The Effects of New Equity Sales Upon Utility Share Prices

By RICHARD H. PETTWAY*

Public knowledge of a forthcoming sale of new equity by a utility company often precipitates a decline in the market price of that equity and continues to impact share prices after the sale has taken place. Such price changes are part of the real cost of selling the new issue. The market pressure costs of new equity capital have been the subject of much speculation in utility rate cases, but have received little detailed study. The author of this article has made such a study and here presents a quantitative analysis of price-return movements encountered by utility stocks in the market, after first defining market pressure as it applies particularly to the regulated utility environment. He concludes that investors clearly view a new sale of equity shares with disfavor and regulators, as well as company managements, should be concerned with the resultant decline in utility stock prices.

When a public utility decides to sell a new issue of equity capital and publicly discloses this information, share prices are thought to decline. Often these selling firms ask for an adjustment to their costs of equity capital for the effects of this market pressure upon share prices. The subsequent argument and debate about the magnitude of an adjustment for market pressure at rate hearings is well known.

The electric utility industry has been one of the largest issuers of new equity shares during the past twenty-five years. Therefore, it is surprising that there has not been much more research to determine the magnitude of market pressure of these numerous new equity sales in this industry. The objective of this article is to report on the results of an analysis of 368 equity sales by 73 different electric utilities from January 1, 1973, through December 31, 1980. The analysis will measure two effects of new common equity sales upon share prices: market pressure and sales effect. Specifically, this article will determine the magnitude of market pressure defined as the effect of the sale upon share prices which reduces the funds received by the issuing company at the sale date, and will determine the size of the sales effect defined as the total effect of the sale upon share prices from before the announcement until after the sale.

There have been studies into the size of market pressure defined as a temporary price decline in share values when a large block of shares is said to be "overhanging" the market. However, most of this research concentrates upon the price effects of new issues of industrial companies sold in the primary markets or of large blocks of existing stock sold in the secondary market [1, 2, 4, 5, 6, 9].** This literature defines market pressure as the amount of recovery in market prices *after* the issue has been sold. A review of this literature indicates either no market pressure existing in large block trades of outstanding shares, or only a small amount of pressure associated with primary market sales of new issues.

Under utility regulation, the concern is with a different definition of market pressure. Market pressure in the public utility industry is generally defined as the decline in prices *while* the issue is still overhanging, *before* it is sold. The main question is how much did the utility's stock decline in the secondary market associated with the sales announcement to the date of sale. This decline is a real cost of selling the new issue as the firm will receive only the reduced price at the sales date. An

*The research underlying this article was partly funded by a grant from the Public Utility Research Center, University of Florida.

Richard H. Pettway is a professor of finance, in the Graduate School of Business at the University of Florida. For the past ten years he has been associated with the Public Utility Research Center at the University of Florida. He has written books, monographs, and articles and has made appearances as an expert witness before public utility commissions specializing in the financial and economic problems and solutions. **Dr. Pettway** received his BBA, MBA, and PhD degrees in finance and statistics from the University of Texas-Austin.

**Numbers in brackets refer to the list of references at the end of the article.

160186-OPC-POD-63-194

article by Bowyer and Yawitz (BY) [3] measured the decline in share prices between the announcement date and the sales date of 278 new equity issues of public utilities from 1973 through 1976. But that research had some obvious problems which are corrected by this study.

The first problem with BY is their definition of the announcement date (AD). They defined this critical AD as the initial Securities and Exchange Commission filing date of the issue prospectus. This may not be the true AD as often public utilities make prior announcements of their new issues to state public service commissions, to investors in the *Irving Trust Calendar*, to underwriters, or to financial analysts much earlier than the SEC filing date. This study redefines the critical announcement date through a detailed questionnaire survey of electric utility companies. Further, an analysis of price changes prior to the established announcement date for each issue will be made to determine the actual impact of new equity sales upon share prices. It is very important to measure the complete decline in market prices associated with the information about the forthcoming sale of new equity shares.

