ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION, EARNINGS, AND THE BEHAVIOR OF STOCK PRICES OF ELECTRIC UTILITY COMPANIES

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PREFACE

This study examines the association between alternative earnings measures related to the controversial allowance for funds used during construction and stock prices of electric utility companies. Three earnings measures are examined: (1) earnings as currently reported which includes allowance for funds, (2) earnings without allowance for funds, and (3) cash flow. The objective is to determine which earnings measure is most related to the information used by the market in setting stock prices. Information is defined as the observed revision in stock prices associated with the release of an earnings measure.

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CHAPTER I

THE RESEARCH PROBLEM

Introduction

Work in progress on a plant under construction presents a special problem for public utility regulatory commissions in setting utility rates. The problem is that a plant under construction produces no revenue during the period of construction, but does involve a real cost to the company. However, most regulatory commissions allow public utility companies to capitalize interest on funds used for plant construction during the construction period. This procedure has the effect of deferring the impact of capital costs on utility rates to the period of usage. The future impact will be greater because the rate base is higher by the amount of the capitalized interest.

The capitalization of such interest includes not only the cost of debt but also a reasonable cost for equity funds used. Since the identification of specific funds used to finance a particular piece of construction is difficult, most regulatory commissions allow a rate to be applied to an average amount of construction work in progress. The product of this rate multiplied by the construction work in progress base is conconsidered to be the cost of funds used during construction for a particular year. The journal entry to capitalize the interest is as follows:

Construction Work in Progress
Allowance for Funds Used During Construction.

The debit allows the cost of funds used for construction to be added to the plant's cost and the credit is shown as a one-line item of non-operating income. This credit not only offsets the interest expense incurred on borrowed funds, but also increases reported income.

Allowance for funds used during construction (allowance for funds) has become a significant item on the income statement of many utility companies because construction programs have increased as unprecedented levels. Pomerantz and Suelflow (1975) noted:

> The decade of the 1960's witnessed the beginning of unprecedented increases in demands for all types of public utility services. Increases were particularly high in the electric utility field, as evidenced by brownouts, blackouts, and voltage reductions in many areas where supply failed to meet immediate demands. As a result, utilities began extremely large construction programs extended in many cases over periods of five to ten years requiring vast amounts of both internal and external funding. In addition, environmental requirements and inflationary pressures have increased the burden of electric company constructions costs beyond any previous level (p. 1).

Fitzpatrick and Stitzel (1978) compiled statistics on electric utility companies showing that the average net income represented by allowance for funds increased from four percent in 1965 to 30 percent in 1975. These statistics are presented in Table I. Fitzpatrick and Stitzel explained that the drop in allowance for funds as a percent of net income in 1975 was due to deferrals of new construction and a small decline in interest rates. However, they expect no significant decline in the future importance of allowance for funds since there appears to be a continuing need for new plant facilities.

TABLE I

GROWTH IN THE IMPORTANCE OF ALLOWANCE FOR FUNDS
FOR INVESTOR-OWNED ELECTRIC UTILITIES

Year	Allowance for Funds as a Percent of Net Income
1965	3.6
1966	4.6
1967	6.4
1968	9.2
1969	12.8
1970	17.1
1971	21.1
1972	24.6
1973	28.5
1974	36.1
1975	30.3

Source: 1965-68 data, Federal Power Commission; 1969-75 data, Value Line.

Identification of the Problem

Disagreement exists over how the allowance for funds component of utility earnings should be interpreted by users of financial statements. The allowance for funds component did not command much attention until it became a significant item in the income statement of many companies. However, as the magnitude of the allowance has increased, so have the discussions surrounding it.

Proponents of capitalizing interest on construction regard allowance for funds as a valid component of utility earnings. Litke (1972) noted that the propriety of allowance for funds must be considered in the light of regulatory practices which limit the amount of prospective earnings

on the investments of utility stockholders. Since most regulatory commissions believe that consumers should pay a return only on those assets which are currently providing a useful service, construction work in process is generally not allowed in the rate base.[1] Unless a utility recognizes the cost of funds used during construction in the plant account, the capital (interest) costs are of doubtful recovery because rate making is not retroactive. The recording of allowance for funds defers capital costs along with the other construction costs to future periods which receive the benefits through a higher base for rate-making. Litke concluded that:

> . . . Income generated from the capitalization of the allowance for funds used during construction is valid income because it will become part of the assets of the utilities on which they will be entitled to earn a return and which will be recovered through depreciation expense in their cost of service over the service life of the property. Accordingly, the allowance capitalized represents a valid asset and the derivative income is equally as valid (p. 21).

Coughlan (1976) stated that allowance for funds represents a valid claim to future earnings even if only to the extent that it represents economic consideration for the use of capital. Frazer and Ranson (1972) described the practice of capitalizing interest on funds used during construction as as sound and necessary.

However, Coughlan (1976) noted that many knowledgeable authorities consider allowance for funds to be an accounting gimmick which is used to inflate earnings. The Value Line Investment Survey (1969) identified it

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[1] A few regulatory commissions allow construction work in progress to be included in the rate base and to calculate the allowance for funds. However, the allowance for funds is deducted from the allowed return which should have the same effect as excluding construction work in progress from the rate base. See Bolster (1971) and Johnson (1977) for a discussion of the method.

as an accounting method which provides a short-term solution to electric utilities facing lower earnings. The Survey summarized the resultant earnings as follows:

> . . . accounting steps such as those indicated above may be perfectly justified in the case of a utility whose politically appointed commissions are very sensitive to rate increases. Also it may be reasoned that these pressures on profits are short-lived and may disappear in a few years at which time more conservative accounting procedures may be adopted. It is apparent, however, that the quality of earnings resulting from any of the above techniques is not as high as would otherwise be the case. Such weakened profit cannot be expected to command as high a multiple as those derived from following more conservative accounting principles (p. 582).

Frazer and Ranson (1972) abstracted the following statements from publications of security analysts:

> Today's utility income accounts for the most part are full of what have come to be known as 'gimmicks' . . . one of the most serious of the gimmicks results from including a credit for interest charges in current earnings (p. 20).

> It is an accounting procedure unique to the utility industry which enables the company to earn a return on its investment while a project is under construction. Interest during construction is a bookkeeping entry that has no impact on cash flow or federal income taxes, but can account for a substantial portion of earnings (p. 21).

Other critics are concerned about the cash flow of public utility companies since a utility does not begin to recover the capitalized interest until after the plant is placed into service. The allowance for funds credit does not produce current funds to reinvest in the business, meet interest payments, or pay dividends. Olson (1971) noted that it appears logical that earnings which include a mere credit for allowance for funds would not be valued as highly by investors as cash flow earnings. Walker (1973) stated:

> Investors apparently do not value a dollar of earnings from the allowance for funds charged to construction as much as they do a dollar of earnings from operations for, in this sense, they view it as being of lesser quality than cash flow earnings (p. 5).

Companies have expressed their concerns along the following lines (Fitzpatrick and Stitzel, 1978):

> Large amounts of allowance for funds used during construction can be a sign of weak financial position because allowance for funds used during construction indicates the amount of nonrevenue-producing investment (p. 20).
>
> Use of allowance for funds affects the quality of earnings by reducing the proportion of cash in reported earnings (p. 20).

To summarize, controversy surrounds the allowance for funds component of utility earnings. Some authorities consider allowance for funds to be a valid component of earnings which represents a realistic recording of a factual situation. Other authorities question the validity of the component because they consider it an accounting gimmick which inflates earnings or are concerned about the cash flow aspects.

Objective of the Study

The objective of this study is to examine the association between alternative earnings measures and stock prices of electric public utility companies. This analysis will be done to determine which earnings measure the market perceives to be the most related to the information used in setting equilibrium stock prices. Information is defined as the observed revision in stock prices associated with the release of a particular earning measure. The emphasis is on earnings measures related to the controversial issue of allowance for funds used during construction. Three earning's measures are examined: (1) earnings as currently reported which includes allowance for funds, (2) earnings without allowance for funds, and (3) cash flow. The latter is examined because some critics have expressed concern about the cash flow of utilities which is affected by allowance for funds as well as other items.

The information content of the earnings measures will be evaluated to determine whether or not the market considers the economic consequences of allowance for funds. If the market considers the economic consequences, earnings which include the allowance should have the highest degree of association with stock prices. This is because allowance for funds represents a claim to future earnings which enables a utility to recover the cost of capital invested in a construction project.

The information content of the earnings measures will be assessed by using time-series residual methodology. The empirical support for this methodology and the research design is discussed in Chapter III.

Value of the Study and Limitations

An examination of the literature indicates that serious misunderstandings exist regarding the allowance for funds item appearing in the income statement. This study provides empirical evidence of how investors perceive the allowance for funds account by examining the relationship between allowance related earnings measures and stock price changes. The findings are important because if the financial community misuses financial statements, it could increase the costs of capital to the utility industry and handicap utilities in their efforts to obtain the necessary financing for construction programs. However, the purpose of this study is not to analyze this effect but rather to provide an insight into how investors view the allowance for funds account.

The study should contribute to a better understanding of the allowance concept in that the results will indicate whether or not investors view the practice of capitalizing allowance for funds to be a sound regulatory principle. If earnings which include allowance for funds

have the highest association with stock prices, it will indicate that the market considers the economic aspect underlying the accounting for allowance for funds. However, if earnings which do not include the allowance have a higher association with stock prices, it would indicate that the market perceives allowance for funds to be an invalid net income component. The latter finding would suggest that ratemakers should reevaluate their current practice because the market either considers allowance for funds to be an invalid component of earnings or is concerned about cash flow aspects. This does not imply that regulatory commissions should change their policy in regards to allowance for funds since policy making involves difficult issues of social choice that are beyond the scope of this study (Demski, 1974). However, the finding would provide evidence that the financial community does not consider the practice of capitalizing allowance for funds as sound.

The study is limited in that it does not seek to evaluate such issues as how the allowance rate should be established, the effect of alternative methods employed in accounting for allowance for funds, or financial statement reporting considerations. The study can only be interpreted with the limitations of the model (see pages 63-64) used to measure the association between alternative income numbers and stock prices in mind.

CHAPTER II

THE NATURE OF ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION

Introduction

In order to better understand the nature of allowance for funds, this chapter discusses its history and presents arguments for and against the concept. The financial reporting requirements associated with allowance for funds are also outlined.

History of Allowance for Funds

The practice of capitalizing interest on funds used for construction began with the railroads in the 1840's (Fitzpatrick and Stitzel, 1978). Electric utilities started using the procedure in 1909 when the regulatory commissions of New York and Wisconsin provided for the capitalization of interest paid on funds used to finance construction (Pomerantz and Suelflow, 1975). However, such capitalization was limited to debt obligations.

Capitalization of an allowance on equity funds did not receive recognition until 1914 when the Interstate Commerce Commission released its first Uniform System of Accounts for Steam Railroads (Litke, 1972). In 1920, the National Association of Railroads and Utilities Commissioners developed a uniform account classification for electric utilities which

contained the following reference to interest on construction (Hatch, 1952):[1]

> When any bonds, notes or other evidences of indebtedness are sold, or any interest-bearing debt is incurred for acquisition and construction of original road and equipment, extension, additions, and betterments, the interest accruing on the part of the debt representing the cost of property chargeable to road and equipment accounts (less interest, if any, allowed by depositaries on unexpended balances) after such funds become available for use and before the receipt or the completion or coming into service of the property so acquired shall be charged to this account.
>
> When such securities are sold at a premium the proportion of such premium assignable to the time between the date of the actual issuance of the securities and the time when the property acquired or the improvement made becomes available for service shall be credited to this account.
>
> This account shall also include such proportion of the discount and expense on funded debt issued for the acquisition of original road, original equipment, road extensions, additions and betterments as is equitably assignable to the period between the date of the actual issuance of securities and the time when the property acquired or the improvement made becomes available for the service for which it is intended. The proportion of discount and expense thus chargeable shall be determined by the ratio between the period to the completion or coming into service of the facilities or improvements acquired and the period of the entire life of the securities issued.
>
> This account shall also include reasonable charges for interest, during construction period before the property becomes available for services, on the carrier's own funds expended for construction purposes (pp. 320-321).

