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Authors

MARCUS, AA
BROMILEY, P
GOODMAN, R

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Preventing Corporate Crises: Stock Market Losses as a Deterrent to the Production of Hazardous Products

Alfred A. Marcus
Philip Bromiley
Robert Goodman

The classic theory of the firm is based on the idea that managers are agents for the owners, so increasing shareholder wealth, according to this theory, is the appropriate norm for judging managerial behavior. Negative stock market returns, therefore, should discourage managers from engaging in activities that lead to corporate crises. This paper calculates the stock market reactions to two kinds of crises—automobile safety recalls and the toxic chemical release in Bhopal. In the auto safety case, shareholder losses are limited largely to a few days around the event (to one company, Chrysler, for two time-periods 1973-74 and 1976-77). In the Bhopal case, while Union Carbide stock suffers a steep decline in the period after the accident, within 90 trading days it begins to rebound largely because the company is undervalued and is an attractive takeover target. These results raise questions as to whether the stock market dependably discourages managers from engaging in actions that lead to corporate crises.

ACCORDING TO Friedman (1970), Rappaport (1981, 1983), and others the appropriate objective of managers is to increase the wealth of shareholders within the bounds of law and ethics. This view, however, is not unanimously held. The debate about appropriate managerial goals and motivations is an old one (Marris, 1963; Cyert and March, 1963; Williamson, 1964), and its resolution is not within the scope of this paper. (Seitz, 1982, Donaldson and Lorsch, 1983, and Chakravarthy, 1986 have useful perspectives on these issues.) Rather, we ask: *If* managers' primary goal is to increase shareholder wealth, would stock market returns discourage them from engaging in practices that might lead to corporate crises?

THE CORPORATE SOCIAL POLICY LITERATURE

Although there have been few systematic studies of corporate crises, many crises can be viewed as the

Philip Bromiley is an Assistant Professor of Strategic Management at the Carlson School of Management, University of Minnesota. His past publication topics include corporate capital investment, organizational planning and decision making. His current research examines the determinants of corporate risk taking and the influence of risk taking on corporate performance.

Alfred M. Marcus is an Assistant Professor of Business, Government, and Society at the Carlson School of Management, University of Minnesota. He is co-editor of Business Strategy and Public Policy *which will be published by Greenwood Praeger in August, 1987. This study of stock mar-* *ket reactions to corporate crises is part of a larger research endeavor.*

Robert Goodman is a Professor of Strategic Management at the University of Syracuse School of Business. He is in the process of getting his Ph.D. at the Carlson School of Management. He formerly worked in commercial banking.

outcome of corporate social policies, and there have been many studies of the relations between corporate social policy and stock market performance. Toxic chemical leaks, product safety recalls, major industrial accidents, and cases of bribery, fraud, and corruption have major social costs in addition to direct costs to the firm. It can be argued that socially responsible behavior is in the interest of shareholders because the socially responsible firm is likely to avoid legal liabilities and intangible losses such as reputational damage that a firm might incur if it were irresponsible. Also, one can speculate that "socially aware and concerned management" should possess the skills necessary to run a superior company in the traditional financial sense (Alexander and Bucholz, 1978). Social *and* financial success may be a function of the same factors, i.e. flexible norms or structure

TABLE 1

**Results of Studies That Show
The Relationship Between Corporate
Social Policies
and Financial Performance**

Definition of Social Policy	Results
Reputational Assessment/ Survey of Students and Executives	
Moskowitz (1972)	+
Vance (1975)	—
Alexander & Bucholz (1978)	0
Cochran and Wood (1984)	+*
Disclosure of Social Policy in Annual Reports	
Belkaoui (1976)**	+
Ingram (1978)	0
CEP Pollution Performance	
Folger and Nutt (1975)	0
Spicer (1978)	+
Chen and Metcalf (1980)	0***
Social Plans/Programs	
Newgren, Rasher, & LaRoe (1984)	+

* when controlled for asset age
** pollution disclosure
*** spurious positive, size is the explanatory variable

and sensitivity to outside forces. On the other hand, socially responsible behavior does cost money, and so concerned firms may reduce their income stream to the obvious detriment of shareholder wealth. Actions designed to further social policies, therefore, may not be in investors' interests.

The Empirical Evidence

The empirical evidence on the relationship between corporate social policies and stock market performance is mixed. As can be seen from Table 1, five studies show that the market rewards firms who engage in socially responsible behavior, four studies show no effect, and one shows that the market punishes socially responsible firms.

Existing studies suffer from some major methodological problems, such as the difficulty in defining and measuring the relationship between socially responsible behavior and market performance. Definitions of social policies include everything from a concern for the elderly and handicapped to corporate giving, pollution control, employee discrimination, sexual harassment, workplace safety, military contracts, or investment in South Africa. Given that social policies have been defined this broadly, it is difficult to assess them. Investigators have ranked companies based on reputation, disclosure of activities in annual reports, and pollution performance (See Table 1). These methods have major shortcomings (Ullman, 1985). The main flaw is that they are based on "the subjective judgments of individuals and ideologically homogeneous groups that are no more than a small part of society" (Baysinger and Keim, 1985).

