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Project Termination Announcements and the Market Value of the Firm

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■ Termination is one form of abandonment; the other form is sell-off. In a termination the project's assets remain within the firm, while they are sold in a sell-off. The normative approach to project abandonment has been investigated by Bonini [4], Dyl and Long [9], Gaumnitz and Emery [10], Howe and McCabe [14], McCabe and Sanderson [18], and Robichek and Van Horne [20, 21]. While these investigations vary in many aspects, they share the conclusion that projects should be abandoned when the expected present value of cash flows given that the project is abandoned today is greater than the expected present value of cash flows given that the project is continued for at least one additional period. Sunk costs should be ignored.

The alternative, behavioral hypothesis is that managers postpone project termination decisions, relative to the normative rule, when abandonment leads to the realization of losses (see Statman and Caldwell [23]). As elucidated by Jensen [15] in his discussion of corporate takeovers:

> *"Managers often have trouble abandoning strategies they have spent years devising and implementing, even when those strategies no longer contribute to the organization's survival. Such changes can require abandonment of major projects, relocation of facilities, changes in managerial assignments, and closure or sale of facilities or divisions"* [p. 318].

Do managers follow the normative rule of project termination? Examining stock price reactions to announcements of project terminations finds that the announcements are accompanied by stock price increases. This evidence is consistent with the behavioral hypothesis but inconsistent with the normative one.

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I. The Normative and Behavioral Hypotheses

Consider the case of the ill-fated venture of Texas Instruments, Inc. into home computers. On Thursday, April 21, 1983, the company announced that its first quarter net income fell 74%, largely on lost sales associated with a potential defect in its 99/4A home computer and intense competition in the home computer market (*Wall Street Journal,* April 22, 1983). Texas Instrument's stock, which closed at $160-1/4 on April 20, closed at $149 on April 21, a 7% decline. Subsequently, Texas Instruments announced after the market closed on Friday, June 10, that it expected a $100 million loss in the second quarter because of a drop in the sales of home computer models and extensive price cutting (*Wall Street Journal,* June 13, 1983). On Monday, June 13, the stock price declined 25% to ($118-1/4) from its level the previous Friday. Finally, after the market closed on Friday, October 28, Texas Instruments announced more losses and a decision to quit the home computer business (*Wall Street Journal,* October 31, 1983). On Monday, October 31, the stock price increased 22%, from $101-3/4 to $124-1/2. What caused the changes in the price of Texas Instruments' stock?

Shareholders' expectations must be analyzed, because changes in stock prices come with changes in expectations. What do shareholders expect before a termination announcement is made? And how do shareholders change their expectations once a termination announcement is made?

According to the normative hypothesis, projects are terminated when continuation results in a lower net present value than termination. Consider a project where the information available to shareholders before the termination announcement indicated that its net present value under continuation is higher than its net present value under termination. If the normative hypothesis holds, then a termination announcement should deliver bad news to shareholders. Shareholders lower their expectations about the net present value of the project, and that revision in expectations is accompanied by a decline in the price of the stock.

Now consider the case where the information available to shareholders before the termination announcement indicated that the net present value of the project under continuation is equal to its net present value under termination. The termination announcement provides neutral news, since shareholders are indifferent between continuation and termination. No change in the price of the stock would be expected under the normative hypothesis.

The case where the information available to shareholders before the termination announcement indicated that the net present value of the project under continuation is lower than its net present value under termination is inconsistent with the normative hypothesis. The normative hypothesis predicts that projects are terminated as soon as their net present value under continuation falls below their net present value under termination.

Can a termination announcement deliver good news to shareholders under the normative hypothesis? Consider the case where a project has a higher net present value under continuation than under termination. Now imagine that a new project possibility has arisen and that the new project and the existing one are mutually exclusive. Termination of the existing project is expected under the normative hypothesis if the net present value of the new project exceeds that of the existing project. An announcement of project termination would be consistent with an increase in the price of the stock if the termination announcement is accompanied by information about a new mutually exclusive project with a higher net present value.