This system was the first to allow electric utilities to capitalize interest on both debt and equity funds used for construction. The Federal Power Commission adopted a similar position in its system of accounts in 1922. Subsequent systems of accounts have undergone considerable change, but the principle of capitalizing on allowance

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[1]The National Association of Railroads and Utility Commissioners is now known as the National Association of Regulatory Utility Commissioners.

for funds used during construction has remained unchanged (Hatch, 1952).

Arguments for Allowance of Funds

Valid Asset

Proponents of capitalizing interest on construction such as Frazer and Ranson (1972), Litke (1972), and Coughlan (1976) consider allowance for funds to be a real economic cost as are labor and material. In supporting this position, they compare two utility companies which need to acquire plants identical in all respects. One utility constructs its own plant and the other utility purchases the completed plant from an outside contractor. They conclude that the outside contractor would certainly include capital costs during construction in the sales price just as it would labor and material. Consequently, logic dictates that a utility which chooses to construct its own plant should likewise capitalize the cost of funds which relate to the construction project. It is illogical for the cost of a plant to differ depending on how the plant is acquired. In support of recognizing allowance for funds as a valid cost which should be recognized in financial statements, Coughlan (1970) stated:

> The practice of including a cost of money component as part of the cost of new facilities is neither new nor without obvious economic justification. It is recognized that the cost of new facilities is not only the direct cost of labor and material but includes all additional costs that would not have been incurred if the facilities were not built. The funds required to bring the facilities to the point where they are income producing have a cost which is measured in terms of interest on borrowed funds and in terms of foregone earnings on equity funds which could have been profitably invested elsewhere . . . (p. 36).

Regulatory Philosophy and Procedures

The propriety of allowance for funds is frequently defended in light of regulatory philosophy and procedures. Litke (1972) argues that since it is the general practice of most regulatory commissions to base rate schedules only on those assets which are currently providing a useful service, utility companies should be allowed to earn a return on a plant's costs during construction. This is because regulated industries, unlike nonregulated companies, are limited in the amount of future returns they can earn on their investment. Morris (1972) explained that while capital costs are real costs to nonregulated companies, it is not necessary for nonregulated companies to record these costs as part of the investment because of the possibility of large returns once a plant is placed into service. The returns are determined by supply and demand and what the market will bear. However, since regulated industries are limited as to return after the construction period, capital costs are as valid as any of the other construction costs which are capitalized. Bonbright (1961) added that capitalizing an allowance for funds is a satisfactory method for compensating a utility for its advance commitment of funds. The practice allows a utility to recover capital costs that would otherwise not be recovered in view of current regulatory practice.

Separation Argument

Another argument presented in favor of allowance for funds is that it separates current operating results from the effects on a construction program. From an accounting viewpoint, current operating results should not be impaired by construction activities. Furthermore, Frazer and Ranson (1972) asserted that earnings per share during construction should

be the same as it would have been without a construction program. They demonstrate through a numerical example that this will result if the allowance rate equals the capital costs. To illustrate the argument, assume the following facts:[2]

1. Companies A and B are identical except that A has no construction program but B has a construction program.

2. At the end of one year A purchases a plant identical to the completed constructed plant possessed by B.

3. Both companies began the year with the following capital structure:

Bonds - 8%	$27,500
Preferred stock - 8%	5,000
Common stock - $10 par	17,500

4. The new construction of $10,000 is financed at the beginning of the year as follows:

Bonds - 8%	$5,500
Preferred stock - 8%	1,000
Common stock - $10 par	3,500

5. The weighted cost of capital is:

	After tax cost	x weight =	cost component
Bonds	.04	.55	.022
Preferred stock	.08	.10	.008
Common stock	.143	.35	.050
			.080%

6. The allowance for fund rate is 8%.

7. The tax rate is 50%.

The results from Table II show that current operating results were not impaired by construction activity since Company B's earnings per share did not drop because of the construction. This result is achieved if a utility's allowance for funds rate is equal to its cost of capital.

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[2] This illustration is similar to the one used by Frazer and Ranson (1972) and Johnson (1976).

TABLE II

SEPARATION ARGUMENT FOR ALLOWANCE FOR FUNDS

	A	B
Revenues	$20,000	$20,000
Less operating expenses excluding taxes	$12,000	$12,000
Taxes (50%)	2,900*	2,680
Net income plus interest	$ 5,100	$ 5,320
Interest	2,200	2,640
Preferred dividends	400	480
Net income available to common stockholders before allowance for funds	$ 2,500	$ 2,200
Allowance for funds	0	800
Net income available to common stockholders	$ 2,500	$ 3,000
Number of shares	1,750	2,100
Earnings per share	$ 1.43	$ 1.43

*$20,000 - ($12,000 + $2,200) = $5,800 x 50% = $2,900

Matching Concept

In addition to the arguments of valid asset, regulatory philosophy and procedures, and separation, the matching concept associated with income determination is often used to defend the allowance for funds practice. Hendriksen (1977) describes the matching concept as follows:

> . . . the measurement of net income is assumed to represent the excess of revenues reported during a period over the expenses associated and reported during that same period. A proper matching is assumed to occur only when a reasonable association is found between revenues and expenses. The timing of expenses, therefore, requires (1) association with revenue, and (2) reporting in the same period as the related revenue is reported (p. 198).

Accordingly, Morris (1972) noted that proponents emphasize that the capitalization of an allowance for funds enables customer benefits to be matched with costs. That is, customers are billed for services which are related to the cost of a plant after it is placed into service.

Criticisms of Allowance for Funds

Accounting Philosophy and Practices

Some criticize the allowance for funds because it is the general practice of industrial companies, as distinguished from public utility companies, to consider interest as a period financing charge rather than a capitalizable cost. Welsch, Zlatkovich, and White (1976) indicate that historically, interest has been viewed as a cost of borrowing funds rather than part of the cost of the asset acquired with those funds. Consequently, they consider the capitalization of interest during construction to be theoretically unsound from an accounting point of view.

Others would exclude allowance for funds from the cost of a plant because regulated firms, although protected from competition, are subject to the same risks as nonregulated firms. Davidson (1952) states:

> Appropriate 'original cost', on the other hand has been overstated by the commission's inclusion of interest during construction and preoperating losses in its total. It must be recognized that utilities, though freed from the threat of competition in the sale of specific service, are subject to all the other risks and uncertainties that confront non-regulated firms. One of those risks is that a return on funds used during the construction period may not be earned and, indeed, part of the funds may be lost. As compensation for assumption of this risk, the utility should be permitted to earn a slightly higher rate of return during its operating life, if it is able to do so (p. 122).

Realization Concept

A further criticism of capitalizing an allowance for funds is that public utility companies capitalize not only the interest cost incurred on borrowed funds, but also impute interest on their own funds used for construction. Paton and Littleton (1940) held the view that it is inappropriate to impute interest on funds used for construction. They state:

> . . . the function of accounting is not the reporting of all data which influence market prices but the reporting of costs actually incurred by a single enterprise whether or not it is typical of the industry. . . inclusion of any element of return on capital in expense would tend to prevent disclosure of actual income or loss in the particular case and would thus be confusing to both managers and investors. The reward for the services represented by furnishing capital does not appear in effective form until validated by revenues in excess of applicable cost incurred (granting that contractual interest might temporarily be met from residual capital funds), and accruing this reward prior to such validation would constitute an extreme case of recognition of unrealized income. Very likely the peculiar service of the business enterprise in the long run is just as effective an influence in the economic process, just as definitely entitled to a niche in the price of the product, as are the acquired factors, the purchased goods and services. But this condition does not make it good accounting, from the point of view of the enterprise itself, to record as cost incurred any portion of the estimated amount of anticipated income (p. 35).

Accordingly, Morris (1971) points out that the practice of recording imputed interest seems to be in conflict with the realization concept because revenue is recognized prior to the asset entering the earnings process.

Manipulation of Earnings

Another criticism of allowance for funds is that the amount can be subject to manipulation by management (Morris, 1971). Some critics

contend that management can change the amount of allowance by changing the allowance rate or rate base to which it is applied. However, Morris noted that this criticism is not valid since allowance practices are subject to approval by regulatory commissions.

Noncomparability of Financial Statements

Some criticize the allowance for funds because the imputed interest rate used is frequently different from one utility to another. Kieso and Weygandt (1974) contend that these differences (including some public utility companies which do not capitalize interest) make financial statements noncomparable. Accordingly, they conclude that the practice of capitalizing an allowance for funds should be eliminated.

Quality of Earnings

A frequent criticism of allowance for funds is that earnings resulting from the allowance are not of the same quality as earnings from operations. This criticism results from the fact that the allowance credit can significantly increase earnings without a commensurate increase in cash inflows. In connection with this criticism, Pomerantz and Suelflow (1975) quote Truslo Hyde, an economist and public utility consultant, as follows:

> Investors can hardly be expected to give much value to earnings so heavily dependent on the credit for interest charged to construction which results from nothing more than an arbitrary credit and an assumption that the plant under construction will produce sufficient earnings to offset the decline in this credit when the plant is placed into service. This is a highly speculative and problematical assumption (p. 5).

There have been several empirical studies regarding this criticism. Benore (1975) surveyed investor attitudes and found that about four out

of five investors he contacted believed that allowance earnings are inferior to other earnings.

Fitzpatrick and Stitzel (1978) examined the influence of allowance for funds on various market to book value ratios. They hypothesized that allowance for funds accounting would tend to depress market to book valuations of electric utility stocks because the allowance represents a current noncash element of net income. To test their hypothesis, they constructed a series of multiple regression models for the years 1969 through 1975. Independent variables included such items as allowance for funds as a percent of net income, return on common equity, the square of the return on common equity, common dividends as a percent of cash flow, long-term debts as a percent of long-term capital, five year earnings per share growth, Moody's bond ratings, etc. Fitzpatrick and Stitzel concluded that allowance for funds as a percent of net income has a depressant impact on market-to-book valuations since the regression coefficients had negative signs. However, the results were statistically significant only for the 1972-75 period.

Burkhart and Viren (1978) conducted a study to determine which set of financial characteristics best explains observed market-to-book values of electric utility companies. One of the explanatory variables investigated was the magnitude of allowance for funds as a percent of net income available for common stockholders. They examined this variable because many analyses suggest that the magnitude of the relationship is very significant in investor valuation since it does not represent a current source of cash for the utility. Using a multiple regression model, explanatory variables were regressed on the dependent variable, market-to-book value. Market-to-book value was calculated as the average

high-and-low market price for 1976 divided by the year-end book value per share. Explanatory variables in addition to allowance for funds as a percent of net income available for common stockholders included book yield, earnings growth, bond rating, regulatory ranking, dividends coverage, stock exchange, equity ratio, and several dummy variables. Burkhart and Viren concluded that the fundamental determinants (in 1976) of electric utility companies' common stock prices were book yield, historical earnings growth, dividends coverage, stock exchange listing, regulatory ranking, and bond ranking. Their results were in conflict with the findings of Fitzpatrick and Stitzel's study because allowance for funds levels had no quantifiable impact on observed market-to-book ratios. This implies that in order to entice investors to invest in electric utility stock at prices above book value, it is not necessary to have earnings free of allowance for funds.

Financial Reporting Requirements

Federal Power Commission

Prior to 1971, the allowance for funds was referred to as "Interest charged to construction-credit" and appeared in the "Interest charges" section of the income statement. In 1971, the Federal Power Commission issued an order which changed both the account title and income statement classification. The account title was changed to "allowance for funds used during construction" and the account was moved to the "other income" section. It was believed that the latter account title would better depict the economic objective of the concept since "interest" is commonly only used to refer to contractual payments for borrowed funds (Litke, 1972).

