

MANAGERIAL MOTIVES FOR SPLITTING STOCKS: EVIDENCE FROM ELECTRIC UTILITY COMPANIES

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Abstract

Despite the rich literature on stock splits, studies have omitted public utility firms from their analysis when examining managerial motives for splitting stocks. In 1992 Congress enacted the Energy Policy Act (EPACT) to encourage the development of a competitive, national, wholesale electricity market. I argue that the change in the regulatory environment for public utilities provides a clean setting to study and compare the signaling and liquidity motivations for splitting stock. Before deregulation, the signaling motivation for splitting stocks is not applicable for these firms because the level of information asymmetry is low. Hence, the liquidity hypothesis should be the primary motivation for electric utilities to split stocks during this period. After deregulation, however, the signaling effect is expected to play a more dominant role because of higher level of information asymmetry. The results are consistent with the hypothesis posed. For the pre-EPACT period, liquidity motive seems to predominate in explaining the abnormal announcement return of utility stock splits. On the other hand, the results support the signaling motive as a leading explanation of abnormal returns in the post-EPACT period.

Keywords : stocks, electric utility companies, managerial motives

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1. Introduction

In a stock split a firm substitutes a certain number of new shares for each outstanding share. Thus, stock splits are only expected to affect the par value of each share and the number of shares outstanding and should not impact the firm's capital structure or its cash flows. While stock splits appear to be pure cosmetic events previous studies document that investors react positively to their announcements. For example, Grinblatt, Masulis and Titman (1984), McNichols and Dravid (1990), and Ikenberry, Rankine, and Stice (1996) find announcement period abnormal return of approximately three percent for splitting firms.⁵⁰ These results suggest that there are some tangible benefits associated with splitting stocks.

Prior studies have put forward the signaling and the marketability theories as two alternative but non-mutually exclusive hypotheses to explain the positive abnormal returns at stock split announcements. The signaling theory posits that managers split their shares

to reveal favorable future information.⁵¹ Consistent with this hypothesis Asquith, Healey, and Palepu (1989), McNichols, and Dravid (1990), and Tawatnuntachai and D'Mello (2002) document an increase in earnings and dividends subsequent to stock splits. Further, McNichols, and Dravid (1990) find a significant positive relation between the split factor and subsequent earnings changes implying that managers use the split factor to signal information.

The marketability theory states that firms split stocks to increase its liquidity. By realigning the share price to a preferred trading range firms make the stocks more affordable to individual investors thus broadening the stockholders' base. Managers surveyed by Baker and Gallagher (1980) and Baker and Powell (1993) state that this is an important motivation for splitting stocks. Evidence supporting this hypothesis is presented by D'Mello, Tawatnuntachai, and Yaman (2003) and Fernando, Krishnamurthy, and Spindt (1999). They find that firms split stock to make the subsequent SEO more marketable to individual investors who are attracted to low-priced shares.

Previous studies that examine managerial motives for splitting their stock draw their conclusions based

⁵⁰ Also see Fama, Fisher, Jensen, and Roll (1969), Bar-Yosef and Brown (1977), McNichols and Dravid (1990), Ikenberry, Rankine, and Stice (1996) and Desai and Jain (1997).

⁵¹ Stocks splits increase the production of firm-specific information by increasing the number of analysts that follow the firm's stock because of higher ex-post per share commissions.

on an analysis of industrial firms only. Public utility firms are omitted from most studies in corporate finance because they are regulated and hence, are fundamentally different from industrial firms. Consistent with this line of reasoning, studies find significant differences in the market reaction to corporate event announcements between public utilities and industrial firms. For example, Asquith and Mullins (1986), Masulis and Korwar (1986), and Szewczyk (1992) find that industrial firms experience larger negative excess returns than utility firms at announcement of new equity issuances. They argue that since utilities are regulated they have lower levels of asymmetric information than industrial firms, which explains the different market reactions.

