CORPORATE CAPITAL EXPENDITURE DECISIONS AND THE MARKET VALUE OF THE FIRM*

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This paper is an 'event-time' study of the common stock prices of a sample of 658 corporations around the dates on which they publicly announced their future capital expenditure plans. For industrial firms, announcements of increases (decreases) in planned capital expenditures are associated with significant positive (negative) excess stock returns. For public utility firms, neither increases nor decreases in planned capital expenditures are associated with significant excess stock returns. We interpret the evidence as being consistent with the hypothesis that managers seek to maximize the market value of the firm in making their corporate capital expenditure decisions.

1. Introduction

The theory of corporation finance has traditionally maintained that corporate managers are confronted with two major policy decisions: investment decisions and financing decisions. Recently, a number of studies have carefully analyzed the effect of announcements of corporate financing decisions on the market value of the firm.[1] However, with the exception of intercorporate acquisitions, there exists relatively little evidence on the valuation effects of

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[1] See, for example, Masulis (1980b, 1983), McConnell and Schlarbaum (1981), Mikkelson (1981), and Pinegar and Lease (1983) who examine exchange offers and recapitalization, Aharony and Swary (1980), Asquith and Mullins (1983), Brickley (1983) and Eades (1982) who examine dividend announcements, Asquith and Mullins (1985), and Dann and Mikkelson (1984) who examine new security issues, and Dann (1981), Masulis (1980a), and Vermaelen (1981) who examine common stock repurchases.

announcements of corporate investment decisions. This difference in coverage is understandable given the controversial nature of the debate concerning the theoretical relationship between corporate financing decisions and the market value of the firm and given the widely (although not universally) shared presumption that market forces compel managers to follow the market value maximization rule in making their corporate capital expenditure decisions.[2] Unfortunately, evidence from the one class of corporate investment decisions that has been widely studied, namely intercorporate acquisitions, lends ambiguous support, at best, to the hypothesis that managers seek to maximize the market value of the firm in making their corporate investment decisions.[3]

This paper provides additional evidence on the effect of corporate investment decisions on the market value of the firm. Specifically, this paper addresses two questions: First, when managers announce their corporate capital expenditure decisions does the market respond by revaluing their companies' shares? Second, given the information contained in the announcement, does the market respond in a way that is consistent with the predictions of the market value maximization hypothesis?

We address these questions in the context of a traditional model of corporate valuation. Traditional valuation theory posits that the market value of the firm is equal to the discounted value of future earnings expected to be generated by assets already in place, plus the discounted net present value of investment opportunities that are expected to be available to the firm in the future.[4] First, consider the set of firms which have opportunities to invest in projects that are expected to earn a rate of return greater than the market required return (i.e., the set of firms that has positive net present value projects). If managers follow the market value maximization rule, then, according to traditional valuation theory, an announcement of an unexpected increase in capital expenditures should have a positive impact on the market value of the firm and an announcement of an unexpected decrease in capital expenditures should have a negative impact on the market value of the firm. The positive revaluation associated with unexpected capital expenditure increases comes about because the market immediately capitalizes the incremental positive net present value associated with the unexpected projects to be undertaken by the firm. Similarly, the negative revaluation associated with

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[2] For presentations of the market value maximization hypothesis see, for example, Fama and Miller (1972, ch. 2) and Fama and Jensen (1985). For alternatives to the market value maximization hypothesis, see, for example, Berle and Means (1932), Penrose (1959), Reid (1968), and Roll (1984). For a summary of the alternative hypotheses, see Malatesta (1983).

[3] Jensen and Ruback (1983) contains an extensive reference list of this literature. For evidence inconsistent with the market value maximization hypothesis, see especially Dodd (1980), Malatesta (1983), and Roll (1984).

[4] Miller and Modigliani (1961) develop this valuation model in detail.

unexpected capital expenditure decreases occurs, not because the firm is undertaking negative net present value projects, but rather because the firm has fewer positive net present value projects than the market previously anticipated.

Now consider those firms whose investment opportunity rate of return is just equal to the market required return. For this set of firms, traditional valuation theory predicts that neither announcements of unexpected increases nor announcements of unexpected decreases in capital expenditures will have any effect on the market value of the firm. This result comes about because, for these firms, there is no positive net present value to be capitalized into the market value of the firm when capital expenditures are unexpectedly increased. Likewise, there is no previously capitalized net present value to be dissipated when capital expenditures are unexpectedly reduced. This result also is consistent with the market value maximization hypothesis because, for these firms, each investment project is a marginal one and undertaking marginal investment opportunities is consistent with the market value maximization hypothesis.

This study investigates whether the capital market response to corporate capital expenditure announcements is consistent with the joint predictions of the market value maximization hypothesis and the traditional model of corporate valuation. To do so, this paper conducts an 'event-time' analysis of the common stock prices of a large sample of companies that made public announcements about their capital expenditure plans over the period 1975 through 1981. In general, the results indicate that managers do reveal information that is relevant to the valuation of their firms by means of announcements about their corporate capital expenditure plans. Additionally, the reactions of common stock prices to capital expenditure announcements are generally consistent with the market value maximization hypothesis.

The remainder of the paper is organized as follows. The next section of the paper describes the data. Section 3 describes the statistical procedures used in the empirical analysis and presents and interprets the results. The final section contains a brief summary and some concluding remarks.

2. Sample selection procedure and data description

2.1. Sample selection procedure

The objective of this study is to analyze the market values of corporations around the time at which they reveal information about their capital expenditure plans. To accomplish this objective, a sample of firms which made announcements about their capital expenditure plans over the seven-year period 1975 through 1981 was constructed. For this purpose, only announce-

ments about company-wide capital expenditure plans are included. Thus, announcements about specific projects are excluded from the sample. Also excluded from the sample are capital budget announcements made by financial institutions, capital expenditure announcements which include funds for the purpose of acquisitions and tender offers, and announcements of capital expenditure plans by corporate subsidiaries or corporate divisions.