In 1977, the Federal Power Commission issued another order which affected the allowance account. The order established two accounts, an "allowance for borrowed funds used during construction", and an "allowance for other funds used during construction". The order also changed the income statement presentation of the accounts. The allowance for "borrowed funds" is now shown as a deduction from interest expense while the allowance for "other funds" is now shown as a component of other income. The order was issued due to the lack of uniformity in determining equity and interest amounts (Electrical World, 1975). Uniformity was not of major concern prior to the mid-1960s since allowance for funds was relatively small. As the magnitude of the account significantly increased, so did the concerns.

Table III illustrates the income statement presentation of the allowance for funds credit prior to 1972, between 1972-76, and currently. The amounts are hypothetical including the $100 allowance for funds which is made up of $80 of interest on "borrowed funds" and $20 interest on "other funds". Notice that although the income statement classification of the allowance for funds accounts is different, the net effect of the credits is the same.

Securities and Exchange Commission

There were no Securities and Exchange Commission pronouncements directly related to the financial statement presentation of allowance for funds prior to 1977. However, subsequent to the Federal Power Commission's 1977 order which established two allowance accounts, the Securities and Exchange Commission (1977) issued a Staff Accounting Bulletin which affected the income statement presentation. The

TABLE III

PARTIAL INCOME STATEMENT ILLUSTRATION OF THE PRESENTATION OF THE ALLOWANCE FOR FUNDS CREDIT

	Before 1971	Between 1972-76	Currently
Net operating income	$1,000	$1,000	$1,000
Other Income and Deductions			
Other Income:			
Nonutility operating income	200	200	200
Interest and dividend income	300	300	300
Allowance for funds used during construction		100	
Allowance for other funds used during construction			20
Total Other Income	$ 500	$ 600	$ 520
Total Income	$1,500	$1,600	$1,520
Miscellaneous income deductions	700	700	700
Income before interest charges	$2,200	$2,300	$2,220
Interest charges:			
Interest on long-term debt	400	400	400
Amortization of debt discount, premium and expense	50	50	50
Other interest expense	200	200	200
Interest charged construction-cr.	(100)		
Allowance for borrowed funds used during construction			(80)
Total Interest Charges	$ 550	$ 650	$ 570
Income before extraordinary charges	$1,650	$1,650	$1,650

pronouncement required that the two allowance accounts be presented in the income statement for financial reporting in the manner prescribed by the Federal Power Commission. Thus, apparently, both commissions believe that only the "other funds" part of the allowance for funds constitutes valid income since the allowance for "borrowed funds" is offset by interest expense (Johnson, 1978).

Regulation by the Accounting Profession

There are no accounting pronouncements which specifically relate to allowance for funds.[3] Despite the absence of formal reporting requirements by the accounting profession, most utilities disclose the nature of allowance for funds and rate used to compute the allowance in a note to their financial statements. Examples of the footnote disclosures are presented in Table IV.

Summary

In this chapter, the nature of allowance for funds used during construction was discussed. First, the history of the concept was traced. Electric utilities began capitalizing interest on funds for construction in the early 1920s and the principle of capitalization has remained unchanged.

Second, a review of the literature in which the allowance concept has been criticized or defended was presented. Arguments discussed which support allowance for funds included valid asset, regulatory philosophy and procedures, separation, and matching. Criticisms of

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[3]However, the Financial Accounting Board has pending a standard on accounting for interest cost.

TABLE IV

EXAMPLES OF FOOTNOTE DISCLOSURES OF ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION

Example 1: Central Illinois Public Service Company

Utility plant is stated at original cost of construction and includes allowance for the cost of funds used during construction. The rate applied to major construction projects during 1975 and 1976 was 7%.

Example 2: The Cleveland Electric Illuminating Company

In accordance with the regulations of the FPC and PUCO, the Company capitalizes as part of the cost of property and plant an allowance for the interest and equity costs on funds required to finance construction work in progress and such amount is also recorded in the results of operations as other income. This allowance becomes part of construction work in progress in the balance sheet and when a construction project is placed in service, the allowance is included in the rate base (together with construction labor, material and overhead costs capitalized) on which the Company is entitled to earn a fair rate of return. This accounting treatment thus provides for the cash recovery of such costs through rates, which include depreciation charges of these capitalized amounts over the service life of the property and plant. The amount of the allowance depends principally on the size of the construction program, the length of the construction period and the cost of capital as reflected in the rate used in the computation of the allowance.

Example 3: Northern Indiana Public Service Company

The allowance for funds used during construction, an item of nonoperating income, is defined in the applicable regulatory system of accounts as the net cost for the period of construction of borrowed funds used for construction purposes and a reasonable rate upon other funds when so used. The allowance is capitalized at a rate based on the estimated cost of such funds used for construction. An allowance for funds rate of 8% (an after-tax rate) was used during the years 1975 and 1976 for gas and common construction. The 8% rate was applied to electric construction from January through September 1975. In October 1975, the Company changed its method of computing the interest component of the allowance for funds from the use of an after-tax rate of 8% to a pretax rate of 10% for its electric construction. The pretax rate of 10% was used during the entire year of 1976 for electric construction. The income effect of increasing the allowance for funds rate has been offset by a provision for deferred income taxes, so that the change had no effect on net income.

TABLE IV (Continued)

No separate rates have been identified as to cost of equity or debt funds specifically devoted to construction as this requires arbitrary cost allocations. However, if it is assumed that funds used to finance construction during the two years ended December 31, 1976 were generally supplied in the same proportion as the Company's average capitalization ratios during that period (55% for long-term debt, 12% for preferred and preference stock, and 33% for common stock equity), and also assuming the current cost of preferred and preference stock financing and the current cost of long-term debt (after reflecting the federal income tax effect except as applicable to electric construction commencing in October 1975), the common stock equity component of the allowance for funds used during construction as related to net income available for common stock amounted to 21.6% and 18.9% for the years 1975 and 1976, respectively (p. 5)

Source: The Public Utility Industry. New York: Price Waterhouse and Company, 1977, p. 5.

the allowance included accounting philosophy and practices, realization concept, manipulation of earnings, noncomparability of financial statements, and quality of earnings.

Third, the financial reporting requirements associated with allowance for funds were outlined. Other than the income statement classification specified by the Federal Power Commission and Securities and Exchange Commission, there are no formal financial statement reporting requirements. However, most utility companies disclose the nature of allowance for funds and rate used to compute the allowance in a note to their financial statements.

The following chapter will develop a research design and methodology to examine the association between alternative earnings measures related to the allowance and stock prices.

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

Sample Selection

The population of interest consists of all electric public utility companies listed on the New York Stock Exchange which meet the following criteria:

(1) The company's fiscal year ends on December 31.

(2) The company has an account balance in allowance for funds used for construction at the end of each year during the study period.

(3) Earnings data are available on the Compustat Utility tape for all years from 1958 through 1975.

(4) Monthly stock prices and dividend data are available on the Center for Research in Security Prices tape (CRSP) for all months during the period from January 1968 through April 1976.

Electric public utility companies for this period are being examined because allowance for funds used during construction was extremely important to these companies due to high levels of new construction. Statistics presented in Table I of Chapter I show that on the average net income represented by the allowance increased from nine percent in 1968 to 30 percent in 1975. Other utility companies, such as telephone and natural gas, were not as involved in new construction. To ensure that

all necessary information is publicly available, only New York Stock Exchange companies are considered.

The 80 electric public utility companies which met the selection criteria are presented in the Appendix.

Methodology

Background

Much of the literature on the association between accounting earnings and stock prices is based on developments in finance literature documenting the efficiency of capital markets. A considerable amount of theoretical and empirical analysis supports the semi-strong form of market efficiency which states that security prices reflect all publicly available information. The major implication of this hypothesis is that security prices will adjust rapidly in an unbiased manner to any relevant information and ignore all irrelevant data (Fama, 1970).

Fama, Fisher, Jensen and Roll (1969) conducted the first study of the semi-strong form of the efficient market hypothesis. They examined the behavior of stock prices surrounding the announcement of stock splits. Since stock splits are often associated with increased dividend payouts, they believed that the split announcement would contain some relevant economic information pertinent to assessing equilibrium stock prices.

To test for the effects of stock splits on security returns, Fama et al. (1969), using Sharpe's (1963) market model, regressed individual monthly stock returns on market returns over time. The market model assumes that the total return of a stock can be separated into two components: a general component which reflects the extent of common movement of a stock

with the average return of the market, and a specific component which reflects that part of the stock's return that is independent of the market. The model was used to abstract the effect of events which have economy-wide impact so that the effects of events which have an impact only on particular companies can be isolated and examined. The latter effects are called residuals and are viewed as deviations from a security's normal relationship with other securities in the market. The analysis of Fama et al. concentrated on examining the behavior of the regression residuals in months surrounding stock splits. They reasoned that if a stock split is associated with abnormal behavior in security returns, the behavior should be reflected in the regression residuals.

Fama et al. found that the average cumulative abnormal stock return for the 30 months prior to the month of the announcement was significantly above the normal rate of return. However, the average cumulative abnormal stock return which was increasing prior to the announcement, ceased to increase (or decrease) significantly in the periods following the stock split announcement. The behavior of the stock returns around the stock split announcement period was consistent with the semi-strong form of the efficient market hypothesis.

Information Content of Reported Earnings

One of the earliest and most widely quoted studies of information content was performed by Ball and Brown (1968). Ball and Brown's objective was to determine empirically the relative importance of the reported annual earnings number. They reasoned that an observed revision in stock

prices associated with the release of reported earnings would provide evidence that the information reflected in income numbers is useful.

To test for information content, Ball and Brown constructed two alternative models as measures of the market's expectation of income since they did not have access to such expectation data. One model used was a cross sectional linear regression model in which the change in a company's earnings is assumed to be consistent with its historical association with an aggregate market index. This model was based on a previous Ball and Brown (1967) finding that a substantial part of a company's earning variability is associated with the variability of the aggregate earnings of all companies. The other model used was a naive martingale model which assumes that the best estimate of the current period's income is the previous period's income number. Both models produced an estimate of the market's expectation of earnings. Earnings forecast errors were computed by comparing estimated earnings with actual earnings. Companies whose actual earnings exceeded expected earnings, defined as "good news", were placed in one portfolio and companies whose actual earnings numbers were less than expected, defined as "bad news", were placed in another portfolio. These portfolios were formed 12 months prior to the actual release of reported earnings to test whether foreknowledge of actual earnings would enable an investor to earn abnormal returns.

Ball and Brown used the market model developed by Sharpe (1963) to estimate monthly abnormal security returns for each of the portfolios for the 12 months prior to the release of reported earnings. An Abnormal Performance Index (API) was computed for each portfolio using the monthly abnormal security returns. The API measure reflected the

abnormal return associated with knowing the earnings figure in advance of the market. A composite (average) API was also computed for each earnings model.

Ball and Brown hypothesized that if the earnings announcement figure contained new information not yet impounded in stock prices, there would be an association between the sign of the forecast error and the sign of the abnormal return.

Ball and Brown concluded that reported annual earnings numbers do have information content, but most of the information contained in reported income (85 to 90 percent) is anticipated by the market price prior to the release of the actual earnings numbers.[1] Gathering information in anticipation of the earnings announcement and adjusting stock prices accordingly is consistent with a semi-strong efficient market. The API did not display any significant behavior in the months following the earnings announcement. This indicated that the earnings information is quickly impounded in stock prices in an unbiased manner which is consistent with the semi-strong form of the efficient market hypothesis.

Gonedes (1974) replicated the Ball and Brown study using a variety of financial ratios and the earnings per share (EPS) number to compute surrogates for market expectations of company performance. He found that the EPS variable had more information content than any of the variables he tested.