Consider again the home computer project of Texas Instruments. The declines in price following the first two announcements are clearly consistent, under the normative hypothesis, with their bad-news nature. But what is the good news that caused the price of the stock to increase as the company announced that it is terminating the home computer project? There was no information about a new, higher net present value and mutually exclusive project that required the assets currently devoted to the home computer project. Indeed, all available information indicated that the home computer project was terminated because of its own poor prospects. The termination announcement can possibly tell shareholders that the prospects of the home computer project are worse than previously known, even bad enough to justify termination. But such information is consistent with a decline in stock price. If all the bad news has already been disclosed prior to the termination announcement, there should have been no effect on the stock price when the announcement was made. So why did the price of Texas Instruments' stock increase? The increase in the price of the stock is consistent with the behavioral hypothesis.

The essence of the behavioral hypothesis is that managers commit themselves to projects by taking responsibility for costs that are now sunk. Subsequently, managers find it difficult to realize their losses by terminating losing projects when the net present value under continuation falls below the net present value under termination. Instead, they throw good money after bad as they attempt to 'break even.' Shareholders do not make investment decisions, and they are not blinded by commitment to losing projects. When both managers and shareholders have information about the poor prospects of projects, shareholders see the desirability of termination more clearly than committed managers. But shareholders find it costly to enforce their views on managers. Instead, they incorporate the expected waste of good money into stock prices. The good news that comes with the termination of losing projects under the behavioral hypothesis is that less good money than expected will be thrown after bad.

If the behavioral hypothesis holds, a termination announcement should be accompanied by a decline in the price of the stock if no information about the poor prospects of the project has been disclosed to shareholders before the termination announcement. This prediction is identical to the prediction of the normative hypothesis because shareholders do not know that good money is thrown after bad until the termination announcement is made.

The change in the price of the stock where some information about the poor prospects of the project was available before the termination announcement depends on the relative magnitudes of the bad and good news that come with termination. The bad news is that the prospects of the project are worse than expected. The good news is that managers did not become entrapped and that no more good money will be thrown after bad.

A termination announcement would be accompanied by an increase in the price of the stock if all information about the poor prospects of the project has been disclosed to shareholders before the termination announcement. There is no bad news in this case, only the good news that no more good money will be thrown after bad.

Under the behavioral hypothesis, shareholders expect managers to resist project terminations, but they do not expect that resistance to last forever. For example, imagine that shareholders expected, just before the termination announcement was made, that managers would wait another year and waste another $2 million before the project was terminated. The termination announcement leads shareholders to add $2 million to the value of the company in the form of higher stock prices. The process of expectations formation and revision under the behavioral hypothesis presents a question. If managers resist termination of losing projects now, why would they terminate them later?

The typical management structure has several levels. Consider, for simplicity, the case of three levels. Project managers at one level, above them a company president, and above the president the board of directors. Project managers probably know more about their projects than anyone, but project managers are also project 'champions;' they are committed to their projects and likely to ignore or distort negative information as they fight to continue them. Presidents know less about each project, but they are usually not as committed to individual projects as the project managers.

Presidents who follow the normative rule overrule entrapped project managers. Similarly, boards of directors overrule entrapped presidents. However, internal control mechanisms are rarely perfect. Shareholders can reasonably expect that termination decisions will be delayed even when internal control mechanisms can eventually overcome the resistance to termination. Otherwise, intervention from the outside is needed, which frequently comes in the form of a takeover. As Jensen noted, it is easier for new managers than for current managers to devise and implement strategies that involve changes such as abandoning major projects or closing facilities.

Takeovers are an effective external control when internal control systems fail. However, takeovers may not always be possible, even when the benefits of terminations are significant. Specifically, takeovers are costly or impossible if committed managers hold large blocks of company shares. The death of such managers may be the only time to terminate losing projects. Johnson, Magee, Nagarajan, and Newman [16] found that, on average, positive returns accompany the sudden death of executives who are company founders and who hold large blocks of its shares. As Schwert [22] noted in his interpretation of the results, it is possibly a situation

> *"where somebody hung on too long in his job, and couldn't be forced out because of his controlling stock interest. The death of such individuals is good news for the other stockholders"* [p. 176].