To be included in the sample, the common stock of a company making an announcement about its capital budget had to be listed on the New York Stock Exchange (NYSE) or the American Stock Exchange (AMEX) at the time the announcement was made, and daily stock prices had to be available on the Investment Statistics Laboratory (ISL) database.[5,6]

The original sample of capital expenditure announcements was compiled from examination of the annual editions of the *Wall Street Journal Index* (WSJI). Every entry for every NYSE or AMEX company in the *WSJI* was read for the years 1975–1981. Articles referring to capital expenditure plans were identified for inclusion in the sample. To augment this sample the annual *Predicasts F&S Index* (*PFSI*) was searched in the same manner for the same years. *PFSI* indexes corporate news for over 750 financial publications, business-oriented newspapers, trade journals and special reports. The use of *PFSI* allowed the study to analyze a larger sample of announcements than just those reported in the *Wall Street Journal* (WSJ). Additionally, the *PFSI* confirmed announcement dates appearing in the *WSJ* because it also indexes the *WSJ*.[7] Once the articles containing information about capital budget announcements were identified from the *Indexes*, each article was read to gather information about the size and intended uses of the allocated funds.

To test the empirical predictions discussed in the Introduction, it is necessary to categorize capital expenditure announcements as containing information about either unexpected increases or unexpected decreases in anticipated capital expenditures. Development of such a categorization requires a model of

[5] When we move to the empirical analysis, a question that arises is whether changes in the market value of common stock are synonomous with changes in the market value of the firm. For firms that have more than one class of securities outstanding, a shift in the 'risk class' of the firm's investments could give rise to an increase (decrease) in the market value of common stock and a concurrent decrease (increase) in the market value of the firm's senior securities. This could cause the total market value of the firm to increase, decrease, or remain unchanged. In the empirical analysis we assume that changes in the market value of common stock in response to capital expenditure announcements are a good proxy for changes in the total market value of the firm.

[6] The ISL data base is available from Interactive Data Service, Inc.

[7] There is one other virtue in using *PFSI*. In referencing corporate news releases *PFSI* reports the actual date of the news releases. In a few cases, the *WSJ* did not publish information about capital expenditures until several days after it was released. Because the information was available to the public and was most likely carried on the wire services to brokers and traders on the day it was issued, we use the day on which the information was actually released as the announcement day rather than the *WSJ* publication date.

the way in which investors formulate their expectations of future capital expenditures. The model used here is a naive one. It assumes that investors forecast no changes in a firm's capital expenditures from previous amounts or from previously announced levels. That is,

$$E[I(t)] = I(t-1),$$

where $E[I(t)]$ is the expected dollar amount of capital expenditures in period t and $I(t-1)$ is the actual or planned dollar amount of capital expenditures announced in period $t-1$. Accordingly, the announcement of a planned capital budget is categorized as an unexpected increase from a previous announcement if $I(t) > I(t-1)$ and it is categorized as an unexpected decrease from a previous announcement if $I(t) < I(t-1)$ where $I(t)$ is the dollar amount of capital expenditures announced for time t.[8]

Many corporations announce their planned capital expenditures for the ensuing twelve months at the beginning of their fiscal year. Less frequently, corporations announce mid-year revisions in their previously announced capital budgets. These two different types of announcements were identified for separate analysis.

Some companies make capital budgeting decisions for multiple-year time horizons. For example:

> Deere & Co. said it plans to make nearly $2 billion in new capital investments during the next five years, almost double its investment spending over the last six years... (*WSJ*, 5/24/79, p. 12).

Multi-year announcements such as these were eliminated from the sample because it was not clear whether to classify them as either increases or decreases from previous budgets given the simple model of expectations employed.

Given the classification scheme used, a capital expenditure announcement can be categorized as one of four major types: (1) an announcement of an annual capital budget which is an increase from the previous year's budget; (2) an announcement of an annual capital budget which is a decrease from the previous year's budget; (3) an announcement of an increase in the current year's previously announced budget; and (4) an announcement of a decrease in the current year's previously announced budget. The text of most of the articles announcing capital expenditure plans clearly indicated into which of

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[8] In addition to the 'naive' model we experimented with adjusting changes in expectations for the general inflation rate. The results did not differ from those generated with the naive model of expectations in any major way.

the four categories the announcement should be placed. In those instances wherein the text made no reference to the previous year's budget, the company's annual report from the previous year was consulted to determine whether the announced budget represented an increase or a decrease from the previous year's budget.

Examples of announcements which would be placed into each of these categories are as follows:

(1) An increase from the previous year's budget:

Scott Paper Co. said it expects to spend more than $200 million on capital projects this year, compared with $147 million in 1975. (*WSJ*, 3/27/75, p. 22).

(2) A decrease from the previous year's budget:

Halliburton Co. said its 1977 capital budget was set at $262 million, down from 1976 capital expenditures of $315 million. (*WSJ*, 2/9/77, p. 5).

(3) An increase in the current year's previously announced budget:

Browning-Ferris Industries Inc. said its board approved a revised capital outlay budget for fiscal 1978, ending Sept. 30, of $61 million, up 9% from the $55 million originally planned for the year. (*WSJ*, 2/22/78, p. 30).

(4) A decrease in the current year's previously announced budget:

Geoffry R. Simmonds, Chairman and Chief Executive Officer of Simmonds Precision Products, Inc., said that he expects the company's 1980 capital spending to total about $7 million, down from an earlier estimate of $10 million. (*WSJ*, 5/6/80, p. 41).

The four-way classification scheme is the basic method used for categorizing capital expenditure announcements. However, according to traditional valuation theory, the stock prices of companies will respond differently to capital expenditure announcements depending upon whether the firm's investment opportunity rate of return is equal to or greater than the current market required rate of return. To examine this issue, firms in the sample were identified as being either an industrial company or a public utility. The motivation for splitting the sample in this way is that public utilities are output–price regulated firms. According to standard regulatory practice, as embodied in the landmark Bluefield Waterworks Co. vs. Public Utilities Commission, 262 U.S. 679 (1923) and the Federal Power Commission vs. Hope Natural Gas Co., U.S. 591 (1944) decisions, the prices of output–price regulated companies are to be set so as to allow those companies to earn the

current market required rate of return on invested funds.[9] Thus, if it is assumed that regulatory boards set prices so that public utilities are permitted to earn only their marginal 'cost of capital' on invested funds, traditional valuation theory predicts that the stock prices of this sample of companies will be unaffected by unexpected changes in their capital expenditure plans.