Brown and Kennelly (1972) examined the information content of quarterly earnings to ascertain whether quarterly earnings were in the

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[1]Alternative sources of other information include industry production statistics, security analysts' forecasts, trade journals, etc.

information set used by investors. They used the Ball and Brown methodology to determine if advance knowledge of quarterly earnings would allow investors to earn superior returns. They reasoned that "if the disaggregation of annual EPS into quarterly EPS adds information, it should reduce errors in classification for shorter periods." Their findings indicated that advance knowledge of quarterly earnings enabled investors to earn superior returns compared to those investors who only had advance knowledge of annual earnings.

Ball and Brown's (1967) research as well as the other related studies discussed above are relevant to this study in that they provide evidence that reported earnings have information content. Accounting earnings have been shown to play an important role in investor expectations about the future performance of the firm in that prior knowledge would enable investors to earn superior returns.

Information Content of Alternative Earnings Measures

Beaver and Dukes (1972), in a study which focused on the issue of interperiod tax allocation, examined the association between stock prices and three competing definitions of accounting earnings. The three competing definitions of earnings were: reported earnings (earnings with deferral), flow through earnings (earnings without deferral), and cash flow earnings. Their objective was to assess whether earnings with deferral would yield lower abnormal returns because they involve more allocation and are further from actual cash flows than earnings without deferral. This result would imply that the information set impounded in stock prices is broader than reported earnings. The

association metric used to test for information content was a variant of the API introduced by Ball and Brown (1968). Beaver and Dukes concluded that earnings with deferral appeared to be most consistent (exhibited the highest association) with the information in stock prices. Earnings without deferral and cash flow were less consistent, respectively.

Since the above findings were inconsistent with their expectations, Beaver and Dukes (1973) undertook a second study in an attempt to explain results that they felt were anomalous. In the second study, they treated the difference between tax expense and taxes payable as a form of depreciation rather than as a deferred charge or credit. Alternatively stated, they viewed the tax allocation issue as one of accelerated depreciation rather than of determining a deferred tax liability account. Consequently, their sample consisted of companies which used an accelerated method for tax purposes but a straight-line method for annual report purposes. Beaver and Dukes found that an earnings measure based on a depreciation charge somewhat greater than straight-line tended to display the highest association with stock prices. This result provides evidence that the market does not react to reported earnings naively, but looks beyond reported earnings and considers the economic effects in setting stock prices. Foster (1975) found similar results concerning the market's reaction to alternative earnings measures of insurance companies.

Since past research has shown that time-series residual methodology is effective is assessing the relative importance of earnings measures, it will be used in this research to determine which alternative earnings measure of electric public utilities is most associated with the information used in setting stock prices. This methodology requires estimates of (1) abnormal security returns and (2) unexpected earnings changes.

Measurement of Abnormal Security Returns

The market model of Sharpe (1963) is used to estimate abnormal (unexpected) security returns of individual securities. The model is a description of the stochastic process generating security returns. The following version of the model is used:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

$$E(\varepsilon_{it}) = 0$$

$$\sigma(R_{mt}, \varepsilon_{it}) = 0$$

$$\sigma(\varepsilon_{it}, \varepsilon_{jt}) = 0, \text{ for all } i \neq j$$

where:

R_{it} = the return on security i in period t,

R_{mt} = the general market factor in period t,

ε_{it} = the stochastic portion of the individualistic factor representing the part of security i's return which is independent of R_{mt},

α_i, β_i = the intercept and slope of the linear relationship between R_{it} and R_{mt}.

The model asserts that the expected return on a security is conditional upon the ex post value of the market factor. If the ex post return on a security differs from this conditional expectation, the residual reflects the abnormal portion of ex post return on the security.

Operationally, R_{it} and R_{mt} are calculated as follows:

$$R_{it} = \frac{D_{it} + P_{it}}{P_{it-1}} \tag{2a}$$

$$R_{mt} = \frac{C_t}{C_{t-1}} \tag{2b}$$

where:

D_{it} = the cash dividends paid per share of firm i in month t,

P_{it} = the closing price per share of firm i at end of month t,

P_{it-1} = the closing price per share of firm i at the end of month t-1,

C_t = the closing value of the CRSP index adjusted for dividends at the end of month t,

C_{t-1} = the closing value of the CRSP index adjusted for dividends at the end of month t-1,

R_{it} = the monthly price relative of security i in period t,

R_{mt} = the monthly price relative for all New York Stock Exchange firms in period t.

R_{it} and R_{mt} are obtained from the CRSP tape which contains monthly data for all New York Stock Exchange companies. Ordinary least squares regression is performed on realizations of R_{it} and R_{mt} to obtain estimates of α_i, β_i, and ε_i. The estimated coefficients are used to form predictions of R_{it} during the forecast period where the expected return on security i over period t is defined as:

$$E(R_{it}) = \alpha_i + \beta_i \, E(R_{mt}) \tag{3a}$$

and the abnormal return as:

$$E_{it} = R_{it} - [\alpha_i + \beta_i \, R_{mt}] \tag{3b}$$

Table V summarizes the ordinary least squares regression estimates of equation (1) over the 100 months from January, 1968 through April, 1976. The beta coefficients are less than one which indicates that the systematic risk of utilities included in the sample is less than the

overall market. This implies that utility stocks are likely to have price changes that are less than the market.

TABLE V

DECILES OF THE DISTRIBUTION FOR STOCK RETURN REGRESSIONS

Decile	α	β	R^2
.1	-.0026	.5730	.2118
.2	-.0010	.6230	.2499
.3	.0001	.6603	.2703
.4	.0007	.6962	.2894
.5	.0013	.7365	.3037
.6	.0018	.7860	.3224
.7	.0025	.8258	.3422
.8	.0031	.8848	.3701
.9	.0042	.9635	.4080

Note: Estimated over the 100 months, January, 1968 through April, 1976.

The distribution of values for the square correlation coefficient (R^2) corresponds to those values reported by Ball and Brown (1968).

Measurement of Unexpected Earnings Changes

Three earnings measures are examined in this study: (1) earnings available to common stockholders as currently reported which is called allowance earnings, (2) earnings available to common stockholders before the allowance for funds credit which is called nonallowance earnings, and (3) cash flow. Cash flow is computed by adding depreciation and deferred taxes to nonallowance earnings. Since the market's expectation regarding

these earnings cannot be observed, a prediction model must be employed to provide the expectations. Expected earnings changes for each alternative are estimated using the following market model form:

$$\Delta E_{it} = \alpha_i + \beta_i \ \Delta E_{mt} + \mu_{it} \tag{4}$$

$$E(\mu_{it}) = 0$$

$$E(\Delta E_{mt}, \mu_{it}) = 0$$

$$E(\mu_{it}, \mu_{ij}) = 0, \text{ for all } i \neq j$$

where:

ΔE_{it} = the change in the earnings variable of firm i from period t-1 to t,

ΔE_{mt} = the change in the average earnings variable of all firms other than firm i in the sample from period t-1 to t (general market factor),

μ_{it} = the part of security i's return which is independent of ΔE_{mt} (individualistic factor),

α, β_i = the intercept and slope of the linear relationship between ΔE_{it} and E_{mt}.

The ΔE_{it} and E_{mt} are obtained from the Compustat Utility tape which contains annual earnings data for all New York Stock Exchange companies. Assessments of α_i and β_i are obtained from a time series ordinary least squares regression of each firm's change in earnings on the average change in earnings of the other firms in the sample using data for years 1958 through year t-1 in all cases. The expected income change for firm i in year t is defined as:

$$\Delta E_{it} = \alpha_i + \beta_i \ \Delta E_{mt} \tag{5a}$$

and the expected earnings are:

$$\mu_{it} = \Delta E_{it} - [\alpha_i + \beta_i \Delta E_{mt}]. \quad (5b)$$

Earnings data for 1958 through year t-1 are used in estimating (4). Since the study is limited to the eight fiscal years 1968-1975, an average of 13 observations is assured when estimating the income regression equations. The distribution of squared coefficients of correlation (R^2) between the changes in the earnings of individual utilities and the changes in the market's earnings index for each variable are summarized in Table VI. For each earnings variable, approximately one-fifth of the variability in the changes in the median utility's earnings can be associated with changes in the market index. These results are slightly less than the R^2 reported by Ball and Brown (1968).

TABLE VI

DECILES OF THE DISTRIBUTION OF SQUARED COEFFICIENTS OF CORRELATION FOR EARNINGS CHANGE REGRESSIONS

Decile	Allowance Earnings	Nonallowance Earnings	Cash Flow
.1	.01	.00	.01
.2	.04	.02	.02
.3	.08	.06	.05
.4	.13	.11	.10
.5	.19	.18	.15
.6	.24	.25	.22
.7	.33	.35	.30
.8	.41	.48	.42
.9	.56	.63	.55

Ball and Brown (1967) referred to the existence of autocorrelation in the residuals when levels of net income were regressed on the market index. This study uses first differences rather than levels in analyzing the stock market's reaction to earnings measures. However, as a check, the extent of autocorrelation in the residuals was tested. Table VII summarizes the distribution of first order serial correlation coefficients (ρs) and Durbin-Watson (D-W) statistics. Durbin and Watson's (1951) critical region for one independent variable and 13 observations (the average number of observations used in estimating the income regression equations) at a significance level of .05 is $d_u = .97$. If the Durbin-Watson statistic (D-W) is greater than d_u and less than $4-d_u$, the hypothesis of no significant autocorrelation is accepted. The results indicate no significant autocorrelation.

TABLE VII

DECILES OF THE DISTRIBUTION OF AUTOCORRELATION STATISTICS IN THE EARNINGS CHANGE REGRESSIONS RESIDUALS

Decile	Allowance Earnings		Nonallowance Earnings		Cash Flow	
	ρ_s	D-W	ρ_s	D-W	ρ_s	D-W
.1	-.47	1.12	-.50	1.30	-.46	1.28
.2	-.33	1.39	-.36	1.50	-.32	1.53
.3	-.26	1.56	-.26	1.68	-.28	1.72
.4	-.18	1.76	-.18	1.80	-.21	1.87
.5	-.12	1.93	-.11	1.93	-.13	2.05
.6	-.03	2.06	-.02	2.08	-.06	2.17
.7	.07	2.23	.07	2.22	.02	2.34
.8	.20	2.41	.13	2.40	.14	2.51
.9	.33	2.64	.26	2.69	.30	2.72

Abnormal Performance Index

The signs of the unexpected earnings changes from (5b) are used to form two portfolios for each earnings alternative. Companies whose actual earnings change exceeds the expected earnings change (positive forecast error) are included in one portfolio and companies whose actual earnings change were less than expected (negative forecast error) are included in another portfolio. The unexpected security price changes from (3b) for the above portfolios are aggregated using the model developed by Ball and Brown (1968).

$$API_T = \frac{1}{N} \sum_{i=1}^{N} \prod_{t=1}^{T} (1 + \varepsilon_{it}) \tag{6}$$

where:

API_T = the Abnormal Performance Index after T-month holding period; t=1, 2, ..., T,

N = number of securities; i=1, 2, ..., N,

ε_{it} = the return on security i for month t (forecast error).

A composite index (average) is then computed for each earnings alternative in the following manner:

$$API = \frac{N(+) \cdot API(+) - N(-) \cdot API(-)}{N(+) + N(-)} \tag{7}$$

where:

N(+) = number of securities with positive forecast errors,

N(-) = number of securities with negative forecast errors.

The API is used to test whether foreknowledge of the actual earnings measure would enable an investor to earn abnormal returns. It is used to measure the return from an unusual investment strategy because portfolios are formed 12 months prior to the actual release of an

earnings measure. The information received by the investor is a forecast of whether a company's earnings measure will increase or decrease. The investor then adopts a long position in the company's stock if the earnings change forecast is positive or a short position if the earnings change forecast is negative. The API assumes a dollar is invested in equal amounts in each security in each portfolio from t up to time T. At time T the earnings numbers are assumed to be made public.

