SECURING ORGANIZATIONAL LEGITIMACY: AN EXPERIMENTAL DECISION CASE EXAMINING THE IMPACT OF ENVIRONMENTAL DISCLOSURES*

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ABSTRACT

This paper explores the role that environmental disclosures might play in producing a legitimating effect on investors within the context of the chemical industry. By way of an experimental decision case it examines effects of negative, and the offsetting effects of positive environmental disclosures surrounding chemical firms' liabilities for toxic waste site liabilities. The paper outlines the theoretical bases for the process of organizational legitimation, and sets the decision experiment in a detailed historical analysis of the toxic waste problems of the 1970s that led to the enactment of legislation requiring clean up and imposing significant liabilities on chemical firms. How chemical firms and their industry have reacted to the crisis of confidence that has followed their activities is also charted. The results from the decision experiment, which indicate that under some circumstances positive disclosures can restore or repair an organization's legitimacy, are discussed in the context of the earlier theoretical and historical analysis.

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"This is the worst company I've ever worked with. They lied, they seized a camera from one of our men, they obfuscated facts and hid information. I couldn't believe the dumping at Montague. It was incredible that they would dump that stuff on the ground. They argue that they were operating 'state-of-the-art' disposal. The heck they were." Dr. James Truchan, Michigan State Department of Natural Resources Investigator commenting on Hooker Chemical's disposal of 20,000 barrels of toxic waste which contaminated 2 billion gallons of groundwater on a 364 acre zone at White Lake during the 1970s. Some toxins were recorded at thousands of times above EPA standards (quoted in *Laying Waste: The Poisoning of America by Toxic Chemicals*, Brown, M., 1979, p. 90).

INTRODUCTION

In recognition of the increasing liabilities firms now face as a result of toxic dumping and the subsequent Superfund legislation to clean it up, the standard setting bodies in the U.S. appear to be responding to the demand for greater environmental disclosure. The Securities and Exchange Commission (SEC), in its *Financial Reporting Release No. 36*, issued in May of 1989, provided a Superfund-related item as a specific example of recommended Management Discussion and Analysis (MD&A) disclosure. Four years later the SEC provided further guidance on the reporting of environmental liabilities in its Staff Accounting Bulletin 92. The Financial Accounting Standards Board, although not promulgating any statements of accounting standards on the subject, has issued two relevant Emerging Issues Task Force (EITF) reports. EITF Issue No. 90-8 addresses the expensing or capitalization of contamination treatment costs, and EITF Issue No. 93-5 provides guidelines for recognizing environmental liabilities and the impact of potential recoveries on related losses. Finally, and most recently, the American Institute of Certified Public Accountants in its Statement of Position 96-1 requires corporations with environmental remediation liabilities to specifically disclose those items, as well as other environmental cost information, in the annual report.

While such disclosure requirements are clearly in line with the stated demands of investors and shareholders,[1] a substantial body of literature suggests firms will seek to avoid such disclosures for fears of communicating negative images of the organization and devaluing the firm. Deegan and Rankin (1996), for example, reported that Australian firms prosecuted and fined by the EPA for environmental laws violations typically failed to mention this in their annual reports. Similarly, in an experimental portfolio investment decision study, Chan and Milne (1999) observed that disclosures of negative environmental information resulted in a negative investment reaction, while no reactions were observed to the company reporting state-of-the-art environmental management processes. Content analyses of corporate annual reports typically reveal that firms tend to publicize only their positive environmental impacts (e.g., Guthrie and Parker, 1990; Coopers & Lybrand, 1993; Greenpeace, 1993, 1996; Deegan and Gordon, 1996; Hackston and Milne, 1996). Large firms in particular industries (e.g., oil, gas, forestry, mining, and chemicals) also tend to be the most prolific providers of such information. Several studies (e.g., Adler and Milne, 1997; Brown and Deegan, 1998; Neu *et al*., 1988) have also noted the correlation between firms' disclosures and their exposure in the media, a factor further considered because of its ability to erode corporate

[1] Recent surveys by Epstein (1992), Deegan and Rankin (1997) and Goodwin *et al.* (1996), for example, report strong demand for the disclosure of environmental fines, penalties, and assessments, estimated future costs for environmental clean-up, and performance toward environmental targets. Epstein's (1992) survey of U.S. shareholders, reports that 80 percent wanted environmental disclosures included in the annual report because investors have long-term social and financial concerns that environmental problems could lead to substantial increases in costs, regulation, and governmental fines.

legitimacy. Consequently, such findings have led many researchers to suggest that social and environmental disclosures within annual reports are nothing short of public relations and impression management tactics geared to maintaining or regaining legitimacy (e.g., Patten, 1991, 1992, Deegan and Gordon, 1996; Walden and Schwartz, 1997; Neu *et al*., 1998).

Further evidence to support such arguments appears from recent studies by Gamble *et al.* (1995), Walden and Schwartz, (1997), and Patten, (2000) who all report a concurrent rise in the provision of other (positive) types of environmental information in U.S. corporations' financial reports over the period in which negative environmental liability disclosures are being required. Patten (2000), in particular, examines the change in the disclosure of Superfund-related exposures in corporate financial reports from the mid-1980s to the mid-1990s for a sample of 95 U.S. companies. He documents a significant increase in this disclosure. However, he also notes a significant increase in the provision of other, more positive environmental disclosures as well. Furthermore, Patten reports a statistically significant correlation between firm-specific changes in Superfund disclosures and changes in other environmental disclosure. Patten argues that the increase in the disclosure of more positive environmental information by U.S. firms is due to the companies' attempts to offset or mitigate the negative impact of the remediation-related disclosures.

Despite these findings, several issues remain unresolved with this literature. For example, few of the studies provide any direct evidence on whether or how such annual report disclosures are *used* by the external stakeholder groups that are perceived as the intended recipients of such legitimating disclosures. This is often left assumed, or secondary evidence, such as Tilt's (1994) survey of pressure groups, is often relied upon instead. Similarly, many studies tend to treat 'stakeholder groups' as a homogenous group of intended recipients of annual report disclosures, and fail to identify the 'relevant publics' of such reports (see Pfeffer and Salancik, 1978; Lindblom, 1994), or, identify 'definitive' stakeholders' claims (Mitchell *et al*., 1997). A notable exception, however, is Neu *et al*. (1998, p. 279) who suggest environmental disclosures in annual reports are likely to be targeted at the organization's most important relevant publics, with financial stakeholders and regulators identified as those most important publics. Environmentalists are seen as a secondary public, while the general public, Neu *et al.* suggest, can be reached by other media such as organizational advertising. Likewise, no evidence is introduced that indicates the *influence* of such disclosures on external stakeholder or pressure groups, or that management perceives such disclosures could influence such external groups. While the coincidence of 'other' environmental disclosures with negative liability disclosures observed by Patten (2000) is certainly indicative of management's attempts to neutralize the negative impact of such information, we have little direct evidence whether it does or whether it was ever intended to. As Pfeffer and Salancik (1978, p.194, see also Lindblom, 1994) note, organizational legitimacy is a state or condition that is conferred upon the organization by groups or individuals external to it. It is not something that necessarily arises from organizations pursuing strategies of legitimation, for those strategies may fail. In some respects, then, the literature on social and environmental disclosures has tended to focus on only a part of the organizational legitimacy story. The focus has largely been upon what firms are doing with information rather than upon whom the actual or intended recipients might be, and what they are or are expected to be doing with the information. This emphasis seems to conform with Ashforth and Gibbs' (1990, p.177) more general observation that:

> Despite the problematic nature of legitimacy, most research on the construct has been confined to the means of legitimation and has overlooked the conditions under which such means are or are not successful. Previous work has implicitly assumed that the means indeed produce the desired effects.

In this study, we attempt to partially overcome some of these issues, albeit in a very limited way, by focusing on whether chemical firm annual report environmental disclosures influence investment

decisions. Chemical firms are shown to have wide ranging legitimacy problems with the public, citizen groups, regulators, and because of their potentially enormous liabilities, shareholders and investors. Furthermore, by now being required to disclose contingent liabilities relating to hazardous waste sites, some of which run into tens and hundreds of millions of dollars, such organizations are further required to communicate and reinforce their legitimacy problems to annual report users.

While annual reports may be used by a variety of external groups, like Neu *et al*., (1988) we believe such reports (and their environmental disclosures) are largely intended for financial stakeholders. Other groups' concerns like regulators, the public and environmental activists we suggest are likely to be met primarily by other activities that we outline. The disclosure requirements for toxic waste offences create the need for investors to be not only reassured about potential liabilities, but also about the extent to which the firm is managing it relationships with regulators. With investors or investment advisors as our chosen "relevant public" for annual reports, we seek to determine whether the hazardous waste liabilities information now required to be disclosed actually impacts investment decision-making. Secondly, and more importantly though, we investigate whether the attempts by chemical companies to legitimate those previous hazardous waste activities and liabilities to potential investors by way of accompanying positive disclosures actually work. Our study, then, provides a specific examination of legitimation behaviour by not only focusing on a specific industry, but also on a specific aspect of its environment (toxic waste liabilities) as it is communicated by the annual report to a specific stakeholder group, namely potential investors.

PRIOR LITERATURE

Organizations, Their Environments and Legitimation.

Organizations operate within a larger social system or environment as part of a coalition of individuals and sub-coalitions (Cyert and March, 1963). Pfeffer and Salancik's (1978, p. 257) resource dependence theory of organizations proposes that organizational behavior is both an attempt to comply with the demands of others and to manage the dependencies that create constraints on organizational actions. Negotiating exchanges to ensure the continuation of needed resources is the focus of much organizational action (Pfeffer and Salancik, 1978, p. 258). The more critical and scare the resources required by the organization, the greater the control over the organization those with the resources possess, and the greater the attention they receive from the organization. An organization's environment, however, not only provides resources but is also a threat (Perrow, 1970). The utilization of resources from the larger social system, that could otherwise be allocated elsewhere, must be accepted as legitimate by members of that larger system (Parsons, 1960). Consequently, survival depends not only on such mundane matters as efficiency and profits, but upon the acceptance of output and methods of operation by significant sectors of the organization's environment (Perrow, 1970). To the extent that the actual or perceived behavior of an organization departs from the social values and norms held by those significant sectors, its legitimacy is threatened (Dowling and Pfeffer, 1975) and a legitimacy 'gap' may develop (Sethi, 1975, 1978, 1979). Legitimacy, then, is a conferred status (Perrow, 1970) that, to the extent that it is lacking, may be viewed as a resource (Dowling and Pfeffer, 1975) to be obtained from groups outside the organization.

