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Socially Irresponsible and Illegal Behavior and Shareholder Wealth

A Meta-Analysis of Event Studies

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This article provides empirical results indicating that acting in a socially responsible and lawful manner is a necessary, though not sufficient, condition for increasing shareholder wealth. It meta-analyzes 27 event studies that have measured the stock market's reaction to incidences of socially irresponsible and illicit behavior. It finds that for firms engaging in socially irresponsible and illicit behavior, the effect on shareholder wealth is negative (wealth decreases), statistically significant ($p < .001$), and so substantial in size ($D = -.932$) that the distribution of abnormal returns is shifted nearly a full standard deviation to the left (i.e., negatively) from their expected standard normal distribution. This result gives rationally self-interested firms a self-interested reason to act in a socially responsible and law-abiding manner. It also provides support for a moral position called enlightened self-interest, which prescribes that firms should act in a socially responsible manner to promote the shareholders' interests.

Business and society scholars have spent decades wrestling with the economic assumption that people are rationally self-interested and try to maximize their personal welfare, especially in terms of monetary wealth. The problem is simple: If this is so, why would any business choose to be socially responsible, assuming that social responsibility costs a firm more than irresponsibility? Enlightened self-interested arguments for corporate

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social responsibility (CSR) have focused on the long-term benefits of socially responsible behavior, benefits such as greater customer and employee loyalty, less regulation, and a more supportive external environment (e.g., Baumol, 1970; Committee for Economic Development, 1971; Steiner, 1972). Moral arguments have focused on the philosophical justifications for right behavior, with or without regard to consequences (e.g., Kant, 1785/1981; Mill, 1863/1992). Stakeholder arguments have focused on contractual and interest-based reasons for CSR (Clarkson, 1995; Evan and Freeman, 1988; Freeman, 1991). None of these positions, however, has generated convincing data in support of social responsibility. Furthermore, finance and economics research has been assumed to discount and discredit the CSR concept.

In this article, however, I show that empirical support for CSR is found in a surprising context: the finance literature based on the event study methodology. A meta-analysis of 27 event studies using CSR-related and law-related events yields the conclusion that socially irresponsible and illegal corporate acts result in substantial unrecovered decreases in shareholder wealth. This finding gives empirical weight to an enlightened self-interest argument for CSR and shows that markets do recognize and account for downstream costs (tangible and intangible) to the firm of socially irresponsible and unlawful behavior.

Enlightened self-interest as a reason for corporations to act in a socially responsible and lawful manner was developed by CSR theorists, including such researchers as Baumol (1970), Wallich and McGowan (1970), Committee for Economic Development (1971), Steiner (1972), and Davis (1973). In the words of the Committee for Economic Development (1971: 27), for instance, the doctrine of enlightened self-interest calls for "corporations to promote the public welfare in a positive way" because this is in the long-term interest of firms' shareholders. Thus, the maxim of enlightened self-interest, as defined by these theorists, could be simply stated as:

> Proposition 1: Firms ought to act in a socially responsible and lawful manner to increase shareholder wealth.

Proposition 1 is not a causal statement as in "A causes B." It is simply a logical statement of the form "A implies B." That is, if firms act in a socially responsible and lawful manner, then shareholder wealth will increase. Ultimately, the field of business and society would like to support Proposition 1. Empirically, however, no consistent support has been found for the proposition that CSR and lawful behavior are a sufficient condition

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for increasing shareholder wealth. However, there are data available—the results of event studies—the nature of which lends itself to supporting a proposition that, ceteris paribus, CSR and lawful behavior are a necessary condition for increasing shareholder wealth. Of course, other factors can be assigned a role in generating shareholder wealth without detracting from the necessity of CSR and lawful behavior. This leads to the second proposition:[1]

> Proposition 2: If firms do not act in a socially responsible and lawful manner, shareholder wealth is not increased.

Proposition 2 is a weak statement of the relationship between CSR, legal behavior, and shareholder wealth. It is also difficult to test empirically. Not acting in a socially responsible manner could mean acting irresponsibly, or it could mean acting in some "neutral" way that is not assessed within a responsibility/irresponsibility framework. Likewise, to say that shareholder wealth is not increased could be to say that shareholder wealth stays the same or decreases. Empirically, a workable test of Proposition 2 would be to assume that not acting in a socially responsible manner is equivalent to acting in a socially irresponsible manner, and then testing to see if shareholder wealth decreases. This leads to the third proposition:

> Proposition 3: If firms act in a socially irresponsible or illegal manner, shareholder wealth is decreased.

Although Proposition 3 is an oversimplification of reality, its strong grammatical form yields a conservative approach to testing indirectly the fundamental idea expressed in Proposition 2.

The rest of this article, then, focuses on empirically testing Proposition 3. In short, the article presents an empirical analysis of the effects of socially irresponsible and illicit behavior on shareholder wealth, the results of which indicate that, ceteris paribus, Proposition 3 is a true statement. In other words, all other things equal, socially responsible and lawful behavior is necessary, though not sufficient, for shareholder wealth to be increased.

LITERATURE REVIEW

Of course, in one sense, a meta-analysis might be thought of as an empirical literature review because it quantitatively summarizes the re-

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sults of previously published works. In this sense, the rest of this article might be seen as a lengthy literature review. However, this article does focus its attention exclusively on the results of only one type of previously published work—event studies. Event studies, though, are a very recent phenomena, and researchers have been looking at the link between social and financial (including market) performance for quite some time. Indeed, as far back as the early 1970s, Milton Moskowitz (1972) called for empirical proof to verify the commonly held belief that economic incentives could be used to motivate companies to be socially responsible. During the 1970s and much of the 1980s, then, researchers published some 50 studies answering his call (Wood and Jones, 1995). The studies all sought a correlation between financial performance variables (e.g., accounting data, investor returns data, and risk data) and corporate social responsibility variables (e.g., existence and type of social programs, pollution performance, and reputation variables). Two previous review articles (Arlow and Gannon, 1982; Ullmann, 1985) that looked at many of these empirical studies found the results to be inconsistent. These two review articles, however, were done before anyone had begun applying event study methodology to the issue.