To construct the sample of public utilities all companies were identified according to their Standard Industrial Classification (SIC) code numbers. Those companies with SIC code numbers 4811 (telephone communication), 4911 (electric services), 4922 (natural gas transmission), 4923 (natural gas transmission and distribution), 4924 (natural gas distribution), 4931 (electric and other services combined), 4932 (gas and other services combined), 4939 (combination utilities not elsewhere classified), and 6711 (holding companies) were initially classified as belonging to the public utility sample. If the description of a company in Moody's *Public Utility Manual* indicated that at least eighty percent of the company's gross operating revenue was derived from the regulated sector of its business, the company remained in the public utility sample. Otherwise the company was moved to the industrial company sample. All companies that were not classified as a public utility were placed in the industrial company sample.

Despite our efforts to carefully categorize the sample, we should emphasize that this classification scheme is only a rough approximation for distinguishing companies whose investment opportunity rate of return exceeds their cost of capital from those whose investment opportunity rate of return just equals their cost of capital. This classification scheme further rests on the presumption that regulatory boards actually do set prices so that public utilities just earn the market required rate of return on invested funds.

2.2. Data description

Tables 1 through 3 provide descriptive statistics for the sample of capital expenditure announcements. Panels A and B of table 1 display the number of capital expenditure announcements in each category made in each of the years 1975 through 1981 for the sample of industrial and public utility companies, respectively. The industrial firm sample contains a total of 547 announcements made by 285 different companies. The public utility sample contains a total of 111 announcements made by 72 different companies. For both the industrial and public utility firm samples the announcements were relatively evenly distributed over the seven-year period considered. However, there is some

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[9]Myers (1973) contains a survey of the use of finance theory in public utility rate cases. His survey focuses on the issue of using capital market data to set utility prices so as to allow utilities to earn the market required return on invested funds. See, also, Brennan and Schwartz (1982).

Table 1

Frequency distribution of 658 capital expenditure announcements by category and year of announcements, 1975–1981.

Category	1975	1976	1977	1978	1979	1980	1981	Row total
(A) *Industrial Firm Sample*								
Increase from previous year's budget	49	45	38	46	44	68	64	354
Increase from current year's previously announced budget	5	8	3	8	14	23	12	73
Decrease from previous year's budget	27	13	5	8	3	11	20	87
Decrease from current year's previously announced budget	11	1	5	2	0	9	5	33
Column total	92	67	51	64	61	111	101	547
(B) *Public Utility Firm Sample*								
Increase from previous year's budget	13	10	9	18	7	8	7	72
Increase from current year's previously announced budget	0	3	3	2	2	0	1	11
Decrease from previous year's budget	6	2	2	4	1	2	1	18
Decrease from current year's previously announced budget	4	0	0	1	0	3	2	10
Column total	23	15	14	25	10	13	11	111

Table 2

Frequency distribution of 658 capital expenditure announcements by intended use of funds, 1975–1981.

(1) Intended use	Industrial firm sample		Public utility firm sample	
	(2) Number	(3) Relative frequency (in percent)	(4) Number	(5) Relative frequency (in percent)
Unspecified	202	36.9	83	74.8
General plant & equipment	155	28.3	14	12.6
Research & development	8	1.5	0	—
Exploration & development	93	17.0	6	5.4
General plant & equipment and research & development	5	0.9	0	—
General plant & equipment and exploration & development	64	11.7	8	7.2
Retail stores	20	3.7	0	—
Column total	547	100.0	111	100.0

Table 3

Summary statistics for amounts of 658 capital expenditures by category of capital budget increase or decrease, 1975–1981.

(1) Category	(2) Sample size	(3) Total budget (in millions of dollars)	(4) Total budget divided by market value of equity (in percent)	(5) Change in budget (in millions of dollars)	(6) Change in budget divided by previous budget (in percent)	(7) Change in budget divided by market value of equity (in percent)
(A) Industrial Firm Sample						
Increase from previous year's budget	354	544ᵃ	2.79	116	36.3	0.68
		140	2.36	33	29.0	0.46
Increase in current year's previously announced budget	73	1159	3.10	168	24.0	0.55
		258	2.77	58	22.2	0.40
Decrease from previous year's budget	87	287	2.56	34	21.0	0.36
		180	2.10	16	18.3	0.28
Decrease in current year's previously announced budget	33	369	3.00	48	20.3	0.44
		186	2.54	30	16.7	0.35
(B) Public Utility Firm Sample						
Increase from previous year's budget	72	951	4.77	84	28.8	0.96
		231	4.05	38	23.0	0.67
Increase in current year's previously announced budget	11	2439	4.68	162	15.2	0.56
		415	4.58	41	9.0	0.31
Decrease from previous year's budget	18	1368	4.13	52	11.7	0.42
		201	4.05	14	9.5	0.33
Decrease in current year's previously announced budget	10	340	5.85	33	16.6	0.78
		170	5.43	23	16.5	0.91

ᵃMean above, median below.

clustering of announcements during the months of December through May. Approximately 70% of the announcements occurred during this six-month period, although each sample contains announcements in each month of the year. Additionally, on a daily basis the announcements were non-contemporaneous.[10]

In addition to specifying the dollar amount involved, capital budget announcements often indicate the intended use of the funds in general terms. For this sample, intended uses were identified as falling into one of the six broad categories listed in column 1 of table 2. An announcement was labeled general plant equipment if the announcement stated that the entire budget was for that purpose. An announcement was categorized as research and development if the announcement stated that over 50% of the budget was to be allocated for that purpose.[11] If the announcement stated that the budget was to be used for a mixture of general plant and equipment and research and development, but less than 50% of the budget was to be used for research and development, then the announcement was placed into the general plant and equipment and research and development category. Announcements involving funds budgeted for exploration and development were handled in a manner identical to those involving expenditures for research and development. Lastly, announcements involving funds budgeted for the specific purpose of constructing retail stores were categorized as a separate group.