Another problem with the BY study concerns its authors' use of the Dow-Jones utility index to measure differential declines in share prices and returns. The use of this index is flawed for at least four reasons. First, the number of companies included is small, 15 firms, and only 11 are electric companies; whereas four are gas transmission and distribution companies. The inclusion of the gas companies raises serious questions concerning the similarities of risks between electric utilities tested and the companies which make up their comparison index. Second, their index does not capture the dividend portion of the return and thus only measures the changes in prices without adjusting for dividends paid. In the electric power industry, the dividend yields tend to be a high portion of the total return and the omission of dividends could impart a bias to the index. Third, if there is evidence of market pressure in new sales of equity shares by utilities as BY found, then it is certain that this market pressure is contained also in share prices of Dow-Jones utility index firms when they sold new equity shares. The effect of using an index which contains market pressure to measure the size of market pressure of a particular firm which sold new equity naturally will understate the true amount of market pressure which is present. Fourth, if utilities are impacted differently from unregulated firms, there may be an additional "industrial effect" which will not be observed by looking only at other utilities rather than a broadly based comparison index of share prices and returns.

Finally, there are some technical problems with the way that BY measured the decline in stock returns or market pressure. These problems concern the use of average residual returns versus a more correct measure (geometric residual returns) and the way BY handled underwriting costs.

Data

A questionnaire survey was conducted of the 93 New York Stock Exchange-listed, investor-owned electric utilities from which 73 usable company replies were obtained for a response rate of over 78 per cent. Each company provided all identifiable costs and critical dates for each new equity capital sale made by the firm from January 1, 1973, through December 31, 1980. The survey results contain data on 368 actual equity sales over the eight-year survey period. The data represent more than five new equity sales per company on average over the study period. The size of these equity sales ranged from $4.7 million to $198 million with a mode sale value in a range between $30 and $49.9 million per issue. The frequency of the issues over the eight years of the survey shows that 1975 was the most popular year followed by 1976 and 1980. Yet, the individual year variation was not dramatic as the range over the eight years was from a low of 37 issues in 1974 to a high of 64 issues in 1975. Eighty-two per cent of the sales were through negotiated underwriting, 16 per cent through competitive bidding, and 2 per cent through rights offerings. See [7] for a thorough review of the data and details on the flotation costs of these issues.

Data on realized share returns including dividends for each company were obtained on a daily basis for a period which began sixty-five trading days before the announcement date and ended thirty trading days after the sale date (SD). Thus, company returns were obtained from a fixed period prior to the AD through a fixed period after the SD for each issue. It is best to think of these data sets as 368 separate arrays of returns. Because the interim time period between the AD and the subsequent SD varied for each issue, the number of return observations in each array is different. Each collected array of returns is unique to the particular announcement and issue dates and is not impacted by other equity sales of the same company.

Methodology

In order to control for risk, to adjust for movements in general prices and returns, and to reduce estimating bias, a two-stage regression process was used to measure the effects of new equity sales upon share returns and prices. First, during the estimating period, the market regression model (1) was applied to a firm's daily equity returns over a uniform estimating period which began sixty-five trading days prior to the AD and ended fifteen days before the AD for each issue. The market regression model asserts that:

$$\tilde{R}_{i,t} = \hat{a}_i + \hat{B}_i\tilde{R}_{m,t} + \tilde{e}_{i,t} \quad (1)$$

where $\tilde{R}_{i,t}$ is the daily return including dividends of the issuing company for equity issue i — i.e., one to 368 — at time t; where daily returns of the issuing company concerning issue i are defined as $(P_{i,t} + D_{i,t} - P_{i,t-1}) / (P_{i,t-1})$; P is the price and D is the dividend per share; $\tilde{R}_{m,t}$ is the daily return at time t on a market portfolio for comparison; $\hat{a}_i$ and $\hat{B}_i$ are the estimated parameters of the market model; and $\tilde{e}_{i,t}$ is the error term of the model.