Event studies focus on a particular type of event—product recalls, for instance—and try to determine whether the stock market responds to the news of the event. In other words, at the time of a recall, does anything "abnormal" happen to the share price of a recalling firm, relative to how other stocks in the same risk class were performing at that time? To test for such "abnormal" behavior, event studies examine the effects of an event on many companies, never a single one. For example, an event study that considers the market's response to government-mandated automobile recalls (e.g., Bromiley and Marcus, 1989) does not look at a single recall by a single company on a single date. Rather, it looks at many recalls by all the companies in the industry over the course of many years. The sample of recalls is then statistically evaluated to see if across the sample the market reacted in a consistent manner (e.g., decreasing the value of firms recalling). The theory underlying these event studies is the efficient markets hypothesis, originally proposed by Fama, Fisher, Jensen, and Roll (1969). The methodology was developed mainly by Fama (1970, 1976) and further refined by Brown and Warner (1980, 1985) and Dodd and Warner (1983).

Meta-analysis is a quantitative review method used to synthesize the findings of previous empirical studies on an issue. Meta-analysis treats the results of each study it examines as a single data point. Because this article examines 27 event studies that have used incidences of socially

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irresponsible or illegal behavior as their events, this meta-analysis has 27 data points. The technique of meta-analysis dates back as far as the 1930s, but it was not until the 1980s that social science researchers (e.g., Glass, McGaw, and Smith, 1981; Hedges and Olkin, 1985; Hunter, Schmidt, and Jackson, 1982) began to refine the statistical techniques for their uses. The most up-to-date work on meta-analysis can be found in the edited volume by Cooper and Hedges (1994), which includes the approach to meta-analysis that this article takes. Recent developments in meta-analytic procedures include a technique for meta-analyzing multilevel independent variables (Nouri and Greenberg, 1995), a technique for identifying outliers in data sets comprising correlation coefficients (Huffcutt and Arthur, 1995), and a technique for comparing the results of two meta-analyses using independent data sets (Alliger, 1995).

By meta-analyzing the results of event studies using socially irresponsible and illegal actions as their events, this article significantly extends the work of Arlow and Gannon (1982) and Ullmann (1985). This article is the first to collect event studies involving socially irresponsible and illegal behavior and the first to meta-analyze their results. It finds that, together, the 27 event studies produce a statistically significant result, indicating that substantial losses accrue to the shareholders of irresponsible and unlawful firms. In short, the wealth of shareholders does decrease when companies engage in socially irresponsible and illegal behavior.

THE LONG-TERM EFFECTS OF A FIRM'S BEHAVIOR ON ITS STOCK PRICE

Although event studies may gauge the market's reaction only during the few days preceding and following reports of some action taken by a firm, the effect of the market's reaction to an event is not short-term in nature. Financial economists believe that any action taken by a firm permanently affects the value of that firm's stock (Brealey and Myers, 1996; Ross, Westerfield, and Jaffe, 1996).

Recall that share prices reflect the opinion of market participants regarding a firm's future cash flows. If participants believe that the future cash flows of a firm will decrease due to some behavior of the firm, demand for the stock will decrease, thus lowering the value of the stock. Later, if they believe that future cash flows will increase due to some new behavior of the firm, demand for the stock will increase, and this increased demand will drive up the value of the stock. But the resulting final value

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of the stock will not be as high as it would have been if the stock had not lost value previously.

Consider this simplified example: Initially (time t_0), market participants determine that the stock of firm F is worth \$80 a share. (That is, the discounted value of the future cash flows divided by the number of outstanding shares equals \$80.) The firm engages in some action A at time t_1, and market participants conclude the action will decrease future cash flows by 10%. When they recalculate share price based on these lower future cash flows, they find that F should only sell for \$72, that is, $80 - (80 \times 10\%) = 72$ per share. (A stable discount rate is assumed throughout this example.) If a rough consensus forms that F is overpriced, then demand for F declines, and its price drops to around \$72. (Abnormal negative returns will be recorded during this drop.) Some time later, at time t_2, F engages in some action B. Market participants believe this action will increase F's future cash flows by 15%. The participants recalculate share price and find that firm F should sell for \$82.80, that is, $72 + (72 \times 15\%) = 82.80$ per share. We would now expect to see positive abnormal returns on F as its stock climbs to around \$82.80.

The point, then, is that if F had not committed action A at t_1, then at t_2, firm F's shares would have been worth \$92, that is, $80 + (80 \times 15\%) = 92$. In this sense, the consequences of action A are permanent: For all times periods after t_1, F's stock will be worth less than it would have been if F had not taken the action A at t_1.

METHODOLOGY

Because this article is not an event study but rather a meta-analysis of event studies, meta-analysis methodology is explained in this section of the article. First, there is an explanation of how the articles meta-analyzed in this article were selected, and then there is a description of which data were used from them. Finally, there is a review of the actual statistical tests that were applied to the data. An explanation of event study methodology appears in the Appendix.

Selection of Studies

The following two subsections are concerned, respectively, with two issues: (a) the method used for finding event studies for possible inclusion in this meta-analysis sample and (b) the definition of a CSR event and how it was used to establish inclusion/exclusion criteria for the sample.

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The 27 studies ultimately selected and meta-analyzed in this article are summarized in Table 1.

Search procedure. Searches for event studies were conducted using electronic databases, including ABI/INFORM, INFOTRAC, LEXIS, and PERI. An extensive manual search, making use of the reference lists of each event study, was also done to find additional event studies. Because there may be a bias among journal editors to print studies producing significant results, a special effort during the manual search phase was devoted toward finding yet-unpublished studies or studies appearing in conference proceedings. (Only a few of these studies, though, ultimately ended up passing the inclusion/exclusion criteria.) Each event study found during the search procedure was considered for inclusion in this article's meta-analysis, based on whether illegal behavior was involved and based on the inclusion/exclusion criteria generated from the definition of a CSR event, as given below.

Definition of a CSR event. Because this article uses the results of event studies as its data, it defines CSR in terms of "events." The definition is given below. Within that definition can be found inclusion/exclusion criteria for deciding which event studies ought to be meta-analyzed here. The definition of a CSR event that this study uses is based on similar ones found in the business ethics literature defining moral issues and actions. A CSR event is:

> An action by a firm, which the firm chooses to take, that substantially affects an identifiable social stakeholder's welfare.

