in interest coverage have no impact on interest rates or stock price. Nevertheless, these simulation experiments show that should the effects of leverage on the cost of capital be less than those assumed here, the advantage to the utility of reducing the amount of debt would diminish.

EFFECT OF LEVERAGE ASSUMING NO CAPITAL MARKET IMPACT AND PRICES BASED ON ORIGINAL CAPITAL STRUCTURE

A final simplifying assumption in "textbook" leverage analysis is that prices are unaffected by the capital structure change. If we also make that assumption by assuming that regulators use the original capital structure to establish prices (50% debt, 40% common, 10% preferred), rather than the ratios in the more or less debt options, and that price changes have no impact on demand, the impact of leverage on financial performance is shown in Exhibits 18 and 19. With both capital market and price feedbacks removed, greater leverage does in fact produce improved earnings and market price per share. In the short term, less debt reduces earnings per share because a greater number of shares must be issued to finance the construction program. But whereas in the last two experiments prices increased, thereby reducing demand and construction requirements, that does not happen in this experiment. As a result, the utility must finance the same level of construction regardless of the capital structure. Therefore, less debt results in lower earnings per share, and more debt increases earnings per share. These differences then translate into corresponding differences in market price per share.

Figure 19

COMPARISON OF MARKET PRICE PER SHARE -- NO CAPITAL MARKET FEEDBACK AND PRICES BASED ON ORIGINAL CAPITAL STRUCTURE



V. CONCLUSIONS

The present environment and condition of electric utilities calls for a re-thinking of past strategies. One apparently attractive alternative for utilities would be to reduce the amount of debt in their capital structure, and thereby improve interest coverage, reduce risk, and increase earnings and market price per share.

Now is a particularly advantageous time for many utilities to effect such a change in strategy. As noted in the discussion of the Base Case simulation output (representative of many utility situations today), the cash flow of many utilities will improve dramatically over the course of the decade. With plentiful internal capital, stock prices will be improving as interest coverage improves and dividends are increased. Utilities should take advantage of the internally generated funds and improving stock price to replace debt with equity as it is retired, and perhaps to repurchase debt to speed the transition process. (Alternative strategies to take advantage of the so-called 'Window of Opportunity' are discussed in Geraghty and Lyneis, 1984b).

As conditions change, this strategy should be re-evaluated. In particular, should the regulatory environment improve, the need for less debt as a percentage of capital would diminish (because with improved profitablity, the risk of utilities is substantially less). Similarly, should a declining cost environment ever return profitability would improve and riskiness diminish.

REFERENCES

Brooks, David M. III and Malcolm C. Harris, "The Case for Higher Common Equity Ratios in Electric Utilities", _Public Utilities Fortnightly_, Sept. 2, 1982.

Dominic M. Geraghty and James M. Lyneis, "Feedback Loops: The Effect of External Agents on Utility Performance," _Public Utilities Fortnightly_, Sept. 2, 1982.

James M. Lyneis and Dominic M. Geraghty, "Regulatory Policy and the Performance of Electric Utilities," _Proceedings of the 1983 System Dynamics Research Conference_, Boston, MA, 1983.

James M. Lyneis, "Modeling and Valuation of Utility Investments," EPRI Report EA-3531, Electric Power Research Institute, 3412 Hillview Avenue, Palo Alto, CA 94304, May 1984a).

James M. Lyneis and Dominic M. Geraghty, "Electric Utility Strategies for the Eighties: Taking Advantage of a `Window of Opportunity'", (_Public Utilities Fortnightly_, May 24, 1984b).