To extend, maintain or defend an organization's legitimacy, managers engage in a process of legitimation (Dowling and Pfeffer, 1975; Ashforth and Gibbs, 1990; Suchman, 1995). Pfeffer (1981, p. 5) suggests:

> Management provides rationalizations or reasons that make sense of and thereby explain the organization's activities. These rationalizations or explanations for behavior are constructed so as

> to legitimate the organization to its constituents both within and outside its boundaries, in that explanations for activity provide reasons for organizational action that are consistent with social norms, values and expectations for the organization. This legitimation occurs to ensure support not only from the organization's environment but also to ensure the continued participation and indeed, acquiescence, enthusiasm, and commitment for the organization on the part of its employees or members.

Organizations, then, may seek to change things other than their performance. Through communication they may seek to change the norms, values and beliefs of those external constituents (Dowling and Pfeffer, 1975; Sethi, 1975, 1977, 1978, 1979; see also Lindblom, 1994). Organizations, again by way of communication, may also attempt to *appear* legitimate by aligning themselves with other symbols, values or institutions which are themselves legitimate (Dowling and Pfeffer, 1975; Jackall, 1988, pp. 134-161). There is also a wide range of mechanisms or tactics that can be deployed to implement either substantive or symbolic approaches to legitimation. Ashforth and Gibbs (1990), for example, suggest managers may change role performance, alter resource dependencies (e.g., by contracting, interlocking directorships, etc.) and alter institutionalized practices (e.g., by lobbying). Symbolic management may involve espousing socially acceptable goals, denial or concealment of information, redefining means and ends, offering accounts (including "excuses" and "justifications") and offering apologies.[2]

The process of legitimation, however, is not only *strategic* (i.e., within management's control); another perspective on legitimation emphasises its *institutional* nature (Suchman, 1995). Institutionalists (e.g., Meyer and Rowan, 1977; Zucker, 1977; DiMaggio and Powell, 1983; Meyer and Scott, 1983):

> …downplay both managerial agency and manager-stakeholder conflict. In a strong and constraining symbolic environment, a manager's decisions often are constructed by the same belief systems that determine audience reactions. Consequently, rather than examining the strategic legitimation efforts of specific focal organizations, institutionalists tend to emphasize the collective structuration (DiMaggio and Powell, 1983) of entire *fields* or *sectors* of organizational life (Suchman, 1995, p. 576, emphasis in original).

Much management behaviour, including attempts to legitimate, may be controlled not by managers but by institutional pressures that produce an "iron cage" and create tendencies towards isomorphism within the organizational field (DiMaggio and Powell, 1983). These pressures, however, may be subtle, pervasive, yet powerful, myths of why organizations ought to exist, and how they ought to behave. Consequently, actions and decisions, including ceremonies and rituals, may occur with little realization. From the institutionalist perspective, legitimacy (and hence resources and survival) is gained by the organization becoming isomorphic with its environment (Meyer and Rowan, 1977). Legitimacy can be enhanced by mentioning institutionalized structures and practices in the accounts that managers provide to external constituencies (Meyer and Rowan, 1977; Elsbach & Sutton, 1992; Allen and Caillouet, 1994; Arndt and Bigelow, 2000).

While much of the foregoing analysis suggests a substantive/symbolic division between means of legitimation, it is worth noting that *all* attempts at legitimation are likely to form part of a "myth system" that is loosely or entirely de-coupled (Weick, 1969) from the organization's "operational code" (Reisman, 1979). In legitimating the organization, senior management provide a buffer between the organization and its environment (Thompson, 1967; Ginzel *et al*., 1992). Managers, for

[2] Further expanding on the means that organisational actors might use to tactically or strategically defend (or assert) the identities that others (ought to) assign to them and their organisations is a literature referred to as "impression management" (see, for example, Staw *et al*., 1983; Tedeshi and Melburg, 1984; Ginzel *et al*., 1992; Elbach and Sutton, 1992; Elsbach, 1994; Sutton and Galunic, 1996; Mohamed *et al*., 1999).

example, may provide accurate accounts of a variety of institutionalized practices to reduce pollution (e.g., environmental committees, ISO 14000, audits, etc.), but such initiatives may actually do little to change the 'real work' of the organization (see, e.g., Dalton, 1959; Jackall, 1988; Kanter, 1977; Bowles, 1991). Such initiatives may simply be an elaborate and convincing façade designed or adopted to conceal the 'back stage' activities from prying eyes (Jackall, 1988, pp. 162-190; Punch, 1996, pp. 213-247). Consequently, whether legitimating initiatives occur as a result of management desire or institutional pressure, and whether they involve pure symbolism or substantive activity, they may mean little in terms of significantly changing the organization's activities.

As illustrated above the conceptual issues involved with legitimation are complex, but which or why do organizations have low legitimacy? And from whom do organizations seek legitimacy? More specifically, to whom do managers direct their legitimating attention, and when?

Ginzel *et al*., (1992) suggest both identity-enhancing and identity-threatening events lead to impression management behavior. The former provide opportunities for image enhancement, while the latter, which are seen to center around faulty decisions, inattention to emerging problems or neglect of ethical responsibilities, threaten the organization's legitimacy and create a need for image repair. Sethi (1977) suggests the source of a legitimacy gap may involve changing societal expectations that result from a gradual awareness of some matter or other that becomes objectionable. Tobacco companies, for example, started coming under fire as more information was gleaned about the potential health effects of cigarette smoking (Miles and Cameron, 1982). Alternatively, a legitimacy gap may arise out of new information that is suddenly gained about an organization, particularly if it differs from the organization's image. Bowles (1991) suggests that organizations have 'shadows' that constantly threaten to reveal themselves, and some organizations, and their primary actors, are under close and persistent monitoring and evaluation (Sutton and Galunic, 1996). Such information, consequently, may result from within the organization, i.e., part of its 'operational code' becomes revealed by a whistle-blower, journalists or other activists. Alternatively, the organization may suffer some accidental, controversial or crisis event (Elsbach, 1994; Allen and Caillouet, 1994). Consequently, events precipitating the opportunity or need for legitimation and impression management can be both gradual and sudden, both anticipated and unanticipated (Ginzel *et al*., 1992).

Further emphasizing this variability, Mitchell *et al*. (1997), in exploring "who and what really counts" within a theory of stakeholder identification, suggest that the expectations of the "dominant" stakeholders—those *perceived* by managers to have *power* and *legitimacy*—will typically "matter" to managers. When these groups also have a claim that is *perceived* to be *urgent*, however, they become "definitive" and managers are considered to have a clear and immediate mandate to attend to their claim. However, as they note (p. 879), "stakeholders change in salience, requiring different degrees and types of attention depending on their attributed possession of power, legitimacy, and/or urgency, and that levels of these attributes (and thereby salience) can vary from issue to issue and from time to time."

Bansal and Roth (2000) contribute further to our understanding of legitimation by developing a model grounded in management's explanations that proposes three basic motivations for 'greening' the firm: competitive advantage, legitimation, and environmental responsibility. Firms classified with a legitimation motive for adopting environmental initiatives tended to emphasize survival, compliance with norms and regulations, a stakeholder focus, the costs and risks associated with noncompliance, thwarting impending legislation, imitating and following others in the industry. Furthermore, the legitimation motive tended to manifest itself in terms of regulatory compliance, networking with interest groups and impression management.

> Examples of legitimation as shown by the data included complying with legislation, establishing an environmental committee or environmental manager position to oversee a firm's ecological impacts and advise senior management, developing networks or committees with local community representation, conducting environmental audits, establishing an emergency response system, and aligning the firm with environmental advocates (Bansal and Roth, 2000, p. 727).

Three primary variables (issue salience, field cohesion, and individual concern) are theorized to influence firm motives, and Bansal and Roth posit that all three act positively on those firms seeking legitimacy from their environmental initiatives. Salient issues were those that were perceived by the firms as *certain* (impacts easily determined, quantified or costed), *transparent* (easily attributed to the firm), and *emotive* (elicit an emotional response from constituents) and these tended to produce the greatest reactions. Salient issues were perceived as threatening legitimacy and profitability. Field cohesion is largely defined following the institutionalist framework outlined earlier (e.g., DiMaggio and Powell, 1983) and focuses on the "intensity and density of formal and informal network ties between constituents in an organizational field". Field cohesion is strengthened by negative images of the industry's ecological impacts and by the activities of industry associations. As Bansal and Roth (2000, p. 730) suggest:

> Fields labeled as "dirty", such as oil, chemicals, mining and forestry industries, were under intense scrutiny. As a result, field members colluded either through formal arrangements, such as industry associations or through informally monitoring each other's ecological responses. Industry associations further promote field cohesion by transferring information about "best practices", lobbying government to adjust legislation and regulations, and collectively managing an industry's image.

Firms in highly cohesive fields were strongly motivated by legitimacy concerns since often their survival depends on the behavior of all field members. Firms tended to conform to the industry norms, since standing apart from the industry's behavior on green initiatives was both difficult, because of information sharing and informal sanctions, and seen as undesirable, because superior performance ratcheted up the standards for others and so costs for all. Finally, while individual concern (leadership, values, etc.) was a powerful factor in explaining why some firms were motivated by a desire to be ecologically responsible, these firms tended to operate in less cohesive fields and so were less constrained by their institutional context. Individual concern served to reinforce the legitimation motive within firms from highly cohesive fields.

Legitimation, then, is a process that results from the interaction of organizations and their environments. From one perspective, legitimation is grounded in a behavioral or resource dependence theory of the firm. This theoretical perspective emphasizes the criticality of resources, the need for management attention to be paid to those who control such resources, and, consequently, on the power, legitimacy and urgency of claims as perceived by management of those constituents controlling the resources. Precipitating issues or events have the ability to become urgent or salient to some stakeholders, so threatening the organization's legitimacy, its access to resources and so survival. Such issues or events may temporarily lift stakeholders to a definitive status that requires management's more immediate attention. Such attention may involve actions and decisions that result in performance change, but it will also involve symbolic and impression management.

From another perspective, legitimation is grounded in institutional theory with its emphasis on institutional pressures to conform. From this perspective firms are found to develop and adopt structures, procedures and personnel that signal conformity, credibility and so legitimacy to outside audiences and the rest of the organizational field. Field cohesion—the intensity and connectedness of organizational members—serves to increase the threat to legitimacy and reinforce legitimation.

While the outcomes of such institutional pressures are largely 'other' controlled, management may control their communication. Bansal and Roth (2000, also see Elsbach, 1994) illustrate how the strategic and institutional perspectives can serve as complementary explanations for firms' attempts to legitimate.