Researchers have also failed to develop satisfactory measures of corporate performance (Spencer and Wokutch, 1984). A number of researchers have argued that stock prices are more accurate than accounting data since they reflect shareholder evaluation of new information as soon as it becomes available (see Schwert, 1983; Fischer and McGowan, 1983). Stock market data also ra-

pidly encapsulates perceptions of the company's future prospects. Unfortunately, there has been a lack of uniformity across existing studies in defining stock market performance. Folger and Nutt (1975), for example, use price-earnings ratios, while Alexander and Bucholz (1978) rely on a more sophisticated model that takes risk into account.

Another problem is that many studies assume social policies affect financial performance. However, effects can run the other way. For example, a company which is performing well financially may have the slack resources to pay for increased social awareness. On the other hand, a company performing poorly may attempt to "cut corners" and engage in practices that risk corporate crises.

Studies Which Focus on Specific Social Policies

Studies which focus on specific social policies may yield a better understanding of the relations between practices that can produce crises and financial performance. Two such studies are worthy of note. After identifying abnormal reductions in stock prices following accusations of bribery, fraud, and illegal political contributions, Strachan, Smith, and Beedles (1983) argue that an awareness of these losses can help managers "resist the temptation" (p. 121). Similarly, Jarrel and Peltzman (1985) conclude that shareholder losses suffered after auto recalls are a sufficient deterrent to the production of hazardous products and that additional regulation may not be necessary.

Although a complete analysis requires estimates of the benefits of taking actions that can lead to crises, of the probability that the actions will result in crises, and of the concomitant impacts on shareholder wealth (Marcus and Bromiley, 1987), a first step towards analysis is to assess the shareholder impacts of crises. If they are negligible, additional analysis may not be necessary. This paper, therefore, examines the assumption that stock market losses can deter actions that may lead to crises by reporting on two studies. The first examines in

detail the contention that stock market losses can inhibit actions which might result in product safety recalls. The second assesses the Bhopal accident through an analysis of Union Carbide stock returns in the period after this tragedy.

The results of both studies suggest that only in special cases do corporate crises have substantial and long term negative effects on shareholder wealth. Although the first study shows that on average stock prices for automobile manufacturers declined around the time of recalls, the reduction was limited to a few days. By day six after the recall, we observed the beginning of a stock market rebound. Moreover, the main effects were felt by a single company, Chrysler, during the period from 1977-78 when the company's continued existence was in doubt. By 1982-83, we were unable to detect significantly abnormal returns. In the case of Union Carbide, returns declined dramatically after Bhopal, but the resulting low price was responsible for a perception by investors of undervaluation, which led to rumors of a take-over. These rumors helped restore prices to their pre-accident levels. Ultimately, investors in Union Carbide achieved returns that were greater than those realized before the accident. Thus, stockholders who retained their shares in the company's stock actually benefitted. The implications of these findings will be discussed after presenting the data analysis.

THE AUTO RECALL STUDY

A manager who wishes to estimate the average impact of auto recalls on stock prices has several choices about the appropriate level of aggregation. Assumptions that can be made are:

- The mean percentage impact of recalls on shareholder wealth is constant for all companies in all time periods. Thus, the best estimate of the impact of a recall on shareholder wealth is the average impact of recalls *for all companies in all time periods.*

- The mean percentage impact of recalls on shareholder wealth varies over time. Thus, the best estimate of the impact of a recall on shareholder wealth is the average impact for the recalls for all companies *in a given time period.*

- The mean percentage impact on recalls on shareholder wealth varies across companies. Thus, the best estimate of the impact of a recall on shareholder wealth is the average impact for the recalls *for a company* in all time periods.

- The mean percentage impact of recalls on shareholder wealth varies across companies and over time. Thus, the best estimate of the impact of a recall on shareholder wealth is the average impact for the recalls *for a company in a given time period.*

Combining all recall events may lead to a serious error as not all events and reactions are similar. A manager, therefore, should examine specific categories of events (e.g., events that occur to specific companies or to specific companies over time). Even after examining specific categories of events, managers may be misled, because the events in a specific category are not homogeneous. Thus, managers may want to examine individual recalls.

The Attention Focusing Role of Corporate Organizations

However, managers should not be misled by individual recalls. A realistic view of what actually takes place in organizations (see Simon, 1947; Cyert and March, 1963) is that managers would be concerned *only* with recalls that are closely related to their current role and function (see also Halpern, 1979). Managers in auto firms working in product development or manufacturing generally participate directly in only a handful of recalls. Because they would be in a position to observe only a few recalls, they would perceive stock market reactions on a case-by-case basis.

Anecdotal evidence suggests that managers perceive stock market returns in precisely this manner. In the Pinto case, a financial officer reported that Ford's stock price dropped on the day of the acquittal in one of the Pinto trials, whereas it went up after the announcement of a quarterly loss and a substantial reduction in dividend (Fisse and Braithwaite, 1983). Because the manager focused on individual cases, he concluded that the stock market was not a reliable indicator of corporate performance. Moreover, the Strachan, Smith, and Beedle (1983) analysis of alleged corporate crimes found that over forty percent of *individual* abnormal returns were *positive*. Thus, a manager who observed isolated cases without being aware of the aggregate results (see Tversky and Kahneman, 1974), would have a two in five chance of coming to the wrong conclusion i.e., investors *reward* questionable practice because of profit-making potential.