According to table 2 approximately 37% of the industrial firm sample and 75% of the public utility sample did not specify the intended use of the funds. Of the industrial firms that did specify the intended use of the funds, the two most frequently encountered uses were general plant and equipment (28.3% of the sample) and exploration and development (17.0% of the sample).

Table 3 summarizes the dollar and relative amounts of funds involved in the capital expenditure announcements. Panel A contains information about the industrial firm sample, and panel B contains information about the public utility firm sample. Columns 3 and 5 give the means and medians of the dollar amounts of the total budgets and the means and medians of the dollar amounts of the changes in the budgets, respectively. Perhaps the most interesting statistics are the relative amounts of the capital budgets and the relative

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[10]As regards the source reporting the announcements, approximately 75% of the sample of announcements by industrial firms appeared in the *WSJ*. The second leading source was *American Metal Market* with approximately 11% of the sample. The remainder of the announcements were spread among eleven other periodicals including *New York Times* (3.8%), *Journal of Commerce* (3.1%), *Oil and Gas Journal* (2.4%), *Chemical Week* (2.4%), corporate news release (0.7%), *Chemical Market Review* (0.5%), *Chemical and Engineering News* (0.5%), *Metal Bulletin* (0.2%), *Chemical Age* (0.2%), *Wall Street Transcript* (0.2%), and *Aviation Week* (0.2%). For the public utility sample, one announcement appeared in the *Oil and Gas Journal* and the remainder appeared in the *WSJ*.

[11]The use of 50% as a cut-off percentage is arbitrary; however, there were very few borderline cases. The majority of announcements that were classified as research and development or exploration and development allocated more than 75% of the capital expenditures for one of these purposes.

amounts of the changes in the capital budgets. In general, for the various categories, the means and medians of the dollar amounts of the total budget as a percentage of the total market value of the firm's common stock ranged from 2.1% to 5.8% (column 4).[12] The dollar amounts of the changes in the budget as a percentage of the previous budget ranged from 9.0% to 36.3% (column 6). Lastly, the dollar amounts of the changes in the budget as a percentage of the total market value of common stock ranged from 0.28% to 0.96% (column 7). In most cases, the estimated mean percentages differed little from the estimated median percentages.

Finally, 36.2% of the industrial firm sample and 49.5% of the public utility firm sample released other firm-specific information on the same day as the announcement of the capital budget. This information included announcements about expected or reported earnings, financing decisions, dividend decisions, and merger and acquisition activity. In the analysis that follows, the various statistical tests are first conducted with the full sample of announcements and then with the 'clean' sample which excludes announcements containing other firm-specific information.

3. Empirical results

3.1. Statistical methodology

The procedure used to analyze the effect of capital expenditure announcements on common stock values is the familiar one of examining stock returns over a two-day announcement period that encompasses the day on which the announcement appeared in print plus the previous day.[13] The method used to determine the statistical significance of the announcement period return is the comparison period procedure developed by Masulis (1980a).

To implement the comparison period procedure, each sample of securities is formed into a portfolio in 'event-time', where the event in question is the capital expenditure announcement, and two-day cross-sectional mean rates of return are computed for each portfolio. Then, for each portfolio, a two-day comparison period mean return is estimated as the average of the two-day portfolio returns over the period beginning 60 days before the event and ending 60 days after the event, but omitting days −10 to +10.

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[12] Total market value of common stock was estimated as the number of shares outstanding times the market price per share ten trading days before the capital expenditure announcement. The number of shares outstanding and stock price data were taken from the ISL daily tapes.

[13] A two-day announcement period return is used because the publication of an announcement generally occurs on the day after the information is actually released to the public. If the announcement occurs after the close of trading on the previous day, any immediate valuation effects will be reflected in the security's price on the day in which the announcement appears in print. However, if the information is released prior to the close of trading, any immediate valuation effect will be registered on the day before the announcement appears in print.

Two tests are performed to determine the statistical significance of the announcement period return. The primary test is a difference of means test that is computed as

$$t = (\overline{R}_a - \overline{R}_c)/S\sqrt{1 + 1/N} ,$$

where $\overline{R}_a$ is the cross-sectional mean two-day announcement period raw return for the sample of securities in question, $\overline{R}_c$ is the comparison period mean two-day return for the sample, S is the standard deviation of two-day portfolio returns obtained from the comparison period two-day portfolio returns, and N is the number of two-day returns during the comparison period. On the assumption that the two-day portfolio returns are independent drawings from a stationary distribution with finite variance this statistic is Student-t distributed with $N - 1$ degrees of freedom. This test determines whether the two-day announcement period return is significantly different from the average return earned over a 'normal' period which excludes the period during which security returns may have been influenced by information regarding the firm's capital budget announcement.

The second test is a binomial sign test which determines whether the percentage of positive two-day returns during the announcement period is significantly different from the expected percentage of positive returns. This statistic is a test of location and thus is not affected by outlier returns in either a positive or negative direction. As a consequence, this test serves as a check on the robustness of the difference of means tests. This statistic is computed as

$$z = (p - nr)/\sqrt{n(1 - r)r} ,$$

where p is the number of positive two-day security returns during the announcement period, n is the total number of two-day security returns during the announcement period, and r is the fraction of positive two-day security returns during the comparison period. This test determines whether the fraction of positive two-day returns during the announcement period is statistically different from the fraction of positive two-day returns during the comparison period. Two-tailed tests of statistical significance are employed in all cases.[14,15]

[14]All tests were replicated using the 'market model' procedures as described, for example, in Brown and Warner (1985) and the results are nearly identical to those generated with the comparison period procedure.