160186-OPC-POD-63-195

In order to make comparisons, an electric utility portfolio index of returns was created over the period January 1, 1973, through December 31, 1980, containing an equal investment in each of 73 electric companies which sold equity during the period. It is a daily returns index including dividends and provides the average return for each day on a portfolio consisting of an equal dollar investment in each of the 73 electric utilities.

Thus, the first stage uses an estimating period of fifty trading days, approximately two and one-half months, to determine the parameters of the market regression model. The second stage then applies these estimated parameters to the returns series during the subsequent test period after the estimating period in each array in order to calculate the expected returns for each company on each issue i using:

$$\hat{R}_{i,t} = \hat{a}_i + \hat{B}_i \hat{R}_{m,t} \tag{2}$$

where $\hat{R}_{i,t}$ is the expected return for the issuing company associated with issue i at time t. Then residual returns during the test period are obtained by comparing the actual versus the predicted returns using:

$$\tilde{R}_{i,t} - \hat{R}_{i,t} = \hat{u}_{i,t} \tag{3}$$

where $\hat{u}_{i,t}$ is the daily residual return of the issuing company for issue i at time t.

In order to display these residual returns properly, a decision must be made of how to combine the individual company residuals centered on a common date during the test period. The method of combining residuals used by Bowyer and Yawitz is called cumulative average residual or CAR. This method would find the average residual return of all issues on a specific day relative to the common AD or SD and would accumulate these averages over the period in an additive way. A different way of combining residual returns, average geometric residual return (AGRR), was chosen for this study. It is a theoretically better measure of residual returns over time than CAR. AGRR does not use the average residual returns on a specific date but takes the individual issue residual ($\hat{u}_{i,t}$) from (3) and converts it into a price relative for each t and then forms a geometric return series by multiplying successive price relatives from fourteen days prior to AD to the end of the residual data for each company using formula (4). Thus, a geometric return series which precisely measures the change in investment worth for each individual issue is created. At any point in time relative to the common dates, AD and SD, the AGRR was determined as the numeric average of the geometric returns up to that point in time of all issues using formula (5).

$$GRR_{i,T} = \prod_{t=1}^{T} (1 + u_{i,t}) \tag{4}$$

$$AGRR_T = \sum_{i=1}^{N} GRR_{i,T}/N \tag{5}$$

where i is the issue number, t is time, T is the specific point in time (T=1, 2, 3, . . . total number of observations in the test period which was from fourteen days before the AD until thirty trading days after the SD), and N is the number of issues. For further details concerning the specifics of the methodology employed see [8].

In observing the pattern of these residuals over the test period, it is important to be able to use common definitions to describe their movements. "Market pressure" is defined as the decline of share prices and average geometric residual returns from fourteen days before the AD until the SD. "Sales effect" is defined as the change in share prices and AGRRs from fourteen days before the AD until thirty trading days after the SD. This sales effect would be the net change over the entire test period from before the announcement until well after the sale.

Price-Return Movements

Because the number of days between the AD and the SD are not identical for each issue, arrays of residual returns had to be centered on two separate common dates. The first common date is the AD and then data are centered on the common SD. To begin measuring any price effects of these new equity sales, the study first observed movements in residual returns when the data are centered on the common AD.