The Chemical Industry, Toxic Waste and 'Superfund'

Ever since Rachel Carson's (1962) *Silent Spring* predicted the apocalyptic loss of nature from the use of synthetic chemical pesticides, concerns have been raised about the efficacy and legitimacy of the chemical industry. Carson concerned herself with the insidious mutagenic and carcinogenic effects of such chemicals as DDT. Recently, Colborn *et al.*'s (1996) *Our Stolen Future* raises the spectre of such compounds altering our hormones, fertility and fundamentally our ability to reproduce and survive. If the manufacture and use of such chemicals were not enough, the past three decades have seen a series of industrial incidents and disasters, most notably the 1984 Bhopal chemical leak, in which individuals have either been outright killed or exposed to potentially lethal chemicals.[3]

While incidents such as Bhopal might be put down to human error, there is nothing accidental about the thousands of toxic chemical waste sites that have been discovered across the U.S over the past 30 years. Nor can one put such behavior down to a rogue company or two. The practices were, and probably still are, pervasive throughout much of the chemical industry.[4] From the infamous toxic dump at Love Canal, to sites at White Lake, Michigan, to waste sites in New Jersey, Tennessee, Louisiana, Maryland and California, Brown (1979) charts in excruciating detail the effects of the appalling and contemptible behavior of chemical companies, and their waste disposal companies. In 1979, the EPA estimated that there were at least 51,000 waste sites and of these perhaps 1200 to 34,000 displayed 'significant problems'. However, Brown (1979, p. 298) suggests "It became clear that no one had a firm idea of the extent of the problem. It had grown beyond count." Brown also documents, and later congressional hearings confirmed, that Hooker Chemical executives had known about the possible health effects of its toxic dumps for years and chose to ignore them.[5] The EPA itself came under fire for not doing enough. For example, one grand jury claimed the government at all levels had fostered "actual and potential criminality and profiteering" by its response to hazardous waste which has been characterized by "ignorance, neglect, laxity, and fractionalization of responsibility." (quoted in Brown, 1979, p.329). The sheer cost of dealing with the potential problem, however, was also a factor. EPA estimates in 1979 suggested providing a permanent solution would cost $26 million at each site. Based on only the 1700 worse sites this suggested an overall cost of $44 billion. Since neither the EPA or the federal government had this kind of money, the Carter Administration proposed raising an emergency 'superfund' of $1.6

[3] While the gas and chemical explosion at Union Carbide's Bhopal plant in India in 1984 is perhaps the most notable incident since it killed at least 1700 people and permanently injured 20,000 (see, for example, Shrivastava, 1992; Jasanoff, 1994; Pearce and Tombs, 1998, pp.194-219), there have been numerous others. For example, at Seveso, Italy, 1976, thousands of residents were exposed to a poisonous cloud of dioxin. In 1973, the entire community of Times Beach, Missouri, had to be permanently relocated after it was discovered the roads had been tainted with dioxin.

[4] Pearce and Tombs (1998, pp. 177-178), for example, suggest "There is evidence which attests to the fact that environmental crimes are routine and ubiquitous. Moreover, the chemicals industries are integrally implicated in the incidence of such crimes. These typically involve the illegal dumping of hazardous wastes (Bullard, 1990; Block and Scarpitti, 1985; Cass, 1996), crimes of environmental destruction, notably of forests and landscapes (Paehlke, 1995), and crimes involving illegal emissions into land, air and waterways (Hyatt and Trexler, 1996; Howarth, 1991)."

[5] Brown (1979, pp.82-96), for example, provides evidence from a testifying 'whistle-blower' that employees were instructed to ignore routine chlorine gas emissions at White Lake as if they were steam, and 'play dumb' to any resident complaints of such emissions. Employees were told that "this is not a chocolate factory…we got to make money." Internal memoranda from plant environmental engineers acknowledged that "laboratory records indicate that we are slowly contaminating all wells in our area …to the point of being toxic to animals or humans" and yet little was done because "other companies solutions were so expensive…"

billion over four years to begin the clean up process. The vast majority of the fund (80 percent) was to come from taxing chemicals, with the rest from federal and state government.

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), typically referred to as Superfund, was enacted in 1980, and subsequently amended in 1986 by the Superfund Amendement and Reauthorization Act (SARA).[6] Under the Superfund process, the EPA enters potentially hazardous sites on its database as it becomes aware of them (in 1995, over 36,000 sites were listed). Following preliminary assessments and site inspections, the sites are scored using a Hazard Ranking System that permits some sites to be placed on the National Priorities List (NPL). In 1995, 1200 sites were listed on the NPL. Only sites on the NPL are eligible for funding and long term remedial action. Once listed, a serious of steps including damage assessment, remedial design, and eventually remedial action lead to site clean up. The clean-up process is cumbersome and one estimate puts the average time elapsed between database listing and clean up at 12 years, with being on the NPL to clean up at 8½ years (Acton, 1989). As at 1990, Congress had authorized a total of $15.2 billion to fund the clean up, and by 1992 the EPA had cleaned up 111 sites, with work in progress at a further 400 sites. Some estimates now put the total clean up cost of all NPL sites at over $100 billion and maybe as high as $400 billion with no likely completion before the year 2020. Average clean up costs at NPL sites are $30million (see, Barnett, 1994; Revesz and Stewart, 1995).

Consequently, liability under Superfund can be potentially enormous. Under existing legislation, liability is strict (demonstrating fault or negligence is not required), retroactive (sites before 1980 are caught), joint and several. These latter aspects of the statute mean *potentially responsible parties* (*PRPs* —who might include current and previous site owners, operators, substance generators, waste disposers, and transporters) are equally liable for the damage and clean up costs unless they can show the harm and clean up is clearly divisible. Moreover, where parties are no longer in existence, or financially incapable of meeting their obligations, the remaining parties must meet the "orphan" share of the costs. *PRPs* are typically identified and notified during the EPA's preliminary assessment. Barth and McNichols (1994, p. 179) identify nearly 1500 C*ompustat* firms as *PRPs*, with some of these identified as *PRPs* on as many as 61 Superfund sites. The chemical industry had 32 firms identified with 10 or more sites, almost three times the number of such companies as any other industry classification.

In the early years, the EPA would organize the feasibility and assessment work, hire a contractor to clean up, pay for the clean up from the 'Superfund' and then seek reimbursement from the *PRPs*. Now, however, *PRPs* are typically undertaking the bulk of the remedial investigations, feasibility studies, remedial designs and remedial action work as a result of settlements with the EPA. Barth and McNichols (1994, p. 184) note that while being identified as a *PRP* is usually sufficient to indicate a probable liability, estimating the liability is likely to involve considerable uncertainty. Site complexity, remediation alternatives, changes in remediation technology, clean up standards, the number and financial viability of other *PRPs*, the availability of records on site dumping by *PRP*s, the uncertainly of insurance cover, and the protracted period over which litigation and negotiation might take place, all create liability estimation difficulties. Nonetheless, some firm's liabilities will run into tens of $millions, if not hundreds, of $millions.

[6] For detailed descriptions of the provisions of this legislation, its effects, and its success, see, for example, Revesz and Stewart (eds.) (1995), Dalton (1995), and Barnett (1994).

A Crisis of Public Confidence and the Chemical Industry's Reactions

Perhaps not surprisingly in the wake of the events discussed above, the Chemical industry is, and has been for some time now, suffering a crisis of public confidence.[7] A 1990 opinion poll conducted in the U.S., and noted in Gunningham (1995, p.59), for example, found the chemical industry's rating of public acceptability had dropped to 25 percent, with over 60 percent of respondents rating the industry as 'very harmful to the environment.' Similarly, in the U.K., Liardet (1991) charts the fall of the chemical industry's public image through a series of MORI polls conducted from the late 1960s to the late 1980s. While during the 1970s the industry's ratings of public acceptability held at about 50%, by 1989 the industry's public image ratings had fallen to 26%. Moreover, as Liardet (1991, p. 119) notes, the industry faced "the ugly thought that the public is hearing more about [the chemical industry] and, in the context of a greener world, does not like what it hears." A 1992 Australian survey of community attitudes seemed to confirm this by concluding that the:

> …chemical industry is associated with pollution, danger, explosions and possible ill-effects from the use of chemicals and chemically based products. It is also associated with secrecy, lack of public discourse, possible dishonesty and lack of ethics…[Its] operations are of concern…[to] more than twice as many participants in the study as any other industry. (Motive Market Research, 1992, quoted in Gunningham, 1995, p. 59).

There are also signs that such attitudes are not just the "hysterical", "ignorant", "emotional" and "irrational" fears of a public caught up with "chemophobia".[8] Grant et al. (1988, cited in Tombs, 1994, p. 134) report, for example, that professional and managerial social groups have declining attitudes towards the chemical industry —social groups which traditionally have held the most favorable attitudes towards the industry, and social groups from which legislators and regulators are drawn.

There is also substantial evidence that industry leaders have realized that if they are to survive, then they need to change track, or at least persuade the public and others that this is occurring. Dow Chemical's 1989 annual report, for example, claims that "One issue more than any other will effect Dow's prospects in the 90s and beyond. That issue is the environment." Likewise, Edgar Woolard, Du Pont's CEO, stated in *Chemistry & Industry* (1990, p. 738) that "The future of the chemical industry will be directly shaped, and indeed may ultimately be determined by environmental issues." Despite numerous and extensive attempts (discussed below) to restore its tarnished image, it appears the chemical industry is yet to make much headway. Hunter (1998a, p. 3), for example, notes that public opinion surveys conducted by the industry itself still show that fewer than one-quarter of the respondents have a favorable view of the chemical industry. Similarly, Art Sigel, U.S. Chemical Manufacturers Association Chairman, told the association's 1998 conference that "The

[7] A chemical company production manager interviewed by Robert Jackall (1988, p. 155, emphasis in original) describes the 'fall' of the chemical industry over the past three decades from a personal perspective as follows:

> Well, from 1957 through 1962, I was intimately involved with the manufacture of DDT. During that time, we doubled production and sold almost all of it to Africa and India. [And]…I *knew* I was saving thousands of lives by doing this…Then Rachel Carson's *Silent Spring* came out and not only did I become a murderer of falcons and robins, but also one of the mass murderers of the world. I was now doing evil things… Then I went to a plant manufacturing CFCs and we increased production 20-25%… We also used vinyl chloride and found out that it was causing liver cancer. Then I found out that I was destroying the whole ozone layer of the earth and doing it for personal gain…Children learned in school that chemicals killed… I was perceived as an evil person doing evil things. And that became true even in the corporation. Plants became a *liability*, rather than the source of wealth.