Estimating the Market Reaction

To estimate the impact of crises on shareholder wealth, it is necessary to make assumptions about the way the market operates. The standard assumption in the finance literature is that the market is fundamentally and informationally efficient, i.e., stock prices use all available information, and therefore, reflect an optimal estimate of the net present value of the future cash flows of the firm (Fama, 1976). Thus, unanticipated announcements or new information should result in nearly instantaneous adjustments in stock prices.

To assess the effect of new information, one must examine the extent to which security prices around the time of an event are "abnormal." Many studies (see for example, Montgomery, Thomas, and Kamath, 1984; and Reinganum, 1985) use the capital asset pricing model (CAPM) to control for market wide effects. Most studies using the CAPM estimate the measure of systematic risk, i.e., (beta) using regression techniques on historical data. In the Bhopal study the CAPM model will be used, because beta makes sense for long adjustment periods. Brown and Warner (1985), however, have found that a simpler methodology, mean adjusted returns, "pick up abnormal performance no less frequently" (p. 245). In the auto

safety mean, adjusted returns are used (Eades, Hess, and Kim, 1984; Alexander, Benson, and Kampmeyer, 1984; and Strachan, Smith, and Beedles, 1984).

Methodology

Since the methodology followed (mean adjusted returns) is standard and well described in Brown and Warner (1985) and in particular in Strachan et al. (1983), the basic procedure is only briefly discussed here. (For specific equations, see Strachan et al.) For a given portfolio of stocks, the mean adjusted abnormal returns for a given day or set of days (window) are calculated by taking the average return on the portfolio for some previous period (the normal return) and subtracting it from the return(s) on the day(s) of interest to give the abnormal returns. Using an estimate of the variance of returns from the normal returns period, one can then test whether the abnormal returns differ significantly from zero.

Thus, we form a series of "portfolios" comprised of the recalls identified by each of the assumptions noted above, calculate the abnormal returns for those portfolios, and test whether they differ significantly from zero. We use a normal returns period that starts 244 days before the event and ends sixteen days before it. Under the assumption of constant effects across companies and over time, the returns for fifteen days before and ten days after the event are examined. The day of the event is defined to be the day on which its announcement appeared in the *Wall Street Journal* (*WSJ*).

For the time and company portfolios, the abnormal returns are estimated for two time periods: (1) the day of the announcement and (2) the day before and the day of the announcement. The day before the announcement is commonly included because news of the announcement may be public and the market may react before an announcement actually appears in the *Wall Street Journal* (*WSJ*) (Ruback, 1982 and 1983). Care is taken in the use of significance tests; given the size of sample being investigated in some of these

portfolios and the size of effect (one percent or so) being sought, even if an effect were present, it might not be possible to reject the no-effect/null hypothesis (Brown and Warner, 1985). On the other hand, estimates of the mean are unbiased regardless of sample size.

Automobile Recall Sample

Aggregate abnormal returns for a portfolio of companies consisting of the *four* major American automobile manufacturers are examined. These estimates are for *four periods,* 1967-1968, 1972-1973, 1977-1978, and 1982-1983, because industry conditions vary and investors might reasonably view the impact of recalls differently in these periods. The first period is before the creation of the National Highway Traffic Safety Administration (NHTSA), as the National Traffic and Motor Vehicle Safety Act of 1966 was initially administered by the Federal Highway Administration and NHTSA was not created until 1970. The second period is prior to the 1974 amendments to the 1966 Safety Act. The 1974 amendment required that the auto manufacturers pay for all repairs made during recalls. The third period includes the Carter administration, when NHTSA, headed by Nader associate Joan Claybrook, vigorously enforced the recall program and recalled more cars than were actually produced. The final period includes parts of the Reagan administration when NHTSA was accused of "lacking purpose," "losing vigor," and "failing to enforce the law" (See Claybrook, 1934).

The sample is based on all *major* recalls reported in the WSJ. Major

recalls are defined based on the relative market share of the manufacturers and thus assume that: for GM a recall involving more than 50,000 cars is major; for Ford a recall involving more than 20,000 cars is major; and for Chrysler a recall involving more than 10,000 cars is major. For American Motors, we consider a recall above 2,000 cars major. By using this method, 128 major recalls were identified of which nine could not be used in the analysis due to errors in the data.

Table 2 presents the cases used in the analysis by manufacturer and time period.

As can be seen, the number of major recalls peaked in 1977-1978. Ford had the most major recalls both absolutely and in each period with the exception of 1982-1983 when the number of GM's major recalls escalated.

Automobile Recall Results

The results in Table 3 reflect the performance of a portfolio that includes recalls from all manufacturers in all time periods (119 events) on each of the 15 days proceeding and 10 days following the recall announcement. These results show a significant reduction in stock price on the day before and the day of the recall announcement. The abnormal change in stock price was .72% in the two days with a cumulative abnormal change (decline) in stock price of 1.34% from the day before the announcement to four days after the announcement.

