Information effects in financial distress

The case of Seabrook Station

Fred R. Kaen
University of New Hampshire, Durham, NH 03824, USA

Hassan Tehranian
Boston College, Chestnut Hill, MA 02167, USA

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In 1972 a group of electric utilities announced plans to construct Seabrook Station, a nuclear generating facility. In 1988, the lead partner in the venture, Public Service Company of New Hampshire (PSNH), filed for bankruptcy. Examination of the stock price effects of a variety of financial events preceding the bankruptcy filing shows that information about cash flows paid to PSNH security holders affected the common stock prices of PSNH and its Seabrook partners, whereas information about investment and operating cash flows had little or no effect.

1. Introduction

Finance theory regards financial markets as sophisticated information processing systems. The accumulation of empirical evidence since the 1960s has generally confirmed the theory's predictions by showing that publicly released information is rapidly incorporated in security prices. Much of this empirical work, however, has evaluated the stock price reactions of many companies to a single type of event, such as a merger, dividend, or security issue announcement. Less attention has been directed to the question of how

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news about a continuing event such as a major investment program affects
the security prices of the company or companies involved. Recent work by
Cutler and Summers (1988), Baldwin and Mason (1983), and Ruback (1983),
though, raises some interesting theoretical and institutional questions. For
example, Cutler and Summers use their examination of the Texaco–Pennzoil
litigation to raise questions about the explanatory power of current bargain-
ing theory and the importance of bankruptcy costs in capital structure theory.

We use this focused approach to investigate the reaction of security prices
to the disclosure of various financial setbacks associated with the construc-
tion of Seabrook Station, a nuclear generating plant owned jointly by a
number of electric utilities.1 We examine two questions. First, how did the
market respond to news about financial and economic problems associated
with the construction of Seabrook? Second, to what extent were news items
about the managing partner's economic situation reflected in the time series
of security returns of the other privately owned joint venture partners?

We are interested in Seabrook's history of financial distress because the
investment and financing decisions were all ratified by state and federal
regulatory agencies. Those agencies have the power to modify or overturn
decisions that, in an unregulated setting, would normally be left in the hands
of managers acting as agents for the stockholders. As part of the 'social
contract' by which they yield this power to a regulatory body, the utility
owners are promised a fair rate of return on their investment. The implica-
tion of this promise is that regulatory bodies, through the rate setting
process, may permit regulated utilities to survive financial and economic
shocks by passing the costs through to the rate payers.

We find that announcements about the quality or amount of cash flows
paid to security holders of the Public Service Company of New Hampshire
(PSNH) triggered stock price reactions for both PSNH and its partners.
Announcements about operating or investment cash flows, however, do not
trigger price movements in the partner company common stock prices and
are associated with relatively small, if any, movements in PSNH's stock price.
These results are consistent with a conjecture that news about operating cash
flows is interpreted differently from news about cash payments to the security
holders.

The paper is organized as follows: section 2 contains background informa-
tion about Seabrook and a discussion of the events we examine. Our research
procedure is described in section 3. We report our empirical results in
section 4 and our conclusions in section 5.

1We use the term public utilities to include both privately owned stock form utilities and
municipally owned utilities or utility cooperatives. We use the term investor-owned utilities to
refer to the privately owned stock form category.
2. Seabrook Station history and events

2.1. The history

In 1972, PSNH announced plans to build nuclear generating facilities in Seabrook, New Hampshire. This project became known as Seabrook Station. Originally it included plans for four separate generating units. Although the application for construction was filed with the State of New Hampshire in early 1972, the official groundbreaking ceremony was not held until August 1976. In March 1990, the plant finally received a full power operating license with court appeal pending.

When Seabrook Station was first announced, construction costs were estimated at $1.0 billion. PSNH was to own 50% of the facility. Thus, with total pre-Seabrook assets of $1.0 billion, PSNH was embarking on a project that would increase its asset base by 50%.

Eleven other investor-owned and five municipal utilities joined the original project. The private utilities, including PSNH, owned 85%; the publics, the remaining 15%. One private utility – Vermont’s Green Mountain Power and Light Company – left the project very early because of its own financial difficulties.

The privately owned utilities that retained pieces of the project through the end of 1985 are listed in table 1, along with their ownership interests and the percentage of each utility’s total assets represented by this interest on

<table>
<thead>
<tr>
<th>Seabrook partner</th>
<th>Seabrook ownership as a percent of total assets</th>
<th>Total assets (billions)</th>
<th>Ownership of Seabrook as percent of assets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Service Co. of N.H.</td>
<td>35.57%</td>
<td>$2.663</td>
<td>66.7%</td>
</tr>
<tr>
<td>Bangor Hydro-Electric Co.</td>
<td>2.17</td>
<td>0.187</td>
<td>58.2</td>
</tr>
<tr>
<td>Commonwealth Energy System</td>
<td>3.32</td>
<td>0.727</td>
<td>24.2</td>
</tr>
<tr>
<td>Central Maine Power</td>
<td>6.04</td>
<td>1.153</td>
<td>26.2</td>
</tr>
<tr>
<td>Central Vermont Public Service</td>
<td>1.59</td>
<td>0.374</td>
<td>20.6</td>
</tr>
<tr>
<td>Eastern Utilities Associates</td>
<td>2.90</td>
<td>0.714</td>
<td>20.3</td>
</tr>
<tr>
<td>Fitchburg Gas and Electric</td>
<td>0.86</td>
<td>0.098</td>
<td>43.9</td>
</tr>
<tr>
<td>Maine Public Service Co.</td>
<td>1.46</td>
<td>0.115</td>
<td>63.4</td>
</tr>
<tr>
<td>New England Electric System</td>
<td>9.96</td>
<td>3.687</td>
<td>13.5</td>
</tr>
<tr>
<td>Northeast Utilities</td>
<td>4.06</td>
<td>6.147</td>
<td>3.3</td>
</tr>
<tr>
<td>United Illuminating</td>
<td>17.50</td>
<td>1.652</td>
<td>52.9</td>
</tr>
</tbody>
</table>

*Ownership as percent of assets defined as company’s dollar investment in Seabrook assets divided by the company’s total assets.
December 31, 1985. The calculation is based on a projected construction cost of $5.0 billion. Financial data for 1985 are used because five of the partners - Central Maine Power, Central Vermont Public Service, Bangor Hydro-Electric Company, Fitchburg Gas and Electric Company, and Maine Public Service - sold their interests to a unit connected with Eastern Utilities in 1986. Through 1985, the partner ownership stakes represented from 3% to 67% of the partners' year-end total assets, with nine being greater than 20%.

2.2. The events

We divide our events into two major categories. The first contains announcements about the quality and amount of cash flows PSNH is expected to pay its bondholders and stockholders. We label these events financial status events. They include security rating changes, financial statement qualifications, and bankruptcy prognostications.