[15]We also examined cumulative mean-adjusted returns computed using the comparison period procedure and cumulative abnormal returns computed using the market model methodology. In most cases the cumulative returns were not statistically significantly different from zero. In those instances in which they were different from zero there did not appear to be consistent patterns across samples. Because presenting these results for the various samples would have greatly increased the length of the paper without adding substantively to content, we have chosen not to report them. However, they are available from the authors.

The results of the statistical analysis are presented in tables 4 through 7. In each table column 1 identifies the sample, column 2 gives the sample size, column 3 gives the announcement period mean raw return, column 4 gives the comparison period mean two-day return, column 5 gives the *t*-statistic for the difference of means test, column 6 gives the fraction of positive two-day returns during the announcement period, column 7 gives the fraction of positive two-day returns during the comparison period, and column 8 gives the *z*-statistic for the binomial sign test.

3.2. Results

For both the industrial firm sample and for the public utility firm sample the analysis was conducted for six categories of capital expenditure announcements: (1) the sample containing all announcements of capital budget increases; (2) the subsample containing announcements of increases from the previous year's budget; (3) the subsample containing announcements of increases in the current year's budget from a previously announced budget; (4) the sample containing all announcements of capital budget decreases; (5) the subsample containing announcements of decreases from the previous year's budget; and (6) the subsample containing announcements of decreases in the current year's budget from a previously announced budget.

For industrial firms, the joint predictions of the market value maximization hypothesis and the traditional model of corporate valuation are that unexpected increases in capital expenditures will lead to increases in common stock prices and unexpected decreases in capital expenditures will lead to decreases in common stock prices. The results presented in panel A of table 4 are consistent with these predictions. According to the table, for each of the six industrial firm samples the announcement period raw return has the predicted sign. In four of the six cases the null hypothesis of no change in the market value of common stock can be rejected at the 0.01 level of significance according to the difference of means test. In the remaining two cases the hypothesis can be rejected at the 0.05 level of significance. Specifically, for the three categories of capital budget increases – the full sample of capital budget increases, the subsample of annual budget increases, and the subsample of mid-year budget increases – the announcement period raw returns are $+1.21\%$, $+1.22\%$, and $+1.19\%$ with corresponding *t*-statistics of $+6.89$, $+7.29$, and $+2.30$. Additionally, the binomial sign test permits rejection of the null hypothesis at the 0.01 level of significance for all three categories of capital expenditure increases. The relevant *z*-statistics are $+6.34$, $+5.70$, and $+2.80$.

For the three categories of capital expenditures decreases – the full sample of capital budget decreases, the subsample of annual budget decreases, and the subsample of mid-year budget decreases – the announcement period raw returns are -1.52%, -1.64%, and -1.19% with corresponding *t*-statistics of

Table 4

Summary of analysis of announcement period common stock returns for 658 capital expenditure announcements, 1975–1981.

(1) Category	(2) Sample size	(3) Announcement period raw return (in percent)	(4) Comparison period mean return (in percent)	(5) t-statistic	(6) Fraction of positive announcement period returns	(7) Fraction of positive comparison period returns	(8) z-statistic
(A) *Industrial Firm Sample*							
All budget increases	427	1.21	0.19	6.89[a]	0.62	0.46	6.34[a]
Increase from previous year's budget	354	1.22	0.18	7.29[a]	0.61	0.46	5.70[a]
Increase from current year's previously announced budget	73	1.19	0.27	2.30[b]	0.64	0.48	2.80[a]
All budget decreases	120	-1.52	0.16	-6.56[a]	0.21	0.44	-5.18[a]
Decreases from previous year's budget	87	-1.64	0.21	-6.02[a]	0.16	0.45	-5.50[a]
Decrease from current year's previously announced budget	33	-1.19	0.04	-2.12[b]	0.33	0.41	-0.93
(B) *Public Utility Firm Sample*							
All budget increases	83	-0.09	0.15	-1.03	0.41	0.43	-0.44
Increase from previous year's budget	72	-0.05	0.15	-0.83	0.42	0.43	-0.29
Increase from current year's previously announced budget	11	-0.31	0.10	-0.67	0.36	0.43	-0.46
All budget decreases	28	-0.13	0.16	-0.73	0.32	0.43	-1.20
Decrease from previous year's budget	18	-0.24	0.11	-0.74	0.39	0.43	-0.34
Decrease from current year's previously announced budget	10	0.06	0.24	-0.23	0.20	0.44	-1.54

[a] Different from zero at 0.01 level of statistical significance.
[b] Different from zero at 0.05 level of statistical significance.

Table 5

Summary of analysis of announcement period common stock returns for 405 capital expenditure announcements which contain no other firm-specific information, 1975–1981.

(1) Category	(2) Sample size	(3) Announcement period raw return (in percent)	(4) Comparison period mean return (in percent)	(5) t-statistic	(6) Fraction of positive announcement period returns	(7) Fraction of positive comparison period returns	(8) z-statistic
(A) *Industrial Firm Sample*							
All budget increases	273	1.30	0.18	5.60[a]	0.61	0.46	4.81[a]
Increases from previous year's budget	216	1.32	0.16	6.15[a]	0.60	0.46	4.20[a]
Increase from current year's previously announced budget	57	1.20	0.25	2.04[b]	0.63	0.48	2.36[b]
All budget decreases	76	−1.75	0.18	−5.78[a]	0.17	0.44	−4.77[a]
Decreases from previous year's budget	53	−1.97	0.24	−6.35[a]	0.13	0.46	−4.73[a]
Decreases from current year's previously announced budget	23	−1.26	0.04	−1.74[c]	0.26	0.41	−1.47
(B) *Public Utility Firm Sample*							
All budget increases	39	0.14	0.11	0.07	0.36	0.42	−0.78
Increases from previous year's budget	34	0.28	0.12	0.40	0.38	0.42	−0.43
Increase from current year's previously announced budget	5	−0.85	0.04	−0.91	0.20	0.44	−1.06
All budget decreases	17	−0.84	0.22	−1.79[c]	0.24	0.45	−1.78[c]
Decreases from previous year's budget	11	−0.37	0.18	−0.86	0.27	0.46	−1.25
Decreases from current year's previously announced budget	6	−1.71	0.28	−1.94[c]	0.17	0.43	−1.32

[a] Different from zero at 0.01 level of statistical significance.
[b] Different from zero at 0.05 level of statistical significance.
[c] Different from zero at 0.10 level of statistical significance.