These results are consistent with efficient markets theory in finding significant effects in the period im-

TABLE 2

Major Auto Recalls

	1967-68	1972-73	1977-78	1982-83	Totals
AMC	1	1	8	2	12
Chrysler	7	7	8	3	25
Ford	6	8	24	12	50
GM	2	5	7	18	32
# of recalls	16	21	47	35	119

TABLE 3

Abnormal Returns for a Portfolio of 119 Major Recalls

Trading Day	Abnormal Return (%)	Cumulative	Raw Abnormal Return (%)	t-test
—15	—.03	—.05	.05	—0.28
—14	—.17	—.24	.29	—1.45
—13	+.19	+.11	.18	+0.67
—12	+.19	+.21	+.03	+1.24
—11	—.17	—.24	.21	—1.44
—10	+.17	+.09	.13	+0.51
—09	+.07	—.01	.14	—0.06
—08	+.23	+.15	+.01	+0.87
—07	—.09	—.17	.16	—1.00
—06	+.21	+.13	.03	+0.76
—05	+.16	+.08	+.05	+0.48
—04	+.13	+.05	+.10	—0.32
—03	+.02	—.05	+.05	—0.32
—02	—.02	—.09	.04	—.56
—01	—.23	—.31	.35	—1.81*
00	—.33	—.41	.76	—2.43*
+01	—.13	—.21	.97	—1.22
+02	+.02	—.06	—1.03	—0.37
+03	—.09	—.17	—1.20	—1.00
+04	—.10	—.18	—1.38	—1.08
+05	+.34	+.27	—1.12	+1.57
+06	+.70	+.62	.50	+3.65*
+07	+.28	+.20	.30	+1.17
+08	+.22	+.14	.16	+0.83
+09	—.10	—.18	.34	—1.08
+10	—.17	—.25	.59	—1.45
Means	+.06	—.02	—0.37	—0.18

Normal return = +.07841%
Standard deviation = .16881%
* significant at the .05 level

mediately around the announcement day. On this basis alone, we might conclude that the market adequately deters actions that can lead to recalls.

However, our findings show that the *largest* abnormal return occurs on day six and is *positive*. Although substantial reductions in stock price occur around the time of the recall, the abnormal returns a week later (days five and six) exceed (.89) the negative abnormal returns on days minus one and zero (.72). This suggests that there may be some "rebound" about a week after a recall. Indeed, by day eight the cumulative abnormal returns are close to zero (—.16%) which is well within the normal variability of the portfolio. Whether the observed positive returns on days five to eight indicate a real market correction and rebound or are simply normal random variations is unclear.

Estimates by Manufacturer and Time Period

As noted, a manager may not want to assume that the market reaction to recalls is constant across companies and over time. Thus, reactions were estimated by (1) manufacturer, (2) time period, and (3) for each manufacturer in each time period. Table 4 presents these results.

Only Chrysler has significant abnormal returns over the entire time series. Although the average returns for the other three companies are negative, they are of substantially smaller magnitude and none is statistically significant. Similarly, looking at the results for all companies averaged over each of the four time periods, we find significant effects only on the day of the WSJ recall announcement in only two time periods, 1972-73 and 1977-78. Thus, no

time period has significant effects over the entire two day event window.

Given the controversy over the correct technique for comparing means with differing standard deviations, a proper test of these differences cannot be executed. Nonetheless, examination of the estimated mean abnormal returns show substantial differences. Event day means vary from —.6% for General Motors to —1.09% for Chrysler, and from —.9% in the 1957-68 period to —.69% in 1972-73. Thus, estimates of the magnitude vary by factors of over 18 across companies and over seven across time periods. Although the statistical significance of means can vary with sample size (and such sample sizes vary across companies and time in our data), mean estimates are unbiased and, as we have shown, they display substantial differences across time and companies.

The most interesting differences are the results for the individual companies by time period. Although test statistics are sensitive to sample size, let us begin by noting that only Ford in 1967-68 and Chrysler in 1972-73 and 1977-79 have significant returns at the .05 level with a one-tailed t-test. The day of the recall effects for Chrysler vary from .43% in the 1967-68 time period to —1.44%, —1.75%, and —2.01% in the subsequent three periods. Ford returns also vary from —.89% in 1967-68 to —.41%, —.31% and .8% in the subsequent three periods. General Motors effects, on the other hand, seem small and undistinguishable from normal variation throughout: —.48%, —.21%, .00%, and —.10% for the four time periods.

These results suggest that the stock market reaction varies by companies and time period. The market response to Chrysler recalls is much greater than the response to other companies in the post 1967-68 periods. In 1982-83, Chrysler stock price posted an abnormal one-day decline of —2.01% compared to only .08% and —.10% for Ford and GM. In 1977-78, the one-day Chrysler effect was —1.75% compared to only —.31% and 0% for Ford and GM. In 1972-73, the one-day Chrysler

effect was −1.44% compared to −.41% and −.21% for Ford and GM. In contrast, during 1967-68, the one-day abnormal change for Chrysler stock was .43% compared to .89% and .48% for Ford and GM.