Common Announcement Date

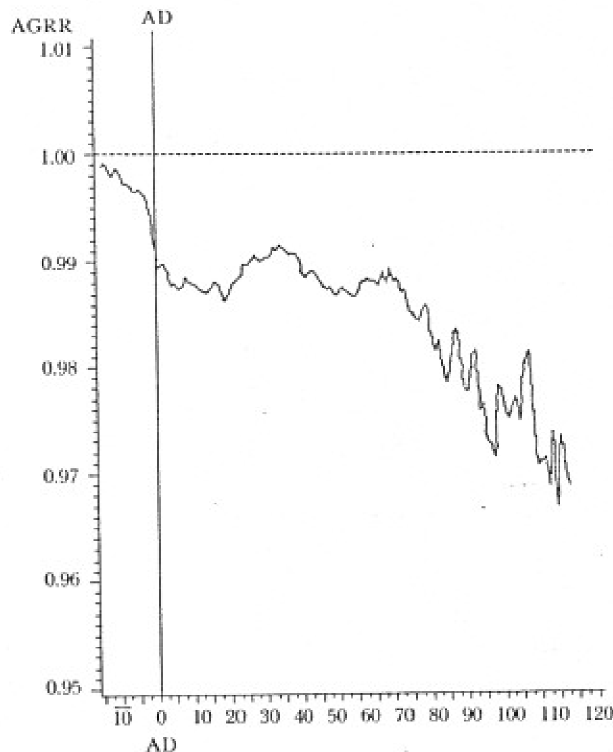
Figure 1 illustrates the AGRRs derived from the use of the electric utility market index of returns for comparison.† The derived residuals are accumulated for 128 days starting fourteen days before the announcement date. All issues are centered on the AD. The trend of the AGRRs are clearly downward and below one during the entire span of 128 days. The downward trend is most noticeable immediately before and around the AD and is then followed by a period of relative stability. During this initial decline, share prices had fallen between one per cent and 1.4 per cent. The downward trend resumes again beginning about sixty-seven days after the AD. The latter downward trend may be associated with the SD, but since these data are centered on the AD, the SD did not occur at a common point in time in the data. Further, because SD is not a common point in the data, the amount of market pressure cannot be measured from the data in this format.

Panel 1 of the accompanying table contains statistical summaries of changes in AGRRs over the entire period shown in Figure 1. It is clear from the data that the change over the 128-day period centered on the AD was a negative 3.019 per cent, indicating a sales effect of this

†If there were no effects of new equity sales upon electric utilities which sold new shares, then the AGRRs shown on Figure 1 would be very close to one over time. A detrimental effect and a relative decline in share prices would be represented as a decline in AGRRs below one. A favorable effect would be represented as an increase in AGRRs. Also notice that the x-axis displays time with negative numbers as days before the AD and positive numbers as days after the AD. The AD, or centering date, is designated as zero.

160186-OPC-POD-63-196

Figure 1
AGRR Centered on Announcement Date
(Utility Index)



magnitude. Thus, comparing the returns over the same time period of an electric utility which sold new equity shares with returns of a portfolio of electric companies which also sold equity during the eight-year study period, there appears to have been a substantial and significant decline or sales effect of −3 per cent. There appear to be two periods of rapid declines, one just before and around the AD and another which appears to begin about sixty-seven days after the AD. Measuring the initial decline during a period from fourteen days before the AD to fourteen days after the AD, the specific decline was −1.2 per cent. This first major decline which begins before the AD suggests that the market was either anticipating the new equity sale or obtaining information about the new equity sale just prior to the public announcement.

Because of the decline in these residuals, it is clear that the market considered the potential new equity sale as detrimental to the future prospects of the current equity holders of the selling firm. Since the decline begins before the AD, this article measures more precisely the *total* decline in share prices than did the work of Bowyer and Yawitz.

Common Sales Date

Figure 2 shows the AGRRs using the electric utility returns index for comparison with all issues centered on the SD. This plot is clearly one whose trend is also downward across the entire time period, although it appears not to begin its major decline until eighty-five to ninety days prior to the SD.

In Panel 2 of the table are found the summary statistics describing the magnitudes of the AGRRs shown on Figure 2. The changes or sales effect during the period from fourteen days before the AD to after the SD over 147 days was −2.041 per cent.