[8] These are terms that have regularly been used by members of the chemical industry to describe the public's reactions to their affairs. See, for example, Brown (1979, p.94), Lindheim (1989), and Tombs (1993).

challenge today is the same one we faced 10 years ago: We need to earn the public's trust." He went on to conclude "To the public, 'chemical' is a dirty word, and until we change that very basic fact we'll remain on the defensive." (quoted in Hunter, 1998b, p.5).

Tombs (1993) suggests part of the reason the chemical industry may have failed to lift its flagging image is that many of its moves seem little more than rhetorical, superficial or tactical techniques aimed at denial or neutralizing the threats of stricter governmental regulation resulting from public pressure. Shrivastava *et al*.'s (1988) and Smith's (1990, 1992) conceptualization of crisis management also provides a structure within which to document many of the chemical industry's reactions. According to Shrivastava *et al*. (1988) and Smith (1990, 1992), 'crises' are a normal part of organizations' lives (see Perrow, 1984) and particularly organizations that involve complex processes like chemical manufacturers. Crisis management, they suggest, involves three phases: a pre-crisis of management phase, an operational crisis management phase, and a post-crisis legitimization phase. Tombs and Smith (1995, p. 143) suggest:

> Almost all crises uncover pre-event warning voices which have been ignored because they come from 'outsider' groups (such as workers, environmental or consumer groups and journalists), or individuals who are relatively marginalized within corporate structures, such as safety officers or safety engineers. Moreover, these sources of pre-event information do not share the short-term productivist logic of senior corporate decision makers.

Not only do Brown's (1979) accounts of the internal memoranda at Hooker bear this out, but so to do other in-depth investigations of organizational behavior as it relates to health, safety and environmental matters (see, for example, Heilbroner *et al*., 1972; Jackall, 1988; Fineman, 1996, 1997, 1998; Crane, 2000). Surveys of industry executives (e.g., Rappaport & Flaherty, 1991; Hunter, 1993) have also revealed that emphasis on short-term profitability often impedes progress on health, safety and environmental issues.

In the second operational phase—crisis management, Tombs and Smith (1995, p. 141) suggest managers employ "immediate attempts at mitigation strategies involving symptomatic treatments." Such tactics may vary from a rapid positive attempt to show concern and correct the situation to a stalling defensive attempt at denial (see, for example, Goldberg and Harzog, 1996). Such tactics typically involve press releases, press conferences, site visits, and meetings, as well as perhaps logistically dealing the consequences of the situation. [9] The post-crisis phase involves responding to "fundamental threats to organizational rationalities and legitimacy…this later stage may, but all too often does not, contain a search for 'fundamental' or underlying causes" (Tombs and Smith, 1995, p.141). Moreover, as Tombs and Smith (1995, p. 141) suggest, "In the longer-term, it may be that the apparent 'lessons' of a crisis are unacceptable to an organization or organizations —that is, they are too challenging of core beliefs, predominant cultures, assumptions of managerial authority or existence power structures."

[9] Hooker's tactics to its public were to either take out local newspaper advertisements proclaiming its innocence, intimidate the newspapers' reporters and editors for carrying the original stories of its atrocities, or, mostly, keep quiet. One such advertisement, for example, proclaimed "IT'S EASY TO HATE A BIG CHEMICAL COMPANY" and went on "…toxicological evidence available to us indicates there is no hazard to fish or to people who eat fish form White Lake." As if to obscure the matter further it went on "…There are 150 different chemical substances in a potato…One of them is arsenic, a deadly poison." Another suggested "TRY TELLING BRUCE DAVIS THAT HOOKER DOESN'T CARE ABOUT NIAGARA FALLS" and went on to detail Hooker's financial importance to the community and its environmental remediation programs. It finally ended with: "When you get right down to it, you'd be hard pressed to find any group of people who care as much about the environmental and economic well-being of Niagara Falls as the people at Hooker." Quoted from Brown (1979, pp. 81-96). According to Brown (1979, p. 94), Bruce Davis, a Hooker executive, claimed to the very end that Hooker never did anything wrong at Love Canal. The problems started according to Davis when local contractors disturbed the "sealed" site.

It is within this context that the U.S. Chemical Manufacturers Association's (CMA) 'Responsible Care' program, adopted in 1988, can be interpreted. Responsible Care was created as an industry-wide initiative developed to overcome the negative image resulting from accidents like Bhopal (see, e.g., Bowman and Kunreuther, 1988; Rees, 1997).[10] The CMA's (1993) claim was that Responsible Care would "promote continuous improvement in member company environmental, health, and safety performance in response to public concerns, and to assist members' demonstration of their improvements to critical public audiences", but detailed examinations of the program's performance suggests it does not. King and Lennox (2000, p. 713), for example, conclude "without explicit sanctions for malfeasance. [Responsible Care] has fallen victim to enough opportunism that it includes a disproportionate number of poor performers, and its members do not improve faster than nonmembers." Gunningham's (1995, p. 78) analysis reveals even more disturbing evidence; noting for example, that:

> …the chemical industry has sought to challenge and delay the development of rules [Under the Chemical Accident Prevention and Clean Air Act (1990) amendments]…and thereby delay their own compliance with those rules for as long as possible. To say the least, this sits uncomfortably with the industry's pledges under Responsible Care and its commitment to continuous improvement."

Of course, Responsible care was not the only action taken by the chemical industry and its firms to bolster its image. Post-Bhopal, the U.K. Chemical Industries Association produced a series of glossy leaflets and created its 'Open Door 86' program ―when over 200,000 people visited chemical plants (Tombs, 1993). Between 1993 and 1996, the CMA also ran a $40 million advertising campaign in an attempt to arrest the industry's declining fortunes in opinion polls (*Chemistry & Industry*, December, 16, 1996: 961). The chemicals industry sector also leads the way in terms of stand-alone corporate environmental reports, and/or health, safety and environment reports, and comes close to doing so with environmental disclosures with the annual report (KPMG, 1999).[11] Pearce and Tombs (1991), suggest that initiatives like these are nothing short of deliberate attempts to "allay fears" and thwart the threat of impending legislation by *appearing* to self-regulate and act responsibly.[12]

As Tombs and Smith (1995) might have predicted, Gunningham (1995, p. 92) goes on to conclude:

> Today, although the spectre of Bhopal still stalks the chemical industry, its impact is fading. More important, a major recession has inflicted substantial damage on the industry's profits, and environmental groups have far less influence as the economy takes center stage in national politics and policymaking. There is impressional evidence that commitment to Responsible Care is weakening, and that any aspects of the scheme that are likely to damage short-term industry profits now meet with substantial opposition, even from many major enterprises. There is also evidence of a slippage from genuine commitment toward improved environmental performance to seeking painless public relations benefits.

It must be noted that some chemical company initiatives addressing the production, use, storage and disposal of toxic chemicals have led to real improvements. But Peace and Tombs (1998) suggest these are rarely motivated out of autonomous acts of altruism. Prakash (2000), for example, charts

[10] Responsible Care was first launched in Canada and subsequently brought to the U.S. Important to note, however, is that it was Robert Kennedy, Union Carbide's CEO, who persuaded the US CMA's *Public Perception Committee* (our emphasis) that the program had industry-wide benefits.

[11] Milne *et al*., (2001), note that companies either planning to, or already issuing stand-alone corporate environmental reports identify local communities and regulators as the primary audiences for their reports.

[12] It is also within this context that Pearce and Tombs (1998) view Union Carbide's own cynical attempts during the late 1980s to appear environmentally responsible, by releasing as it did a series of pamphlets and press releases, including one entitled *Towards Environmental Excellence: A Progress Report* (1989).

the decision-making processes at Eli Lilly and Baxter during the 1980s and 90s when implementing several environmental programs including the replacement of storage tanks and reducing Toxic Release Inventory (TRI) chemicals. Both companies eventually decided to adopt policies that went beyond those required by the EPA, and therefore incurred more costs than was strictly necessary, in fact, $ millions more, but Prakash's analysis reveals the basis for such decisions was often associated with maintaining image, thwarting even tougher regulations, or avoiding liabilities. He (p.68-69) notes, for example, that:

> …beyond-compliance features create goodwill for firms with regulators, local communities, citizen groups, etc. Importantly, this goodwill…imparts benefits in many ways: firms get quicker approval for their environmental permits; regulators consult firms on new laws and regulations and incorporate their suggestions; and regulators treat minor environmental violations leniently… Baxter and Lilly's environmental policies have been significantly influenced by their history of problems with the EPA. Hence, these leaders emphasized that removing *all* USTs [Underground Storage Tanks]…had significant symbolic value for both the internal and external constituents of these firms.

Likewise, with respect to the TRI reduction policies, Prakash (2000, p. 79) notes that policy supporters emphasized the negative publicity that came from media reports of TRI emissions, even where the firm had substantially reduced those emissions. Prakash suggests such negative images were perceived by company managers to be "sticky", and created pressure from external stakeholders. At Baxter's, the policy supporters also argued that the TRI program was a likely forerunner to more stringent regulations, and illustrated this by emphasizing a letter Baxter had received from the EPA's chief administrator. The EPA threatened to bring in "detailed direction which is likely to be demanded by the public if voluntary efforts are not fruitful."

Much of the foregoing evidence, then, seems to bear out Bansal and Roth's (2000) arguments for why firms go green. In the case of chemical companies and their industry, the certainty, transparency and emotivity of disasters like Love Canal and Bhopal, coupled with the industry's cohesiveness have led to a public image so poor it has created external pressures that, according to its leaders, potentially threaten the industry's survival. The need to restore legitimacy seems a more powerful motive than either competitive advantage or social responsibility. Moreover, a great deal of the evidence seems to fit Mintzberg's (1983, pp. 13-14, emphasis in original) earlier observations that true social responsibility requires commitment and involvement on a *personal* basis, and the opportunities for this in large diversified bureaucratic organizations seems to be increasingly limited. Consequently, "a good deal of what passes for social responsibility would disappear without other, countervailing forces on the corporation—pressure campaigns by activists, regulations by government, and so on" (Mintzberg, 1983, p.12). It is against this background and context that we now examine environmental disclosures in chemical companies' annual reports and their impact on one external group, namely investors.

RESEARCH METHOD

Similar to Chan and Milne (1999), an experimental investment scenario was used to generate data. The advantage of such an approach is the ability to manipulate the variables of interest (in this case the levels of environmental disclosure) to more directly measure potential impacts. However, it must be noted that, as an experiment, participants are not making real-world allocation decisions and as such, the external validity of the results cannot be assessed.

