

CORPORATE ENVIRONMENTAL STRATEGY: IMPACT UPON FIRM VALUE

Richard J. Curcio* and Fran M. Wolf**

Abstract

The purpose of this paper is to investigate the relationship between corporate environmental strategy and firm value. The major finding of this study is that corporate performance with regard to environmental responsibility is related to overall firm value. Adopting an environmentally responsible strategy appears to significantly enhance corporate financial performance for all firms except those serving industrial customers. Firms supplying industrial customers seem to benefit financially from a strategy of environmental indifference or irresponsibility.

INTRODUCTION

The purpose of this paper is to investigate the relationship between corporate environmental strategy and firm value. Understanding what motivates firms to be environmentally responsible and how these decisions ultimately impact firm value is of great significance to corporate management. It is hypothesized that, in addition to traditional economic factors, the relationship between firm value and environmental responsibility involves stakeholder considerations. Environmental policies seem to be formulated, not only with respect to shareholders and debtholders, but additionally, with regard to their potential impact upon customers, suppliers, employees, management, the community, regulators, and other stakeholders.

Although environmental issues can profoundly affect the financial health and, indeed in some cases, the very viability of a firm, empirical research has been meager. This is the first study to apply stakeholder considerations to environmental policy. The major finding of this study is that corporate performance with regard to environmental responsibility is related to overall firm value. Adopting an environmentally responsible strategy appears to significantly enhance corporate financial performance for all firms except those serving industrial customers. Firms that supply industrial customers seem to benefit financially from a strategy of environmental indifference or irresponsibility.

REVIEW OF THE LITERATURE

A popular theoretical view of the firm is that of an efficient nexus of contracts between and among diverse parties (e.g. Coase 1937, Jensen & Meckling 1976). Cornell and Shapiro (1987) expand upon this view, emphasizing that non-investor stakeholders provide an often overlooked connection between corporate strategy and corporate well-being.

Cornell and Shapiro distinguish between explicit and implicit claims. The former are contractual in nature while the latter include promises that a firm makes to various stakeholders but are often too vague to put into writing. Stakeholders' explicit claims (e.g. warranties) are risk-free unless financial distress occurs. Stakeholders' implicit claims (e.g. continued service and manufacture of parts for a prior purchase) are risky even if financial distress is not a problem. Expected cash flows are determined by the price of implicit claims. Cornell and Shapiro conclude that firms which excel at stakeholder management increase the value of implicit claims. This results in enhanced revenues and/or decreased costs relative to firms that do not manage their stakeholders so well.

*Kent State University

**Youngstown State University

The practical effect of environmental issues has been documented in the lending, real estate, and investment arenas. Examination of corporate environmental policy is now a customary part of all credit analysis. Few commercial loans are made without first performing environmental audits. An American Banking Association survey[1] shows that 63% of banks report rejecting loan applications based upon potential environmental exposure. The secondary market has further motivated many lenders to perform environmental audits. The Federal National Mortgage Association (FNMA) and other mortgage purchasers are requiring loan originators to perform due diligence with regard to environmental matters before purchase consideration will be given.

Davis (1993) notes that more than \$700 billion is now invested in socially screened portfolios compared to only \$40 billion a decade ago. In addition to some institutional entities, individuals are now swelling the ranks of socially concerned investors. Socially and environmentally responsible mutual funds are growing larger and receiving increasingly greater attention.

This study attempts to bridge the theoretical and practical aspects of environmental policy. Stakeholder theory considerations are incorporated into an analysis of corporate environmental strategy. An investigation of corporate decision making with regard to the preference for degree of environmental responsibility follows.

RESEARCH DESIGN

Background

Businesses differ with respect to the number, power and type of stakeholders. It appears likely, then, that the influence of environmentally concerned stakeholders will vary cross-sectionally. Hence, analysis of the benefits and costs of an environmentally responsible stance should differ across corporations. The weight put on stakeholder demand is a function of management's perception of the importance a particular stakeholder group has upon the success of the firm.

An environmentally responsible firm (*ERF*) is defined as one that goes beyond regulatory compliance and is precisely defined in the methodology section of this paper. While compliance is a factor in environmental responsibility, environmental strategy must be defined in broader terms. A firm's history of regulatory compliance will be viewed as part of an overall strategic policy.