In this paper I extend the literature by analyzing stock splits conducted by electric utility firms. The reason this sample of firms is interesting is because of a change in the regulatory environment that dramatically affected the motivations of these firms to conduct a stock split. In 1992 Congress enacted the Energy Policy Act (EPACT) to encourage the development of a competitive, national, wholesale electricity market with open access to transmission facilities and this act was implemented on January 1, 1993. One of the fundamental implications of this act was the deregulation of public electric firms. Deregulation transformed the information environment in which public utilities operated because now the actions of managers were no longer subject to close supervision by regulatory agencies making it more difficult for the public to observe and judge their actions. Thus, while information asymmetry was low before 1993 when these firms were highly regulated, it increased significantly after EPACT was adopted because of the reduction in oversight.

I argue that that the change in the regulatory environment for public utilities provides a clean setting to study and compare the signaling and liquidity motivations for splitting stock. Before deregulation, the signaling motivation for splitting stocks is not applicable for these firms because the level of information asymmetry is low. Hence, the liquidity hypothesis should be the primary motivation for electric utilities to split stocks before 1993. In the post-EPACT period however, defined as the interval beginning in 1993, the signaling effect is expected to play a more dominant role because of higher level of information asymmetry that accompanied deregulation. In addition, such an analysis also allows us to investigate whether the conclusions for industrial firms regarding stock splits also extends to public utilities.

The final sample consists of 108 electric utilities with stock splits during 1986- 2002 period. Consistent with prior studies, the stock price reaction to announcement of public utility splits is significantly positive. These results suggest that investors view stock splits by these firms as

conveying positive information similar to industrial firms.

The results suggest that the motivation for splitting stocks varies through time and is impacted by the passing of EPACT. Prior to 1993 when the firms were regulated the liquidity hypothesis seems to be the primary motivation for electric utilities to split their stocks. There is an increase in the shareholder base as well as trading by individual shareholders and the announcement period returns are positively related with the increase in liquidity.

After the industry is deregulated and information asymmetry levels increase, the signaling hypothesis is the main reason for splitting stocks. There is an increase in abnormal operating performance both in the short- and long-run and managers use the split factor to reveal favorable future information. Analysis of announcement period returns confirms that this motivation was dominant during the 1993-2002 interval.

The following section provides data description and sample characteristics. Analysis of the results is presented in Section 3 and I conclude the paper in section 4.

2. Data description

2.1. Data

The initial sample consists of stock splits conducted between 1986 and 2002 by public utilities listed on the American Stock Exchange (AMEX), the New York Stock Exchange (NYSE) and the National Association of Securities Dealers Automated Quotation System (NASDAQ). Because EPACT only affected electric and gas utility companies we restrict our sample to firms listed on the Center for Research in Security Prices (CRSP) database with Standard Industrial Classification (SIC) codes between 4900 and 4939. Gas production and distribution companies are also included in the sample because these firms are highly interconnected with electricity suppliers resulting in mergers between these two types of utilities within the sample period.

I identify stock splits using the CRSP distribution code 5523 and only stock splits of five-for-four (split factor of 0.25) or greater are included in the sample.⁵² I find 158 stock splits conducted by 112 public utilities over the 17 year sample period. I verify the CRSP announcement date with the *Wall Street Journal Index* (WSJI). However, because WSJI stopped reporting stock split announcements after 1998, I used the *Mergent Public Utility Annual Report* to confirm split announcements beyond that year.

⁵² This study considers stock distributions of 25 percent or more as splits. According to generally accepted accounting principles, stock distributions of 20 percent or less are considered 'stock dividends', which leads to a dramatic reduction in a firm's retained earnings. For stock distributions between 20 percent and 25 percent, the accounting principles grant full discretion to managers.