In the paragraphs that follow, this definition will be unpacked for meaning. It has five components, and each will be explained. It will also be shown how in each case the five parts of the definition form, in essence, the criteria for determining whether a study's event is a CSR event and therefore whether the study ought to be included in or excluded from this meta-analysis.

An action by a firm. The first phrase in the definition indicates that CSR events must stem from actors that are firms and not governmental units. The purpose of this part of the definition is to put this meta-analysis squarely into the realm of corporate social responsibility and out of the realm of public policy. In other words, the focus of this meta-analysis is the market's response to the actions of corporations, not the actions of

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Table 1
Event Studies With CSR Events

	Study	*Event*
1	Peltzman (1981)	Federal Trade Commission (FTC) false advertising suits
2	Garbade, Silber, and White (1982)	Department of Justice (DOJ) and FTC antitrust suits
3	Eckbo (1983)	DOJ and FTC antitrust suits against bidders
4	Eckbo (1983)	DOJ and FTC antitrust suits against targets
5	Shane and Spicer (1983)	Council of Economic Priorities pollution ratings
6	Strachan, Smith, and Beedles (1983)	Domestic criminal misconduct
7	Wier (1983)	DOJ and FTC antitrust suits resulting in convictions
8	Wier (1983)	DOJ and FTC antitrust suits resulting in settlements
9	Jarrell and Peltzman (1985)	Pharmaceutical product recalls
10	Jarrell and Peltzman (1985)	Automobile recalls
11	Pruitt and Peterson (1986)	Nonautomobile product recalls
12	Davidson and Worrell (1988)	Domestic criminal misconduct
13	Hoffer, Pruitt, and Reilly (1988)	Automobile recalls
14	Bromiley and Marcus (1989)	Automobile recalls
15	Fry and Lee (1989)	Occupational Safety and Health Administration citations
16	Muoghalu, Robison, and Glascock (1990)	Environmental Protection Agency (EPA) hazardous waste lawsuits
17	Viscusi and Hersch (1990)	Agent Orange lawsuit
18	Viscusi and Hersch (1990)	DES (pregnancy drug) lawsuit
19	Block (1991)	Criminal misconduct
20	Block (1991)	Federal Aviation Administration fines for airline safety violations
21	Bosch and Eckard (1991)	DOJ indictments for price fixing
22	Davidson and Worrell (1992)	Nonautomobile product recalls
23	Alexander and Cohen (1993)	Criminal misconduct
24	Karpoff and Lott (1993)	Criminal fraud
25	LaPlante and LaNoie (1994)	Canadian EPA environmental lawsuits
26	Davidson, Worrell, and Lee (1994)	Criminal misconduct
27	Dranove and Olsen (1994)	Pharmaceutical product recalls

governmental agencies. Thus, an event study that examines the market's reaction to the government imposing new tax laws (e.g., Umlauf, 1993) is not of interest, but an event study that examines the market's reaction to firms choosing to break tax laws is of interest (e.g., Davidson and Worrell, 1988). In the former case, the government is the actor, and the

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market is responding to a public policy action; in the latter case, corporations are the actors, and the market is responding to a socially irresponsible action. Furthermore, it should be noted that when a firm has broken the law, the following sequence of actions will have occurred: the action by the firm, the reaction by the regulator, and the report by the press. It is clear that nominally, the action the market responds to is either the reaction by the regulator or the report by the press. However, the underlying action motivating the entire sequence—the first cause in the causal chain, so to speak—is the firm's action. Therefore, all the event studies considered by this meta-analysis, such as the one on firms breaking tax laws, involve events in which the first cause is a firm's action, even though a regulator's reaction may be involved at some other point in the causal chain.

Which the firm chooses to take. The second phrase in the definition of a CSR event indicates that the actor must act out of choice, that is, with both freedom of will and willful purpose. In other words, for an actor to be a moral agent, there must be volition (Jones, 1991; Velasquez, 1992) and intention (French, 1986; Mackie, 1977). As a result, an event study that used airplane crashes (Bruning and Kuzma, 1989) as its event was not included in this meta-analysis because, as these authors observed, airplane crashes are frequently the result of bad weather or pilot error. In such cases choice is not involved. On the other hand, a study that examined FAA airline safety violations involving fines (Block, 1991) was included in this meta-analysis. The assumption here is that safety regulations are knowable and achievable by airline companies, and safety violations on some level involve an explicit or implicit decision on the part of management to not give safety observance the priority—that is, the energy, time, and money—it needs.

That substantially affects. Although *substantial effect* is rightfully part of the CSR event definition, it did not turn out to be a useful criterion for accepting or rejecting event studies for this meta-analysis. Basically, all studies found during the search procedure met this requirement—no researchers of event study examined actions that had insubstantial effects. The reasons for this seem obvious: First, such actions would be uninteresting to study, and second, if they were not of substantial effect they would not be newsworthy, and so there would be no data available on them.

An identifiable social stakeholder's. By *identifiable*, this part of the CSR event definition states that if the set of people being harmed by an action is actually an empty set, then no harm is being done. This notion

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that someone must be harmed for harm to have occurred can be located in the works of many philosophers (see, e.g., Hobbes's [1651/1994] discussion of the justice of action versus the justice of manners and Mill's [1863/1992] discussions of justice and its "ingredients"). By *social stakeholder*, I mean to draw the distinction between social and economic groups that the very phrase *corporate social responsibility* draws. In other words, I do not mean studying whether a firm is being economically responsible—that is, generating wealth for its shareholders and creditors, for instance. Rather, I wish to direct attention at social stakeholders, such as communities, consumers, employees, and the environment. For example, the investment advisory service, *Value Line*, ranks firms for timeliness based on predicted short-term price performance. An event study that investigated the market's response to *Value Line*'s timeliness ratings (Affleck-Graves and Mendenhall, 1992) sought to determine how investors were being affected by the ratings. This was not of interest to this study because a social stakeholder's welfare did not seem to be at stake. However, an event study that examines the market's response to pollution ratings issued by the Council on Economic Priorities (Shane and Spicer, 1983) is of interest to this meta-analysis. It was included in this study because the many diverse stakeholders of a firm certainly include environmental activist groups (Freeman, 1984) whose welfare could be identified as being affected by firms' pollution performance. Furthermore, many would identify the natural environment itself as a stakeholder whose welfare would be directly affected by a firm's pollution performance (Starik, 1993; Stone, 1974).