These findings suggest that the aggregate estimates are dominated by the Chrysler experience. The results for Chrysler could be influenced by the heightened risk of bankruptcy the company faced in the latter periods (See Reich and Donahue, 1985). This view is consistent with the very small market reaction to the 1967-68 Chrysler recalls. When Chrysler was in less danger, the market actually showed some gain in stock price on days when recalls were announced.

Overall, the results indicate that although a market decline in response to a recall should be expected, the decline is not likely to be large relative to normal price variability unless special conditions such as the financial problems confronted by Chrysler prevail.

As would hardly be surprising, the stock market evaluation of the impact of recalls on a corporation's long term performance appears to vary over time (the reaction under the Carter administration quite reasonably should be different than the reaction under the Reagan administration) and across companies. The results for Chrysler could be viewed as an anomaly, the reaction of anxious investors to a company that was already vulnerable because of the energy crisis, the larger size of its fleet, and managerial problems.

Individual Recalls and Shareholder Wealth

Results that might be reasonably perceived by corporate managers who have worked in a limited functional area for a short period of time are examined. Table 5 summarizes what these managers would observe.

These results are not very different from what would be expected by *chance*, about 5 percent of the tests are significant at the .05 level, and about 10 percent are significant at the .10 level. Nearly 40 percent of the cases had *positive* results. A manager looking at a few recall events one at a time would not perceive a substantial pattern of stock price reductions and might misinterpret the results to mean that investors actually rewarded behavior that could lead to crises.

Even if a manager saw some pattern of price reductions, the ability to infer the cause or causes would be problematic. When dealing with individual event returns, averaging does not "wash out" the effect of other events that occur on the same day. Indeed, on the days on which recalls were announced, *The Wall Street Journal* published other stories on the same company in 56 percent of the cases. This fact, which helps explain the weak results of the event-by-event analysis, would make it very difficult for a manager to interpret the stock market reaction.

The Bottom Line

Our findings should cast doubt on the dependability of the market, as a deterrent to actions that can lead to crises. Although the aggregate results indicate substantial reductions in stock prices, these aggregate results appear to dissipate rapidly: ten days after the event the cumulative excess returns are near zero. Moreover, the results demonstrate different reactions for individual companies in different time periods. Although Chrysler stock in recent time periods has been strongly influenced by recalls, Ford, GM, and AMC stock show little reaction. For example, in 1982-83,

TABLE 4

Abnormal Returns By Year and Company

	Company Totals %	Individual Company/Recall Period Totals			
		1967-68 %	1972-73 %	1977-78 %	1982-83 %
AMC					
day before and	—.45	2.92	.07	.58	—1.87
day of recall	(—.54)	(0.82)	(0.03)	(—0.65)	(—0.67)
day of recall	—.33	—.13	.07	—.44	—.21
	(—.39)	(—.04)	(.03)	(—.49)	(—.08)
Chrysler					
day before and	—.71	.22	—.76	—1.14	—1.60
day of recall	(—1.77)*	(0.30)	(—0.91)	(—2.17)*	(—0.74)
day of recall	—1.09	.43	—1.44	—1.75	—2.01
	(—2.72)*	(.58)	(—1.73)*	(—3.35)*	(—.93)
Ford					
day before and	—.16	—.27	—.51	—.03	—.14
day of recall	(—.69)	(—0.53)	(—1.56)	(—0.12)	(—0.18)
day of recall	—.31	—.89	—.41	—.31	.08
	(—1.31)	(—1.73)*	(—.93)	(—1.36)	(.10)
GM					
day before and	—.35	—.34	—.39	—.37	—.33
day of recall	(—1.25)	(—.28)	(—.82)	(—1.11)	(—.78)
day of recall	—.06	.48	—.21	+0.00	—.10
	(—.22)	(.40)	(—.43)	(+0.00)	(—.25)
Time Period Totals					
day before and		—.13	—.54	—.36	—.46
day of recall		(0.31)	(—1.46)	(—1.64)	(—1.19)
day of recall		—.09	—.69	—.53	—.21
		(—.22)	(—1.86)*	(—2.43)*	(—.55)

t-tests are in parenthesis

* significantly negative at the .05 level, one-sided test

TABLE 5

Individual Case Analysis

		Totals	Day Before & Day of The Recall	Day of The Recall
Total Number of Cases		238	119	119
Number	< .05	10	2	8
Significantly	< .10	18	3	15
Negative				
Number	< .05	3	0	3
Significantly	< .10	9	3	6
Positive				
Percentage of	< .05	5.5%	1.7%	9.2%
Significant	< .10	11.3%	5.0%	17.6%
Cases				
Percentage of Cases with Positive Returns		39.1%	39.5%	38.7%
Percentage of Cases with Other Announcements on Day of the Recall		56%	56%	56%

Ford and GM estimated average abnormal returns for the notice day were .08% and −.10%, well within the normal variability of the stock price. With such estimates, managers should not be overly concerned about the potential impact of stock market losses and stock market reaction alone should not deter them from engaging in actions that might result in corporate crises.