The primary analysis includes an examination of abnormal returns around stock split announcements. Therefore I require all firms to have valid stock return information on CRSP for the announcement period defined as the three-day interval centered around the event date (day 0), identified as the earlier of the declaration date on CRSP or the announcement date in published reports. Further, I control for the effects of contemporaneous announcements by eliminating observations where WSJI reports earnings or dividend information during the announcement period. These restrictions reduce the sample by 50 observations resulting in a final sample size of 108 stock splits announced by 80 firms.

The frequency of stock splits as well as the annual percentage of utilities that conduct is presented in Table 1. The number of splits range from 2 to 18 and the percentage of utilities that conduct a split is as

low as 0.77 percent in 1995 to a high of 7.14 percent in 1987. The pre-EPACT period, defined as years 1986 to 1992, has 66 splits and the post-EPACT period, defined as years 1993 to 2002, has 42 observations. Approximately 56 percent of the stock splits are two-for-one splits (split factor 1) while about 40 percent are three-for-two splits (split factor 0.5). This pattern holds for both the pre- and post-EPACT periods and is also similar to the results for industrial firms.

In addition to sample of splitting electric utilities, I also construct a control sample of firms, defined as all companies with SIC codes between 4900 and 4939, that did not split their stocks during the sample period. The control sample of 249 utilities is used to compute abnormal operating performance in subsequent analysis.

Table 1. Annual Distribution of Electric Utility Stock Splits

The “Total Number of Utility Companies” column shows the total number of utility companies reported on CRSP under SIC codes 4900 – 4999 for every year of the sample selection. The column label “Number of Splits” shows the distribution by year of 108 electric utility stock splits from 1986 through 2002. The “Split Frequency” column shows the frequency of electric utility stock splits in a given year. That is, the number of splits divided by the total number of utility companies.

Year	Total Number of Utility Companies	Number of Splits	Split Frequency
1986	247	17	6.88
1987	252	18	7.14
1988	260	3	1.15
1989	253	8	3.16
1990	256	2	0.78
1991	254	2	0.79
1992	262	16	6.11
1993	258	12	4.65
1994	263	3	1.14
1995	261	2	0.77
1996	258	7	2.71
1997	256	2	0.78
1998	243	2	0.82
1999	229	5	2.18
2000	208	4	1.92
2001	182	3	1.65
2002	173	2	1.16
Total		108	

2.2. Sample summary

Table 2 presents the firm characteristics for splitting firms and the control sample at the year-end before the split announcement. Given the relatively small number of observations in our splitting sample we concentrate on median results to minimize the impact of outliers. Further, non-parametric Wilcoxon rank sum statistic is used to test the statistical difference in median results between the two samples (last column).

The results show that the median splitting firm is larger in terms of assets (*Compustat* item #A6), book

value of equity (*Compustat* item #A60), and market value of equity (*Compustat* item #A25*#A99) compared to the median non-splitting firm. Firms that split firms also experience more profitable performance, defined as operating income before depreciation (*Compustat* item #A13), compared to non-splitting firms in the fiscal year-end previous to the split announcement. These results, which are consistent with those reported by previous studies, suggesting that splitting firms are larger and experience abnormal positive performance in the period before the split than their industry counterparts.

Table 2. Descriptive Statistics

The table presents descriptive statistics for selected variables for both splitting and non-splitting firms. Non-splitting firms are defined as firms in *Compustat* with SIC codes between 4900 and 4939 that did not announce a split during the period of 1986 – 2002. All data is obtained from *Compustat* and is at the fiscal year-end immediately before the split announcement. All values except Number of Shareholders (in thousands) are in millions of dollars. The Wilcoxon-Z tests differences in median values between the two groups. ***, ** denote significance at 1, and 5 percent levels, respectively.