In computing the API for any 12-month holding period, estimates of the monthly unexpected security price change from (1) must be obtained. The API is constructed to investigate strategies where the expected value of the residuals may be nonzero. However, the ordinary least square regression technique used to estimate the residuals assumes that the expected value is zero. Inclusion of observations for which this assumption is violated reduces the validity of the estimation procedure. To circumvent this problem, a separate regression is run for each 12-month holding period with the 12 months prior to the relevant earnings announcement deleted in each regression. Earnings announcements are assumed to be issued in the third month following the end of the calendar year. Prior research indicates that approximately 90 percent of all firms release their annual earnings by that date (Beaver and Dukes, 1973).

It is hypothesized that if the market considers the economic aspects underlying allowance for funds, allowance earnings will have the highest API association with stock prices. This is because allowance earnings better depict the economic aspect since allowance for funds will add to the rate base after construction is completed, enabling a utility to recover the cost of capital invested in a construction project. If

allowance earnings have the highest API associated with stock prices, this finding would indicate that the market perceives allowance earnings as most consistent with the information used in setting stock prices. Evidence inconsistent with the above would suggest that the arguments used to justify allowance for funds are invalid.

The Chi Square test is employed to test for significance of the difference generated by the comparisons since previous research (Fama et al., 1969) indicates that a nonparametric test is appropriate because of the violation of the normality of the ε's from (1). Conover (1971) fully describes the properties of the test. This test draws attention to the frequencies with which positive abnormal rates of return are assigned to the positive earnings portfolio and negative abnormal rates of return are assigned to the negative earnings portfolio. The null hypothesis is stated as follows:

H_0: There is no association between the sign of the earnings forecast error and the sign of the abnormal rate of return.

H_1: There is association between the sign of the earnings forecast error and the sign of the abnormal rate of return.

The API is also computed for the 6-month period subsequent to the release of the earnings numbers. Prior research (Beaver and Dukes, 1973; Foster, 1975) has found that once earnings are publicly announced, there is little difference between the stock price behavior of companies with positive earnings changes and companies with negative earnings changes. This finding is consistent with a semi-strong efficient market in which new information is rapidly and unbiasedly impounded into stock prices. Consequently, if the market is efficient, the abnormal stock returns observed after the release of the earnings numbers should be relatively small for all earnings measures.

Summary

This chapter outlined the sample selection criteria. Eighty electric public utility companies met the selection criteria.

The empirical support for expecting an association between accounting earnings and stock prices was discussed. These studies which used time-series residual methodology provide evidence that accounting earnings have information content. Information was defined as the observed revision in stock prices associated with the release of a particular earnings measure. The measure which produced earnings numbers having the highest degree of association with stock prices was considered to be the most consistent with information used in setting prices.

Since past research has shown that time-series residual methodology is effective in assessing the relative importance of earnings measures, it is used in this study to determine which alternative earnings measures of electric public utilities is most associated with the information used in setting stock prices. Three earnings measures are examined: earnings as currently reported which includes allowance for funds (allowance earnings), earnings without allowance for funds (nonallowance earnings) and cash flow.

Time-series residual methodology requires estimates of (1) abnormal security returns and (2) unexpected earnings changes. A form of the market model is employed to provide these estimates. Utilities whose actual earnings changes exceeded expected earnings (positive forecast errors) are placed in a positive portfolio and utilities whose actual earnings changes were less than expected (negative forecast errors) are placed in a negative portfolio. Abnormal monthly stock price changes

are calculated for each of the portfolios for the 12 months prior to the announcement of earnings. An Abnormal Performance Index (API) is computed for each portfolio using the monthly abnormal returns. The API measure reflects the abnormal return associated with knowing the earnings number in advance of the market.

It is hypothesized that if the market considers the future economic consequences of allowance for funds, allowance earnings will have the highest API associated with stock prices. This is because allowance earnings better reflect the earnings potential of a utility since the allowance represents a claim to future earnings which enables a utility to recover the financing costs associated with a construction project.

The Chi Square test is employed to determine if the association between earnings and stock prices are statistically significant. This test draws attention to the frequencies with which positive abnormal returns are assigned to the positive earnings portfolios and negative abnormal returns are assigned to negative earnings portfolios.

The API is also computed for the 6-month period subsequent to the release of the earnings numbers. If the market is efficient, the abnormal stock returns observed after the release of earnings numbers should be relatively insignificant.

CHAPTER IV

RESULTS OF THE ANALYSIS

Introduction

This chapter presents Abnormal Performance Index (API) statistics for each earnings measure for the 12-month holding period. Since there are many common elements in the computation of the earnings measures, an analysis is made of those times in which the signs of the forecast errors differed. Finally, post forecast API performances are examined.

API Statistics for the 12-Month Holding Period

Table VIII presents composite APIs for each earnings measure. The composite API assumes an investment strategy of buying long the positive earnings change utilities and selling short the negative change utilities. The results are summarized by month relative to the earnings announcement date with the month of the earnings announcement set at month T=0. Although API measures are presented at monthly intervals, the APIs are cumulative, beginning with month T=-11.

Table VIII shows that for the years 1968-75, foreknowledge of the years' earnings sign 12 months prior to the earnings announcement results in an abnormal return of 3.0 percent for allowance earnings, 2.2 percent

TABLE VIII

API MEASURES FOR COMPOSITE EARNINGS PORTFOLIOS BY MONTH RELATIVE TO EARNINGS ANNOUNCEMENT DATE

Month T	Allowance	Nonallowance	Cash Flow
-11	1.002	1.001	1.004
-10	1.005	1.001	1.006
- 9	1.004	1.000	1.006
- 8	1.001	1.001	1.011
- 7	1.015	1.013	1.012
- 6	1.014	1.011	1.012
- 5	1.020	1.016	1.020
- 4	1.026	1.019	1.023
- 3	1.026	1.018	1.019
- 2	1.027	1.017	1.012
- 1	1.028	1.021	1.017
0	1.030	1.022	1.020
+ 1	1.030	1.024	1.023
+ 2	1.034	1.027	1.026
+ 3	1.037	1.028	1.025
+ 4	1.037	1.027	1.019
+ 5	1.035	1.028	1.022
+ 6	1.037	1.028	1.023

for nonallowance earnings, and 2.0 percent for cash flow.[1] This indicates that allowance earnings have the highest degree of association with stock price changes, followed by nonallowance earnings, and then by cash flow.

An analysis of the APIs also shows that most of the information contained in each annual earnings measure appears to be anticipated by the market before announcement. The market begins to anticipate earnings forecast errors as early as month T=-11 and continues to do so with increasing success throughout the year. The expectation is so accurate that the actual earnings number does not appear to cause any unusual movement in the APIs at month T=0. This is consistent with a semi-strong efficient market in which the market gathers information and adjusts stock prices accordingly in anticipation of the earnings announcement.

To evaluate the cross-sectional aggregation effect of the data, a Chi Square test was conducted, the results of which are presented in Table IX. The frequencies with which the forecasting method assigned utilities with positive abnormal returns to the positive error portfolio and utilities with negative abnormal returns to the negative error portfolio are compared in two-by-two contingency tables. The Chi Square statistic tests the null hypothesis that there is no association between the sign of the earnings forecast error and the sign of the abnormal return. Whether the computed test statistic (χ^2) is significant can be determined by reference to a table of critical values of χ^2s. A computed

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[1]For example, the 3.0 percent abnormal return for allowance earning is computed by subtracting the investment ($1.000) from the proceeds ($1.030) and dividing the investment ($1.000).

TABLE IX

SUMMARY CHI SQUARE STATISTICS BY MONTH RELATIVE TO EARNINGS ANNOUNCEMENT DATE

Month T	Allowance	Nonallowance	Cash Flow
-11	1.84	.23	1.87
-10	2.79	.12	1.25
- 9	2.42	1.15	1.06
- 8	14.56	10.31	3.78
- 7	13.36	7.76	4.64
- 6	12.81	11.37	9.42
- 5	27.80	15.89	15.66
- 4	25.47	7.80	9.77
- 3	20.29	13.46	4.37
- 2	21.58	11.96	1.00
- 1	21.04	18.76	2.80
0	23.81	13.98	6.23
+ 1	26.94	21.01	12.06
+ 2	21.46	20.31	9.42
+ 3	26.19	19.17	9.99
+ 4	26.55	10.73	1.93
+ 5	23.88	10.43	4.67
+ 6	21.35	23.24	5.89

Note: Probability (Chi Square $\geq 3.84 | \chi^2 = 0) = .05$, for one degree of freedom.
Probability (Chi Square $\geq 6.64 | \chi^2 = 0) = .01$. for one degree of freedom.

value of χ^2 which is equal to or greater than the value for a given significance level, indicates that the null hypothesis is false and should be rejected. The test results show that for all earnings measures it is unlikely that there is no relationship between the sign of the earnings forecast error and the sign of the abnormal return in most of the months up to and including the month of announcement.

The two-by-two contingency tables for the earning measures at month T=0 are presented in Table X. The table shows that positive abnormal returns are assigned to positive portfolios and negative abnormal returns to negative portfolios correctly in more than 50 percent of the cases for all earnings measures. The results indicate that the allowance earnings forecast is superior to each of the other models, with $\chi^2 = 23.81$, although all measures are highly significant.

Table XI and Table XII present the API measures for the positive and negative earnings portfolios, respectively from which the composite API is aggregated. Foreknowledge of the year's earnings sign 12 months prior to the earnings announcement for positive earnings portfolio yields an abnormal return of 2.4 percent for allowance earnings, 1.7 percent for nonallowance earnings, and 1.5 percent for cash flow. The negative portfolio earnings group yields an abnormal return of 3.3 percent for allowance earnings, 2.7 percent for nonallowance earnings, and 2.4 percent for cash flow. These results indicate that for both positive and negative portfolios allowance earnings have the highest degree of association with stock price changes, followed by nonallowance earnings, and then by cash flow.

TABLE X

CLASSIFICATION OF UTILITIES BY SIGN OF FORECAST ERROR AND SIGN OF API

	Forecast Error					
	Allowance		Nonallowance		Cash Flow	
	+	-	+	-	+	-
API_0 +	190	115	179	126	164	141
API_0 -	143	192	146	189	146	189
Composite API_0	1.300		1.022		1.020	
χ^2	23.81		13.98		6.23	
Percent Correct	59.7		57.3		55.3	

Note: Probability (Chi Square $\geq 3.84 | \chi^2 = 0) = .05$, for one degree of freedom.
Probability (Chi Square $\geq 6.64 | \chi^2 = 0) = .01$, for one degree of freedom.

An analysis of the monthly API measures for the positive and negative portfolios suggests that the market appears not to anticipate earnings forecast errors with the increasing degree of success shown in the composite API measures. Figure 1 shows that the abnormal return for positive portfolios reached its highest level at month T=-2 and then declined moderately through month T=0. Figure 2 shows that the abnormal return for the negative portfolios during the same period moved in the opposite direction of the positive portfolio movement. However, when the abnormal rates of return for the positive and negative portfolios are averaged across utilities, the composite API measures display neither of the above trends as reflected in Figure 3.