An environmentally responsible strategy has both benefits and costs associated with it. Previous analyses have emphasized the latter while discounting or completely ignoring the former. Potential benefits accruing to an *ERF* can be categorized as: 1) lower operating costs, 2) lower cost of capital, 3) decrease in regulatory risk resulting from change in environmental regulation and 4) enhanced revenues.

Lower operating costs can be the result of a number of factors. An *ERF* may be able to decrease costs associated with employees. It may be possible to reduce insurance premiums related to employee medical, disability, and worker compensation insurance. Improved morale may translate into the ability of a firm to attract higher quality workers while decreasing turn-over, recruiting and basic training expenses. There is a reduced possibility of litigation of the toxic tort kind brought by an employee or employee group as a result of environmental exposure or accident.

Federal and state governments reward environmentally responsible behavior through tax incentives, such as accelerated depreciation or investment tax credits for investing in pollution abatement equipment. Steuteville (1992) enumerates other benefits that local governments extend to *ERF*'s. These benefits include rebates, exemption from sales tax on equipment purchase, low interest loans, grants, and wage reimbursements for hiring and training employees.

A good relationship with activist groups cannot be overemphasized. Lavelle (1993) reports that more than one-half of corporate attorney respondents in a National Law Journal/Arthur Andersen survey state that community activists impact corporate behavior. "Reg-neg", or regulatory negotiation between corporations and interested parties such as environmental groups, has already been written into some environmental legislation. The firm and environmental groups may agree on a plan that reduces costs by allowing the firm to bypass rigid command-and-control regulation in favor of an alternative that is better both for the firm and for the environment.

Firms that have chosen an environmentally proactive strategy face fewer expenses when conducting inter-state and international business. Corporations must comply with more stringent environmental standards originating with other states and countries. For example, Germany regularly returns excess packaging to the offending

company at the latter's expense. Extra expenditures are incurred by less environmentally responsible firms in the form of special packaging, manufacturing or other requirements when shipping to those areas.

In many cases, recycled inputs or raw materials used by the *ERF* are less costly. Similarly, recycling can decrease disposal costs. One significant cost faced by most manufacturers is waste disposal of hazardous materials. An *ERF* is often able to significantly reduce hazardous material disposal costs along with the potential liability associated with them.

An *ERF* may be able to decrease its cost of capital while simultaneously increasing its accessibility to funds. As previously noted, lenders and rating agencies carefully scrutinize a firm's environmental record, responsibility and risk. A firm found environmentally deficient is thought to face potentially substantial fines and/or need to make large expenditures to comply with regulation. These expenditures can eventually make the firm unprofitable or result in an inability to make principal and interest payments. A more environmentally responsible firm will, all other things equal, receive a higher credit rating. Many companies, especially small to medium sized firms that have become embroiled in environmentally-related litigation, report difficulty and added expense related to obtaining working capital loans.

The strategic implications of regulation to an *ERF* must be considered. This firm is more adaptable when changes in law or enforcement takes place in the regulatory arena. Less responsible firms are often forced to purchase new equipment, adjust production inputs or processes, train employees and generally incur more costs at the time of regulatory change. The *ERF* bears fewer costs of additional regulation relative to its competitors. If rivals are weak enough, more rigorous laws may eventually force one or more of them out of business. The long term consequence of stricter regulation is to increase market share for the *ERF* while increasing cost of entry into that industry.

An *ERF* expects to enhance revenues. Because of world-wide focus on the environment, U.S. and European consumers are demanding more environmentally friendly manufacturing, packaging and eventual recyclability of products. Not only is demand growing but surveys have demonstrated that many consumers are willing to pay more and have paid more for greener products. The environmentally responsible corporation is able to market itself and its products to attract a growing segment of the world population. This marketing strategy aims to increase volume while minimizing public relation costs.