Variable	Splitting Firms (N=95)				Non-Splitting Firms (N=249)				Difference t-statistic (Wilcoxon-Z)
	Median	Max.	Min.	Std. dev.	Median	Max.	Min.	Std. dev.	
Assets	952.65	33,409.00	27.43	4,414.30	582.75	80,265.15	0.22	8,164.76	2.038**
Equity - Market Value	509.28	18,345.75	17.99	2,376.55	366.16	50,020.37	0.48	3,872.67	2.272**
Equity - Book Value	286.96	8,998.00	8.73	1,279.75	173.99	26,691.74	-418.76	2,299.27	2.233**
Earnings	41.87	847.00	-11.90	151.89	10.30	3,761.56	-3,299.00	295.23	3.814***
Number of Shares Outstanding	27.69	732.00	1.08	108.39	17.52	1,280.20	0.00	158.59	2.488***
Number of Shareholders	11.14	167.83	0.05	33.48	4.20	775.96	0.00	69.04	2.334***

3. Results

3.1. The market reaction to split announcements by electric utilities

Initially I examine the stock price reaction to split announcements by electric utilities during the period of 1986 through 2002. Abnormal announcement period return is defined as the return in excess of the value-weighted market return cumulated over the three-day window centered on the announcement date.⁵³

The results are presented in Table 3. I find mean (median) increase in stock prices of 1.471% (1.161%) at the split announcement, significant at one percent. These results indicate that similar to industrial firms, investors view splits announcements by public utilities as good news and react positively to these announcements. I also investigate whether the passage of the EPACT in 1992 has a significant impact on stock splits announcement period returns given that it changed the information environment in which public utilities operate. I divide the sample into pre- and post- EPACT periods defined as years 1986-1992 and years 1993-2002, respectively. The mean (median) announcement return decreases from 1.773% (1.256%) in the 1986-1992 period to 0.960% (1.001%) in the 1993-2002 period for the utility stock split sample. However, the Wilcoxon rank-sum statistic that tests for statistical difference in median abnormal returns between the two periods is insignificant implying that the introduction of EPACT did not affect investors' reactions to split announcements.

⁵³ Brown and Warner (1985) find no significant differences between the market-adjusted model and the market model in the computation of abnormal returns.

3.2. Tests of the Signaling and the Marketability Hypotheses

In this paper we investigate whether the motivation for splitting stocks varies with time because of the enactment of EPACT that changed the information environment. Before 1993, electric utilities were well regulated with little information asymmetry making signaling hypothesis less important as a motivation for splitting stocks. After the enactment of EPACT information asymmetry dramatically increased for these firms, and thus we should observe the signaling hypothesis as the primary motivation for stock splits by utilities.

3.2.1 Tests of the Signaling Hypothesis

I first examine the signaling hypothesis that posits that firms split their stocks to convey favorable private information about future earning changes. In the context of this paper, this would imply that we should observe a higher abnormal change in operating performance in the post-EPACT interval compared to the pre-1993 period. Operating performance is defined as earnings before depreciation and amortization. I calculate change in operating performance over the short-term and long-term. Short-term change is defined as change from the fiscal year-end immediately after the split announcement (year 0) relative to that at the fiscal year-end immediately before the split announcement (year -1). Long-term change in operating performance is operating performance two fiscal year-end after the split announcement minus operating income before depreciation at year -1. Both the short-run and long-run changes are standardized by year -1 book value of total assets. Abnormal change in a firm's operating performance is the change in operating performance of the splitting firm in excess of that of the median control firm.

Table 3. Abnormal Returns at the Announcement of Stock Splits by Electric Utilities

The table reports abnormal returns at stock split announcements conducted by electric utilities between 1986 –2002. Abnormal returns are defined as returns in excess of the value-weighted CRSP index returns cumulated from one day before through one day after the announcement date. Mean (median) abnormal returns are reported overall and by time period. *** denotes significance at 1 percent level.