Our second major category contains announcements about construction delays associated with judicial and regulatory decisions, revised construction cost estimates, ownership changes, and political climate changes. We label these events asset value events.

This classification scheme distinguishes between news about operating and investment (asset value) cash flows and news about cash distributions to the security holders. Such a distinction is important in a regulated industry because regulators can 'undo' unexpected negative and positive operating cash flow shocks through the rate setting process. Consequently, financial market participants might ignore operating cash flow news because they believe regulatory actions will offset any otherwise expected changes in the company's fundamental value.

Our events are listed by category and subcategory in table 2 and in tables 5 through 8. There are 26 financial status events and 24 asset value events. We use standard event methodology to examine stock price reactions to the event announcements.

3. Data and research design

3.1. Data

The data analyzed are common stock daily rates of return from the Center for Research in Security Prices (CRSP) files from February 1, 1972 through January 29, 1988. February 1, 1972 was the date that PSNH filed a Seabrook construction permit application with the New Hampshire Site Evaluation

2 The return data from January 4, 1988 through February 1, 1988 were hand-gathered from the Wall Street Journal and adjusted for any dividend payments.
Committee. January 29, 1988 is when PSNH filed for protection from creditors under Chapter 11 of the bankruptcy code.

Eight of the original eleven investor-owned Seabrook Station companies (including PSNH) have returns on the CRSP files prior to the first event date which is February 25, 1974. Returns for Fitchburg Gas and Electric Company begin in October 1975, which is before all but our first event. Returns for Bangor Hydro-Electric Company are not available on the CRSP files so this company is eliminated from our analysis. The electric cooperatives and municipally owned utilities are not included because no common stock is associated with their organizational form.

We checked the Wall Street Journal Index for other news about PSNH reported around the event announcement date. Frequently there is a clustering of financial distress events. Therefore, we further identify our events as clean or contaminated. An event is classified as clean if no other news is reported in the period beginning two days before and ending one day after the event announcement date. Clean events have #’s after their respective announcement dates in table 2 and in tables 5 through 8.

3.2. Research design

We use common event study methodology to detect abnormal security returns for PSNH and the Seabrook partner companies. We calculate the prediction error for event day \( t \) as follows:

\[
PE_{jt} = R_{jt} - (\hat{\alpha}_j + \hat{\beta}_j R_{Ut} + \hat{\beta}_j' R_{Mt}),
\]

where

- \( PE_{jt} \) = prediction error for company \( j \) on event day \( t \).
- \( R_{jt} \) = daily return of company \( j \) common stock on day \( t \).
- \( R_{Ut} \) = daily return on an equally weighted index of utility common stocks on day \( t \);
- \( R_{Mt} \) = daily return on the CRSP equally weighted index,
- \( \hat{\alpha}_j \) = ordinary least squares (OLS) estimate of the regression model intercept term estimated during the postevent scale period, and
- \( \hat{\beta}_j \) = OLS estimate of the model regression coefficient for company \( j \) estimated during the postevent scale period.

\(^3\)For example, events 7, 8, 9, and 19 occurred within five trading days of one another. Events 5 and 21 occurred on consecutive days. Events 11, 12, and 24 occurred within four days of one another. All of these events are identified as contaminated events.
An index of utility returns as well as an index of market returns is used to calculate prediction errors to remove any industry effects. The utility index is constructed by weighting equally the returns of the non-Seabrook utilities in the CRSP files that have the same four-digit industry code as PSNH. Only utilities that have daily returns from February 1, 1972 through December 31, 1988 are included. The total number of utilities in this index is 52.

The period used to estimate the regression parameters is day $t + 61$ to day $t + 360$, where day $t = 0$ represents the event announcement date. We use postevent estimation period because the change in financial position associated with financial distress events may also be associated with a change in the market risk of the company. Prediction errors are calculated for each security from day $-10$ to day $+10$. For a sample of $N$ securities in our Seabrook partner portfolios the average prediction error ($APE$) for each day $t$ is calculated as:

$$APE_t = \frac{1}{N} \sum_{j=1}^{N} PE_{jt}.$$  \hspace{1cm} (2)

We also combine the prediction errors into our event subgroups to test for the presence of abnormal returns by a group.

The statistic used to test the significance of abnormal returns is based on the time series variance of the prediction errors from the market and utility market models from day $+61$ to day $+160$. For the daily average prediction error, the statistic is:

$$t = \frac{APE_t}{s_{APE}},$$  \hspace{1cm} (3)

where

$$s_{APE} = \left[ \frac{1}{99} \sum_{t=61}^{160} (APE_t - \overline{APE})^2 \right]^{1/2}.$$  

4The analysis was also performed by applying a one-factor index model. In no instance were the results different.

5We also used a pre-event estimation from day $-136$ to day $-16$ in event time. The results are not sensitive to the estimation period.

6The cumulative prediction errors were calculated for days $-10$ to $-2$ and $+2$ to $+10$ so as to test for early or delayed reactions to the announcements. No significant results were obtained.

7Similar results were obtained using the mean-adjusted returns discussed in Brown and Warner (1985) for calculating the prediction errors.

8In the case of abnormal returns for PSNH, the $APE$ is the same as the prediction error because we are considering only one stock.
and

$$\overline{APE} = \frac{1}{100} \sum_{t=1}^{160} APE_t.$$\(\text{(1)}\)

The cumulative prediction error (CPE) over \(k\) days from \(T\) to \(T + k\) is calculated as

$$CPE_{T,T+k} = \sum_{t=T}^{T+k} APE_t.$$\(\text{(4)}\)

The significance of \(CPE_{T,T+k}\) is tested with

$$t = \frac{CPE_{T,T+k}}{\sqrt{k} s_{APE}}.$$\(\text{(5)}\)

In both cases the test statistic is assumed to be distributed Student-\(t\) with 99 degrees of freedom. The test statistics are calculated as in Holthausen and Leftwich (1986).

4. The events

Our events and their associated two-day (\(t = -1\) to \(t = 0\)) announcement-period abnormal returns are listed in table 2 and in tables 5 through 8. Cumulative prediction errors for both PSNH and the Seabrook partner company portfolio are reported for each event as well as for event categories. The Seabrook portfolio does not contain PSNH common stock. It is an equally weighted portfolio.

4.1. Financial status events: Security rating changes

Moody’s and Standard and Poor’s evaluate and rate PSNH securities. Their ratings reflect the opinions of independent financial experts who have more information, access to information, and/or information processing skills than the typical public investor. Therefore, rating revisions by these agencies may convey information to other investors (and public utility commissions) about changes in the financial health of a company and the risk and return characteristics of its securities. Griffin and Sanvicente (1982) as well as

\[\text{Depending on what time during the trading day the announcement was made, either the publication day or the day before might be the relevant announcement day. Since the exact time of the announcement is unknown, the announcement period is the two trading days } t = -1 \text{ and } t = 0 \text{ relative to the published announcement.} \]
Holthausen and Leftwich (1986) provide evidence supporting this assertion, at least for bond rating changes.