TABLE XI

API MEASURES FOR POSITIVE EARNINGS PORTFOLIOS BY MONTH
RELATIVE TO EARNINGS ANNOUNCEMENT DATE

Month T	Allowance	Nonallowance	Cash Flow
-11	.971	.970	.971
-10	.967	.962	.966
- 9	.981	.980	.981
- 8	.997	.993	.996
- 7	.985	.982	.981
- 6	.985	.981	.981
- 5	1.004	1.000	1.004
- 4	1.022	1.016	1.020
- 3	1.024	1.017	1.018
- 2	1.052	1.042	1.039
- 1	1.037	1.031	1.027
0	1.024	1.017	1.015
+ 1	1.003	.996	.995
+ 2	1.000	.992	.990
+ 3	1.008	.999	.996
+ 4	1.017	1.008	1.000
+ 5	1.008	1.001	.996
+ 6	1.021	1.010	1.006

TABLE XII

API MEASURES FOR NEGATIVE EARNINGS PORTFOLIOS BY MONTH RELATIVE TO EARNINGS ANNOUNCEMENT DATE

Month T	Allowance	Nonallowance	Cash Flow
-11	.964	.996	.965
-10	.954	.959	.956
- 9	.971	.975	.971
- 8	.972	.976	.974
- 7	.952	.956	.958
- 6	.954	.959	.960
- 5	.962	.967	.965
- 4	.970	.977	.975
- 3	.972	.980	.981
- 2	1.000	1.010	1.014
- 1	.981	.988	.994
0	.967	.973	.976
+ 1	.940	.947	.951
+ 2	.928	.937	.941
+ 3	.931	.942	.948
+ 4	.942	.953	.963
+ 5	.937	.945	.953
+ 6	.946	.953	.961

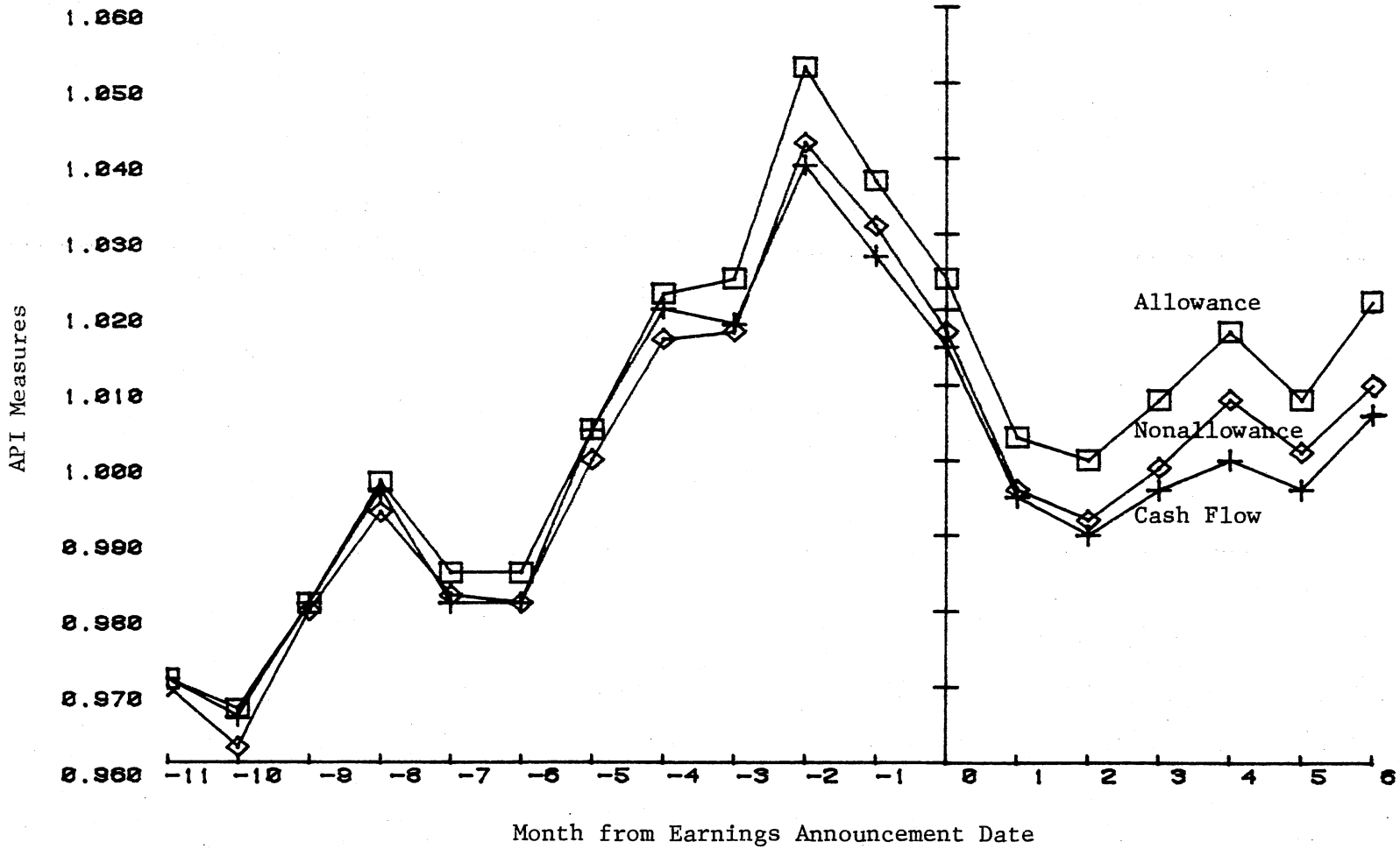

Figure 1. Time-Series Behavior of Positive Earnings Portfolio APIs

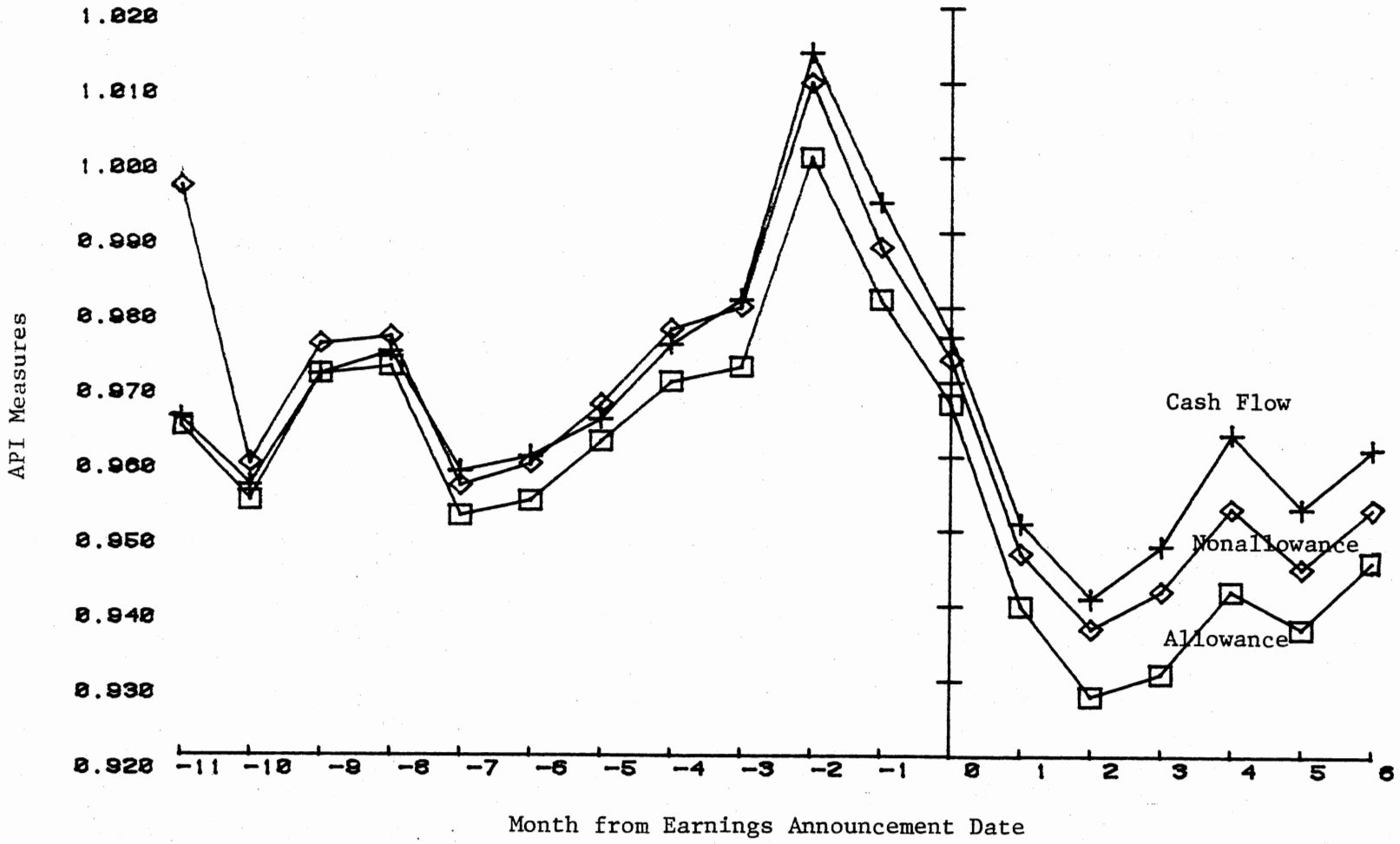

Figure 2. Time-Series Behavior of Negative Earnings Portfolio APIs

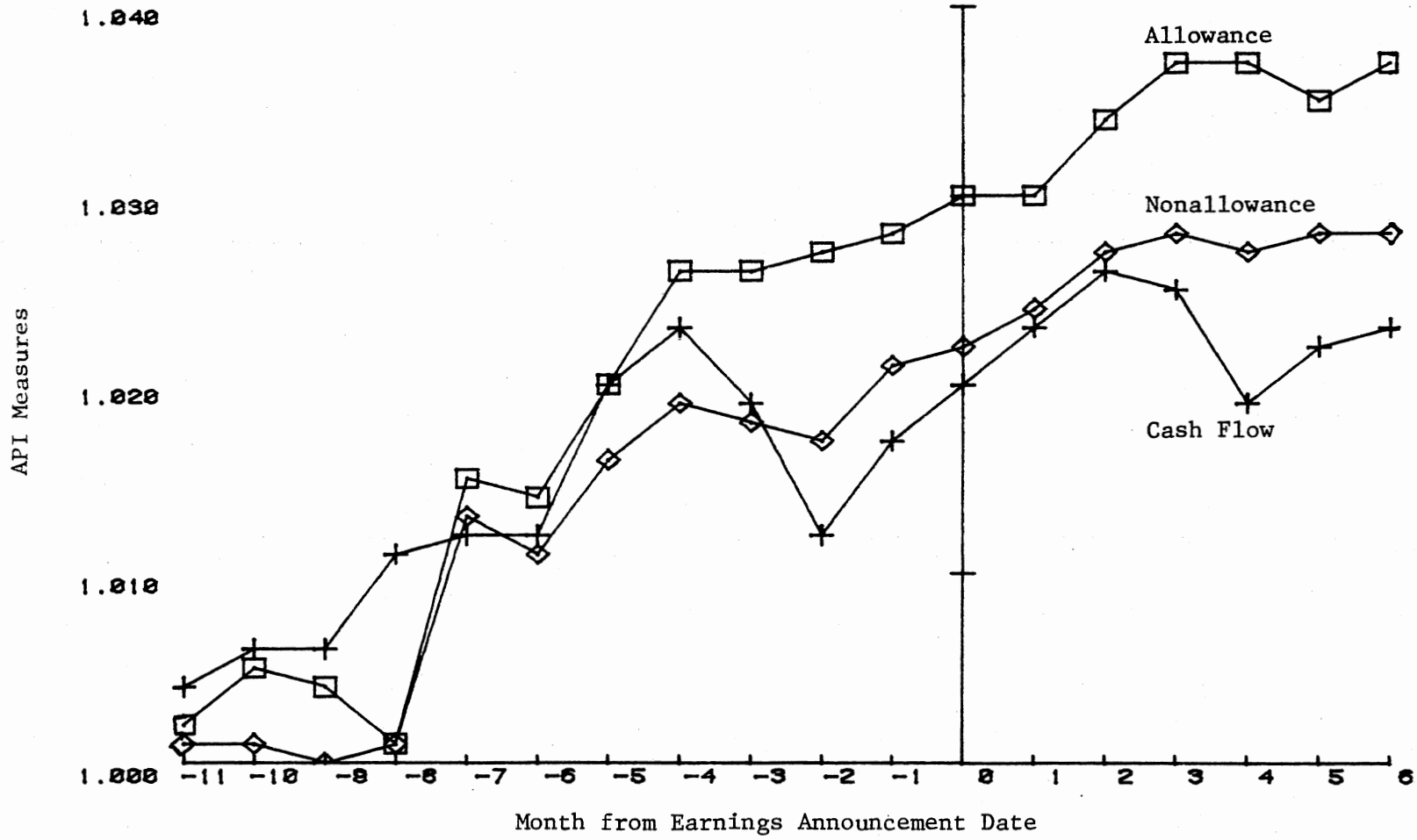

Figure 3. Time-Series Behavior of Composite Earnings Portfolio APIs

The unexpected movement of the API measures for the positive and negative portfolios from month T=-2 to month T=0 appears to be the result of President Ford's proposed legislation to liberalize the passing through of cost increases to customers through rate increases. The proposal was made in his State of the Union address to Congress in January, 1975 (month T=-2). The proposal was preceded by a period in which utilities faced a poor financial outlook caused largely by high interest rates, growing fuel costs, and lagging rate increases. However, at the time of President Ford's proposal, favorable conditions, such as moderate interest rate declines and increased recognition by regulatory authorities of rate increase requirements, were beginning to benefit the utility industry (Standard and Poors, 1975). This environment together with President Ford's proposal materially affected the abnormal rates of return that were aggregated in month T=-2. These extremely favorable conditions appear to have caused a significant increase in the abnormal returns for month T=-2 for positive portfolios. However, during the same time period abnormal returns for negative portfolios significantly declined which apparently offset the positive portfolios increases when the portfolios were averaged across utilities for the study period.