Welfare. The final component of the CSR event definition has to do with people's welfare being affected. As James Rest (1986) has noted, ultimately for a situation or an event to be a moral issue, actions involved must have consequences affecting someone's welfare. Indeed, business ethicists would argue that whether someone's welfare is being affected lies at the very core of ethics and social responsibility (e.g., Hosmer, 1994). Therefore, a study that examined the market reaction to the "purely cosmetic change" of a company splitting its stock (Lamoureux and Poon, 1987: 1347) was not of interest to this meta-analysis. However, a study that examined the market's reaction to a company recalling products because the government had deemed the products substandard—that is, defective or dangerous for consumers (Jarrell and Peltzman, 1985)—was included in this meta-analysis.

Thirty event studies were found to either fit the above definition or involve illegal behavior. Because this meta-analysis focuses on socially

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irresponsible and illegal behavior (actions where welfare is affected negatively), two studies (Meznar, Nigh, and Kwok, 1994; Patten, 1990) examining the effects on shareholder wealth of firms deciding to withdraw from South Africa (ostensibly socially responsible behavior) were not included. Another study (Rubin, Murphy, and Jarrell, 1988) was excluded because it failed to provide a piece of critical data needed for this meta-analysis (i.e., the value of the *t* statistic from their hypothesis test). This left 27 event studies, with a total of 2,161 incidents of socially irresponsible or illegal behavior to be meta-analyzed. These 27 studies are grouped by their events in Table 2, which shows how each study fits the inclusionary/exclusionary requirements.

Finally, it should also be noted that this meta-analysis excluded from its sample those event studies using monthly return data (typically written in the 1970s and early 1980s). As Brown and Warner (1985) showed, such coarse analyses were not very dependable because too much noise could be picked up in an event month besides the effect of an event itself.

Data Analyzed

Most meta-analyses make use of correlation coefficients (e.g., Cohen, 1993; Damanpour, 1991; Williams and Livingstone, 1994). Event studies do not, however, produce correlation coefficients. This makes the methodology of this article different from most other meta-analyses. Event studies produce two numbers of interest: test statistic values and size-of-return data. However, as will be explained, size-of- return data cannot be used. Indeed, anyone meta-analyzing event studies will be forced to perform the meta-analysis on test statistic values. The following two subsections explain why the test statistic values are used and why the return sizes reported in the event studies cannot be used. The data used in the meta-analysis are presented in Table 3.

Why test statistic values can be used. Every event study employs hypothesis tests to see if abnormal returns around the event day are significant. Such hypothesis testing makes use of either the student's *t* distribution or the standard normal (*z*) distribution. Of the 27 events included in this meta-analysis, 15 reported *t*-statistic values, 9 reported *z*-statistic values, and 3 studies reported *p* values.

The *z*s were directly changed into *t*s on the assumption that as sample size increases, the student's *t* distribution approaches the normal distribution (Marascuilo and Serlin, 1988). This was done for those studies in

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Table 2
Inclusionary/Exclusionary Requirements for Studies

Studies	*What Type of Action Is Involved?*	*Grounds for Assuming Volition?*	*Who Is the Actor?*	*Which Identifiable Persons or Groups Could Be Affected?*	*How Is the Person's Welfare Affected?*
2, 3, 4, 7	Violations of antitrust laws	Any firm large enough to be publicly traded should be large enough to afford lawyers familiar with antitrust legislation.	The firms involved in mergers or acquisitions identified as violating antitrust laws by the DOJ or the FTC	Managers and employees of target firms and consumers of the industry's goods	Elimination of competition by monopolization may lead to higher prices and loss of jobs.
8, 9, 10, 12, 13, 16, 17, 21, 26	Manufacturing and subsequent government-mandated recall or withdrawal of substandard quality or dangerous products	Product design is assumed to be intentional and that firms have some responsibility to test products prior to marketing.	The firms recalling or withdrawing the product	Consumers	Substandard quality causes dollar losses; hazardous products present health risks.
6, 11, 18, 20, 22, 23, 25	Criminal misconduct (price fixing, tax evasion, procurement frauds, misrepresentation of financials, etc.)	Any firm large enough to be publicly traded should be large enough to afford lawyers who will recognize when the firm acts criminally.	The firms accused of misconduct (usually by the DOJ)	Consumers, competitors, shareholders, employees, government, etc. (depending on the type of misconduct)	Financial losses are most obvious losses.

5, 15, 24	Pollution of the natural environment	Firms large enough to be publicly traded have either environmental engineers on staff or access to consultants.	The firms being monitored for environmental compliance	Residents of the community where the firm is located and the natural environment itself	Devaluing of property, health risks, loss of aesthetic value can all result from environmental degradation.
1, 14, 19	Violations of standards of government regulatory agencies (OSHA, FTC, FAA)	Any firm large enough to be publicly traded should be large enough to afford lawyers who will recognize when the firm violates standards.	The firms issued citations by the regulatory agency	Employees, consumers	Work safety and airline violations affect people's safety. False advertising may defraud consumers.