Changes in PSNH security ratings may also convey information about the financial status of the Seabrook partner companies, including the possibility of partner company securities being rerated. This hypothesis is plausible because virtually every PSNH rating change mentions Seabrook as a prime cause for the revision.

We obtain information about PSNH security rating changes by searching the Wall Street Journal Index, Moody’s Bond Survey, and Standard and Poor’s Credit Week. We identify sixteen rating change announcements between the time Seabrook construction plans are announced and the date PSNH files for bankruptcy. There are thirteen bond or combined bond and preferred stock downgradings, two preferred stock only downgradings, and a bond upgrading announcement. The announcements are listed in table 1. The date assigned to each event is the earlier of its appearance in the Wall Street Journal or the rating agency announcement release date.

Seabrook Station is the focal point of every rating change. Two years before ground was even broken, Moody’s was citing the project and noting: ‘Annual construction expenditures will be increasing sharply now and with the company’s low internal cash generation relative to such spending, external reliance for funds will be heavy for the foreseeable future’ (Moody’s Bond Survey, January 25, 1974, p. 1270). Moody’s proceeded to lower all outstanding bonds to Baa from A. Standard and Poor’s quickly followed in March 1974 by lowering PSNH bonds to BBB from A. Eventually, Moody’s dropped its ratings on PSNH debentures to Caa and Standard and Poor’s dropped the debentures to D.

Eleven of the thirteen bond and combined bond and preferred stock downgrading events reported in table 2 have negative two-day abnormal returns. Of the two events with positive abnormal returns, one (event 12) occurred three days after Standard and Poor’s said it would reduce debt ratings to D− if PSNH did not make a debt interest payment soon. That earlier announcement was associated with a significantly negative two-day abnormal return. PSNH did not make the interest payment and Standard and Poor’s lowered the rating to D−; the failure was apparently anticipated by the market.

Debt rating reductions continue to produce statistically significant negative abnormal returns when only clean rating events are used. The summary line for cumulative prediction errors across clean PSNH bond downgrades shows that the two-day announcement period cumulative abnormal return is −20.39% with a t-statistic of −4.70, which is significantly different from zero at the 0.01 level.

Bond rating reductions to below investment grade are associated with larger negative abnormal returns than the other rating reductions. The first
Table 2
Two-day cumulative percentage prediction errors (CPEs) on PSNH Seabrook partners' common stock for Seabrook security rating change events, 1974 to 1988 (t-statistics in parentheses).

<table>
<thead>
<tr>
<th>Event number</th>
<th>Event date</th>
<th>Event description</th>
<th>CPEs for PSNH</th>
<th>CPEs for Seabrook partners</th>
<th>Number of partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>02/25/74#</td>
<td>Moody's reduces ratings on first mortgage bonds from A to Baa. Moody's says: 'Annual construction expenditures will be increasing sharply now and with the company's low internal cash flow, external reliance for funds will be very heavy for the foreseeable future.'</td>
<td>-0.83</td>
<td>-0.27</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-0.23)</td>
<td>(-0.13)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>01/18/82#</td>
<td>Standard and Poor's reduces ratings on PSNH general and refunding bonds to BB+ from BBB-; first mortgage bonds are dropped from BBB- from BBB; preferred stock is dropped from BB- from BB+. The headline in the WSJ story is: 'PS New Hampshire's Seabrook Funding is Clouded by S&amp;P's Cut in Bond Ratings.'</td>
<td>-6.37</td>
<td>-2.12</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-4.02)</td>
<td>(-2.18)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>06/03/82#</td>
<td>Standard and Poor's downgrades first mortgage bonds to below investment grade from BBB-; general and refunding bonds to BB- from BB+; and preferred stock to B- from BB+. The WSJ story says: 'Standard and Poor's cited impairment in financial flexibility and liquidity, while the utility tries to finish building the $3.6 billion Seabrook nuclear power plant.'</td>
<td>-3.78</td>
<td>-2.06</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-3.90)</td>
<td>(-2.15)</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>08/12/82#</td>
<td>Moody's downgrades all first mortgage bonds to Baa (below investment grade) from Baa3; all general and refunding bonds to Baa3 from Baa; preferred stock to Baa3 from Baa. Moody's ties rating changes to Seabrook.</td>
<td>-1.34</td>
<td>-0.76</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-0.62)</td>
<td>(-0.82)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>01/07/83</td>
<td>Standard and Poor's lowers first mortgage bonds to BB from BB+; general and refunding bonds to B+ from BB-; and preferred stock to B from BB+. Seabrook is mentioned as a major concern.</td>
<td>-2.23</td>
<td>-0.80</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.41)</td>
<td>(-0.72)</td>
<td></td>
</tr>
<tr>
<td>Event number</td>
<td>Event date</td>
<td>Event description</td>
<td>CPEs for PSNI</td>
<td>CPEs Seabrook</td>
<td>Number of partners</td>
</tr>
<tr>
<td>--------------</td>
<td>------------</td>
<td>-------------------</td>
<td>---------------</td>
<td>---------------</td>
<td>------------------</td>
</tr>
<tr>
<td>6</td>
<td>03/16/84#</td>
<td>Moody's downgrades PSNI debentures and guaranteed Euronotes to B1 from Ba3 and preferred stock to ba3 from b1. Moody says: 'The cost increases and delays at the Seabrook nuclear power plant place an added burden on PSNI...'.</td>
<td>-0.83 (0.14)</td>
<td>-0.40 (0.30)</td>
<td>9</td>
</tr>
<tr>
<td>7</td>
<td>04/12/84</td>
<td>Standard and Poor's lowers PSNI first mortgage bonds to B - from BB; general and refunding bonds to CCC from B +; and preferred stock to C from CCC.</td>
<td>-0.51 (0.92)</td>
<td>-0.74 (0.98)</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>04/16/84</td>
<td>Moody's lowers ratings on first mortgage bonds to Ba3 from Ba1; general and refunding bonds to B2 from Ba3, and debentures and Eurodollar notes to B3 from B1. Moody says company may have to seek protection under the bankruptcy code.</td>
<td>3.90 (0.67)</td>
<td>0.54 (0.40)</td>
<td>9</td>
</tr>
<tr>
<td>9</td>
<td>04/23/84</td>
<td>Moody's lowers first mortgage bonds to B3; general and refunding bonds to Caa; debentures and Eurobonds to Caa; preferred stock to Caa. Reductions are tied to Seabrook and prospects of bankruptcy are noted.</td>
<td>-28.73 (4.93)</td>
<td>-3.16 (2.28)</td>
<td>9</td>
</tr>
<tr>
<td>10</td>
<td>09/29/87#</td>
<td>Moody's downgrades PSNI's long-term debt, reflecting utility's recent statement that it is likely to stop paying cash interest on certain securities after October 1; about $1.3 billion of securities are affected.</td>
<td>-7.24 (2.60)</td>
<td>-2.43 (1.68)</td>
<td>5</td>
</tr>
<tr>
<td>11</td>
<td>10/12/87</td>
<td>Standard &amp; Poor's will reduce its rating of utility debentures to D from CCC if firm fails to make an interest payment due soon.</td>
<td>-6.71 (2.36)</td>
<td>-2.09 (1.34)</td>
<td>5</td>
</tr>
<tr>
<td>12</td>
<td>10/18/87</td>
<td>Standard &amp; Poor's lowers its rating of PSNI debt and preferred stock because directors decided to stop paying interest on certain debentures; about 1.9 billion of securities are affected.</td>
<td>2.83 (0.09)</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>12/02/87</td>
<td>Standard and Poor's lowers its ratings on utility's unsecured pollution control revenue bonds to D from CCC; change, which affects about $20 million of bonds, is in anticipation of PSNI's omission of a $1.3 million interest payment on the bonds.</td>
<td>-9.37 (3.41)</td>
<td>-2.51 (1.73)</td>
<td>5</td>
</tr>
</tbody>
</table>
I6 Ol/BI/H0 Moody's raises rating on I'SNI I first mortgage bonds IO; general and interest third mortgage bonds. Moody's cites a favorable ruling by the New Hampshire PUC on proposed Senbrook linancing as a major reason for the upgrade.