THE BHOPAL STUDY

Having examined a relatively frequent kind of crisis, we now turn to an extremely rare and particularly large crisis. The Bhopal disaster was the worst industrial accident in history (Shrivastava, 1987). As many as 3,000 people lost their lives and more than 300,000 people were injured. The rough estimates of the direct dollar costs vary from $150 million to over $1 billion (Sharplin, 1985). Legal decisions on compensating the victims have yet to be adjudicated. Moreover, the time period in question actually contains several major sub-events: the methyl isocyonate (MIC) leak in Bhopal, the aldicarb oxime leak in Institute, West Virginia, and the prelude to a hostile takeover battle.

The period from December 4, 1984 when news of the tragedy first appeared in the *Wall Street Journal,* to September 3, 1985 when GAF in a takeover attempt boosted its stake in Union Carbide (UC) to 9.9%, was examined. UC stock was very active during this period with sharp moves up and down in stock prices. Its price per share dropped from $48 to $35 then rose to $57. The tragedy affected the company in many areas including its financial standing and the operation of its plants in countries including the United States, France, and Ireland. During this period, Warren Anderson, Union Carbide's chairman, wrote that the "main purpose" of the company "was and remains the creation of shareholder value" (1986, p. 1).

Legal negotiations included numerous parties, with the stakes being very high. The legal issue of where the cases should be tried—in the US or India—became the center of a long and drawn-out conflict between UC and Indian officials. The company wanted to settle the claims of the victims within six months for $300 million but was rebuffed by the Indian government which sought $600 million in damages. Indian authorities also turned down UC's offer to immediately donate first $1 million and then $5 million and to create a modern medical facility in Bhopal. UC and the EPA were embroiled in

a controversy about the safety of the facility in Institute, West Virginia and the conditions under which operations at this facility could be resumed.

Methodology

Here the CAPM event study methodology tested by Brown and Warner (1985) was employed. Daily stock return data from the Center for Research on Security Prices (CRSP) tapes were analyzed using a market risk adjusted returns model. The returns of a standard market index and the ordinary least squares value of beta came from an estimation period that began 244 trading days and ended 6 trading days before news of the event was first announced.

The cumulative excess returns (CER) for the entire period-trading day, 2 to 189 were graphed (See Chart 1). The graph gives information about the performance of the stock during this period showing fundamental turning points and suggesting what may have caused them.

Findings

As can be seen from Chart 1, the immediate effect of the event is a radical and monumental decline in returns. After about a week, returns stablized at a new low with another drop beginning on about day 20. This pattern continues for nearly 100 trading days. If returns persisted at this low level, it could be concluded that investor reaction should deter managers from engaging in actions that lead to such crises.

However, the pattern of low returns appears to be transitory. Even before it is publicly announced that a takeover attempt by GAF is underway, this pattern is broken. Because it is perceived to be vastly undervalued, UC becomes a candidate for a takeover. Bass Brothers started to buy a huge stake in the company a week after the accident and its stake peaked at 5.4% by January 21 (*Wall Street Journal,* 1986). GAF's takeover attempt was not announced until July 29, 1986. By then, returns had rebounded to near pre-event levels.

CHART 1

CUMULATIVE EXCESS RETURN GRAPH
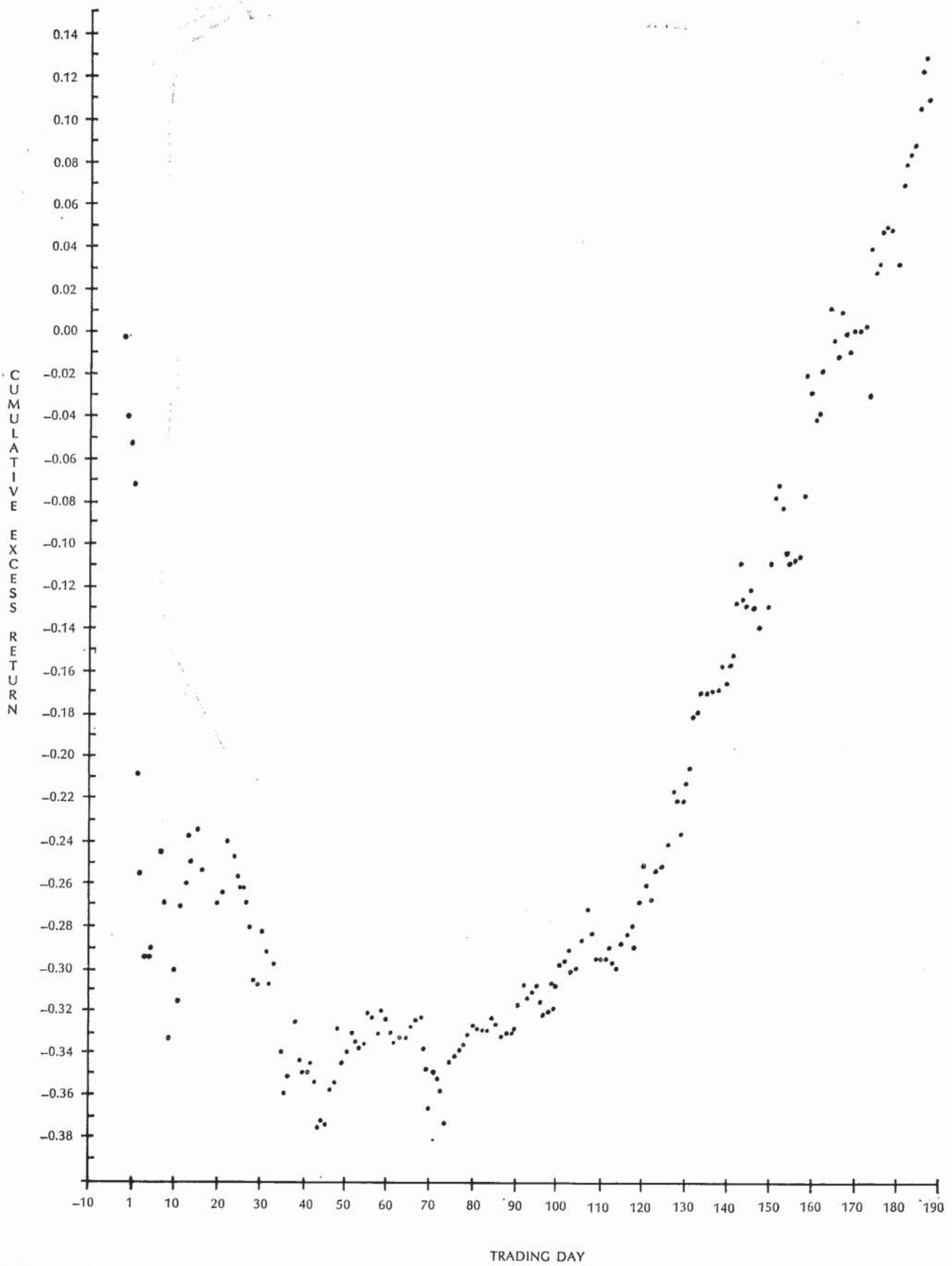
TRADING DAY