II. Analysis of the Reaction of Stock Prices to Project Termination Announcements

The focus here is on the termination of projects with a history of substantial losses. To choose such a sample, all the companies on the COMPUSTAT Annual Industrial Tape that reported significant losses from discontinued operations (data item 66) for the years 1969–1983 were identified.[1] Specifically, firms were included in the initial sample if losses from discontinued operations exceeded 10% of the operating earnings of that year. There were 1,172 meeting this requirement.

Next, the *Wall Street Journal Index* was searched for the companies and years identified in the initial search to obtain the first announcement date of decisions to discontinue operations. Observations where an operation was sold have been deleted. Only observations in which an operation was terminated were retained. Examples of terminations include Flexi-Van's decision "to trim unprofitable truck rental activities by closing some terminals," and Moog Inc's decision "to discontinue ski-binding manufacturing operations in New York, which would end the firm's production of recreational items." None of the observations involves a case where the termination announcement was accompanied by information indicating that the motivation behind the termination was to transfer the assets of the terminated project to another, more profitable, project. That left 111 observations.

Next, all observations with confounding announcements were deleted . Most of these, such as the case of Texas Instruments, involve earnings announcements. Observations in which return data for the announcement period (discussed below) were missing were also deleted. The final sample includes 70 observations. The firms in the sample belong to a wide range of industries and they are not concentrated in any particular one. Similarly, the events are not concentrated in any particular year or month.

Daily stock returns from the CRSP tape for 141 days were obtained—the *Wall Street Journal* publication date of the termination announcement (day 0), the 70 days preceding the publication date (-70 to -1), and the 70 days following the publication date (1 to 70). Market-adjusted returns were calculated by subtracting the CRSP value-weighted market index returns from the returns of the individual stocks.

The analysis was performed with market-adjusted returns rather than with returns adjusted according to the market model. Both adjustments account for general movements of stock prices, but market-adjusted returns are not adjusted for differences in the systematic risk of individual stocks. Brown and Warner [7] compared the power of tests using daily market-adjusted returns, market model returns, and mean-adjusted returns in event studies. They concluded that tests with the three have approximately equal power in detecting abnormal performance. For example, they noted in their Table 3 that when the actual level of abnormal performance in a sample of 50 securities was zero, the null hypothesis (H_0: mean abnormal performance = 0) was rejected in 4.4% of all simulations using the market model and in 4.8% of all simulations using market-adjusted returns. When the actual level of abnormal performance was 0.01, the null hypothesis was rejected in 80.4% of all simulations using the market model and 79.6% of all simulations using market-adjusted returns. And when the actual level of abnormal performance was 0.02, the null hypothesis was rejected in 99.6% of all simulations using the market model, and an identical percentage of simulations using market-adjusted returns. Results of tests with mean-adjusted returns are similar to those with market-adjusted returns and market model returns. While the use of market model returns is common, mean-adjusted returns were used by Masulis [17] and Brickley [6].

A termination announcement that is reported in the *Wall Street Journal* on day 0 is likely to have been made the previous day, by -1. The effect of an announcement on stock prices might occur on day -1 if the announcement is made early in the day. However, if the announcement is made after the close of the market on day -1, its effect on stock prices will be postponed until the following day, day 0. Days 0 and -1 have been designated as the "announcement period" and the announcement period market-adjusted returns as the cumulative market-adjusted returns over the two days. The announcement period market-adjusted returns are compared with pre-announcement period market-adjusted returns. The comparison period consists of 30 two-day observations based on the 60 days, -70 through -11. The nine days immediately preceding the announcement period were not included in the comparison period so as to lessen the chance that the comparison period returns are affected by the announcement. Mean two-day market-adjusted returns for the 70 sample observations are presented in Exhibit 1. The table also

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[1] Accounting Principles Board Opinion #30 [1] defines an "operation" as either a separate product line or class of customer.