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Announcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 04/01/81#</td>
<td>WSJ announcement of preferred stock downgrade to BB from BBB by Standard and Poor's; the lowered rating is in connection with an announced new offering of preferred stock on 3/25/81.</td>
</tr>
<tr>
<td>15 05/16/84</td>
<td>Standard and Poor's lowers preferred stock rating to C from CCC.</td>
</tr>
</tbody>
</table>

**Cumulative prediction errors across all events**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>66.11</td>
<td>-17.49</td>
</tr>
<tr>
<td></td>
<td>(-6.34)</td>
<td>(-3.87)</td>
</tr>
</tbody>
</table>

**Cumulative prediction errors across clean events**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>20.39</td>
<td>-8.04</td>
</tr>
<tr>
<td></td>
<td>(-4.70)</td>
<td>(-2.96)</td>
</tr>
</tbody>
</table>

**Panel B: Preferred Stock Downgrades**

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Announcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>14 04/01/81#</td>
<td>WSJ announcement of preferred stock downgrade to BB from BBB by Standard and Poor's; the lowered rating is in connection with an announced new offering of preferred stock on 3/25/81.</td>
</tr>
<tr>
<td>15 05/16/84</td>
<td>Standard and Poor's lowers preferred stock rating to C from CCC.</td>
</tr>
</tbody>
</table>

**Panel C: Bond Upgrade**

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Announcement</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 01/31/86</td>
<td>Moody's raises rating on PSNI first mortgage bonds to B1; general and interest third mortgage bonds. Moody's cites a favorable ruling by the New Hampshire PUC on proposed Seabrook financing as a major reason for the upgrade.</td>
</tr>
</tbody>
</table>

Events are numbered by specific event category; within each category the events are in order by calendar date.

# indicates clean events for which no other announcements are found in the Wall Street Journal Index in the period two days before through one day after the event announcement date.

Cumulative prediction error is calculated over the two trading days $t = -1$ and $t = 0$ relative to the published announcement.

Significant at the 0.10 level two-tail test.

Significant at the 0.05 level two-tail test.

Significant at the 0.01 level two-tail test.

Positive and significant abnormal return is due to the announcement of plans to avoid bankruptcy filing. See the effect of 5/15/84 bankruptcy events.
such reduction occurs on January 18, 1982, and generates a two-day abnormal return of $-6.37\%$ with a $t$-statistic of $-4.02$, which is significant at the 0.01 level.\(^{10}\)

Our bond rating change results are consistent with those reported in other studies. Holthausen and Leftwich (1986) report negative abnormal returns for bond downgrades, with larger negative returns for rating reductions across letter grades, e.g., from A to BBB. They report no abnormal returns for bond rating increases.

We find no statistically significant abnormal returns associated with the clean preferred stock rating changes. These results are consistent with results reported by Stickel (1986) and Davidson and Glasnock (1985).

Several of the reviews of PSNH securities ratings were prompted by proposed bond or preferred stock offerings. None of these security offering announcements are themselves associated with statistically significant excess returns for PSNH. Apparently, even though market participants knew that PSNH securities were to be reviewed because of the proposed security offering, it did not fully anticipate the outcome of the rating process. For example, on May 15, 1982, PSNH announced it would offer $50.0$ million of new bonds. This announcement was associated with a two-day statistically insignificant announcement period abnormal return of $0.15\%$. The rating review prompted by the announcement, however, resulted in Standard and Poor's lowering outstanding PSNH bonds to below investment grade, an action associated with a highly significant negative two-day abnormal return of $-3.78\%$.

Column 5 of table 2 contains the two-day prediction errors associated with PSNH security rating changes for the Seabrook partner common stock portfolio. Depending on the event date, the number of partners ranges from five to nine. The Seabrook partner results are virtually identical to the PSNH results.

Twelve of the thirteen PSNH debt rating reductions are associated with negative abnormal returns. Five of the individual negative returns are statistically significant. The cumulative prediction error for these events is $-17.49\%$ and is statistically significant at the 0.01 level.

The first two highly significant Seabrook partner negative abnormal returns in table 2 (events 2 and 3) are for the two 1982 rating reductions of PSNH debt securities to below investment grade. These rating reductions contain bad news for the Seabrook partner stockholders as well as the PSNH stockholders.

\(^{10}\)A rating change is within class if the change occurs within any of three gradations for a given class, e.g., AA+ to AA or AA−. A rating change is across classes if it changes from one letter grade to another, say A− to BBB. A rating change is below investment grade if the ratings are dropped to below Baa by Moody's and BBB by Standard and Poor's.
Table 3
Seabrook partner companies included in the clean-clean event analyses, 1974 to 1988.

<table>
<thead>
<tr>
<th>Event</th>
<th>Common Wealth</th>
<th>Central Vermont</th>
<th>Eastern Fitchburg</th>
<th>Maine Public Utilities</th>
<th>Gas and Service Electric</th>
<th>Northeast Utilities</th>
<th>Illuminating</th>
</tr>
</thead>
<tbody>
<tr>
<td>02/25/74</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01/18/82</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>06/03/82</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>08/12/82</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>03/16/84</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>09/29/87</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Panel A: Bond Downgrade

Panel B: Bankruptcy

The April 23, 1984 rating reduction announcement, the third significant event in table 2 (event 9), occurs during a period when much news about PSNH's financial distress is forthcoming, so it is difficult to attribute this reaction solely to a rating change announcement.

This noisy situation also characterizes the marginally statistically significant December 2, 1987 reduction of PSNH pollution control revenue bonds from C to D (event 13). Like event 9, however, this was a rating reduction across investment grades, a result which continues to be consistent with Holthausen and Leftwich (1986).