Time Period	N	Abnormal Return
1986-2002	108	1.471*** (1.161***)
1986 – 1992	66	1.773*** (1.256***)
1993 - 2002	42	0.960*** (1.001***)
Difference between periods (Wilcoxon)		-1.572

Table 4 presents the abnormal operating performance for the full period as well as for the pre- and post-EPACT intervals. Over the full sample period I find that the mean and median operating performance of the splitting sample exceeds those of the median firm by 1.063 percent and 0.037 percent respectively. The long-run the abnormal change in operating performance is positive and highly significant. These results suggest that similar to industrial firms, there is an improvement in abnormal operating performance subsequent to a stock split by electric utilities.

The next step is to look at abnormal operating performance of pre- and post- EPACT periods. In the

pre-EPACT period the median results do not indicate a statistically difference in operating performance change between the sample of splitting firms and the median industry firm in both the short- and the long-run. In the post- EPACT period, the results are quite different. I find that the abnormal change in operating performance is statistically significant both in the short- and the long-run. These results support our hypothesis that there is a change in the motivation for public electric utilities to split their stocks. After the enactment of EPACT, these firms split stocks to reveal favorable information about earning changes, a motivation that was not important prior to 1993.

Table 4. Abnormal Operating Performance

The table shows the mean and median abnormal operating performance overall and by time period. Short-term operating performance is defined as operating income before depreciation at the fiscal year-end immediately after the split announcement minus operating income before depreciation at the fiscal year-end prior to the stock split announcement standardized by book value of total assets a year prior to the announcement. Long-term operating performance is defined as operating income before depreciation two fiscal year-end immediately after the split announcement minus operating income before depreciation at the fiscal year-end prior to the stock split announcement standardized by book value of total assets a year prior to the announcement. Abnormal values are calculated for each of these variables by subtracting the value of the median firm in the industry from that of our sample

$$AOP_S = \frac{O_0 - O_{-1}}{TA_{-1}} - \frac{MedO_0 - MedO_{-1}}{MedTA_{-1}}$$

$$AOP_L = \frac{O_{+2} - O_{-1}}{TA_{-1}} - \frac{MedO_{+2} - MedO_{-1}}{MedTA_{-1}}$$

Where O is the operating income before depreciation, TA is total assets, Subscripts -1, 0, and 2 are the fiscal year-ends immediately before the stock split announcement, the year-end of the stock split, and three year-ends after the split respectively. Med is the median firm in the industry. ***, **, and * denote significance at 1, 5, and 10 percent levels, respectively.

	1986 – 2002		1986 – 1992		1993 - 2002	
	Short-Term	Long-Term	Short-Term	Long-Term	Short-Term	Long-Term
Mean	1.063***	2.276***	0.534	1.072**	1.778***	4.403*
Median	0.037	0.397**	0.013	0.276	0.237*	0.703**
N	94	83	54	53	40	30

Prior studies also find that managers use the split factor to reveal information.⁵⁴ Given that the motivation to reveal information becomes important after 1992, we hypothesize that investors' reaction to a given split factor will be greater in this interval than in the pre-1993 period. I test this hypothesis by regressing the three-day abnormal returns (AR) on the split factor (SPFAC) for the entire sample period and separately for the two sub-periods and present the results in Table 5.

For the full sample period, I find the coefficient for SPFAC to be positive but insignificant. This result suggests that, on average, investors' reaction to the split announcement by public utilities is not influenced by the split factor. However, I find interesting results when the sample is divided into pre- and post EPACT. The coefficient for SPFAC which is insignificant in the pre-EPACT period becomes highly significant after electric utilities are deregulated. This finding suggests that when information asymmetry is high, investors view the split factor as conveying information, consistent with the signaling hypothesis.

The result presented in Table 5 suggests that the signaling motivation for splitting stocks became important after 1992 when information asymmetry levels increased. Prior to the enactment of EPACT, investors did not view stock splits as revealing information.