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Table 3
Data for Meta-Analysis

Study		n	*Test Statistic*
1	Peltzman (1981)	23	–4.22
2	Garbade et al. (1982)	34	–7.71
3	Eckbo (1983)	49	–2.26
4	Eckbo (1983)	17	–7.20
5	Shane and Spicer (1983)	72	–3.35
6	Strachan et al. (1983)	84	–2.64
7	Wier (1983)	24	–3.97
8	Wier (1983)	63	–6.56
9	Jarrell and Peltzman (1985)	32	–6.23
10	Jarrell and Peltzman (1985)	116	–3.30
11	Pruitt and Peterson (1986)	156	–3.71
12	Davidson and Worrell (1988)	131	–3.48
13	Hoffer et al. (1988)	29	–.41
14	Bromiley and Marcus (1989)	119	–1.62
15	Fry and Lee (1989)	28	–1.70
16	Muoghalu et al. (1990)	128	–4.51
17	Viscusi and Hersch (1990)	6	–2.11
18	Viscusi and Hersch (1990)	7	+.87
19	Block (1991)	32	–2.15
20	Block (1991)	10	–2.90
21	Bosch and Eckard (1991)	127	–4.06
22	Davidson and Worrell (1992)	133	–2.80
23	Alexander and Cohen (1993)	60	–2.66
24	Karpoff and Lott (1993)	132	–4.38
25	LaPlante and LaNoie (1994)	9	+.03
26	Davidson et al. (1994)	535	–.06
27	Dranove and Olsen (1994)	5	–3.45

Note. Number of events in meta-analysis: $N = 27$. Total number of incidents of socially irresponsible behavior: $n = 2{,}161$.

Table 3 numbered 3, 4, 16, 19, 20, 22, 24, 26, and 27. Because Studies 16, 22, 24, and 26 all had sample sizes above 100, this was a reasonable change to have made. The conversion of *z*s into *t*s for Studies 3 and 19 was a bit more tenuous because these studies had sample sizes of 49 and 32, respectively. And because the conversion for Studies 4, 20, and 27 (with sample sizes of 17, 10, and 5) was even more questionable, the statistical tests were run with a sample of 18 (all the studies using *t* statistics originally) and with a sample of 22 (the 18 studies that used *t*s plus the 4 studies that had used *z*s but had samples of over 100). The results of these runs were almost identical to the results of the full sample of 27 and are reported in the Results section below.

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Three of the studies (5, 15, 23) reported *p* values, but not *t*s or *z*s. The *p*s were converted into *t*s by using a *t* table and the appropriate degrees of freedom. Studies 15 and 23 did not give exact *p* values and instead merely indicated that the data were significant at a Type II error rate of less than .05 or .01, respectively. For these two studies, *t* values were taken off the student's *t* table by assuming the *p*s were exactly .05 and .01.

In short, *t*s could be obtained for each study, and these *t*s became the metric on which all the statistical analyses were based, as will be explained in the Analysis section below.

Why size-of-return data cannot be used. Besides producing test statistics, event studies also produce size-of-return data. Davidson and Worrell (1992), for example, showed that during the 3 days surrounding their event (nonautomobile recalls), firms lost on average .0238 of their value. In other words, the average abnormal size-of-return was a negative 2.3%. Although intuitively it might seem reasonable to base the meta-analysis on such size-of-return data, such an analysis cannot be done for two reasons. First, about one third of event studies only compute average abnormal returns (AARs), another third compute only cumulative average abnormal returns (CAARs), and about a third compute both. Therefore, meta-analyzing size-of-return data would clearly lead to complications because AARs and CAARs are different metrics for measuring returns. Second, in meta-analyzing size-of-return data, one would need to standardize the returns by their standard deviations (Rosenthal, 1994). Unfortunately, almost no event studies report these standard deviations. For these reasons, then, the meta-analysis had to be performed on the test statistics.

In addition, because of these problems with size-of-return data, this study did not use the replication method of meta-analysis. The replication method was used by the only other known meta-analysis of event studies (Datta, Pinches, and Narayanan, 1992). In that meta-analysis, the authors used a regression model with size-of-return data as their dependent variable. However, as just noted, because the size-of-return data collected for this meta-analysis come in two different metrics, the possibility of them being used as a variable in this study is precluded. The method of meta-analysis that this article does use is explained below.

Analysis

This article makes use of a direct weighted linear combination of estimators method of meta-analysis, developed by Hedges and Olkin (1985). They developed a testing procedure for a fixed-effects categorical

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model, such as the one this study fits. The test procedure employs Hedges's g, a commonly used effect size estimator, that makes use of t statistics and sample sizes—the only two pieces of data this study could make use of. (Throughout this article, an n will represent the sample sizes of the event studies meta-analyzed. It will range from 5 to 535, as Table 3 indicates. An N will represent the sample size of the meta-analysis itself; typically, $N = 27$). Hedges's g has a chi-squared distribution and is defined by the following formula (Rosenthal, 1994: 238):

$$g = \frac{2t}{\sqrt{n}}.$$

Studies of Hedges's g, however, have shown it to have a small sample bias, and because this meta-analysis has several studies with very small sample sizes, the estimator d was used to correct for the bias (Hedges and Olkin, 1985: 81):

$$d = \left(1 - \frac{3}{4n - 9}\right) g.$$

The variance of the estimator d is given by the formula:

$$var(d) = \frac{n}{n - 1} + \frac{d^2}{2n},$$

which is the two-sample variance formula modified because the event studies meta-analyzed here are one-sample studies. The two-sample formula is $var(d) = [(n^e + n^c)/n^e n^c] + d^2/(2n^e + 2n^c)$, where n^e is the sample size of the experimental group, and n^c is the sample size of the control group. Taking $n^e + n^c = n$, the single-sample formula is obtained by setting $n^c = 1$, the smallest positive integer for n^c possible, because setting $n^c = 0$ in the two-sample formula will produce an undefined result (Rosenthal, 1994: 238).

It should be mentioned here that this meta-analysis makes no attempt to weight the studies on quality. There are two reasons for this. First, weighting schemes that involve weighting for anything other than sample size (accomplished in this meta-analysis by Hedges's g and d) are not recommended: "They should be applied with caution and viewed as primarily exploratory in nature" (Shadish and Haddock, 1994: 264). Second, because event study methodology was standardized by the early to mid-1980s, it can be argued that all the studies meta-analyzed here are roughly equivalent in quality.

Three procedures were followed for analyzing the data: a test for homogeneity, a test for significance, and a computation of effect size. To

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perform these procedures, Hedges and Olkin (1985: 163) give computational formulas, intended to facilitate computer programming, involving the *d*s and their variances. (Essentially, the sums of the reciprocals of the variances are used to weight the effect sizes.) The components of these computational formulas, which will be used in the following three subsections, are the following:

TW = total of weights (reciprocals of the variances) = $\Sigma[1/\text{var}(d)]$
TWD = total of weighted *d*s = $\Sigma[d/\text{var}(d)]$
TWDS = total of weighted *d* squares = $\Sigma[d^2/\text{var}(d)]$.