Table 6

Summary of analysis of announcement period common stock returns by intended use of funds for 547 capital expenditure announcements by industrial firms, 1975–1981.

(1) Intended use of funds	(2) Sample size	(3) Announcement period raw return (in percent)	(4) Comparison period mean return (in percent)	(5) t-statistic	(6) Fraction of positive announcement period returns	(7) Fraction of positive comparison period returns	(8) z-statistic
(A) *Budget Increases*							
All budget increases	427	1.21	0.19	6.89[a]	0.62	0.46	6.34[a]
Unspecified	138	1.49	0.15	4.25[a]	0.62	0.46	3.95[a]
General plant & equipment	123	1.80	0.21	6.02[a]	0.71	0.46	5.49[a]
Research & development	8	0.20	0.21	−0.01	0.38	0.47	−0.52
Exploration & development	84	−0.55	0.28	−2.21[b]	0.35	0.47	−2.34[b]
General plant & equipment and research & development	5	0.95	−0.10	1.22	0.60	0.44	0.74
General plant & equipment and exploration & development	55	2.27	0.17	4.24[a]	0.87	0.47	5.93[a]
Retail stores	14	0.35	0.18	0.20	0.50	0.46	0.30
(B) *Budget Decreases*							
All budget decreases	120	−1.52	0.16	−6.56[a]	0.21	0.44	−5.18[a]
Unspecified	64	−1.72	0.12	−5.15[a]	0.20	0.44	−3.87[a]
General plant & equipment	32	−1.68	0.20	−3.80[a]	0.13	0.44	−3.56[a]
Research & development	0	—	—	—	—	—	—
Exploration & development	9	1.49	0.27	0.98	0.67	0.45	1.29
General plant & equipment and research & development	0	—	—	—	—	—	—
General plant & equipment and exploration & development	9	−2.32	0.31	−2.41[b]	0.00	0.48	2.88[a]
Retail stores	6	−1.76	0.09	−1.29	0.33	0.40	−0.33

[a] Different from zero at 0.01 level of statistical significance.
[b] Different from zero at 0.05 level of statistical significance.

Table 7

Summary of analysis of announcement period common stock returns by intended use of funds for 349 capital expenditure announcements by industrial firms which contain no other firm-specific information, 1975–1981.

(1) Intended use of funds	(2) Sample size	(3) Announcement period raw return (in percent)	(4) Comparison period mean return (in percent)	(5) t-statistic	(6) Fraction of positive announcement period returns	(7) Fraction of positive comparison period returns	(8) z-statistic
(A) *Budget Increases*							
All budget increases	273	1.30	0.18	5.60[a]	0.61	0.46	4.81[a]
Unspecified	77	1.66	0.11	3.93[a]	0.62	0.46	2.90[a]
General plant & equipment	80	1.98	0.22	5.31[a]	0.71	0.46	4.48[a]
Research & development	6	1.56	0.19	1.17	0.50	0.46	0.21
Exploration & development	55	-0.74	0.27	-1.99[c]	0.29	0.47	-2.67[a]
General plant & equipment and research & development	5	0.95	-0.10	1.22	0.60	0.44	0.74
General plant & equipment and exploration & development	41	2.40	0.13	4.10[a]	0.85	0.46	5.04[a]
Retail stores	9	-0.53	0.28	-0.86	0.44	0.48	-0.20
(B) *Budget Decreases*							
All budget decreases	76	-1.75	0.18	-5.78[a]	0.17	0.44	-4.77[a]
Unspecified	35	-2.23	0.11	-4.61[a]	0.14	0.45	-3.60[a]
General plant & equipment	22	-1.78	0.24	-2.74[a]	0.09	0.43	-3.24[a]
Research & development	0	—	—	—	—	—	—
Exploration & development	7	1.47	0.31	0.82	0.71	0.45	1.38
General plant & equipment and research & development	0	—	—	—	—	—	—
General plant & equipment and exploration & development	8	-2.36	0.34	-2.31[b]	0.00	0.47	-2.69[a]
Retail stores	4	-0.77	-0.15	-1.21	0.25	0.34	-0.57

[a] Different from zero at 0.01 level of statistical significance.
[b] Different from zero at 0.05 level of statistical significance.
[c] Different from zero at 0.10 level of statistical significance.

-6.56, -6.02, and -2.12. The binomial sign test permits rejection of the null hypothesis at the 0.01 level of significance for two of the three categories of capital expenditure decreases. The relevant z-statistics are -5.18, -5.50, and -0.93.

In short, for the industrial firm sample, announcements of increases in capital expenditures are associated with positive 'excess' stock returns and announcements of decreases in capital expenditures are associated with negative 'excess' stock returns.

The results for the public utility firm sample, in panel B of table 4, are also supportive of the implications of traditional valuation theory. Under the assumption that public utility firms do not have opportunities to earn a rate of return greater than their cost of capital, traditional valuation theory predicts that there will be no significant changes in the values of these firms when they announce either unexpected increases or unexpected decreases in their capital budgets. Such a result is also consistent with the market value maximization hypothesis for these firms.

In none of the six public utility samples considered is it possible to reject the null hypothesis at the 0.10 level of significance according to either of the statistical tests employed. For the three samples of capital expenditure increases the announcement period raw returns are -0.09%, -0.05%, and -0.31% with corresponding t-statistics -1.03, -0.83, and -0.67. The corresponding z-statistics are -0.44, -0.29, and -0.46. For the three samples of capital expenditure decreases the announcement period raw returns are -0.13%, -0.24%, and $+0.06\%$ with corresponding t-statistics of -0.73, -0.74, and -0.23. The corresponding z-statistics are -1.20, -0.34, and -1.54. Thus, for the public utility firm sample, on average, neither announcement of capital expenditure increases nor announcements of capital expenditure decreases have a significant effect on the market value of common stock.