Sample

Consistent with previous studies of investment actions (see, e.g., Belkaoui, 1980; Chan and Milne, 1999), practicing accountants were used as the sample participants for this study. The advantage of using accountants in an investment study is summarized by Chan and Milne (1999, p. 262), who note that "individuals who possess a significant degree of experience in accounting are more likely to understand financial reporting practices and the accounting information contained in the annual report than 'unsophisticated' investors." Consequently, we believe such participants will enhance the internal validity of the study.

For this investigation, twelve different firms agreed to have employees with accounting backgrounds participate in the study. All participation was voluntary and the experiment was administered on individual rather than company time. In total, the investment experiment was administered, either by one of the project co-authors or by a trained assistant, to 76 sample participants. Table 1 presents demographic data on the members of the sample.[13]

---------- Table 1 about here ----------

Task

The experiment was administered in two steps. First, participants were given a statement of the task (see Appendix A) indicating they were being asked by a friend to help allocate $20,000 of investment money across two firms.[14] Because Chan and Milne (1999) report that the use of environmental information appeared to vary across long-term and short-term investment scenarios, participants were asked to make the allocation under two differing sets of assumptions. The first set of assumptions indicated that the allocation was being made as a long-term investment with a goal of long-term growth. Under the second set of assumptions, the time frame for the investment holdings was given as short-term, with a goal of potential speculative gain. The order in which the two scenarios were presented to the participants was varied so that one-half of the sample was given the long-term scenario first and the other half had the short-term scenario presented first. No order differences were detected in the results. Participants were also given summary financial statements and a Management Discussion and Analysis (MD&A) for each of the two firms (see Appendix B). While the firms (Benzocorp and Midwest Chemical) are fictitious, the financial statements and MD&As were constructed based on a review of more than 25 U.S. chemical firms' annual reports for 1997 and 1998 and are meant to be representative of mid-range firms in the industry. The statements were designed to make the firms similar in regards to financial attractiveness.[15] Similar

[13] Both parametric (t-test on differences in means) and non-parametric (Mann-Whitney) tests were used to examine for significant differences in responses across sample classifications. Comparisons were made for (1) male versus female, (2) under 30 versus over 30, (3) bachelor's versus advanced degrees, (4) five or fewer years of experience versus more than five years of experience, (5) ten or fewer years of experience versus more than 10 years of experience, (6) no or very limited investment experience versus moderate or more investment experience, and (7) moderate or less investment experience versus considerable and extensive investment experience. There were no statistically significant (at $p < .10$, two-tailed) differences in allocations in any of the comparisons.

[14] The amount of money to be invested was arbitrarily determined with three factors in mind. First, we wanted the amount to be large enough that allocating it across two companies rather than just investing in one was potentially attractive. Second, we wanted the sum to be meaningful in relation to the overall portfolio amounts as identified in the scenario. Finally, we wanted an amount that would seem believable for people in the positions identified in the scenario. Informal feedback from pilot test participants (see footnote #15) indicated the investment amounts were believable.

[15] Given the relatively exploratory nature of this investigation it was decided to focus on an investment decision where financial attractiveness between choices was comparable. In essence, the argument here is that if environmental information is likely to have an influence it would be easier to isolate that in a setting where there is not confounding financial factors. As such, the two companies' data was designed to be similar in terms of investment appeal. A pilot test using the financial data without the environmental disclosures on a sample of twenty senior and graduate level accounting students indicated no statistically significant (at $p < .10$, two-tailed) differences in allocations across the two experimental firms under either a long-term or a short-term investment horizon.

to the procedure used with regard to the scenarios, the company order in which the data was presented to the participants was varied. No order effects were noted in the results.

The manipulation variable for this study was the environmental disclosure section of the MD&A. As required by current U.S. reporting standards, both Benzocorp and Midwest Chemical included Superfund-related disclosures in their MD&As. However, the magnitude of exposure, and consequent threat to the organization's legitimacy, was designed to be greater for Midwest Chemical. This was conveyed by disclosing that Midwest Chemical had more Superfund sites (32 as opposed to nine for Benzocorp), greater estimated total potential cost (projected total exposure of $50 million to $90 million in contrast to $15 million to $23 million for Benzocorp), and higher annual expenditures (a three year average of $9.2 million whereas Benzocorp's three year average was only about $4.2 million).[16] If negative environmental information does impact investment decision making, the average allocation to Midwest Chemical (the worse environmental performer) would be expected to be significantly lower than the allocation to Benzocorp.

In order to test the legitimation arguments associated with the provision of positive or neutral environmental information, one-half of the sample participants received an MD&A for Midwest Chemical (the worse environmental performer) that included substantial additional environmental disclosures of an offsetting or mitigating nature. The information included was based on a review of the categories examined for in previous studies of environmental disclosure (e.g., Walden and Schwartz, 1997; Patten and Nance, 1998; Patten, 2000).[17] If these additional, voluntary disclosures do offset or mitigate the negative impact of the required remediation information, the investment dollars allocated to Midwest Chemical would be expected to be higher for the participants with the more extensive disclosures in the MD&As than for those participants with MD&As not containing the legitimating disclosures.

Participants were not told what the purpose of the study was and they were given up to one hour to analyze the statements and make an allocation decision.

The second step in the experiment centered on gathering feedback information on why the participants made the allocations they did. After completing the allocation decision, all participants were given a questionnaire (see Appendix C) that asked them to indicate and rank (independently for the short-term and long-term scenario allocations) all factors that they relied on in making their decisions. Seven potential factors, including "environmental concerns," were listed

[16] Kinder, Lydenberg, Domini, and Company (KLD), an U.S. ethical investment screening organization, provide ratings on firms according to their social and environmental performance. For each dimension covering community, employees, diversity, natural environment and product safety, KLD has developed criteria to which it assigns ratings of -2 (major concern) to +2 (major strength). For the natural environment dimension, companies with current liabilities for hazardous waste sites that exceed $50 million are awarded a rating of -2. (See, for more details, Domini Social Investments, 1997). Furthermore, in all cases where environmental performance or exposure was addressed in the comments on the post-task questionnaire, Midwest Chemical was identified as being a worse performer or facing more environmental exposure than Benzocorp. It appears, therefore, that the manipulation was successful in this regard.

[17] It will be noted that this information contains reference to actual expenditures of several $million, and may therefore be deemed more than simply an empty public relations exercise; that is our firm is not a "cynic" but rather a "repenter" (Wokutch and Spencer, 1987). Several points may be made here. First, by its own admission, and as noted earlier, the chemical industry during the 1980s and 1990s was suffering such a crisis of public confidence that it needed to change the reality as much as the image to maintain its legitimacy (see, for example, Trowbridge, 1987; Bruel, 1990; Di Meana, 1990; Tombs, 1993, 1994; Gunningham, 1995; Pearce and Tombs, 1998, pp.175-183). Second, in our experiment, Midwest spends about 3% of its annual capital expenditures on pollution abatement. This sum is quite considerably below average industry estimates made during the 1990s of between 10% and 25% (Cowe, 1991; Liardet, 1991; McGavin, 1991). Third, even where companies spend considerable sums of money on abatement equipment, there is no guarantee such expenditures will translate into safer and cleaner operations. Lack of staff training and management expediency, for example, can both serve to undermine or circumvent such measures as was noted at the Hooker Chemical company (but also see, for example, Jackall, 1988; Smith and Tombs, 1995; Punch, 1996).

on the questionnaire (see Appendix C). The form also had spots for three additional "other" items. Finally, for each of the three most important factors, the participants were asked to explain how the item impacted their decision.

RESULTS

Table 2 provides a breakdown of how the issue "environmental concerns" was ranked by sample participants under both the long-term and the short-term scenarios. As noted in the table, 48 of the 76 sample members (63 percent) ranked environmental concerns either 1st, 2nd or 3rd in terms of the importance it played in their investment allocation under the long-term scenario. Only eight participants did not cite it as influencing the decision at all. However, under the short-term scenario environmental concerns appeared to have less impact. To illustrate, 20 participants (26.3 percent) did not cite environmental concerns as influencing the investment decision. Further, only 33 sample members (43 percent) cited it as being one of the top three factors. In general, therefore, it appears that, consistent with the results presented by Chan and Milne (1999), environmental factors may have more relevance to investors under long-term investment strategies.

---------- Table 2 about here ----------

Table 3 presents the comparisons for mean allocations across the two sample companies under the long-term investment scenario. Panel A shows the results for the total sample. As noted in Panel A, the mean allocation to Benzocorp (the better environmental performer) was $11,890 and the mean allocation to Midwest Chemical was $8,110. Both parametric (t-test on the difference in the means) and non-parametric (Mann-Whitney test) tests indicate the difference in allocation is statistically significant.

Panels B and C, respectively, report the breakdown in allocations for only those sample members citing environmental concerns as a factor in the decision (n = 68), and only those citing environmental concerns as one of the top three factors in the decision (n = 48). The results for these sub-groups are essentially identical to the overall sample results. The results summarized in Table 3 suggest that the negative environmental information did influence the investment decisions where long-term growth was the desired outcome.

---------- Table 3 about here ----------

Interestingly, the results for the short-term investment scenario are not consistent with those reported above. As noted in Panel A of Table 4, the sample participants, on average, allocated significantly higher amounts to Midwest Chemical, the worse environmental performer. The mean allocation to Midwest Chemical was $11,454 in contrast to a mean allocation of $8,546 to Benzocorp. However, it must also be noted that those who cited environmental concerns as influencing the decision (reported in Panel B of Table 4) did have a lower mean allocation to Midwest Chemical than for the overall sample. Indeed, for those sample participants who cited environmental concerns as one of the top three factors, the mean allocation was actually higher to Benzocorp than to Midwest Chemical (see Panel C of Table 4). However, this difference in the mean allocations is not significantly different. At a minimum, it appears that the influence of negative environmental information differed across investment time horizons.

---------- Table 4 about here ----------

Results for the Impact of Legitimating Disclosure

Table 5 presents the comparisons of the amount allocated to Midwest Chemical (the worse environmental performer) under the long-term scenario separated by those who received additional legitimating environmental disclosures in the MD&A and those who did not. Results for the entire sample (presented in Panel A) indicate that those receiving the legitimating disclosures did allocate a higher amount to Midwest Chemical than those who did not receive the additional disclosures, but the difference in the mean allocations is not statistically significant. However, when only those respondents who cited environmental concerns as impacting the investment decision are included in the analysis the differences in allocation are significantly different. Panel B indicates that for this sub-group, the mean allocation to Midwest Chemical was $9,147 for those with legitimating disclosures in contrast to a mean allocation of $6,995 for those without. Both parametric and non-parametric tests indicate a significance level at $p < .05$, one-tailed. The results are similar for those who cited environmental concerns as one of the top three factors in the decision. As noted in Panel C, the mean allocation for these respondents was $8,698 for the group with legitimating disclosures and $6,166 for the participants who did not have offsetting disclosures in the MD&A. This difference is also statistically significant at $p < .05$, one-tailed. Overall, these results suggest that under a long-term investment strategy, the legitimating environmental disclosures did appear to reduce the negative effects of the required environmental disclosure for those sample participants who indicated that environmental concerns influenced their investment allocations.