3.2.2 Tests of the Marketability Hypothesis

The marketability hypothesis posits that by splitting stocks firms reduce their share price to a preferable trading range. A lower share price enables a greater number of investors to trade economically in round lots and thereby encourages wider stock ownership. Therefore, splitting stocks increases the attractiveness of a firm's shares to individual shareholders. Consistent with this, previous literature documents a significant increase in the number of individual shareholders for industrial firms, investors whose trading behavior is most likely to be affected by a firm's share price. Broadening outside ownership may be value-enhancing especially if it improves liquidity. In this sub-section we examine the marketability hypothesis for the full sample period as well as for the sub-periods before and after the enactment of EPACT.

I first investigate whether there is an increase in the number of shareholders after stock splits by electric utilities. The percentage change in the number of shareholders is measured between the fiscal year-end immediately following the split ex-date and the fiscal year-end preceding the ex-date. The ex-date is obtained from CRSP and the number of shareholders is downloaded from *Compustat*.

Table 6 presents the percentage changes in the number of shareholders for the 1986-2002 period as well as for the pre- and post-EPACT sub-periods. For the full sample period I find a significant average increase of 3.25 percent in the number of shareholders. The median change, however, is small and statistically insignificant. For the pre-EPACT period, the mean (median) increase in the number of shareholders is 4.25% (0.47%), and significant. This result is quite different from that for the 1993 – 2002 interval where the mean change is positive but insignificant.

⁵⁴ See McNichols and Dravid (1990) and Conroy and Harris (1999).

Table 5. Regression Results of Abnormal Returns on Split Factors

resents multivariate regression results overall and by time periods. The dependent variable is the three-day value weighted abnormal return from pre through one day after the announcement date. The independent variable is the split factor. *** denotes significance at 1 percent level.

	1986-2002	1986-1992	1993-2002
Intercept	0.006	0.040	-0.009
SPFAC	0.008	-0.046	0.034***
Adj. R ²	0.005	0.128	0.104
N	108	66	42

Table 6. Percentage Changes in the Number of Shareholders

This table shows the mean and (median) percentage change in the number of shareholders for the clean sample overall and by time periods. The change in the number of shareholders is measured between the fiscal year-end preceding the split ex-date and the fiscal year-end immediately following the ex-date. ** denotes significance at 5 percent level.

	1986-2002	1986-1992	1993-2002
Mean	3.25**	4.246**	1.830
Media	0.02	0.473	-1.800
N	90	53	37

The finding that changes in the number of shareholders is higher in the pre-EPACT period than subsequent to deregulation is consistent with the idea that the marketability motivation for splitting stocks is more likely to occur before 1993 when levels of information asymmetry are the lowest.

The marketability hypothesis also has implications for daily trading volume. In this subsection, I test the hypothesis that daily trading volume changes after the split. Similar to Muscarella and

Vetsuypens (1996) I collect daily trading volumes for 120 days before and after the utility stock split ex-date. Table 7, panel A, shows the mean and median daily dollar volume for the pre- and post-split period for the overall sample during 1986 – 2002 period. On average there is a significant increase in daily dollar volume from \$5.2 million before the split to \$6.1 million after the split, which suggests that similar to industrial firms, public utilities also experience an increase in trading subsequent to splitting stocks.

Table 7. Changes in Trading Patterns Around Utility Splits

This table shows the mean and median change in daily dollar volume 120 days before and 120 days after the split ex-date. The data to calculate the daily dollar volume is taken from CRSP. Panel A shows the results for the overall period that includes 180 public utility stock splits during 1986- 2002 period. Panel B shows the results for the two sub-periods. The t-statistic and Wilcoxon-Z test statistical differences in mean and median between pre and post-split period. * denotes significance at 10 percent level.