To remove some of the noise from our Seabrook partner portfolio, we drop for each event any company for which an unrelated announcement appears in the Wall Street Journal Index over the period two days before through one day after the PSNH announcement. Table 3 contains a matrix displaying which PSNH bond downgrades and bankruptcy events are clean for both PSNH and the Seabrook partner companies ("clean-clean" events).

For each clean PSNH event listed in table 3, a clean-clean equally weighted Seabrook partner portfolio was constructed. For example, for event 1 (2/25/74) in tables 3 and 4, the equally weighted portfolio contains common stocks from Commonwealth Energy System, Eastern Utilities Associates, Maine Public Service Company, Northeast Utilities, and United Illuminating. The abnormal returns from these clean-clean events are reported in table 4.

The signs on every one of these clean-clean events are negative. Furthermore, the size and significance of the negative two-day announcement period
average abnormal returns for January 18 and June 3, 1982 – the dates on which PSNH bonds were dropped to below investment grade – increases. Removing the noisy debt rating reduction announcements from the Seabrook partner sample strengthens the observed association between the PSNH events and their effects on the partner company portfolio.

As with PSNH itself, there is no discernable association between PSNH preferred stock rating changes and the partner portfolio stock prices. This outcome also holds for the one PSNH bond upgrade event.

4.2. Financial status events: Bankruptcy prognostications

We identify ten events we believe are primarily bankruptcy information announcements. We label them bankruptcy prognostication events and list them in table 5. Almost all of the abnormal returns associated with these events have the expected sign and are statistically significant.

The first event is a 1982 announcement by the New Hampshire Public Utilities Commission that unless PSNH is able to reduce its percentage ownership in Seabrook it may face bankruptcy. This clean event produces a highly significant two-day negative 12.55% abnormal return. Five days later,
Standard and Poor's lowers PSNH bond ratings, which, as noted earlier, results in another negative abnormal return of 6.37%.

Four bankruptcy events are clustered in the second quarter of 1984, a year of considerable turmoil for PSNH. On April 3 (event 18), Peat Marwick and Mitchell, in qualifying PSNH's 1983 financial statement, says PSNH may have to seek the protection of a bankruptcy court. The abnormal return for that announcement is a significant -35.84%.

Some two weeks later (event 19), PSNH directors vote to omit cash dividends on common and preferred stock because of threatened bankruptcy proceedings. This announcement is associated with a -25.37% abnormal return.

In early May (event 20), PSNH fails to make a scheduled $3 million loan principal payment and is declared in technical default. A -12.61% abnormal return is observed.

On May 15 (event 21), the owners of Seabrook approve a Merrill Lynch financing plan that allows PSNH to escape bankruptcy. A positive 16.10% abnormal return is recorded for this announcement.

Although all of these 1984 announcements produce large abnormal returns, they are contaminated with other news on or close to the announcement date. Therefore, we cannot be confident that the stock price is reacting only to the bankruptcy news.

In 1985, Peat Marwick and Mitchell once again qualifies PSNH's financial results. Although a negative abnormal return is observed, it is not statistically significant.

In 1987 there are two clean bankruptcy announcements. A June Wall Street Journal article about likely problems PSNH would face in raising funds to avoid insolvency is associated with a significant negative abnormal return of -9.95%. This event is followed in December by a creditor's filing suit to attach some of PSNH's assets, an event that produces a -9.32% abnormal return.

Our other 1987 event is a vote by PSNH on October 14 to suspend interest and principal payments on $800 million of debt. This is the only bankruptcy event with the 'wrong' sign. We believe this payment suspension was widely anticipated, however, because it quickly followed a Standard and Poor's October 12 announcement that it would lower PSNH bonds to D were the payment not made.

For example, on the day before the PMM qualification, the owners of Seabrook decided to cancel the second reactor unit. On the day after the event, New Hampshire threatened to block or delay construction of a power line unless the partner companies or their regulatory agencies 'helped' PSNH and Seabrook. The day before the dividend omission, PSNH laid off 5,200 workers at Seabrook. The day after the May 8 technical default, the banks said they would not force the company into bankruptcy court.
Table 5

Two-day cumulative percentage prediction errors (CPEs) on PSNH Seabrook partners' common stock for Seabrook bankruptcy events, 1974 to 1988

<table>
<thead>
<tr>
<th>Event number</th>
<th>Event date</th>
<th>Event description</th>
<th>CPEs for PSNH</th>
<th>CPEs for Seabrook partners</th>
<th>Number of partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td>01/13/82#</td>
<td>New Hampshire PUC raised the specter of bankruptcy for PSNH in an order granting an 8% rate increase unless PSNH is able to reduce its 35% interest in Seabrook.</td>
<td>-12.55</td>
<td>-0.20</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-7.78)</td>
<td>(-0.23)</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>04/03/84</td>
<td>Peat Marwick and Mitchell qualifies 1983 results and says PSNH may have to seek bankruptcy court protection.</td>
<td>-35.84</td>
<td>-2.74</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-6.27)</td>
<td>(-2.04)</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>04/20/84</td>
<td>Threatened with bankruptcy law proceedings, firm's directors vote to omit dividends on preferred and common stock.</td>
<td>-25.37</td>
<td>-4.93</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-4.20)</td>
<td>(-3.71)</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>05/08/84</td>
<td>PSNH fails to make a $3 million principal payment on loan and is declared in technical default.</td>
<td>-12.61</td>
<td>1.12</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-2.09)</td>
<td>(0.82)</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>05/15/84</td>
<td>Owners of Seabrook approve a revised Merrill Lynch plan to finance completion of the first two reactors; the move apparently allows PSNH to avoid a threatened bankruptcy filing.</td>
<td>16.10</td>
<td>2.31</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(2.78)</td>
<td>(1.78)</td>
<td></td>
</tr>
<tr>
<td>22</td>
<td>02/22/85#</td>
<td>PSNH announces Peat Marwick and Mitchell has qualified its opinion of 1984 results.</td>
<td>-0.50</td>
<td>-0.59</td>
<td>9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-0.12)</td>
<td>(-0.41)</td>
<td></td>
</tr>
</tbody>
</table>
Wall Street seems suddenly uneasy about PSNI's prospects, raising doubts about its plans to sell long-term debt this fall, a financing the company says is essential for it to avoid seeking bankruptcy court protection.

PSNII votes to suspend interest and principal payments on $800 million debt.

PSNI-I's efforts to avoid seeking bankruptcy-court protection are set back as MidAtlantic National Bank, a creditor, files suit to attach some of the utility's property because of defaults on interest payments; while suit in itself won't force a bankruptcy court filing, it could set off a scramble by other unsecured creditors to seek similar attachments.

PSNI, burdened by heavy debt for the controversial Seabrook nuclear power plant, files for protection from creditors under Chapter 11 of the Federal Bankruptcy Code.