Exhibit 1. Mean Two-Day Abnormal Returns for the Pre-Announcement Period (Days -70 through -11), the Announcement Period (Days -1 and 0), and the Post-Announcement Period (Days 1 through 70)

Two-Day Period[a]	Mean Two-Day Excess Return	Sample Size[b]	Number Positive, Number Negative
-70, -69	-0.0003	69	32, 37
-68, -67	-0.0030	70	29, 41
-66, -65	-0.0014	69	37, 32
-64, -63	0.0094	70	41, 29
-62, -61	-0.0017	70	34, 36
-60, -59	-0.0076	70	28, 42
-58, -57	-0.0043	70	26, 44
-56, -55	-0.0040	70	26, 44
-54, -53	0.0033	70	33, 37
-52, -51	-0.0066	70	29, 41
-50, -49	0.0024	70	39, 31
-48, -47	0.0017	70	40, 30
-46, -45	-0.0050	70	29, 41
-44, -43	0.0021	70	35, 35
-42, -41	-0.0107	70	26, 44
-40, -39	-0.0055	70	32, 38
-38, -37	-0.0018	70	32, 38
-36, -35	0.0028	70	38, 32
-34, -33	0.0017	70	35, 35
-32, -31	-0.0001	70	34, 36
-30, -29	-0.0035	70	29, 41
-28, -27	-0.0064	70	26, 44
-26, -25	-0.0010	70	33, 37
-24, -23	0.0042	70	37, 33
-22, -21	-0.0012	70	33, 37
-20, -19	-0.0037	70	36, 34
-18, -17	-0.0037	70	36, 34
-16, -15	0.0003	70	33, 37
-14, -13	-0.0014	70	35, 35
-12, -11	-0.0021	70	32, 38
[-1, 0]	[0.0124]	[70]	[40, 30]
1, 2	0.0030	70	32, 38
3, 4	-0.0053	70	29, 41
5, 6	-0.0020	70	35, 35
7, 8	-0.0100	70	27, 43
9, 10	-0.0093	70	30, 40
11, 12	0.0012	70	31, 39
13, 14	0.0072	70	37, 33
15, 16	0.0022	70	32, 38
17, 18	0.0002	70	34, 36
19, 20	-0.0063	70	26, 44
21, 22	-0.0028	70	35, 35
23, 24	-0.0014	70	35, 35
25, 26	-0.0033	70	33, 37
27, 28	0.0006	70	33, 37
29, 30	0.0005	70	28, 42
31, 32	0.0040	70	32, 38
33, 34	-0.0042	70	31, 38
35, 36	0.0053	70	39, 31
37, 38	0.0094	70	40, 30
39, 40	0.0117	70	38, 32
41, 42	-0.0001	70	28, 42
43, 44	0.0026	70	31, 39
45, 46	0.0035	70	36, 34
47, 48	0.0004	70	37, 33
49, 50	0.0143	70	37, 33
51, 52	-0.0046	70	31, 39
53, 54	-0.0010	70	34, 35
55, 56	-0.0043	70	38, 32
57, 58	0.0007	70	28, 42
59, 60	0.0064	70	33, 37
61, 62	0.0071	70	37, 33
63, 64	-0.0080	70	28, 42
65, 66	0.0117	70	39, 31
67, 68	0.0019	70	38, 32
69, 70	-0.0019	70	26, 44

[a] Abnormal returns are defined as the difference between stock returns and the corresponding CRSP value-weighted returns. The announcement period (-1, 0) is defined as the day of the publication of the announcement in the *Wall Street Journal* (day 0) and the previous day (day -1). The announcement period excess return is defined as the mean excess return over days -1 and 0.

[b] Includes 70 observations. The sample size for the two-day periods -70, -69 and -66, -65 is only 69 because of missing returns data for one observation.

lists the number of observations with positive and negative market-adjusted returns.

Under the normative hypothesis, market-adjusted returns should be zero if the information available before the termination announcement indicated that the present value of projects under continuation is equal to their values under termination. This is the case in which termination provides neutral news. Otherwise, termination announcements deliver bad news about the projects and negative market-adjusted returns accompany them.