Traditional economic analysis views corporate environmental policy as a simple minimization problem. The company trades off the costs of pollution abatement with expected penalties associated with noncompliance. Items neglected in the traditional model include:

- 1) The concept of stakeholder management and how this can modify a firm's decision as to the amount of environmental control to take.
- 2) A realistic cost analysis. In addition to the cost of pollution control and potential fines, firms must consider potentially lower costs resulting from decreases in operating costs, cost of capital, or adaptation costs involved with new regulation.
- 3) The upgrading of standards over time with newer regulation requiring more pollution abatement. In addition to more stringent standards, the ability to more accurately measure pollution and detect noncompliance will act in much the same fashion.
- 4) The potential for increased revenues as a result of an environmentally responsible strategy. Increasingly, more consumers are seeing these "green" products as value-added and are changing their consumption patterns accordingly.

This expanded model, then, incorporates all economic effects of a firm's environmental stance. It attempts to explain behavior ranging from noncompliance decisions to environmentally responsive strategies. The traditional approach can explain the former behavior but ignores the latter.

Methodology and Data

Performance measures for each firm are regressed upon control variables and an indicator variable for independent ranking of environmental responsibility. That is:

$$FP_{t,j} = \beta_0 + \sum_{i=1}^2 \beta_i ER_i + \sum_{i=3}^5 \beta_i IND_i + \beta_6 BOOK + \beta_7 SIZE + \beta_8 \frac{\sum_{t=4}^0 S_{t,j}}{5} + \epsilon$$

where:

$FP_{t,j}$ = Financial performance measure for period t for firm j
 ER_i = Environmental strategy of the firm
 IND_i = Industry specification of the firm
 $S_{t,j}$ = Slack measure for Firm j
 $BOOK$ and $SIZE$ = Control variables

Each firm is coded as follows:

$ER1$ = 1 if responsible strategy; 0 otherwise
 $ER2$ = 1 if irresponsible strategy; 0 otherwise
 $ER3$ = 1 if ambiguous strategy; 0 otherwise

Financial performance criteria to be studied include excess value and several accounting measures. These performance measures are examined for the 1980-1989 time period and are discussed next. Excess value captures those premiums or discounts granted by the market to individual firms. It is defined as:

$$EV = \frac{\text{Market Value Equity} + \text{B.V. Of Debt} - \text{Total Assets}}{\text{Sales}}$$

Accounting indices to be measured are defined in the appendix and include:

- 1) Earnings relative to sales (ESR)
- 2) Earnings relative to assets (EAR)
- 3) Selling expenses relative to sales (SSR)
- 4) Selling expenses relative to assets (SAR)

The amount of slack (or excess cash plus accessibility to cash) available to the corporation acts as a boundary on strategic decisionmaking and may restrict the environmental strategy that a firm chooses. One difficulty with prior research has been the lack of control over this slack factor. This study will employ a moving average of slack that considers the previous four years as well as the current period. It is imperative to distinguish the nonavailability of slack from the choice not to pursue an environmentally proactive strategy even when sufficient slack is available.

Fama and French (1992) note that size and book-to-market equity seems to best capture cross-sectional variation in average stock returns that have occurred over the past 50 years. Hence, these two measures that appear to proxy so well for risk and additionally control for size and some leverage factors will be used here.

Regressions are run with and without the industry control variable in effect. Additionally, firms are separated into two categories--those that report receiving a majority of revenues through sales to the ultimate consumer and those that primarily serve industrial customers. This latter regression tests for cross-sectional differences arising from major consumer-stakeholder.

Past researchers have often relied on quantity or quality of environmental disclosure to act as a measure of environmental responsibility. This study will employ independent rankings of environmental responsibility provided by the Council on Economic Priorities (CEP). The CEP is an independent, research-oriented, non-profit organization that has provided environmental reports on hundreds of companies in its 25-year history. Additionally, companies to be included in this study must have information available on the Compustat database for the 1976-1989 time period.

The CEP attempts to rank corporations based upon the global impact of environmental strategy. The Council on Economic Priorities ranks firms environmentally according to the following scheme:

Environmentally Proactive Or Responsible Strategy: Substantial positive programs, such as the use and encouragement of: recycling, alternative energy sources, waste reduction, etc. A record relatively clear of major regulatory violations.

Environmentally Ambiguous Strategy: A mixed record. Some positive programs such as use and encouragement of recycling, alternative energy sources, waste reduction, etc. Problems such as accidents, regulatory infractions, fines, complaints, etc.

Environmentally Irresponsible Strategy: Company has a poor public record of significant violations, major accidents, and/or history of lobbying against sound environmental policies.