Cumulative prediction errors across all events except event no. 21

Cumulative prediction errors across clean events except event no. 21

Events are numbered by specific event category; within each category the events are in order by calendar date.

# indicates clean events for which no other announcements are found in the Wall Street Journal Index in the period two days before through one day after the event announcement date.

Cumulative prediction error is calculated over the two trading days \( t = -1 \) and \( t = 0 \) relative to the published announcement.

Significant at the 0.10 level two-tail test.

Significant at the 0.05 level two-tail test.

Significant at the 0.01 level two-tail test.
The final bankruptcy event is the PSNH Chapter 11 filing. It had a two-day negative abnormal return of $-20.89\%$ with a $t$-statistic of $-7.34$. Like Clark and Weinstein (1983), we find that news was released in this bankruptcy filing even though it was widely anticipated.

The cumulative sum of the nine two-day abnormal returns associated with announcements of impending bankruptcy is $-125.98\%$. For the clean bankruptcy events, the cumulative sum is $-32.32\%$. The associated $t$-statistics are $-11.34$ and $-7.25$. Both statistics are significant at the 0.01 level. These results are consistent with the findings of Aharony, Jones, and Swary (1980), who report that shareholders experience abnormal losses of 76\% over a period from four to six years prior to bankruptcy.

We conclude that the bankruptcy announcements contain new information about PSNH. In comparison with the abnormal returns observed for the security rerating, the abnormal returns associated with the bankruptcy announcements are large.

Seabrook partner company common stock prices are also affected by PSNH bankruptcy prognostications. The cumulative two-day abnormal return associated with announcements of impending bankruptcy is $-14.73\%$, which is statistically significant at the 0.01 level. The single PSNH bankruptcy avoidance announcement produces a statistically significant positive cumulative abnormal return of $2.31\%$ on the Seabrook partner portfolio.

An examination of the individual bankruptcy events reveals that the average effect is not attributable to one or two announcements. Virtually all of the individual announcements display the expected sign and five of the ten are statistically significant.

A mild surprise in table 5 is the weak negative reaction of the Seabrook partner companies to the first PSNH bankruptcy event. This is the New Hampshire PUC report stating that if PSNH is unable to reduce its Seabrook ownership substantially it may find itself in serious financial difficulty. This announcement results in a significant negative $12.55\%$ PSNH abnormal return but only an insignificant $-0.20\%$ abnormal return for the partner portfolio. Apparently, the market reacted as if any potential Seabrook problems would be limited to PSNH itself. Alternatively, the market may have interpreted the PUC statement as being primarily political and not truly reflective of any severe difficulties.

The first time the partners are affected by a bankruptcy announcement is in April 1984 (event 18), when Peat Marwick and Mitchell, in qualifying PSNH financial statements, says the company may have to seek the protection of the bankruptcy court. This significant negative reaction of $-2.74\%$ is followed by an even larger significant negative abnormal return of $-4.93\%$ on the partner portfolio when PSNH management omits cash dividend payments on its preferred and common stock (event 19).
The 1984 Merrill Lynch financial rescue plan (event 21) is greeted as good news by the market; it produces a positive and marginally significant partner portfolio abnormal return of 2.31%. However, an insignificant negative effect is observed once again in 1985 when Peat Marwick and Mitchell qualifies PSNH's 1985 operating results (event 22).

The June 1987 *Wall Street Journal* news about PSNH's deteriorating prospects (event 23) produces a statistically significant spillover on the partner companies. An announcement in October 1987 (event 24) that PSNH will suspend interest and principal payments on outstanding debt has no effect and was probably anticipated. The last 1987 event (event 25) is the creditor suit filed by Midatlantic National Bank. It is associated with a negative but not significant partner abnormal return.

The Seabrook partner portfolio sustains a $-3.79\%$ significant two-day announcement period abnormal return when PSNH files for protection under Chapter 11 (event 26).

As with the bond downgrading events, we also eliminate the noisy bankruptcy events and examine only the clean-clean events in this group. The two-day announcement period abnormal returns for these clean-clean events are also reported in table 4. The returns are all negative and support the interpretations we offer for the outcomes reported in table 5.

4.3. Asset value events: Regulatory events

We classify regulatory decisions that increase the cost of, delay, and/or halt construction as asset value events because the immediate effect of these decisions is to alter the project's investment and operating cash flows.

Whether the additional cash outflows associated with these regulatory decisions will be recovered through the rate setting regulatory process complicates the interpretation of these events for regulated utilities. The extreme-case regulatory outcome is a permanent revocation of the construction permit with no capital recovery granted the utility. Less extreme cases are temporary halts in construction with implied threats of no further cost recovery.

Five regulatory events result in construction permit revocations or a very serious threat of revocation. There are four construction permit reinstatement events. These nine events are listed in table 6. The dates for our regulatory events continue to be *Wall Street Journal* reporting dates. We also used *Seabrook and Nuclear Regulatory Commission: The Licensing of a Nuclear Power Plant* to identify judicial hearing and regulatory events. In all cases, the *Wall Street Journal* story appears on the trading day following the regulatory decision.
Table 6
Two-day cumulative percentage prediction errors (CPEs) on PSN11 Seabrook partners’ common stock for Seabrook regulatory events, 1974 to 1988 (t-statistics in parentheses).

<table>
<thead>
<tr>
<th>Event number</th>
<th>Event date</th>
<th>Event description</th>
<th>CPEs(^c) for PSN11</th>
<th>CPEs(^c) for Seabrook partners</th>
<th>Number of partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>27</td>
<td>10/01/76</td>
<td>Nuclear Regulatory Commission board suspends PSN11 permit to build two atomic reactors</td>
<td>-3.73 ( -2.11(^d) )</td>
<td>0.63 (1.69)</td>
<td>8</td>
</tr>
<tr>
<td>28</td>
<td>11/11/76#</td>
<td>EPA regional administrator revokes approval for cooling system necessary to operate Seabrook.</td>
<td>-1.83 ( -1.16)</td>
<td>0.31 (0.36)</td>
<td>8</td>
</tr>
<tr>
<td>29</td>
<td>02/08/77#</td>
<td>Nuclear Regulatory Commission again suspends Seabrook construction permit.</td>
<td>0.65 (0.54)</td>
<td>-0.68 (0.62)</td>
<td>8</td>
</tr>
<tr>
<td>30</td>
<td>04/07/77</td>
<td>Nuclear Regulatory Commission suspends Seabrook construction permit.</td>
<td>-1.22 ( -1.03)</td>
<td>-0.22 ( -0.20)</td>
<td>8</td>
</tr>
<tr>
<td>31</td>
<td>07/03/78#</td>
<td>Work at Seabrook suspended by Nuclear Regulatory Commission.</td>
<td>-5.85 ( -3.23(^d) )</td>
<td>0.20 (0.18)</td>
<td>8</td>
</tr>
</tbody>
</table>