It is, of course, apparent that the samples of all budget increases and all budget decreases are not independent of the two subgroups within those categories. Thus, overall there are only eight independent samples – the samples of annual budget increases and decreases and the samples of mid-year increases and decreases for industrial firms and for public utilities. The results for all eight samples are consistent with the joint predictions of the market value maximization hypothesis and the traditional model of corporate valuation. For each of the industrial firm samples the announcement period raw return has the predicted sign and the difference of means test permits rejection of the null hypothesis at he 0.05 level of significance. Additionally, in most cases the binomial sign tests also permits rejection of the null hypothesis at the 0.05 level of signficance. However, for none of the public utility samples is it possible to reject the null hypothesis at the 0.10 level of significance for either of the tests employed.

As discussed in section 2.2, approximately 36% of the announcements by companies in the industrial firm sample and 49% of the announcements by companies in the public utility firm sample also contained announcements of other firm-specific information. It is possible that the market response to capital expenditure announcements is due to the other firm-specific information released rather than the information about the firm's capital expenditure plans. To examine this possibility, all announcements which contained firm-specific information in addition to the announcement of the firm's capital budget were deleted from the sample and the statistical analyses were repeated. The results are contained in table 5.

In some cases the samples become quite small. However, the results are very similar to those in table 4. For industrial firms, capital expenditure increases are associated with positive and statistically significant announcement period returns and capital expenditure decreases are associated with negative and statistically significant announcement period returns. For the public utility firm sample, there are two differences between the results in tables 4 and 5. For public utilities it is still not possible to reject the null hypothesis for either the full sample or for the two subsamples of capital expenditure increases nor for the subsample of annual capital expenditure decreases. However, for both the sample of all budget decreases and for the subsample of decreases in the current year's budget from a previously announced budget, the announcement period raw returns are more negative in table 5 and for both samples it is possible to reject the null hypothesis at the 0.10 level of significance according to the difference of means test. For the sample of all budget decreases, the announcement period raw return decreases from −0.13% with a *t*-statistic of −0.73% in table 4 to −0.84% with a *t*-statistic of −1.79 in table 5. For the subsample of decreases in the current year's budget from a previously announced budget, the announcement period raw return decreases from +0.06% with a *t*-statistic of −0.23% in table 4 to −1.71% with a *t*-statistic of −1.94 in table 5. It should be noted, of course, that these two samples are not independent. Therefore, in three of the four independent public utility subsamples it is still not possible to reject the null hypothesis of no effect at the 0.10 level of significance according to either of the statistical tests employed.

Thus, for industrial firms, in each of the four independent samples considered, the announcement period raw return has the predicted sign and is significantly different from the comparison period mean return. For public utilities, in three of the four independent samples considered the announcement period raw return is not statistically different from the comparison period mean return. With one exception, then, the results for the full sample and for the 'non-contaminated' sample are similar. This similarity indicates that the results for the full sample are not 'caused by' the contemporaneous release of other firm-specific information contained in the capital budget announcements.

As a further investigation, the statistical tests also are conducted for the various subsamples of industrial firm announcements categorized according to the intended use of the allocated funds. The seven subsamples are listed in column 1 of table 6. For each category of intended use, the analysis is conducted for the samples of all increases in capital budgets and for the samples of all decreases in capital budgets. The results for the full sample are contained in table 6. The results for the 'non-contaminated' sample are presented in table 7. The results for the full sample and the non-contaminated sample are again quite similar. In most cases, the various categories of increases in capital budgets exhibit positive and statistically significant announcement period returns and the various categories of decreases in capital budgets exhibit negative and statistically significant announcement period returns. The only major exception to this rule is the category containing announcements of capital budgets in which the primary intended use of the funds is for exploration and development. For the full sample in this category, increases in budgets have an announcement period return of -0.55% with a t-statistic of -2.21 and decreases in budgets have an announcement period return of $+1.49\%$ with a t-statistic of $+0.98$. For the 'clean' sample, increases in this category of budgets have an announcement period return of -0.74% with a t-statistic of -1.99 and decreases in budgets have an announcement period return of $+1.47\%$ with a t-statistic of $+0.82$.[16]

A great deal of care must be exercised when interpreting peculiarities in the data that are revealed through extensive analysis. However, if the results for the exploration and development sample are taken at face value, they suggest that companies in our sample were 'overinvesting' in exploration and development. When they cut their exploration and development expenditures, the market reacted favorably and when they boosted their exploration and development expenditures, the market reacted negatively. Further investigation of the exploration and development category revealed that this sample is comprised primarily of companies that have allocated substantial portions of their capital budgets for the exploration and development of oil and gas fields. Given the degree to which federal government intervention may have influenced decisions regarding exploration and development for oil and gas over the period 1975 through 1981, interpreting the results to imply that firms 'overinvested' in oil and gas exploration is not entirely implausible. For example, various excess profit taxes and dividend restrictions could have

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[16] The tests were also conducted for the public utility firm sample categorized according to the intended uses of funds. However, most of the sample sizes were quite small – over 87% of the observations fall into either the 'unspecified' or 'general plant and equipment' categories – so that the results are highly dependent on a few observations. For that reason we have chosen not to report these results. They are available, however, to any interested reader.

induced oil and gas exploration and refining companies to 'overinvest' in development of new sources of reserves.[17,18]

Thus, with the exceptions discussed above, the reactions of common stock prices to announcements of capital expenditure increases and decreases generally are consistent with the joint predictions of the traditional model of corporate valuation and the market value maximization hypothesis: market participants respond positively to capital expenditure increases and negatively to capital expenditure decreases regardless of the types of projects in which the funds are to be invested.