---------- Table 5 about here ----------

In contrast to the results under the long-term scenario, the legitimating disclosures did not appear to have much influence when the investment strategy was short-term. Results, presented in Table 6, indicate that allocations to Midwest Chemical were actually higher where no legitimating disclosure had been included than where it had been. This is not perhaps unexpected, given that the analysis above indicated the negative environmental information disclosures did not lead to lower investments in Midwest Chemical (relative to Benzocorp) under the short-term strategy.

---------- Table 6 about here ----------

DISCUSSION

This study used an investment experiment to test whether environmental disclosures on Superfund-related remediation exposures, as required by U.S. financial disclosure standards, influence investment decisions. In addition, it sought to examine to what extent firms' may be able to use voluntary positive disclosures in an attempt to offset such negative disclosures and maintain legitimacy from one group external to the organization: namely, potential investors.

Consistent with Belkaoui (1980) and Chan and Milne (1999), the results show a significant difference of behavior across investment strategies, a point also observed in Harte *et al*. (1991). As expected, in the long term most investors on average sought to avoid Midwest Chemical, and the result was most noticeable for those citing environmental concerns. Clearly, the long term risks and potential liabilities associated with Midwest are much greater than for Benzocorp. In the short run, however, a number of investors appear to not only have ignored the environmental liability information, but taken it as an indication to invest more into Midwest. On the basis of the pilot survey, we might have expected a "non result" in which the Superfund disclosures were treated as evidence of future liabilities and ignored, with approximate equal sums were placed in each firm. However, note that not only have all groups, including those who cite environmental concerns,

increased their average stake in Midwest (compare Tables 3 and 4) under the short run, but there is clearly a group of investors who appear to have significantly "rewarded" Midwest for its previous delinquent behavior. These observations are consistent with Chan and Milne's (1999, p. 274) study in which they observed that:

> Consistent with Friedman's (1962, 1970) argument, Belkaoui (1980) observed that accountants under a short-term strategy tended to avoid the firm making expenditures on pollution abatement. Actively seeking to invest in a firm who is avoiding its social responsibilities, however, seems to stretch even Friedman's argument, but presumably breaching emission limits and paying the fines for doing so could be considered to be operating within the 'rules of the game'.

Why accountants should behave this way is not entirely clear, but several of our respondents reveal that they have interpreted the worse environmental performance of Midwest Chemical as a signal of risk and were willing to reward risk in the short-term. In essence, it appears the information is signaling something about the management's attitude towards risks. Several post-task comments with regard to environmental concerns, for example, suggest: "I found Midwest Chemical to be more risky than Benzocorp," and "I recommended Midwest Chemical for [the short-term investment] for this factor." Another more directly noted "Midwest seems more risky with its environmental accrual, which I equate to be a potential (sic) good investment for a single person with short-term growth in mind." Note, however, that this kind of risk-seeking behavior appears limited to about a quarter of our respondents.

The impact of the legitimating disclosures under a long-term investment strategy appear to be off-setting for the vast majority of our respondents, although not for those eight respondents who failed to cite environmental concerns in their decision-making. This raises the question whether the positive disclosures have led to significant increases in the average amounts invested in Midwest because they have communicated real reductions in risk, and so been rewarded, because they have distracted investors' attentions from the risks and liabilities associated with the Superfund sites, or both. Wokutch and Spencer (1987, p. 70), in examining corporate philanthropic giving and criminal activity, suggested:

> The cynical view is that they [companies] are using the contributions as a public relations tool to create a positive image which glosses over their criminal record. The other explanation is that they are sincerely trying to atone for their transgressions. It is very difficult, if not impossible, to ascribe one single motivation for philanthropic contributions. It is even possible that both of these motivations are in operation in a single company.

Likewise, difficulties arise in unpacking the precise interpretations placed on the legitimating disclosures. Nonetheless, several things can be noted. First, while the positive disclosures certainly communicate likely actual improvements in *current and future pollution control,* and so reduced risks and costs associated with those, they in no way reduce the *actual* risks and liabilities associated with the past pollution problems of the hazardous sites. Consequently, either our investors have rationally rewarded the firm for risk reductions associated with current pollution, or they have been fooled into believing the risks have been reduced for the hazardous sites. For our groups it is entirely possible both effects have occurred. Chan and Milne (1999), however, failed to note any investment reward under a long-term strategy for the firm employing current state-of-the-art pollution abatement technology and methods in their study, suggesting perhaps the fooling explanation is not without merit.

A second point is that corporate attempts at legitimation are not just those associated with empty public relations exercises. As was noted in the earlier literature, legitimation may involve bringing the organization's output, methods, and goals into conformity with popular views of what is

appropriate and going on to publicize such achievements to its relevant publics. This may occur for institutional reasons, and Bansal and Roth's analysis suggests that much of what was communicated to our investors arose out of institutional pressures in a highly cohesive field, or for management's strategic reasons. For example, Jean-Marc Bruel, President of the Rhone-Poulenc Group, believes in using corporate improvements to the industry's advantage, and bringing them "to the attention of the public, which is clearly not up to date or *au fait* with the state of the chemical industry" (quoted in Tombs, 1993, p. 139). Firms, then, can be expected to 'milk' even their modest achievements for all they are worth, and, as we noted earlier, by the industry standard of 10-20% our firm's annual rate (3%) of capital expenditure on pollution abatement equipment is modest.

Third, because the "social mechanisms for assessing the legitimacy of an output are quite clumsy", 'outsiders' are largely reliant upon "the good conscience of the powerful people who run and direct large corporations, to maintain an adequate level of legitimacy…" (Perrow, 1970, p.101).[18] Or, to put it another way, it is often difficult to break through the "myth system" to reveal the underlying "operational code" (Reisman, 1979). King and Baerwald, (1999) note the objective assessment of a firm's environmental performance is virtually impossible. Many environmental assessment organizations (e.g., the Council on Economic Priorities) have limited resources, and many government databases, (e.g., Toxic Release Inventory) are not easily used to accurately assess relative firm impacts on the environment. The result is that even committed environmental assessment organizations often have to "take short cuts and use proxies for environmental impact" (King and Baerwald, 1999, p. 315) and that the "association between environmental disclosures and "environmental performance" is always equivocal and partial." (Neu *et al*., 1998, p. 279). Consequently, whether our firm is representative of a "cynic" or "repenter", and we suggest for the reasons just discussed 'outsiders' face great difficulties in unraveling which may be the more accurate, its legitimation strategy of releasing positive statements alongside its negative disclosures appears to have met with some success.

Under a short-term investment strategy, however, the legitimation disclosures have failed to produce an off-setting effect. In fact, they have actually ensured less money was invested in Midwest than in the absence of such disclosures. In short, the legitimating disclosures have made matters worse for Midwest. While such a result seems counter intuitive, it can perhaps be explained in terms of the costs involved in striving to achieve legitimacy. We suspect Midwest has been punished for its expenditures on pollution abatement equipment, expenditures that are largely assured of providing no short-run returns. Consequently, as Chan and Milne (1999) observed with some of their respondents, but we find much more prevalent here; in the short-run, investors may punish firms for 'throwing good money after bad'.

Ashforth and Gibbs (1990) have proposed that legitimation may be "double-edged" and that in their attempt to defend their legitimacy low legitimacy organizations may act clumsily, nervously or overact, thereby "protesting too much" and signifying the opposite of what they intended. By overstating their case in a self-aggrandizing or inflammatory manner, or by making claims that exceed what a high legitimacy organization would claim, organizations may fail to persuade. It appears from our case, however, that whether particular actions and/or disclosures are perceived by external constituents to be overacting depends upon the constituents' decision framework. What appeals to and persuades investors looking to the long term seems to have the opposite effect for them when looking to the short-term. Emphasizing the complexity and problematic nature of

[18] Mintzberg (1983b, p. 111) too makes a similar point when he refers to the fact that due to their enormous power, managers have to be to an extent "trusted". As he notes, "without honest and responsible people in important places, we are in deep trouble." This is not to suggest that we, Mintzberg, or Perrow, believe that firms shouldn't be regulated, but to note the difficulties involved in controlling them (see, also, Heilbroner, 1972; Smith, 1993).

organization legitimacy and legitimation, then, we have shown in an investment decision-making context that particular impression management or disclosure strategies may secure legitimacy for an organization, but it also may not.

CONCLUSIONS

This paper has provided evidence that positive environmental disclosures as provided in chemical firms' annual reports could serve more than empty public relations exercises. By juxtaposing positive messages with the required communication of significant liability exposures, the results indicate an impression management strategy that may offset the negative effects of such liabilities. Such a strategy, however, is found to only work when decision-makers faced a long-term investment strategy. When faced with a short-term strategy, the offsetting messages in fact appeared to exacerbate the negative liability message, providing evidence that legitimation is indeed double-edged (Ashforth and Gibbs, 1990) and may produce counter-effects. Of course, it needs to be acknowledged that all of the results produced in this study occur from a controlled and contrived experiment, and this limits their generalisability.

It also needs to be recognised that this study is confined to an examination of risk and return image management as it relates to toxic waste liabilities and as perceived by potential investors. We have investigated the likely success or otherwise of firms using environmental disclosures to counter negative reactions associated with the potential *financial* losses that may be born by potential investors as a result of the environmental impacts of the firm. While the disclosures may have averted negative reactions to our chemical firm on *environmental* or *moral* grounds, from the nature of our experimental respondents, their decision task, and their comments this seems unlikely. Consequently, our results cannot be generalised to firms' abilities to secure legitimacy from potential investors (e.g., ethical investors) or other stakeholder groups who may have concerns over the firms' environmental, social or ethical behaviour.

The analysis provided within this study suggests several directions for further research. One obvious possibility involves alternative manipulations to the disclosed messages within experimental frameworks to see if they elicit similar responses. Would, for example, more subtle symbolic messages that fail to communicate institutional adaptations produce similar levels of offsetting impact? Similarly, both experimental frameworks and other methods (e.g., structured interviews) could used to examine to what extent annual report disclosures and other forms of corporate communication are successful at changing the image of the firm's environmental, social and/or ethical behaviour in the eyes of other internal and external constituencies.