Test for homogeneity. If the underlying population of effect sizes is not the same across all the studies, then any attempt to group the effect sizes and analyze them will be questionable. A test for homogeneity is needed to determine if indeed the effect sizes could be coming from the same population. Only if the null hypothesis that the data are homogeneous is retained is it possible to proceed to a test for significance and to the calculation of a single estimate of effect magnitude.

The general procedure to be used for a fixed-effects model for which observed effect sizes are being combined from a series of independent studies is explained succinctly in Shadish and Haddock (1994: 265-68). The specific procedure used in this meta-analysis is described in much more detail in Hedges and Olkin (1985: 147-65).

The test statistic (TS) for homogeneity recommended by Hedges and Olkin (1985) is chi-square distributed, with degrees of freedom equal to $N - 1$. The test statistic and procedure are based on a total weighted sum of squares method (with effect sizes being weighted by the reciprocals of their variances), given by Hedges and Olkin as

$$(TS)_{\chi^2} = \Sigma \frac{d^2}{var(d)} - \frac{\left(\Sigma \frac{d}{var(d)}\right)^2}{\Sigma \frac{1}{var(d)}},$$

or, in its computational form, as

$$(TS)_{\chi^2} = TWDS - \frac{(TWD)^2}{TW}.$$

Test for significance. The null hypothesis for this test is that the population effect size, *D*, is zero. The test for significance is performed on the weighted grand mean or the weighted average effect size over

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studies. The weighted grand mean, $[\Sigma d/\text{var}(d)]/[\Sigma 1/\text{var}(d)]$, is standardized by its standard error of estimate $[\Sigma 1/\text{var}(d)]^{-1/2}$. This gives the following formula (Hedges and Olkin, 1985: 152):

$$(TS)_z = \Sigma \frac{d}{var(d)} \left(\Sigma \frac{1}{var(d)} \right)^{-½},$$

or, in its computational form, as

$$(TS)_z = TWD \times (TW)^{-½}.$$

The large sample distribution of this statistic is standard normally distributed.

Estimate of effect size. The best estimator of effect size is the weighted grand mean, $[\Sigma d/\text{var}(d)]/[\Sigma 1/\text{var}(d)]$. It is the best estimator in the sense that it has the smallest variance of linearly weighted estimates and is "also the most precise in a larger class of estimators of effect size that includes those that are not weighted linear combinations of the d" (Hedges and Olkin, 1985: 114, 153). The formula for the estimator is the following:

$$D = \frac{\Sigma \frac{d}{var(d)}}{\Sigma \frac{1}{var(d)}},$$

or, in its computational form, as

$$D = \frac{TWD}{TW}.$$

RESULTS

The results of the test for homogeneity, test for significance, and the estimate of effect size are all summarized in Table 4. In addition to the analysis of the full 27 studies and the four other samples mentioned above, a sample containing only those event studies reflecting socially irresponsible behavior and a sample containing only those event studies reflecting illegal behavior were also analyzed. The following subsections interpret the homogeneity, significance, and effect size results for all seven of these samples.

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Table 4
Results of Meta-Analysis

Sample	*Homogeneity Test*	*Significance Test*	*Effect Size Estimator*
Full sample	$(TS)\chi^2 = 16.322$	$(TS)_z = -4.648$*	$D = -.932$
Sample using AARs[a]	$(TS)\chi^2 = 4.547$	$(TS)_z = -2.918$*	$D = -.754$
Sample using CAARs[b]	$(TS)\chi^2 = 10.588$	$(TS)_z = -3.777$*	$D = -1.201$
Sample using *t* distribution[c]	$(TS)\chi^2 = 9.546$	$(TS)_z = -3.610$*	$D = -.879$
Sample using *t*, or *z* with large *ns*[d]	$(TS)\chi^2 = 10.382$	$(TS)_z = -3.690$*	$D = -.808$
Sample using illegal behavior studies[e]	$(TS)\chi^2 = 9.222$	$(TS)_z = -4.210$*	$D = -1.124$
Sample using irresponsible behavior studies[f]	$(TS)\chi^2 = 5.911$	$(TS)_z = -2.251$**	$D = -.683$

a. The 16 studies reporting average abnormal returns were the following: 5-8, 11, 14-16, 17-21, 23-25.
b. The 11 studies reporting only cumulative abnormal returns were the following: 1-4, 9, 10, 12, 13, 22, 26, 27.
c. The 18 studies that reported *t*-statistic values were the following: 1, 2, 5-15, 17, 18, 21, 23, 25.
d. The 22 studies that reported *t* statistics or reported *z* statistics but had large samples were the following: 1, 2, 5-18, 21-26.
e. The 15 studies that had illegal behavior as their event were the following: 1-4, 6-8, 12, 15, 19-21, 23, 24, 26.
f. The 12 studies that had irresponsible behavior as their event were the following: 5, 9-11, 13, 14, 16-18, 22, 25, 27.
*Significant at < .01. **Significant at < .05.

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Test for Homogeneity

The homogeneity test for the full sample of 27 event studies resulted in a test statistic value of (TS)$\chi^2 = 16.322$. The critical value for acceptance/rejection of the null hypothesis for $df = 26$, and a Type II error rate of .05 is 38.9. This means that the null hypothesis of the data being homogeneous is retained, indicating that the event studies do indeed share a common population effect size. Homogeneity allows this meta-analysis to proceed to a test for significance and to an estimate of effect size.

Homogeneity tests on the other samples—the sample of studies that reported AARs, the sample of studies that reported only CAARs, the sample of studies that based significance on *t* distributions, the sample of studies that used *t* distributions or used *z* distributions but had large samples, the sample of illegal actions, and the sample of irresponsible actions—also produced test statistics indicating homogeneity (see Table 4).

Test for Significance

For the full sample of 27 event studies, the value of the test statistic for the significance test, $(TS)_z = -4.648$ ($p < .001$), makes it clear that the null hypothesis that the population effect size is zero can be rejected (at $p < .05$). The significance tests on the other six samples, as reported in Table 4, also permit us to reject the null hypothesis.