4. Conclusion

The statistical analysis of common stock prices around the dates of capital expenditure announcements yields two conclusions. First, managers do reveal information that is relevant to the valuation of their firms by means of

[17]There are a number of other plausible interpretations. For example, Claudio Loderer has suggested that unexpected increases in expenditures for development of oil and gas reserves could imply that the cost of development is greater than expected. Robert Eskew has suggested that unexpected increases in exploration implies that existing reserves are less than expected. At a minimum, the results for the exploration and development samples are intriguing and are the subject of another study.

[18]Two additional questions about the sample were investigated. First, given the documented effects of corporate financing decisions on the market value of the firm, it seems reasonable to investigate the interaction between corporate investment and financing decisions. To investigate this question, we reread each of the newspaper articles containing the capital expenditure announcements to identify those that contain information about corporate financing decisions. The results of this search turned out to be fairly meager. For the industrial firm sample more than 90% of the announcements provided no information about intended sources of financing. Of those that did provide information, the breakdown was as follows: For the sample of capital expenditure increases, twenty firms announced intentions to fund the expenditures 'internally', one planned to issue stock, six planned to issue debt, six planned to issue a combination of debt and equity, and one planned to increase its line of credit. For the sample of capital expenditure decreases, four firms announced 'internal' financing plans, one planned to issue stock, one planned to issue debt, and three planned to increase their lines of credit. The public utility firm sample yielded even smaller samples. Because of the small samples involved, it seemed unlikely to us that analyzing capital expenditure announcements according to contemporaneous announcements of intended financing would yield any interesting results and we did not pursue the issue further.

Second, it can be argued that a relationship should exist between the size of the capital expenditure increases or decrease and the change in the market value of the firm. This argument is correct for an individual firm, but requires that two strong conditions be met in order to apply across a sample of different firms. First, the spread between the investment opportunity rate and the cost of capital must be homogeneous across firms. Second, the duration of the future net present value associated with new projects must be homogeneous across firms. Given the heterogeneity of firms in this sample, these conditions are unlikely to be met. Nevertheless, to investigate this relationship, the dollar change in the market value of common stock divided by the market value of common stock was regressed against the dollar value change in the capital budget divided by the market value of common stock. This regression was estimated for a variety of subsamples of industrial and public utility firms. In only one subsample of public utility firms, was the estimated slope coefficient different from zero at the 0.05 level of significance.

announcements about the firm's capital expenditure plans. Second, the reaction of common stock prices to capital expenditure announcements is generally consistent with the joint predictions of the market value maximization hypothesis and a traditional model of corporate valuation: For a sample of industrial firms (that are likely to have positive net present value investment opportunities) announcements of increases in planned capital expenditures are associated with statistically significant increases in the market value of common stock and announcements of decreases in planned capital expenditures are associated with statistically significant decreases in the market value of common stock. For a sample of public utility firms (that are less likely to have positive net present value investment opportunities) neither announcements of increases nor announcements of decreases in planned capital expenditures are associated with statistically significant changes in the market value of common stock.

Various theories have been proposed as possible alternatives to the market value maximization hypothesis as the explanation of corporate investment decisions. However, the primary challenger is the size maximization hypothesis. Under the market value maximization hypothesis, managers invest up to the point where the marginal rate of return on invested funds just equals the market required rate of return. The empirical prediction of the market value maximization hypothesis is that unexpected increases in capital expenditures should be accompanied by increases in the market value of the firm and unexpected decreases in capital expenditures should be accompanied by decreases in the market value of the firm.

Under the size maximization hypothesis, managers seek to increase the size of the firm. Thus, they are led to overinvest in capital projects. That is, they invest beyond the point where marginal return equals the market required return. The empirical prediction of the size maximization hypothesis is that unexpected increases in capital expenditures should have a negative impact on the market value of the firm and unexpected decreases in capital expenditures should have a positive impact on the market value of the firm. The empirical results of this paper (at least, on average) are consistent with the market value maximization hypothesis, and they are inconsistent with the size maximization hypothesis.[19]

The results of this study may have implications for other questions and hypotheses regarding corporate investment decisions which we have not yet

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[19]It is readily apparent that the results for the industrial firm sample are inconsistent with the size maximization hypothesis. However, the results for the public utility firm sample are also inconsistent with the size maximization hypothesis. Presumably the managers of regulated companies could find negative net present value projects in which to invest. The negative net present value projects would increase the size of the firm even though they would have a negative impact on the market value of currently outstanding securities. The results from the public utility firm sample are inconsistent with this implication of the size maximization hypothesis.

discovered. In any event, as is the case with most empirical studies, some caveats are in order. At least two should be noted here. First, we have interpreted the market response to corporate capital expenditure announcements as resulting from information about the firm's future investment opportunities. Alternatively, it is possible that the market reaction to capital expenditure announcements occurs because such announcements contain a 'signal' about the firm's current earnings from projects already in place. Specifically, when already existing projects generate larger than expected earnings, capital expenditures are increased; when earnings from existing projects are less than expected, capital expenditures are decreased. Such an interpretation is consistent, for example, with Myers and Majluf (1984). We cannot rule out the earnings information interpretation of the results. However, under this explanation, announcements by public utilities presumably would contain the same information as those by industrial firms. As a consequence, the lack of any market reaction to capital expenditure announcements by public utilities does not appear to be consistent with the earnings information explanation.

The second caveat has to do with the use of a naive model of investor expectations about future corporate capital expenditures. The naive model used here is unlikely to reflect precisely the way in which investors form expectations regarding corporate capital expenditures. It is possible that a more refined model of expectations could separate total changes in capital expenditures into expected and unexpected components. If so, the use of such a model could strengthen the results for the industrial firm sample and it could lead to rejection of the null hypothesis for the public utility firm sample. However, such an outcome would not fundamentally alter the primary conclusion of this investigation: Market participants do react to corporate capital expenditure announcements by reassessing the market value of the firms making the announcements and, given the information contained in the announcement, the market reaction is consistent with the hypothesis that managers seek to maximize the market value of the firm in making corporate capital expenditure decisions.

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