The results of the analysis for the 12-month holding period indicate that allowance earnings have the highest API associated with stock prices. This finding supports the contention that the market considers the economic consequences of allowance for funds. Although disturbances were observed in the underlying data as discussed, the above findings are not altered.

Analysis of Earnings Forecast Differences

In order to more fully analyze the relative performance of the earnings measures, a comparison is made of those periods in which the signs of the forecast errors of the measures differed. This analysis is necessary because there are many common elements in the computation of the measures. Table XIII reproduces the measures of Table X, restricting the analysis to utilities whose forecast error signs disagree. Comparison (1) is an analysis of the API when the signs of the forecast errors for allowance earnings and nonallowance earnings differed. Following the sign of the allowance earnings rather than the nonallowance earnings yields a 1.2 percent average abnormal return. The allowance earnings forecast classified more than 54 percent of the comparison correctly. However, the χ^2 statistic has a probability of occurrence of less than 0.3 under the null hypothesis that there is no association between the sign of the earnings forecast error and the sign of the API. Although the χ^2 statistic for this comparison is not as highly significant as for the complete sample, the nonnegative composite API suggests that on the average the allowance earnings sign should be followed rather than the nonallowance earnings sign.

Comparison (2) is an analysis of the API when the signs of forecast errors for allowance earnings and cash flow differed. Following the sign of allowance earnings rather than cash flow yields a 1.6 percent average abnormal return. The allowance earnings forecast correctly classified approximately 57 percent of the comparison, and the χ^2 statistic has a probability of occurrence of less than 0.05.

The results of the analysis of earnings forecast differences indicate that on average the allowance earnings sign should be followed

TABLE XIII

ANALYSIS OF DIFFERENCES IN FORECAST ERRORS

	(1) Allowance vs. Nonallowance		(2) Allowance vs. Cash Flow	
	+	-	+	-
API_0 +	55	45	68	40
API_0 -	48	55	50	53
Composite API_0	1.012		1.016	
χ^2	1.12		3.88	
Percent Correct	54.2		57.3	

Note: Probability (Chi Square $\geq$ 1.07$|\chi_2^2 = 0$) = .30, for one degree of freedom.
Probability (Chi Square $\geq$ 3.84$|\chi_2^2 = 0$) = .05, for one degree of freedom.
Probability (Chi Square $\geq$ 6.64$|\chi^2 = 0$) = .01, for one degree of freedom.

rather than the nonallowance earnings sign or the cash flow sign. These results are consistent with those of the complete sample.

Post Forecast API Performances

In order to analyze the relationship between earnings measures and stock price changes after the release of earnings numbers, APIs are computed for the subsequent 6-month period. Table VIII presents monthly composite API measures for each earnings alternative. The analysis shows that a trading strategy starting after month T=0 enables a .7 percent abnormal return for allowance earnings, a .6 percent abnormal return for nonallowance earnings, and a .3 percent abnormal return for cash flow. These results are consistent with a semi-strong efficient market in that once earnings are publicly announced there is a relatively low probability of realizing any significant abnormal return.

Tables XI and XII contain monthly API measures for the six month strategy for the positive and negative earnings portfolios, respectively. A trading strategy starting after month T=0 for positive portfolios yields a .3 percent abnormal loss for allowance earnings, a .7 percent abnormal loss for nonallowance earnings, and a .9 percent abnormal loss for cash flow. The negative portfolios yield an abnormal return of 2.1 percent for allowance earnings, 2.0 percent for nonallowance earnings, and 1.5 percent for cash flow.

Since prior studies have found that once earnings are announced there is little difference between stock price behavior of firms with positive earnings changes and firms with negative earnings changes, the above results appear to be inconsistent. However, the unexpected movement in the APIs can be traced to month T=+1 and T=+2 for both the

positive and negative earnings portfolios. It may be that these unexpected movements were the result of Consolidated Edison's announcement in April, 1974, (month T=+1) of the omission of its second quarter dividend, The Wall Street Journal reported that the announcement "shocked" Wall Street and disproved the axiom that utilities always pay their dividends. Edison Electric Institute (1976) noted that the omission of the dividend came at a time when the industry was facing serious financial problems which were largely a result of rising interest rates and Arab oil price increases. The dividend news, coupled with the industry's financial outlook, caused a sharp decline in the abnormal return for positive portfolios in month T=+1 which persisted through T=+2 as shown in Figure 1. On the other hand, Figure 2 shows that the abnormal return increased sharply for negative portfolios during the same time period. However, when the abnormal returns for positive and negative portfolios are averaged across utilities for the study period, the results appear to be offsetting as reflected in Figure 3.

The results of the post forecast API performances are consistent with a semi-strong efficient market in that after the release of the earnings numbers, relatively small abnormal returns are observed in the composite portfolios. Although there is a difference between the stock price behavior of utilities with positive earnings changes and utilities with negative earnings changes, the difference appears to be the result of the events that occurred in April, 1974, which caused disturbances in the underlying data.

CHAPTER V

SUMMARY AND CONCLUSIONS

Summary

The objective of this study was to examine the association between alternative earnings measures related to allowance for funds used during construction and stock prices of electric public utility companies. The allowance account is a noncash item of income and represents the interest capitalized on funds used for plant construction during the construction period. Such capitalization of the cost of funds used during construction results in an immediate credit to income, but the credit ceases as soon as the new asset is operational. After the new asset is placed into service, the noncash item is expensed and billed to customers as the asset is depreciated. As the magnitude of the allowance has increased, many critics have questioned the validity of the component because they consider it an accounting gimmick used to inflate earnings or they are concerned about the cash flow consequences.

The central focus of this dissertation was to determine which allowance related earnings measure is most related to the information used by the market in setting stock prices. Information was defined as the observed revision in stock prices associated with the release of a particular earnings measure. The measure which produced earnings numbers having the highest degree of association with stock prices was

considered to be the most consistent with information used in setting prices. Three earnings measures were examined: earnings as currently reported which included allowance for funds (allowance earnings), earnings without allowance for funds (nonallowance earnings), and cash flow.

To test for information content, an abnormal performance index (API) was developed for each earnings measure, based on the association between unexpected earnings changes and unexpected stock price changes. A form of the market model with coefficients based on a time series regression was used to form earnings expectations in which earnings are assumed to be consistent with their historical association with an aggregate market index. Earnings forecast errors were computed by comparing estimated earnings with actual earnings. Utilities whose actual earnings change exceeded expected earnings (good news) were placed in a positive portfolio and utilities whose actual earnings changes were less than expected (bad news) were placed in a negative portfolio. Simultaneously, the market model was also used to estimate unexpected (abnormal) monthly stock price changes for each of the portfolios for the 12 months prior to the announcement of earnings. An API was computed for each portfolio using the monthly abnormal stock returns. A composite (average) API was then computed for each earnings measure. The API was used to test whether foreknowledge of actual earnings would enable investors to earn abnormal returns. The API measure reflects the abnormal return associated with knowing the earnings number in advance of the market.

It was hypothesized that if the market considers the economic consequences of allowance for funds, allowance earnings would have the highest degree of association with stock prices. This is because

allowance earnings better reflect the earnings potential of a utility since the allowance represents a valid claim to future earnings which enables a utility to recover the cost of capital invested in a construction project.

Results for the complete sample showed that allowance earnings had the highest API associated with stock prices changes, followed by nonallowance earnings, and then by cash flow. These results supported the contention that allowance earnings are most consistent with the information used in setting stock prices.

The Chi Square test was employed to determine if the association was statistically significant since the association could be a product of chance. The degree of association was statistically significant for all earnings measures.

Since there were many common elements in the computation of the earnings measures, a comparison was made of those periods in which the sign of the forecast error of the measures differed. The results were generally consistent with those of the complete sample.

Post forecast API performances were also examined. The results indicated that after the release of earnings numbers, abnormal returns were insignificant for all earnings measures.

Conclusions

This study provides some evidence about how investors perceive the controversial allowance for funds component of electric public utility earnings. The results of this study indicate that for the years 1968-75, allowance earnings were the most consistent with the information used in setting stock prices, followed by nonallowance

earnings, and then by cash flow. This conclusion is supported by the fact that allowance earnings had the highest API associated with stock prices followed by nonallowance earnings and cash flow, respectively.

The results fail to support the arguments advanced by critics who questioned the validity of the allowance for funds component of earnings. It appears that the aggregate market does consider the allowance to be a valid component of earnings because allowance earnings had the highest API associated with stock prices. This suggests that investors consider the economic aspect underlying the allowance in that it enables a utility to recover the cost of capital of a construction project after the construction is completed. It also suggests that investors perceive the practice of capitalizing allowance for funds to be a sound regulatory principle. However, this does not necessarily imply that the practice of capitalizing allowance for funds is the preferred practice. Making preference rankings involve difficult issues of social choice that are beyond the scope of this study (see Demski, 1974).

This study also provides evidence regarding the behavior of the APIs subsequent to the public announcement of earnings. Trading strategies starting after the public announcement of earnings appear to offer relatively small abnormal returns for all earnings measures. This result is consistent with a semi-strong efficient market is which stock prices adjust rapidly in an unbiased manner to any relevant public information.

Methodological Limitations

The results of this study can only be interpreted with the limitations of the API in mind. First, an assumption of the measure is that the

systematic risk reflecting the relationship between individual securities and the market is constant over time. Meyers (1973) presented evidence that beta values were unstable during the 1950-67 period. As a result, he noted that the assumption may be unwarranted in situations where estimates from relatively long periods of time are used to estimate expected stock returns during shorter segments of that period. The total data base used to estimate the returns for this study included 100 months--January, 1968 through April, 1976. Although this is a relatively short time period, the systematic risk of the portfolios could have changed over time.

Second, Marshall (1975) criticized the API because the classification of a security is based strictly on whether the earnings signal is positive or negative. He explained that this systematically ignores the joint probability behavior of unexpected earnings and unexpected security returns. However, Barefield, Foster, and Vickery (1976) questioned the desirability of considering the joint probability behavior because of its inherent subjectivity and the costliness in time to develop the distribution.

Third, the API uses only a limited, but important, portion of the data contained in financial statements (Dyckman, Downes, and Magee, 1975). Despite this limitation and the others cited, past research has shown that the time-series residual methodology used to measure the API is an effective method to assess the relative importance of earnings measures. However, any inferences made from the study are conditional upon the models used to measure the association.