The above rankings are followed for all industries with the exception of the oil and paper industries. The *CEP* has published specialty reports and studies geared to the high pollution refinery and paper and pulp industries. For these industries then, the *CEP*'s specialized early and updated publications on the rankings of environmental responsibility within those industries will be employed.

Table 1 in the appendix lists all firms ranked by the *CEP* which have information available for the 1976-1989 time period on the Compustat database and which were used in this study.

ANALYSIS AND DISCUSSION OF RESULTS

1) Corporate performance with regard to environmental responsibility is related to overall firm value as gauged by the measure, excess value (*EV*). (See Tables 2 through 4 in the appendix for a summary of T-probabilities.) Adopting an environmentally responsible strategy appears to significantly enhance corporate financial performance for all firms except those serving industrial customers. Contrarily, those firms supplying industrial customers seem actually to be benefitting financially from a strategy of environmental indifference or irresponsibility. The enhanced financial performance of firms choosing an environmentally responsible strategy (other than those which serve industrial customers) appears to be attributable to stakeholder considerations. The significantly superior financial performance of environmentally responsible corporations in this category seems to be due to stakeholders rewarding and/or not penalizing firms which are environmentally responsible.

The exception to the findings, firms who serve industrial customers, may also be stakeholder related. Stakeholders' general awareness of a firm's predisposed strategy towards environmental responsibility and/or the ability of stakeholders to reward or penalize such behavior may be less for industrial suppliers than it is for firms which make products for or provide services to the ultimate consumer. It seems reasonable to expect that the availability of information on a given firm's environmental performance is greater for corporations which serve the ultimate consumer than for those who are industrial suppliers. For example, the media might be likely to find reporting environmental breaches by firms which serve the ultimate consumer more newsworthy and thus give such greater coverage.

Also, it appears that firms which make products for and or provide services to the ultimate consumer, more frequently and emphatically attempt to promote their good corporate citizen image than do corporations which serve industry. However, whether or not the ultimate consumer has more or less awareness of environmental performance by firms that serve them versus industrial suppliers, they are less able to reward or penalize the industrial suppliers for their disposition towards environmental issues. Additionally, regulators might sense a greater sensitivity of the public towards environmental breaches by firms with whom they are most familiar (i.e. those that serve the ultimate consumer) and hence give such firms greater attention.

2) Earnings relative to sales or assets (*ESR* and *EAR*) best distinguish the strategies when stakeholder analysis was implemented and are consistent with the results found with the *EV* variable. Among the group serving individual consumers, the responsible strategy tended to result in superior performance. Of firms selling mainly to industrial customers, earnings for the ambiguous and irresponsible strategies were superior to responsible firms, particularly in the final years tested.

3) All examinations indicating significance of the *SAR* and *SSR* variables point to the heavy incurrence of expenses by firms choosing the ambiguous strategy. This strategy seems to result in more expenses than either the irresponsible or responsible approaches. Firms choosing an environmentally responsible strategy probably expend a majority of resources on compliance planning while environmentally irresponsible firms may incur more fines or

litigation expenditures. Firms choosing a middle-of-the-road or ambiguous strategy are more likely to incur large amounts of both types of expenses.

4) Results of this study imply that firms relying on institutional consumers may not have strong economic incentives to choose an environmentally responsible strategy. In fact, it appears that regulatory and market forces may actually reward these firms for shirking environmental responsibility.

Reasons for the findings may be due to differences in these types of firms. The industrial consumer operates in a highly competitive environment and is probably most concerned with quality and price of intermediate goods purchased. The ultimate consumer may have difficulty perceiving the environmental responsibility of the supplier. That is, individuals and regulators may perceive the acquisition of raw or intermediate materials as a given. The firm may be judged on how well it performs environmentally once the manufacturing process is initiated. Under this scenario, the industrial consumer may be unable to charge the correct price for its goods based upon the implicit value associated with dealing with an environmentally responsible supplier. Market forces to provide incentive for firms serving industrial consumers seem to be lacking.