Panel A: Overall Period

	Daily Dollar Volume	
	Mean	Median
Pre-split	\$5,188,794	\$802,315
Post-split	\$6,088,658	\$786,719
Change	\$899,864	-\$9,722
t-Statistic/Wilcoxon-Z	1.661*	-0.604

Panel B: Time Period

1986-1992		
Pre-split	\$1,652,432	\$537,897
Post-split	\$1,689,297	\$515,679
Change	\$36,865	-\$15,649
t-Statistic/Wilcoxon-Z	0.493	-0.969
1993-2002		
Pre-split	\$9,415,178	\$1,575,232
Post-split	\$11,346,431	\$1,570,651
Change	\$1,931,253	-\$3,822
t-Statistic/Wilcoxon-Z	1.637*	-0.086

In panel B, I follow the same procedure of the previous section and I break down the sample in two periods, before and after the enactment of EPACT. I examine the changes in trading patterns for from before to after the split ex-date for each of the two sub-periods separately. During the first period, 1986-1992, there is a small and insignificant change between the pre-and post-split daily dollar volume. Median results show a drop in dollar value of shares trades. On the other hand, the second period, 1993-2002 shows a significant average increase of \$1.9 million in daily dollar value of shares traded between pre- and post-split periods.

Overall, I conclude from Table 7 that stock splits by utilities during the period of 1986-2002 increase the daily trading volume marginally on average. However, when the sample is broken into two sub-periods, the results are not the same for the pre- and post-deregulation periods. The 1986-1993 period experiences no significant change in dollar value of shares traded. However, there is an increase in the number of shareholders after the split in this sub-period implying that there is a greater number of small transactions by individual shareholders occurring in this interval. On the other hand, the second period, 1993-2002, experiences a significant increase in the average dollar value of trade, consistent with the liquidity hypothesis.

3.3. Multivariate Analysis

In this section I estimate cross-sectional ordinary least square regressions to determine whether the abnormal returns, found in Table 3, are significantly related to signaling and the marketability variables. The dependent variable is the three-day announcement period return and the independent variables include natural log of firm asset value (LNAT), the split factor (Split), change in operating performance (Δ OPER), price run-up (RUNUP), and percentage change in the number of shareholders (Δ SHOL). I use total assets instead of market value since Lakonishok and Lev (1987) find that market value increases substantially in the period before a split announcement because of the run-up in stock price.

Small firms have greater levels of information asymmetry, are less likely to be covered by analysts, and when covered are followed by fewer analysts. Thus, the signaling hypothesis predicts a negative coefficient for LNAT. The signaling hypothesis also suggests that firms split stocks to convey information about future earnings increases and use split factor to reveal the information. Therefore, we should observe positive coefficients for both Δ OPER and Split. The marketability hypothesis predicts a positive

coefficient for Δ SHOL because liquidity is expected to improve after the split. Finally, if the stock price increase is abnormally large, then managers will be inclined to split their stocks to bring share prices to a typical trading range. Thus, this variable acts as a forecast of the forthcoming stock split. Hence, RUNUP should be negatively related to the announcement returns of stock splits according to the marketability hypothesis. The predicted signs are presented in column two of the table.

Table 8 shows the results of the multivariate analysis for the entire period, 1986 – 2002 and the pre- and post-regulation intervals. For the entire sample period (column three), the coefficient on LNAT is negative and significant indicating that investors react more positively to splits of smaller, less-followed firms and this is consistent with past empirical findings for industrial firms (Grinblatt *et al.*, 1984, Ikenberry *et al.*, 1996). The coefficient for the split factor is positive but insignificant. This finding contradicts the hypothesis that investors view public utility firms with greater split factors as having more favorable private information. The change in operating performance does not seem to influence the announcement return of utility stock splits. The coefficient is -0.028 and insignificant. The coefficient of RUNUP is also not significant suggesting that the price variation previous to the split does not act as a forecast of the forthcoming stock split. Finally, the change in the number of shareholders is positive and significant as predicted implying that investors perceive stock splits by public utilities to increase liquidity.