Suggestions for Future Research

Allowance for funds used during construction will continue to be the subject of much discussion as substantial utility construction programs continue and the time required to complete projects increases. This means that earnings on a continuing basis will contain a large proportion of allowance for funds which represents a high level of investment that is not yet earning any cash return. Since this may add significantly to a utility's risk, research could be undertaken to assess the relative stability of systematic risk.

A frequently proposed alternative to capitalizing allowance for funds is to discontinue the capitalization and allow construction work in progress in the rate base. This alternative has been increasingly permitted by regulatory commissions and is often advocated as a means of solving cash flow problems because of its immediate cash generating effect. In light of the current financial dilemma facing many electric public utilities, the market reaction to the change from capitalization of allowance for funds to its noncapitalization could be investigated.

SELECTED BIBLIOGRAPHY

Ball, Ray and Philip Brown. "Some Preliminary Findings on the Association Between the Earnings of a Firm, Its Industry and Economy." Empirical Research in Accounting: Selected Studies, 1967. Supplement, The Journal of Accounting Research, 5 (1967), pp. 55-77.

_____. "An Empirical Evaluation of Accounting Income Number." The Journal of Accounting Research, 6 (Autumn, 1968), pp. 159-178.

Barefield, Russel M., Taylor W. Foster, and Don Vickery. "Interpreting the API." The Accounting Review, 51 (January, 1976), pp. 172-175.

Beaver, W. H. and R. E. Dukes. "Interperiod Tax Allocation, Earnings Expectations, and the Behavior of Security Prices." The Accounting Review, 47 (April, 1972), pp. 320-332.

_____. "Interperiod Tax Allocation and ∂-Depreciation Methods: Some Empirical Results." The Accounting Review, 48 (July, 1973), pp. 549-559.

Benor, Charles A. "Accounting Procedure and Standards Related to Capital Formation in the Electric Power Industry and the Differences in Earnings Quality Among Major Electric Power Companies." Paper presented to the NARUC Staff Subcommittee, September, 1975.

Bolster, Dennis R. "Should Plant Under Construction be Included in Rate Base?" Public Utilities Fortnightly, 87 (May 27, 1971), pp. 25-28.

Bonbright, James C. Principles of Public Utility Rates. New York: Columbia University Press, 1961.

Brown, Philip and John W. Kennelly. "The Information Content of Quarterly Earnings: An Extension and Some Further Evidence." The Journal of Business, 45 (July, 1972), pp. 403-415.

Burkhart, Daniel A. and Michael A. Viren. "Investor Criteria for Valuing Utility Common Stocks." Public Utilities Fortnightly, 102 (July 20, 1978), pp. 27-35.

"Con Edison Omits Dividend for Second Quarter." Wall Street Journal (April 24, 1974), p. 3

Conover, W. J. Practical Nonparametric Statistics. New York: John Wiley and Sons, Inc., 1971.

Coughlan, Paul B. "Interest During Construction: A Little Appreciated Cost." Public Utilities Fortnightly, 86 (November 19, 1970), pp. 35-40.

_____. "Allowance for Funds in Construction: Accounting Stepchild and Regulatory Football." Public Utilities Fortnightly, 98 (November 4, 1976), pp. 26-33.

Dahlenbury, Lyle M. "Allowance for Funds Used During Construction Calculation and Disclosure Problems." Public Utilities Fortnightly, 93 (January 17, 1974), pp. 17-23.

Davidson, Sidney. The Plant Accounting Regulation of the Federal Power Commission: A Critical Analysis. Ann Arbor, Michigan: University of Michigan Press, 1952.

Demski, Joel S. "Choice Among Financial Reporting Alternatives." The Accounting Review, 49 (April, 1974), pp. 221-232.

Durbin, J. and G. Watson. "Testing for Serial Correlation in Least Squares Regression." Biometrika, 38 (1951), pp. 159-177.

Dyckman, Thomas R., David H. Downes, and Robert P. Magee. Efficient Capital Markets and Accounting: A Critical Analysis. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1975.

Edison Electric Institute. Economic Growth in the Future. New York: McGraw-Hill Book Co., 1976.

Fama, Eugene F. "Efficient Capital Markets" A Review of Theory and Empirical Work." The Journal of Finance, 25 (May, 1970), pp. 383-417.

Fama, Eugene F., Lawrence Fisher, Michael Jensen, and Richard Roll. "The Adjustment of Stock Prices to New Information." International Economic Review, 10 (February, 1969), pp. 1-21.

Federal Power Commission. Uniform Systems of Accounts Prescribed Public Utilities and Licensees. Order No. 436. Washington: U. S. Government Printing Office, 1971.

_____. Uniform Systems of Accounts Prescribed Public Utilities and Licensees. Order No. 561. Washington: U. S. Government Printing Office, 1977.

Fitzpatrick, Dennis B. and Thomas E. Stitzel. "Capitalization of Allowance for Funds Used During Construction: The Impact on Earnings Quality." Public Utilities Fortnightly, 101 (January 19, 1978), pp. 18-22.

Foster, George. "Stock Market Reaction to Estimates of Earnings per Share by Company Officials." Journal of Accounting Research, 11 (Spring, 1973), pp. 25-37.

_____. "Accounting Earnings and Stock Prices of Insurance Companies." The Accounting Review, 50 (October, 1975), pp. 686-698.

Frazer, Robert E. and Richard C. Ranson. "Is Interest During Construction 'Funny Money'?" Public Utilities Fortnightly, 90 (December 21, 1972), pp. 20-27.

Gonedes, Nicholas J. "Capital Market Equilibrium and Annual Accounting Number: Empirical Evidence." The Journal of Accounting Research, 12 (Spring, 1974), pp. 26-62.

Gonedes, Nicholas J. and Nicholas Dopuch. "Capital Market Equilibrium, Information Production, and Selecting Accounting Techniques: Theoretical Framework and Review of Empirical Work." Studies of Financial Accounting Objectives Supplement, The Journal of Accounting Research, 12 (1974), pp. 48-129.

Hatch, A. W. "Interest During Construction." Proceedings of the National Conference of Electric and Gas Utility Accountants (1952), pp. 320-321.

Hendriksen, Eldon S. Accounting Theory. Homewood, Illinois: Richard D. Irwin, Inc., 1977.

Johnson, Johnny. "The Allowance for Funds Used During Construction: Market Reaction to Current Accounting Practice." (Unpub. Ph.D. dissertation, Virginia Polytechnic Institute and State University, 1976.)

_____. "The Income Quality of Allowance for Funds Used During Construction." Public Utilities Fortnightly, 99 (June 9, 1977), pp. 32-36.

_____. "Losses on Investments in Construction Work in Progress." Public Utilities Fortnightly, 102 (September 14, 1978), pp. 20-24.

Kieso, Donald E. and Jerry J. Weygandt. Intermediate Accounting. New York: John Wiley and Sons, Inc., 1974.

Litke, Arthur L. "Allowance for Funds Used During Construction." Public Utilities Fortnightly, 90 (September 28, 1972), pp. 19-22.

Marshall, Ronald M. "Interpreting the API." The Accounting Review, 50 (January, 1975), pp. 99-111.

Meyers, Stephen L. "The Stationarity Problem in the Use of the Market Model of Security Price Behavior." The Accounting Review, 48 (April, 1973), pp. 318-322.

Morriss, Everett L. "Capitalization of Interest on Construction: Time for Reappraisal?" Public Utilities Fortnightly, 87 (March 4, 1971), pp. 19-29.

Olson, Charles E. "Interest Charged Construction: Economic, Financial, and Regulatory Aspects." Public Utilities Fortnightly, 88 (August 19, 1971), pp. 30-34.

Patell, James M. "Corporate Forecasts of Earnings Per Share and Stock Price Behavior: Empirical Test." The Journal of Accounting Research, 14 (Autumn, 1976), pp. 246-277.

Paton, W. A. and A. C. Littleton. An Introduction to Corporate Accounting Standards. Chicago: American Accounting Association, 1941.

Pomerantz, Lawrence S. and James E. Suelflow. Allowance for Funds Used During Construction: Theory and Application. East Lansing, Michigan: Division of Research, Michigan State University, 1975.

Price Waterhouse and Company. The Public Utility Industry. New York City, New York, 1977.

Securities and Exchange Commission. Staff Accounting Bulletin No. 15. Washington, D. C., 1977. In Commerce Clearing House. "Amended Interpretations Relating to Allowance for Funds Used During Construction." Executive Disclosure Guide (August 11, 1977), pp. 5362-5363.

Sharpe, William F. "A Simplified Model for Portfolio Analysis." Management Science, 9 (January, 1963), pp. 277-293.

Standard and Poor's Corporation. "Electric Utilities: What We See Ahead." The Outlook, 47 (January 6, 1975), pp. 992-994.

Value Line Investment Survey, New York: Arnold Bernhard and Company, (May 16, 1969), pp. 581-582.

Walker, Richard. "Testimony and Exhibits of Richard Walker and Arthur Andersen and Company." Florida Public Service Commission Docket No. 72609-PV, 1973. In Pomerantz, Lawrence S. and James E. Suelflow, Allowance for Funds Used During Construction: Theory and Application. East Lansing, Michigan: Division of Research, Michigan State University, 1975.

Welsch, Glenn A., Charles T. Zlatkovich, and John A. White. Intermediate Accounting. Homewood, Illinois: Richard D. Irwin, Inc., 1976.

APPENDIX

ELECTRIC UTILITIES IN THE SAMPLE

Utility Name
Allegheny Power System
American Electric Power
Arizona Public Service Company
Atlantic City Electric Company
Boston Edison Company
Carolina Power and Light Company
Central and South West Corporation
Central Hudson Gas and Electric
Central Illinois Light Company
Central Illinois Public Service Company
Central Main Power Company
Cincinnati Gas and Electric Company
Cleveland Electric Illuminating Company
Columbus and Southern Ohio Electric Company
Commonwealth Edison Company
Consolidated Edison of New York
Consumer Power Company
Dayton Power and Light Company
Delmarva Power and Light Company
Detroit Edison Company
Duke Power Company
Duquesne Light Company
Eastern Utilities Association
Empire District Electric Company
Florida Power Corporation
General Public Utilities Corporation
Gulf States Utilities Company
Hawaiian Electric Company
Houston Light and Power Company
Idaho Power Company
Illinois Power Company
Indianapolis Power and Light Company
Interstate Power Company
Iowa Electric Light and Power Company
Iowa-Illinois Gas and Electric Company
Iowa Power and Light Company
Iowa Public Service Company
Kansas City Power and Light Company
Kansas Gas and Electric Company
Kansas Power and Light Company
Kentucky Utilities Company
Long Island Lighting Company
Middle South Utilities
Minnesota Power and Light Company
Missouri Public Service Company
Montana-Dakota Utilities Company
Montana Power Company

Utility Name
Nevada Power Company
New England Electric System
New York State Electric and Gas
Niagara Mohawk Power Corporation
Northeast Utilities
Northern Indiana Public Service Company
Northern States Power Company
Ohio Edison Company
Oklahoma Gas and Electric Company
Orange and Rockland Utilities Company
Pacific Gas and Electric Company
Pacific Power and Light Company
Pennsylvania Power and Light Company
Philadelphia Electric Company
Portland General Electric Company
Public Service Company of Colorado
Public Service Company of Indiana, Inc.
Public Service Electric and Gas Company
Rochester Gas and Electric Corporation
San Diego Gas and Electric Company
Savannah Electric and Power Company
South Carolina Electric and Gas Company
Southern California Edison Company
Southern Company
Southern Indiana Gas and Electric Company
Tampa Electric Company
Texas Utilities Company
Toledo Edison Company
Union Electric Company
Utah Power and Light Company
Virginia Electric and Power Company
Washington Water Power Company
Wisconsin Public Service Corporation

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