From a decline of nearly 40% on day 75 after the event, UC's stock began a period of dramatic and sustained recovery. Although not as rapid as the decline after the event, this comeback was larger. Returns by trading day 160 exceeded original returns prior to the accident. This remarkable turnaround, undoubtedly fueled by the takeover bid, had the effect of not only eliminating any losses that investors may have suffered, but also of handsomely rewarding them if they had the foresight to retain their investment. Again, it can be seen that the market impact was temporary and that it did not provide a sufficient deterrent to activities that might cause corporate crises.

CONCLUSION AND IMPLICATIONS

The two cases presented here show that stockmarket effects do not serve as dependable constraints on actions that can lead to corporate crises. In the auto safety case, negative aggregate results were found around the time of an incident; however, by extending the window we observed that the aggregate results began to dissipate. Moreover, the stock market reaction varied by time and company with most of the effect concentrated in two periods 1973-74 and 1976-77, and on one company, Chrysler. Although there are many good reasons to avoid making hazardous products, these findings suggest that avoiding adverse stock market reactions following recalls is not one of them.

The findings from the second case study, Bhopal, only increase our doubts about the dependability of the stock market deterrent. Although the initial market decline following the accident was quite strong, it was also relatively shortlived. Within 90 trading days, the cumulative excess returns began to rise, reaching their former level about 160 days after the accident. A case can be made that Bhopal actually increased the wealth of UC's stockholders. The drastic reduction in stock prices led to perceptions of undervaluation. Rumors of a takeover pushed the stock to its initial price levels. When these rumors proved true, shareholders won substantial gains. Again, many good reasons exist for preventing industrial accidents like Bhopal, but these data do not support the argument that avoiding declines in shareholder wealth is one of the reasons.

The assumption that the objective of a corporation is to maximize shareholder wealth poses serious difficulties in many strategic situations. The simple answer that it provides is that in the corporate social policy area stock market reactions appropriately deter actions which may precipitate industrial accidents and the production of unsafe cars. This position, however, is not supported by the data examined here.

REFERENCES

Alexander, G.J. and R.A. Buchholz, "Corporate Social Responsibility and Stock Market Performance," *Academy of Management Journal,* March 1982, 21, 3.

Alexander, G., G. Benson, and J. Kampmeyer, "Investigating the Valuation Effects of Announcements of Voluntary Corporate Selloffs," *The Journal of Finance,* August 1984, 84, 488-500.

Baysinger, B. and G. Keim, "An Empirical Examination of the Determinants and Correlates of Exceptional Corporate Social Performance," Department of Management, Texas A&M University, 1985.

Belkaoui, A., "The Impact of the Disclosure of the Environmental Effects of Organizational Behavior on the Market." *Financial Management,* 1976, 5(4) 26-31.

Brown, S. and J. Warner, "Using Daily Stock Returns: The Case of Event Studies," *Journal of Financial Economics,* 1985, 14:3-31.

Chakravarthy, Balaji S., "Measuring Strategic Performance," *Strategic Management Journal,* 1986, 7, 437-458.

Chen, K.H. and R.W. Metcalf, "The Relationship Between Pollution Control Record and Financial Indicators Revisited," *Accounting Review,* 1980, 55, 168-177.

Claybrook, J., *Retreat From Safety.* New York, NY: Pantheon Books, 1984.