Panel 3 of the table contains the magnitudes of AGRRs shown on Figure 2 but stopping at the SD. This decline in relative share prices and returns, called market pressure, is caused by the equity sale and is the discount required to sell the new issue. These costs of new equity issues were 1.893 per cent on average. Thus, market prices of shares of electric utilities which sold new equity declined by about 1.9 per cent from before the AD until the SD over 104 days. This is the decline in price that the firm did not receive when it sold new equity shares at the SD and is the market pressure of the new equity issue.

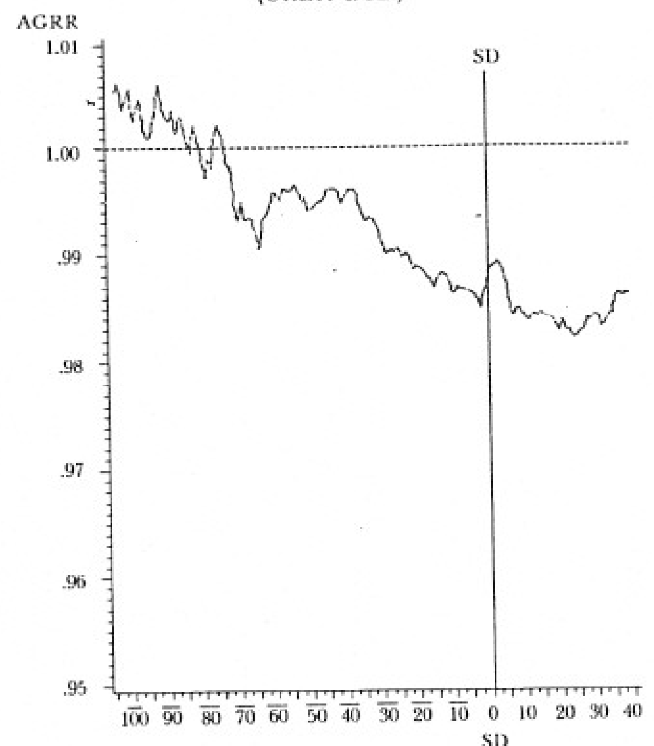
Effects of New Equity Sales of Utilities upon Share Prices
Changes in the Average Geometric Residual Returns

368 New Equity Issues of 73 Electric Utilities from January 1, 1973, through December 31, 1980

Using the Utility Index

Measurements	*Panel 1* Centered on AD (Sales Effect)	*Panel 2* Centered on SD (Sales Effect)	*Panel 3* Centered and Ending on SD (Market Pressure)
Change over the Period	−3.019%	−2.041%	−1.893%
Length of Period (Days)	128	147	104
Change from −14 AD to +14 AD	−1.170%		
Length of Period (Days)	29		

Figure 2
AGRR Centered on Sale Date
(Utility Index)



160186-OPC-POD-63-197

Summary and Conclusions

When electric utilities sold new equity shares between January 1, 1973, and December 31, 1980, the share prices of these companies were depressed downward because of the sale. This downward movement or market pressure measured from before the announcement date to the sales date of the new issue was −1.9 per cent when compared with returns of other electric utilities which sold new equity regularly. Further, a sales effect ranging from −3 per cent to −2 per cent was found over the period from before the announcement date until after the sales date depending upon whether the data were centered on the AD or on the SD.

These averages are conservative and the minimum estimated average declines as they were derived from using a return index of comparison (electric utility) which itself contains the effects of market pressure. Further, the use of another index of return for comparison which was composed of regulated and unregulated firms would substantially raise these average costs. (In fact, if the comparison were to be made against the return of all equities listed on the New York and American stock exchanges over the same time period, the average estimate for market pressure would rise to −3 per cent and the average estimates for sales effect would rise to −4.4 per cent centered on the AD to −3.6 per cent centered on the SD. See [8] for details.)

The sizeable sales effect over the entire period from before the announcement date to after the sales date using the portfolio of electric companies for comparison provides direct evidence that share prices of electric utilities which sell new equity continue to decline after the sale has taken place. This condition may be explained as the impact of other factors than market pressure alone upon share prices. Perhaps some of these factors are due to the investors' perceptions of increased dilution problems caused by regulatory lag and regulatory risk associated with these public utilities not being allowed a rate of return on new equity equal to the investors' required rate of return over the eight-year survey period.