CONCLUSION

This study attempts to analyze the relationship between environmental responsibility and firm value. Stakeholder theory is utilized to expand traditional economic cost-benefit analysis and to explain different environmental strategies adopted by corporations. Excess value (*EV*), a market index is used, and supplemented with several accounting indices, to measure firm value. Results suggest that an environmentally responsible strategy increases corporate value only when those companies are also serving the ultimate consumer. However, for firms supplying industrial consumers, an environmentally irresponsible or indifferent stance seems to result in greater firm value.

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TABLE 1
Companies With 14 Years Of Data Available

Responsible Environmental Strategy

Abbott Laboratories	Atlantic Richfield
Carter Hawley Hale	Church & Dwight
Clorox Co	Colgate Palmolive
Dayton Hudson	The GAP
Helene Curtis	Hershey Foods Corp.
H.J. Heinz Co	Johnson & Johnson
Kellogg Company	Nordstrom
Quaker Oats Co	Smucker Company
Sony	Tambrands
WalMart Stores	Wendy's International
Weyerhaeuser	

Ambiguous Environmental Strategy

Alberto Culver	American Home Prods
AMOCO Corp	Anheuser Busch
Avon Products	Boise Cascade
Borden Inc	Bristol Myers
Campbell Soup	Carter Wallace
Champion International	Coca Cola
Coors Company	CPC International
Crown, Cork & Seal	Dow Chemical Co
Eastman Kodak	General Mills
Genesco	Georgia Pacific
Gillette	GTE Corp
Huffy	International Paper
Kimberly Clark Corp	Kmart
Matsushita Elec	McDonald's
Mead Corporation	3M
Penney, J.C.	PepsiCo Inc
Polaroid Corp	Procter & Gamble
Ralston Purina Co	Reynolds Metal Co
Russell	Sara Lee Corp
Schering Plough	Scott Paper Co
Sears, Roebuck	Stride Rite
Time Warner	Unilever PLC
Union Camp Corp	Upjohn Company
V. F. Corp	Warner Lambert Co
Westvaco	Wrigley Jr. Co, Wm.

Irresponsible Environmental Strategy

American Cynamid	AD Midland
British Petroleum	Brunswick Corp
Chevron Corp	Chiquita Brands
Conagra	DuPont
Exxon Corp	General Electric Co
James River Corp	Louisiana Pacific
Mobil Corp	Monsanto
Occidental	Pfizer Inc
Phillip Morris	Potlach
Sun Co	Texaco Inc

TABLE 2
T-Probabilities (And Direction Of Relationship) For Years With Significant Results –
For Responsible Strategy Firms Relative To Firms Choosing The Ambiguous Strategy

Dependent Variables	Without Industry Controls	With Industry Controls	Firms Serving Ultimate Consumer	Firms Serving Industrial Consumer
<i>EV</i>	+ 1980 .0036	+ 1980 .0109	+ 1980 .0003	- 1985 .0459
	+ 1981 .0106	+ 1981 .0325	+ 1981 .0010	- 1986 .0887
	+ 1988 .1333	+ 1982 .0525	+ 1982 .0406	- 1987 .0956
	+ 1989 .0442	+ 1985 .0443	+ 1983 .0107	- 1988 .0123
		+ 1986 .0309	+ 1984 .0995	- 1989 .0280
		+ 1987 .0203	+ 1985 .0115	
		+ 1988 .0529	+ 1986 .0120	
		+ 1989 .0194	+ 1987 .0371	
			+ 1988 .0104	
			+ 1989 .0127	
<i>ESR</i>			+ 1980 .0849	
			+ 1981 .0657	
			+ 1982 .0473	
			+ 1983 .0404	
			+ 1985 .0696	
			+ 1986 .0759	
<i>EAR</i>				- 1986 .0977
				- 1987 .0283
				- 1988 .0204
				- 1989 .0142
<i>SSR</i>		- 1980 .0412	- 1982 .0640	
		- 1981 .0552	- 1985 .0587	
		- 1982 .1290	- 1986 .0801	
<i>SAR</i>		- 1980 .1064	- 1985 .0057	
		- 1981 .0432	- 1986 .0241	
		- 1982 .0442	- 1987 .0171	
		- 1983 .0467	- 1988 .0058	
		- 1984 .0452		
		- 1985 .0299		
		- 1988 .0307		