**Cumulative prediction errors across all events**
- 11.98 ( -3.13\(^c\) )
- 0.24 (0.18)

**Cumulative prediction errors across clean events**
- 7.03 ( -2.22\(^d\) )
- 9.17 ( -0.05 )
### Panel B: Reinstatements

<table>
<thead>
<tr>
<th>Event Date</th>
<th>Description</th>
<th>Cumulative Prediction Error Across All Events</th>
<th>Cumulative Prediction Error Across Clean Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/06/76#</td>
<td>Nuclear Regulatory Commission temporarily reinstates PSNH permit to build Seabrook.</td>
<td>0.36 (0.22)</td>
<td>1.87 (0.05)</td>
</tr>
<tr>
<td>06/20/77#</td>
<td>EPA drops objections to Seabrook plant.</td>
<td>0.28 (0.23)</td>
<td>1.23 (0.68)</td>
</tr>
<tr>
<td>07/27/77</td>
<td>Federal Appeals Board reinstates construction permit.</td>
<td>2.02 (1.67)</td>
<td>3.89 (1.40)</td>
</tr>
<tr>
<td>08/11/78#</td>
<td>Nuclear Regulatory Commission reinstates construction permit.</td>
<td>1.50 (0.67)</td>
<td>2.10 (0.97)</td>
</tr>
</tbody>
</table>

Events are numbered by specific event category; within each category the events are in order by calendar date.

# indicates clean events for which no other announcements were found in the Wall Street Journal Index for the period two days before through one day after the event announcement date.

Cumulative prediction error is calculated over the two trading days $t = -1$ and $t = 0$ relative to the published announcement.

*Significant at the 0.05 level two-tail test.*

*Significant at the 0.01 level two-tail test.*
All of our regulatory events are decisions made by a federal regulatory agency or a federal court. Presumably, these decisions were reached in private and were not leaked to selected individuals prior to their announcement. Under these assumptions, the decisions should be news.

As shown in table 6, the permit revocation announcements are usually associated with negative abnormal returns on PSNH common stock. These returns are less negative than those associated with the financial status events, however. Overall, negative and statistically significant two-day announcement period abnormal returns of $-11.98\%$ and $-7.03\%$ are observed for all and clean events. Permit reinstatements produce positive abnormal returns but they are never significantly different from zero.

The Seabrook partner portfolio is unaffected by the regulatory events. For these events, the sign on the cumulative partner portfolio abnormal return is positive but insignificant.

The outcomes of these regulatory events were unexpected because PSNH management has attributed many of Seabrook's problems to regulatory intervention.

\subsection*{4.4. Asset value events: Cost overruns}

Our second category of asset value events is cost overruns. The true cost of Seabrook has been a controversial issue. As early as 1974, Horrigan (1974), using PSNH's own financial data, testified that PSNH was using cost and revenue estimates that produced an internal rate of return greater than 34\% for the project. Horrigan concluded that either the revenues were overstated (since no rate setting agency was likely to award a 34\% return on assets to PSNH) or, more likely, the necessary investment in the project was substantially understated. Eventually, the rating agencies would refer to cost overruns and revised cost estimates as reasons for downgrading the company's securities.

We identify nine major cost overrun announcements between 1980 and 1984. Five of these announcements are made by PSNH, two are made by the New Hampshire Public Utilities Commission, one is made by the firms hired by PSNH to build Seabrook, and one is made by a Seabrook partner company in connection with a call to cancel Seabrook unit 2, the second of the four reactors originally planned. The announcements appear in table 7.

None of the nine cost overrun events produces significant abnormal returns for either PSNH or the Seabrook partner portfolio. In fact, some returns associated with the events are positive, not negative.

We are reluctant to conclude that these cost overruns were unimportant in the overall scheme of events because cost overruns were cited in some security rating change releases. Either the market had already incorporated these estimates in PSNH and partner company security prices or the market thought these costs would eventually be recovered from the rate payers.
4.5. Asset value events: Ownership changes

We identify three major ownership events. They are listed in panel A of table 8. As construction costs mounted, questions arose about the ability of PSNH to generate the cash flows and financing required to maintain a 50% stake in Seabrook. Eventually, in March 1979 (event 45), the PSNH board of directors instructed PSNH management to reduce the company's percentage ownership in Seabrook from 50% to 28%. We initially thought that this directed sale would be viewed favorably by the market because it would reduce the need for further external financing, a factor often mentioned as a cause for downgrading PSNH debt securities. However, a negative abnormal return of \(-2.59\%\) resulted.

Perhaps this outcome is attributable to a lack of firm buyers for the PSNH interest. On April 26, 1979, nine New England utilities did agree to buy 22% of Seabrook from PSNH, but this announcement had no effect on the PSNH stock price.

Announcement of the sale of five Seabrook partners' interests to an Eastern Utilities affiliate also fails to affect PSNH's stock price. This information may have already been incorporated into PSNH security prices because rumors of such a sale had been around for some time.

The Seabrook partner portfolio is also unaffected by the ownership events. The two-day cumulative prediction error over all the ownership events for the partner portfolio is an insignificant \(-1.10\%\).

For the Seabrook partners, the ownership events may be interpreted as an indication that they would probably make, perhaps out of necessity, additional investments (capital expenditures) in Seabrook. Our finding that these capital expenditure events are not associated with abnormal returns is consistent with the public utility findings of McConnell and Muscarella (1985). They report positive abnormal returns for industrial company capital expenditure announcements, but statistically zero abnormal returns for their public utility sample.

4.6. Asset value events: Political climate changes

We classify three events that PSNH management thought were important to its financial and economic health as political climate events. They are listed in panel B of table 8.

The first political event is the announcement by PSNH management that it will postpone a common stock offering until after the 1978 New Hampshire gubernatorial election. This election pitted Meadham Thomson, the incumbent governor and a strong advocate of Seabrook, against a challenger, Hugh J. Gallen, who was an outspoken critic of PSNH's managers. The postponement of the 2.0 million share stock offering results in a negative but not significant \(-2.05\%\) abnormal return.
### Table 7

Two-day cumulative percentage prediction errors (CPEs) on PSNH Seabrook partners' common stock for Seabrook cost overrun events, 1974 to 1988 (t-statistics in parentheses).