Even though the exact causes are not known precisely, it is definitely clear that investors view the new sale of equity shares with disfavor and that the new equity sale results in a substantial decline in equity prices. Public utility regulators should be concerned with these impacts of new equity sales upon share prices and returns and attempt to make proper adjustments in the allowed rate of return to offset or eliminate these effects in the future.

References

1. "Market Pressure: The Sales of New Common Equity and Rate of Return Regulation," by Raymond Armknecht, Fred Grygiel, and Patrick Hess, "Proceedings of the Business and Economic Statistics Section of the American Statistical Association," 1974, pp. 80-91.

2. "The Effect of the Size of Public Offerings of Common Stocks upon Preoffering Stock Prices," by Lee Bodenhamer, unpublished dissertation, Harvard University, Graduate School of Business, May, 1968.

3. "The Effect of New Equity Issues on Utility Stock Prices," by John W. Bowyer, Jr., and Jess B. Yawitz, 105 Public Utilities Fortnightly 25, May 22, 1980.

4. "On the Existence, Measurement, and Economic Significance of Market Pressure in the Pricing of New Equity Shares," by Robert E. Evans, unpublished dissertation, University of Wisconsin-Madison, 1978.

5. "Price Impacts of Block Trading on the New York Stock Exchange," by Alan Kraus and Hans Stoll, *Journal of Finance,* June, 1972, pp. 569-588.

6. "New Issue Stock Price Behavior," by J. G. McDonald and A. K. Fisher, *Journal of Finance,* March, 1972, pp. 97-102.

7. "A Note on the Flotation Costs of New Equity Capital Issues of Electric Companies," by Richard H. Pettway, 109 Public Utilities Fortnightly 68, March 18, 1982.

8. "Impacts of New Equity Sales upon Electric Utility Share Prices," by Richard H. Pettway and Robert C. Radcliffe, working paper series, Public Utility Research Center, Graduate School of Business, University of Florida, Gainesville, Florida, May, 1983.

9. "The Market for Securities: Substitution versus Price Pressure and the Effects of Information on Share Prices," by Myron S. Scholes, *Journal of Business,* April, 1972, pp. 179-211.

Utilities Raise Their Capital Appropriations

The nation's investor-owned utilities appropriated $7.2 billion (seasonally adjusted) for new plant and equipment in the final quarter of 1983, up 25 per cent over the unusually low figure recorded in the third quarter, the Conference Board reported in April. Both the gas and electric utilities shared in this fourth-quarter gain. (Capital appropriations are authorizations to spend money in the future for new plant and equipment. Appropriations are the first step in the capital investment process, preceding the ordering of equipment, the letting of construction contracts, and finally the actual expenditures. Appropriations are considered to be a leading indicator for capital spending.)

Electric utility appropriations rose to $5.8 billion in the fourth quarter, their first quarterly increase since the third quarter of 1982. Cancellations of previously approved projects were widespread, however, amounting to $2.7 billion in the final quarter of 1983.

Gas utility appropriations climbed to $1.4 billion in the fourth quarter, a 68 per cent jump over the third quarter. It was the highest quarterly total recorded last year. For the full year, however, the gas utilities appropriated only $4.4 billion, down by a third from 1982, and canceled a record $1.3 billion worth of earlier-approved projects.

Actual capital spending by the investor-owned utilities fell to $8.3 billion in the fourth quarter, an 8 per cent dip from the third quarter. The electric utilities accounted for all of the fourth-quarter decline. For 1983 as a whole, the electric utilities spent a record $32.2 billion on new plant and equipment, up 3 per cent over 1982. Gas utility expenditures amounted to $3.5 billion in 1983, down 30 per cent from 1982.

160186-OPC-POD-63-198