TABLE 3
T-Probabilities (And Direction Of Relationship) For Years With Significant Results –
For Responsible Strategy Firms Relative To Firms Choosing The Irresponsible Strategy

Dependent Variables	Without Industry Controls	With Industry Controls	Firms Serving Ultimate Consumer	Firms Serving Industrial Consumer
<i>EV</i>	+ 1980 .0066	+ 1980 .0263	+ 1985 .0074	- 1985 .1258
	+ 1981 .0568	+ 1987 .1081	+ 1986 .0119	- 1988 .0731
	+ 1987 .0634	+ 1989 .0053	+ 1987 .0117	- 1989 .0709
	+ 1988 .0172		+ 1988 .0010	
	+ 1989 .0049		+ 1989 .0004	
<i>ESR</i>			+ 1980 .0721	
			+ 1981 .1111	
			+ 1982 .0466	
			+ 1985 .1367	
			+ 1986 .0238	
			+ 1987 .0194	
			+ 1988 .0167	
		+ 1989 .0046		
<i>EAR</i>				- 1986 .0343
				- 1987 .0403
				- 1988 .1019
				- 1989 .1209
<i>SSR</i>		+ 1984 .0266	+ 1984 .0482	
		+ 1985 .0401	+ 1985 .0688	
		+ 1986 .0218	+ 1986 .0634	
		+ 1987 .0122	+ 1987 .0176	
		+ 1988 .0062	+ 1988 .0260	
		+ 1989 .0062	+ 1989 .0056	
<i>SAR</i>				

TABLE 4
T-Probabilities (And Direction Of Relationship) For Years With Significant Results –
For Ambiguous Strategy Firms Relative To Firms Choosing The Irresponsible Strategy

Dependent Variables	Without Industry Controls	With Industry Controls	Firms Serving Ultimate Consumer	Firms Serving Industrial Consumer
<i>EV</i>			+ 1988 .0334 + 1989 .0175	
<i>ESR</i>				
<i>EAR</i>				
<i>SSR</i>	+ 1980 .0004 + 1981 .0007 + 1982 .0031 + 1983 .0031 + 1984 .0022 + 1985 .0061 + 1986 .0113 + 1987 .0215 + 1988 .0592 + 1989 .0353	+ 1980 .0001 + 1981 .0001 + 1982 .0008 + 1983 .0007 + 1984 .0012 + 1985 .0017 + 1986 .0012 + 1987 .0011 + 1988 .0004 + 1989 .0014	+ 1981 .0231 + 1982 .0264 + 1983 .0098 + 1984 .0037 + 1985 .0010 + 1986 .0015 + 1987 .0009 + 1988 .0011 + 1989 .0009	
<i>SAR</i>		+ 1980 .0007 + 1981 .0018 + 1982 .0033 + 1983 .0081 + 1984 .0127 + 1985 .0431	+ 1980 .0915 + 1981 .0933 + 1982 .0795 + 1983 .0966 + 1984 .1052 + 1985 .0744	

APPENDIX

EV (Excess Value) is defined as the total of market value of equity plus book value of debt less total assets/sales and is operationalized as *Compustat items* $((24 \times 25) + 9 + 34 - 6) / 12$.

ESR (Earnings to Sales Ratio) is defined as operating earnings before depreciation/sales and is operationalized as *Compustat item 13 divided by item 12*.

EAR (Earnings to Asset Ratio) is defined as operating earnings before depreciation/net operating assets and is operationalized as *Compustat item 13 divided by items 8 + 4 - 5*.

SSR (Selling Expense to Sales Ratio) is defined as selling, general & administrative expenses/sales and is operationalized as *Compustat item 189 divided by item 12*.

SAR (Selling Expense to Asset Ratio) is defined as selling, general & administrative expenses/net operating assets and is operationalized as *Compustat item 189 divided by items 8 + 4 - 5*.

SLACK (The Slack Control Variable) is defined as cash flow/investment and is operationalized as *the sum of Compustat items 123, 124, and 125 divided by Compustat item 128*.

BOOK (First of the Fama & French Control Variables) is defined as *the natural log of book equity/market equity*.

SIZE (Second of the Fama & French Control Variables) is defined as *the natural log of the year end price of shares multiplied by the number of shares outstanding*.