Cochran, P.L. and R.A. Wood, "Corporate Social Responsibility and Financial Performance," *Academy of Management Journal,* 1984, 27, 42-56.

Cyert and March, *A Behavioral Theory of the Firm.* Englewood Cliffs, NJ: Prentice-Hall, 1963.

Donaldson, G. and J. Lorsch, *Decision Making at the Top.* New York, NY: Basic Books, 1983.

Eades, K., P. Hess and E. Kim, "On Interpreting Security Returns During the Ex-Dividend Period," *Journal Financial Economics,* 1984, 13 (March): 7-31.

Fama, E., *Foundations of Finance.* New York, NY: Basic Books, 1976.

Fisher, F.M. and J.J. McGowan, *The American Economic Review,* 1983, 73 (March): 82-98.

Fisse, B. and J. Braithwaite, *The Impact of Publicity on Corporate Offenders.* Albany, NY: State University of New York Press, 1983.

Folger. H.R. and F. Nutt, "A Note on Social Responsibility and Stock Valuation," *Academy of Management Journal,* 1975, 18, 155-160.

Halpern, P., "The Corvair, the Pinto, and Corporate Behavior," paper presented at the Symposium on Regulatory Policy, University of Houston, Houston, TX, November 19, 1979.

Ingram, R.W., "An Investigation of the Information Content of (certain) Social Responsibility Disclosures," *Journal of Accounting Research,* 1978, 16, 270-285.

Jarrell, L. and S. Peltzman, "The Impact of Product Recalls on the Wealth of Sellers," *Journal of Political Economy,* 1985, 93 (3): 512-536.

Marcus, A.A. and P. Bromiley, "Shareholder Losses As A Deterrent to Dubious Corporate Behavior," University of Minnesota, 1987.

Marris, R., "A Model of the Managerial Enterprise," *Quarterly Journal of Economics,* 1963, 75: 189-209.

Montgomery, T., A. Thomas and R. Kamath, "Divestiture, Market Valuation, and Strategy," *Academy of Management Journal,* 1984, 4: 830-840.

Moskowitz, M., "Choosing Socially Responsible Stocks," *Business and Society Review/Innovation,* Spring 1972, 1, 71-75.

Newgren, K.E., A.A. Rasher and P.F. Rust, "An Empirical Investigation of the Relationship Between Environmental Assessment and Corporate Performance," in Pearce, John A., III, and Richard B. Robinson, Jr., eds, *Academy of Management Proceedings,* 1984.

Rappaport, A., "Corporate Performance Standards and Shareholder Value," *The Journal of Business Strategy,* 1983, 3(4): 28-38.

Rappaport, A., "Selecting Strategies That Create Shareholder Value," *Harvard Business Review,* May-June 1981, 139-149.

Reich, R. and J. Donahue, *New Deals.* New York, NY: NY Times, 1985.

Reich, R. and John D. Donahue, *New Deals,* New York, NY: Penguin Books, 1985.

Reinganum, M., "The Effect of Executive Succession on Stockholder Wealth," *Administrative Science Quarterly,* 1985, 30: 46-61.

Ruback, R., "The Effect of Discretionary Price Control Decisions on Equity Values," *Journal of Financial Economics,* 1982, 10 (March): 83-106.

Ruback, R., "The Cities Service Takeover: A Case Study," *Journal of Finance,* May 1983: 319-330.

Schwert, G., "Using Financial Data to Measure The Effects of Regulation," *Journal of Law and Economics,* 1983.

Seitz, N., "Shareholder Goals, Firm's Goals, and Firm Financing Decisions," *Financial Management,* 1982, 11 (Autumn): 20-26.

Sharplin, A., "Union Carbide of India Ltd.: The Bhopal Tragedy," *Case Research Journal,* 1985, 23, 229-248.

Shrivastava, P., *Bhopal: Anatomy of a Crisis.* Cambridge, Mass.: Ballinger, 1987.

Spencer, B. and R. Wokutch, "Corporate Crime, Social Responsibility, and Financial Performance," working paper, Department of Management, Virginia Tech, Blacksburg, VA 24061.

Spicer, B.H., "Investors, Corporate Social Performance and Information Disclosure: An Empirical Study," *Accounting Review,* 1978, 53, 94-111.

Strachan, J., D. Smith, and W. Beedles, "The Price Reaction to (Alleged) Corporate Crime," *The Financial Review,* 1983, 121-132.

Tversky, A. and D. Kahneman, "Judgment Under Uncertainty: Heuristics and Biases," *Science,* 1974, 184: 1124-1131.

Ullman, A., "Data in Search of a Theory: A Critical Examination of the Relationships Among Social Performance, Social Disclosure, and Economic Performance of U.S. Firms," *Academy of Management Review,* July 1985, 10, 540-558.

Union Carbide Corporation, Annual Report 1985, Danbury, Conn.: Union Carbide Corporation, 1986.

Vance, S.C., "Are Socially Responsible Corporations Good Investment Risks?" *Management Review,* March 1978, 67:3, 8-15.

Williamson, O., *The Economics of Discretionary Behavior.* Englewood Cliffs, NJ: Prentice-Hall, 1964.