<table>
<thead>
<tr>
<th>Event number</th>
<th>Event date</th>
<th>Event description</th>
<th>CPEs&lt;sup&gt;a&lt;/sup&gt; for PSNH</th>
<th>CPEs&lt;sup&gt;a&lt;/sup&gt; for Seabrook partners</th>
<th>Number of partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>03/26/80</td>
<td>PSNH raises by 15.3% its estimated final cost of Seabrook to $3.16 billion and lays off half of 4,700 workers at site because of high interest rates.</td>
<td>-0.59</td>
<td>0.04</td>
<td>8</td>
</tr>
<tr>
<td>37</td>
<td>04/15/81#</td>
<td>PSNH raises cost estimate to $3.56 billion and extends the completion dates of Seabrook to 1984 and 1985.</td>
<td>0.55</td>
<td>-0.42</td>
<td>8</td>
</tr>
<tr>
<td>38</td>
<td>08/19/82#</td>
<td>New Hampshire PUC said that PSNH's estimate of the cost of its Seabrook nuclear power plant is $700 million too low; PUC estimate is $4.3 billion.</td>
<td>-0.15</td>
<td>0.17</td>
<td>9</td>
</tr>
<tr>
<td>39</td>
<td>12/01/82</td>
<td>PSNH raises the cost of completing Seabrook by 44% to $5.12 billion.</td>
<td>-1.09</td>
<td>-0.19</td>
<td>9</td>
</tr>
<tr>
<td>40</td>
<td>05/02/83</td>
<td>New Hampshire PUC expects costs of both Seabrook units to be about $8 billion, far exceeding PSNH estimates.</td>
<td>-1.81</td>
<td>0.96</td>
<td>9</td>
</tr>
</tbody>
</table>
Citing exorbitant cost, Central Maine Power Co. supports canceling unit 2. Its study estimates Seabrook’s total cost at more than $10.0 billion, greatly exceeding $5.24 billion estimate of PSNH.

PSNH says cost of Seabrook could reach $9.0 billion.

United Engineers and Construction, architect and engineer at Seabrook, says two plants are likely to cost more than PSNH $9 billion estimate.

PSNH raises the cost of completing unit 1

<table>
<thead>
<tr>
<th>06/08/84#</th>
<th>Cumulative prediction errors across all events</th>
<th>Cumulative prediction errors across clean events</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-12.59 (-1.17)</td>
<td>-1.11 (-0.03)</td>
</tr>
<tr>
<td></td>
<td>-1.27 (-0.26)</td>
<td>-1.55 (-0.50)</td>
</tr>
</tbody>
</table>

Events are numbered by specific event category, within each category the events are in order by calendar date.

# indicates clean events for which no other announcements were found in the Wall Street Journal Index for the period two days before through one day after the event announcement date.

Cumulative prediction error is calculated over the two trading days $t = -1$ and $t = 0$ relative to the published announcement.
Table 8
Two-day cumulative percentage prediction errors (CPEs) on PSNH Seabrook partners’ common stock for Seabrook ownership and political events, 1974 to 1988 (*-statistics in parentheses).

<table>
<thead>
<tr>
<th>Event number</th>
<th>Event date</th>
<th>Event description</th>
<th>CPEs for PSNH</th>
<th>CPEs for Seabrook partners</th>
<th>Number of partners</th>
</tr>
</thead>
<tbody>
<tr>
<td>45</td>
<td>03/05/79#</td>
<td>PSNH board directs management to reduce Seabrook ownership from 50% to 28%.</td>
<td>-2.59</td>
<td>-0.41</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(-1.44)</td>
<td>(-0.39)</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>04/26/79</td>
<td>Nine New England utilities agree to purchase 22% of Seabrook.</td>
<td>0.97</td>
<td>-0.62</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.57)</td>
<td>(-0.57)</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>11/25/86#</td>
<td>Final closing on sale of Seabrook by five utilities.</td>
<td>1.28</td>
<td>-0.07</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.40)</td>
<td>(-0.03)</td>
<td></td>
</tr>
</tbody>
</table>

*Panel A: Ownership Change Events*

Cumulative prediction errors across all events: -0.34 (-1.10)

Cumulative prediction errors across event events: -1.31 (-0.48)
### Panel B: Political Events

<table>
<thead>
<tr>
<th>Event</th>
<th>Date</th>
<th>Description</th>
<th>Prediction Error</th>
<th>Cumulative Prediction Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>48</td>
<td>11/09/78#</td>
<td>PSNH temporarily postpones offering of 2.0 million shares of common stock originally planned for 11/14 until after gubernatorial election.</td>
<td>-2.05, (1.14)</td>
<td>-2.37, (0.48)</td>
</tr>
<tr>
<td>49</td>
<td>11/14/78#</td>
<td>Hugh J. Gallen elected as governor.</td>
<td>-0.47, (0.22)</td>
<td>-2.37, (0.48)</td>
</tr>
<tr>
<td>50</td>
<td>05/07/79#</td>
<td>Recovery of construction work in progress charges prohibited by New Hampshire legislature.</td>
<td>0.15, (0.08)</td>
<td>0.04, (0.03)</td>
</tr>
</tbody>
</table>

*Cumulative prediction errors across all events*  
-2.37, (0.48)  
*Cumulative prediction errors across clean events*  
-2.37, (0.48)

*Events are numbered by specific event category; within each category the events are in order by calendar date.*

*#* indicates clean events for which no other announcements were found in the Wall Street Journal Index for the period two days before through one day after the event announcement date.

*Cumulative prediction error is calculated over the two trading days \( t = -1 \) and \( t = 0 \) relative to the published announcement.*
Five days after the postponement announcement, Hugh Gallen was elected governor in what many in New Hampshire regarded as an upset victory. His election is our second political climate event. The election announcement abnormal return is an insignificant 0.47%.

During Gallen's first year as governor, the New Hampshire legislature passed a law that prohibited utilities from passing financing charges on construction work in progress (CWIP) through to the rate payers. The law was dubbed the anti-CWIP bill. PSNH continues to maintain that the passage of this bill was a major reason for its financial difficulties. As we report in table 8, however, announcement of the bill's passage results in an insignificant 0.15% abnormal return on PSNH common stock.

Statistically significant Seabrook partner portfolio abnormal returns are also not associated with any of the political climate events. Only a small negative return is found on the date of Gallen's election.

5. Conclusions

Our empirical results show that new information about both PSNH and its Seabrook partners is contained in PSNH debt security rating reductions and bankruptcy prognostication announcements. No new information is contained in cost overrun, ownership change, and political climate announcements. Regulatory agency revocations of the Seabrook construction permit have a negative effect on PSNH stock returns, but no effect on the Seabrook partner stock prices.

These results suggest that financial market participants responded differently to information about the quality of PSNH security holder cash flows (financial status events) than they did to information about the investment and operating cash flows (asset value events) from which the required payments would be made. Perhaps a simple explanation for the observed lack of price reactions to the investment events is that this information was widely known and already incorporated into the security prices, but this explanation implies that the regulatory decisions we examine were completely anticipated or that information about them leaked out in advance.

An alternative explanation is that in a regulated monopoly, there is a chance that the higher cash outflows may be passed on to rate payers through regulatory decrees. Consequently, operating cash flow shocks are less likely to be translated into security price changes for a regulated than for an unregulated firm. In contrast, even in a regulated setting, information about security holder cash flows requires no such flow-through assumptions by the investors.

12According to David Moore, a political poll taker. Meldrim Thomson was still leading in the polls the day before the election.
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