The announcement period mean market-adjusted return of 0.0124 is positive and higher than any other two-day market-adjusted return in the comparison period. Of the 70 market-adjusted returns in the announcement period, 40 are positive. That is the second highest number of positive market-adjusted returns. This result is inconsistent with the normative hypothesis, but it is consistent with the behavioral hypothesis under conditions where some or all information about the prospects of the projects have been disclosed to shareholders before the termination announcement.

A t-statistic is used to test formally the null hypothesis that the announcement period mean market-adjusted return ($\bar{R}_2 a$) equals the mean of the two-day returns of the comparison period ($\bar{R}_2 c$). The t-statistic is given by:

$$t = \frac{\bar{R}_2 a - \bar{R}_2 c}{\hat{s}\sqrt{1 + 1/N}}, \qquad (1)$$

where $\hat{s}$ is the estimate of the standard deviation of the two-day portfolio market-adjusted returns using the 30 comparison period two-day market-adjusted returns. $\bar{R}_2 a = 0.0124$, $\bar{R}_2 c = -0.0014$, $\hat{s} = 0.0040$, and $N = 30$. The t-statistic for the difference between the mean market-adjusted return of the announcement period and the mean market-adjusted return of the comparison period is 3.38, and the null hypothesis can be rejected at the 0.01 level of significance.[2]

The sample includes projects where little or no information about their poor prospects was available to shareholders before the termination announcement was made. According to the behavioral hypothesis, the positive reaction of stock prices to project termination announcements should be more pronounced in cases where much information about the poor prospects of the project was known before the termination announcement was made than in cases where little information was known.

Consequently, the sample was partitioned into observations where much information about the prospects of projects was available to shareholders before the termination announcement was made, and observations where little or no information was available. Publication in the *Wall Street Journal* was used as a rough measure of the availability of information. An observation was classified into the INFORMATION group if the *Wall Street Journal* reported problems associated with the project within three years preceding the termination announcement. An observation was classified into the NO INFORMATION group if no such report was found. There are 11 INFORMATION and 59 NO INFORMATION observations. If the good news that comes with project termination is that no more good money will be thrown after bad, then the mean market-adjusted return of the INFORMATION group should exceed the mean market-adjusted return of the NO INFORMATION group. Indeed, that is what happened. The mean announcement period market-adjusted return for the INFORMATION group is 0.0404, with a standard deviation of 0.068. It is higher than the 0.0072 mean announcement period market-adjusted return (with a standard deviation of 0.043) of the NO INFORMATION group. The difference is significant at the 0.05 level.

The evidence in this paper is consistent with the behavioral hypothesis, but other evidence is possibly inconsistent with it. De Bondt and Makhija [8] found negative stock price reactions to announcements of cancellations of nuclear plants. This is consistent with a case where shareholders assumed, before termination announcements, that the present value of nuclear plants was positive. However, as De Bondt and Makhija noted, the results may be due to the regulatory environment within which public utilities operate. Owers and Rogers [19] found that the mean market-adjusted return following abandonment announcements was not significantly different from zero. However, they did not separate firms in which much information about the poor prospects of the projects was known before termination from firms where little information was known. Blackwell, Marr, and Spivey [3] focused on announcements of plant closings. They used the sequence of closings as a measure of information about the poor prospects of the plants. Specifically, they defined the first plant closing by a firm as a case where little information was known before the closing announcement. Subsequent announcements by the same firm were defined as cases where more information was known. They found negative stock price reactions in the first group, but insignificant reactions in the second.

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[2] This test assumes normality and equal variances for the distributions generating announcement period and comparison period two-day portfolio returns.

III. A Hypothesis about Sell-Offs

Abandonment by sell-off is different from abandonment by termination. Assets remain within the firm in a termination, but they are sold to outsiders in a sell-off. Several studies on the valuation effects of sell-offs exist (Alexander, Benson, and Kampmeyer [2], Hearth and Zaima [11], Hite and Owers [12], and Hite, Owers, and Rogers [13]).