The institutional theory of legitimation also suggests possibilities for further work. Institutionalism, particularly in fields with high levels of cohesiveness, suggests high levels of conformity and mimetic behavior leading to isomorphism. Consequently, in fields such as chemicals, oil, and mining in contrast to say food retailers, one should expect to observe not only similar levels of legitimating disclosure, but also similar narratives. If firms have adopted initiatives and rituals to seek legitimacy as institutionalism predicts, then these are likely to be similar and consequently should be reflected as so in organizational communications (e.g. corporate environmental reports). Institutional theory, then, provides a basis to examine the nature of the messages. Similarly, working backwards from a careful content of analysis of corporate environmental reports or other impression management messages, it may be possible to determine to what extent firms are pursuing competitive advantage, legitimation and ecological responsiveness motives as suggested by Bansal and Roth's (2000) model. Finally, and consistent with Mitchell *et al.*'s (1997) arguments, much more work needs to be done on exploring management's *perceptions* of stakeholders' power,

legitimacy and the urgency of their claims, and how management seek to address such issues.

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Appendix A
Scenario and Task

Assume that you are approached by a friend for advice concerning an investment decision. The friend is looking to further diversify an existing investment portfolio, and has narrowed the investment choice to two chemical firms, Benzocorp and Midwest Chemical Corporation. The friend has $20,000 to be allocated across the two firms and wants your advice as to how much to put into each. The friend has provided you with summary financial statements and management discussions for each of the two companies.

Please review the attached summary financial statements and management discussions for Benzocorp and Midwest Chemical Corporation. Following your review please indicate how much of the $20,000 you recommend be invested with each of the firms under each of the following *independent* conditions:

Condition A: Assume the friend is about 35 years old, married with two children, and holds a mid-management position with a well-established firm. The investments in Benzocorp and Midwest Chemical Corporation will be added to the friend's retirement portfolio, which currently has a market value of approximately $100,000. The friend's goal for these investments is long term growth.

Condition B. Assume the friend is 35, single, and holding a mid-management position with a well-established firm. This investment is viewed by the friend as a short-term venture with a goal of speculative gain. The friend's overall investment portfolio is currently valued at about $100,000.

Appendix B
Financial Statements And Management Discussion & Analyses

Benzocorp

Overview
Benzocorp is one of the world's leading full-service suppliers of specialty chemicals. These specialty chemical products are created through the application of advanced chemical and mechanical technologies to enhance the performance, quality and value of the products in which they are used. Benzocorp is a recognized world leader in specialty additive systems for lubricating oils used in gasoline and diesel engines, automatic transmissions, gear drives, marine engines and tractors. The company is also one of the world's leading producers of water treatment and process chemicals. With 1999 revenues of over $1.6 billion, Benzocorp is a proud member of the Fortune 1000 U.S. corporations for the tenth straight year. Founded as a private chemical firm in 1936, Benzocorp now has more than 4,000 employees worldwide.

Review of Operations
The Company recorded its 27th consecutive record year for both sales and earnings. Sales reached $1.64 billion, an increase of 6.1 percent over 1998. Earnings grew 6.25 percent to $119 million. The increase in sales is due almost entirely to higher unit volume as price adjustments were negligible.

The Company's gross profit margin (as a percentage of sales) declined slightly, falling to 37.9 percent from 38.9 percent the previous year. This decrease is largely a function of union-negotiated wage increases that took effect during the year. Raw material price changes were not significant this year. The Company is confident that manufacturing costs for the foreseeable future will continue to be effectively managed.

Company efforts at eliminating non-essential costs resulted in a reduction in selling and administration expenses. These expenses (as a percentage of sales) decreased from 27.4% percent in 1998 to 26.2 percent in 1999. Interest expense was higher than in 1998 due largely to higher rates in the short-term market.

The Company's foreign sales and operating results are subject to the impact of foreign currency fluctuations. However, because the vast majority of the Company's foreign sales are in countries with relatively stable currencies this effect has not been significant in the past and it is not anticipated to be significant in the near future.

Capital Resources and Liquidity
The Company generated $167 million of cash flows from operations in 1999 in comparison to $164 million in 1998. Cash flows from operations continue to be the primary source of financing for the Company's internal growth.

Capital expenditures amounted to $90 million during 1999. These expenditures were made primarily to support the Company's continued growth through improved production and distribution efficiency and capacity. 1999 capital expenditures are slightly higher than in past years due to Company efforts at expansion in the Water Treatment Division.

The Company reduced long term debt outstanding by $3 million during 1999. The Company is planning a public offering of $50 million of bonds to support expansion across both operating divisions in the next year. Dividend payments (at $0.92 per share) totaled a Company record of $74.1 million.

Environmental Matters
As of December 31, the Company has been identified as a potentially responsible party under the Comprehensive Environmental Response, Compensation, and Liability Act (the federal Superfund law) or equivalent state statutes at 9 sites around the country. In addition, the Company is currently undertaking corrective actions pursuant to the Resource Conservation and Recovery Act at a number of additional Company-owned sites. It is the Company's policy to accrue environmental investigatory and noncapital remediation costs when it is probable that a liability has been incurred and the amount of loss can be

reasonably estimated. While there is considerable uncertainty with respect to total potential costs under CERCLA, RCRA, and similar statutes, the Company estimates future remediation costs will range from $15 million to $23 million. The balance sheet as of December 31 includes an accrual of $ 23 million. Remediation expenditures were $4 million, $3.5 million, and $5 million, over the past three years, respectively.

Forward Looking Statements

The foregoing discussion contains forward-looking statements relating to the business of the Company. These forward-looking statements, or other statements made by the Company, are based on management's expectations and beliefs concerning future events impacting the Company and are subject to uncertainties and factors that are difficult to predict and, in many instances, are beyond the control of the company.

Benzocorp

Summary Financial Statements	1999	1998	1997
Income Statement	**$million**	**$million**	**$million**
Net Sales	1,643	1,549	1,472
Cost of Goods Sold	1,020	945	889
Gross Profit	623	604	583
Selling and Administration Expenses	431	425	407
Interest Expense	26	21	29
Income Before Taxes	166	158	147
Income Taxes	47	46	42
Net Income	119	112	105
Earnings Per Common Share	$	$	$
Basic	1.48	1.39	1.31
Diluted	1.46	1.37	1.30
Cash Dividends Per Common Share	0.92	0.88	0.85
Statement of Cash Flows	**$million**	**$million**	**$million**
Net Income	119	112	105
Adjustments	48	52	31
Cash Flows from Operating Activities	167	164	136
Net Cash Flows from Investing Activities	-67	-76	-61
Net Cash Flows from Financing Activities	-87	-92	-64
Net Increase in Cash	13	-4	11
Cash at Beginning of Year	78	82	71
Cash at End of Year	91	78	82

Benzocorp

Summary Financial Statements	1999	1998
Balance Sheet	**$million**	**$million**
Assets		
Cash and Equivalents	91	78
Receivables -Net	273	258
Inventories	252	244
Other Current Assets	28	40
Total Current Assets	644	620
Property, Plant and Equipment	865	870
Less: Accumulated Depreciation	303	307
Net Property, Plant and Equipment	562	563
Other Assets	320	322
Total Assets	1,526	1,505
Liabilities and Shareholders' Equity		
Accounts Payable	220	202
Income Taxes Payable	47	45
Other Current Liabilities	112	124
Total Current Liabilities	379	371
Long Term Debt	210	213
Deferred Taxes	29	33
Other Long Term Liabilities	126	120
Total Liabilities	744	737
Common Stock -without par value -80.6 and 80.5 shares O/S	81	80
Retained Earnings	730	701
Accumulated Other Comprehensive Income (Loss)	-29	-13
Total Shareholders' Equity	782	768
Total Liabilities and Shareholders' Equity	1,526	1,505

Other Financial Data		
Share Price at December 31	$24.83	$20.55
Current Ratio	1.70	1.67
Net Profit Margin (After Tax)	7.24%	7.23%
Return on Equity (After Tax)	15.21%	14.58%
Return on Assets (After Tax)	7.80%	7.44%
Debt/Equity Ratio	95.14%	95.96%

Midwest Chemical Corporation

Company Overview
Midwest Chemical was founded in St. Joseph, Missouri more than fifty years ago as a specialty producer of phosphate and potash crop nutrients. The company has since grown into one of the world's leading producers of performance chemicals used in fire protection, recreational water treatment, and water-based products such as latex paint. The corporation's focus is on sustainable, long-term growth in shareholder value through development, manufacture, and sale of high-quality chemical products. Midwest Chemical is one of the 1,000 largest corporations in the United States.

Results of Operations
Sales for the year amounted to $1,451 million, which is an increase of $97 million over 1998. This is Midwest Chemical's 12th straight year of record sales. The 1999 earnings of $147 million are also a record and represent a 7.3 percent increase over 1998. Both the Agrichemical and Specialty Chemical Divisions participated in the record growth, with 5.5 percent and 8.1 percent increases in sales, respectively. Market demand, both domestically and internationally remained strong throughout 1999, and sales increases were attributable primarily to volume rather than price changes.

Both Cost of Goods Sold (44 percent) and Selling and Administration Expenses (39 percent) as a percentage of sales remained essentially unchanged from the previous year. Interest expense increased moderately during 1999 due primarily to slightly higher levels of long term debt outstanding. Foreign currency fluctuations did not have a material impact on operations during 1999.

The Company's 1999 $2.30 basic earnings per share and $1.20 dividend per share were both the highest in Company history.

Financial Condition and Liquidity
Cash flow from the operating activities of the Company amounted to $211 million in 1999 compared to the $185 million in 1998. This cash flow, coupled with increased long-term borrowings of $18 million during 1999, was used to fund capital expenditures for plant and equipment additions of $105 million and cash dividend payments of $80 million. Both accounts receivable and inventories increased slightly relative to 1998 levels while accounts payable and income taxes payable were reduced. The Company also recorded minor increases in both other current assets and other current liabilities.

The Company's net outstanding long-term debt increased from $297 million to $315 million during 1999. However, this still leaves the Company's Long term Debt to Total Assets ratio at a comfortable 22 percent, which is well within industry norms.