Estimate of Effect Size

The full sample of 27 event studies shows an effect size estimate of $D = -.932$, or approximately one full (negative) standard deviation difference between the distributions of the normal and abnormal returns. So, on average, abnormal returns were a full standard deviation below expected normal (i.e., zero) returns. Or, in other words, one could think of the AARs and CAARs as typically having a distribution centered around zero, but on and around the event day one could think of the distribution of those AARs and CAARs as having a distribution shifted a full standard deviation to the left of zero—that is, indicating significantly negative abnormal returns. In a sense, then, socially irresponsible and illicit behavior decreases abnormal returns by a full standard deviation.

The 95% confidence interval for the effect size is given by the following formula (Hedges and Olkin, 1985: 86):

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$$d - (z_{\alpha/2} \times \sigma_d) < D < d + (z_{\alpha/2} \times \sigma_d),$$

where $z_{\alpha/2}$ is the two-tailed critical value of the standard normal distribution. In this meta-analysis, then, the confidence interval of the effect size estimator is $-.93 - (1.96)(.20) < D < -.93 + (1.96)(.20)$, which simplifies to $-1.32 < D < -.54$. This means quite simply that we can be 95% confident that the difference between the distribution of the abnormal returns and the normal returns is at least –.54 standard deviation units and may be as much as –1.32 standard deviation units.

Without any clear standards existing in the event study methodology with which to evaluate an effect size of approximately –1 standard deviation unit, one is forced to fall back on Cohen and Cohen's (1983) rule of thumb for interpreting effect sizes: $d = .2$ (small effect), $d = .5$ (medium effect), and $d = .8$ (large effect). Effect sizes from –.93 to –1.32 are quite substantial, then, and even an effect size as small as –.54 (the upper limit of the confidence interval) still shows that socially irresponsible and illicit behavior can have a "moderate" effect on abnormal returns.

*D*s were also calculated under all the various assumptions indicated in Table 4 and ranged from $D = -.683$ (for the sample of studies using irresponsible behavior as their events) to $D = -1.201$ (for the sample of studies using CAARs). The average *D* for the seven meta-analysis samples reported in Table 4 is –.912, which reflects as large an effect as the full sample of 27 event studies.

DISCUSSION

From the test for significance it is clear that abnormal returns are significant and negative across the studies. These event studies are showing that shareholder wealth is decreased when firms act in a socially irresponsible or illegal manner. This supports Proposition 3, suggesting that acting in a socially responsible and law-abiding manner can be seen as a necessary (though not sufficient) condition for increasing shareholder wealth, all other things equal. This would suggest, then, that the maxim (Proposition 1) of enlightened self-interest may indeed serve the shareholder's interests.

In addition, the effect size is substantial—approximately a full standard deviation unit. This means that the distribution of abnormal returns, which is expected to be centered around zero (i.e., generally no abnormal returns

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are expected), is shifted dramatically to the negative side of zero. A shift to the left in the distribution of abnormal returns by a full standard deviation indicates a strong negative effect on shareholder wealth.

For theorists, these results lend support to the normative ethical position of enlightened self-interest. It supplies those doing research in business ethics and corporate social responsibility with empirical results showing that social responsibility does indeed have a role to play in business.

These results also present a self-interested reason to practitioners to be socially responsible and law abiding. Such a self-interested reason seems needed due to the simple fact that no other reason has worked or may ever work. Christopher Stone (1975), for instance, pointed out in a chapter titled "Why the Law Can't Do It" that the legal system is best at enforcing minimum behavior—in a sense, preventing people from being bad—but does not do a very good job of getting people to be good. Mancur Olson (1965) showed why calls for socially responsible cooperation may fail due to the free rider problem. In short, maybe a self-interested, economic argument is the only argument that may work. Thomas Schelling (1978) has observed that self-interest has succeeded at motivating people to be good at times when the law, social contracting, the golden rule, and other moral arguments have all failed.

The argument supported here—that socially responsible and law-abiding behavior is a necessary condition for increasing shareholder wealth—is one argument that can be directed at economically self-interested firms. To continue building the case in favor of socially responsible behavior, additional work still needs to be done by researchers regarding event studies. The rest of this section poses three questions to guide such research.

One question future research ought to address is whether the market rewards socially responsible and law-abiding behavior. This article meta-analyzed studies looking only at whether shareholder wealth was affected by firms engaging in socially irresponsible and illegal behavior. This was done because this was essentially the data that were available. (The 27 studies of irresponsible and illicit behavior constitute a reasonable sample size for meta-analysis.) Only 3 studies have examined the effects on shareholder wealth of socially responsible behavior, and 3 studies do not represent a large enough sample for meta-analysis. Of the 3 studies, Shane and Spicer (1983) found that there were significantly negative abnormal returns for companies that were given bad pollution ratings and that there were significantly positive abnormal returns for companies receiving good pollution ratings. The other two studies, which examined the effects

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on the shareholder wealth of firms withdrawing from South Africa (Meznar et al., 1994) or adopting the Sullivan Principles (Patten, 1990), found no significant effects. Both studies noted that using actions toward South Africa as an event presented this complication: Arguments were made in the CSR literature demonstrating that remaining in South Africa was socially irresponsible, but other arguments in the CSR literature demonstrated that remaining in South Africa was socially responsible. So although it is difficult to draw any conclusions from these three studies as a group, their existence indicates that it is at least possible to conduct event studies focused on socially responsible events. I believe that more such event studies are called for, and at some future date a meta-analysis of socially responsible behavior and its effects on shareholder wealth would be warranted.