The fourth and fifth columns show the results regression analysis for the two sub-periods, 1986 – 1992 and 1993 – 2002. For the first period, the coefficient of LNAT is negative and insignificant. Of particular interest in this sub-sample is the coefficient of the change in the number of shareholders which is positive and highly significant ($t = 4.539$). Since information asymmetry in this period is smaller than after the enactment of EPACT, motives other than signaling should predominate in the decision of splitting stocks. The evidence supporting the marketability motivation supports this hypothesis.

For the second period, 1993-2002, the two significant variables are the change in operating performance and the split factor. These results suggest that investors reactions to stock splits by public utilities in this interval suggests that they expect an improvement in operating performance and that the split factor influences their reaction positively. Both of these findings are consistent with the signaling motivation.

Table 8. Regression Results of Test of the Signaling and Marketability Hypotheses

This table presents multivariate regression results overall and by time periods. The dependent variable is the three-day value weighted abnormal return from one day before through one day after the announcement date. The independent variables include the split factor, the price runup, total assets, the change in the number of shareholders, and the change in operating performance. LNAT is the natural logarithm of the firm's total assets the fiscal year-end previous to the split announcement, Split is the split factor, Δ SHO is the percentage change in the number of shareholders from the fiscal year-end previous to the split announcement to the fiscal year-end immediately after the split, and Δ OPER is the change in operating performance from the fiscal year-end previous to the split announcement to the fiscal year-end immediately after the split. The variable runup measures the stock price increase from day -120 to day -6. ***, **, * denote significance at 1, 5 and 10 percent levels, respectively.

Variables	Predicted Signs	1986-2002	1986-1993	1993-2002
Intercept		0.045***	0.046**	0.011
LNAT	-	-0.006***	0.000	-0.004
Split	+	0.009	-0.048	0.032***
Δ OPER	+	-0.028	0.026	0.195***
RUNUP	-	0.000	0.000	0.001
Δ SHOL	+	0.002*	0.007***	0.000
Adjusted R squared		0.094	0.105	0.487

4. Conclusion

This paper examines managerial motivation for splitting stocks in the public electric utility industry before and after the enactment of the Energy Policy Act (EPACT) of 1992. The implementation of EPACT deregulated electric public utilities. Thus firms in this industry moved from a low information asymmetry environment when they were regulated to a high information asymmetry environment when they were deregulated with little oversight.

The change in the regulatory process opened a window of opportunity for the study and comparison of the two leading explanations for stock splits found in the literature, namely signaling and marketability hypotheses. The signaling hypothesis posits that firms split their shares to reveal favorable future information. The marketability hypothesis states that stock splits enhance the attractiveness of shares to investors and increase the volume of trade by restoring prices to a preferred trading range. Hence, the marketability motive should play a more important role in the pre-EPACT era, while signaling motive should dominate in the post-EPACT era due to the increase of information asymmetry.

During the pre-EPACT period (1986-1992) I find that the results are consistent with the idea that marketability motive for splitting stocks predominates given that the levels of information asymmetry are the lowest. I find an increase in the number of shareholders as well as trades by individual investors suggesting that splitting stocks increased the attractiveness of these stocks to small investors. Consistent with the marketability hypothesis, investors' reaction to the split announcement is positively related to the increase in subsequent liquidity.

During the post-EPACT era (1993-2002) when information asymmetry is high I find evidence consistent with signaling motivation for stock splits. Results of univariate analysis suggest a greater change in abnormal operating performance after 1992 relative to the pre-EPACT period. I also find that investors' reaction test is consistent with the signaling hypothesis but only after deregulation. Announcement period returns are related to the change in operating performance as well as the split factor during the 1993-2002 interval. This result suggests that managers use the split factor to convey information about the firm's future performance.

In conclusion, I find evidence which is consistent with both the signaling and marketability hypotheses. For the pre-EPACT period, liquidity explanations seem to predominate in explaining the abnormal announcement return of utility stock splits. The post-EPACT period on the other hand seems to have the signaling motive as a leading explanation of abnormal announcement return.

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