Environmental
Midwest Chemical has a strong commitment to protecting the environment and the company's policies and practices are designed to ensure compliance with existing laws and regulations. The Company is continuing its program of updating manufacturing facilities to further reduce their negative environmental impacts. Capital expenditures for pollution abatement and control equipment, Company-wide, were $3.2 million in 1999 and $2.8 million in 1998. Projected environmental capital expenditures for 2000 are projected at $3 million. Toxic releases into the environment for 1998, as reported to the Environmental Protection Agency, were slightly higher than they had been in 1997. However, when adjusted for increased manufacturing activity, average releases showed a slight decline. This is the fifth straight year that releases adjusted for manufacturing activity have declined. Relative to 1987 base year releases, the Company has reduced toxic emissions by more than 60 percent. The installation of new scrubbers at the Alton, Illinois and Topeka, Kansas facilities was completed in 1999, which should lead to further substantial reductions in air emissions at both plants. In addition, the Company's environmental audit program is now fully operational. Midwest Chemical is continuing to strive to be an exemplary environmental citizen.

Midwest Chemical, like most companies in the chemical industry, is a party in various government enforcement actions at former waste disposal sites. The Company has been cited as a "potentially responsible party" at 32 federal or state Superfund sites. The company is also undertaking corrective actions

at some of its manufacturing facilities. Remediation related expenditures were $9.4 million in 1999, $11.2 million in 1998, and $6.6 million in 1997. Due to the inherent uncertainties associated with investigative and remediation activities it is difficult to estimate what the Company's total projected exposure might be. However, based on current data, the Company believes the range of potential liability is between $50 million and $90 million. The Company has accrued $50 million as of December 31, 1999.

[Authors' note: The first paragraph was added for the legitimating (cynic) case, and omitted for the sinner case. This was the extent of the experimental information manipulation.]

Forward-Looking Statements

This discussion contains forward-looking statements relating to the business of the Company. These statements are based on management's expectations and beliefs but are subject to uncertainties and factors beyond the control of the Company.

Midwest Chemical Corporation

Summary Financial Statements	**1999**	**1998**	**1997**
Income Statement	**$million**	**$million**	**$million**
Net Sales	1,451	1,354	1,280
Cost of Goods Sold	638	593	557
Gross Profit	813	761	723
Selling and Administration Expenses	572	534	509
Interest Expense	15	12	16
Income Before Taxes	226	215	198
Income Taxes	79	78	70
Net Income	147	137	128
Earnings Per Common Share	$	$	$
Basic	2.30	2.14	2.00
Diluted	2.25	2.08	1.95
Cash Dividends Per Common Share	1.20	1.15	1.10
Statement of Cash Flows	**$million**	**$million**	**$million**
Net Income	147	137	128
Adjustments	64	48	60
Cash Flows from Operating Activities	211	185	188
Net Cash Flows from Investing Activities	-120	-104	27
Net Cash Flows from Financing Activities	-82	-73	-210
Net Increase in Cash	9	8	-5
Cash at Beginning of Year	40	32	37
Cash at End of Year	49	40	32

Midwest Chemical Corporation

Summary Financial Statements	1999	1998
Balance Sheet	**$million**	**$million**
Assets		
Cash and Equivalents	49	40
Receivables -Net	242	235
Inventories	90	88
Other Current Assets	27	26
Total Current Assets	408	389
Property, Plant and Equipment	1,040	1,031
Less: Accumulated Depreciation	429	427
Net Property, Plant and Equipment	611	604
Other Assets	411	390
Total Assets	1,430	1,383
Liabilities and Shareholders' Equity		
Accounts Payable	105	110
Income Taxes Payable	27	41
Other Current Liabilities	99	93
Total Current Liabilities	231	234
Long Term Debt	315	297
Deferred Taxes	36	41
Other Long Term Liabilities	165	152
Total Liabilities	747	724
Common Stock - 64.99 shares O/S	8	8
Paid-In Capital	78	78
Retained Earnings	632	585
Accumulated Other Comprehensive Income (Loss)	-35	-12
Total Shareholders' Equity	683	659
Total Liabilities and Shareholders' Equity	1,430	1,383
Other Financial Data		
Share Price at December 31	$40.50	$33.28
Current Ratio	1.77	1.66
Net Profit Margin (After Tax)	10.13%	10.12%
Return on Equity (After Tax)	21.52%	20.79%
Return on Assets (After Tax)	10.28%	9.91%
Debt/Equity Ratio	109.37%	109.86%

Appendix C

Post-Decision Evaluations

Part A - Now that you have completed the exercise we would like some information on what you perceive to be the factors that entered into your decision. From the following list of items, please indicate those factors that impacted your investment decision for Friend A. Please indicate with 1 being the most important item, 2 the second most important, 3 as the third most important item, and so on, identifying ONLY those items that impacted on your decision. Note that there are no right answers so please try to identify what factors you actually relied on in making your decision.

1. Cash Flow Concerns _____
2. Company History _____
3. Company Name _____
4. Environmental Concerns _____
5. Growth Trends _____
6. Liquidity Concerns _____
7. Price/Earnings Ratios _____
8. Other (Please Identify) _____ _____
9. Other (Please Identify) _____ _____
10. Other (Please Identify) _____ _____

Part B - For the item above you identified as most important in the decision (the item you rated 1), please explain how this factor impacted your decision, and clearly specify which company it favored and why.

Part C - For the item above you identified as second most important in the decision (the item you rated 2), please explain how this factor impacted your decision, and clearly specify which company it favored and why.

Part D - For the item above you identified as third most important in the decision (the item you rated 3), please explain how this factor impacted your decision, and clearly specify which company it favored and why.

[Authors' note. Two post-decision instruments were completed by each subject: one for Friend A and one for Friend B.]

Table 1
Summary of Sample (N=76) Participants' Descriptive Data.

Gender	N	**Age**	N
Female	34	<30 years	48
Male	42	30-39	15
Education	N	40-49	8
No College Degree	1	50-59	4
Bachelors' Degree	64	>59 years	1
Masters' Degree	9	**Self-Reported Investment Experience**	N
Law Doctorate	2		
Professional Experience	N	None	7
< 2 years	13	Very Limited	34
2-5 years	25	Moderate	24
6-10 years	18	Considerable	9
> 10 years	20	Extensive	2

Table 2
Sample (N=76) Participants' Rankings of the Importance of "Environmental Concerns" in the Long-term and Short-term Investment Decision Scenarios.

Rank	**Long-Term**	**Short-Term**
	N	N
1	13	9
2	16	9
3	19	15
4	6	7
5	4	7
6	7	6
7	2	2
8	1	1
Not Noted	8	20

Table 3
Comparison of Amounts Invested in Benzocorp and Midwest Chemical Corporation Under the Long-term Investment Scenario.

Panel A - Total sample (n=76)

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Benzocorp	$11,890	$4,769		
Midwest Chemical	$8,110	$4,769	4.887	4.934
			(0.000)	(0.000)

Panel B - Participants Citing Environmental Criteria (n=68)

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Benzocorp	$11,929	$4,799		
Midwest Chemical	$8,071	$4,799	4.687	4.821
			(0.000)	(0.000)

Panel C - Participants Citing Environmental Criteria in "Top Three" (n=48)

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Benzocorp	$12,545	$5,049		
Midwest Chemical	$7,455	$5,049	4.939	4.637
			(0.000)	(0.000)

*The t-statistic reports for a test of the difference between mean investment amounts in Benzocorp and Midwest Chemical, while the Mann-Whitney Z-score reports an equivalent non-parametric test. One-tailed significance levels are reported in parentheses beneath the statistical measures.

Table 4
Comparison of Amounts Invested in Benzocorp and Midwest Chemical Corporation Under the Short-term Investment Scenario

Panel A - Total sample (n=76)

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Benzocorp	$8,546	$5,758		
Midwest Chemical	$11,454	$5,758	-3.113	-3.062
			(0.002)	(0.002)

Panel B - Participants Citing Environmental Criteria (n=56)

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Benzocorp	$9,518	$5,718		
Midwest Chemical	$10,482	$5,718	-0.892	-1.003
			(0.374)	(0.316)

Panel C - Participants Citing Environmental Criteria in "Top Three" (n=33)

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Benzocorp	$10,409	$5,903		
Midwest Chemical	$9,591	$5,903	0.563	0.684
			(0.575)	(0.494)

*The t-statistic reports for a test of the difference between mean investment amounts in Benzocorp and Midwest Chemical, while the Mann-Whitney Z-score reports an equivalent non-parametric test. Two-tailed significance levels are reported in parentheses beneath the statistical measures.

Table 5
Comparison of Amounts Invested in Midwest Chemical Corporation by Participants Receiving MD&A with and without Legitimating Disclosures under the Long-term Investment Scenario.

Panel A - Total sample

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Legitimacy Disclosures (n=38)	$8,776	$5,246		
No Legitimacy Disclosures (n=38)	$7,443	$4,204	1.223	0.972
			(0.113)	(0.162)

Panel B - Participants Citing Environmental Criteria

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Legitimacy Disclosures (n=34)	$9,147	$5,206		
No Legitimacy Disclosures (n=34)	$6,995	$4,157	1.884	1.656
			(0.032)	(0.049)

Panel C - Participants Citing Environmental Criteria in "Top Three"

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Legitimacy Disclosures (n=25)	$8,698	$5,453		
No Legitimacy Disclosures (n=23)	$6,166	$4,324	1.731	1.743
			(0.045)	(0.041)

*The t-statistic reports for a test of the difference between mean investment amounts in Midwest Chemical under the two information conditions (i.e., with and without the legitimating disclosures), while the Mann-Whitney Z-score reports an equivalent non-parametric test. One-tailed significance levels are reported in parentheses beneath the statistical measures.

Table 6
Comparison of Amounts Invested in Midwest Chemical Corporation by Participants Receiving MD&A with and without Legitimating Disclosures under the Short-term Investment Scenario.

Panel A - Total sample

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Legitimacy Disclosures (n=38)	$10,816	$6,246		
No Legitimacy Disclosures (n=38)	$12,092	$5,231	-0.966	-0.861
			(0.337)	(0.389)

Panel B - Participants Citing Environmental Criteria

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Legitimacy Disclosures (n=28)	$8,670	$5,493		
No Legitimacy Disclosures (n=28)	$12,268	$5,459	-2.440	-2.289
			(0.018)	(0.022)

Panel C - Participants Citing Environmental Criteria in "Top Three"

	Mean Amount Invested	Std. Dev.	t-statistic*	Mann-Whitney Z-score*
Legitimacy Disclosures (n=18)	$8,528	$5,527		
No Legitimacy Disclosures (n=15)	$10,867	$6,275	-1.138	-1.169
			(0.264)	(0.242)

*The t-statistic reports for a test of the difference between mean investment amounts in Midwest Chemical under the two information conditions (i.e., with and without the legitimating disclosures), while the Mann-Whitney Z-score reports an equivalent non-parametric test. Two-tailed significance levels are reported in parentheses beneath the statistical measures.