Sell-off announcements are typically accompanied by positive returns to the shareholders of the selling firms. Hite, Owers, and Rogers (following Bradley, Desai, and Kim [5]) consider two possible explanations for the positive returns—information and synergy. Under the information hypothesis the target assets are undervalued by investors. An offer for the purchase of these assets provides credible evidence about mispricing. Under the synergy hypothesis the target assets are more valuable in the hands of the buyers than in the hands of the sellers. Hite, Owers, and Rogers found that permanent revaluation of stock prices occurred only in firms that completed their sell-offs. They interpret this finding as consistent with the synergy hypothesis but inconsistent with the information hypothesis, since the information hypothesis predicts that permanent revaluation would occur even to firms that did not complete their sell-offs.

The synergy hypothesis of sell-offs rests on potential productive gains that can be realized only by the transfer of the target assets from their current use to the buyer's use. But does the synergy occur in the operations of the sellers or the buyers? The logic of the synergy hypothesis suggests that the synergy occurs in the buyers' operations, as the acquired assets complement the buyers' particular existing assets. Synergy can hardly occur in the sellers' operations, since all buyers pay cash or cash equivalents and the cash of one buyer is no more complementary to the operations of the seller than the cash of any other buyer. If the potential for synergy is indeed in the buyers' operations, this should endow the buyer with an advantage at the bargaining table. It is likely that alternative buyers would realize less synergy and therefore would be willing to offer less for the asset. Thus, it is surprising that security holders of the selling firms in Hite, Owers, and Rogers receive a higher proportion of the increase in value associated with sell-offs than do security holders of the buying firms. Of course, it is possible that security holders of the selling firms receive higher benefits because people in selling firms are generally better at negotiations than people in buying firms. As an alternative, perhaps most of the value comes to shareholders of selling firms because most of the value comes to selling firms. Perhaps the value created in sell-offs is mostly value that comes from giving up projects that have been draining resources in the selling firms, rather the value that comes from synergy between existing and acquired projects in buying firms.

Consider two assets sold in sell-offs. The first has been a 'losing' asset to its current owner and its sale would result in a write-off. The second has been a 'winning' asset to its current owner and its sale would result in an extraordinary gain. Neither the synergy nor the information hypothesis would predict that stock price reactions to the two sell-offs be different.[3] However, it could be argued that managers of 'losing' assets delay sell-offs. Thus, there is the testable hypothesis that sell-offs of 'losing' assets are accompanied by larger gains in the prices of the stocks of the selling firm than sell-offs of 'winning' assets. Indeed, the resistance to asset writedowns might explain the finding of Strong and Meyer [24]—that asset writedowns are closely associated with the replacement of senior managers by outside managers.

IV. Conclusion

On average, shareholders consider project termination announcements good news. Positive returns thus accompany termination announcements, and returns are especially high when a large portion of the information about the poor prospects of a project has been known to shareholders before the termination announcement.

What is the source of the good news conveyed with termination announcements? Termination announcements convey good news because they tell shareholders that managers will no longer throw good money after bad. In this scenario, managers who carry the responsibility for initiating projects are reluctant to terminate their projects, even when analysis of expected future cash flows favors termination. Shareholders prefer termination, but find it costly to force their view on managers. The good news that shareholders receive with termination decisions is similar to the news that they receive at a takeover bid or at the death of an executive who hung on too long to his job. It is the news that the amount of good money thrown after bad will be less than they expected.

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[3] The tax consequences of write-offs are different from those of extraordinary gains, but the consequences are known to both shareholders and managers before a sell-off announcement is made.

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1989 AMERICAN REAL ESTATE SOCIETY WILEY MANUSCRIPT PRIZE WINNER

"Refining the Analysis of Regional Diversification for Income-Producing Real Estate," by David J. Hartzell, David G. Shulman, and Charles H. Wurtzebach, *The Journal of Real Estate Research* (Winter), pp. 89–95. This prize ($1,000) is for the best article to appear in *The Journal of Real Estate Research* in the last twelve months, as determined by a mail ballot of ARES members.