A second question that future research needs to concern itself with is how the magnitude of the abnormal returns relates to the size of any costs absorbed by the firms. The theoretical literature suggests that the size of the abnormal returns ought to be tied closely to the size of the costs a company must pay to rectify a socially irresponsible act. Only eight of the event studies, however, tried to find a correlation between the size of the abnormal returns and the magnitude of remedial costs (e.g., court costs, damages, lost goodwill) firms incur. Five of these eight studies (Studies 9, 11, 14, 21, and 24 in Table 1) showed no systematic relationship between remedial costs and abnormal returns. One study (27), however, did find that the size of the abnormal returns correlated to the added costs of more stringent regulations that were passed in response to the irresponsible behavior. Two studies (5, 22) tested whether the magnitude of the penalty imposed by the market was related to the magnitude of the firm's irresponsible behavior and found that indeed the most irresponsible companies were penalized the most. Clearly this is not enough evidence to conclude anything, and so correlating the size of the market penalty in dollar-per-share terms to the abnormal returns is something for all future CSR event studies to consider doing.

A final question researchers still need to address is this: The market does appear to be reacting to the socially irresponsible and illicit behavior of firms in such a way that shareholder wealth decreases. If we were to think of this as a penalty absorbed by shareholders, we might ask whether the market is imposing the penalty in response to the socially irresponsible and illegal behavior of the firms (in which case the market's action would be ethical in nature), or whether it is imposing the penalty in response to the bad news and its potential to decrease expected future income streams (in which case the market's action would be economic in nature)?

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Whichever the answer turns out to be, though—whether ethical or economic—we can say that based on this meta-analysis, the shareholder wealth of firms engaging in socially irresponsible or illicit behavior is decreasing. In other words, even if we do not know why the shareholders are losing wealth, this meta-analysis shows that they are. And, as a result, we can still say that Proposition 3 holds true, that socially responsible and lawful behavior is necessary, though not sufficient, for shareholder wealth to be increased.

So despite the need for further research, this meta-analysis does indicate that socially responsible and illicit behavior is necessary (though not sufficient) to increase shareholder wealth, all other things equal. That the shareholder wealth of those firms engaging in irresponsible or illegal behavior does decrease finally gives economically self-interested firms a self-interested motive for being socially responsible and law abiding.

APPENDIX
Event Study Methodology

Event studies focus on a particular type of event—product recalls, for example—and try to determine whether the stock market responds to the news of the event. In other words, does anything "abnormal" happen to a company's stock when the company makes a recall? The theory underlying event studies is the efficient markets hypothesis, which argues that modern financial markets are information efficient. The markets can anticipate and correctly interpret news about a security and adjust the price of the security very quickly to reflect that news (Fama et al., 1969). Although most researchers agree now that financial markets are not "information perfect" in their performance, they do work with a high degree of efficiency and accuracy (Holthausen, Leftwich, and Mayers, 1990).

The methodology for event studies became standardized by the mid-1980s, before most of the CSR event studies meta-analyzed here had even been done. (This standardization served to facilitate this meta-analysis because it ensured that the results of the studies are roughly comparable, that is, homogeneous.) For details regarding event study procedures, readers can consult Brown and Warner (1980, 1985). This article includes only a brief summary of event study methodology that centers on the use of two key concepts: abnormal returns and average abnormal returns.

Abnormal Returns (ARs)

Abnormal returns accrue when a stock outperforms the market. So when a stock earns significantly greater positive or negative returns than other stocks in

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its risk class, it is earning abnormal returns. Abnormal returns can be computed according to the market model and its equation for calculating abnormal returns (Fama et al., 1969). An abnormal return can be defined as

$$\text{Abnormal Return} = \text{Actual Return} - \text{Expected Return},$$

or, in mathematical terms, as

$$AR_{it} = R_{it} - E(R_{it}),$$

where AR_{it} = the abnormal return for security i in time period t, R_{it} = the actual return for security i in time period t, and $E(R_{it})$ = the expected return for security i in time period t.

It should be noted here that $E(AR_{it}) = 0$; that is, on average we expect a firm's abnormal returns to be zero—we expect nothing abnormal to be happening to a firm's returns (unless of course, as will be explained, something abnormal is happening to the firm).

The expected return for individual stock i can be determined first by regressing its returns against the return of a market portfolio (e.g., the S+P 500) and calculating the slope (beta) and vertical intercept (a_i) of that function. Then, given the return of the market portfolio on any given day (R_{mt}), the expected return for a stock can be calculated according to the following formula:

$$E(R_{it}) = a_i + B_i R_{mt},$$

where a_i = the regression intercept for security i (a constant calculated from the market model), B_i = the beta for security i (a constant), and R_{mt} = the actual return for the market portfolio (e.g., S+P 500) in time period t.

Average Abnormal Returns (AARs)

The key to event study methodology is that it examines not just one action but rather many actions simultaneously. Put another way, an event study on automobile recalls would not look at only one recall made by Chrysler Corporation in August 1986, for instance, but rather at all recalls made by Ford, Chrysler, and General Motors between 1980 and 1989, for example. Thus, an average abnormal return could be calculated as:

$$AAR_t = (\Sigma AR_{it})/n,$$

where AAR_t = the average abnormal return in time period t for all the events involved, and n = the number of events in the study.

Standard hypothesis testing is used on the average abnormal returns for each day in the event window. If the market reacts specially to events, then the average abnormal return will be significantly different from zero.

Finally, it should be noted here that 11 studies used a variation of this standard methodology and ended up computing cumulative average abnormal returns (CAARs). This methodology is explained in detail in Dodd and Warner (1983).

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NOTES

1. The logic of my argument is as follows:

First the statements:

1. A: Firms acted in a socially responsible and lawful manner.
2. B: Shareholder wealth is increased.

Enlightened self-interest theorists argue:

3. A → B (i.e., if firms acted in a socially responsible and lawful manner, then shareholder wealth is increased.)

We have no data to substantiate (3) but argue that we can show A is a necessary condition for B, that is:

4. B → A (i.e., if shareholder wealth is increased, then firms acted in a socially responsible and lawful manner.)

The contrapositive of (4)—that is, a logical equivalent of (4)—is:

5. ~A → ~B (i.e., if firms did not act in a socially responsible and lawful manner, then shareholder wealth is not increased.)

We focus our attention on this proposition because of the nature of the data, which are data on the effects of socially irresponsible behavior on shareholder wealth.

2. Event studies presume that the market finds out about the irresponsible behavior. It is possible that some firms engaging in illegal or irresponsible behavior succeed in concealing that behavior and would thus never become the subject of an event study. (Thanks to an anonymous reviewer for this observation.)

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